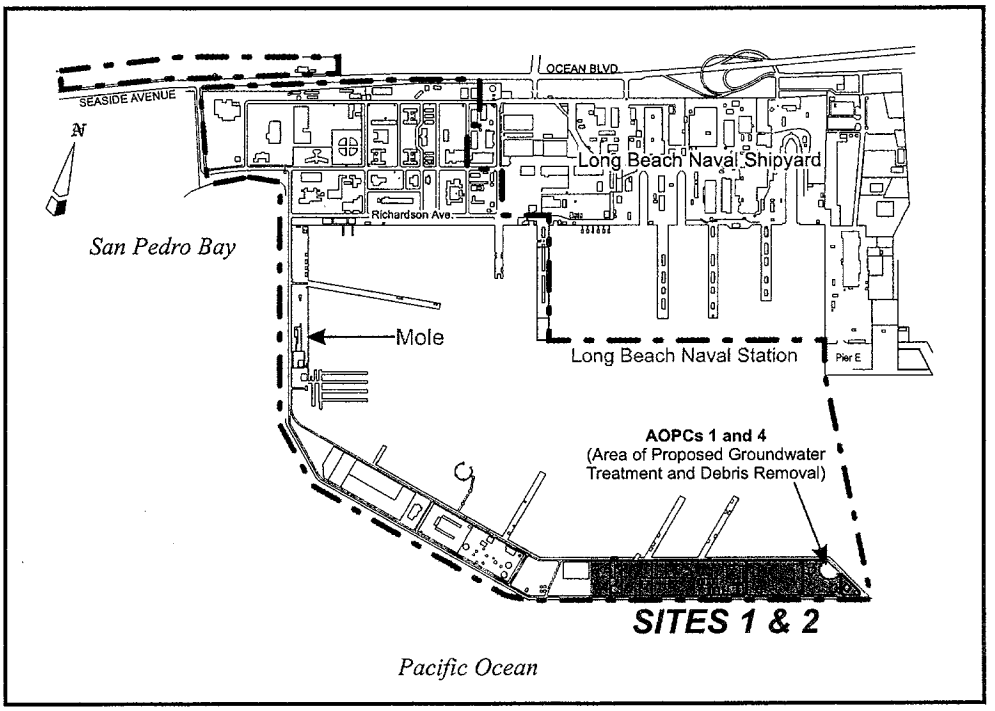
FINAL

Record of Decision for Installation Restoration Sites 1 and 2

Naval Station Long Beach
Long Beach, California



Prepared for

and

NAVAL FACILITIES ENGINEERING SERVICE CENTER
1100 23rd Avenue
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SOUTHWEST DIVISION NAVAL FACILITIES ENGINEERING COMMAND
1220 Pacific Highway
San Diego, California 92132-5190

by

Battelle
. . . Putting Technology To Work
505 King Avenue
Columbus, Ohio 43201-2693

June 2000

DEPARTMENT OF THE NAVY
SOUTHWEST DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
1220 PACIFIC HIGHWAY
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5090
Ser 05CA.TM/0470
June 20, 2000

Ms. Soad Hakim
California Environmental Protection Agency
Department of Toxic Substances Control
5796 Corporate Way
Cypress, CA 90630

Dear Ms. Hakim:

Enclosed is the Final Record of Decision (ROD) for Installation Restoration Sites 1 and 2 located at the former Naval Station Long Beach.

Thank you for your support with this project. We look forward to working with the regulatory agencies while implementing the remedial action.

If you have any questions regarding the ROD, please contact me at (619) 532-0907.

Sincerely,

THOMAS L. MACCHIARELLA, JR.
BRAC Environmental Coordinator
By direction of the Commander

Encl: (1) Record of Decision for Installation Restoration Sites 1 and 2, Naval Station Long Beach, Long Beach California [June 9, 2000]

Copy to:
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U.S. Environmental Protection Agency
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San Francisco, CA 94105

Mr. Steve Anderson
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5090
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Ms. Ana Veloz-Townsend
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P.O. Box 570
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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

June 16, 2000

Mr. Thomas L. Macchiarella Jr.
BRAC Environmental Coordinator
Long Beach Naval Complex
Southwest Division
Naval Facilities Engineering Command
1220 Pacific Highway
San Diego, CA 92132-5190

Dear Mr. Macchiarella:

The United States Environmental Protection Agency, Region IX (USEPA) has received and reviewed the RECORD OF DECISION FOR INSTALLATION RESTORATION SITES 1 AND 2 for the Naval Station Long Beach, Long Beach California, dated May 16, 2000. The Record of Decision (ROD) addresses groundwater contamination and related soil contamination. The chosen remedial alternatives at the sites are designed to reduce levels of contamination to or below those levels acceptable for industrial uses by removal of soil and buried debris and the construction of a combination soil vapor extraction(SVE) / in situ air sparging(IAS) system. Additionally, long-term groundwater monitoring and land use controls in the form of deed restrictions will be implemented. Based upon the Local Reuse Authority(LRA) long term reuse plans, cleanup to industrial standards with deed restrictions will meet the long term goals of the LRA and will be protective of human health and the environment. Long term monitoring will ensure no unacceptable impacts to surface waters occur in the future. The institutional controls will restrict the property to commercial or industrial uses and will prohibit residential and child occupancy uses.

Because the Long Beach Naval Station is not on the National Priorities List, the USEPA does not have a formal concurrence role and will not be signing the ROD. However, the USEPA has been an active participant in the investigation, testing and analysis of the various aspects of the remedial work at these sites. The Department of the Navy (DON) has worked in cooperation with the State of California Department of Toxic Substances Control and the Los Angeles Regional Water Quality Control Board as well as the USEPA in the development of the remedial alternatives and the selection of the final remedy for these sites. Based upon our review of the investigations at these sites and the remedial alternatives evaluated, the USEPA supports the Navy's selected alternatives for these sites.

We wish to thank the Navy for the opportunity to be involved in the work at the Long Beach Naval Complex. We look forward to working with the Navy and regulatory agencies in the future to insure a thorough and safe transfer of all DON property comprising the Long Beach Naval Complex. If you have and questions, please call Martin Hausladen of my staff at (415) 744-2388.

Sincerely,

Daniel A. Meer

Daniel A. Meer
Chief, Federal Facilities Cleanup Branch

cc: John Scandura, DTSC
Dennis A. Dickerson, LARWQCB

FINAL
RECORD OF DECISION FOR
INSTALLATION RESTORATION SITES 1 AND 2,
NAVAL STATION LONG BEACH,
LONG BEACH, CALIFORNIA

June 9, 2000

PREPARED BY:
NAVAL FACILITIES ENGINEERING SERVICE CENTER
1100 23RD AVENUE
PORT HUENEME, CALIFORNIA 93043

SOUTHWEST DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
1220 PACIFIC HIGHWAY
SAN DIEGO, CALIFORNIA 92132-5190

THROUGH:
CONTRACT # N47408-95-D-0730

WITH:
Battelle
Environmental Restoration Department
505 King Avenue
Columbus, Ohio 43201

DECLARATION FOR THE RECORD OF DECISION

Site Name and Location

Installation Restoration (IR) Sites 1 and 2 are located at Naval Station (NAVSTA) Long Beach, Los Angeles County, CA. Both sites are located within Operable Unit 1 (OU 1) at NAVSTA Long Beach on a mole extending into Long Beach Harbor. IR Site 1 is located totally within the boundaries of IR Site 2.

Statement of Basis and Purpose

This decision document presents the selected remedy for IR Sites 1 and 2 located within OU 1 at NAVSTA Long Beach in Long Beach, CA. The remedy was selected in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP).

The remedy was selected based on the information in the administrative record for NAVSTA Long Beach. The primary documents used as the bases for decision making are the *Final Remedial Investigation (RI) Report, Installation Restoration Program for Sites 1 through 6A, Naval Station Long Beach, Long Beach, California* (Bechtel National, Inc. [BNI], 1996) and the *Final Feasibility Study for Installation Restoration Sites 1 and 2, Naval Station Long Beach, Long Beach, California* (Battelle, 1999a).

This document is issued by the Department of the Navy (DON). The DON, with state regulatory oversight, is the lead federal agency for IR site activities. As the lead agency, the DON, with state regulatory concurrence, has the final decision-making authority over the remedy selections and overall public participation activities.

The DON is working in cooperation with the California Environmental Protection Agency (Cal-EPA) Department of Toxic Substances Control (DTSC); the Los Angeles Regional Water Quality Control Board (RWQCB); and the U.S. Environmental Protection Agency (U.S. EPA) in the implementation of this remedy. All involved parties agree with the selected remedy for IR Sites 1 and 2 that is outlined in this Record of Decision (ROD).

Assessment of the Sites

Actual or threatened releases of hazardous substances from IR Sites 1 and 2, if not addressed by implementing the response actions selected in the ROD, may endanger public health and welfare or the environment.

Description of the Selected Remedy

The IR Program at the Long Beach Naval Complex (LBNC) is part of an installation-wide strategy for environmental restoration at the LBNC. It is being conducted in accordance with CERCLA. The strategy is to conduct the IR Program using the CERCLA process as a model, but to continually review the process and accelerate whenever possible. The ultimate goal of the IR Program is to complete the cleanup of all the IR Program sites in accordance with the requirements of CERCLA so that the property can be transferred.

This ROD addresses soil and groundwater contamination at IR Sites 1 and 2. The remedial strategy is to reduce contaminant levels, remove debris and soil, monitor groundwater contaminants, and restrict future land use at the sites. Future land use at IR Sites 1 and 2 will be restricted to industrial use, and contaminant levels in groundwater will be reduced to concentrations that do not exceed the State of California Water Resources Control Board (SWRCB) *California Ocean Plan* (1997) criteria.

A combination of treatment technologies in the form of in situ air sparging (IAS) with soil vapor extraction (SVE), excavation, long-term groundwater monitoring, and land use controls in the form of deed restrictions constitutes the selected remedy for IR Sites 1 and 2. This combination offers the best balance of performance for these sites.

The Reuse Plan, which was developed by the Local Redevelopment Authority (LRA) of the City of Long Beach, CA (City of Long Beach, 1995), designates that the future use of IR Sites 1 and 2 will be industrial in nature. In addition, the transfer of property from the DON to the City of Long Beach, the public benefit conveyance, is set up so that the land can be used for port-related purposes only.

Because IR Sites 1 and 2 will be used by the City of Long Beach for industrial purposes only, the human health risk assessment (HHRA) in the RI (BNI, 1996) assumes an industrial scenario for the sites. The excess lifetime cancer risks (ELCRs) calculated in this HHRA are 4.7×10^{-6} for industrial workers and 1.0×10^{-6} for utility maintenance workers. These risks fall within the U.S. EPA's target range of 1×10^{-6} to 1×10^{-4} for managing cancer risks at sites where industrial exposure scenarios are applied. That is, the HHRA showed that, as long as land use is industrial, between 1 in 1 million and 4.7 in 1 million workers have the potential to develop cancer during their lifetimes as a result of working on the sites.

The hazard indices for non-cancer health effects calculated in the HHRA are less than 1 for both industrial workers and utility maintenance workers. These risks fall within the U.S. EPA's index value of less than 1 to represent acceptable non-cancer health effects. Land use controls in the form of deed restrictions will restrict future land use at IR Sites 1 and 2 to industrial uses.

Both the HHRA and groundwater modeling in the RI show that there are no contaminants of concern (COCs) or areas of concern (AOCs) associated with IR Sites 1 and 2, providing that land use is industrial. However, analytical data indicated the presence of four organic compounds

(1,1-dichloroethene [DCE], benzene, trichloroethene [TCE], and vinyl chloride [VC]) in groundwater at concentrations in excess of *California Ocean Plan* criteria (SWRCB, 1995). These contaminants are present in a groundwater plume at the eastern end of the mole (Gull Park) where IR Sites 1 and 2 are located. Because of the location of the plume, the prevalent movement of groundwater toward ocean waters, and the concentrations of these organic compounds, the groundwater at the eastern end of the mole (Gull Park) at IR Sites 1 and 2 will be treated using IAS with SVE.

Groundwater remediation goals are based on removing contaminants to levels at or below *California Ocean Plan* criteria (SWRCB, 1997), as measured through groundwater monitoring wells. Groundwater monitoring will be conducted to verify attainment of groundwater remediation goals.

The major components of the selected remedy are as follows:

- Use IAS with SVE to remediate the groundwater contaminant plume at the eastern end of the mole (Gull Park).
- Locate, remove, and dispose of cans, drums, other debris, and soil clinging to the debris from the area overlying the groundwater contaminant plume at the eastern end of the mole (Gull Park).
- Conduct quarterly groundwater monitoring throughout the remedial action phase and for one year, at a minimum, following completion of the remedy to monitor plume movements and to verify attainment of groundwater cleanup goals. In addition to the five monitoring wells, three additional wells will be installed, for a total of eight monitoring wells to be sampled each quarter.
- Implement land use controls.

The rationale for selecting and implementing treatment technologies in the form of IAS with SVE, excavation, long-term groundwater monitoring, and land use controls in the form of deed restrictions at IR Sites 1 and 2 is as follows:

- IAS with SVE will be used to treat contaminated groundwater in the plume at the eastern end of the mole (Gull Park) at IR Sites 1 and 2 to prevent groundwater contaminants at concentrations in excess of *California Ocean Plan* criteria from migrating to marine ecosystems.
- Removal and disposal of cans, drums, other debris, and soil clinging to the debris from the area overlying the groundwater contaminant plume at the eastern end of the mole (Gull Park) will eliminate existing and future sources of contamination.

- Long-term groundwater monitoring will monitor concentrations of groundwater contaminants and plume movements to verify that remediation goals are being met. Groundwater monitoring, which is ongoing at IR Sites 1 and 2, will continue through the remedial action phase and for one year, at a minimum, following completion of the remedy.

- Land use controls in the form of deed restrictions will be implemented upon property transfer of IR Sites 1 and 2 through the use of restrictive covenants in the deed that the United States gives to the City of Long Beach. Restrictions will include provisions to prevent disturbance of monitoring systems and restrictions on land use for residential purposes, types of construction allowed, and use of groundwater.

On March 16, 2000, the DON and the DTSC executed a memorandum of agreement (MOA) (DON, 2000). The purposes of the MOA were to:

- Formalize the use of two model Environmental Restriction Covenants and Agreements

- Describe under what specific conditions the Environmental Restriction Covenant and Agreement would be used to give DTSC the same authority as the DON to enforce environmental restrictions imposed on transferring parcels of property.

The Environmental Restriction Covenant will contain environmental restrictions and will serve as a mechanism to implement the institutional control use restrictions set forth in Section 11.4.1 of the ROD in accordance with DON policy. Once the Environmental Restriction Covenant and Agreement is finalized, it will be executed contemporaneously with the negotiation and execution of the conveyance of the property to the transferee(s) by deed pursuant to the Defense Base Closure and Realignment Act of 1990, 10 USC Section 2687 note.

Remedial Action Plan

The California Health and Safety Code (HSC), Section 25356.1 Remedial Action Plan (RAP) requirements have been incorporated into the ROD to fulfill state requirements. A copy of the California H&SC Section 25356.1 is included in the ROD as Appendix A.

Statutory Determinations

The selected remedy is protective of human health and the environment, complies with federal and state requirements that are applicable or relevant and appropriate to the remedial action, is cost-effective, and uses permanent solutions and alternative treatment technologies to the maximum extent practicable. This remedy also satisfies the statutory preference for treatment as a

principal element of the remedy (i.e., reduces the toxicity, mobility, or volume of contaminants as a principal element through treatment).

Because this remedy will result in contaminants remaining on site above levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted within five years after initiation of the remedial action to ensure that the remedy is, or will be, protective of human health and the environment.

PAGE NO. viii

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FOR THE UNITED STATES DEPARTMENT OF THE NAVY, SOUTHWEST DIVISION, NAVAL FACILITIES ENGINEERING COMMAND, SAN DIEGO:

Thomas M. Machiarella
BRAC Environmental Coordinator
Southwest Division
Naval Facilities Engineering Command

7 June 00
Date

FOR THE STATE OF CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY:

John E. Scandura, Chief
Department of Toxic Substances Control
Southern California Branch
Office of Military Facilities

6/7/00
Date

Dennis A. Dickerson
Executive Officer
California Regional Water Quality Control Board
Los Angeles Region

6/7/00
Date

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ACRONYMS AND ABBREVIATIONS

ACGIH	American Conference of Governmental Industrial Hygienists
AOC	area of concern
AOPC	area of potential concern
AQMD	Air Quality Management District
ARCO	Atlantic Richfield Company
ARAR	applicable or relevant and appropriate requirement
BCP	Base Realignment and Closure Cleanup Plan
bgs	below ground surface
BNI	Bechtel National, Inc.
BRAC	Base Realignment and Closure
BTEX	benzene, toluene, ethylbenzene, and xylenes
CAA	Clean Air Act
Cal-EPA	State of California Environmental Protection Agency
CCR	California Code of Regulations
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act (of 1980)
CFR	Code of Federal Regulations
CLP	contract laboratory program
COC	contaminant of concern
COPC	contaminant of potential concern
CPT	cone penetrometer test
CRDL	contract required detection limit
CRP	community relations plan
CWA	Clean Water Act (of 1972)
DCA	dichloroethane
DCB	dichlorobenzene
DCE	dichloroethene
DHS	State of California Department of Health Services
dL	deciliter
DON	Department of the Navy
DTSC	Department of Toxic Substances Control
DWC	Dominguez Water Corporation
DWR	State of California Department of Water Resources
ELCR	excess lifetime cancer risk
EM	electromagnetic

FEMA	Federal Emergency Management Agency
FOSET	finding of suitability for early transfer
FOST	finding of suitability for transfer
FS	feasibility study
GAC	granular activated carbon
HSC	Health and Safety Code
HHRA	human health risk assessment
HP	Hydropunch™
IAS	in situ air sparging
IDL	instrument detection limit
IR	Installation Restoration
JEG	Jacobs Engineering Group, Inc.
kg	kilogram
L	liter
LBNC	Long Beach Naval Complex
LBNSY	Long Beach Naval Shipyard
LRA	Local Redevelopment Authority
LUC	land use covenant
MARAD	Maritime Administration of the Department of Transportation
MCL	maximum contaminant level
mg	milligram
MOA	Memorandum of Agreement
msl	mean sea level
MW	monitoring well
NA	not applicable (unless otherwise noted)
NAVSTA	Naval Station
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
ND	not detected
NFA	no further action
NISZ	Newport-Inglewood Structural Zone
O&M	operation and maintenance
OU 1	Operable Unit 1
PAH	polynuclear aromatic hydrocarbon
PCB	polychlorinated biphenyl

PCE	perchloroethene
ppm	parts per million
PRG	preliminary remediation goal
QC	quality control
RAB	Restoration Advisory Board
RAP	remedial action plan
RBC	risk-based concentration
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
RI	Remedial Investigation
ROD	record of decision
RWQCB	Regional Water Quality Control Board
SARA	Superfund Amendments and Reauthorization Act (of 1986)
SB	soil boring
SCE-LBGS	Southern California Edison Long Beach Generating Station
SFA	supplemental field activity
SI	site investigation
STLC	soluble threshold limit concentration
SVE	soil vapor extraction
SVOC	semivolatile organic compound
SWRCB	State of California Water Resources Control Board
TAL	target analyte list
TBC	to be considered
TCE	trichloroethene
TCLP	Toxicity Characteristic Leaching Procedure
TDS	total dissolved solids
TRPH	total recoverable petroleum hydrocarbon
TSCA	Toxic Substances Control Act
TSD	treatment, storage, and disposal
TTLC	total threshold limit concentration
UNOCAL	Union Oil of California
USC	United States Code
U.S. EPA	U.S. Environmental Protection Agency
VC	vinyl chloride
VOC	volatile organic compound
µg	microgram
µg/dL	micrograms per deciliter
µg/kg	micrograms per kilogram

1.0: SITE NAME, LOCATION, AND DESCRIPTION

Installation Restoration (IR) Sites 1 and 2 are located at Naval Station (NAVSTA) Long Beach, Los Angeles County, CA. The Department of the Navy (DON) is the lead federal agency for selecting and implementing remedial activities at these sites. The State of California Environmental Protection Agency (Cal-EPA) Department of Toxic Substances Control (DTSC) and the California Regional Water Quality Control Board (RWQCB), Los Angeles Region, provide oversight and concurrence.

1.1 Name and Location of Installation Restoration Sites 1 and 2

NAVSTA Long Beach is located in the western portion of the Long Beach Naval Complex (LBNC), Long Beach, CA. The LBNC is made up of the NAVSTA and the Long Beach Naval Shipyard (LBNSY), on the south side of Terminal Island within the Los Angeles and Long Beach Harbor districts, approximately 24 miles south of downtown Los Angeles. The NAVSTA is bounded by oil fields and container yards to the north, the Los Angeles Harbor facility to the west, the San Pedro Bay to the south, and the LBNSY to the east (Bechtel National, Inc. [BNI], 1996). Figure 1-1 is a map of the LBNC.

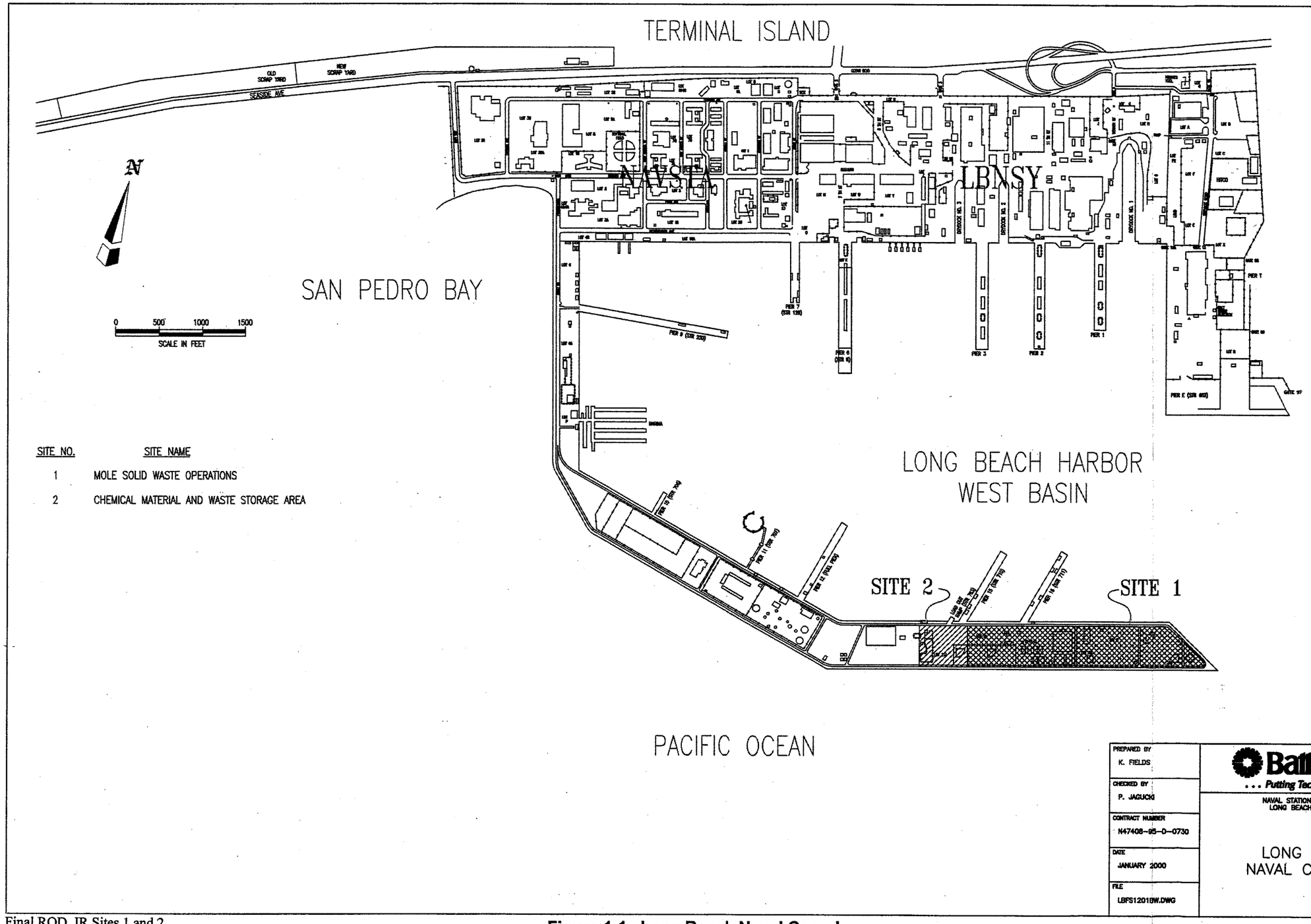
The NAVSTA property consists of the following:

- The western portion of the LBNC, including the mole
- Most of the Long Beach Harbor West Basin and submerged perimeter lands
- The western and southern edges of Pier E
- The strip of land bounded by Seaside Avenue and Ocean Boulevard to the south, and Union Pacific Railroad tracks to the north (BNI, 1996).

IR Sites 1 (Mole Solid Waste Operations) and 2 (Chemical Material and Waste Storage Area) are located within Operable Unit 1 (OU 1) at NAVSTA Long Beach, on the mole extending into Long Beach Harbor. IR Site 1 is located totally within the boundaries of IR Site 2. Figure 1-1 shows the location of these sites at the LBNC.

1.2 Regional Area and Setting

This section describes areas within and adjacent to the NAVSTA facility. Topics discussed in the following subsections include physiography, climate, geology, hydrology and flood potential, hydrogeology, groundwater and surface water use, seismic activity, and the surrounding land use and populations.



SITE NO.	SITE NAME
1	MOLE SOLID WASTE OPERATIONS
2	CHEMICAL MATERIAL AND WASTE STORAGE AREA

PREPARED BY: K. FIELDS	Battelle ... Putting Technology To Work
CHECKED BY: P. JAGUCKI	NAVAL STATION LONG BEACH LONG BEACH, CALIFORNIA
CONTRACT NUMBER: N47408-95-D-0730	LONG BEACH NAVAL COMPLEX
DATE: JANUARY 2000	
FILE: LBFS12016W.DWG	

Figure 1-1. Long Beach Naval Complex

1.2.1 Physiography

The LBNC property is located within the West Coast Basin, which extends from the Ballona Escarpment (at the south edge of Ballona Gap) and Baldwin Hills on the northwest, to the San Gabriel River on the southeast. The LBNC property is located within the Dominguez Gap area of the basin. Dominguez Gap consists of a nearly flat, broad, marine terrace platform which is incised by the roughly north-south oriented river channel, and is eroded and partially backfilled by the ancestral Los Angeles River (BNI, 1996).

The LBNC property is relatively flat, with less than 35 feet total relief. The highest part of the LBNC, the area along Pier T (eastern part of the LBNSY), varies from less than 15 feet above mean sea level (msl) at its northern end to more than 20 feet above msl at its southern end. The lowest portion of the facility, the area northeast of Drydock No. 1, is less than 10 feet below msl. The top of the mole is between 12 and 15 feet above msl.

1.2.2 Climate

The local climate is classified as Mediterranean. It is characterized by warm, dry summers and mild winters. High pressure over the Los Angeles coastal basin blocks moist ocean air masses during most of the year. During winter months, however, the high-pressure system weakens, allowing storms from the northern Pacific Ocean to move into the area. For this reason, precipitation commonly occurs between November and March, and is generally less than 12 inches annually. The dominant wind direction is westerly (on shore). At night, however, cooled air from the mountains and hills typically flows down the valleys to the coast, producing a gentle offshore flow. During the late summer, winds may blow offshore as well. These northeasterly winds, referred to as Santa Ana winds, are high-speed, gusty winds that occasionally exceed 80 miles per hour (DON, 1983).

1.2.3 Geology

The geology of the West Coast Basin consists of up to about 14,000 feet of Miocene to Recent marine and continental sediments, which overlie pre-Miocene basement material. Stratigraphically, the upper 500 to 700 feet is composed of the San Pedro Formation, Lakewood Formation, Holocene (Recent) sediments, and constructed fill. Detailed information about site stratigraphy can be found in the Remedial Investigation (RI) report (BNI, 1996).

The LBNC is located in the northern part of the Peninsular Range Geomorphic Province, which is dominated by northwest-trending geologic structures. The dominant structural feature in the Long Beach area is the Newport-Inglewood Structural Zone (NISZ), expressed 4 miles northeast of the LBNC by a chain of elongated low hills and fault scarps caused by northwest-trending, left-stepping, en echelon faulting (Randall et al., 1983). Detailed information about major subsurface features and subsidence problems near the LBNC can be found in the RI report (BNI, 1996).

1.2.4 Hydrology and Flood Potential

Several surface water features, including beaches, parks, refuges, reserves, and rivers, are located within a 5-mile radius of the LBNC. There are no reported surface intakes for drinking water within a 15-mile radius of the LBNC. Terminal Island is surrounded by the following surface water bodies: Long Beach Middle Harbor West Basin, between the mole and mainland portion of LBNC; Long Beach Outer Harbor (San Pedro Bay), south and west of the mole; Los Angeles Main Channel and Turning and East Basins, on the west and northwest sides of Terminal Island; Cerritos Channel, on the northeast; and Back Channel, on the east. A breakwater separating San Pedro Bay from the Pacific Ocean is located about 1.6 miles south of the mole. The Los Angeles River drains into San Pedro Bay at a point located about 1 mile east of the LBNC. The Dominguez Channel drains into the East Basin on the north side of Terminal Island between the Cerritos and Los Angeles Main Channels. Except for West Basin, there are no surface water bodies within the boundary of the LBNC.

Surface water drainage within the main portion of the LBNC generally is toward its lowest topographic area, northeast of Drydock No. 1. Storm drains located throughout LBNC collect surface water runoff and convey it from the main portion of the LBNC to pump stations, which then discharge the water to the West Basin in compliance with the appropriate discharge permits. On the north side of the mole, storm drains convey runoff into the West Basin. On the south side, runoff is conveyed to the outer harbor (Jacobs Engineering Group, Inc. [JEG], 1992).

According to Federal Emergency Management Agency (FEMA) flood insurance rate maps, Terminal Island is not within an area considered susceptible to flooding during a statistical 100- or 500-year flood (JEG, 1992). However, portions of the LBNSY are below msl as a result of subsidence. These areas could be susceptible to flooding during high tide conditions if there were a breach of a seawall, or in the event of high precipitation and a failure of the storm water pumping system.

1.2.5 Hydrogeology

The Wilmington/Long Beach area has been designated by the California RWQCB, Los Angeles Region, as part of the southern portion of the West Coast Basin (RWQCB, 1975). Several water supply production zones (aquifers) have been identified within the Recent deposits, the upper Pleistocene Lakewood Formation, and the lower Pleistocene San Pedro Formation.

The shallowest water-bearing zone beneath Terminal Island is in the surficial deposits, and comprises the constructed fills and near-surface native soils (upper Recent deposits). Groundwater is encountered in these sediments generally at a depth between ground level and 25 feet below ground surface (bgs), with the depth depending at least in part on ground surface elevation. Detailed information about the major aquifers reported in the West Coast Basin can be found in the RI report (BNI, 1996). Although these major aquifers are important water-producing zones within the West Coast Basin, contamination by seawater intrusion has limited their usefulness in areas near the coast, including the Terminal Island area. Terminal Island is surrounded by saline surface waters and groundwater in the upper Recent deposits. It is saline

and nonpotable. Its mineral content approaches that of seawater (JEG, 1993). The upper Recent deposits are not identified as a water-producing zone by the State of California Department of Water Resources (DWR) (BNI, 1996). Several pumping stations that may be influencing the groundwater flow regime have been identified on or near the eastern part of Terminal Island. A list of pumping activities is provided in the RI report (BNI, 1996).

Because of high concentrations of total dissolved solids (TDS), groundwater within the mole is exempted from some beneficial use designations (see Section 1.4). In addition, Regional Board Resolution No. 98-18, adopted November 2, 1998 by the Los Angeles Regional Water Quality Control Board, modified the regulatory provisions of the Water Quality Control Plan for the Los Angeles Region by removing the beneficial use designation from the aquifers underlying Terminal Island, which includes LBNC. The Resolution was approved by the California Office of Administrative Law by their Notice of Approval dated February 9, 2000.

1.2.6 Groundwater and Surface Water Use

Two active municipal groundwater wells are located within 4 miles of the LBNC. Both wells are located inland of the Dominguez Gap Injection Barrier. They are operated by the Dominguez Water Corporation (DWC) and reportedly produce from the Silverado aquifer. The wells are typically operated between March and August each year and are dormant between August and March, when it is less expensive to purchase imported water.

Several active industrial water supply wells are located within 5 miles of the LBNC. These include at least seven active wells operated by the Atlantic Richfield Company (ARCO), two operated by Texaco Refining and Marketing, Inc., and two operated by Union Oil of California (UNOCAL) (DWR, 1994). The wells are located inland from the Dominguez Gap Injection Barrier, and generally produce from the Silverado aquifer.

Water supply to the LBNC is provided by the Cities of Long Beach and Los Angeles. The City of Long Beach supplies water for the LBNSY. No groundwater is used for water supply at the LBNC (BNI, 1996).

1.2.7 Seismic Activity

The LBNC is located near two known major faults: the Newport-Inglewood fault zone, located about 4 miles northeast of the LBNC; and the Palos Verdes fault, located about 1.2 miles south-west of the mole. Detailed information about historical seismic activity of the two faults can be found in the RI report (BNI, 1996).

The San Andreas and San Jacinto faults are more distant faults that could produce significant ground shaking at LBNC. Because no known active faults actually pass through the LBNC, fault rupture at the site is not considered to be a credible hazard. Shallow groundwater conditions and the presence of deep, relatively cohesionless soils make liquifaction a concern in the event of significant ground shaking (BNI, 1996).

1.2.8 Surrounding Land Use and Populations

Land use in the vicinity of the LBNC is port-related, commercial, or industrial (see Figure 1-2). Residential areas are located more than 2 miles from the LBNC. On Terminal Island, the areas west and east of the LBNC are used for commercial shipping, liquid bulk handling, heavy industrial activities, and commercial fishing activities. The area north of the facility is used for oil production activities.

Land use for the area adjacent to the LBNC includes primarily port uses, tank farms, automobile terminals, a cement terminal, cargo handling, cargo terminals, and the Southern California Edison Long Beach Generating Station (SCE-LBGS). Located west of Terminal Island is the Port of Los Angeles, which has general cargo, liquid bulk, commercial fishing, institutional, industrial, container handling, and other commercial and recreational uses.

The Reuse Plan developed by the Local Redevelopment Authority (LRA) of the City of Long Beach, CA designates that future use of the land will be industrial in nature (City of Long Beach, 1995).

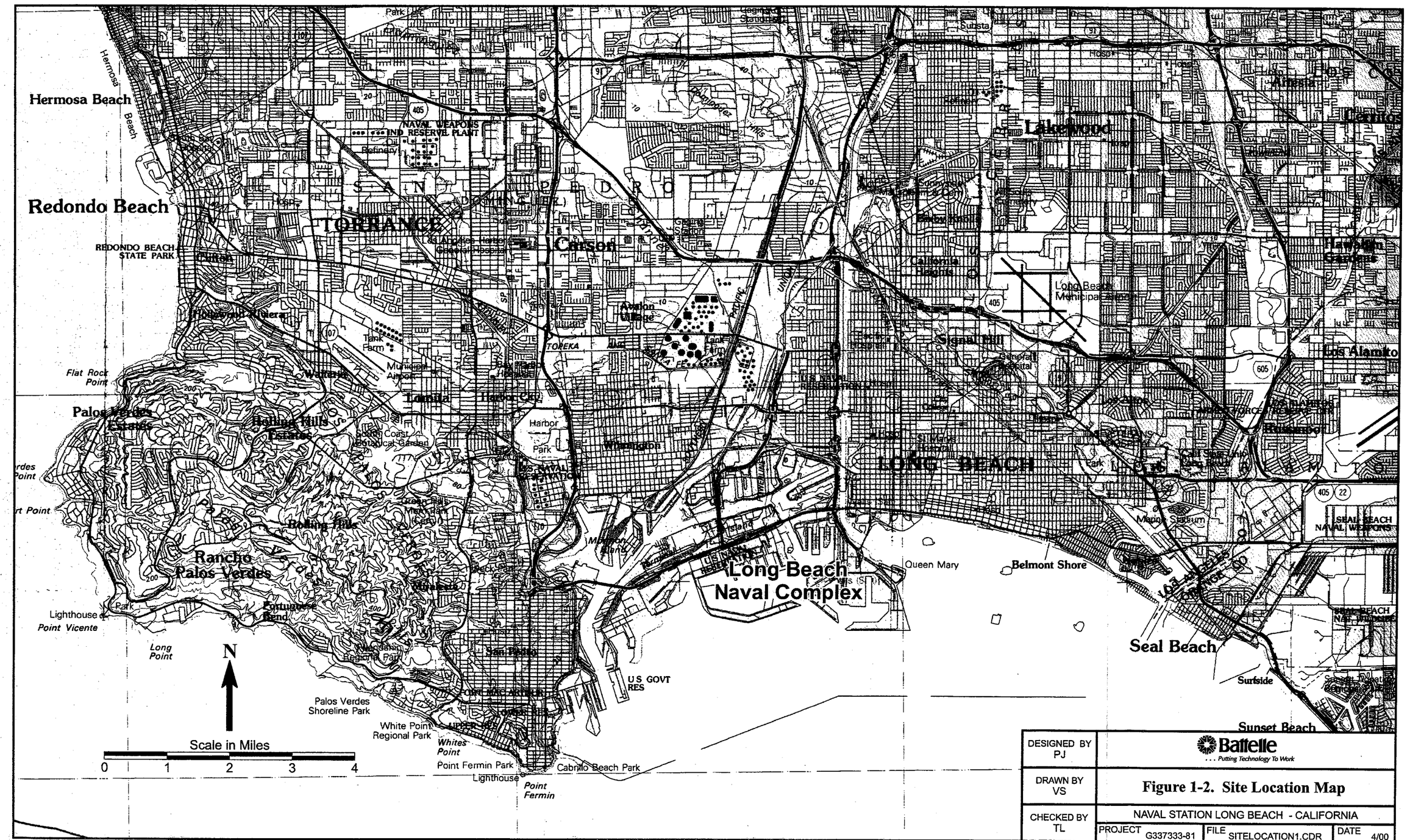
1.3 Site Description

This section describes the site arrangement and significant features associated with IR Sites 1 and 2. Because IR Site 1 is located totally within the boundaries of IR Site 2 (see Figure 1-1), they have been combined for the purposes of site description.

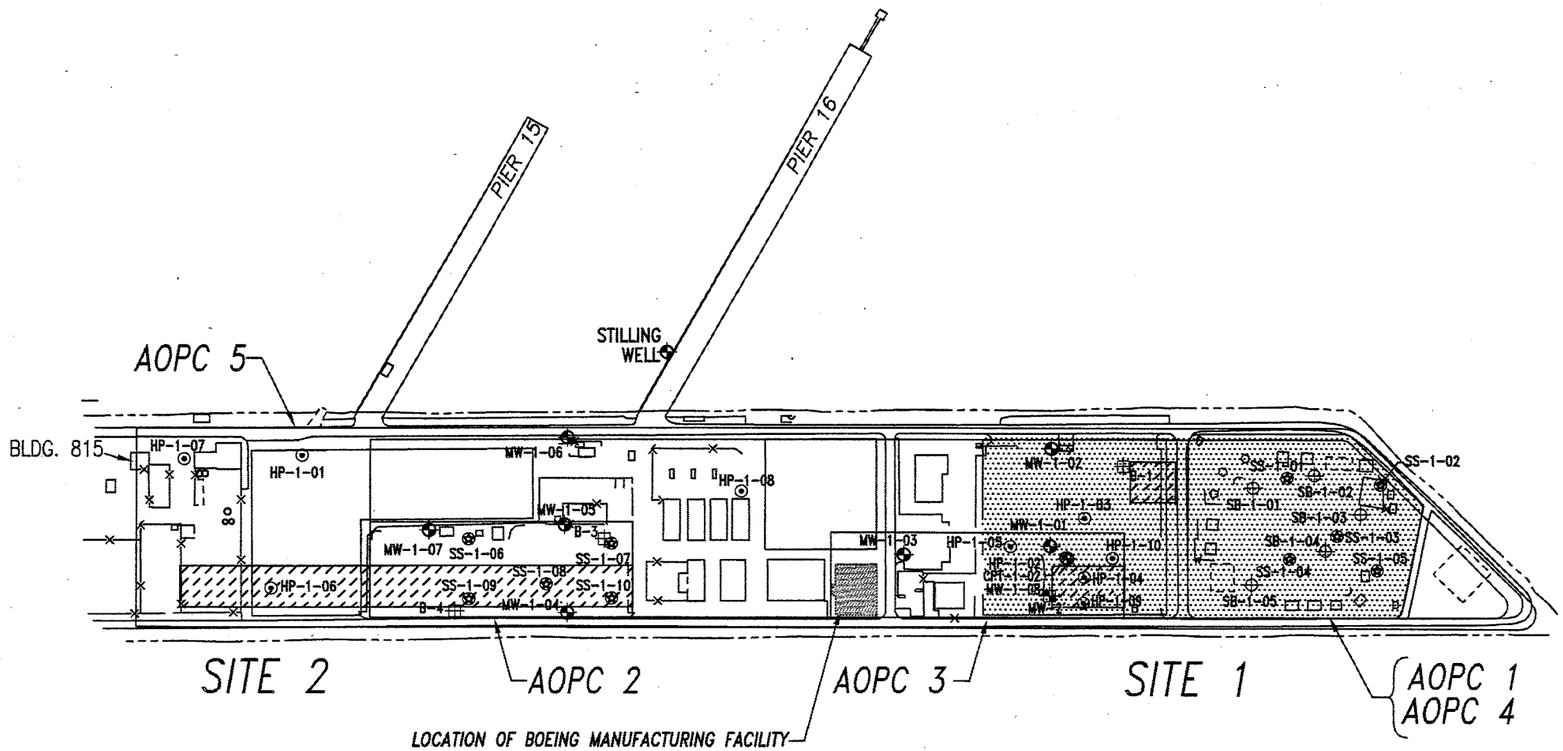
IR Site 1 covers the area on the mole extending approximately from Pier 15 to the east end of the mole. IR Site 2 covers the same general area, but extends approximately from Building 815 on the west to the eastern boundary of the mole. The total area is approximately 33 acres. Figure 1-3 is a map of IR Sites 1 and 2. The sites contain many buildings and recreational areas, including ballfields and a park. Primary activities in the area are waterfront fleet support and parking. West Basin, Middle Long Beach Harbor, and San Pedro Bay border the mole. Access to IR Sites 1 and 2 is limited by the security provided by the Port of Long Beach at the NAVSTA. Additional security is provided in some areas via chain-link fences. However, the water edge of the sites is not secured by fences.

In the RI report (BNI, 1996) and the Feasibility Study (FS) (Battelle, 1999a), IR Sites 1 and 2 are divided into several areas of potential concern (AOPCs), as shown in Figure 1-3. AOPCs are areas where site-specific information indicates that the potential for contamination is similar and is assumed to be homogeneous. The following descriptions delineate the AOPCs as presented in the RI report and the FS:

- **AOPC 1.** Surface soils (0 to 1 foot bgs) in Gull Park are considered to be within the same potential area of surface spills, dust suppression activities, shallow earthworks, and trench-and-fill activities, which may include cans, drums, and other debris.



DESIGNED BY PJ	Battelle … Putting Technology To Work
DRAWN BY VS	**Figure 1-2. Site Location Map**
CHECKED BY TL	NAVAL STATION LONG BEACH - CALIFORNIA
	PROJECT G337333-81 · FILE SITELOCATION1.CDR · DATE 4/00



N

LEGEND

SI SAMPLING LOCATIONS

- SOIL BORING (SB or B)
- MONITORING WELL (MW)

RI/FS SAMPLING LOCATIONS

- CONE PENETROMETER TEST (CPT)
- HYDROPUNCH™ (HP)
- SOIL BORING (SB or B)
- MONITORING WELL (MW)
- SURFACE SOIL SAMPLE

AOPC = AREA OF POTENTIAL CONCERN
MLLW = MEAN LOWER LOW WATER

SITE BOUNDARY

AREA OF POTENTIAL CONCERN (AOPC) BOUNDARY

AREA OF GEOPHYSICAL EXPLORATION

FORMER DRUM STORAGE AREAS (U.S. DON, 1983)

BOEING MANUFACTURING FACILITY

NOTE:

1. SAMPLE LOCATIONS ARE APPROXIMATE. LOCATIONS SHOWN INCLUDE ALL SI AND RI SAMPLE POINTS.
2. MAP TAKEN FROM THE RI REPORT (BNI, 1996).
3. STILLING WELL USED FOR MEASURING ELEVATION OF SURFACE WATER.

0 500

SCALE IN FEET

AOPC 1 – SURFACE SOILS (GULL PARK)

AOPC 2 – SURFACE SOILS (WESTERN BALLFIELD)

AOPC 3 – SUBSURFACE SOILS AND GROUNDWATER (BURNING AREA)

AOPC 4 – SUBSURFACE SOILS (GULL PARK)

AOPC 5 – ALL OTHER SUBSURFACE SOIL AND GROUNDWATER

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CHECKED BY: P. JAGUCKI	NAVAL STATION LONG BEACH LONG BEACH, CALIFORNIA
CONTRACT NUMBER: N474408-95-D-0730	MAP OF IR SITES 1 AND 2 SHOWING AOPCs AND WELLS
DATE: MARCH 1998	
FILE: LBFS1202.DWG	

Figure 1-3. Map of IR Sites 1 and 2 Showing AOPCs and Wells

- **AOPC 2.** Surface soils (0 to 1 foot bgs) in Western Ballfield are considered to be within the same potential bilge water disposal area, and are bounded by the mole and asphalt pavement.

- **AOPC 3.** Subsurface soils (deeper than 1 foot bgs) and groundwater in AOPC 3 are considered to be within the same potential area of contamination related to burning of wastes in the Burn Pit Area from the early 1940s to the 1970s.

- **AOPC 4.** Subsurface soils (deeper than 1 foot bgs) in Gull Park are considered to be within an area of similar earthwork and trench-and-fill activities, which may include cans, drums, and other debris.

- **AOPC 5.** Subsurface soils (deeper than 1 foot bgs) and groundwater on the rest of IR Sites 1 and 2 are considered to be within the same potential area of chemical storage and spills.

1.4 IR Sites 1 and 2 Geology and Hydrogeology

This section describes the geology and hydrogeology of IR Sites 1 and 2. Geologic and hydrogeologic information for IR Sites 1 and 2 is based on IR site investigation borehole logs, cone penetrometer test (CPT) soundings, geotechnical laboratory data, and available historic data, and can be found in greater detail in the RI report (BNI, 1996). Because IR Site 1 is located totally within the boundaries of IR Site 2 (see Figure 1-1), they have been combined for the purposes of geologic and hydrogeologic description.

Soils below IR Sites 1 and 2 consist of areas of burn and construction debris and hydraulically and mechanically placed native sediments and fill materials. Construction debris consists of gravel, sand, and silt mixtures with fragments of glass, wood, brick, metal, and net-like wastes. Fill materials exist to about 45 feet bgs and consist of lenses and pockets of loose to medium dense, predominantly fine-grained sand, silty sand, soft to firm sandy silt, and silt, with local lenses of shells throughout. Native materials in the vicinity of CPT sounding CPT-1-02 (see Figure 1-3) begin below the fill materials and consist of, in ascending order, clean sand; a 17-foot-thick layer of interbedded fine-grained silty clay to clay, sandy silt, and silty sand; a 10- to 12-foot-layer of sand to silty sand; and an 8-foot-thick layer of sandy silt to silt.

Within Gull Park (AOPCs 1 and 4; see Figure 1-3), the undifferentiated mechanical and hydraulic fill materials consist of mixtures of loose to medium dense, predominantly finer-grained sandy silts, with lesser amounts of interlayered clayey silts, silts, and silty sands to sands. CPT soundings were made to a depth of about 80 feet bgs. These soundings showed that the fill materials in the area of AOPC 4 have a thickness of about 45 to 49 feet. The native materials under the fill materials in the vicinity of Hydropunch™/CPT soundings HP/CPT-1-11, HP/CPT-1-25, and HP/CPT-1-27 (see Figure 5-3) consist of, in ascending order, a series of interlayered sandy silts, silty sands, clayey silts, and silty clays (fine-grained interval); an 11- to 22-foot-thick

sand to silty sand layer (upper coarse-grained interval); and a 7- to 8-foot-thick sandy silt to clayey silt layer (bay deposits).

The depth to groundwater beneath IR Sites 1 and 2 typically is between 9 and 11 feet bgs. Some variation in groundwater depth may be the result of tidal fluctuation at the time of measurement (see Section 1.5). The depth to groundwater defines the thickness of the vadose zone beneath the site. Groundwater monitoring data indicate that the vadose zone is approximately 10 feet thick.

TDS concentrations on the mole (including IR Sites 1 and 2) range from 3,520 mg/L to 35,800 mg/L (brackish to saline). Initial bore water in the mole was either placed along with the marine sediments during construction or infiltrated from the harbor immediately after bringing the mole surface elevation up to sea level during construction. Therefore, the original TDS of groundwater beneath the mole was that of seawater. The lower TDS concentrations are probably the result of (1) infiltration and percolation of rainwater in the noncovered areas, such as ball parks or green areas, and (2) the irrigation of noncovered areas.

The State of California Water Resources Control Board (SWRCB) Resolution 88-63 ("Sources of Drinking Water" policy) designates all waters of the state to be suitable or potentially suitable as sources of drinking water, except waters with existing high dissolved solids (TDS greater than 3,000 mg/L), low sustainable yield (less than 200 gallons per day for a single well), and waters with contamination that cannot be treated for domestic use using best management practices or best economically achievable treatment practices. The groundwater at IR Sites 1 and 2 exceeds 3,000 mg/L TDS. Proposed U.S. Environmental Protection Agency (U.S. EPA) guidelines may classify an aquifer as a potential source of drinking water if it contains less than 10,000 mg/L TDS. The groundwater in the aquifer at IR Sites 1 and 2 generally exceeds 10,000 mg/L TDS. The DON proposed, therefore, that it is unnecessary to remediate the groundwater to protect the beneficial use of municipal or domestic water supply. The RWQCB agreed that, at the LBNC, the groundwater meets the cited exceptions in Resolution 88-63.

Regional Board Resolution No. 98-18, adopted November 2, 1998 by the Los Angeles Regional Water Quality Control Board, modified the regulatory provisions of the Water Quality Control Plan for the Los Angeles Region by removing the beneficial use designation from the aquifers underlying Terminal Island, which includes LBNC. The Resolution was approved by the California Office of Administrative Law by their Notice of Approval dated February 9, 2000.

The potential exists for groundwater containing concentrations of constituents that may exceed the water quality objectives of the *California Ocean Plan* (SWRCB, 1997) to migrate to surface waters. The selected remedy includes monitoring to evaluate such migration.

1.5 Tidal Influences at IR Sites 1 and 2

Plots of harbor and groundwater elevations versus time (hydrographs) showed that groundwater elevations beneath the mole were influenced by harbor tides (BNI, 1996). In addition, a 5- to 11-day tidal survey of 8 shallow monitoring wells (MW-1-01, MW-1-02, MW-1-03, MW-1-04,

MW-1-05, MW-1-06, MW-1-07, and MW-2, as shown in Figure 1-3), indicated that the shallow water-bearing units throughout IR Sites 1 and 2 are influenced by harbor tides (BNI, 1996). The fluctuation of groundwater elevations observed at the mole appears to be a response of pore water pressures to the tidal cycles rather than actual saltwater intrusion to the center of the mole. Essentially, the water table fluctuation observed at the monitoring wells on the mole represents a "pore-pressure wave" effect in response to the tidal influence. The tidal response for wells located in the central part of the mole is generally less than that for wells located near the edge of the mole. Differences in tidal response are generally attributed to distance from shoreline.

Horizontal and vertical flows resulting from tidal influences are significant only in the shoreline riprap and the mixing zone in groundwater immediately adjacent to the riprap. The tidal response in most of the mole, beyond a narrow mixing zone along the riprap, is a response to the pressure wave created by the tide and does not indicate that flow is occurring. However, wells with mean groundwater elevations higher than those calculated for the harbor indicate that groundwater is flowing from the mole to the harbor on a long-term net basis. Wells with lower mean elevations indicate net flow from the harbor into the mole.

2.0: SITE HISTORY AND ENFORCEMENT ACTIVITIES

Because IR Site 1 is located totally within the boundaries of IR Site 2 (see Figure 1-1), they have been combined for discussions of site history and enforcement.

2.1 History of IR Sites 1 and 2

Beginning in the mid-1940s and continuing until the mid-1960s, landfilling of solid wastes occurred within the boundaries of IR Sites 1 and 2 (DON, 1983). Solid wastes, including empty wooden and cardboard boxes, construction and demolition debris, rags, and other shipyard trash, also were burned at these sites (DON, 1983). A map from 1950 was used to identify a 200-by-700-foot burn pit area. Quantities of liquid or chemical wastes disposed of during the landfilling operations were not reported and therefore are unknown.

Beginning in the mid-1960s until 1980, the LBNSY Public Works Department, production shops, and ships stored waste drums of raw chemicals on pallets in the area defined as IR Site 2 (DON, 1983). Noticeable leakage of liquid from damaged drums reportedly occurred, including releases of waste oils, acids, solvents, paints, and chromic acid. Total spillage of wastes to the ground surface was estimated to be less than 3,000 gallons (DON, 1983).

Presently, IR Sites 1 and 2 contain various buildings and recreational areas, including ballfields and a park.

IR Sites 1 and 2 were identified as potentially contaminated sites during an initial assessment study in 1983 (DON, 1983). The sites also were included in the Resource Conservation and Recovery Act (RCRA) Facility Assessment (RFA) conducted by the State of California Department of Health Services (DHS) in 1989, which recommended that further action be taken to investigate potential releases and exposure pathways (DHS, 1989). This recommendation resulted in a site investigation, which was conducted in 1991 (JEG, 1992).

The site investigation included collecting subsurface and groundwater samples to verify the presence of hazardous chemicals, evaluating potential migration pathways and targets, and assessing whether further action was warranted (JEG, 1992). The site investigation recommended further action for IR Sites 1 and 2, which resulted in the RI (BNI, 1996). Later, supplemental field activities (SFAs) also were performed as part of the RI (BNI, 1997a).

No documented removal actions have taken place at IR Sites 1 and 2. However, during a petroleum response action, drums and other waste containers were identified in shallow soils at Gull Park (AOPC 4; see Figure 1-3). Samples of soils and container contents were collected at the time of the discovery but have not been documented in a report. The sample locations are unknown, and the analytical results were not validated as part of the RI or SFA. Further excavation was halted. However, during a meeting on January 7, 1997, between the DON and several regulatory agencies, an agreement was made. The DON agreed to include the excavation and

disposal of cans, drums, other debris, and soil clinging to the debris from the area overlying the contaminated groundwater at Gull Park as part of the selected remedy for IR Sites 1 and 2.

2.2 Administrative Record

A list of all documents used to select and justify remedial alternatives and the selected remedy for LBNC is provided in Appendix B. These documents comprise the administrative record and are available for public review at:

Long Beach Public Library
Government Publications Department
101 Pacific Avenue
Long Beach, CA 90822
(562) 570-7500
Hours: Mon (10-8), Tue-Sat (10-5:30), Sun (12-5)

and

Southwest Division
Naval Facilities Engineering Command
1220 Pacific Highway, Building 129
San Diego, CA 92132
(619) 532-1144
Hours: Mon-Fri (7-3:30).

3.0: COMMUNITY PARTICIPATION

The Long Beach community is kept well-informed about the progress of environmental programs at the LBNC. The RI/FS reports and the Proposed Plan for IR Sites 1 and 2 were made available to the public on June 10, 1999. The documents can be found in the Administrative Record file located at Southwest Division's Naval Facilities Engineering Command in San Diego, CA, and at the information repository located at the Long Beach Public Library, Long Beach, CA.

A public notice announcing the availability of these documents, the comment period, and the public meeting was published in *The Long Beach Times* on June 9, 1999, and *The Long Beach Press Telegram* on June 13, 1999. The Proposed Plan was prepared in fact-sheet format and mailed out to the LBNC project mailing list on June 4, 1999. The public comment period extended from June 10, 1999 through July 9, 1999.

A public meeting was held on June 28, 1999 to present the Proposed Plan to the community, to answer questions, and to accept formal comments. Representatives from the DON, the DTSC, the City of Long Beach, the Port of Long Beach, the U.S. EPA, and the RWQCB were present at this meeting.

The DON's responses to the comments received during the comment period are summarized in Section 15.0, "The Responsiveness Summary," of this Record of Decision (ROD). A copy of the public notice, the roster of public meeting attendees, and the public meeting transcript are included in Appendix C.

A community relations plan (CRP) update was finalized for the LBNC in October 1998. The purpose of the CRP, and the community relations program it describes, is to promote communication between the public and the DON about the status of remediation at the LBNC. The program provides communities and public officials with accurate information about the IR Program underway at NAVSTA Long Beach. It also provides citizens and public officials the opportunity to participate in the decision-making process.

The local, citizen-based Restoration Advisory Board (RAB) provides another opportunity for public involvement at the LBNC. The RAB is an advisory body designed to act as a focal point for the exchange of information between the DON and the local community regarding environmental activities at NAVSTA Long Beach. The RAB meets bimonthly. As a part of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process for IR Sites 1 and 2, the RAB meetings provided stakeholders the opportunity for input to the remedy selection process for the sites.

4.0: SCOPE AND ROLE OF RESPONSE ACTION WITHIN SITE STRATEGY

The IR Program at the LBNC is part of an installation-wide strategy for environmental restoration at the LBNC. It is being conducted in accordance with CERCLA. The strategy is to conduct the IR Program using the CERCLA process as a model, but to continually review the process and accelerate it whenever possible. The ultimate goal of the IR Program is to complete the cleanup of all of the IR Program sites in accordance with the requirements of CERCLA so that the property can be transferred.

The 14 IR Program sites at the LBNC are as follows:

- IR Site 1 — Mole solid waste operations
- IR Site 2 — Chemical materials and waste storage area
- IR Site 3 — Industrial waste disposal pits
- IR Site 4 — Mole extension operations
- IR Site 5 — Skeet range solid waste fill area
- IR Site 6A— Boat disposal location and water tank parcel
- IR Site 7 — Harbor sediments
- IR Site 8 — Building 210, trichloroethene (TCE) disposal site
- IR Site 9 — Building 129, ground floor spills
- IR Site 10 — Parking lot H, past operations
- IR Site 11 — Hillside east of Drydock No. 1
- IR Site 12 — Parking lot X, toxic sandblast disposal
- IR Site 13 — Tank farm near Building 303
- IR Site 14 — Former dry cleaning facility (Building 46).

The CERCLA process at the LBNC includes a remedial action process and/or a removal action process that is selected specifically for each IR Program site. The CERCLA remedial action process is conducted for most sites. It provides a progression through the phases of identification, investigation, cleanup, and closeout.

Thirteen of the 14 IR Program sites at the LBNC are concurrently undergoing remediation using the CERCLA remedial action process. These 13 sites are divided into five operable units, as follows:

- OU 1 includes IR Sites 1, 2, 3, and 4
- OU 2 includes IR Sites 5 and 6A
- OU 3 includes IR Site 7
- OU 4 includes IR Sites 8, 9, 10, 12, and 13
- OU 5 includes IR Site 11.

There is no OU designation for either IR Site 14 or Site 6B, which is not an IR Program site. However, IR Site 14 is currently being remediated using the CERCLA removal action process.

IR Sites 1 and 2 within OU 1 are being remediated using the CERCLA remedial action process. The FS and Proposed Plan for these sites have been completed. This ROD addresses soil and groundwater contamination at the sites. The remedial strategy is to reduce contaminant levels, remove debris and soil, monitor groundwater contaminants, and restrict future land use at the sites. This action is consistent with actions being taken at other IR sites to achieve the ultimate cleanup goal of all of the IR Program sites so that the property can be transferred in accordance with the *Pre-Draft Base Realignment and Closure (BRAC) Cleanup Plan (BCP) for Long Beach Naval Complex* (DON, 1999).

5.0: SITE CHARACTERISTICS

Site characteristics for IR Sites 1 and 2 are summarized from the findings of the RI, the SFAs of the RI, and long-term groundwater monitoring. Results of all previous environmental activities at IR Sites 1 and 2 were compiled in the RI report, along with the results from the remedial investigation itself (BNI, 1996). The SFAs are additional studies that were performed to fill data gaps, thereby enabling the DON to complete the RI. The results of these studies are presented in the Final Appendix U (BNI, 1997a) of the RI report. The results of the SFAs clarified the recommendations in the RI report. Long-term groundwater monitoring was initiated following the SFAs of the RI.

The following sections summarize the results of the RI, the SFAs of the RI, long-term groundwater monitoring, and contaminant fate and transport analysis at IR Sites 1 and 2.

5.1 Remedial Investigation

The results of the RI are presented in BNI's *Final RI Report, IR Program for Sites 1 through 6A* (1996). The following subsections summarize the potential contaminant sources at each of the AOPCs and the results of the soil and groundwater investigations conducted at IR Sites 1 and 2.

5.1.1 Potential Contaminant Sources

Potential contaminant sources for AOPCs 1 and 4 (surface and subsurface soils at Gull Park) consist of former disposal operations, which included landfilling of solid wastes by cut-and-fill methods in the northeastern sections of the site, and earthwork/stained areas on the southern half of the AOPCs. The lateral extent of potential disposal areas on the eastern portion of the site was defined by the geophysical investigation. Landfilling reportedly began in the mid-1940s (DON, 1983) and was shown to continue by aerial photographs taken in 1950, 1952, and 1953. A 1958 photo indicates that landfilling operations had ceased, but the Initial Assessment Study indicates that landfilling continued through the mid-1960s (DON, 1983). This study reported that asbestos insulation, paint chips, and sandblast grit comprised the largest quantities of hazardous wastes disposed of in the trench areas. During the RI investigation, however, elevated concentrations of chemicals that would indicate these types of sources were not detected. There were no reports of large quantities of liquid or chemical wastes disposed of within the cut-and-fill operations (DON, 1983). Waste oils used for dust suppression may have been sprayed during on-site operations. These liquids may explain the detection of long-chain organic chemicals within AOPCs 1 and 4. By 1962, this area apparently was used as a pipe laydown area that might have contributed organic chemicals detected in soils within the AOPCs. By 1964, ballfields at the site were established, and the use and/or disposal of hazardous materials at the AOPCs reportedly ceased, with the potential exception of pesticides.

Potential contaminant sources for AOPC 2 (surface soils in the Western Ballfield) consist of a surficial dark-colored feature identified in a review of a 1950 aerial photograph (BNI, 1994). Reportedly, this area was used for disposal of ship bilge water (JEG, 1992) that may have

contained organic and inorganic compounds and petroleum products. By 1964, the ballfield was established and disposal of hazardous materials is assumed to have ceased. Pesticides may have been used on the ballfields after 1964 (BNI, 1996).

Potential contaminant sources for AOPC 3 (Burn Pit Area) consist of residual material from burning activities that occurred from the early 1940s to the 1970s. An aerial photograph review delineates this area in photos from 1950, 1953, 1958, 1962, and 1970 (BNI, 1994). The geophysical investigation confirmed the boundaries of the eastern portion of the Burn Pit Area. Material such as empty wooden and cardboard boxes, construction and demolition debris, rags, and other trash were reportedly burned (DON, 1983). In addition, a 1953 aerial photograph identified an area that may represent a disposal trench (BNI, 1996). Organic compounds and metallic debris were potentially disposed of along with materials that were burned for volume reduction. By 1964, a vegetative cover appears over a large portion of the Burn Pit Area. By 1970, a parking lot had been built on the western portion of the AOPC, and the Burn Pit Area had been paved over for parking by 1982.

Potential contaminant sources for AOPC 5 consist of the storage of drums of wastes and raw chemicals by the LBNSY Public Works Department, production shops, and ships from the mid-1960s to 1980s. Leakage of liquid from damaged drums reportedly occurred. The volume released was estimated to be less than 3,000 gallons (DHS, 1983). In addition, a dark-colored (potentially stained) area that appears to be the result of water/liquid flow was identified in a 1952 aerial photo (BNI, 1994). A single Hydropunch™ groundwater sample was collected within this area for characterization purposes.

5.1.2 Results of the RI Soils Investigation

Soils below IR Sites 1 and 2 consist of areas of burn/construction debris and hydraulically and mechanically placed fill materials and native sediments. Construction debris consists of gravel, sand, and silt mixtures with fragments of glass, wood, brick, metal, and net-like wastes. Fill materials exist to approximately 45 feet bgs and consist of lenses and pockets of loose to medium dense, predominately fine-grained sand and silty sand, and soft to firm sandy silt and silt with local lenses of shells throughout. Native materials begin below the fill materials and consist of (in descending order): an 8-foot-thick layer of sandy silt to silt; a 10- to 12-foot-thick layer of thick sand to silty sand; a 17-foot-thick layer of interbedded fine-grained silty clay to clay, sandy silt, and silty sand; and clean sand the remaining depth of the borehole.

Individual contaminant concentrations for organic and inorganic compounds are presented in the RI report (BNI, 1996). Contaminant concentrations in soils exceeding non-detect values were screened against statistical backgrounds and industrial preliminary remediation goals (PRGs). U.S. EPA *Region IX PRGs, Second Half 1994* (U.S. EPA, 1994) were used in the screening process.

The screening criteria generated chemicals of potential concern (COPCs) that were analyzed in a human health risk assessment (HHRA). There were no organic COPCs detected in the surface or subsurface soil samples above the soil screening criteria at IR Sites 1 and 2. The classes of organic

compounds included in the COPC screen were polynuclear aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides, and polychlorinated biphenyls (PCBs). The only COPCs detected above screening criteria were asbestos and the elements arsenic, cobalt, beryllium, and lead. Table 5-1, taken from the RI report (BNI, 1996), presents all the COPCs detected in soils above the screening criteria at IR Sites 1 and 2. Figure 5-1 shows the COPCs identified in surface and subsurface soils during the RI.

5.1.3 Results of the RI Groundwater Investigation

The depth to groundwater beneath IR Sites 1 and 2 is between 9 to 11 feet bgs. Although the number of monitoring events was limited to three, it is believed that this depth to groundwater is typical for the sites. The depth to groundwater defines the thickness of the vadose zone beneath the sites. Groundwater monitoring data indicate that the vadose zone is approximately 10 feet thick.

Table 5-1. COPCs Detected at Concentrations Exceeding Statistical Background and Industrial PRGs in Surface and Subsurface Soils at IR Sites 1 and 2

AOPC	COPCs in Soil (Surface or Subsurface)	Range of Concentrations[a] in Soil (mg/kg)	Ratio of Detected Concentration to Screen[b]	Screening Criteria[c]
1	Arsenic	7.67 to 7.92	1.04 to 1.07	Background
2	Arsenic	8.98	1.21	Background
	Cobalt	13.2	1.08	Background
3	Arsenic	8.1	1.09	Background
	Cobalt	13.6B[d] to 54.5B	1.11 to 4.43	Background
	Beryllium	10.2	8.16	Background
	Lead	9,330	7.78	PRG
4	Arsenic	9.8	1.32	Background
	Cobalt	15.4	1.25	Background
5	Arsenic	8	1.08	Background
	Cobalt	14.1 to 18.5	1.15 to 1.50	Background
	Asbestos	10%	NA[e]	Above detection

Source: BNI (1996).

(a) Only one value is listed for those COPCs detected above screen at only one location. Asbestos is listed as a percentage rather than mg/kg.

(b) The ratio of the detected concentration of the COPC to the screening concentration (e.g., PRG, background, etc.).

(c) Screening criteria include: PRG, which refers to U.S. EPA *Region IX PRGs, Second Half 1994* (U.S. EPA, 1994) for industrial soil; background, which refers to statistically calculated background metal concentrations values contained in Appendix H of the RI report (BNI, 1996); and above detection, which applies to asbestos only.

(d) Concentration reported is less than the contract required detection limit (CRDL) and greater than or equal to the instrument detection limit (IDL).

(e) NA = Not applicable.

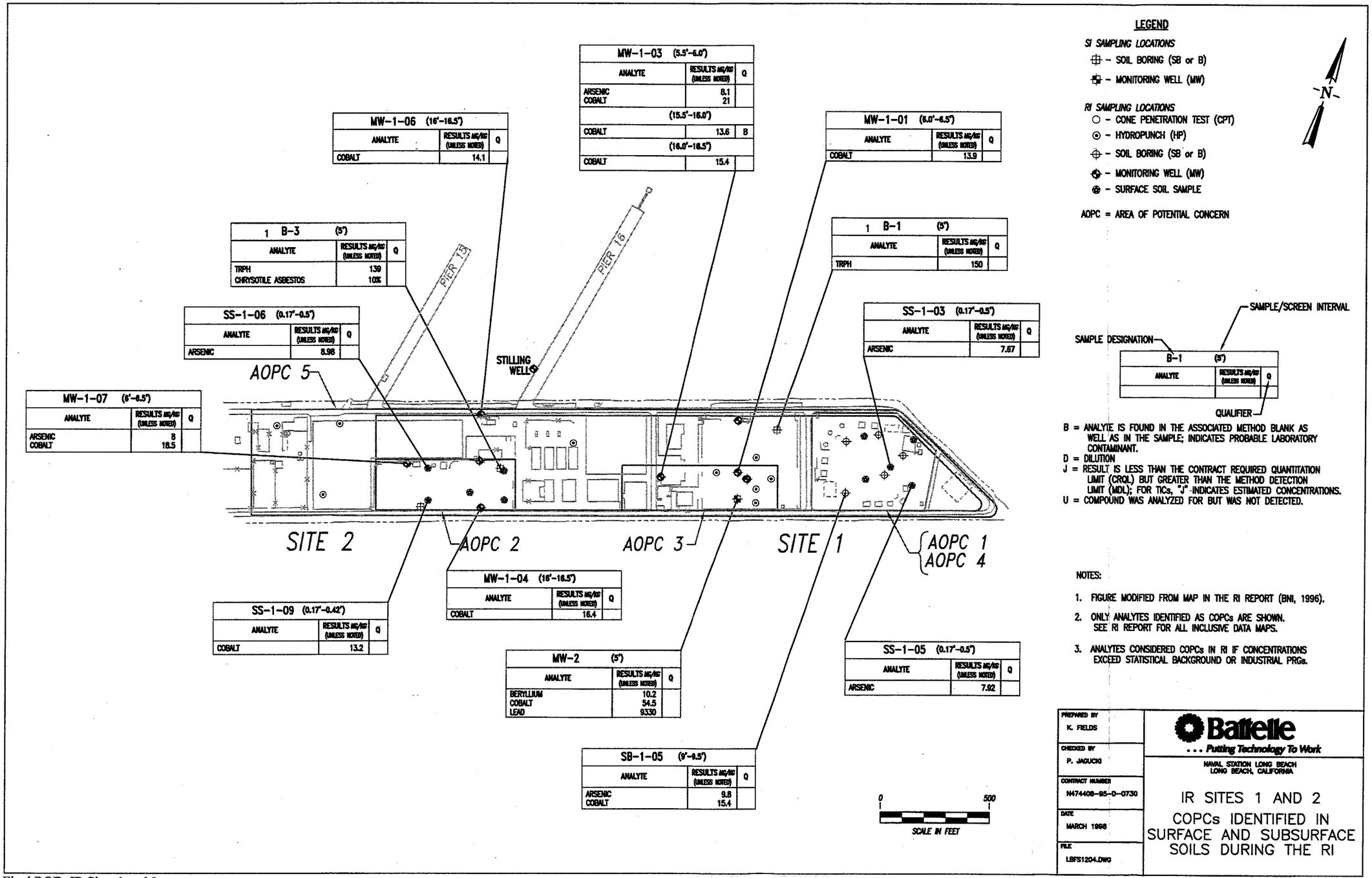


Figure 5-1. COPCs Identified in Surface and Subsurface Soils During the RI

COPCs were identified at AOPCs 3 and 5 at concentrations greater than their respective statistical background concentrations, tap water PRGs, and maximum contaminant levels (MCLs). At AOPC 3, 1,2-dichloroethane (DCA) and vinyl chloride (VC) were detected at concentrations in excess of industrial PRGs and MCLs. Carbon disulfide was detected at one location in excess of the industrial PRG. The classes of organic compounds included in the COPC screen were PAHs, VOCs, SVOCs, pesticides, and PCBs. Antimony, lead, and thallium were detected at AOPC 5 in excess of statistical background levels. Table 5-2, taken from the RI report (BNI, 1996), presents the COPCs that were identified in groundwater samples taken from IR Sites 1 and 2. Figure 5-2 shows the COPCs identified in groundwater during the RI.

Table 5-2. COPCs Detected at Concentrations Exceeding Statistical Background and Risk-Based Screening Criteria in Groundwater at IR Sites 1 and 2

AOPC	COPCs	Range of Concentrations[a] (µg/L)	Screen Concentration (µg/L)	Screening Criteria[b]
COPCs with Concentrations Exceeding Both Statistical Background and Industrial PRG Values				
3	1,2-Dichloroethane	0.6 to 18 (3)	0.123	PRG
	Vinyl chloride	14 to 14.38 (2)	0.02	PRG
5	Carbon disulfide[c]	75 (1)	21	PRG
	Antimony	79 (1)	64.9	Background
	Lead	28 (1)	22.3	Background
	Thallium	22 (1)	3.34	Background
COPCs with Concentrations Exceeding Both Statistical Background and MCL Values[d]				
3	1,2-Dichloroethane	18 (1)	5	MCL
	Vinyl chloride	14 to 14.38 (2)	2	MCL
5	Antimony	79 (1)	64.9	Background
	Lead	28 (1)	22.3	Background
	Thallium	22 (1)	3.34	Background

Source: BNI (1996).

(a) The number in parentheses indicates the number of samples that contained detectable levels of the analyte above screen.

(b) Screening criteria include (1) PRG, which refers to U.S. EPA *Region IX PRGs, Second Half 1994* (U.S. EPA, 1994); (2) background, which refers to statistically calculated background metal concentrations values contained in Appendix H of the RI Report (BNI, 1996); and (3) MCL, which refers to U.S. EPA MCLs for drinking water, May 1995 (U.S. EPA, 1995).

(c) Carbon disulfide was detected in a sample collected during the site investigation (SI). It was not detected in any of the RI samples for IR Sites 1 and 2.

(d) Evaluation was performed on only those COPCs for which MCLs had been assigned.

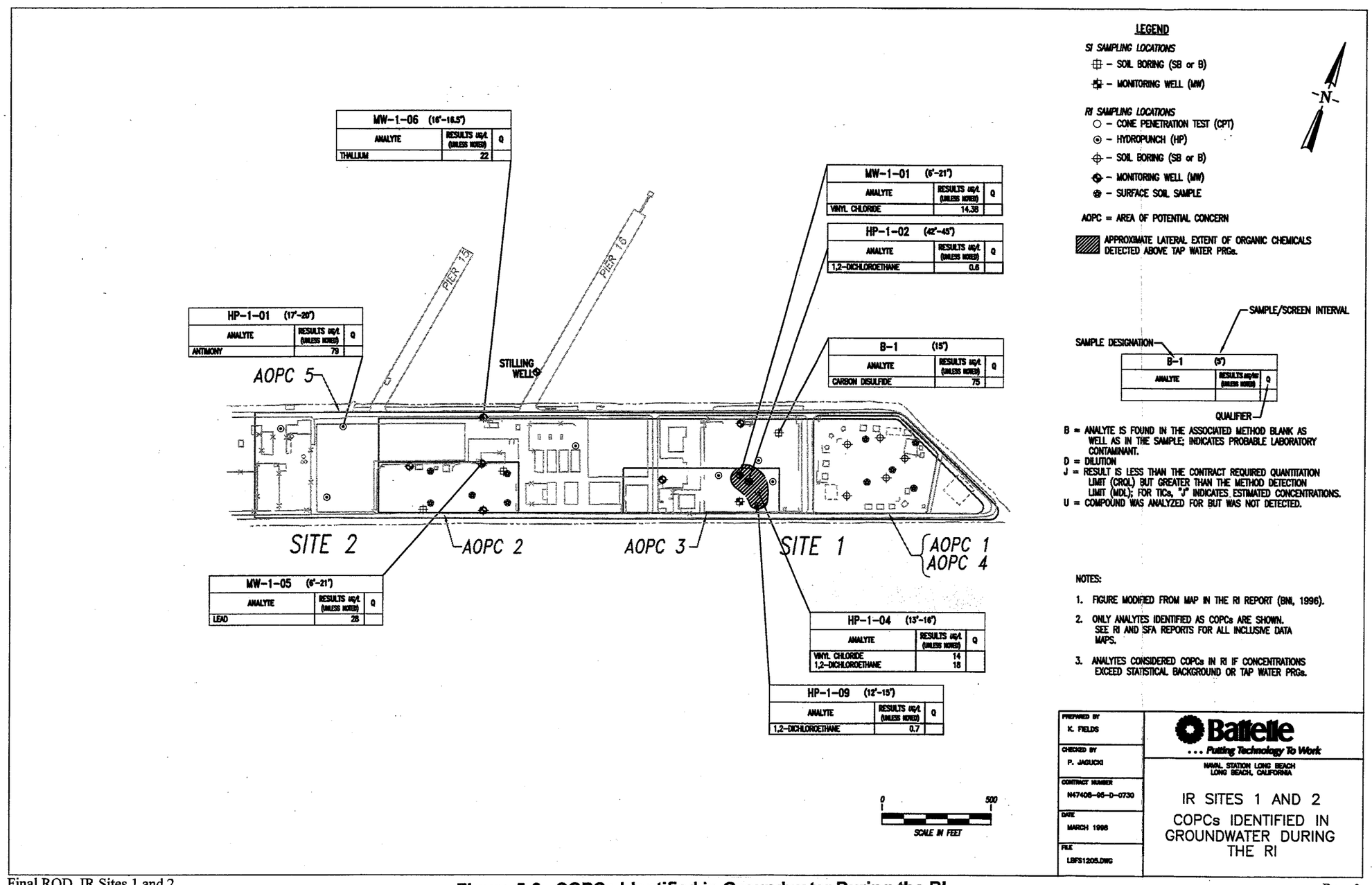


Figure 5-2. COPCs Identified in Groundwater During the RI

5.1.4 Results of the RI Geophysical Investigation

A geophysical investigation was performed within an approximately 500-by-1,025-foot area at IR Site 1 in the vicinity including Gull Park (see Figure 5-3 and inset). Both electromagnetic (EM) and magnetometer surveys were conducted. The EM and magnetometer data were contoured, and the limits of the potential waste disposal areas were defined. Figure 5-3 shows the approximate locations of the geophysical anomalies.

The lateral extent of three potential waste disposal areas (Areas I, II, and III in figure 5-3 inset) was reported in the *IR Site 1 Geophysical Investigation Report* (BNI, 1996, Appendix K). Areas I and II corresponded to an area defined from multiple aerial photographs as a burn pit area. Area III, in the northeast part of the site, was identified as a former cut-and-fill operation. These areas are shown on the inset to Figure 5-3.

5.2 Supplemental Field Activities

Results of SFAs performed by BNI as follow-up studies for the RI were incorporated as Appendix U of the RI report (BNI, 1997a). Only AOPCs 1 and 4 were sampled during the SFAs. During the SFAs, soil and groundwater samples were collected to evaluate the risk to human health based on a screening against industrial PRGs and the potential for VOCs detected in soils to be a source of VOCs in groundwater. RI and SFA sampling locations for IR Sites 1 and 2, AOPCs 1 and 4, are shown in Figure 5-3.

5.2.1 Results of the SFA Soils Investigation

Soil samples collected at IR Sites 1 and 2, AOPCs 1 and 4, during SFAs confirmed the presence of both chlorinated and nonchlorinated VOCs. Chlorinated VOCs detected in soil samples included *cis*-1,2-dichloroethene (DCE), *trans*-1,2-DCE, 1,2-DCE (total), trichloroethene (TCE), perchloroethene (PCE), and VC. TCE was detected at a maximum concentration of 780 micrograms per kilogram (µg/kg) at sample location SB-1-07 at 8.0 to 8.5 feet bgs (see Figure 5-3).

Nonchlorinated VOCs detected in soil samples included acetone, 2-butanone, carbon disulfide, ethylbenzene, toluene, and xylenes (total). Table 5-3, taken from Appendix U of the RI report (BNI, 1997a), lists the VOCs detected during both the RI and the SFA at IR Sites 1 and 2 (AOPCs 1 and 4), provides the maximum concentration detected for each analyte, and compares the maximum detected concentration for each VOC with its industrial PRG (U.S. EPA, 1994).

The comparison of industrial PRGs to the detected VOCs in soil samples and their maximum concentrations indicated that all detected VOCs in soils, with the exception of VC, were present at concentrations below industrial PRGs. VC was detected at an estimated concentration of 340 µg/kg, or about 31 times the industrial PRG, based on an excess lifetime cancer risk (ELCR) of 1×10^{-6}. The ratio of the maximum detected VC concentration to the industrial PRG drops to 0.31 when an ELCR of 1×10^{-4} is used.

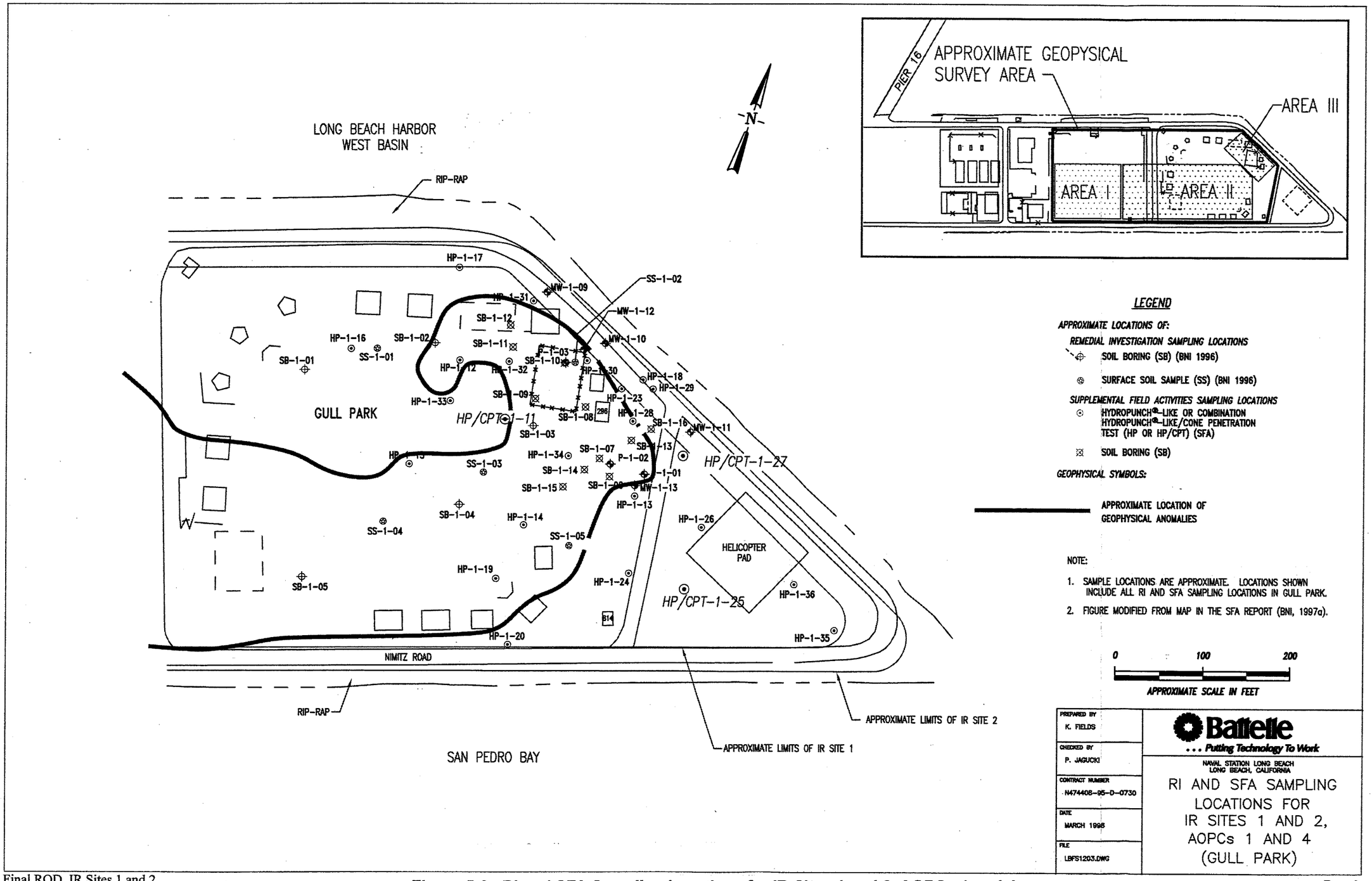


Figure 5-3. RI and SFA Sampling Locations for IR Sites 1 and 2, AOPCs 1 and 4 (Gull Park)

Table 5-3. VOC Analytes Detected in Soils at IR Sites 1 and 2, AOPCs 1 and 4, During the RI and the SFA

Class/Analyte	Concentration Range (µg/kg)[a]	Frequency of Detection[b], [c]	Industrial PRG[d] (µg/kg) Assuming a Risk of 10^{-6}	Industrial PRG (µg/kg) Assuming a Risk of 10^{-4}	Ratio of Maximum Observed Concentration 10^{-4} Industrial PRGs
2-Butanone	ND[e] to 19	1/30	3.4E+07	3.4E+09	<.01
cis-1,2- Dichloroethene	ND to 3,500	10/15	2.0E+05	2.0E+07	<.01
trans-1,2-Dichloroethene	ND to 710	1/39	6.0E+05	6.0E+07	<.01
1,2-Dichloroethene (total)	ND to 3,600	11/30	2.7E+05	2.7E+07	<.01
Acetone	ND to 74	3/30	8.4E+06	8.4E+08	<.01
Carbon disulfide	ND to 10	4/30	5.2E+04	5.2E+06	<.01
Ethylbenzene	ND to 750	6/54	6.9E+05	6.9E+07	<.01
Perchloroethene	ND to 1	2/54	2.5E+04	2.5E+06	<.01
Toluene	ND to 52,000	12/54	2.8E+06	2.8E+08	<.01
Trichloroethene	ND to 780	23/54	1.7E+04	1.7E+06	<.01
Vinyl chloride	ND to 340	6/54	1.1E+01	1.1E+03	0.31
Xylenes (total)	ND to 85,000	13/54	9.9E+05	9.9E+07	<.01

Source: BNI (1997a).

(a) µg/kg = micrograms per kilogram.

(b) Total number of samples and number of detects exclude field duplicates, matrix spike, and matrix spike duplicate samples where regular sample was analyzed; however, if duplicate or spike result was a detect and regular was a nondetect, the higher result was retained.

(c) Frequency detected = number of samples with detectable levels of compound divided by the total number of samples analyzed for that compound during the RI and SFA (excluding quality control [QC] samples). Note that for SFA data, mobile laboratory analysis performed was SW-846 Method 8010/8020 and does not include all VOC analytes as does the U.S. EPA Contract Laboratory Program (CLP) VOC method.

(d) Industrial PRGs (U.S. EPA, 1994) used to compare against VOC analytes.

(e) ND indicates not detected in one or more samples.

5.2.2 Results of the SFA Groundwater Investigation

During SFAs, a VOC plume composed of both chlorinated and nonchlorinated compounds was detected in the groundwater beneath IR Sites 1 and 2, AOPC 4. The VOCs were in the upper part of the shallow water-bearing zone at depths less than about 51 feet bgs.

The chlorinated VOCs detected in the groundwater beneath IR Sites 1 and 2 (AOPC 4) included chloromethane, chlorobenzene, 1,2-dichlorobenzene (DCB), 1,1-DCA, 1,1-DCE, 1,2-DCA, *cis*-1,2-DCE, *trans*-1,2-DCE, TCE, and VC. Nonchlorinated VOCs detected in the groundwater beneath IR Sites 1 and 2 (AOPC 4) included benzene, toluene, ethylbenzene, and total xylenes (BTEX). Table 5-4, taken from Appendix U of the RI report (BNI, 1997a), presents the results of groundwater sampling on IR Sites 1 and 2, AOPC 4, including data from the RI and SFAs.

The analytical results indicate a plume of commingled chlorinated and nonchlorinated VOCs in the hydraulically placed fill part of the shallow water-bearing zone. The limits of the VOC plume were defined using *California Ocean Plan* criteria for comparison (SWRCB, 1995). The

Table 5-4. VOC Analytes Detected in Groundwater 0 to 51 feet bgs at IR Sites 1 and 2, AOPC 4, During the RI and SFA

Class/Analyte	Concentration Range (µg/L)	Frequency of Detection[a], [b], [c]	*California Ocean Plan* Criteria (µg/L)	Ratio of Maximum Concentration to *California Ocean Plan* Criteria[d]
1,2-Dichlorobenzene	ND[e] to 7.5	1/37	NA[f]	—
1,1-Dichloroethane	ND to 14.0	1/37	NA	—
1,2- Dichloroethane	ND to 1.7	1/37	36.2	>0.1
1,1-Dichloroethene	**ND to 50**	**7/37**	**0.9**	***55.6***[g]
cis-1,2- Dichloroethene	4,400 to 20,000	5/5	NA	—
trans-1,2-Dichloroethene	ND to 960	14/38	NA	—
Acetone[h]	ND to 470	0/5	NA	—
Benzene	**ND to 190**	**10/39**	**5.9**	***32.2***
Chloromethane	ND to 1.6	1/37	NA	—
Chlorobenzene	ND to 11.0	1/37	570	>0.1
Ethylbenzene	ND to 170	2/37	4,100	>0.1
Toluene	ND to 670	8/37	85,000	>0.1
Trichloroethene	**ND to 1,800**	**6/37**	**27**	***66.7***
Vinyl chloride	**ND to 21,000**	**18/37**	**36**	***583.3***
Xylenes (total)	ND to 210	4/37	NA	—

Source: BNI (1997a).

(a) Total number of samples and number of detects excludes field duplicates, matrix spike, and matrix spike duplicate samples where regular sample was analyzed; however, if duplicate or spike result was a detect and regular was a nondetect, the higher result was retained.

(b) Frequency detected = number of samples with detectable levels of compound divided by the total number of samples analyzed for that compound during the RI and SFA (excluding QC samples). SW-846 Method 8010/8020 does not include all VOC analytes as does CLP VOC method.

(c) VOCs detected using CLP VOC Method or SW-846 Method 8010/8020 for SFA Mobile Laboratory data.

(d) Industrial PRGs (U.S. EPA, 1994) used to compare against VOC analytes.

(e) ND indicates not detected in one or more samples.

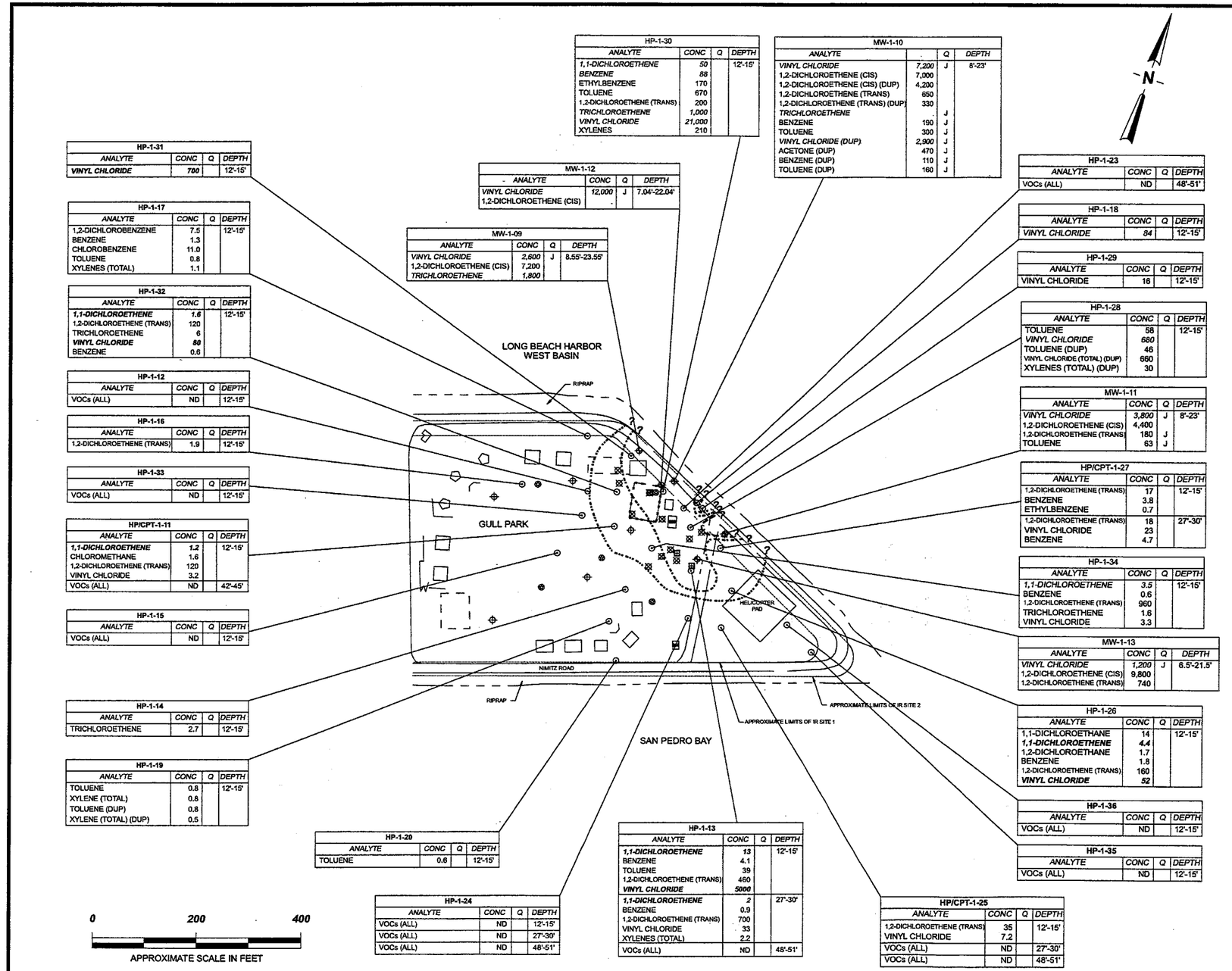
(f) NA indicates no applicable requirements established in the *California Ocean Plan* (SWRCB, 1995) for comparison.

(g) Text in bold and bold italics indicates maximum results greater than *California Ocean Plan* criteria (SWRCB, 1995).

(h) Maximum concentration for acetone is from a duplicate sample. Acetone was not detected in the regular sample; therefore, this detect is not reflected in the "Frequency of Detection" column.

extent of the plume is shown in Figure 5-4. Based on the analytical data for groundwater, this plume appears to extend eastward, approaching the Long Beach Harbor West Basin.

Analytical results from deeper groundwater samples indicate that the vertical extent of the plume is limited to the upper saturated part of the hydraulically placed fill. Debris observed at the site is limited to the vadose zone. The decrease in contaminant concentrations with depth was apparent in the analytical results for groundwater from sample locations HP-1-13, HP-1-23, and HP-1-25 (see Figure 5-4) (BNI, 1997a).



APPROXIMATE LOCATIONS OF:

REMEDIAL INVESTIGATION SAMPLING LOCATIONS

- SOIL BORING (SB) (BNI, 1996)
- SURFACE SOIL SAMPLE (SS) (BNI, 1996)

SUPPLEMENTAL FIELD ACTIVITIES (SFA) SAMPLING LOCATIONS

- HYDROPUNCH™-LIKE OR COMBINATION HYDROPUNCH™-LIKE/CONE PENETRATION TEST (HP OR HP/CPT)
- SOIL BORING (SB)
- MONITORING WELL (MW)
- PIEZOMETER (P)

ISOCONCENTRATION CONTOURS RELATIVE TO OCEAN PLAN CRITERIA:

- EXCEEDING OCEAN PLAN CRITERIA
- 10 TIMES GREATER THAN OCEAN PLAN CRITERIA
- 100 TIMES GREATER THAN OCEAN PLAN CRITERIA
- FORMER PLAYGROUND AREA

SAMPLE DESIGNATION — SCREEN INTERVAL

HP-1-23

ANALYTE	CONC	Q	DEPTH

CONCENTRATION (ug/L) — LAB QUALIFIER

B = ANALYTE IS FOUND IN THE ASSOCIATED METHOD BLANK AS WELL AS IN THE SAMPLE; INDICATES PROBABLE LABORATORY CONTAMINANT.
D = DILUTION
J = RESULT IS LESS THAN THE CONTRACT REQUIRED QUANTITATION LIMIT (CRQL) BUT GREATER THAN THE METHOD DETECTION LIMIT (MDL); FOR TICs, "J" INDICATES ESTIMATED CONCENTRATIONS.
U = COMPOUND WAS ANALYZED FOR BUT WAS NOT DETECTED.

NOTES:

1. RESULTS OF MOBILE LAB DATA, VERIFIED/NOT VALIDATED.
2. ANALYTE CONCENTRATIONS IN MICROGRAMS PER LITER (ug/L).
3. *ITALICIZED* COMPOUNDS AND CONCENTRATIONS EXCEED OCEAN PLAN LIMITS.
4. ALL HP LOCATIONS ANALYZED BY ONSITE MOBILE LABORATORY (OML).
5. MAP TAKEN FROM THE SFA REPORT (BNI, 1997a).
6. OFFSHORE SEDIMENTS AND SURFACE WATER ARE CONSIDERED PART OF IR SITE 7 (BNI, 1997b).

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CHECKED BY: P. JAGUCKI	NAVAL STATION LONG BEACH, LONG BEACH, CALIFORNIA
CONTRACT NUMBER: N474408-95-D-0730	LATERAL EXTENT OF GROUNDWATER VOC PLUME AT IR SITES 1 AND 2, AOPC 4, FOR COPCs WITH CONCENTRATIONS IN EXCESS OF THE CALIFORNIA OCEAN PLAN CRITERIA (SWRCB, 1995)
DATE: MARCH 1998	
FILE: LBFS1206.DWG	

5.3 Long-Term Groundwater Monitoring

As a result of the recommendations presented in the RI report and RI report Appendix U (SFA) (BNI, 1996 and 1997a, respectively), a long-term groundwater monitoring program was initiated at NAVSTA Long Beach in proximity to previously identified groundwater plumes and areas of soil contamination at IR Sites 1, 2, 3, 4, and 6A. Quarterly reports were prepared to summarize the analytical results of groundwater sampling. The results of the first through fourth quarterly samplings (BNI, 1997c-1997f) are presented in this section along with the annual (fourth quarter) report for 1999 (CDM Federal Programs Corporation, 1999). Activities conducted during these four monitoring periods included groundwater potentiometric surface elevation monitoring, groundwater and field QC sample collection and analysis, and verification and validation of the resultant analytical data.

During the first quarter, groundwater samples were collected from 14 groundwater monitoring wells on the mole at IR Sites 1, 2, 3, 4, and 6A. Sample collection began on November 21, 1996 and ended on December 3, 1996. At IR Sites 1 and 2 (AOPC 4), five monitoring wells were sampled, and VOCs were detected in the samples collected from monitoring wells MW-1-09, MW-1-10, and MW-1-11 (see Figure 5-3). The VOC concentrations detected in these three wells exceeded *California Ocean Plan* criteria (SWRCB, 1995). The compounds exceeding *California Ocean Plan* criteria were VC, 1,2-DCA, 1,1-DCE, and benzene.

Other compounds were detected during the first quarter of groundwater sampling (BNI, 1997c). SVOCs were detected in groundwater samples collected from monitoring wells MW-1-09, MW-1-10, MW-1-11, MW-1-12, and MW-1-13 (see Figure 5-3). However, SVOC concentrations detected in samples collected from the wells were not in excess of *California Ocean Plan* criteria.

Target analyte list (TAL) metals were detected in groundwater samples collected from monitoring wells MW-1-09, MW-1-10, MW-1-11, MW-1-12, and MW-1-13 (see Figure 5-3). In the sample collected from MW-1-09, cadmium was detected at a concentration in excess of the *California Ocean Plan* criterion (SWRCB, 1995) and established background concentration. In the sample collected from MW-1-12, cyanide was detected at a concentration in excess of the *California Ocean Plan* criterion (SWRCB, 1995) and established background concentration.

Analytical results of second quarter groundwater sampling at IR Sites 1 and 2 indicated the presence of VOCs, SVOCs, TAL metals, and total recoverable petroleum hydrocarbons (TRPHs) at AOPC 4 (BNI, 1997d). VOCs and TAL metals were present in concentrations exceeding *California Ocean Plan* criteria (SWRCB, 1995). SVOCs and cyanide exhibited decreases in occurrence from the first to the second quarter, and TRPH exhibited an increase in occurrence (BNI, 1997d).

Analytical results of third quarter groundwater sampling at IR Sites 1 and 2 indicated the presence of VOCs, SVOCs, TAL metals, cyanide, and petroleum hydrocarbons at AOPC 4 (BNI, 1997e). Three VOCs, 1,1-DCE, benzene, and VC, were present at concentrations exceeding *California Ocean Plan* criteria (SWRCB, 1995). The occurrence and concentrations of VOCs,

SVOCs, and cyanide remained consistent during the first three quarters of sampling. TRPH concentrations appeared cyclical.

Analytical results of fourth quarter groundwater sampling at IR Sites 1 and 2 indicated the presence of VOCs, SVOCs, TAL metals, and cyanide at AOPC 4 (BNI, 1997f). Concentrations of VOCs and SVOCs exceeded *California Ocean Plan* criteria (SWRCB, 1995). Detected concentrations of cyanide, TRPH, and cadmium (the only TAL metal previously detected in groundwater samples at concentrations exceeding screening criteria) did not exceed screening criteria during the fourth quarter. Statistical trend analysis indicated no upward trends in contaminant concentrations for these analytes (BNI, 1997f).

Analytical results of the fourth quarter 1999 groundwater sampling at IR Sites 1 and 2, conducted at five monitoring wells on the mole on April 21, 22, and 30, 1999, indicated detectable concentrations of VOCs and SVOCs at AOPC 4 (CDM Federal Programs Corporation, 1999). Concentrations of benzene and vinyl chloride exceeded *California Ocean Plan* criteria (SWRCB, 1995). In fact, benzene and vinyl chloride are the only contaminants that were consistently detected throughout the 1998 and 1999 groundwater samplings at concentrations equal to or exceeding their respective *California Ocean Plan* criteria (5.9 µg/L and 36 µg/L) in the monitoring wells at IR Sites 1 and 2 (CDM Federal Programs Corporation, 1999).

The analytical results indicate the continued presence of a plume of VOC-impacted groundwater previously identified in the shallow water-bearing zone beneath IR Sites 1 and 2, AOPC 4. The lateral extent of the plume, shown in Figure 5-4, was defined during SFAs (BNI, 1997a). Results of the SFAs also indicated that the former trench-and-fill operations conducted on site served as the source for VOCs and TRPH detected in on-site soils.

The RI report (BNI, 1996) concluded that concentrations of VOCs and TRPH detected in soil samples are not sufficiently high to be potential sources of groundwater contamination. However, debris remaining on IR Sites 1 and 2 could be a potential source of future contamination. The vertical extent of the VOC-impacted groundwater plume appears to be limited to the shallow water-bearing zone. A tidal mixing zone, created through tidal fluctuations that cause harbor waters to flow into and out of water-bearing, subsurface stratigraphic units during each tidal cycle, was found along the edge of the mole. The fluctuations may facilitate contaminant mobilization, but also would reduce dissolved-contaminant concentrations by dilution (BNI, 1997f).

5.4 Contaminant Fate and Transport Analysis

An evaluation of contaminant fate and transport was performed as part of the RI. This evaluation was limited to the inorganic COPCs beryllium, cobalt, lead, mercury, thallium, and zinc, and the organic COPCs 1,2-DCA and vinyl chloride. The evaluation included determining and documenting potential routes of migration and persistence of contaminants. However, because no COPCs were identified during the RI at concentrations exceeding *California Ocean Plan* criteria (SWRCB, 1995), transport modeling was not performed. Transport modeling also was not performed after the SFA.

As part of the FS, soil and groundwater risk-based concentrations (RBCs) were determined for IR Sites 1 and 2. Potential exposure and transport mechanisms in soil and groundwater were evaluated as part of the RBC calculations. Details of the RBC calculations are included in the FS for IR Sites 1 and 2 (Battelle, 1999a) and are not repeated in this ROD.

The concentrations of COPCs existing in solid, aqueous, and vapor phases may change over time as the result of biotic (biochemical) and abiotic (physical) transformation and degradation. Thus, rates of transformation and degradation are important parameters in estimating declines in COPC concentrations over time.

Because metals are elements that cannot be degraded, the total mass of these inorganic COPCs will not change as a result of chemical reactions. These COPCs are, therefore, considered persistent and may bioaccumulate.

The chlorinated hydrocarbons 1,2-DCA and VC can undergo biotic and abiotic sorption and complexation reactions. These COPCs can also be biodegraded, that is, degraded through biochemical reactions mediated by microorganisms. However, both 1,2-DCA and VC are relatively persistent in groundwater. The half-lives of 1,2-DCA and VC are on the order of 100 days to 12 months and 8 weeks to 8 years, respectively (Howard et al., 1991).

VC released to soil will be subject to rapid volatilization. VC that does not evaporate will be leached to groundwater and subject to biodegradation. VC also can be generated from anaerobic biodegradation of PCE, TCE, and other chlorinated aliphatic compounds. However, dehalogenation of chlorinated aliphatic compounds occurs in a sequential fashion, and the final step, transformation of VC to chloroethane, is the most rate-limiting. Therefore, VC often accumulates (Chappelle, 1993). VC may degrade to carbon dioxide under aerobic conditions (Vogel and McCarty, 1985).

A statistical trend analysis of the COPC concentrations, completed as part of the fourth-quarter groundwater monitoring and analysis, showed no upward trends in contaminant concentrations for any of the COPCs detected in IR Sites 1 and 2, except for benzene (BNI, 1997f). The detected benzene concentration from the sample from well MW-1-09 (see Figure 5-3) was 1.8 µg/L, below the screening criterion of 5.9 µg/L.

Although active biodegradation and tidal mixing within the aquifer somewhat attenuates contaminant concentrations, the contaminant fate and transport evaluation indicated that concentrations of COPCs may exceed *California Ocean Plan* criteria (SWRCB, 1995) at the interface between the riprap along the mole perimeter and the fill material that comprises the upper subsurface environment (BNI, 1997f).

5.5 Exposure Pathways

The expected land use at IR Sites 1 and 2 is port-related and may be characterized as industrial for the foreseeable future. The site conceptual model shown in Figure 5-5 identifies the exposure

Figure 5-5. Contaminant Exposure Pathway Conceptual Model, IR Sites 1 and 2

pathways and potential receptors for the sites. Potential receptors of soil or groundwater contaminants are future on-site industrial workers and/or utility maintenance workers at the Port of Long Beach. Residential exposures were not considered because the future land use is industrial only.

The industrial worker exposure pathways include (1) outdoor inhalation of volatile chemicals and particulates released to the atmosphere from soils and groundwater, (2) direct dermal contact with contaminated soils, and (3) incidental ingestion of contaminated soils. Groundwater ingestion was not included as a potential exposure pathway.

The utility maintenance worker scenario assumes potential exposure to contaminated subsurface soils or groundwater during subsurface utility maintenance, repair, or installation. Exposure pathways for the utility maintenance worker include (1) outdoor inhalation of volatile chemicals and particulates released to the atmosphere from soils and groundwater, (2) direct dermal contact with contaminated soils and groundwater, and (3) incidental ingestion of contaminated soils. No groundwater ingestion was assumed.

6.0: CURRENT AND POTENTIAL FUTURE LAND AND RESOURCE USES

IR Sites 1 and 2 are located at NAVSTA Long Beach on a mole extending into Long Beach Harbor. IR Site 1 is located totally within the boundaries of IR Site 2. IR Site 1 is the location of former mole solid waste operations. IR Site 2 is the location of a former chemical material and waste storage area that encompassed the mole solid waste operations. Land use of the mole, as well as in the vicinity of the LBNC, is currently port-related, commercial, or industrial (see Figure 1-2).

The reasonably anticipated future land use for IR Sites 1 and 2 is also port-related, commercial, or industrial. The basis for the reasonably anticipated land use for these sites is the Reuse Plan developed by the City of Long Beach, CA (City of Long Beach, 1995) and the transfer of property by deed from the Maritime Administration of the Department of Transportation (MARAD) to the Port of Long Beach pursuant to a public benefit conveyance. The public benefit conveyance allows only for a port use of the property. In addition, the Reuse Plan developed by the LRA of the City of Long Beach, CA designates that future use of the land will be industrial in nature (City of Long Beach, 1995).

The SWRCB Resolution 88-63 ("Sources of Drinking Water" policy) designates all waters of the state to be suitable or potentially suitable as sources of drinking water, except waters with existing high dissolved solids (TDS greater than 3,000 mg/L), low sustainable yield (less than 200 gallons per day for a single well), and waters with contamination that cannot be treated for domestic use using best management practices or best economically achievable treatment practices. The groundwater at IR Sites 1 and 2 exceeds 3,000 mg/L TDS.

Proposed U.S. EPA guidelines may classify an aquifer as a potential source of drinking water if it contains less than 10,000 mg/L TDS. The groundwater in the aquifer at IR Sites 1 and 2 generally exceeds 10,000 mg/L TDS. The DON proposed, therefore, that it is unnecessary to remediate the groundwater to protect the beneficial use of municipal or domestic water supply. The RWQCB agreed that, at the LBNC, the groundwater meets the first exception in Resolution 88-63.

Regional Board Resolution No. 98-18, adopted November 2, 1998 by the Los Angeles Regional Water Quality Control Board, modified the regulatory provisions of the Water Quality Control Plan for the Los Angeles Region by removing the beneficial use designation from the aquifers underlying Terminal Island, which includes LBNC. The Resolution was approved by the California Office of Administrative Law by their Notice of Approval dated February 9, 2000.

7.0: SUMMARY OF SITE RISKS

This section presents a brief summary of the human health and environmental risks posed by existing chemical contaminants at IR Sites 1 and 2 and provides the basis for taking action at the sites. A more detailed summary of the HHRA for IR Sites 1 and 2 is presented in the RI report (BNI, 1996). The HHRA does not include information collected during the SFAs conducted at IR Sites 1 and 2 after completion of the RI report.

The Reuse Plan of the LRA (City of Long Beach, 1995) designates the future use of IR Sites 1 and 2 as industrial. Because IR Sites 1 and 2 will be used for industrial purposes, the HHRA in the RI (BNI, 1996) for the sites assumes that future land use at IR Sites 1 and 2 is industrial in nature. Because no pathways were identified and because the future use of IR Sites 1 and 2 will be industrial in nature, an ecological risk assessment was not performed for the sites. However, ecological risks associated with chemicals that might enter sediments of the Long Beach Harbor West Basin from soil or groundwater on NAVSTA Long Beach are addressed in the RI/FS for IR Site 7, harbor sediments (BNI, 1997b).

7.1 Summary of Human Health Risk Assessment

The HHRA for IR Sites 1 and 2 estimates the risks that these sites pose if no action is taken. It provides the basis for taking action and identifies the contaminants and exposure pathways that need to be addressed by the remedial action. This section of the ROD summarizes the results of the HHRA for IR Sites 1 and 2.

The HHRA for IR Sites 1 and 2 was performed as part of the RI (BNI, 1996). It consisted of four major elements: data evaluation, toxicity assessment, exposure assessment, and risk characterization. It presented risk estimates, identified the chemicals that accounted for most or all of the total risk in each contaminated medium, and discussed the uncertainties in the risk estimates.

The HHRA estimated potential risks presented by chemicals known or suspected to have been released at IR Sites 1 and 2. The risk estimates were based on exposure of an industrial worker (a person who works at a site 8 hours per day, 5 days per week, 250 days per year for 25 years) and an underground utility maintenance worker (a person who repairs buried utility lines at a site 8 hours per day, 10 days per year for 25 years).

All of the usable analytical results collected during the RI were evaluated in the HHRA calculations in parallel with the screening process described in Section 5.1 of this report. Therefore, the screening evaluation did not result in a reduction of the data set used for the HHRA (BNI, 1996).

For chemicals in soil, potential exposure pathways and routes for industrial and utility maintenance workers are direct contact with soil through ingestion and dermal contact, inhalation of volatile chemicals released to the atmosphere from the soil, and inhalation of chemicals sorbed to soil particles entering the atmosphere through wind erosion. For purposes of the HHRA, no

ground cover (such as buildings, parking lots, and grass) was assumed to be present at IR Sites 1 and 2. This intentionally conservative assumption probably overestimated the exposure of workers to chemicals present in the soil.

For chemicals in groundwater, no direct exposure pathways were assumed for industrial workers because groundwater beneath IR Sites 1 and 2 is saline and non-potable and is considered to be of non-beneficial use by the DWR (BNI, 1996). However, for utility maintenance workers, who may work in trenches containing some groundwater, exposure may occur through direct dermal contact with the water. Both industrial and utility maintenance workers may be indirectly exposed though inhalation of volatile chemicals released from groundwater into the outdoor air. Only exposure through dermal contact was evaluated in the risk calculations. If, after the DON transfers the property, the exposure scenarios at IR Sites 1 and 2 change as a result of construction of buildings or for other reasons, the HHRA may need to be re-evaluated by the new property owner.

The ELCRs calculated in the HHRA are 4.7×10^{-6} for industrial workers and 1.0×10^{-6} for utility maintenance workers. These risks fall within the U.S. EPA's target range of 1×10^{-6} to 1×10^{-4} for managing cancer risks at sites where industrial exposure scenarios are applied. That is, the HHRA showed that, as long as land use is industrial, between 1 in 1 million and 4.7 in 1 million workers have the potential to develop cancer during their lifetimes as a result of working on the sites. This risk is defined by the U.S. EPA as generally acceptable under an industrial scenario (U.S. EPA, 1990).

The potential for systemic toxicity was insignificant at IR Sites 1 and 2 (BNI, 1996). Lead did not present a significant risk. Table 7-1, taken from the RI report (BNI, 1996), summarizes the results of the HHRA. The HHRA showed that there are no contaminants of concern (COCs) or areas of concern (AOCs) associated with IR Sites 1 and 2, provided that land use is industrial in nature.

7.2 Summary of Environmental Risks

This section presents a brief summary of the environmental risks posed by existing chemical contaminants at IR Sites 1 and 2, based on the conclusions of the SFAs (BNI, 1997a), as discussed in Section 5.0.

The SFAs concluded that concentrations of VOCs in soils, as evidenced in soil samples, were not at levels sufficient to serve as a potential source of contaminants to groundwater. However, debris remaining on IR Sites 1 and 2 could be a potential source of future contamination (BNI, 1997a).

Because no pathways were identified and because future use of IR Sites 1 and 2 will be industrial in nature, an ecological risk assessment was not performed for the sites. However, ecological risks associated with the chemicals that might enter sediments of the Long Beach Harbor West Basin from soil and/or groundwater on NAVSTA Long Beach are addressed in the RI/FS for IR Site 7, harbor sediments (BNI, 1997b).

Table 7-1. Results of the HHRA for IR Sites 1 and 2

Estimates of Risk	Industrial Worker	Utility Maintenance Worker	Risk Drivers
ELCR	4.7×10^{-6}	1.0×10^{-6}	Soil: Arsenic (arsenic represents 60% of the total risk for the industrial and the utility maintenance worker), hexavalent chromium, and benzo(a) pyrene Groundwater: VC (VC represents 31% of the total risk for the utility maintenance worker.)
Hazard index	0.19	0.027	
99th percentile blood-lead level	4.8 µg/dL	3.9 µg/dL	

µg/dL = micrograms per deciliter.

Based on a comparison of the VOC analytical results for groundwater with the *California Ocean Plan* criteria (SWRCB, 1995), four VOCs (1,1-DCE, benzene, TCE, and VC) were found to be present in groundwater at concentrations in excess of the criteria. Evaluation of the dilution of these contaminants by natural processes suggested that the actual concentrations that would be discharged into the nearby ocean waters would be less than the maximum concentrations detected. However, the lateral distribution of these contaminants and their concentrations indicated a potential for impact to the waters of the West Basin of Long Beach Harbor.

The SFA analytical data further indicated that a commingled chlorinated and nonchlorinated VOC plume exists in the groundwater beneath the north-northeast part of IR Sites 1 and 2, and that VOCs are present in groundwater at concentrations in excess of *California Ocean Plan* criteria (SWRCB, 1995). This plume potentially could impact nearby ocean waters.

7.3 Conclusions and Recommendations

This section presents the conclusions and recommendations from the RI (BNI, 1996) and the SFAs performed after the RI (BNI, 1997a) and states the basis for action at IR Sites 1 and 2.

7.3.1 RI Conclusions and Recommendations

None of the COPCs identified for IR Sites 1 and 2 were present at concentrations associated with a 1×10^{-4} ELCR or a hazard index greater than 1.0 (see Table 7-1). Thus, there are no COCs at IR Sites 1 and 2 (BNI, 1996). Because no areas within IR Sites 1 and 2 contained COCs, there are also no AOCs at IR Sites 1 and 2.

Remedial action was not recommended at IR Sites 1 and 2 because the overall site risk for an industrial scenario fell within the NCP-defined, generally acceptable range (U.S. EPA, 1990), and the potential for degradation of surface water by groundwater appeared negligible (BNI, 1996). However, additional groundwater evaluation was recommended for AOPC 4, the Gull Park area, at IR Sites 1 and 2.

7.3.2 SFA Conclusions and Recommendations

Soil samples with detected concentrations of VOCs above industrial PRGs (U.S. EPA, 1994) correlated with the limits of former waste disposal activities discussed in the RI report (BNI, 1996). VC was the only VOC detected in soil at concentrations above the industrial PRG, but at a concentration less than the 1×10^{-4} risk-based screening criterion.

SFAs included the review of data on chlorinated VOCs and concluded that the VOCs, after release into the subsurface, mostly had degraded into breakdown products. Thus, concentrations of VOCs in soils, as evidenced in soil samples, were not present at levels sufficient to serve as a potential source of contaminants to groundwater. However, debris remaining on IR Sites 1 and 2 could be a potential source of future contamination (BNI, 1997a).

Based on a comparison of the VOC analytical results for groundwater with the *California Ocean Plan* criteria (SWRCB, 1995), only four VOCs (1,1-DCE, benzene, TCE, and VC) are present in groundwater at concentrations in excess of the criteria. The concentrations of 1,1-DCE, benzene, TCE, and VC are, respectively, 55.6, 32.2, 66.7, and 583.3 times the listed *California Ocean Plan* criteria (SWRCB, 1995). Evaluation of the dilution of these contaminants by natural processes on the mole suggests that their actual concentrations as discharged into the nearby ocean waters will be less than the maximum concentrations detected. However, the lateral distribution of these contaminants and their concentrations indicate a potential for impact to the waters of the West Basin of Long Beach Harbor.

The SFA analytical data indicated that a commingled chlorinated and nonchlorinated VOC plume exists in the groundwater beneath the north-northeast part of IR Sites 1 and 2 (AOPC 4). This plume potentially could impact nearby ocean waters. Analytical data indicated that VOCs were present in groundwater at concentrations in excess of the *California Ocean Plan* criteria (SWRCB, 1995). Therefore, the groundwater beneath AOPC 4 at IR Sites 1 and 2 was recommended for further action.

7.3.3 Basis for Action

The response action selected in this ROD is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment. Both the HHRA and groundwater modeling showed that there are no COCs or AOCs associated with IR Sites 1 and 2, providing that land use is industrial in nature. However, analytical data indicated the presence of organic compounds in groundwater at concentrations in excess of *California Ocean Plan* criteria (SWRCB, 1995). These contaminants are present in a groundwater plume at the eastern end of the mole (Gull Park) where IR Sites 1 and 2 are located. Because of the location of the plume, the prevalent movement of groundwater toward ocean waters, and the concentrations of these organic compounds, the groundwater at the eastern end of the mole (Gull Park) at IR Sites 1 and 2 will be treated.

The response action for IR Sites 1 and 2 addresses both soil and groundwater contamination. The remedial strategy is to reduce groundwater contaminant levels, remove debris and soil, monitor groundwater contaminants, and restrict future land use at the sites to industrial uses.

8.0: REMEDIAL ACTION OBJECTIVES

Remedial action objectives were established to allow selection of remedial alternatives that achieve protection of human health and the environment and are consistent with designated industrial land use as described in the Reuse Plan of the LRA (City of Long Beach, 1995).

Determination of remedial action objectives included consideration of site-specific risks and ARARs (see Section 13 and Appendix of this ROD) in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). Remedial action objectives were developed for IR Sites 1 and 2 based on industrial land use because the Reuse Plan of the LRA designates industrial use as the future land use for the sites.

There are no potable groundwater resources at NAVSTA Long Beach due to high levels of dissolved minerals in the water. Industrial land use for parking, warehousing, and merchant marine support is the anticipated future use for IR Sites 1 and 2.

Based on CERCLA, the NCP, the risk assessment in the RI, and ARARs, the remedial action objectives for IR Sites 1 and 2 are as follows:

Groundwater

- Minimize the potential for the migration of groundwater contaminants at concentrations that exceed *California Ocean Plan* criteria (SWRCB, 1997).
- Maintain industrial and utility maintenance worker exposure scenarios defined in the RI to prevent human exposure to groundwater containing carcinogens that result in an ELCR greater than 1.0×10^{-4}.
- Maintain industrial and utility maintenance worker exposure scenarios defined in the RI to prevent human exposure to groundwater containing chemical concentrations that result in a chronic toxicity hazard index greater than 1.

Surface and Subsurface Soil

- Locate and remove drums, other waste containers, and soil clinging to the containers in the north-northeast portion of IR Sites 1 and 2, AOPCs 1 and 4 (see Figure 1-3).
- Maintain industrial and utility maintenance worker exposure scenarios defined in the RI to prevent human exposure to soil containing carcinogens that result in an ELCR greater than 1×10^{-4}.

- Maintain industrial and utility maintenance worker exposure scenarios defined in the RI to prevent human exposure to soil containing chemical concentrations that result in a hazard index greater than 1.

9.0: DESCRIPTION OF ALTERNATIVES

Remediation alternatives that meet the remedial action objectives for IR Sites 1 and 2 (see Section 8.0) will reduce contaminant concentrations or reduce the potential for continued transport of contaminants in soils and groundwater, will monitor IR Sites 1 and 2 for changes in groundwater flow and contaminant transport, and will preserve the designated future land use for IR Sites 1 and 2. These goals are evaluated in detail in the *Feasibility Study for Installation Restoration Sites 1 and 2* (Battelle, 1999a). This section describes the three remediation alternatives considered for IR Sites 1 and 2.

All of the remedial alternatives presented in this section would be conducted in conjunction with the excavation of soils and debris at IR Sites 1 and 2 (AOPCs 1 and 4). The screening evaluation performed in the FS did not include excavation of soils and debris at IR Sites 1 and 2 because the DON had already agreed to conduct this excavation as part of the selected remedy for the sites. The DON and several regulatory agencies agreed that excavation was necessary to address the first surface and subsurface soil remedial action objective. A cost estimate for pre-design characterization and debris removal in Gull Park, IR Sites 1 and 2, is included in Appendix D of the FS. The estimated total cost for debris removal is $1,209,000. The estimated time to complete debris removal is six months. The proposal for excavation of soils was presented to the public in the Proposed Plan, which was open for a 30-day public review and comment period (June 10, 1999, to July 9, 1999).

9.1 Alternative 1: No Further Action

The NCP requires that the "no further action" (NFA) alternative be evaluated for all sites to establish a baseline against which to compare and evaluate other alternatives (U.S. EPA, 1990).

9.1.1 Description of Remedy Components

The NFA alternative implies that no activities will be implemented to remediate contaminants at the sites. It does not provide for treatment or containment of contaminants, and it does not provide for protection of human health and the environment by means of institutional controls.

9.1.2 Common Elements and Distinguishing Features

The NFA alternative does not present immediate risk to human health or the environment. However, it also does not ensure industrial use of IR Sites 1 and 2. In addition, the NFA alternative is not expected to comply with *California Ocean Plan* criteria (SWRCB, 1997) if groundwater contaminants at concentrations in excess of the criteria migrate to ocean waters. Because the NFA alternative requires no action to implement, its total time to implement is 0 months, and its total costs to implement are $0.

9.1.3 Expected Outcomes

The NFA alternative is not a treatment or containment technology and is not expected to reduce the toxicity, mobility, or volume of contaminants at IR Sites 1 and 2. In addition, the NFA alternative provides limited long-term effectiveness and permanence because there is no provision for ensuring industrial land use, the presupposition upon which the HHRA for IR Sites 1 and 2 was based.

9.2 Alternative 2: Long-Term Groundwater Monitoring and Land Use Controls (Deed Restrictions)

Alternative 2 for IR Sites 1 and 2 includes long-term groundwater monitoring and land use controls in the form of deed restrictions.

Land use controls include non-emergency institutional and legal measures designed to limit access to land use activities at a property. They may be selected in combination with other remedies to minimize or prevent human exposure to contaminants. They may be used as part of an environmental remedy to limit exposure pathways of contaminants to humans or to the environment, or they may protect a remedy that is in place. Land use controls will be described in further detail in the finding of suitability for transfer (FOST) or finding of suitability for early transfer (FOSET) for NAVSTA Long Beach.

9.2.1 Description of Remedy Components

Like Alternative 1, Alternative 2 provides for no treatment or containment of contaminants. However, Alternative 2 does provide for protection of human health and the environment by means of groundwater monitoring and institutional controls.

A groundwater monitoring network of seven monitoring wells for IR Sites 1 and 2 is already in place. Alternative 2 assumes the installation of three additional wells. Under Alternative 2, groundwater monitoring is assumed to continue for one year after the installation of the three additional wells, at which time the stability of the existing groundwater plume will be evaluated and a decision made to continue or terminate the monitoring program.

Land use controls in the form of deed restrictions are the institutional controls applied to IR Sites 1 and 2 under Alternative 2. Under this alternative, land use controls are used to limit groundwater use and to ensure that IR Sites 1 and 2 are industrial in nature.

9.2.2 Common Elements and Distinguishing Features

Like Alternative 1, Alternative 2 does not present immediate risk to human health or the environment. The HHRA for IR Sites 1 and 2 showed that no further controls on the land are needed to ensure protection of human health, so long as land use at the sites is industrial in nature.

Through implementation of land use controls, Alternative 2 ensures industrial use of IR Sites 1 and 2.

Long-term groundwater monitoring is useful in monitoring COPC concentrations and plume movement. It is an effective tool for evaluating whether remediation goals are being met. However, it provides for no treatment or containment of contaminants. Thus, like Alternative 1, Alternative 2 is not expected to comply with *California Ocean Plan* criteria (SWRCB, 1997).

Installation of groundwater monitoring wells is a well-known construction technology that can be completed within a few days to a few weeks. It imposes minor safety risks to workers and has minimal impact on the environment. Groundwater monitoring, which will continue for a minimum of one year after installation of the three additional wells, employs standard, available commercial technology and is expected to have minimal impacts to workers and surrounding ecosystems during periodic sampling activities.

Neither groundwater monitoring nor land use controls will prevent migration of contaminants into the marine ecosystem in concentrations exceeding *California Ocean Plan* criteria (SWRCB, 1997).

The estimated total cost for implementing Alternative 2 is $98,000. This total includes $18,000 capital costs to implement groundwater monitoring and $74,000 annual operating and maintenance (O&M) costs for groundwater monitoring for 12 months, plus $6,000 to implement land use controls. The estimated time to implement land use controls is three months.

9.2.3 Expected Outcomes

Groundwater beneath IR Sites 1 and 2 is saline and non-potable and is considered to be of non-beneficial use by the DWR (BNI, 1996).

Long-term groundwater monitoring is not a treatment or containment technology and is not expected to reduce the toxicity, mobility, or volume of contaminants at IR Sites 1 and 2. Groundwater monitoring will detect changes in groundwater quality and flow concentrations at IR Sites 1 and 2.

Likewise, land use controls will not prevent migration of groundwater contaminants into the marine ecosystem in concentrations exceeding *California Ocean Plan* criteria (SWRCB, 1997). However, land use controls can effectively prevent further land use changes at IR Sites 1 and 2, and thus can ensure that future land use at the sites remains industrial in nature.

9.3 Alternative 3: In Situ Air Sparging with Soil Vapor Extraction, Long-Term Groundwater Monitoring, and Land Use Controls (Deed Restrictions)

Alternative 3 includes in situ air sparging (IAS) treatment of soils and groundwater in conjunction with long-term groundwater monitoring and land use controls. Discussions of the

components, distinguishing features, and expected outcomes of long-term groundwater monitoring and land use controls are presented in Section 9.2, and are not repeated here.

9.3.1 Description of Remedy Components

In addition to long-term groundwater monitoring and land use controls, Alternative 3 includes IAS with soil vapor extraction (SVE). IAS involves injecting pressurized air into a contaminated aquifer. Air streams through the soil, creating an underground action that transfers contaminants to air. The air carries the contaminants to a SVE system. SVE is implemented in conjunction with air sparging to remove contaminants from the air before they discharge to the atmosphere.

IAS requires environmental drilling and construction of IAS wells. In addition, implementing IAS requires construction of pipe manifolds, equipment pads, and electrical connections for equipment. Finally, long-term operation of IAS requires ex situ vapor treatment. A reliable, effective vapor treatment system is needed in conjunction with IAS activities.

IAS technology and equipment are readily available. However, because of the relatively low hydraulic conductivity at Gull Park (AOPC 4), pilot testing for IAS is needed to evaluate its overall effectiveness.

Pilot testing is conducted to determine site-specific design parameters and to verify the feasibility of IAS with SVE. Testing is used to determine optimal SVE extraction rates, SVE radius of influence, and IAS well sparging, as well as optimal parameters for the IAS air delivery system.

To assure that remediation goals are reached, groundwater monitoring at IR Sites 1 and 2 will proceed both during IAS and for a minimum of one year following cessation of IAS.

9.3.2 Common Elements and Distinguishing Features

Like Alternative 2, through implementation of land use controls, Alternative 3 ensures industrial use of IR Sites 1 and 2, and thus is protective, in the long-term, of human health. In addition, Alternative 3 provides for treatment using IAS to reduce concentrations of contaminants at the sites.

IAS with SVE can reduce contaminant concentrations or reduce the potential for continued transport of contaminants in soils and groundwater. With proper design and operation, IAS with SVE can permanently remove and destroy contaminants. Thus, Alternative 3 is protective of the environment in the long term, because it will prevent migration of contaminants into the marine ecosystem in concentrations exceeding *California Ocean Plan* criteria (SWRCB, 1997).

Assuming that some support services can be provided by existing infrastructure at NAVSTA Long Beach, the estimated total cost for implementing Alternative 3 is $846,000. Capital costs for IAS with SVE are estimated to be $360,000, which includes the cost of pilot testing. Annual O&M costs for IAS with SVE are estimated to be $120,000, and the operation is expected to last for two years. Capital costs for groundwater monitoring are estimated at $18,000, and annual

O&M costs are estimated to be $74,000. Groundwater monitoring is estimated to last for three years. Cost of implementation of land use controls is estimated to be $6,000 and is expected to be completed within three months.

9.3.3 Expected Outcomes

Groundwater beneath IR Sites 1 and 2 is saline and non-potable and is considered to be of non-beneficial use by the DWR (BNI, 1996).

IAS results in the removal of contaminants from groundwater. A reduction in toxicity results directly from reduction in concentration of the contaminants by both mass transfer and biological destruction mechanisms. Thus, IAS with SVE will prevent migration of groundwater contaminants into the marine ecosystem in concentrations exceeding *California Ocean Plan* criteria (SWRCB, 1997). In addition, land use controls will effectively prevent further land use changes at IR Sites 1 and 2, and thus can ensure that future land use at the sites remains industrial in nature.

Under Alternative 3, cleanup goals for IR Sites 1 and 2 are expected to be reached within two years. However, a third year of groundwater monitoring will be conducted to ensure stability of results.

10.0: SUMMARY OF THE COMPARATIVE ANALYSIS OF ALTERNATIVES

The U.S. EPA has developed nine evaluation criteria to be used in evaluating and comparing remedial action alternatives (U.S. EPA, 1988). Section 10.1 categorizes, defines, and discusses these nine criteria. Section 10.2 uses these criteria to evaluate and compare the remedial action alternatives for IR Sites 1 and 2.

10.1 Discussion of Evaluation Criteria

The nine evaluation criteria developed by the U.S. EPA (1988) for evaluation of remedial action alternatives are as follows:

- Protection of human health and the environment
- Compliance with ARARs
- Long-term effectiveness and permanence
- Reduction of toxicity, mobility, or volume of contaminants
- Short-term effectiveness
- Implementability
- Cost
- State acceptance
- Community acceptance.

These criteria can be categorized into three groups: threshold criteria; primary balancing criteria; and modifying criteria. All threshold criteria must be satisfied for a remedial alternative to be eligible for selection. The primary balancing criteria are used to weigh major tradeoffs among alternatives. The modifying criteria usually are taken into account after public comment is received on the Proposed Plan (Battelle, 1999b) and reviewed with state regulatory agencies to determine if the preferred alternative remains the most appropriate remedial action.

10.1.1 Threshold Criteria

Protection of Human Health and the Environment. This criterion assesses whether an alternative provides adequate protection of human health and the environment and describes how risks posed by the site will be eliminated, reduced, or controlled through treatment, engineering controls, and/or institutional and regulatory controls.

The responsiveness of a remedial alternative to the "protection of human health and the environment" criterion is determined by evaluating how well the alternative achieves and maintains protection of human health and the environment. The assessment is based on overall performance in short-term and long-term effectiveness and compliance with applicable laws and regulations. The assessment focuses on whether a specific alternative

achieves adequate protection and describes how contaminated sites are eliminated, reduced, or controlled through treatment, engineering, and/or institutional controls.

Compliance with ARARs. Compliance with ARARs addresses whether a remedial alternative meets all related federal and state environmental statutes and requirements. An alternative must comply with ARARs, or be covered by a waiver, to be acceptable (see Section 13.0 and Appendix E).

10.1.2 Primary Balancing Criteria

Long-Term Effectiveness and Permanence. This criterion addresses the expected residual risk and the ability of a remedial alternative to maintain reliable protection of human health and the environment over time, after the remedial action objectives have been met.

Long-term effectiveness considers the risk posed by treatment residuals and untreated materials. For each remedial alternative considered, the permanency of the remedial action is determined. Factors such as the extent of destruction and reduction of contaminant toxicity, irreversible reduction in contaminant mobility, and reduction in volume of contaminated media are considered.

Reduction of Toxicity, Mobility, or Volume of Contaminants. This criterion addresses the statutory preference for selecting remedial actions that use treatment technologies that permanently and significantly reduce toxicity, mobility, and/or volume of contaminants.

In general, preferred remedial alternatives use techniques, such as treatment technologies, that can permanently eliminate or substantially reduce the inherent potential for contaminants to cause future environmental releases or other risks to human health and the environment.

Short-Term Effectiveness. The evaluation of short-term effectiveness addresses the period of time needed to implement the remedy and any adverse impacts that may be posed to workers, the community, and the environment during construction and operation of the remedy until cleanup levels are achieved.

Short-term effectiveness refers to the control of adverse impacts on human health and the environment imposed during the construction and implementation of a remedial alternative until cleanup goals are achieved. Short-term effectiveness accounts for potential effects of the contaminants on human health and the environment during the implementation of the remedial alternative. It may be particularly relevant when remedial activities are conducted in densely populated areas, or where contaminant characteristics are such that risks to worker or to the environment are high and special protective measures are needed. Possible factors to consider are fire, explosion, exposure to hazardous substances, and potential threats associated with excavation, treatment, transportation, and/or redisposal or containment of contaminated materials.

Implementability. Evaluation of implementability addresses the technical and administrative feasibility of implementing a remedial alternative from design through construction and operation. Factors such as availability of services, materials, adminstrative feasibility, and coordination with other governmental entities also are considered.

Evaluation of implementability also includes consideration of the degree of difficulty associated with constructing a remedial alternative, expected operational reliability, and availability of equipment and specialists needed to construct the remedy.

Cost. Evaluation of cost addresses the total cost of a remedial alternative, including consideration of the required capital costs, annual O&M costs, and net present value of the capital and O&M costs.

10.1.3 Modifying Criteria

State Acceptance. Evaluation of state acceptance addresses the apparent acceptability of a remedial alternative to State of California regulatory agencies.

Community Acceptance. Evaluation of community acceptance addresses the apparent acceptability of a remedial alternative by the community.

10.2 Comparison of Remedial Alternatives Using Evaluation Criteria

This section uses the nine U.S. EPA evaluation criteria discussed in Section 10.1 to compare and evaluate the remedial action alternatives for IR Sites 1 and 2. Table 10-1 summarizes a comparative evaluation of the alternatives based on best engineering judgment. A long-term groundwater monitoring program is currently in place at NAVSTA Long Beach, and data have been collected since November 1996.

All of the remedial alternatives discussed in this section would be conducted in conjunction with the excavation of soils and debris at IR Sites 1 and 2 (AOPCs 1 and 4). The screening evaluation performed in the FS did not include excavation of soils and debris at IR Sites 1 and 2 because the DON had already agreed to conduct this excavation as part of the selected remedy for the sites. The DON and several regulatory agencies agreed that excavation was necessary to address the first surface and subsurface soil remedial action objective. A cost estimate for pre-design characterization and debris removal in Gull Park, IR Sites 1 and 2, is included in Appendix D of the FS. The estimated total cost for debris removal is $1,209,000. The estimated time to complete debris removal is six months. The proposal for excavation of soils and debris at IR Sites 1 and 2 (AOPCs 1 and 4) was presented to the public in the Proposed Plan, which was open for a 30-day public review and comment period (June 10, 1999, to July 9, 1999). Because excavation was not evaluated against the nine evaluation criteria, it is not discussed further in this section.

Table 10-1. Summary of Comparative Evaluation of Remedial Alternatives for IR Sites 1 and 2

Criterion	Remediation Alternatives		
	Alternative 1[(a)] No Further Action	Alternative 2[(a)] Long-Term Groundwater Monitoring and Land Use Controls (Deed Restrictions)	Alternative 3[(a)] IAS with SVE, Long-Term Groundwater Monitoring, and Land Use Controls (Deed Restrictions)
Protection of Human Health and the Environment	1	2	4
Compliance with ARARs	1	3	4
Long-term Effectiveness and Permanence	1	2	3
Reduction of Toxicity, Mobility, or Volume of Contaminants	1	1	4
Short-term Effectiveness	1	2	3
Implementability	4	4	3
Cost	4	3	2
State Acceptance	1	3	4
Community Acceptance	1	3	4
Total	15	23	31

1 = poor, 2 = fair, 3 = good, 4 = very good. High scores are favorable.
(a) Although the screening evaluation performed in the FS did not include excavation of soils and debris from Gull Park (AOPCs 1 and 4), it is needed to meet remediation goals, and it was agreed to by the DON and the involved regulatory agencies. Thus, the location and removal of cans, drums, and other debris from Gull Park will be performed as part of the selected remedial alternative.

10.2.1 Protection of Human Health and the Environment

The presupposition upon which the HHRA for IR Sites 1 and 2 is based is continued use of the land for industrial purposes. Alternative 1, the NFA alternative, implies that no activities will be implemented at IR Sites 1 and 2. That is, Alternative 1 does not provide for the protection of human health by means of institutional controls to restrict land use to industrial purposes. Alternative 1 also does not assure that contaminants at concentrations in excess of *California Ocean Plan* criteria (SWRCB, 1997) do not migrate to ocean waters. Thus, the NFA alternative provides poor protection of both human health and the environment.

Alternative 2, long-term groundwater monitoring and land use controls (deed restrictions), provides good protection for human health by means of institutional controls to restrict land use to industrial purposes and to restrict the use of groundwater at the sites. Land use controls

provide protection of human health because they maintain the exposure scenarios on which the HHRA is based.

Long-term groundwater monitoring provides good protection by monitoring the migration of groundwater contaminants and allowing the evaluation of contaminant migration and human health risk. The potential for human exposure to contaminants is limited to drilling operations to install groundwater monitoring well and to periodic groundwater sampling activities. Groundwater monitoring has little impact on surrounding ecosystems. However, groundwater monitoring will not prevent contaminants at concentrations in excess of *California Ocean Plan* criteria (SWRCB, 1997) from migrating to ocean waters.

Alternative 3, IAS with SVE, long-term groundwater monitoring, and land use controls (deed restrictions), provides for very good protection of human health and the environment by means of institutional controls to restrict land use to industrial purposes and to restrict the use of groundwater at the sites, and IAS with SVE to permanently remove and destroy site contaminants.

For IAS, the potential for human exposure to contaminants is restricted to drilling operations, work with the aboveground off-gas stream, and sampling activities. IAS also has minimal ecosystem impacts. Application of SVE minimizes volatile emission to the atmosphere.

Under Alternative 3, land use controls provide protection of human health because they maintain the exposure scenarios on which the HHRA is based. IAS with SVE is protective of the environment because it prevents contaminants at concentrations in excess of *California Ocean Plan* criteria (SWRCB, 1997) from migrating to ocean waters. Alternative 3 also meets remediation goals.

10.2.2 Compliance with Applicable or Relevant and Appropriate Requirements

Alternative 1, the NFA alternative, includes no activities to monitor that contaminants at concentrations in excess of *California Ocean Plan* criteria (SWRCB, 1997) do not migrate to ocean waters. Thus, the NFA alternative gives no assurance of compliance with ARARs.

Alternative 2, long-term groundwater monitoring and land use controls, can comply with all federal, state, and local ARARs (see Section 13 and Appendix E) so long as contaminants at the sites do not enter marine waters at concentrations above *California Ocean Plan* criteria (SWRCB, 1997). However, if groundwater monitoring showed that contaminants were leaching into marine waters at concentrations in excess of *California Ocean Plan* criteria, then Alternative 2 would no longer be in compliance with ARARs.

Alternative 3, IAS with SVE, long-term groundwater monitoring, and land use controls, includes an effective treatment technology that can remove and destroy groundwater contaminants at IR Sites 1 and 2. It is expected to comply with all ARARs.

10.2.3 Long-Term Effectiveness and Permanence

Alternative 1, the NFA alternative, provides poor long-term effectiveness and permanence because it leaves contaminants in place at concentrations that exceed *California Ocean Plan* criteria (SWRCB, 1997).

Alternative 2, long-term groundwater monitoring and land use controls, provides fair long-term effectiveness and permanence by evaluating contaminant concentrations in groundwater and by restricting future land use. Periodic groundwater monitoring at IR Sites 1 and 2 can detect changes in groundwater quality and flow conditions, but requires repeated sampling and analysis of environmental media. However, monitoring does nothing in the long term to prevent contaminants in concentrations that exceed *California Ocean Plan* criteria (SWRCB, 1997) from migrating to ocean waters.

Land use controls, implemented as deed restrictions, can effectively limit land use options. Land use controls are implemented as restrictive covenants in deeds that restrict or prohibit certain uses of the deeded land. These restrictive covenants are recorded with the deed and bind the new owner and subsequent owners of the land. In addition, land use controls continue to be effective after remediation goals have been achieved. However, over time, land use controls in the form of restrictive covenants may be difficult to administer consistently.

Alternative 3, IAS with SVE, long-term groundwater monitoring, and land use controls, provides good long-term effectiveness and permanence by reducing contaminant concentrations or reducing the potential for continued transport of contaminants in soils and groundwater and by restricting future land use.

With proper design and operation, IAS with SVE permanently removes and destroys contaminants. Thus, IAS with SVE can prevent contaminants in concentrations that exceed *California Ocean Plan* criteria (SWRCB, 1997) from migrating to ocean waters.

Historically, IAS has shown the potential for a "rebound effect." The rebound effect limits the long-term effectiveness and permanence because the potential exists for sorbed contaminants in the subsurface to remain untreated. Contaminants potentially may dissolve and re-contaminate groundwater after treatment is halted, thus requiring further groundwater treatment.

If rebound is observed during the year following termination of IAS with SVE, and that rebound exceeds objectives, then remedial operations will resume at IR Sites 1 and 2 until objectives are met. It is possible that this cycle could be repeated. Because rebound cannot be predicted, no costs were included for this possibility.

10.2.4 Reduction of Toxicity, Mobility, or Volume of Contaminants

Alternative 1, the NFA alternative, does nothing to reduce the toxicity, mobility, or volume of contaminants at IR Sites 1 and 2. Alternative 2, long-term groundwater monitoring and land use

controls, also does nothing to reduce the toxicity, mobility, or volume of contaminants at IR Sites 1 and 2. Thus, both alternative 1 and alternative 2 are poor in meeting this criterion.

Alternative 3, IAS with SVE, long-term groundwater monitoring, and land use controls, is very effective in reducing the contaminants present at Gull Park (AOPC 4). IAS results in the removal of contaminants from groundwater. A reduction in toxicity results directly from reduction in the concentrations of contaminants by both mass transfer and biological destruction mechanisms.

SVE includes ex situ treatment of some contaminants by commercially available technologies. During SVE, adsorbents such as granular activated carbon (GAC) are used to adsorb contaminants. Thus, contaminants are transferred from the soil to another medium, the GAC, which then is transported to an off-site facility for final treatment and/or disposal.

10.2.5 Short-Term Effectiveness

Alternative 1, the NFA alternative, is not effective in the short term because it does not protect the public or the environment from exposure to contaminants at IR Sites 1 and 2.

Alternative 2, long-term groundwater monitoring and land use controls, is somewhat effective in the short term for achieving remediation goals. Groundwater monitoring at IR Sites 1 and 2 has only a very minor impact to workers and surrounding ecosystems during periodic sampling activities. However, the installation of groundwater monitoring wells imposes known safety risks, although such wells are a well-known, commercial technology. Land use controls in the form of deed restrictions do not require construction or installation of equipment and, thus, present no risks to workers or surrounding ecosystems.

Alternative 3, IAS with SVE, long-term groundwater monitoring, and land use controls, is effective in the short term. Typical IAS systems achieve relatively high rates of contaminant removal in the first months of operation. However, these high removal rates generally are followed by an exponential decrease in contaminant removal over time.

In addition, IAS requires environmental drilling and construction of IAS with SVE wells. Environmental drillings are likely to produce contaminated soil cuttings and liquids that can impose some risk to workers. Implementing IAS also requires the construction of pipe manifolds, equipment pads, and electrical connections for equipment, using well-known, commercial construction technologies that impose known safety risks.

Finally, long-term operation of IAS requires ex situ vapor treatment. The treatment of collected vapors, especially VC, may present moderate risks to workers and surrounding populations. A reliable, effective vapor treatment system, such as SVE, is needed in conjunction with IAS. The selected SVE system must be effective and reliable because human exposure levels for VC are relatively low (5 parts per million [ppm]) (American Conference of Governmental Industrial Hygienists [ACGIH], 1996).

10.2.6 Implementability

Alternative 1, the NFA alternative, is very easy to implement because it requires no action.

Alternative 2, long-term groundwater monitoring and land use controls, is also easy to implement. Long-term groundwater monitoring employs standard, available commercial technologies. It is ongoing at IR Sites 1 and 2, as part of a long-term monitoring program, and it is expected to continue.

Land use controls in the form of deed restrictions are implemented as restrictive covenants in deeds that restrict or prohibit certain uses of the deeded land. These restrictive covenants are recorded with the deed and bind the new owners and subsequent owners of the land. They are not expected to be difficult to implement. The transfer of property from the DON to the City of Long Beach, the public benefit conveyance, is set up so that the land can be used for port purposes only. Further, in accordance with the California Coastal Act and the Certified Port Master Plan for the Long Beach Harbor Districts, development of IR Sites 1 and 2 is restricted to industrial use.

Alternative 3, IAS with SVE, long-term groundwater monitoring, and land use controls, is reasonably easy to implement. Conventional drilling methods coupled with readily available, commercial equipment make IAS a reasonably easy method to employ for the treatment of contaminated groundwater at Gull Park (AOPC 4). However, because of the relatively low hydraulic conductivity and variable subsurface conditions at Gull Park (AOPC 4), pilot-scale testing is needed to evaluate the overall effectiveness of IAS to meet remediation goals.

Pilot-scale testing is conducted to determine site-specific design parameters for the IAS system and to verify the feasibility of IAS with SVE. Testing is conducted to determine optimal SVE extraction rates, SVE radius of influence, and IAS well sparging, as well as optimal parameters for the IAS air-delivery system.

Because moderate risk may be presented by the vapor treatment system operated in conjunction with IAS, the SVE system must be chosen and implemented carefully for effectiveness and reliability.

10.2.7 Costs

The total costs associated with Alternative 1, the NFA alternative, are the costs of debris removal only, as discussed in Section 9.0 and shown in Table 10-2.

The costs for implementing Alternative 2, long-term groundwater monitoring and land use controls (deed restrictions), and Alternative 3, IAS with SVE, long-term groundwater monitoring, and land use controls (deed restrictions), are discussed in Sections 9.2 and 9.3, respectively, and are summarized in Table 10-2. The costs estimated for each alternative are preliminary and should be used for comparative purposes only. They are expected to be accurate to within –30% to +50% only.

Table 10-2. Comparison of Preliminary Cost Estimates for Remediation Alternatives for IR Sites 1 and 2

Alternative	Capital Cost to Implement	Annual O&M Cost	Estimated Time to Complete[a]	Total Cost[b]	Total Cost with Debris Removal[c]
Alternative 1				$0	$1,209,000
Alternative 2				$98,000	$1,307,000
Long-term groundwater monitoring	$18,000	$74,000	12 months	$92,000	–
Land use controls[d]	$6,000	$0	3 months	$6,000	
Alternative 3				$846,000	$2,055,000
IAS with SVE[e]	$360,000	$120,000	2 years	$600,000	–
Long-term groundwater monitoring[f]	$18,000	$74,000	3 years	$240,000	–
Land use controls[d]	$6,000	$0	3 months	$6,000	–

(a) For costing purposes only, estimated durations are based on reasonable time frames for each technology. They do not imply that IR Sites 1 and 2 can be remediated within the time durations stated.
(b) Total cost includes capital costs and annual O&M costs incurred over the estimated duration. Estimates are expected to be within only a –30% to +50% range of accuracy.
(c) All of the remedial alternatives will be conducted in conjunction with the excavation of soils and debris at IR Sites 1 and 2 (AOPCs 1 and 4). The estimated total cost of debris removal is $1,209,000. The estimated time to complete debris removal is six months.
(d) Land use controls are expected to take three months to implement, but they will have long-term effectiveness.
(e) Cost estimates for IAS with SVE include pilot testing and O&M costs. IAS with SVE will continue for two years following implementation of the full scale system.
(f) Groundwater monitoring will continue for one year after completion of IAS with SVE.

The remedial alternatives require different periods of operation and levels of maintenance. O&M costs are included in the total costs for each alternative on a present worth basis. The estimated durations of two years and three years, respectively for IAS with SVE and long-term groundwater monitoring in Alternative 3 are based on reasonable time frames for each technology. They do not imply that IR Sites 1 and 2 can be remediated within these durations.

The cost estimate for IAS assumes pilot-scale testing to evaluate the overall effectiveness of IAS, followed by two years of actual operation of an IAS system. The cost for installing the IAS system in Gull Park assumes that some support services (for example, power supply and investigation-derived waste disposal) are provided by existing base infrastructure. Major operating costs for IAS include electrical power, monitoring, equipment rental, and vapor treatment.

10.2.8 State Acceptance

The state acceptance criterion requires the DON, as the responsible party, to address the state's comments and concerns for each proposed remediation alternative. Comment responses have

been accepted by the state. All state agencies have agreed to the proposed remedial Alternatives 1, 2, and 3, and the selected remedy, Alternative 3. The acceptance of Alternative 3 is documented by this ROD. The California RWQCB, Los Angeles Region, and the DTSC concur with the recommendations of this ROD.

10.2.9 Community Acceptance

Sections 14.0 and 15.0 and Appendices C and D document community involvement. Section 14.0 documents that there were no significant changes made to the remedial approach as a result of public comments. Section 15.0 provides an overview and background on community involvement in the decision-making process for IR Sites 1 and 2, and summarizes stakeholders issues and the DON's responses.

Appendix C includes a roster of attendees of the public meeting for IR Sites 1 and 2 held on June 28, 1999, in Long Beach, CA, along with a complete transcript of that meeting.

The DON carefully evaluated all public comments, took into consideration information provided by the public, and answered all questions. Appendix D documents the comments that the DON received from the public about IR Sites 1 and 2, and provides the DON's response to those comments.

No one in the community objected to the proposed remedial Alternatives, 1, 2, and 3, or the selected remedy, Alternative 3. However, one member of the community stated that he considered Alternative 2 "more than sufficient for any remedial actions." The community acceptance of the selected remedy is fully addressed by this ROD.

11.0: THE SELECTED REMEDY

The FS for IR Sites 1 and 2 (Battelle, 1999a) established remediation goals and evaluated the most appropriate and effective remedial alternatives for the sites. This section summarizes the results of the FS for IR Sites 1 and 2, as taken from the FS report.

The most appropriate and effective remedial alternatives were determined based on a review and analysis of the ARARs (See Section 11.0 and Appendix E), and on the ability to meet remediation goals. As required by CERCLA and the NCP, the remedial alternatives were developed and screened based on effectiveness, implementability, and cost. Based on the results of the initial screening, remedial alternatives underwent a detailed analysis using the nine criteria described in Section 10.0. The remedial action objectives for IR Sites 1 and 2 are as follows:

Groundwater

- Minimize the potential for the migration of groundwater contaminants at concentrations that exceed *California Ocean Plan* criteria (SWRCB, 1997).
- Maintain industrial and utility maintenance worker exposure scenarios defined in the RI to prevent human exposure to groundwater containing carcinogens that result in an ELCR greater than 1×10^{-4}.
- Maintain industrial and utility maintenance worker exposure scenarios defined in the RI to prevent human exposure to groundwater containing chemical concentrations that result in a hazard index greater than 1.

Surface and Subsurface Soil

- Locate and remove drums, other waste containers, and soil clinging to the containers in the north-northeast portion of IR Sites 1 and 2, AOPCs 1 and 4 (see Figure 1-3).
- Maintain industrial and utility maintenance worker exposure scenarios defined in the RI to prevent human exposure to soil containing carcinogens that result in an ELCR greater than 1×10^{-4}.
- Maintain industrial and utility maintenance worker exposure scenarios defined in the RI to prevent human exposure to soil containing chemical concentrations that result in a hazard index greater than 1.

Based on the comparative analysis of the remedial action alternatives in Section 10.0, the selected remedy for addressing soil and groundwater contamination at IR Sites 1 and 2 is Alternative 3, IAS with SVE, long-term groundwater monitoring, and land use controls in the form of

deed restrictions, along with location and removal of debris, as agreed to by the DON and the involved regulatory agencies.

Alternative 3 is expected to meet all remedial action objectives and to be successful in preventing contaminants in concentrations that exceed *California Ocean Plan* criteria (SWRCB, 1997) from migrating to ocean waters. This alternative also offers the best balance of performance for IR Sites 1 and 2. In the sections that follow, IAS with SVE, excavation of debris, long-term groundwater monitoring, and land use controls in the form of deed restrictions are described in detail, including the rationale for their selection.

11.1 In Situ Air Sparging with Soil Vapor Extraction

Results of the HHRA and groundwater modeling in the RI show that there are no COCs or AOCs associated with IR Sites 1 and 2 under an industrial use scenario. However, analytical data indicated the presence of four organic compounds (1,1-DCE, benzene, TCE, and VC) in groundwater at concentrations in excess of *California Ocean Plan* criteria (SWRCB, 1995). These contaminants are present in a groundwater plume at the eastern end of the mole (Gull Park, AOPC 4). Because of the location of the plume, the prevalent movement of groundwater toward ocean water, and the concentrations of organic compounds, the groundwater at AOPC 4 will be treated using IAS with SVE.

IAS is a remedial technology primarily applied for the removal of VOCs from groundwater aquifers. IAS involves injecting pressurized air into a contaminated aquifer. Air streams move through the soil, creating an underground action that transfers contaminants to air. The air carries the contaminants to the SVE system. SVE is implemented in conjunction with air sparging to remove contaminants from the air before they discharge to the atmosphere. SVE will use an ex situ treatment device either to destroy contaminants or to transfer them to another medium.

IAS will be applied at Gull Park (AOPC 4). The application of IAS will be coupled with SVE in the vadose zone to collect contaminant vapors stripped from the saturated and vadose zone soils. Navy guidance and experience with other IAS systems shows that spacing of sparge wells should be 15 to 20 feet in the most contaminated zones of the groundwater plume. Elsewhere, spacing will be about 30 to 40 feet within the plume. The total number of sparge wells is estimated to be about 45 or 50 wells. These sparge wells will be complemented with about 20 to 25 SVE wells.

SVE will use an ex situ treatment device either to destroy contaminants or to transfer them to another medium.

DON guidance and experience with other IAS systems shows that spacing of sparge wells should be 15 to 20 feet in the most contaminated zones of the groundwater plume. Elsewhere within the plume, spacing will be about 30 to 40 feet. The total number of sparge wells is estimated to be about 45 to 50 wells. These sparge wells will be complemented by about 20 to 25 SVE wells.

Installation, startup, and shakedown of the IAS with SVE system is expected to take two to three months. Pilot testing will be conducted to determine site-specific design parameters and to verify the feasibility of IAS with SVE. Testing to determine optimal SVE extraction rates, SVE radius of influence, and IAS well sparging, as well as optimal parameters for the IAS air delivery system, will be conducted as part of pilot testing.

Duration of operation for IAS with SVE is difficult to estimate before site-specific operational data are available. However, experience at other sites indicates that cleanup objectives could be achieved within two to three years. For costing purposes, two years of operation were assumed.

Potential refinements of the IAS with SVE system may include increasing or decreasing air sparging injection flowrates and installation of additional sparge wells or SVE wells.

If IAS with SVE does not work as anticipated, an alternate remedial action, such as pump and treat, may be required to achieve cleanup objectives.

Once cleanup goals are achieved and the IAS with SVE system is shut down, groundwater monitoring (see Section 11.3) will continue for at least one year to monitor for contaminant rebound. During that time, the IAS with SVE system will be left on standby, so that it can be reinitiated if necessary.

IAS is the most favorable treatment technology for AOPC 4 because the contaminant plume at AOPC 4 is close to ocean waters, and IAS can achieve relatively high contaminant removal rates in the first few months of operation (Marley and Bruell, 1995). Also, the volatility of the contaminants is expected to facilitate IAS.

Readily available equipment and conventional drilling methods will expedite construction of the IAS system. However, because of the relatively low hydraulic conductivity and variable subsurface conditions at Gull Park (AOPC 4), pilot testing will be needed to evaluate the overall effectiveness of IAS. Nonetheless, the application of IAS is expected to result in the permanent reduction of the contaminant mass beneath Gull Park.

11.2 Excavation of Debris

One of the remediation goals for IR Sites 1 and 2 determines the need to locate and remove cans, drums, other waste containers, and soil clinging to the containers from Gull Park in the north-northeast part of the sites. The excavation and removal of this debris were agreed to by the DON and the involved regulatory agencies prior to the site remedial investigations and therefore were not evaluated as part of any alternative for the sites. Thus, excavation of debris is not evaluated in the alternatives in this ROD.

Debris removal at IR Sites 1 and 2 is intended primarily to remove drums and other nonearthen debris. Stained soil and soil clinging to drums and debris also will be removed.

Excavation of debris at IR Sites 1 and 2 (AOPCs 1 and 4) will remove a potential source of contamination at the sites, where this source may be influencing the levels of groundwater contaminants. Debris will be located and removed as part of the selected remedy.

11.3 Long-Term Groundwater Monitoring

Quarterly groundwater monitoring is ongoing at IR Sites 1 and 2, AOPCs 1 and 4. The current groundwater monitoring program, which samples five monitoring wells within AOPCs 1 and 4 on a quarterly basis, is needed to ensure that concentrations of groundwater contaminants do not exceed levels that threaten human health and the environment, and that groundwater contaminants at concentrations in excess of *California Ocean Plan* criteria (SWRCB, 1997) do not migrate to marine ecosystems.

In addition to the five existing monitoring wells, Alternative 3, the selected remedy, assumes the installation of three additional wells within AOPCs 1 and 4. Quarterly groundwater monitoring will be conducted at these eight wells throughout the remedial action phase of the selected remedy and for one year, at a minimum, following completion of groundwater remediation. At that time, the stability of the existing groundwater plume will be evaluated and a decision made to continue or terminate the monitoring program.

Groundwater monitoring is useful in monitoring contaminant concentrations and plume movements. It is also an effective tool for evaluating the efficacy of remedial technologies. Long-term groundwater monitoring will be done at AOPCs 1 and 4 to evaluate the efficacy of removal efforts for remediating contaminated soils and groundwater, and to indicate that adequate protection of human health and the environment has been achieved. Long-term groundwater monitoring will not be conducted at AOPCs 2, 3, and 5. The DON shall prepare a site groundwater monitoring plan for review and concurrence by the agencies that specifies the constituents to be monitored (including VOCs, SVOCs, TAL metals, and cyanide), the well locations, the monitoring frequency, and a reporting schedule. This plan shall be revised as appropriate until monitoring is no longer required.

Table 11-1 summarizes the *California Ocean Plan* numerical criteria for the contaminants found at IR Sites 1 and 2. If an exceedance occurs, it will be reported by the landowner and the DON to the appropriate agencies (i.e., the U.S. EPA, the DTSC, and the RWQCB). If monitoring indicates that groundwater concentrations exceed water quality standards in the SWRCB's *California Ocean Plan* or the California RWQCB's *Water Quality Control Plan*, the DON will provide a document to the state proposing action to respond to the migration of contaminants to surface waters.

11.4 Land Use Controls

Land use controls are a component of the selected remedy for IR Sites 1 and 2. The objectives of land use controls are to ensure that industrial use of the land at IR Sites 1 and 2 is maintained and

Table 11-1. *California Ocean Plan* Criteria for Contaminants at IR Sites 1 and 2

Contaminant	Frequency of Detection[a]	Concentration Range (µg/L)	*California Ocean Plan* Criterion (µg/L)
1,1-Dichloroethene	7/37	ND to 50	0.9
Benzene	10/39	ND to 190	5.9
Trichloroethene	6/37	ND to 1,800	27
Vinyl chloride	18/37	ND to 21,000	36

(a) Frequency of detection = number of samples with detectable level of contaminant divided by total number of samples analyzed.
ND = none detected.

to prevent residential use. The volume and concentration of contaminants left on site is protective for industrial exposures.

The DON developed its assumptions about future land use based on the Reuse Plan of the LRA (City of Long Beach, 1995), which calls for industrial use of IR Sites 1 and 2; and the restrictions associated with the public benefit conveyance from the United States to the Port of Long Beach, which allows only port-related uses of the property conveyed. The remedy selected in this ROD allows IR Sites 1 and 2 to be available for the reasonably anticipated future land use in the risk assessment.

11.4.1 Land Use Restrictions and Controls

The primary legal mechanism used to implement land use controls will be restrictive covenants included in the deed provided to the Port of Long Beach pursuant to California Civil Code Section 1471. The following restrictions and controls will be applied at IR Sites 1 and 2:

- Residential use is prohibited.
- Site operations shall be restricted to industrial uses consistent with the California Coastal Act and the Certified Port Master Plan for the Long Beach Harbor District.
- Industrial use shall not include a hospital for humans, school for persons under 21 years of age, day care center for children, or any permanently occupied human habitation other than those used for industrial purposes.
- Removal of soil from IR Sites 1 and 2 prohibited, unless approved by the DTSC. Excavated soil and groundwater must be tested for hazardous substances and hazardous wastes.

- Construction and/or operations on the property shall not interfere with ongoing monitoring or assessment of work being conducted by or for federal, state, or local regulatory agencies, unless specifically approved by the appropriate lead agency.

- Removal and disposal of contaminated soil or groundwater shall be conducted in accordance with all applicable federal, state, and local regulations governing removal, transport, and disposal of hazardous substances and hazardous waste.

- Disturbance or use of existing groundwater wells is prohibited unless specifically approved by all regulatory agencies. No groundwater production wells may be installed for residential, municipal, agricultural, or industrial use. Monitoring and other test wells are not subject to this provision, including borings for the purpose of testing wells, wells for monitoring the quality of groundwater, and borings to define geology.

- Groundwater shall not be used for drinking water without the expressed authorization of the RWQCB.

In addition, the United States will retain the right to enter and inspect the property to ensure the viability of the selected land use controls or to perform any additional remedial response actions. In the deed transferring the property, the State of California also will be given such right to enter and inspect the property.

11.4.2 Environmental Restrictions in the Covenant and Agreement with DTSC and in the Deed

The following provisions of this section shall apply to all of Sites 1 and 2 that are subject to use restrictions and that the DON intends to transfer by deed to a non-federal agency.

Environmental Restriction Covenant and Agreement (Chapters 6.5 and 6.8 of Division 20 of the California Health and Safety Code Chapters [HSC] and California Civil Code Section 1471)

On March 16, 2000, the DON and the DTSC executed a memorandum of agreement (MOA) (DON, 2000), included in this ROD as Appendix F. The purposes of the MOA were to:

- Formalize the use of two model Environmental Restriction Covenants and Agreements

- Describe under what specific conditions the Environmental Restriction Covenant and Agreement would be used to give DTSC the same authority as the DON to enforce environmental restrictions imposed on transferring parcels of property.

The Environmental Restriction Covenant will contain environmental restrictions and will serve as a mechanism to implement the institutional control use restriction set forth in Section 11.4.1 of the ROD in accordance with DON policy. Once the Environmental Restriction Covenant and Agreement is finalized, it will be executed contemporaneously with the negotiation and execution of the conveyance of the property to the transferee(s) by deed pursuant to the Defense Base Closure and Realignment Act of 1990, 10 USC Section 2687 note. HSC Section 25234 applies to the removal of land-use restrictions imposed through an Environmental Restriction Covenant and Agreement between the DON and the DTSC by "aggrieved persons" as provided by that statute.

In addition, the DON shall include the same environmental restrictions (restrictive covenants) in the deed between the United States and the transferee(s) pursuant to the California Civil Code Section 1471. These restrictive covenants shall be consistent with and incorporate by reference the use restrictions set forth in Section 11.4.1 of the ROD and any Environmental Restriction Covenant and Agreement entered into between the DON and the DTSC for the relevant site(s). In addition, the California Civil Code Section 1471 restrictive covenants will be consistent with the "relevant and appropriate" substantive provisions pertaining to IR Sites 1 and 2.

The California Civil Code Section 1471 restrictive covenants will be executed by the transferee and will serve as a legally binding agreement between the transferee, its successors and assigns (the covenantor), and the United States, the State of California Department of Toxic Substances Control (DTSC), and the Los Angeles Regional Water Quality Control Board (who shall be identified in the deed as the covenantees [beneficiaries]) pursuant to California Civil Code Section 1471. The restrictive covenants will grant the covenantees, their contractors and representatives access to the property in order to ensure the continued effectiveness of the response action and to evaluate monitoring equipment, including but not limited to groundwater wells via site inspection. The deed will include a legal description of the property and/or contaminated areas. In addition, the deed will include information summarizing the remedial actions at the specific sites, and provisions for terminating or modifying the Environmental Restriction Covenant and Agreement in the event it is no longer necessary to protect human health and the environment. The Environmental Restriction Covenant and Agreement will be binding upon all future owners until legally terminated; that is, it will run with the land. The deed will be recorded in the Office of the County Recorder for the County of Los Angeles.

In addition to being referenced in the Environmental Restriction Covenant and Agreement incorporated in the Quit Claim Deed between the DON and the City of Long Beach, the appropriate and relevant parts of California HSC Sections 25202.5, 25222.1, 25230, 25232, and 25233, and California Civil Code Section 1471 also will be incorporated into the Land Use Covenant entered into between the DON and the DTSC pursuant to the Memorandum of Agreement (MOA) and Model Land Use Covenant between the DON and the DTSC (see Appendix F).

The DON will provide the DTSC and the RWQCB with a copy of the relevant language for the proposed deed for DTSC's and the RWQCB's review and comment in connection with DTSC's and RWQCB's review of the FOST and FOSET documents, as appropriate. The scope of the

DTSC's and RWQCB's review of the deed shall be to evaluate whether or not the use restrictions set forth in Section 11.4.1 of the ROD have been incorporated into the deed language in accordance with the DON's commitments in the ROD. A copy of the recorded deed will be provided to the DTSC and the RWQCB following recordation.

12.0: REMEDIAL ACTION PLAN REQUIREMENTS

The Cal-EPA DTSC remedial action plan (RAP) requirements are presented in Table 12-1. The DTSC has concurred that the referenced sections of the RI report (BNI, 1996) and the FS (Battelle, 1999a) satisfy the RAP requirements. Any revised or additional RAP requirements will be provided and administered by the DTSC. A copy of the California Health and Safety Code, Section 25356.1, RAP requirements, is included in the ROD as Appendix A.

Table 12-1. Cal-EPA DTSC RAP Requirements

RAP Requirement	Reference Location
Health and safety risks posed by the conditions at the site. When considering these risks, DTSC or the regional board shall consider scientific data and reports which may have a relationship to the site.	*Final Remedial Investigation (RI) Report Installation Restoration Program for Sites 1 through 6A, Naval Station Long Beach, Long Beach, California*, 1996 (RI). Chapter 5; Appendices R2, R3, and U.
The effect of contamination or pollution levels on present, future, and probable beneficial uses of contaminated, polluted, or threatened resources.	RI Chapter 5; Appendices R2, R3, and U
The effect of alternative remedial action measures on the reasonable availability of groundwater resources for present, future, and probable beneficial uses.	*Final Feasibility Study for Installation Restoration Sites 1 and 2, Naval Station Long Beach, Long Beach, California*, 1999a (FS). Sections 4 and 5.
Site-specific characteristics, including the potential for off-site migration of hazardous substances, the surface and subsurface soils, the hydrogeologic conditions, as well as pre-existing background contamination levels.	RI Chapters 3 and 4; Appendices H1, H2, P1, P2, P3, and U.
Cost-effectiveness of alternative remedial action measures.	FS Sections 6 and 7.
The potential environmental impacts of alternative remedial action measures, including, but not limited to, land disposal of untreated hazardous substances as opposed to treatment of hazardous substances to remove or reduce their volume, toxicity, or mobility prior to disposal.	FS Sections 6 and 7.

13.0: THE STATUTORY DETERMINATIONS

The DON, as lead federal agency, has a primary responsibility at its CERCLA sites to undertake remedial actions that achieve adequate protection of human health and the environment. In addition, Section 121 of CERCLA establishes several other statutory requirements and preferences. These requirements and preferences specify that, when complete, a selected remedy for a site must comply with applicable or relevant and appropriate environmental standards as established under federal and state environmental laws, unless a statutory waiver is justified.

The selected remedy also must be cost effective and use permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. Finally, remedies are preferred that employ treatment that permanently and significantly reduce the volume, toxicity, or mobility of hazardous wastes.

The following sections discuss how the selected remedy meets these statutory requirements.

13.1 Protection of Human Health and the Environment

The selected remedy provides for the protection of human health and the environment under an industrial land use scenario. The remedy also meets all remediation goals. The industrial exposure risks calculated in the RI (BNI, 1996) fall within the NCP's generally acceptable range (U.S. EPA, 1990). Based on industrial exposure risks, no COCs or AOCs were identified for IR Sites 1 and 2. However, during the SFAs, VOCs in the groundwater beneath Gull Park were detected at concentrations in excess of *California Ocean Plan* criteria (SWRCB, 1995). In addition, cans, drums, and other debris exist below Gull Park. These materials, of unknown content, need to be removed. This section briefly describes how IAS with SVE, long-term groundwater monitoring, and land use controls in the form of deed restrictions provide for the protection of human health and the environment.

IAS with SVE will reduce contaminant concentrations or reduce the potential for continued transport of contaminants in soil and groundwater. With proper design and operation, the use of IAS with SVE permanently removes and destroys contaminants. Employing IAS with SVE at IR Sites 1 and 2 will prevent groundwater contaminants at concentrations in excess of *California Ocean Plan* criteria from migrating to marine ecosystems.

Long-term groundwater monitoring will monitor concentrations of groundwater contaminants and plume movements to verify that remediation goals are being met. Monitoring indicates the potential for future contaminant concentrations to exceed regulatory criteria or to exceed levels that threaten human health and the environment, and can facilitate early identification of appropriate actions.

Land use controls provide protection because the HHRA used in the RI for IR Sites 1 and 2 is based on an industrial exposure scenario. If future land use changes, risk scenarios may no

longer be valid. Land use controls will prevent changes in future land use that may increase exposure risks at IR Sites 1 and 2.

13.2 Compliance with Applicable or Relevant and Appropriate Requirements

The NCP states, "Overall protection of human health and the environment and compliance with ARARs (unless a specific ARAR is waved) are threshold requirements that each alternative must meet in order to be eligible for selection" (U.S. EPA, 1990). The selected remedial alternative complies with federal and state ARARs. The federal and state chemical-specific, location-specific, and action-specific ARARs are discussed in the following subsections and are presented in Appendix E.

13.2.1 ARARs Overview

Potential ARARs developed from federal and state sources were reviewed and evaluated for applicability in the FS for IR Sites 1 and 2 (Battelle, 1999a). This section provides an overview of the ARARs process. The following sections summarize those ARARs that were determined to affect the achievement of remedial action objectives at IR Sites 1 and 2.

Identification of ARARs is a site-specific determination. The process involves determining whether a given requirement is applicable and, if it is not applicable, then whether it is relevant and appropriate. A requirement is deemed applicable if the specific terms of the law or regulation directly address a COC, the remedial action, or the location of the site involved. If the jurisdictional prerequisites of the law or regulation are not met, a legal requirement may, nonetheless, be relevant and appropriate if the site's circumstances are sufficiently similar to circumstances in which the law otherwise applies, and if the requirement is well suited to the conditions of the site.

A requirement must be substantive in order to constitute an ARAR for activities conducted on site. Procedural or administrative requirements, such as permits and reporting requirements, are not ARARs.

In addition to ARARs, the NCP provides that, where ARARs do not exist, agency advisories, criteria, or guidance are "to be considered" (TBC) "in helping to determine what is protective at a site or how to carry out certain actions or requirements" (55 Federal Register 8745). The NCP preamble states, however, that the provisions in the TBC category "should not be required as cleanup standards because they are, by definition, generally neither promulgated nor enforceable, so they do not have the same status under CERCLA as do ARARs."

As the lead federal agency, the DON has primary responsibility for identifying federal ARARs at NAVSTA Long Beach. As the lead state agency, the DTSC has primary responsibility for identifying state ARARs.

ARARs and TBCs generally are divided into three categories: chemical-specific, location-specific, and action-specific. Appendix E contains six tables listing all of the potential and actual ARARs pertinent for this ROD.

Chemical-specific ARARs are health- or risk-based numerical values for various environmental media, specified in federal or state statutes or regulations. These numerical values establish the acceptable amount or concentration of a chemical that may be present in a specific medium at a site, or that may be discharged to the site or to the ambient environment during remedial actions.

Location-specific ARARs address the areas in which the remedial action takes place. Identified regulations that are potential ARARs may require actions to preserve or protect aspects of environmental or cultural resources that may be threatened by the remedial actions to be undertaken at the site.

Action-specific ARARs are regulations that apply to specific activities or technologies used to remediate a site. They can include design criteria and performance standards.

13.2.2 Federal ARARs

This section summarizes federal chemical-specific ARARs, location-specific ARARs, and action-specific ARARs that were determined to affect the achievement of remediation goals at IR Sites 1 and 2.

Federal Chemical-Specific ARARs. Based on the evaluation presented in the FS for IR Sites 1 and 2, the federal chemical-specific ARARs identified as applicable for remediation of the sites address groundwater treatment; excavation of cans, drums, other debris, and soil clinging to the debris at AOPCs 1 and 4; and excavation of drill cuttings and purge water from new monitoring wells or soil borings. The substantive provisions of the following requirements are identified as federal chemical-specific ARARs for this ROD:

- **Clean Water Act. 33 USC 1313 and 1314(a), 33 USC 301(b), and 42 USC 9621(d)(2).** Water quality criteria for discharges to surface and groundwaters.

- **Resource Conservation and Recovery Act. Title 22 California Code of Regulations (CCR), Sections 66261.21, 66261.22(a)(1), 66261.23, 66261.24(a)(1), and 66261.100.** Determination of RCRA hazardous waste; Toxicity Characteristic Leaching Procedure (TCLP) regulatory levels.

- **Resource Conservation and Recovery Act. Title 22 CCR, Section 66264.94.** RCRA groundwater protection standards.

- **Resource Conservation and Recovery Act. Title 22 CCR, Section 66264.1030 through 1034 and 1050 through 1063 (excluded section outlined in Table E-1).** RCRA air emission requirements.

- **Comprehensive Environmental Response, Compensation, and Liability Act.** Alternate concentration limits.

- **Toxic Substances Control Act. 40 CFR Section 761.60 (excluded sections outlined in Table E-1: TSCA).** Regulates use and manufacture of toxic substances and storage and disposal of PCBs

Under RCRA Title 22 CCR, Sections 66261.21, 66261.22(a)(1), 66261.23, 66261.24(a)(1), and 66261.100, the TCLP regulatory levels, the persistent and bio-accumulative toxic substances total threshold limit concentrations (TTLCs), and soluble threshold limit concentrations (STLCs) are applicable in identifying hazardous waste. These definitions will be applicable to both soils (i.e., drill cuttings) and water (i.e., purge water). Because solvents may have been discarded at the site and chlorinated solvents have been detected, a listed waste designation may be applicable. Materials that contain detectable concentrations of solvents will be designated as the appropriate F-listed waste. Materials also will be treated for hazardous waste characteristics. Materials that meet these criteria for hazardous waste will be handled as hazardous waste and disposed of in accordance with applicable regulations, including land ban treatment standards.

Under RCRA Title 22 CCR, Section 66264.94, except 66264.94(a)(2) and 94(b), groundwater protection standards are not applicable because there will be no treatment, storage, and disposal (TSD) facilities under the selected remedial action. However, groundwater protection standards are relevant and appropriate because the source of the waste is unknown, and waste constituents have been released to groundwater. Also, groundwater at the mole is not potable and cannot be used for a public water supply. Alternative standards found in the *California Ocean Plan* (SWRCB, 1997) will apply to groundwater remedial action.

RCRA air emission standards, 22 CCR, Sections 66264.1030 through 1034 and 1050 through 1063, except as outlined in Table E-1, are relevant and appropriate because SVE systems will be in contact with VC and other organic chemicals. However, concentrations are expected to be below 10% by weight.

Federal water quality criteria developed pursuant to the Clean Water Act of 1972 (CWA), as amended, may be applicable, because treated groundwater at IR Sites 1 and 2 has the potential to discharge to the ocean. The selected remedial action includes groundwater monitoring to ensure that no release to the ocean occurs in the future. If a release were to occur, then water quality criteria would be applicable in determining if the release caused an impact on marine species.

Under CERCLA, alternative concentration limits are applicable because there is a projected point of entry of groundwater to surface (ocean) water, although there is not a statistically significant increase of hazardous constituents from groundwater in surface water at the point of entry. There are also enforceable institutional controls to preclude human exposure at any point between the site boundary and the point of entry to surface

(ocean) water. This regulation allows a risk-based approach to setting alternative concentration limits based on a surface water discharge pathway.

The TSCA, 40 CFR 761.60 (excluded sections outlined in Table E-1), regulates handling of wastes, including oils, debris, sludge, or dredged materials contaminated with PCBs at concentrations greater than 50 ppm. The regulations are applicable for wastes contaminated at greater than 50 ppm of PCBs. Because PCBs detected in surface soils at IR Sites 1 and 2 are well below concentrations of 50 ppm, the TSCA regulations are relevant and appropriate, but are not applicable.

Federal Location-Specific ARARs. Location-specific requirements include those that involve restriction on how remedial activities are to be conducted in particular locations. Based on the evaluation presented in the FS for IR Sites 1 and 2, the substantive provisions of the following requirements were identified as federal location-specific ARARs for this ROD:

- **Hazardous Waste Control Act. Title 22 CCR, Section 66264.18(a).** Regulates facilities within the 100-year floodplain.
- **Executive Order 11988, Protection of Floodplains. 40 CFR Section 6, Appendix A.**
- **Endangered Species Act. 16 USC 1536(a).**
- **Coastal Zone Management Act. 16 USC 1456(c).**
- **Migratory Bird Act of 1972. 16 USC 703.**
- **Marine Mammal Protection Act. 16 USC 1372(2).**

Most of the location-specific ARARs are related to the coastal location of IR Sites 1 and 2.

The Hazardous Waste Control Act regulates facilities within the 100-year floodplain. Although IR Sites 1 and 2 are not within an area considered susceptible to flooding during a statistical 100- or 500-year flood, it is relevant and appropriate because the area around the sites may be subject to storm surge.

Executive Order 11988, Protection of Floodplains, requires that actions taken by the federal government avoid adverse effects, minimize potential harm, and restore and preserve natural and beneficial values of floodplains. Flooding from the Los Angeles River or from Dominguez Canal is not a major threat to LBNC. Also, FEMA maps show that Terminal Island is not within an area considered susceptible to flooding during a statistical 100- or 500-year flood (BNI, 1996). However, because of their proximity to the ocean, IR Sites 1 and 2 may be subject to storm surge.

Because IR Sites 1 and 2 are located along the coast, the Coastal Zone Management Act is considered an ARAR. This act requires that activities be conducted in a manner consistent with approved state management programs.

The Endangered Species Act of 1973 protects critical habitat upon which threatened or endangered species depend. It is relevant and appropriate because California least tern, California brown pelican, American peregrine falcon, and western snowy plover are known to reside in or frequent the areas around the sites.

The Migratory Bird Treaty Act of 1972 protects almost all species of native birds in the United States from unregulated "take." "Take" includes pursuing, hunting, shooting, wounding, killing, trapping, capturing, and collecting, and can include poisoning at hazardous waste sites. Migratory birds are present at IR Sites 1 and 2 during some parts of the year. However, because the Migratory Bird treaty Act does not apply to federal agencies, it is not applicable but is relevant and appropriate for the selected remedial actions for IR Sites 1 and 2.

The Marine Mammal Protection Act protects any marine mammal in the United States, except as provided in international treaties, from unregulated "take." "Take" includes pursuing, hunting, shooting, wounding, killing, trapping, capturing, and collecting, and can include poisoning from hazardous wastes and other contaminants. Because IR Sites 1 and 2 are located along the coast, and because contaminated groundwater could be treated and discharged to the ocean, this act is applicable.

Federal Action-Specific ARARs. Based on the evaluation presented in the FS for IR Sites 1 and 2, the substantive provisions of the following requirements were identified as the federal action-specific ARARs for this ROD:

- **Resource Conservation and Recovery Act. Title 22 CCR, Sections 66262, 66264, and 66268.** (Various subsections as listed in Table E-3: RCRA.) Regulate generation, handling, and treatment of RCRA hazardous waste.

- **Clean Water Act. 40 CFR Sections 100-140 and Sections 400-470.**

- **Clean Air Act (CAA) (Air Quality Management District [AQMD] Rules).** (Air discharge.)

- **Department of Transportation, 49 CFR Sections 171, 172, and 173.** (Various subsections as listed in Table E-3: Hazardous Materials Handling.)

Most action-specific ARARs are related to generation, handling, and treatment of RCRA hazardous waste under Title 22 CCR, Sections 66262, 66264, and 66268. RCRA waste may be generated as part of the selected remedial action. Thus, the regulations applicable to generating and handling hazardous waste are considered ARARs. If soils and ground-

water are tested and found to be RCRA-characteristic waste, the materials will be managed appropriately and handled in accordance with all applicable regulations. The RCRA requirement for closure of land treatment units specifies closure and post-closure care requirements for hazardous waste land treatment units. This requirement is not applicable because there is no land treatment unit at the sites.

The Clean Water Act is applicable for regulating effluents discharged to surface waters. Discharges of treated groundwater may occur.

The Clean Air Act (Air Quality Management District rules) is applicable because the use of SVE will result in generation of a vapor phase contaminated with vinyl chloride and other organic compounds. This phase will be treated prior to discharge to the atmosphere.

Hazardous wastes that may be generated and transported off site as a result of the remedial actions are subject to U.S. Department of Transportation requirements for transporting and identifying the wastes.

13.2.3 State ARARs

This section summarizes the state chemical-specific ARARs, location-specific ARARs, and action-specific ARARs.

State Chemical-Specific ARARs. Based on the evaluation presented in the FS for IR Sites 1 and 2, the substantive provisions of the following requirement were identified as state chemical-specific ARARs for this ROD:

- **Title 22 CCR, Sections 66261.22(a)(3) and (4), 66261.24(a)(2) to (a)(8), 66261.101, 66261.3(a)(2)(C), or 66261.3(a)(2)(F).**
- **California Water Code, Division 7, Sections 13241, 13243, 13263(a), and 13360.**
- **California Water Code §13240.**
- **Title 23 CCR, Sections 2511(d), 2520, and 2521.**
- **Title 27 CCR, Sections 20090(d), 20200, 20210, 20220, and 20230.**

The Cal-EPA DTSC definition of "non-RCRA hazardous waste" is an ARAR. The remedial actions for IR Sites 1 and 2 may produce non-RCRA hazardous waste. Therefore, soils, drill cuttings, purge water, and groundwater will be analyzed and, if they have the characteristics of non-RCRA hazardous waste as defined by Cal-EPA DTSC, will be handled appropriately.

Portions of the California Water Code are applicable because discharges of treated groundwater may occur. The code establishes water quality objectives for these discharges.

The cited Title 23 and 27 Sections of the CCR require that if waste is removed from the place of its release, it must be classified and then disposed of in accordance with its classification.

State Location-Specific ARARs. Based on the evaluation presented in the FS for IR Sites 1 and 2, the substantive provisions of the following requirements were identified as the state location-specific ARAR for this ROD:

- **California Coastal Act of 1976.**
- **RWQCB, Los Angeles Basin Plan.**

The California Coastal Act of 1976 regulates activities associated with development to control direct significant impacts on coastal waters and to protect state and national interests in California coastal resources. This regulation is applicable because IR Sites 1 and 2 are within the coastal zone.

The beneficial use requirement of the RWQCB's Los Angeles Basin Plan are applicable requirements, because groundwater at the sites has the potential to migrate to ocean waters.

State Action-Specific ARARs. Based on the evaluation presented in the FS for IR Sites 1 and 2, the substantive provisions of the following requirements were identified as the state action-specific ARARs for this ROD:

- **California Water Code, Division 7, Sections 13241, 13243, 13263(a), and 13360.**
- **California Water Code §13420.**
- **RWQCB Order No. 91-10.**
- **California Water Code Section 13273.** Solid waste assessment test program.
- **SWRCB Water Code, Section 13170.2.** Water Quality Control Plan, Ocean Waters of California.
- **California Department of Fish and Game Code, Chapter 2, Sections 5650(a), (b), and (f); Sections 12015 and 12016.**
- **SWRCB Water Code, Section 1243.**

- **California Civil Code, Section 1471**
- **California HSC, Section 25202.5**
- **California HSC, Section 25222.1**
- **California HSC, Subparagraph 25232(b)(1)(A-E)**
- **California HSC, Paragraph 25233(c)**

SWRCB and RWQCB Water Codes that regulate discharges, establish water quality standards or objectives, or otherwise establish programs to protect water quality are applicable because groundwater at IR Sites 1 and 2 is considered to be waters of the state.

The Water Quality Control Plan, Ocean Waters of California is applicable to IR Sites 1 and 2 because groundwater at the sites potentially migrates to the ocean. The *California Ocean Plan* (SWRCB, 1997) establishes beneficial uses of ocean waters, numerical and narrative water quality objectives, discharge prohibitions, and effluent quality objectives, including toxic material limitations. These water quality objectives apply to groundwater at IR Sites 1 and 2 at the point where it migrates to the ocean.

The California Department of Fish and Game Code prohibits water pollution with any substance or material deleterious to fish, plant, or bird life. It applies to any listed or deleterious substances deposited in, permitted to pass into, or placed where they could pass into waters of the state. However, no specific limits for these listed or deleterious substances are provided in the regulation. This regulation is applicable because groundwater at IR Sites 1 and 2 migrates to the ocean.

The California Department of Fish and Game Code also prohibits abandonment, disposal, or throw-away of cans, bottles, garbage, motor vehicles, rubbish, or carcasses within 150 feet of the highest mark of a body of water. In addition, the code specifies that if a person is responsible for polluting, contaminating, or obstructing waters of the state or for depositing or discharging any substance that is detrimental or threatens detriment to fish, plant, bird, or animal life, that person is liable and must remove and abate the substance or material that threatens to pollute, obstruct, or contaminate waters of the state.

The SWRCB, in Section 1243 of the Water Code, defines the use of water for recreation and preservation and enhancement of fish and wildlife resources as a beneficial use of water. It also includes policy on appropriation of water. Because groundwater at IR Sites 1 and 2 discharges to the ocean, this provision is applicable.

State statutes that have been accepted by the DON as ARARs for implementing institutional controls and entering into an Environmental Restriction Covenant and Agreement with DTSC include substantive provisions of the California Civil Code Section 1471 and HSC Sections 25202.5, 25222.1, 25232(b)(1)(A) through (E), and 25233(c).

The substantive provisions of Civil Code Section 1471 are the following general narrative standard: "...to do or refrain from doing some act on his or her own land...where... (c) Each such act relates to the use of land and each such act is reasonably necessary to protect present or future human health or safety or the environment as a result of the presence on the land of hazardous materials, as defined in Section 25260 of the Health and Safety Code." This narrative standard would be implemented through incorporation of restrictive environmental covenants in the deed at the time of transfer. These covenants would be recorded with the Environmental Restriction Covenant and Agreement and run with the land.

The substantive provisions of HSC Section 25202.5 are the general narrative standard to restrict "present and future uses of all or part of the land on which the...facility...is located...." These substantive provisions will be implemented by incorporation of restrictive environmental covenants in the Environmental Restriction Covenant and Agreement at the time of transfer for purposes of protecting present and future public health and safety.

Actual land-use restriction requirements are set forth in HSC subparagraphs 25232(b)(1)(A) through (E). These include prohibitions on construction of residences, hospitals for humans, schools for persons under 21 years of age, day care centers, or any permanently occupied human habitation on hazardous waste property. HSC paragraph 25233(c) sets forth substantive criteria for granting variances from the use prohibited in HSC subparagraphs 25232(b)(1)(A) through (E) based upon specified environmental and health criteria.

HSC 25222.1 provides the authority for the state to enter into voluntary agreements to establish land use covenants with the owner of property. The HSC Section 25222.1 Land Use Covenant Agreement, itself, is in the form of an agreement, and this procedural form does not qualify as a legally binding "applicable or relevant and appropriate" requirement under CERCLA because it is administrative (procedural) in nature. The substantive provision of HSC 25222.1 is the general narrative standard: "restricting specified uses of the property." The DON will comply with the substantive requirements of HSC 25222.1 by incorporating CERCLA use restrictions, which are also consistent with the substantive requirements of HSC subparagraphs 25232(b)(1)(A) through (E) and HSC paragraph 25233(c), into the DON's deed of conveyance in the form of restrictive covenants under the authority of Civil Code 1471. The substantive provisions of HSC 25222.1 may be interpreted in a manner that is consistent with the substantive provisions of Civil Code Section 1471. The covenants would be recorded with the deed and run with the land.

In addition to being implemented through the Environmental Restriction Covenant and Agreement between the DON and the DTSC, the appropriate and relevant portions of the California HSC Sections 25202.5, 25222.1, 25230, 25232, and 25233, and Civil Code Section 1471 shall also be implemented through the deed between the DON and the tranferree.

The U.S. EPA does not agree with the DON and the DTSC that the sections of the California Civil Code and HSC cited above are ARARs. These state regulations fail to meet the criteria for ARARs pursuant to U.S. EPA guidance (i.e., they are administrative, not substantive, requirements that establish a discretionary way to implement land-use restrictions). However, although the U.S. EPA does not agree that these state regulations require the DON to enter into a land-use covenant with the DTSC, the U.S. EPA believes that, if necessary for the protection of human health and the environment, it may be appropriate for the facility to elect to enter into an enforceable written agreement with DTSC to enforce land-use restrictions at a site.

13.3 Cost Effectiveness

Cost effectiveness is determined by comparing the cost of all alternatives being considered with their overall effectiveness to determine whether that costs are proportional to the effectiveness achieved.

IAS with SVE is not a low-cost treatment alternative. The initial capital cost for installing an IAS system in Gull Park (AOPC 4) assumes that some support services, including power supply and investigation-derived waste disposal, can be provided by the existing infrastructure at NAVSTA Long Beach.

The cost for removal of cans, drums, and other debris from Gull Park (AOPCs 1 and 4) is estimated at $1,209,000. This cost is in addition to the total costs for IAS with SVE, long-term groundwater monitoring, and land use controls.

Long-term groundwater monitoring costs are moderate, depending on the period of time needed to evaluate contaminant migration and remediation success. The costs of land use controls are expected to be relatively small.

13.4 Use of Permanent Solutions and Alternative Treatment (or Resource Recovery) Technologies to the Maximum Extent Practicable

The selected remedy uses IAS with SVE treatment for groundwater contamination as the principal remedial action. IAS with SVE is an in situ treatment technology that involves injecting clean air into an aquifer beneath the water table to induce mass transfer of VOCs to the vapor phase (Marley and Bruell, 1995). With IAS, VOCs are removed from the groundwater with little disturbance to the resource itself. That is, the resource is recovered intact. Thus, the selected remedy meets the CERCLA requirement for using treatment and resource recovery technologies to the maximum extent practicable.

IAS with SVE treatment for groundwater at AOPCs 1 and 4 is also a permanent remedy. It meets the statutory requirements to use permanent solutions and treatment technologies to the maximum extent practicable. Because the RI (BNI, 1996 and 1997a) determined that, under an industrial use scenario, there are no COCs or AOCs at IR Sites 1 and 2, and, because the

industrial risk calculated by the HHRA falls within the NCP's generally acceptable range (U.S. EPA, 1990), active remediation technologies are not warranted for AOPCs 2, 3, and 5.

13.5 Preference for Treatment as a Principal Element

The selected remedy includes IAS with SVE treatment for groundwater contamination as the principal remedial action. Thus, the selected remedy meets the CERCLA preference for treatment as a principal element.

13.6 Five-Year Review Requirements

The NCP requires a five-year review if the selected remedial action results in hazardous substances, pollutants, or contaminants remaining on site above levels that allow for unlimited use and unrestricted exposure. Because the selected remedy will result in contaminants remaining on site above levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted within five years after the initiation of the remedial action to ensure that the remedy is, or will be, protective of human health and the environment.

14.0: DOCUMENTATION OF SIGNIFICANT CHANGES

There were no significant changes made to the remedial approach as a result of public comments.

15.0: THE RESPONSIVENESS SUMMARY

This section provides DON decision makers with information about the community's preferences regarding the remediation alternatives as well as the community's general concerns about IR Sites 1 and 2. It also demonstrates to community members that their comments are an integral part of the decision-making process.

15.1 Overview and Background on Community Involvement

The Proposed Plan for IR Sites 1 and 2 was made available to the public on June 10, 1999, thereby initiating the public comment period. The public meeting for the Proposed Plan for IR Sites 1 and 2 was held on June 28, 1999 in Long Beach, CA. The public comment period ran from June 10, 1999 to July 9, 1999. Copies of newspaper notices of the public comment period, and the location and time of the public meeting, are included in Appendix C. A transcript of the public meeting and an attendance roster also are included in Appendix C.

The purpose of the Proposed Plan (Battelle, 1999b) and the public meeting was to provide the public with a concise summary of all the remedial alternatives, including the preferred alternative and the rationale for its selection. In addition to a summary, the Proposed Plan provided a comment form, location of the administrative record (an alternative source of project documentation available to the public), and technical and regulatory contacts. A copy of the administrative record file is included as Appendix B.

15.2 Stakeholder Issues and DON Responses

Comments were received from four members of the public. These comments and the DON's responses are included in Appendix D. In general, two of the comments were concerned with the past and future use of IR Sites 1 and 2, one was concerned with increased human cancer risk resulting from the consumption of fishes caught in the coastal waters around the LBNC, and the fourth was concerned with the cost of the selected remedial action, the need of which was questioned by the commenter.

The key response elements are that, although part of the sites was once a park area and used for human recreational activities, there are currently no plans for any future recreational activities at the sites, and no plans to allow any public access to the sites for recreational purposes.

With respect to the human bioaccumulation of carcinogens from the consumption of fishes taken from the coastal waters around the LBNC, the selected remedial action IAS with SVE will remove contaminants from groundwater to prevent these contaminants from migrating to ocean waters. Thus, the fish that inhabit the coastal water will not be adversely affected by contaminants found at the sites.

Finally, IAS with SVE is not a low-cost remedial action. It was selected for implementation at IR Sites 1 and 2 because contaminants in groundwater at the sites have the potential to migrate to the marine ecosystem in concentrations that exceed State of California criteria. Because this potential exists, the DON and the involved regulatory agencies have deemed it necessary to treat the groundwater at the sites.

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APPENDIX A

California Health and Safety Code, Section 25356.1

hazardous substance, as necessary, except for samples required to be kept for evidentiary purposes.

(b) Notwithstanding any other provision of law, for any hazardous substance that is an illegal controlled substance, a precursor of a controlled substance, or a material intended to be used in the unlawful manufacture of controlled substances, upon notice that the hazardous substance requires a removal action, the department shall take removal action with respect to that hazardous substance, utilizing funds, to the extent available, from the reserve account for emergencies established pursuant to Section 25354 or transferred from the Hazardous Waste Control Account to the Hazardous Substance Account, until December 31, 1995. On and after January 1, 1996, the department may expend funds appropriated from the Illegal Drug Lab Cleanup Account created pursuant to subdivision (e) to pay the costs of removal actions required by this section.

(c) (1) For purposes of Chapter 6.5 (commencing with Section 25100) or this chapter, any person who is found to have operated a site for the purpose of manufacturing an illegal controlled substance or a precursor of an illegal controlled substance is the generator of any hazardous substance at, or released from, the site that is subject to removal action pursuant to this section.

(2) During the removal action, for purposes of complying with the manifest requirements in Section 25160, the department, the county health department, or their designee may sign the hazardous waste manifest as the generator of the hazardous waste. In carrying out that action, the department, the county health department, or their designee shall be considered to have acted in furtherance of their statutory responsibilities to protect the public health and safety and the environment from the release of hazardous substances, and the department, the county health department, or their designee are not responsible parties for the release or threatened release of the hazardous substances.

(3) The officer, investigator, or agency employee specified in subdivision (a) is not a responsible party for the release or threatened release of any hazardous substances at, or released from, the site.

(d) The department may adopt regulations to implement this section in consultation with appropriate law enforcement agencies.

(e) The Illegal Drug Lab Cleanup Account is hereby created in the General Fund and the department may expend any money in the account, upon appropriation by the Legislature, to carry out the removal actions required by this section.

(f) The responsibilities assigned to the department by the act adding this subdivision apply only to the extent that sufficient funding is made available for that purpose.

(Amended by Stats. 1994, 1st Ex. Sess., Ch. 55, Sec. 1. Effective November 30, 1994. Repealed as of July 1, 1998, pursuant to Section 25395.)

25355. (a) The Governor shall be responsible for the coordination of all state response actions for sites identified in Section 25356 in order to assure the maximum use of available federal funds.

(b) The director may initiate removal or remedial action pursuant to this chapter unless these actions have been taken, or are being taken properly and in a timely fashion, by any responsible party.

(c) At least 30 days before initiating removal or remedial actions, the department shall make a reasonable effort to notify the persons identified by the department as potentially responsible parties and shall also publish a notification of this action in a newspaper of general circulation pursuant to the method specified in Section 6061 of the Government Code. This subdivision does not apply to actions taken pursuant to subdivision (b) of Section 25358.3 or immediate corrective actions taken pursuant to Section 25354. A responsible party may be held liable pursuant to this chapter whether or not the person was given the notice specified in this subdivision.

(d) The department shall notify the owner of the real property of the site of a hazardous substance release within 30 days after listing a site pursuant to Section 25356, and at least 30 days before initiating a removal or remedial action pursuant to this chapter, by sending the notification by certified mail to the person to whom the real property is assessed, as shown upon the last equalized assessment roll of the county, at the address shown on the assessment roll. The requirements of this subdivision do not apply to actions taken pursuant to subdivision (b) of Section 25358.3 or to immediate corrective actions taken pursuant to Section 25354.

(Amended by Stats. 1987, Ch. 434, Sec. 1. Repealed as of July 1, 1998, pursuant to Section 25395.)

25355.5. (a) Except as provided in subdivisions (b), (c), and (d), no money shall be expended from the Hazardous Substance Account or the Hazardous Substance Cleanup Fund for removal or remedial actions on any site selected for inclusion on the list established pursuant to Section 25356, unless the department first takes both of the following actions:

(1) The department issues one of the following orders or enters into the following agreement:

(A) The department issues an order specifying a schedule for compliance or correction pursuant to Section 25187.

(B) The department issues an order establishing a schedule for removing or remedying the release of a hazardous substance at the site, or for correcting the conditions that threaten the release of a hazardous substance. The order shall include, but is not limited to, requiring specific dates by which necessary corrective actions shall be taken to remove the threat of a release, or dates by which the nature and extent of a release shall be determined and the site adequately characterized, a remedial action plan shall be prepared, the remedial action plan shall be submitted to the department for approval, and a removal or remedial action shall be completed.

(C) The department enters into an enforceable agreement with a potentially responsible party for the site which requires the party to take necessary corrective action to remove the threat of the release, or to determine the nature and extent of the release and adequately characterize

the site, prepare a remedial action plan, and complete the necessary removal or remedial actions, as required in the approved remedial action plan.

Any enforceable agreement entered into pursuant to this section may provide for the execution and recording of a written instrument which imposes an easement, covenant, restriction, or servitude, or combination thereof, as appropriate, upon the present and future uses of the site. The instrument shall provide that the easement, covenant, restriction, or servitude, or combination thereof, as appropriate, is subject to the variance or removal procedures specified in Sections 25233 and 25234. Notwithstanding any other provision of law, an easement, covenant, restriction, or servitude, or any combination thereof, as appropriate, executed pursuant to this section and recorded so as to provide constructive notice runs with the land from the date of recordation, is binding upon all of the owners of the land, their heirs, successors, and assignees, and the agents, employees, or lessees of the owners, heirs, successors, and assignees, and is enforceable by the department pursuant to Article 8 (commencing with Section 25180) of Chapter 6.5.

(2) The department determines, in writing, that the potentially responsible party or parties for the hazardous substance release site have not complied with all of the terms of an order issued pursuant to subparagraph (A) or (B) of paragraph (1) or an agreement entered into pursuant to subparagraph (C) of paragraph (1). Before the department determines that a potentially responsible party is not in compliance with the order or agreement, the department shall give the potentially responsible party written notice of the proposed determination and an opportunity to correct the noncompliance or show why the order should be modified. After the department has made the final determination that a potentially responsible party is not in compliance with the order or agreement, the department may expend money from the Hazardous Substance Account or the Hazardous Substance Cleanup Fund for a removal or remedial action.

(b) Subdivision (a) does not apply, and money from the Hazardous Substance Account or the Hazardous Substance Cleanup Fund shall be available, upon appropriation by the Legislature, for removal or remedial actions, if any of the following conditions apply:

(1) The department, after a reasonable effort, is unable to identify a potential responsible party for the hazardous substance release site.

(2) The department determines that immediate corrective action is necessary, as provided in Section 25354.

(3) The director determines that removal or remedial action at a site is necessary because there may be an imminent and substantial endangerment to the public health or welfare or to the environment.

(c) Notwithstanding subdivision (a), the department may expend funds, upon appropriation by the Legislature, from the Hazardous Substance Cleanup Fund or the Hazardous Substance Account to conduct activities necessary to verify that an uncontrolled release of hazardous substances has occurred at a suspected hazardous substance release site, to issue an order or enter into an enforceable agreement pursuant to paragraph (1) of subdivision (a), and to review, comment upon, and approve or disapprove remedial action plans submitted by potentially responsible parties subject to the orders or the enforceable agreement.

(d) Notwithstanding subdivision (a), the department may expend funds, upon appropriation by the Legislature, from the Hazardous Substance Cleanup Fund or the Hazardous Substance Account, to provide for oversight of removal and remedial actions, or, if the site is also listed on the federal act (42 U.S.C. Sec. 9604(c)(3)), to provide the state's share of a removal or remedial action.

(e) A responsible party who fails, as determined by the department in writing, to comply with an order issued pursuant to subparagraph (A) or (B) of paragraph (1) of subdivision (a), or to comply with all of the terms of an enforceable agreement entered into pursuant to subparagraph (C) of paragraph (1) of subdivision (a), shall be deemed, for purposes of subdivision (b) of Section 25355, to have failed to take action properly and in a timely fashion with respect to a hazardous substance release or a threatened release.

(Amended by Stats. 1989, Ch. 906, Sec. 13. Repealed as of July 1, 1998, pursuant to Section 25395.)

25355.6. (a) The State Water Resources Control Board or a California regional water quality control board which has jurisdiction over a hazardous substance release site pursuant to Division 7 (commencing with Section 13000) of the Water Code may refer the site to the department as a candidate for listing pursuant to Section 25356. After determining that the site meets the criteria adopted pursuant to subdivision (a) of Section 25356, the department may place the site on the list of sites subject to this chapter and establish its priority ranking pursuant to Section 25356.

(b) If a hazardous substance release site is referred to the department and is listed pursuant to subdivision (a), the department may expend money from the state account or the Hazardous Substance Cleanup Fund for removal or remedial action at the site, upon appropriation by the Legislature, without first issuing an order or entering into an agreement pursuant to paragraph (1) of subdivision (a) of Section 25355.5, if all of the following apply:

(1) The State Water Resources Control Board or a California regional water quality control board has issued either a cease and desist order pursuant to Section 13301 of the Water Code or a cleanup and abatement order pursuant to Section 13304 of the Water Code to the potentially responsible party for the site.

(2) The State Water Resources Control Board or the California regional water quality control board has made a final finding that the potentially responsible party has not complied with the order issued pursuant to paragraph (1).

(3) The State Water Resources Control Board or the California regional water quality control board has notified the potentially responsible party of the determination made pursuant to paragraph (2) and that the hazardous substance release site has been referred to the department pursuant to subdivision (a).

(c) If a hazardous substance release site is referred to the department pursuant to subdivision (a), and the

department makes either of the following determinations, the department shall notify the appropriate California regional water quality control board and the State Water Resources Control Board:

(1) The department determines that the site does not meet the criteria established pursuant to subdivision (a) and the site cannot be placed, pursuant to Section 25356, on the list of sites subject to this chapter.

(2) The department determines that a removal or remedial action at the site will not commence for a period of one year from the date of listing due to a lack of funds or the low priority of the site.

(d) If a California regional water resources control board or the State Water Resources Control Board receives a notice pursuant to subdivision (c), the regional board or state board may take any further action concerning the hazardous substance release site which the regional board or state board determines to be necessary or feasible, and which is authorized by this chapter or Division 7 (commencing with Section 13000) of the Water Code.

(Added by Stats. 1989, Ch. 871, Sec. 1. Repealed as of July 1, 1998, pursuant to Section 25395.)

25355.7. (a) The department and the State Water Resources Control Board concurrently shall establish policies and procedures consistent with this chapter that the department's representatives shall follow in overseeing and supervising the activities of responsible parties who are carrying out the investigation of, and taking removal or remedial actions at, hazardous substance release sites. The policies and procedures shall be consistent with the policies and procedures established pursuant to Section 13307 of the Water Code, and shall include, but are not limited to, all of the following:

(1) The procedures the department will follow in making decisions as to when a potentially responsible party may be required to undertake an investigation to determine if a hazardous substance release has occurred.

(2) Policies for carrying out a phased, step-by-step investigation to determine the nature and extent of possible soil and groundwater contamination at a site.

(3) Procedures for identifying and utilizing the most cost-effective methods for detecting contamination and carrying out removal or remedial actions.

(4) Policies for determining reasonable schedules for investigation and removal or remedial action at a site. The policies shall recognize the dangers to public health and the environment posed by a release and the need to mitigate those dangers, while taking into account, to the extent possible, the financial and technical resources available to a responsible party.

(b) The department and the State Water Resources Control Board jointly shall review the policies and procedures that were established pursuant to this section and Section 13307 of the Water Code prior to the enactment of this subdivision, and concurrently shall revise policies and procedures as necessary to make them as consistent as possible by selecting, from those inconsistent procedures or policies, the policies or procedures that are most protective of the environment. Where they cannot be made consistent because of the differing requirements of this chapter and Division 7 (commencing with Section 13000) of the Water Code, the department and the State Water Resources Control Board shall, by July 1, 1994, jointly develop, and send to the Legislature, recommendations for revising this chapter and Division 7 (commencing with Section 13000) of the Water Code to make consistent the hazardous substance release cleanup policies and procedures followed by the department, the State Water Resources Control Board, and the California regional water quality control boards.

(Amended by Stats. 1994, Ch. 146, Sec. 113. Effective January 1, 1995. Repealed as of July 1, 1998, pursuant to Section 25395.)

25356. (a) The department shall adopt, by regulation, the criteria for the selection and for the priority ranking of sites pursuant to subdivision (b), for removal and remedial action under this chapter, and shall adopt criteria for the assignment of sites to one of the three tiers pursuant to subdivision (c). The criteria shall take into account the pertinent factors relating to the public health and the environment, which shall include, but are not limited to, potential hazards to public health and environment, the risk of fire or explosion, toxic hazards, the extent to which the deferral of a remedial action will result, or is likely to result, in a rapid increase in cost, or in hazard to human health and the environment, and the criteria established pursuant to Section 105(8) of the federal act (42 U.S.C. Sec. 9605(8)). The criteria may include a minimum hazard threshold, below which sites shall not be listed pursuant to this section, if the sites are subject to the authority of the department to order removal or remedial action, or similar action, pursuant to Chapter 6.5 (commencing with Section 25100).

(b) The department shall publish and revise, at least annually, a listing of the sites subject to this chapter. The sites shall be categorized and placed on one of the following lists:

(1) A list of the hazardous substance release sites for which the department has identified a responsible party, and the responsible party is in compliance, as determined by the department, with an order issued, or an enforceable agreement entered into, pursuant to subdivision (a) of Section 25355.5. The department shall publish the list of sites under this paragraph in an appendix to the site-specific plan of expenditures prepared pursuant to Section 25334.5.

(2) A list of the hazardous substance release sites for which all of the following apply:

(A) The department has not been able to identify a responsible party or the responsible party is not in compliance, as determined by the department, with an order issued, or an enforceable agreement entered into, pursuant to subdivision (a) of Section 25355.5.

(B) The nature and extent of the hazardous substance release at the site has not been adequately characterized by the responsible party or the department.

The department shall characterize a site on the list before ranking the site on the list described in paragraph (3).

(3) A list of the hazardous substance release sites which were previously listed pursuant to paragraph (1), if the sites have been adequately characterized but the responsible

parties are not in compliance with an order or enforceable agreement issued or entered into pursuant to subdivision (a) of Section 25355.5, or sites which were previously listed pursuant to paragraph (2) but which have since been adequately characterized by the department. Sites on the list specified in this paragraph shall be ranked numerically in accordance with the criteria adopted for the priority ranking of sites.

(c) The department shall assign each site listed pursuant to paragraphs (2) and (3) of subdivision (b), sites listed on the National Priorities List pursuant to the federal act, and sites which are federal military facilities to one of three tiers for the purpose of informing the public of the relative hazard of the sites. The listing of sites by tiers shall be widely disseminated to the public. The "priority one" tier shall include any site that poses a known or probable immediate threat to public health through direct human contact, explosions, fires, or acutely serious air emissions, has a high potential to contaminate or to continue to contaminate groundwater resources that are present or possible future sources of drinking water, or any site for which the costs for removal and remedial action pose the risk of increasing rapidly if removal or remedial action is deferred. The "priority two" tier shall include any site that poses a substantial but less immediate threat to public health and safety or the environment. The "priority three" tier shall include any site that will require removal and remedial action, but presents only a limited and defined threat to human health or the environment. Priority two and three tiers may contain sites formerly listed in tiers one or two for which direct human health threats have been removed and at which physical deterioration in environmental quality has been stabilized. For the purpose of this subdivision, in informing the public of the relative environmental and public health threats posed by a site, the department shall list sites alphabetically within each of the three tiers. The department shall periodically update the list of sites by tiers to reflect new information regarding existing sites or the addition of new sites requiring removal and remedial action. No site listed pursuant to paragraph (1) of subdivision (b) shall be listed pursuant to this subdivision.

(d) The department's development and publication of the listings of sites, pursuant to subdivision (b) and the adoption of a minimum hazard threshold and the classification of a site as within that threshold pursuant to subdivision (a), are not subject to Chapter 3.5 (commencing with Section 11340) of Part 1 of Division 3 of Title 2 of the Government Code.

(e) Funds appropriated to the department for remedial action shall be expended in conformance with the priority ranking of sites, as established on the list of sites specified in paragraph (3) of subdivision (b), except that funds appropriated for remedial action may be expended without conforming to the priority ranking if either of the following apply:

(1) The funds are necessary to monitor removal or remedial actions conducted by private parties listed pursuant to paragraph (1) of subdivision (b) or the state funds are necessary for the state share of a removal or remedial action pursuant to Section 104(c)(3) of the federal act (42 U.S.C. Sec. 9604(c)(3)).

(2) The funds are used for either of the following purposes:

(A) To assess, evaluate, and characterize the nature and extent of a hazardous substance release on sites listed pursuant to paragraph (2) of subdivision (b).

(B) To carry out activities pursuant to paragraph (2) or (3) of subdivision (b), or subdivision (c) or (d) of, Section 25355.5.

(f) Funds may be expended on more than one site on the list specified in paragraphs (2) and (3) of subdivision (b) at any one time. In addition, funds may be expended for oversight of any activities conducted by a responsible party on more than one site on the list specified in paragraph (1) of subdivision (b) at any one time.

(g) This section does not require the department to characterize every site listed pursuant to paragraph (2) of subdivision (b) before the department may begin removal or remedial actions at sites listed pursuant to paragraph (3) of subdivision (b).

(Amended by Stats. 1988, Ch. 1387, Sec. 6. Repealed as of July 1, 1998, pursuant to Section 25395.)

25356.1. (a) For purposes of this section, "regional board" means a California regional water quality control board and "state board" means the State Water Resources Control Board.

(b) Except as provided in subdivision (h), the department, or, if appropriate, the regional board shall prepare or approve remedial action plans for all sites listed pursuant to Section 25356.

(c) A potentially responsible party may request the department or the regional board, when appropriate, to prepare or approve a remedial action plan for any site not listed pursuant to Section 25356, if the department or the regional board determines that a removal or remedial action is required to respond to a release of a hazardous substance. The department or the regional board shall respond to a request to prepare or approve a remedial action plan within 90 days of receipt. This subdivision does not affect the authority of any regional board to issue and enforce a cleanup and abatement order pursuant to Section 13304 of the Water Code or a cease and desist order pursuant to Section 13301 of the Water Code.

(d) All remedial action plans prepared or approved pursuant to this section shall be based upon Section 25350, Subpart F of the National Oil and Hazardous Substances Pollution Contingency Plan (40 C.F.R. 300.61 et seq.), and any amendments thereto, and upon all of the following factors, to the extent that these factors are consistent with these federal regulations and do not require a less stringent level of cleanup than these federal regulations:

(1) Health and safety risks posed by the conditions at the site. When considering these risks, the department or the regional board shall consider scientific data and reports which may have a relationship to the site.

(2) The effect of contamination or pollution levels upon present, future, and probable beneficial uses of contaminated, polluted, or threatened resources.

(3) The effect of alternative remedial action measures on the reasonable availability of groundwater resources for present, future, and probable beneficial uses. The department or the regional board shall consider the extent to which remedial action measures are available which use, as a principal element, treatment that significantly reduces the volume, toxicity, or mobility of the hazardous substances, as opposed to remedial actions which do not use this treatment. The department or the regional board shall not select remedial action measures which use offsite transport and disposal of untreated hazardous substances or contaminated materials if practical and cost-effective treatment technologies are available.

(4) Site specific characteristics, including the potential for offsite migration of hazardous substances, the surface or subsurface soil, and the hydrogeologic conditions, as well as preexisting background contamination levels.

(5) Cost-effectiveness of alternative remedial action measures. In evaluating the cost-effectiveness of proposed alternative remedial action measures, the department or the regional board shall consider, to the extent possible, the total short-term and long-term costs of these actions and shall use, as a major factor, whether the deferral of a remedial action will result, or is likely to result, in a rapid increase in cost or in the hazard to public health or the environment posed by the site. Land disposal shall not be deemed the most cost-effective measure merely on the basis of lower short-term cost.

(6) The potential environmental impacts of alternative remedial action measures, including, but not limited to, land disposal of the untreated hazardous substances as opposed to treatment of the hazardous substances to remove or reduce its volume, toxicity, or mobility prior to disposal.

(e) A remedial action plan prepared or approved pursuant to this section shall include a statement of reasons setting forth the basis for the removal and remedial actions selected. The statement shall include an evaluation of each proposed alternative submitted to, or prepared by, the department or the regional board for a particular site. The statement shall also include an evaluation of the consistency of the removal and remedial actions proposed by the plan with the federal regulations and factors specified in subdivision (d) and shall set forth the reasons for rejection of alternative removal and remedial actions. The statement shall also include a nonbinding preliminary allocation of responsibility among all identifiable potentially responsible parties at a particular site, including those parties which may have been released, or may otherwise be immune, from liability pursuant to this chapter or any other provision of law. Before adopting a final remedial action plan, the department or the regional board shall prepare or approve a draft remedial action plan and shall do all of the following:

(1) Circulate the draft plan for at least 30 days for public comment.

(2) Notify affected local and state agencies of the removal and remedial actions proposed in the remedial action plan and publish a notice in a newspaper of general circulation in the area affected by the draft remedial action plan. The department or the regional board shall also post notices in the location where the proposed removal or remedial action would be located and shall notify, by direct mailing, the owners of property contiguous to the site addressed by the plan, as shown in the latest equalized assessment roll.

(3) Hold one or more meetings with the lead and responsible agencies for the removal and remedial actions, the potentially responsible parties for the removal and remedial actions, and the interested public, to provide the public with the information which is necessary to address the issues which concern the public. The information to be provided shall include an assessment of the degree of contamination, the characteristics of the hazardous substances, an estimate of the time required to carry out the removal and remedial actions, and a description of the proposed removal and remedial actions.

(4) Comply with Section 25358.7.

(f) After complying with subdivision (e), the department or the regional board shall review and consider any public comments, and shall revise the draft plan, if appropriate. The department or the regional board shall then issue the final remedial action plan.

(g) (1) A potentially responsible party named in the final remedial action plan issued by the department or the regional board may seek judicial review of the final remedial action plan by filing a petition for writ of mandate pursuant to Section 1085 of the Code of Civil Procedure within 30 days after the final remedial action plan is issued by the department or the regional board. Any other person who has the right to seek judicial review of the final remedial action plan by filing a petition for writ of mandate pursuant to Section 1085 of the Code of Civil Procedure shall do so within one year after the final remedial action plan is issued. No action may be brought by a potentially responsible party to review the final remedial action plan if the petition for writ of mandate is not filed within 30 days of the date that the final remedial action plan was issued. No action may be brought by any other person to review the final remedial action plan if the petition for writ of mandate is not filed within one year of the date that the final remedial action plan was issued. The filing of a petition for writ of mandate to review the final remedial action plan shall not stay any removal or remedial action specified in the final plan.

(2) For purposes of judicial review, the court shall uphold the final remedial action plan if the plan is based upon substantial evidence available to the department or the regional board, as the case may be.

(3) This subdivision does not prohibit the court from granting any appropriate relief within its jurisdiction, including, but not limited to, enjoining the expenditure of funds pursuant to paragraph (2) of subdivision (b) of Section 25385.6.

(h) (1) This section does not require the department or a regional board to prepare a remedial action plan if conditions present at a site present an imminent or substantial endangerment to the public health and safety or to the environment or, if the department, a regional board, or a responsible party takes a removal action at a site and the estimated cost of the removal action is less than one million

dollars ($1,000,000). The department or a regional board shall prepare or approve a removal action workplan for all sites where a nonemergency removal action is proposed and where a remedial action plan is not required. For sites where removal actions are planned and are projected to cost less than one million dollars ($1,000,000), the department or a regional board shall make the local community aware of the hazardous substance release site and shall prepare, or direct the parties responsible for the removal action to prepare, a community profile report to determine the level of public interest in the removal action. Based on the level of expressed interest, the department or regional board shall take appropriate action to keep the community informed of project activity and to provide opportunities for public comment which may include conducting a public meeting on proposed removal actions.

(2) A remedial action plan is not required pursuant to subdivision (b) if the site is listed on the National Priority List by the Environmental Protection Agency pursuant to the federal act, if the department or the regional board concurs with the remedy selected by the Environmental Protection Agency's record of decision. The department or the regional board may sign the record of decision issued by the Environmental Protection Agency if the department or the regional board concurs with the remedy selected.

(3) The department may waive the requirement that a remedial action plan meet the requirements specified in subdivision (d) if all of the following apply:

(A) The responsible party adequately characterizes the hazardous substance conditions at a site listed pursuant to Section 25356.

(B) The responsible party submits to the department, in a form acceptable to the department, all of the following:

(I) A description of the techniques and methods to be employed in excavating, storing, handling, transporting, treating, and disposing of materials from the site.

(ii) A listing of the alternative remedial measures which were considered by the responsible party in selecting the proposed removal action.

(iii) A description of methods that will be employed during the removal action to ensure the health and safety of workers and the public during the removal action.

(iv) A description of prior removal actions with similar hazardous substances and with similar public safety and environmental considerations.

(C) The department determines that the remedial action plan provides protection of human health and safety and for the environment at least equivalent to that which would be provided by a remedial action plan prepared in accordance with subdivision (c).

(D) The total cost of the removal action is less than two million dollars ($2,000,000).

(4) For purposes of this section, the cost of a removal action includes the cleanup of removal of released hazardous substances from the environment or the taking of other actions which are necessary to prevent, minimize, or mitigate damage which may otherwise result from a release or threatened release, as further defined by Section 9601 (23) of Title 42 of the United States Code.

(5) Paragraph (2) of this subdivision does not apply to a removal action paid from the Hazardous Substance Cleanup Fund.

(I) Article 2 (commencing with Section 13320), Article 3 (commencing with Section 13330), Article 5 (commencing with Section 13350), and Article 6 (commencing with Section 13360) of Chapter 5 of Division 7 of the Water Code apply to any action or failure to act by a regional board pursuant to this section.

(Amended by Stats. 1994, Ch. 441, Sec. 2. Effective January 1, 1995. Repealed as of July 1, 1998, pursuant to Section 25395.)

25356.2. (a) There is hereby created in the Office of Environmental Health Hazard Assessment a Hazardous Substance Cleanup Arbitration Panel.

(b) The panel shall apportion liability for the costs of removal and remedial actions in accordance with Sections 25356.3 and 25356.4. All meetings of the panel are exempt from Chapter 3.5 (commencing with Section 6250) of Division 7 of Title 1 of, and Article 9 (commencing with Section 11120) of Chapter 1 of Part 1 of Division 3 of Title 2 of, the Government Code.

(c) The panel shall be comprised of independent private arbitrators who have applied to the Office of Environmental Health Hazard Assessment for membership on the panel. Panel members shall have (1) relevant arbitration background and (2) expertise in engineering, expertise in the physical, biological, or health sciences, or other relevant experience and qualifications. Three arbitrators shall be selected from the panel to apportion liability for a single hazardous wastesite. A majority of the arbitrators selected for a single site may apportion liability for the panel under this chapter.

(d) The arbitrators shall be selected for an individual hazardous wastesite as follows:

(1) One arbitrator shall be selected by the department or by the regional water quality control board.

(2) One arbitrator shall be selected by the potentially responsible party, or a majority of the potentially responsible parties, who have submitted to binding arbitration by the panel.

(3) The two arbitrators selected pursuant to paragraphs (1) and (2) shall jointly select a third arbitrator.

(Amended by Stats. 1994, Ch. 143, Sec. 1. Effective January 1, 1995. Repealed as of July 1, 1998, pursuant to Section 25395.)

25356.3. (a) The department or the regional water quality control board shall serve a copy by mail of the draft remedial action plan upon all potentially responsible parties identified in the plan. Within 15 days after the issuance of a final remedial action plan, any potentially responsible parties with aggregate alleged liability in excess of 50 percent of the costs of removal and remedial action, as set forth in the statement of reasons issued pursuant to subdivision (d) of Section 25356.1, but excluding any costs which are the subject of an agreement under which any party agrees to assume liability for those costs, may convene an arbitration proceeding by agreeing to submit to binding arbitration by the panel. The filing of a demand to convene an arbitration panel shall not stay any removal or remedial actions specified in the plan. If an arbitration panel is

APPENDIX B

Chronological Administrative Record File Index

DRAFT ADMINISTRATIVE RECORD FILE INDEX - UPDATE (SORTED BY RECORD DATE/RECORD NUMBER)
NAVSTA Long Beach
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UIC No. / Rec. No. Record Type Contr./Guid. No. Approx. # Pages	Prc. Date Record Date CTO No. EPA Cat. #	Author Affil. Author Recipient Affil. Recipient	Subject	Classification	Keywords	Sites	Location
N68311 / 000287 LTR N6871189D929600 0250	09-21-1994 **04-26-1990** 00017 03.3	JACOBS ENGINEERING B.W.C. WONG SOUTHWEST DIVISION H. PADRO	CONTRACT TASK ORDER #0017 SITE INSPECTION (SI) WORK PLAN, INCLUDING THE FIELD QA/QC AND THE SITE HEALTH & SAFETY PLAN (DRAFT)	ADMIN RECORD	CERCLA FS GW H&SP HAZ WASTE IAS QA QC RI SAP SARA SI	00001 00002 00003 00004 00005 00006 00007	SOUTHWEST DIVISION
N68311 / 000309 MISC NONE 0002	09-23-1994 **10-17-1990** NONE 01.1		HISTORY OF INSTALLATION RESTORATION PROGRAM (IRP)	ADMIN RECORD	GW HAZ WASTE IAS IRP SI	00001 00002 00003 00004 00005	SOUTHWEST DIVISION
N68311 / 000047 RPT N6871189D929600 0150	08-23-1994 **10-31-1990** 00017 03.3	JACOBS ENGINEERING SOUTHWEST DIVISION	INSTALLATION RESTORATION PROGRAM FINAL DRAFT SITE INSPECTION WORK PLAN, INCLUDING THE FIELD QA/QC PLAN & THE SITE HEALTH & SAFETY PLAN	ADMIN RECORD	H&SP IRP QA QC SI	00001 00002 00003 00004 00005 00006 0007A	SOUTHWEST DIVISION
N68311 / 000058 RPT N6871189D929600 0150	08-23-1994 **04-08-1991** 00017 03.3	SOUTHWEST DIVISION	INSTALLATION RESTORATION PROGRAM (IRP) FINAL SITE INSPECTION (SI) WORK PLAN INCL FIELD QA/QC PLAN AND THE SITE SAFETY & HEALTH PLAN (SSHP)	ADMIN RECORD	H&SP IRP QA QC SI	00001 00002 00003 00004 00005 00006 0007A	SOUTHWEST DIVISION

This Administrative Record (AR) Index includes references to documents which cite bibliography sources. These bibliographic citations are considered to be part of this AR but may not be cited separately in the index.

UIC No. / Rec. No. Record Type Contr./Guid. No. Approx. # Pages	Prc. Date Record Date CTO No. EPA Cat. #	Author Affil. Author Recipient Affil. Recipient	Subject	Classification	Keywords	Sites	Location
N68311 / 000062 RPT N6871189D929600 0012	08-24-1994 **07-03-1991** 00017 03.3	SOUTHWEST DIVISION NAVSTA LONG BEACH	INSTALLATION RESTORATION PROGRAM(IRP) RESPONSE TO CA DEPARTMENT OF HEALTH SERVICES REVIEW COMMENTS ON THE SITE INSPECTION (SI) WORK PLAN	ADMIN RECORD	COMMENTS IRP PERMIT RCRA SI	00001 00002 00004 00005 00009 00010 00013 0006A	SOUTHWEST DIVISION
N68311 / 000063 LTR N6871189D929600 0001	08-24-1994 **07-23-1991** 00017 03.3	NAVSTA LONG BEACH J.L. SNYDER RWQCB J. ROSS	FINAL REVISED IR PROGRAM SI WORKPLAN & CA DHS COMMENTS & RCRA CROSS REF (SEE DOC NO 000062 FOR COMMENTS)(SEE DOC 246 FOR SI WORKPLAN)	ADMIN RECORD	COMMENTS IRP PERMIT RCRA SI	00001 00002 00004 00005 00009 00010 00013 0006A	SOUTHWEST DIVISION
N68311 / 000321 RPT N6871189D929600 0150	09-23-1994 **05-08-1992** 00122 01.2	SOUTHWEST DIVISION	INSTALLATION RESTORATION PROGRAM (IRP) SITE INSPECTION (SI) REPORT (VOLUME I)	ADMIN RECORD	CERCLA DATA GW H&SP HAZ WASTE IAS IRP LAB MONITORING PERMIT QA QC RCRA SARA SB SI WATER WELLS	00001 00002 00003 00004 00005 00006 0007A	SOUTHWEST DIVISION

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N68311 / 000076 RPT NONE 0002	08-24-1994 **07-29-1992** NONE 01.2		PORT OF LONG BEACH INSTALLATION RESTORATION PROGRAM (IRP) - DRAFT SITE INSPECTION (SI) REPORT (VOLUME 1) (PRELIMINARY COMMENTS)	ADMIN RECORD	COMMENTS DATA GW IRP SI	00001 00002 00003 00004	SOUTHWEST DIVISION
N68311 / 000087 RPT N6871189D929600 0250	08-25-1994 **11-14-1992** 00122 01.2	SOUTHWEST DIVISION	INSTALLATION RESTORATION PROGRAM (IRP) FINAL SITE INSPECTION (SI) REPORT (VOLUME 1)	ADMIN RECORD INFO REPOSITORY	CERCLA GW HAZMAT IRP SI	00001 00002 00003 00004 00005 00006 0007A	SOUTHWEST DIVISION
N68311 / 000344 MM NONE 0004	09-29-1994 **12-10-1992** NONE 01.1	JACOBS ENGINEERING P. TORREY	SITE MANAGEMENT PLAN (SMP) LAND USE MEETING NO. 1 (HELD 11/2/92)	ADMIN RECORD	BRAC SMP	00001 00002 00003 00004 00005 00006 0006B	SOUTHWEST DIVISION
N68311 / 000361 LTR NONE 0003	09-29-1994 **06-09-1993** NONE 01.1	NAVSTA LONG BEACH J.L. SNYDER SOUTHWEST DIVISION A. LEE	COMMENTS TO INSTALLATION RESTORATION PROGRAM DRAFT SITE MANAGEMENT PLAN DATED 04/30/93	ADMIN RECORD	COMMENTS IRP SMP	00002	SOUTHWEST DIVISION
N68311 / 000115 MEMO NONE 0011	08-26-1994 **06-14-1993** NONE 04.3	CODE 1852.CL C. LEADON CODE 1832.JJ J. JOYCE	TECHNICAL REVIEWS OF THE DRAFT RI/FS WORK PLANS, DRAFT PRELIMINARY ASSESSMENT FOR SITE 6B AND DRAFT SITE MANAGEMENT PLAN	ADMIN RECORD	ARAR COMMENTS FS IRA PA RI SMP	00001 00002 00004 00007 0006A 0006B	SOUTHWEST DIVISION

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N68311 / 000284 RPT N6871189D929600 0400	09-21-1994 **09-13-1993** 00249 03.1	SOUTHWEST DIVISION	INSTALLATION RESTORATION PROGRAM (IRP) REMEDIAL INVESTIGATION/FEASIBILITY STUDY (RI/FS) FINAL SAMPLING AND ANALYSIS PLAN (SAP)	ADMIN RECORD INFO REPOSITORY	DMP FS GW H&SP MONITORING PERMIT QA QAPP QC RI SAP SB WELLS WMP	00001 00002 00003 00004 00005 00007 0006A	SOUTHWEST DIVISION
N68311 / 000130 LTR NONE 0002	08-26-1994 **10-12-1993** NONE 04.1	SOUTHWEST DIVISION E. DIENZO EPA A. GUTIERREZ	REQUEST FOR IDENTIFICATION OF POTENTIAL STATE CHEMICAL-SPECIFIC AND LOCATION-SPECIFIC ARAR FOR IR SITES 1A, 1B, 2, & 5	ADMIN RECORD	ARAR CHAR HAZ WASTE	00002 00005 0001A 0001B	SOUTHWEST DIVISION
N68311 / 000140 RPT N6871192D467000 0005	08-29-1994 **12-18-1993** 00015 03.0	BECHTEL NATIONAL K. KAPUR	DRAFT INVESTIGATION DERIVED WASTE (IDW) MANAGEMENT PLAN CTO-0015,0016,0026	ADMIN RECORD	FS GW IDWMP LAB RI	00001 00002 00003 00004 00005 00007 0006A	SOUTHWEST DIVISION
N68311 / 000141 RPT N6871192D467000 0053	08-29-1994 **12-18-1993** 00015 04.3	BECHTEL NATIONAL K. KAPUR	DRAFT RISK ASSESSMENT WORK PLAN REMEDIAL INVESTIGATION/FEASIBILITY STUDY (RI/FS)	ADMIN RECORD	CERCLA DERA FS HAZ WASTE IRP RA RCRA SARA	00001 00002 00003 00004 00005 00007 0006A	SOUTHWEST DIVISION

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N68311 / 000142 RPT N6871192D467000 0150	08-29-1994 **12-18-1993** 00015 03.3	BECHTEL NATIONAL K. KAPUR	DRAFT DATA MANAGEMENT PLAN FOR CTO'S 015, 016, AND 026	ADMIN RECORD	DATA DMP FS OU QAPP RI SAP	00001 00002 00003 00004	SOUTHWEST DIVISION
N68311 / 000147 LTR NONE 0001	08-29-1994 **12-28-1993** NONE 01.1	NAVSTA LONG BEACH T.S. ERICKSON SOUTHWEST DIVISION A.K. LEE	REVIEW OF PREDRAFT TECHNICAL MEMORANDUM AERIAL PHOTOGRAPHY REVIEW AND GEOPHYSICAL RECOMMENDATIONS FOR SITES 1,2,3, AND 6A	ADMIN RECORD	COMMENTS TECH MEMO	00001 00002 00003 0006A	SOUTHWEST DIVISION
N68311 / 000151 LTR NONE 0002	08-29-1994 **01-13-1994** NONE 10.0	NAVSTA LONG BEACH T.S. ERICKSON SOUTHWEST DIVISION A.K. LEE	FINAL CERFA ENVIRONMENTAL BASELINE SURVEY (EBS) (COMMENTS)	ADMIN RECORD	COMMENTS EBS FS RI TANK UST	00002 00004 0006A 0006B	SOUTHWEST DIVISION
N68311 / 000155 RPT N6871192D467000 0018	08-29-1994 **01-24-1994** 00015 01.1	BECHTEL NATIONAL K. KAPUR	DRAFT TECHNICAL MEMORANDUM AERIAL PHOTOGRAPHY REVIEW AND GEOPHYSICAL RECOMMENDATIONS	ADMIN RECORD	FS OU RI SAP TECH MEMO	00001 00002 00003 0006A	SOUTHWEST DIVISION
N68311 / 000160 RPT N6871192D467000 0051	08-29-1994 **01-30-1994** 00015 03.3	BECHTEL NATIONAL K. KAPUR	FINAL RISK ASSESSMENT WORK PLAN REMEDIAL INVESTIGATION/FEASIBILITY STUDY SITES 1,2,3,4,5,6A AND 7	ADMIN RECORD	CERCLA CHAR DATA DERA FS GW IRP RA RCRA RI SARA	00001 00002 00003 00004 00005 00007 0006A	SOUTHWEST DIVISION

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N68311 / 000161 RPT N6871192D467000 0143	08-29-1994 **01-30-1994** 00015 03.3	BECHTEL NATIONAL K. KAPUR	FINAL DATA MANAGEMENT PLAN FOR CTO'S 015, 016, AND 026	ADMIN RECORD	DATA DMP FS GW LAB OU QAPP RI SAP SB WATER	00001 00002 00003 00004 00005 0006A 0007A 0007B	SOUTHWEST DIVISION
N68311 / 000163 RPT N6871192D467000 0005	08-29-1994 **01-30-1994** 00015 03.3	BECHTEL NATIONAL K. KAPUR	FINAL INVESTIGATION DERIVED WASTE (IDW) MANAGEMENT PLAN CTO'S 0015, 0016, AND 0026	ADMIN RECORD	GW HAZ WASTE IDWMP SB WELLS	00001 00002 00003 00004 00005 00007 0006A	SOUTHWEST DIVISION
N68311 / 000167 LTR N6871192D467000 0002	08-29-1994 **02-04-1994** 00015 01.1	EPA S.L. LAUTH NAVSTA/NSY LB	REVIEW OF THE DRAFT TECHNICAL MEMORANDUM AERIAL PHOTOGRAPHY REVIEW AND GEOPHYSICAL RECOMMENDATIONS FOR SITES 1,2,3, AND 6A	ADMIN RECORD	COMMENTS FS GW RI SB TECH MEMO	00001 00002 00003 0006A	SOUTHWEST DIVISION
N68311 / 000168 LTR N6871192D467000 0004	08-29-1994 **02-07-1994** 00015 01.1	DTSC A.A. ARELLANO NAVSTA/NSY LB	REVIEW OF DRAFT TECHNICAL MEMORANDUM AERIAL PHOTOGRAPHY REVIEW AND GEOPHYSICAL RECOMMENDATIONS FOR SITES 1,2,3, AND 6A	ADMIN RECORD	COMMENTS TECH MEMO	00001 00002 00003 0006A	SOUTHWEST DIVISION
N68311 / 000169 RPT N6871192D467000 0020	08-30-1994 **02-18-1994** 00015 01.1	BECHTEL NATIONAL K. KAPUR	TECHNICAL MEMORANDUM NO. 3 FINAL TECHNICAL MEMORANDUM AERIAL PHOTOGRAPHY REVIEW AND GEOPHYSICAL RECOMMENDATIONS FOR SITES 1,2,3, AND 6A	ADMIN RECORD	FS OU RI SAP TECH MEMO	00001 00002 00003 0006A	SOUTHWEST DIVISION

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N68311 / 000856 PLAN NONE 0315	03-13-1997 **03-01-1994** NONE 03.3	NAVSTA LONG BEACH SOUTHWEST DIVISION	BASE REALIGNMENT AND CLOSURE (BRAC) CLEANUP PLAN		BRAC CLEANUP CLOSURE OU PCB RA UST VOC	00001 00002 00003 00004 00005 00007 0006A 0006B BLDG. 143 BLDG. 144 BLDG. 32 BLDG. 401 BLDG. 675 BLDG. 815 OU 1 OU 2 OU 3	SOUTHWEST DIVISION
N68311 / 000191 RPT N6871192D467000 0018	08-30-1994 **05-01-1994** 00015 04.3	BECHTEL NATIONAL K. KAPUR	TECHNICAL MEMORANDUM NO. 2 REVISED FINAL TECHNICAL MEMORANDUM PROPOSED MODIFICATION TO FINAL RI/FS PLAN	ADMIN RECORD	FS GW RI SAP TECH MEMO WELLS	00001 00002 00003 00004 00005 00007 0006A	SOUTHWEST DIVISION
N68311 / 000193 LTR NONE 0007	08-30-1994 **05-05-1994** 00015 01.1	BECHTEL NATIONAL K. KAPUR SOUTHWEST DIVISION	PRELIMINARY FIELD DATA REVIEW FOR SITES 1 THROUGH 5 AND 6A (MISSING ENCL: CONCENTRATION MAPS)	ADMIN RECORD	DATA FS LAB MAP RI	00001 00002 00003 00004 00005 0006A	SOUTHWEST DIVISION

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N68311 / 000194 LTR NONE 0001	08-30-1994 **05-05-1994** 00015 01.1	NAVSTA LONG BEACH T.S. ERICKSON DISTRIBUTION	PRELIMINARY FIELD DATA REVIEW FOR SITES 1 THROUGH 5 AND 6A (MISSING ENCL: CONCENTRATION MAPS, SEE DOCUMENT NO. 000193 FOR PRELIM. DATA)	ADMIN RECORD	DATA FS LAB MAP RI	00001 00002 00003 00004 00005 0006A	SOUTHWEST DIVISION
N68311 / 000203 LTR N68711-92-D-4670 0081	08-30-1994 **05-18-1994** 00015 04.4	NAVSTA LONG BEACH T.S. ERICKSON VARIOUS AGENCIES	REVISED FINAL - HEALTH AND SAFETY PLAN SUPPLEMENT	ADMIN RECORD	FS H&SP HAZ WASTE RI SB	00001 00002 00003 00004 00005 00007 0006A	SOUTHWEST DIVISION
N68311 / 000437 TEL NONE 0001	10-04-1994 **05-18-1994** 00015 03.1	D. MC NARY A. WINANS	CONTACT REPORT REGARDING PROPOSED CONTINGENT SAMPLING PLAN FOR IR SITES 1 THROUGH 5 AND 6A	ADMIN RECORD	SB	00001 00002 00003 00004 00005 0006A	SOUTHWEST DIVISION
N68311 / 001071 MISC NONE 0001	06-03-1999 **06-09-1994** NONE 03.6	SOUTHWEST DIVISION VARIOUS AGENCIES	MONTHLY RI/FS STATUS MEETING AGENDA FOR JUNE 9, 1994		FS RI	00001 00002 00003 00004 00005 00007 0006A 0006B	SOUTHWEST DIVISION
N68311 / 000216 LTR NONE 0005	08-31-1994 **06-22-1994** NONE 03.1	DTSC A. GUTIERREZ NAVSTA/NSY LB	COMMENTS TO PROPOSED PHASE II (CONTINGENT) SAMPLING - IR SITES 1 THROUGH 5 AND 6A	ADMIN RECORD	COMMENTS DATA FS MONITORING RI SAP SB WELLS	00001 00002 00003 00004 00005 0006A	SOUTHWEST DIVISION

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N68311 / 000222 MISC N6871192D467000 0002	08-31-1994 **07-01-1994** 00015 03.3	BECHTEL NATIONAL K. KAPUR SOUTHWEST DIVISION A.K. LEE	TRANSMITTAL OF DRAFT FINAL RI/FS RISK ASSESSMENT WORK PLAN (ENCL RI/FS RA WORK PLAN CAN BE FOUND WITH DOC NO. 000223)	ADMIN RECORD	FS RA RI	00001 00002 00003 00004 00005 0006A	SOUTHWEST DIVISION
N68311 / 001085 MISC NONE 0002	06-03-1999 **11-10-1994** NONE 03.6	BECHTEL NATIONAL INC O. KADASTER SOUTHWEST DIVISION M. RADECKI	AGENDA FOR NOVEMBER 10, 1994 RI/FS MONTHLY STATUS REVIEW MEETING		FS RI	00001 00002 00003 00004 00005 00007 0006A 0006B	SOUTHWEST DIVISION
N68311 / 000904 LTR NONE 0005	03-26-1997 **01-27-1995** NONE 10.1	EPA SAN FRANCISCO S. LAUTH SOUTHWEST DIVISION A. LEE	COMMENTS ON DRAFT BASE REALIGNMENT AND CLOSURE (BRAC) CLEANUP PLAN		BCP COMMENTS	00001 00002 00003 00004 00005 00007 0006A PARCEL A PARCEL B	SOUTHWEST DIVISION

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N68311 / 000857 PLAN N6871192D467000 0100	03-13-1997 **02-24-1995** 00017 03.3	BECHTEL NATIONAL INC K. KAPUR SOUTHWEST DIVISION A. LEE	FINAL BRAC CLEANUP PLAN (REV. NO. 2)		BCP BRAC CLEANUP GW UST	00001 00002 00003 00004 00005 00007 0006A AOC 1 AOC 10 AOC 11 AOC 12 AOC 13 AOC 14 AOC 15 AOC 16 AOC 17 AOC 18 AOC 19 AOC 2 AOC 20 AOC 3 AOC 4 AOC 5 AOC 6 AOC 7 AOC 8 AOC 9 BLDG. 401 BLDG. 673 BLDG. 676 BLDG. 756 OU 1 OU 2 OU 3	SOUTHWEST DIVISION

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N68311 / 000005 LTR N6871192D467000 0075	03-08-1995 **03-03-1995** 00017 10.0	BNI K. KAPUR A. LEE SWDIV	NAVSTA LONG BEACH, NAVHOSP LONG BEACH AND ASSOCIATED HOUSING FINAL BRAC CLEANUP PLAN (NO. 2)	ADMIN RECORD INFO REPOSITORY	AOC ARAR AST BCP BRAC CERCLA FFSRA FOSL FOST SARA UST	00001 00002 00003 00004 00005 0006A	SOUTHWEST DIVISION
N68311 / 000682 RPT N6871192D467000 0200	03-14-1996 **05-17-1995** 00015 03.4	BNI K.K. KAPUR SOUTHWEST DIVISION	DRAFT REMEDIAL INVESTIGATION (RI) REPORT INSTALLATION RESTORATION PROGRAM FOR SITES 1 THROUGH 6A (VOLUME 1)	ADMIN RECORD INFO REPOSITORY	FS GW RI	00001 00002 00003 00004 00005 0006A	SOUTHWEST DIVISION
N68311 / 000683 RPT N6871192D467000 0200	03-14-1996 **05-17-1995** 00015 03.4	BNI K.K. KAPUR SOUTHWEST DIVISION	DRAFT REMEDIAL INVESTIGATION (RI) REPORT INSTALLATION RESTORATION PROGRAM FOR SITES 1 THROUGH 6A (VOLUME 2)	ADMIN RECORD INFO REPOSITORY	FS GW RI	00001 00002 00003 00004 00005 0006A	SOUTHWEST DIVISION
N68311 / 000684 RPT N6871192D467000 0200	03-14-1996 **05-17-1995** 00015 03.4	BNI K.K. KAPUR SOUTHWEST DIVISION	DRAFT REMEDIAL INVESTIGATION (RI) REPORT INSTALLATION RESTORATION PROGRAM FOR SITES 1 THROUGH 6A (VOLUME 3)	ADMIN RECORD INFO REPOSITORY	FS GW RI	00001 00002 00003 00004 00005 0006A	SOUTHWEST DIVISION
N68311 / 000685 RPT N6871192D467000 0200	03-14-1996 **05-17-1995** 00015 03.4	BNI K.K. KAPUR SOUTHWEST DIVISION	DRAFT REMEDIAL INVESTIGATION (RI) REPORT INSTALLATION RESTORATION PROGRAM FOR SITES 1 THROUGH 6A (VOLUME 4)	ADMIN RECORD INFO REPOSITORY	FS GW RI	00001 00002 00003 00004 00005 0006A	SOUTHWEST DIVISION

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N68311 / 000686 RPT N6871192D467000 0200	03-14-1996 **05-17-1995** 00015 03.4	BNI K.K. KAPUR SOUTHWEST DIVISION	DRAFT REMEDIAL INVESTIGATION (RI) REPORT INSTALLATION RESTORATION PROGRAM FOR SITES 1 THROUGH 6A (VOLUME 5)	ADMIN RECORD INFO REPOSITORY	FS GW RI	00001 00002 00003 00004 00005 0006A	SOUTHWEST DIVISION
N68311 / 000860 XMTL N6871192D467000 0022	03-25-1997 **07-28-1995** 00015 03.4	BECHTEL NATIONAL INC K. KAPUR VARIOUS AGENCIES	RI REPORT ERRATA LIST; SITES 1 THROUGH 5 AND 6A		CONTAM* RI	00001 00002 00003 00004 00005 0006A	SOUTHWEST DIVISION

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N68311 / 000754 RPT N6871192D467000 0250	08-22-1996 **08-11-1995** 00095 01.3	BNI SAN DIEGO K. KAPUR SOUTHWEST DIVISION	DRAFT PRELIMINARY ASSESSMENT FOR THE AREAS OF POTENTIAL CONCERN		HAZ WASTE	00001 00002 00003 00004 00005 00007 0006A AOPC 1 AOPC 10 AOPC 11 AOPC 12 AOPC 13 AOPC 14 AOPC 15 AOPC 16 AOPC 17 AOPC 18 AOPC 19 AOPC 2 AOPC 20 AOPC 3 AOPC 4 AOPC 5 AOPC 6 AOPC 7 AOPC 8 AOPC 9	SOUTHWEST DIVISION
N68311 / 000676 LTR NONE 0016	11-16-1995 **09-05-1995** NONE 03.4	DTSC A. GUTIERREZ SOUTHWEST DIVISION M. RADECKI	DRAFT REMEDIAL INVESTIGATION (RI) FOR SITES 1 THROUGH 6A	ADMIN RECORD	ARAR COMMENTS GW RI RISK SI	00001 00002 00003 00004 00005 0006A	SOUTHWEST DIVISION

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N68311 / 000701 LTR NONE 0007	03-18-1996 **12-11-1995** NONE 03.3	DTSC A. GUTIERREZ BOEING L.V. ATKINS	COMMENTS TO WORK PLAN PRECONSTRUCTION ENVIRONMENTAL ASSESSMENT (PCEA) MOLE AREA SITES 1&2	ADMIN RECORD	COMMENTS EA	00001	SOUTHWEST DIVISION
N68311 / 000698 LTR NONE 0021	03-18-1996 **01-09-1996** NONE 03.3	DAMES & MOORE L.S. FERNANDEZ SOUTHWEST DIVISION A.K. LEE	RESPONSE TO COMMENTS ON WORK PLAN ADDENDUM TO ADDRESS COMMENTS PRECONSTRUCTION ENVIRONMENTAL ASSESSMENT MOLE AREA SITES 1&2	ADMIN RECORD	GW H&SP MONITORING	00001 00002	SOUTHWEST DIVISION
N68311 / 000691 LTR NONE 0005	03-18-1996 **01-18-1996** NONE 03.3	DAMES & MOORE H. MAKARECHI SOUTHWEST DIVISION A.K. LEE	ADDENDUM NUMBER 2 TO PRECONSTRUCTION ENVIRONMENTAL ASSESSMENT FOR THE MOLE AREA	ADMIN RECORD	EA GW	00001 00002	SOUTHWEST DIVISION
N68311 / 000787 LTR NONE 0002	09-09-1996 **02-09-1996** NONE 01.6	BOEING SEATLE WA L. ATKINS SOUTHWEST DIVISION A. LEE	ADDENDUM NUMBER 2, PRE-CONSTRUCTION ENVIROMENTAL ASSESSMENT THE MOLE AREA		EA SB	00001 00002	SOUTHWEST DIVISION
N68311 / 000743 LTR NONE 0100	08-21-1996 **03-12-1996** NONE 01.6	SOUTHWEST DIVISION A. LEE RWCQB H. MARLEY	NAVY REQUEST FOR EXCLUSION FROM MCL REQUIREMENTS WITH ENCLOSURE: TECHNICAL MEMO - EXAMINATION OF GROUNDWATER BENEFICIAL USES		GW	00001 00002 00003 00004 00005 0006A 0006B	SOUTHWEST DIVISION
N68311 / 000746 LTR NONE 0004	08-21-1996 **03-22-1996** NONE 01.6	DTSC S. LEMIEUX SOUTHWEST DIVISION K. KESLER	COMMENTS ON THE FINDINGS OF SUITABILITY TO LEASE NAVY MOLE		COMMENTS FOSL	00001 00002 00003 00004 00005 00006 00007	SOUTHWEST DIVISION

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N68311 / 000747 LTR NONE 0003	08-21-1996 **03-25-1996** NONE 01.6	DTSC S. LEMIEUX SOUTHWEST DIVISION K. KESLER	COMMENTS ON THE FINDINGS OF SUITABILITY TO LEASE NAVY MOLE FROM CRWQCB		COMMENTS FOSL	00001 00002 00004 0006A	SOUTHWEST DIVISION
N68311 / 000748 LTR NONE 0005	08-21-1996 **03-25-1996** NONE 01.6	DTSC S. LEMIEUX SOUTHWEST DIVISION K. KESLER	REVIEW OF ENVIRONMENTAL ASSESSENT FOR THE INTERIM LEASE OF THE NAVY MOLE		EA	00001 00002 00003 00004	SOUTHWEST DIVISION
N68311 / 000751 LTR NONE 0003	08-21-1996 **04-08-1996** NONE 01.6	DTSC S. LEMIEUX SOUTHWEST DIVISION K. KESLER	COMMENTS ON DRAFT FINAL FINDING OF SUITABILITY TO LEASE, NAVY MOLE		FOSL	00001 00002 00003 00004 00005 00007 0006A	SOUTHWEST DIVISION
N68311 / 000724 LTR N6871192D467000 0050	05-22-1996 **04-11-1996** 00015 03.6	BNI J. KLUESENER SOUTHWEST DIVISION P. KENNEDY	DRAFT RESPONSE TO COMMENTS DRAFT REMEDIAL INVESTIGATION (RI) REPORT	ADMIN RECORD INFO REPOSITORY	COMMENTS DATA IRP RI	00001 00002 00003 00004 00005 0006A	SOUTHWEST DIVISION
N68311 / 000790 LTR NONE 0001	09-09-1996 **04-26-1996** NONE 01.6	BOEING SEATTLE WA L. ATKINS SOUTHWEST DIVISION A. LEE	PRE-CONSTRUCTION ENVIRONMENTAL ASSESSMENT INVESTIGATION DERIVED WASTE DISPOSAL, THE MOLE AREA SITES 1 & 2 W/O ATTACHMENT		DISPOSAL IDW	00001 00002	SOUTHWEST DIVISION

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N68311 / 000851 PLAN N6871192D467000 0012	03-13-1997 **05-13-1996** 00110 05.1	BECHTEL NATIONAL INC J. KLUESENER VARIOUS AGENCIES	DRAFT TECHNICAL MEMORANDUM PROPOSED PLANS AND RECORDS OF DECISION FOR IR SITES 1-5, 6A AND 7 DATED MAY 13, 1996		IRA ROD TECH MEMO	00001 00002 00003 00004 00005 00007 0006A AOC 4	SOUTHWEST DIVISION
N68311 / 000723 LTR N6871192D467000 0015	05-22-1996 **05-15-1996** 00110 04.3	BNI J. KLUESENER SOUTHWEST DIVISION P. KENNEDY	DRAFT TECHNICAL MEMORANDUM PROPOSED PLAN AND RECORDS OF DECISION FORIR SITES 1-5, 6A, & 7	ADMIN RECORD INFO REPOSITORY	CERCLA FS NCP RI ROD TECH MEMO	00001 00002 00003 00004 00005 00007 0006A	SOUTHWEST DIVISION
N68311 / 000750 PLAN N6871192D467000 0075	08-21-1996 **06-19-1996** 00112 03.5	BNI SAN DIEGO N. THOMAS SOUTHWEST DIVISION P. KENNEDY	FINAL HEALTH AND SAFETY PLAN SUPPLEMENT FOR GROUNDWATER MONITORING DATED JUNE 19, 1996		GW H&SP MONITORING	00001 00002 00003 00004 00005 0006A 0006B BLDG. 32 BLDG. 8	SOUTHWEST DIVISION
N68311 / 000825 XMTL N6871192D467000 0050	09-13-1996 **06-20-1996** 00037 10.1	BNI SAN DIEGO K. KAPUR SOUTHWEST DIVISION R. SELBY	RESPONSE TO COMMENTS FOR DRAFT RI DATED JUNE 12, 1996 AND JUNE 20, 1996 W/ENCL		COMMENTS RESPONSE RI	00001 00002 00003 00004 00005 0006A 0006B	SOUTHWEST DIVISION

UIC No. / Rec. No. Record Type Contr./Guid. No. Approx. # Pages	Prc. Date Record Date CTO No. EPA Cat. #	Author Affil. Author Recipient Affil. Recipient	Subject	Classification	Keywords	Sites	Location
N68311 / 000742 RPT N6871192D467000 7000	08-21-1996 **07-10-1996** 00015 03.4	BNI SAN DIEGO K. KAPUR SOUTHWEST DIVISION P. KENNEDY	FINAL RI REPORT FOR IR SITES 1 THROUGH 6A VOLUMES I THROUGH VII (W/RESPONSE TO COMMENTS ON THE DRAFT IR FROM DTSC)		DISPOSAL IRP RI	00001 00002 00003 00004 00005 0006A	SOUTHWEST DIVISION
N68311 / 000809 LTR NONE 0002	09-10-1996 **07-10-1996** NONE 01.6	SOUTHWEST DIVISION K. BAER DTSC LONG BEACH A. GUTIERREZ	REQUEST FOR LETTER OF ACCEPTANCE OF THE NAVY'S RESPONSE TO COMMENTS AND THE FINAL RI REPORT BY AUGUST 8, 1996 W/O ENCL		REQUEST RESPONSE RI	00001 00002 00003 00004 00005 0006A	SOUTHWEST DIVISION
N68311 / 000757 PLAN N6871192D467000 0450	08-22-1996 **07-25-1996** 00112 03.3	BNI SAN DIEGO K. KAPUR SOUTHWEST DIVISION	DRAFT GROUNDWATER MONITORING WORK PLAN		GW	00001 00002 00003 00004	SOUTHWEST DIVISION
N68311 / 000766 XMTL N6871192D467000 0007	08-22-1996 **07-29-1996** 15/16 06.0	BNI-LA K. KAPUR SOUTHWEST DIVISION R. SELBY	CONTACT REPORT REGARDING RESOLUTION OF STATE AGENCY COMMENTS ON DRAFT RI FOR IR SITES 1 THROUGH 6A		COMMENTS RI	00001 00002 00003 00004 00005 0006A	SOUTHWEST DIVISION
N68311 / 000771 RPT N6871192D467000 0650	08-27-1996 **08-21-1996** 00112 03.3	BNI SAN DIEGO J.W. KLUESENER SOUTHWEST DIVISION R. SELBY	DRAFT APPENDIX U SUPPLEMENTAL FIELD ACTIVITIES FOR IR SITES 1,2,3, AND 4		EVALUATION GW SAP	00001 00002 00003 00004	SOUTHWEST DIVISION
N68311 / 000836 MM N6871192D467000 0010	11-14-1996 **09-04-1996** 00112 01.6	BNI SAN DIEGO K. KAPUR SOUTHWEST DIVISION R. SELBY	AUGUST 14, 1996 MEETING MINUTES FOR DISCUSSION OF PROPOSED AQUIFER TEST		MTG MINS PROPOSAL	00001 00002	SOUTHWEST DIVISION

UIC No. / Rec. No. Record Type Contr./Guid. No. Approx. # Pages	Prc. Date Record Date CTO No. EPA Cat. #	Author Affil. Author Recipient Affil. Recipient	Subject	Classification	Keywords	Sites	Location
N68311 / 000950 MEMO NONE 0002	09-23-1997 **10-02-1996** NONE 10.1	CRWQCB LOS ANGELES J. ROSS DTSC LONG BEACH A. GUTIERREZ	CRWQCB COMMENTS ON DRAFT GROUNDWATER MONITORING WORK PLAN (REF. DOC. #000757)		COMMENTS DRY DOCK GW MONITORING WELLS WORK PLAN	00001 00003 00004 0006A AOPC 1	SOUTHWEST DIVISION
N68311 / 000885 LTR NONE 0018	03-26-1997 **10-28-1996** NONE 10.1	DTSC LONG BEACH A. GUTIERREZ SOUTHWEST DIVISION K. OSTROUSKI	COMMENTS ON THE DRAFT GROUNDWATER MONITORING WORKPLAN (GWMWP), NAVAL STATION LONG BEACH		COMMENTS GW MONITORING WORK PLAN	00001 00003 00004 00005 0006A AOC 1 AOC 4 OU 1 OU 2	SOUTHWEST DIVISION
N68311 / 000838 PLAN N6871192D467000 0500	11-21-1996 **11-11-1996** 00112 03.3	BECHTEL NATIONAL K. KAPUR SOUTHWEST DIVISION R. SELBY	FINAL GROUNDWATER MONITORING WORK PLAN		GW MONITORING WORK PLAN	00001 00002 00003 00004 0006A 0006B	SOUTHWEST DIVISION
N68311 / 000882 LTR NONE 1000	03-26-1997 **11-19-1996** NONE 10.1	DTSC LONG BEACH A. GUTIERREZ SOUTHWEST DIVISION K. OSTROWSKI	COMMENTS ON FINAL IR REPORTS FOR SITES 1 THROUGH 6A NAVAL STATION LONG BEACH		COMMENTS	00001 00002 00003 00004 00005 0006A	SOUTHWEST DIVISION

UIC No. / Rec. No. Record Type Contr./Guid. No. Approx. # Pages	Prc. Date Record Date CTO No. EPA Cat. #	Author Affil. Author Recipient Affil. Recipient	Subject	Classification	Keywords	Sites	Location
N68311 / 000839 PLAN N6871192D467000 0200	12-24-1996 **12-16-1996** 00118 03.3	BECHTEL NATIONAL INC J. KLUESENER VARIOUS AGENCIES	DRAFT BRAC CLEANUP PLAN (NO.4)-CTO-0118		BCP BRAC CLEANUP UST	00001 00002 00003 00004 00005 0006A AOPC 1 AOPC 2 AOPC 3 AOPC 4 AOPC 5 AOPC 6 AOPC 7 AOPC 8	SOUTHWEST DIVISION
N68311 / 000907 LTR NONE 0002	03-26-1997 **12-17-1996** NONE 10.1	SOUTHWEST DIVISION K. BAER DTSC LONG BEACH A. GUTIERREZ	CLARIFICATION THAT RESPONSE TO ADDITIONAL COMMENT ON FINAL RI CAN BE FOUND AS RESPONSE TO COMMENT 1 FOR DRAFT APPENDIX U		COMMENTS IR RESPONSE RI	00001 00002 00003 00004 00005 0006A	SOUTHWEST DIVISION

UIC No. / Rec. No. Record Type Contr./Guid. No. Approx. # Pages	Prc. Date Record Date CTO No. EPA Cat. #	Author Affil. Author Recipient Affil. Recipient	Subject	Classification	Keywords	Sites	Location
N68311 / 000848 RPT N6871192D467000 0090	03-13-1997 **01-15-1997** 00111 04.2	BECHTEL NATIONAL INC K. KAPUR VARIOUS AGENCIES	DRAFT SUPPLEMENTAL ENVIRONMENTAL BASELINE SURVEY (SUPPLEMENTAL EBS) FOR NAVAL STATION LONG BEACH		EBS	00001 00003 00004 00005 00014 0006A AOPC 17 AOPC 21 AOPC 22 AOPC 5 AOPC 6 AOPC 9 BLDG. 143 BLDG. 144 BLDG. 272 BLDG. 32 BLDG. 4 BLDG. 401 BLDG. 42 BLDG. 576 BLDG. 673 BLDG. 8 BLDG. 815 BLDG. 888	SOUTHWEST DIVISION
N68311 / 001018 MM NONE 0006	12-10-1998 **01-21-1997** NONE 10.4	NAVSTA RAB INTERESTED PARTIES	NOTICE, MINUTES AND AGENDA FROM JANUARY 21, 1997 RESTORATION ADVISORY BOARD MEETING		RAB UST	00001 00007 BLDG. 128	SOUTHWEST DIVISION
N68311 / 000952 MEMO NONE 0001	09-23-1997 **01-30-1997** NONE 10.1	CRWQCB LOS ANGELES J. ROSS DTSC LONG BEACH A. GUTIERREZ	CRWQCB COMMENTS ON PRE-DRAFT TECHNICAL MEMORANDUM NO. 1, GROUNDWATER PUMPING TEST REPORT, IR SITES 1 & 2		COMMENTS DISPOSAL GW LANDFILL TECH MEMO VOC	00001 00002	SOUTHWEST DIVISION

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N68311 / 000910 RPT N6871192D467000 0100	04-01-1997 **02-03-1997** 00112 03.4	BECHTEL NATIONAL INC J. KLUESENER VARIOUS AGENCIES	AMENDMENTS TO DRAFT APPENDIX U-SUPPLEMENTAL FIELD ACTIVITIES		AOPC BRAC IRP RI VOC	00001 00002 00003 00004 00012 0006A AOPC 1 AOPC 2 AOPC 3 AOPC 4 AOPC 8	SOUTHWEST DIVISION
N68311 / 000843 RPT N6871192D467000 0500	03-13-1997 **02-14-1997** 00112 03.4	BECHTEL NATIONAL INC K. KAPUR VARIOUS AGENCIES	LONG-TERM GROUNDWATER MONITORING PROGRAM FIRST QUARTERGROUNDWATER MONITORING REPORT FORMER NAVAL STATION LONG BEACH		GW MONITORING	00001 00002 00003 00004 0006A 0006B AOPC 2 AOPC 4 AOPC 8	SOUTHWEST DIVISION
N68311 / 000850 LTR N6871192D467000 0100	03-13-1997 **02-20-1997** CV112 03.4	BECHTEL NATIONAL INC J. KLUESENER VARIOUS AGENCIES	FINAL TECHNICAL MEMORANDUM NO. 1 GROUNDWATER PUMPING TEST REPORT IR SITES 1 AND 2 NAVAL STATION LONG BEACH DATED FEBRUARY 20, 1997		GW IR TECH MEMO VOC	00001 00002	SOUTHWEST DIVISION

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N68311 / 000845 PLAN N6871192D467000 0142	03-13-1997 **03-01-1997** 00118 03.3	BECHTEL NATIONAL INC J. KLUESENER SOUTHWEST DIVISION R. SELBY	BRAC CLEANUP PLAN (BCP) FOR NAVAL STATION LONG BEACH, NAVAL HOSPITAL AND ASSOCIATED HOUSING (VERSION NO.4) DATED MARCH 1997		BCP BRAC CLEANUP IRP	00001 00002 00003 00004 00005 00007 00008 00009 00010 00011 00012 00013 00014 0006A 0006B AOPC 1 AOPC 10 AOPC 11 AOPC 12 AOPC 13 AOPC 14 AOPC 15 AOPC 16 AOPC 17 AOPC 18 AOPC 19 AOPC 2 AOPC 20 AOPC 21 AOPC 22 AOPC 3 AOPC 4 AOPC 5 AOPC 6 AOPC 7 AOPC 8	SOUTHWEST DIVISION

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						AOPC 9 BLDG. 143 BLDG. 144 BLDG. 152 BLDG. 220 BLDG. 272 BLDG. 299 BLDG. 307 BLDG. 32 BLDG. 398 BLDG. 4 BLDG. 40 BLDG. 401 BLDG. 419 BLDG. 42 BLDG. 422 BLDG. 46 BLDG. 650 BLDG. 669 BLDG. 671 BLDG. 676 BLDG. 741 BLDG. 749 BLDG. 756 BLDG. 8 BLDG. 821 BLDG. 831 BLDG. 888 BLDG. 95	
N68311 / 000918 LTR NONE 0002	05-05-1997 **03-06-1997** NONE 11.0	SOUTHWEST DIVISION K. OSTROWSKI EPA SAN FRANCISCO M. HAUSLADEN	ENCLOSURE LETTER FOR FINAL TECHNICAL MEMORANDUM #1, GROUNDWATER PUMPING TEST REPORT IR SITES 1 & 2 DATED FEBRUARY 20, 1997 (REFERENCE DOC#000850)	GW IR TECH MEMO		00001 00002	SOUTHWEST DIVISION

UIC No. / Rec. No. Record Type Contr./Guid. No. Approx. # Pages	Prc. Date Record Date CTO No. EPA Cat. #	Author Affil. Author Recipient Affil. Recipient	Subject	Classification	Keywords	Sites	Location
N68311 / 000913 LTR NONE 0003	04-03-1997 **03-13-1997** NONE 01.6	DTSC LONG BEACH A. GUTIERREZ VARIOUS AGENCIES	REVIEW OF AMENDMENTS TO DRAFT APPENDIX U - SUPPLEMENTAL ACTIVITIES FOR INSTALLATION RESTORATION SITE 6A		COMMENTS IRP	00001 00002 00003 00004 0006A	SOUTHWEST DIVISION
N68311 / 000922 RPT N6871192D467000 0075	05-05-1997 **03-20-1997** 00111 02.1	BECHTEL NATIONAL INC J. KLESENER SOUTHWEST DIVISION R. SELBY	FINAL SUPPLEMENTAL ENVIRONMENTAL BASELINE SURVEY		EBS	00001 00002 00003 00004 00005 00007 00014 0006A AOPC 17 AOPC 21 AOPC 22 AOPC 6 AOPC 9 APOC 5	SOUTHWEST DIVISION
N68311 / 000926 RPT N6871192D467000 0350	05-13-1997 **04-14-1997** 00112 03.4	BECHTEL NATIONAL INC J. KLUESENER VARIOUS AGENCIES	FINAL APPENDIX U, SUPPLEMENTAL FIELD ACTIVITIES FOR IRP SITES 1, 2, 3, 4, AND 6A		IRP	00001 00002 00003 00004 0006A	SOUTHWEST DIVISION
N68311 / 000955 LTR NONE 0006	09-23-1997 **04-30-1997** NONE 10.1	SOUTHWEST DIVISION K. OSTROWSKI VARIOUS AGENCIES	TRANSMITTAL OF REMEDIAL INVESTIGATION REPORT FOR IRP SITES 1 THROUGH 6A, FINAL APPENDIX U, SUPPLEMENTAL FIELD ACTIVITIES FOR IRP SITES 1-4 & 6A (DOC. #000926)		IRP RI	00001 00002 00003 00004 00005 0006A	SOUTHWEST DIVISION

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N68311 / 000956 LTR N6871192D467000 0002	09-23-1997 **05-15-1997** 00112 03.4	BECHTEL NATIONAL INC K. KAPUR VARIOUS AGENCIES	TRANSMITTAL OF REVISED SPINE TO REMEDIAL INVESTIGATIONREPORT FOR IRP SITES 1 THRU 6A, FINAL APPENDIX U, SUPPLEMENTAL FIELD ACTIVITIES (REF. DOC. #000926)		IRP RI	00001 00002 00004 00005 0006A	SOUTHWEST DIVISION
N68311 / 000964 RPT N6871192D467000 1200	09-23-1997 **07-11-1997** 00112 01.1	BECHTEL NATIONAL INC K. KAPUR SOUTHWEST DIVISION R. SELBY	DRAFT SECOND QUARTER (BIANNUAL) GROUNDWATER MONITORING REPORT NAVSTA LONG BEACH		DATA GW MONITORING WELLS	00001 00002 00003 00004 00005 0006A 0006B AOPC 2 AOPC 4 AOPC 8	SOUTHWEST DIVISION
N68311 / 000969 RPT N6871192D467000 0500	10-22-1997 **09-19-1997** 00112 03.4	BECHTEL NATIONAL INC K. KAPUR VARIOUS AGENCIES	FINAL THIRD QUARTER GROUNDWATER MONITORING REPORT FORMER NAVAL STATION LONG BEACH		GW MONITORING	00001 00002 00003 00004 AOPC 2 AOPC 4 AOPC 8	SOUTHWEST DIVISION
N68311 / 000977 LTR NONE 0003	12-24-1997 **10-08-1997** NONE 01.6	SOUTHWEST DIVISION K. OSTROWSKI VARIOUS AGENCIES	REQUEST THAT DTSC BE LEAD AGENCY FOR THE STATE OF CALIFORNIA ON IDENTIFICATION OF STATE ARARS FOR IR SITES 1,2,3,4,5, AND 6A		ARAR IR REQUEST	00001 00002 00003 00004 00005 0006A	SOUTHWEST DIVISION

UIC No. / Rec. No. Record Type Contr./Guid. No. Approx. # Pages	Prc. Date Record Date CTO No. EPA Cat. #	Author Affil. Author Recipient Affil. Recipient	Subject	Classification	Keywords	Sites	Location
N68311 / 000970 RPT N6871192D467000 1000	11-26-1997 **11-06-1997** 00112 01.2	BECHTEL NATIONAL INC K. KAPUR VARIOUS AGENCIES	DRAFT FOURTH QUARTER (ANNUAL) GROUNDWATER MONITORING REPORT FORMER NAVAL STATION LONG BEACH		GW IR MONITORING	00001 00002 00003 00004 0006A 0006B AOPC 2 AOPC 3 AOPC 4 AOPC 8	SOUTHWEST DIVISION
N68311 / 001023 MM NONE 0005	12-10-1998 **11-18-1997** NONE 10.4	NAVSTA RAB INTERESTED PARTIES	NOTICE, MINUTES AND AGENDA FROM NOVEMBER 18, 1997 RESTORATION ADVISORY BOARD MEETING		MTG MINS RAB	00001 00002 00003 00004 00005 00007 00014 0006A	SOUTHWEST DIVISION
N68311 / 000983 XMTL N6871192D467000 0008	12-24-1997 **12-15-1997** 00112 10.1	BECHTEL NATIONAL INC K. KAPUR SOUTHWEST DIVISION R. SELBY	RESPONSE TO AGENCY COMMENTS ON THE LONG TERM GROUND- WATER MONITORING PROGRAM, DRAFT SECOND QRT.(BIANNUAL) & FINAL THIRD-QTR. GROUNDWATER MONITORING REPORT		COMMENTS GW MONITORING RESPONSE	00001 00002 AOPC 4	SOUTHWEST DIVISION
N68311 / 001004 RPT N6871192D467000 0900	03-16-1998 **02-24-1998** 00112 01.2	BECHTEL NATIONAL INC K. KAPUR VARIOUS AGENCIES	FINAL FOURTH QUARTER (ANNUAL) GROUNDWATER MONITORING REPORT, FORMER NAVAL STATION, DATED FEBRUARY 1998		GW MONITORING	00001 00002 00003 00004 0006A	SOUTHWEST DIVISION

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N68311 / 001005 RPT N6871192D467000 0850	03-16-1998 **02-24-1998** 00112 01.2	BECHTEL NATIONAL INC K. KAPUR VARIOUS AGENCIES	FINAL SECOND QUARTER (BIANNUAL) GROUNDWATER MONITORINGREPORT FORMER NAVAL STATION LONG BEACH		AOPC GW MONITORING RESULTS	00001 00002 00003 00004 AOPC 2 AOPC 4 AOPC 8	SOUTHWEST DIVISION
N68311 / 001027 PLAN NONE 0250	12-10-1998 **02-25-1998** NONE 01.1	SOUTHWEST DIVISION A. LEE VARIOUS AGENCIES	BASE REALIGNMENT AND CLOSURE (BRAC) CLEANUP PLAN UPDATE		BCP CERCLA CERFA NEPA RCRA SARA	00001 00002 00003 00004 00005 00007 00014 0006A BLDG. 816	SOUTHWEST DIVISION
N68311 / 001036 XMTL N4740895D073000 0210	12-14-1998 **04-06-1998** DO 33 04.0	SOUTHWEST DIVISION A. LEE VARIOUS AGENCIES	DRAFT FEASIBILITY STUDY		AOPC ARAR DCE FS GW SOIL TCE VOC	00001 00002 AOPC 4	SOUTHWEST DIVISION

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N68311 / 001043 MISC NONE 0006	12-14-1998 **04-29-1998** NONE 10.6	SOUTHWEST DIVISION F. ALJABI VARIOUS AGENCIES	SUBMITTAL OF DRAFT ENVIRONMENTAL FACT SHEET #1, DATED MAY 1998, FOR REVIEW AND COMMENTS		COMMENTS IRP	00001 00002 00003 00004 00005 00007 00008 00009 00010 00011 00012 00013 00014 0006A 0006B	SOUTHWEST DIVISION
N68311 / 001045 PLAN N6871196D202900 0360	12-14-1998 **05-08-1998** DO 20 03.3	CDM FEDERAL PROGRAMS SOUTHWEST DIVISION	DRAFT WORK PLAN FOR GROUNDWATER MONITORING, SITES 1 & 2 (AOPC 4) AND SITE 3 (AOPC 2)		DCE GW LANDFILL MONITORING SOIL TCE VOC WELLS WORK PLAN	00001 00002 00003 AOPC 2 AOPC 4	SOUTHWEST DIVISION
N68311 / 001055 XMTL N68711-98-D-2029___ 0250	12-14-1998 **06-29-1998** DO 20 03.3	SOUTHWEST DIVISION F. ALJABI VARIOUS AGENCIES	FINAL - WORK PLAN FOR GROUNDWATER MONITORING AT SITES 1 & 2 (AOPC 4) AND SITE 3 (AOPC 2) FOR REVIEW AND COMMENT	ADMIN RECORD	AOPC COMMENTS GW MONITORING WORK PLAN	00001 00002 00003 AOPC 2 AOPC 4	SOUTHWEST DIVISION

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N68311 / 001140 MISC NONE 0008	06-04-1999 **12-22-1998** NONE 10.1	DTSC CYPRESS A. GUTIERREZ SOUTHWEST DIVISION T. MACCHIARELLA	DTSC COMMENTS ON THE DRAFT PUBLIC NOTICE "RECORD OF DECISION FOR SITES 3, 4, 5 AND 6A IS AVAILABLE FOR PUBLIC INSPECTION", DRAFT FACT SHEET #3 AND DRAFT PUBLIC NO		CLEANUP COMMENTS FACT SHEET PUBNOT	00001 00002 00003 00004 00005 00014 0006A	SOUTHWEST DIVISION
N68311 / 001144 RPT N6871196D202900 0300	06-04-1999 **01-08-1999** DO 20 03.4	SOUTHWEST DIVISION F. ALJABI VARIOUS AGENCIES	DRAFT FIRST BIANNUAL (SECOND QUARTER) REPORT FOR GROUNDWATER MONITORING		GW MONITORING SVOCs VOCs WELLS	00001 00002 00003 AOPC 2 AOPC 4	SOUTHWEST DIVISION
N68311 / 001150 RPT N4740895D073000 0235	06-07-1999 **02-04-1999** DO 33 04.2	SOUTHWEST DIVISION A. LEE VARIOUS AGENCIES	FINAL FEASIBILITY STUDY		AOPC ARARs DCE FS GW SOIL TCE VOCs	00001 00002	SOUTHWEST DIVISION
N68311 / 001157 LTR NONE 0001	06-07-1999 **03-25-1999** NONE 03.6	CRWQCB LOS ANGELES A. GUTIERREZ SOUTHWEST DIVISION E. DIENZO	RECEIPT AND REVIEW OF THE FINAL FEASIBILITY STUDY (REF. DOC. #001150) WITH AUTHORIZATION TO IMPLEMENT THE TREATMENT ALTERNATIVES PROPOSED		FS	00001 00002	SOUTHWEST DIVISION
N68311 / 001158 RPT N6871196D202900 0240	06-07-1999 **03-26-1999** DO 20 03.4	SOUTHWEST DIVISION F. ALJABI CRWQCB LOS ANGELES A. VELOS-TOWNSEN	FINAL FIRST BIANNUAL (SECOND QUARTER, SEPTEMBER-DECEMBER 1998) GROUNDWATER MONITORING REPORT		GW MONITORING SVOCs TOC VOCs WELLS	00001 00002 00003 AOPC 2 AOPC 4	SOUTHWEST DIVISION

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N68311 / 001160 RPT N6871196D202900 0230	06-07-1999 **04-02-1999** DO 20 03.4	SOUTHWEST DIVISION F. ALJABI VARIOUS AGENCIES	FINAL THIRD QUARTER GROUNDWATER MONITORING REPORT		GW MONITORING SVOCs TCE VOCs WELLS	00001 00002 00003 AOPC 2 AOPC 4	SOUTHWEST DIVISION
N68311 / 001182 MISC NONE 0001	01-01-2000 **05-15-1999** NONE 10.1	EPA M. HAUSLADEN SOUTHWEST DIVISION T. MACCHIARELLA	LTR RE: COMPLETED REVIEW OF FINAL FEASIBILITY STUDY FOR INSTALLATION RESTORATION SITES 1 AND 2		FS	00001 00002	SOUTHWEST DIVISION
N68311 / 001181 MISC NONE 0011	01-01-2000 **06-04-1999** NONE 10.6	SOUTHWEST DIVSION L. SAUNDERS	FACT SHEET REGARDING PROPOSED PLAN/DRAFT REMEDIAL ACTION PLAN FOR INSTALLATION RESTORATION SITES 1 AND 2		IR PROPOSAL RA	00001 00002	SOUTHWEST DIVISION
N68311 / 001180 RPT N474440895D0730 0200	01-01-2000 **06-07-1999** NONE 05.0	NFESC T. MCENTEE BRAC T. MACCHIARELLA	DRAFT RECORD OF DECISION FOR INSTALLATION RESTORATION SITES 1 AND 2		IR ROD	00001 00002	SOUTHWEST DIVISION
N68311 / 001184 REPT N47440895D07300 0210	06-21-1999 **06-07-1999** NONE 05.0	SOUTHWEST DIVISION T. MACCHIARELLA VARIOUS AGENCIES	DRAFT RECORD OF DECISION		AOCs DCE GW IAS MONITORING ROD SOIL SVE TCE VC	00001 00002	SOUTHWEST DIVISION
N68311 / 000011 LTR NONE 0003	09-24-1999 **08-12-1999** NONE 10.1	DTSC CYPRESS A. YUE SOUTHWEST DIV T. MCCHIARELLA	COMMENTS ON THE CEQA INITIAL STUDY AND PROPOSED NEGATIVE DECLARATION	ADMIN RECORD	CEQA IRP	00001 14 2	SOUTHWEST DIVISION

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No Keywords
Sites=00001;00002

This Administrative Record (AR) Index includes references to documents which cite bibliography sources. These bibliographic citations are considered to be part of this AR but may not be cited separately in the index.

APPENDIX C

Public Notice, Roster of Public Meeting Attendees, and Public Meeting Transcript

Community & Notices

PUBLIC COMMENT PERIOD
PROPOSED CLEANUP PLANS AND PROPOSED NEGATIVE DECLARATION
FOR SITES 1, 2 AND 14
FORMER NAVAL STATION LONG BEACH

The Naval Facilities Engineering Command, Southwest Division, invites public comment on the Proposed Plan/Draft Remedial Action Plan (Draft RAP), Remedial Investigation and Feasibility Study for Sites 1 & 2, and the Engineering Evaluation/Cost Analysis (EE/CA) /Draft RAP for the non-time critical removal action at Site 14. All three sites are located at the former Long Beach Naval Station.

The Proposed Plan/Draft RAP for Sites 1 & 2 provides information about the alternatives considered for remedial action, identifies the preferred cleanup solution, and seeks public input prior to making a final decision. Specifically, the Navy is proposing the following Remedial Action:

- Removal of buried waste containers and contaminated soils, in-situ air sparging with soil vapor extraction (to cleanup volatile organic compounds), groundwater monitoring and institutional controls.

The EE/CA/Draft RAP for Site 14 provides information about the alternatives considered for removal action, identifies the preferred cleanup solution with the rationale for its selection, and seeks public input prior to making a final decision. Specifically, the Navy is proposing the following Removal Action:

- Electrical resistive heating with soil vapor extraction (to cleanup volatile organic compounds), groundwater monitoring, and institutional controls.

The California Department of Toxic Substances Control (DTSC) invites public review and comment on a proposed Negative Declaration, pursuant to the California Environmental Quality Act (CEQA), for the proposed remedial action at Sites 1 and 2 and the proposed removal action at Site 14. The proposed Negative Declaration indicates that the remedial and removal actions will not have a significant negative effect on the environment as defined in the Public Resources Code, section 21068.

Final decisions on the cleanup plans and the CEQA document will not be made until public comments have been received and considered. The public review period and comment period for the above-mentioned documents extends from June 10, 1999 through July 9, 1999. A public meeting will be held to provide the community with an opportunity to discuss and provide comments on the Proposed Plan/Draft RAP and EE/CA/Draft RAP. The meeting will be held:

June 28, 1999 - 6:30 P.M.
City of Long Beach Community Room
(4th Floor, Suite 400) at
200 Pine Street, Long Beach, CA 90802

An administrative record file has been prepared in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986. CERCLA regulates the cleanup of sites containing hazardous waste. The administrative record file includes Sites 1 & 2 Proposed Plan/Draft RAP, Site 14 EE/CA/Draft RAP, and the proposed CEQA Negative Declaration. Documents that provide more detail on the Proposed Plan/Draft RAP and EE/CA/Draft RAP (i.e. remedial investigation, feasibility study reports, and site investigations) are also available in the administrative record file. The administrative record file is located at Naval Facilities Engineering Command (see address below) – please telephone Ms Diane Silva, at (619) 532-1144 to arrange an appointment.

Local residents and other interested parties are encouraged to review the Proposed Plan/Draft RAP, EE/CA/Draft RAP, proposed CEQA Negative Declaration and related documents, which are available for public review at the following information repository.

Long Beach Public Library, Government
Publications Department
101 Pacific Ave.
Long Beach, CA 90822
(562) 570-7500

The proposed CEQA Negative Declaration is also available for review at DTSC, located at 5796 Corporate Avenue, Cypress, California. Please contact Ms. Julie Johnson at (714) 484-5337 for an appointment.

Written comments on the Proposed Plan/Draft RAP and EE/CA/Draft RAP should be postmarked no later than July 9, 1999, and sent to:

Commander
Southwest Division, Naval Facilities
Engineering Command
Attn: Lee Saunders
1220 Pacific Highway
San Diego, CA 92132-5190
(619) 532-3100

Questions regarding the Proposed Plan/Draft RAP, EE/CA/Draft RAP, or other issues related to the environmental cleanup program, should be directed to Mr. Lee Saunders, Environmental Public Affairs Officer, at the above address and telephone number.

Written comments on the proposed CEQA Negative Declaration should be postmarked no later than July 9, 1999, and sent to:

Mr. Alvaro Gutierrez
Department of Toxic Substances Control
5796 Corporate Avenue
Cypress, California 90630
(714) 484-5417

Questions regarding the proposed CEQA Negative Declaration should be directed to Mr. Alvaro Gutierrez, Project Manager, at the above address and telephone number.

PROOF OF PUBLICATION

(2015.5 C.C.P.)

STATE OF CALIFORNIA,
County of Los Angeles,

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a party to or interested in the above-entitled matter. I am the principal clerk of the printer of the Long Beach Press-Telegram, a newspaper of general circulation, printed and published 7 times each week in the City of Long Beach, County of Los Angeles, and which newspaper has been adjudged a newspaper of general circulation by the Superior Court of the County of Los Angeles, State of California, under the date of March 21, 1934.

Case Number 370512; that the notice, of which the annexed is a printed copy (set in type not smaller than nonpareil), has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to-wit:

June 23,

all in the year 1999.

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Dated at Long Beach, California, this

13th day of

July, 1999

Dee Hilsabeck

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Public Comment Period
For mer Naval Station Long Beach

PUBLIC COMMENT PERIOD
PROPOSED CLEANUP PLANS
AND PROPOSED NEGATIVE
DECLARATION FOR SITES 1, 2, AND 14
FORMER NAVAL STATION LONG BEACH

The Naval Facilities Engineering Command, Southwest Division, invites public comment on the Proposed Plan/Draft Remedial Action Plan (Draft RAP), Remedial Investigation and Feasibility Study for Sites 1 & 2, and the Engineering Evaluation/Cost Analysis (EE/CA)/Draft RAP for the non-time critical removal action at Site 14. All three sites are located at the former Long Beach Naval Station.

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Cypress, California 90630
(714) 484-5417

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SAN DIEGO, CA 92132

TELEPHONE: (619) 532-3676

LONG BEACH NAVAL COMPLEX PUBLIC MEETING SIGN-IN SHEET FOR JUNE 28, 1999		
[PRINT] NAME	AFFILIATION	ADDRESS
Michelle Gallice	CDM	3760 Convoy St. Ste 210 San Diego, CA 92111
Thomas Macchiarella	NAVY	1220 Pacific Hwy San Diego, CA 95132
Philip Jagucki	Battelle	505 King Ave Columbus OH 43201
Abe Chen	Battelle	" " "
Rick Sauerwein	Battelle	5235 Sealane Way Oxnard, CA 93035
KARL A. TIEDEMANN	RAB	
Jennifer Rich	DTSC	5796 Corporate Ave Cypress, CA 90630
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John Hill	NAVY	1220 Pacific Hwy SAN DIEGO, CA 92132
Christine Huston	POLB	925 Harbor Plaza Long Beach 90802
Eduardo [illegible]	DTSC	5796 Corporate Ave. Cypress, CA 90630

LONG BEACH NAVAL COMPLEX PUBLIC MEETING SIGN-IN SHEET FOR JUNE 28, 1999		
[PRINT] NAME	AFFILIATION	ADDRESS
Victor Mayer	Battelle	~~193 E Main St~~ 505 King Ave, Columbus, OH 43201
Aaron Yue	DTSC	5796 CORPORATE AVE CYPRESS, CA 90630
Martin Hausladen	USEPA	75 HAWTHORNE ST SAN FRANCISCO, CA 94105
CLYDE NAKATA	———	
JA Fleming	AMC	444 W OCEAN BLVD Long Beach
Ron Matsui	AMC LB	444 W. Ocean Blvd, Ste 505 Long Beach, CA 90802
GREYSEN EDWARD COOLEY	RAB	
MARIA M. VARGAS	RAB Co-CHAIR	

PUBLIC MEETING FOR THE PROPOSED PLAN OF SITES 1 & 2, AND ENGINEERING EVALUATION/COST ANALYSIS (EE/CA) OF SITE 14 AT THE FORMER NAVAL STATION LONG BEACH

given by Michelle Gallice, CDM Federal Programs, and Thomas L. Macchiarella, Navy Project Manager, and Philip E. Jagucki, CPG, Principal Research Scientist-Environmental Restoration Department, commencing at the hour of 6:30 P.M. on Monday, June 28, 1999, at 200 Pine Avenue, Community Room Suite 400, Long Beach, California.

Reported by: Kellie D. Arnold, RPR, CSR 10798

APPEARANCES:

Introduction by:

MICHELLE GALLICE
CDM FEDERAL PROGRAMS

Overview of the Navy's Installation Restoration Program:

THOMAS L. MACCHIARELLA
LEAD REMEDIAL PROJECT MANAGER,
LONG BEACH NAVAL COMPLEX
1430 Kettner Boulevard, Suite 501
San Diego, CA 92101-2404

Presentation of Proposed Plan and the Preferred Alternatives for Sites 1 and 2:

BATTELLE
BY: PHILIP E. JAGUCKI, CPG
505 King Avenue
Room 10-1-17B
Columbus, Ohio 43201

Presentation of the Engineering Evaluation/Cost Analysis for Site 14:

BATTELLE
BY: VICTOR MAGAR
505 King Avenue
Room 10-1-17B
Columbus, Ohio 43201

I N D E X

LONG BEACH, CALIFORNIA

MONDAY, JUNE 28, 1999, 6:30 p.m.

* * *

MS. GALLICE: Okay. So we're now going to officially start the meeting. And just to make sure that everybody knows, the meeting is being tape recorded and there's a court reporter here who will be recording the entire presentation.

I think I went through all the administrative issues already. So does everybody know that we have three presentations tonight? Thomas Macchiarella, Victor Magar, and Phil Jagucki will all be presenting information this evening. And with that, I guess we'll go ahead and introduce our first presenter, who is Thomas Macchiarella.

* * *

MR. MACCHIARELLA: Thanks, Michelle.

Thanks for coming, everybody. There are copies of the Agenda and the Proposed Plan and a handout of the slides for tonight's presentations on the table, if everybody hasn't gotten one yet. You can dive right in.

My name is Thomas Macchiarella. I am the Lead Remedial Project Manager for the Long Beach Naval Complex, which includes the Long Beach Naval Station and

Shipyard. There are some of our BRAC cleanup team members in the audience. Our normal -- our regulators Martin Hausladen and Aaron Yue and Alvaro Gutierrez. I think most of the people here -- and Jennifer Rich. I think most of the people here are familiar with this group.

Tonight we're going to -- I want to go over the Navy's Installation Restoration Program, or I.R. Program. Tonight we're going to discuss two things. One is the Sites 1 and 2 Proposed Plan, and the second is the Site 14 Engineering Evaluation/Cost Analysis, or EE/CA.

The Navy's I.R. Program -- for emphasis I'll read these -- to identify and investigate, assess, characterize, and clean up hazardous substances at the Naval Installation. Usually these are things from accidental spills in the past, or from practices that were acceptable in the past but are no longer acceptable and, therefore, need some action at this point.

To reduce human health -- to reduce the risk to human health and the environment from past waste disposal operations and spills. To be compliant with CERCLA, which is the Comprehensive Environmental Response, Compensation and Liability Act, which I think most people have heard of, at least. And what we want to do is get

all of our sites to what we call "No Further Action" or "Site Closed" status.

This is what the CERCLA or the Installation Restoration Program looks like. We're trying to reach site completion there towards the bottom, and it's sort of a step-wise approach. And in the next few slides I'm going to show you where the sites that we're talking about tonight fall into this category. This path is known as the Remedial Action Path, and we're going to get into more details of these steps. Again, the goal is to reach site completion.

This next slide, which I believe is in your handout, shows what we call the Removal Action Path, which is another way to get to sites closures. You may also use this path in conjunction with the previous path. So we're going to try and simplify all this stuff tonight and follow the presentations.

The Engineering Evaluation/Costs Analysis, again, is where the Site 14 stuff is, and we're going to get into more detail on that tonight. Right now I'm just sort of giving you a snapshot of where these sites are and how they fit into the I.R. Program and CERCLA process so that when we get into the more detailed discussion tonight of the reports, you can have a better feeling on how they fit in.

At Sites 1 and 2 -- which we're going to show you a map shortly on where they are exactly on the Naval Station -- that started back in 1983 with an initial assessment study, which is very similar or satisfied the preliminary assessment, or P.A., that's in the CERCLA process.

And basically what a P.A. does is sort of it's a base-wide approach done at many Navy installations back in the '83 and '86 timeframe, and you identify places that have questionable status with environmental concerns, and then later on you would do a site inspection where you might actually do some sampling. And then if the sampling indicates there's cause for concern, you would move forward to a remedial investigation, as was done in here at Site 22 in '96, and then on to a feasibility study. And I think actually the folks in this room have seen these reports. And then finally we will get on to the Proposed Plan, where we are tonight currently.

In Site 14 -- and these will be explained in more detail shortly -- again, a preliminary assessment followed by a site inspection with another site inspection to augment the previous data set and currently the EE/CA. This is following the Removal Action Path I talked about earlier where Sites 1 and 2 were following the Remedial Action Path.

Sites 1 and 2 are currently at the Proposed Plan stage. That is this document that you've probably received in the mail or seen elsewhere at the library. The Proposed Plan provides for community involvement and identifies a preferred alternative and discusses other alternatives that were considered in the feasibility study that precedes it and leads to a record of decision, which is the next step.

Back to Site 14. This is the last time we'll jump around. Again, we're at the EE/CA stage, which provides for community involvement, identifies the preferred alternative, discusses others that were evaluated, and the next step after this is an Action Memorandum.

So that is a brief overview of the Navy's Installation Restoration Program and where the sites that we're talking about tonight fit into that program, and the next step is to go into more detail on the Proposed Plan and Preferred Alternatives for Sites 1 and 2, and then we will talk in more depth about Site 14.

Without further adieu, Mr. Phil Jagucki is going to talk about the Proposed Plan at Sites 1 and 2.

* * *

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MR. JAGUCKI: I don't want to repeat everything Tom has just said, so --

My name is Phil Jagucki, and I was the project leader for this Sites 1 and 2 project. The key items that I want to cover tonight are to go over the documents that we used to support and got us to this stage that we're at now, cover the Remedial Action Objectives that were established for the site, talk a little bit about the health risk assessment that was completed, and then present the alternatives and the preferred alternative for the Sites 1 and 2.

This map shows the Shipyard and Naval Station. Sites 1 and 2 are out here on the end of the mole and they overlap each other. That's why they're kind of lumped together as we talk about them in these reports tonight. All right. I'll come back to this map a little later to talk about the specific areas.

What I want to talk about in a little bit more detail is some of the documents that we used for this project. Tom has indicated a remedial investigation was completed. As part of that project, soil and groundwater samples were collected to kind of identify the nature and extent of contamination. A human health risk assessment was completed as well as groundwater transport modeling.

The result of that was the I.R. Report. The

next stage was to complete a feasibility study where the Remedial Action Objectives were identified and various technologies were screened preliminarily. And then the ones in the past preliminarily screened were carried further into a detailed evaluation, and that leads up to the Proposed Plan. As part of the CERCLA project, the Proposed Plan is designed to get community involvement and then present the preferred alternative.

Two media that were affected at this site were groundwater and soils. We established a separate set of objectives for each of these areas. For groundwater, first objective we have is to minimize the environmental exposures. That's exposure to the ecosystem. In this case it's the marine environment that surrounds the mole. The second and third objectives were to protect human health.

For soils, for surface and subsurface soils, the second and third objective remain the same, to be protective of human health. An additional objective for the soils, there was debris identified at the site that could be a potential source of the groundwater contamination that was identified; so an objective here is to remove that debris from the soils.

If you look on the map, the area where the debris is and the area of contaminated soil is the small

area out here (indicating). So that's -- for some of the activities, this site will be focusing just on that area.

A risk assessment -- a human health risk assessment was completed for the site. Risk assessments are based on factual information and also various sets of assumptions. The factual information would be things like the concentration of contaminants, the location of the contaminants in the soils and groundwater. The assumptions that need to be made as to how this material could be transported so that someone would be exposed to it, and then the other assumptions would be what type of exposure would occur. All that is put together and evaluated to measure two different types of risks, and that's carcinogenic and non-carcinogenic, or cancer and non-cancer, risks.

For this risk assessment we evaluated industrial exposure scenarios. The reason for this is because this site has been, and based on the reuse plan, will continue to be used for industrial purposes. It's not going to be developed as a residential area. So that's the distinction they were able to make in preparing the risk assessment.

For cancer risk, it's evaluated as a load of 1 in a million to 1 in 10,000 is the range for an acceptable excess lifetime cancer risk for industrial

scenarios; so we want to be within or less than that risk. For non-cancer risk, it's a simple ratio of a potential or actual risk of a compound to the toxicity of the compound. If it's greater than 1, then it's a risk; if it's less than 1, then it's not a risk.

MR. TIEDEMANN: May I ask a question? You said it would continue to be used as industrial use. What was the use of that area before that, before this -- before they closed it?

MR. JAGUCKI: The original use of that area was as a landfill, and then subsequently there was storage, some storage there. The landfill was mostly for solid wastes. And there was some green space at the end of the mole.

MR. TIEDEMANN: Yes. As a matter of fact, that's where the Navy and their families held picnics, 4th of July celebrations, birthday parties, weddings, and everything else.

MR. MACCHIARELLA: There was also recreation space --

MR. TIEDEMANN: Right.

MR. MACCHIARELLA: -- on Sites 1 and 2; correct?

MR. TIEDEMANN: Right. That whole end of the mole was the recreational area.

MR. JAGUCKI: Right. That's not in any future plans for that area.

MR. TIEDEMANN: I understand that. I just wanted to point that out.

MR. MACCHIARELLA: If I could ask that we hold questions at the end, that would be more convenient for the presentation. Thanks.

MR. JAGUCKI: So based on the information collected as part of the remedial investigation and the risk assessments, we move forward to the feasibility study, identified our objective, and then began to screen through alternatives.

The alternatives that we carried through to a detailed analysis include no further action, which is used as a baseline action in the CERCLA process. It's used to compare the other alternatives. The second that we evaluated were institutional controls that were deed restrictions and long-term groundwater monitoring for the site. The third that we evaluated was in situ air sparging along with the alternative mentioned as part of Alternative 2, the long-term groundwater monitoring and deed restriction.

Very briefly, the in situ air sparging is a technology where air is introduced into the groundwater. In our case, we're also going to combine this with an extraction system to contain the airflow out, back out of the system. The compounds are either destroyed through

this process or stripped out and then collected at the surface where they can be destroyed there or hauled off site and destroyed in whatever media they had been collected in.

As part of the process, these alternatives were evaluated against nine different criteria. We've gone through most of these where right now we're down to the community acceptance part of the process.

The alternative that emerged was Alternative 3, the air sparging extraction system along with the institutional controls and groundwater monitoring. As kind of a final test or final evaluation of this alternative, we had to make sure that it met some other requirements. That is, that it be protective of human health and the environment.

Second item is that it will comply with ARAR, all the other rules and regulations and laws that would apply to the implementation of the technology or anything resulting from that action. It needs to be cost effective. And the process establishes that whenever possible, a permanent solution be implemented. That is, as much as is possible, the contaminants be removed. And that's a State statutory preference for treatment. If you don't meet that treatment, you have to state why.

Again, if you go back to the map, the areas

where we have contaminants that we need to provide a permanent solution to are out in the area at the end of the mole where the yellow dot is. The major of the mole the risk was within the manageable or the accepted range in the health risk assessment, and so those will be managed under that, and that's why it doesn't require -- why the technology itself doesn't need to be applied to the entire site or, rather, just a specific area of the site. Thank you.

MR. MACCHIARELLA: With regard to the questions, the typical format for this type of meeting would be for the Navy and the agencies to receive comments. We would address those in writing at a later date. However, since I believe all the public members that are here tonight are RAB members, we might be able to streamline and possibly answer some of your questions sooner, provided that we have our correct person here tonight to answer that question. And I think it would be best if we stick to the agenda and do that at the end.

Victor. Next presentation is for Site 14. This is Victor from Battelle, also.

MR. MAGAR: For those of you who haven't seen it, this is the EE/CA. I brought it with me --

MR. COOLEY: Excuse me for just a moment. You said we're going to stick to the agenda?

MR. MACCHIARELLA: Yes. I'm sorry. On the table.

MR. COOLEY: Okay. Because I got a mailing here, and we were going to be discussing Site 1 and Site 2.

MR. MACCHIARELLA: Right, which we just -- that was the presentation we just went over, and now we're about to talk about Site 14.

MR. COOLEY: Now we're going to do Site 14?

MR. MACCHIARELLA: Correct.

* * *

MR. MAGAR: So I will discuss the Engineering Evaluation and Cost Analysis conducted for Installation Restoration Site 14. This is the Removal Action process that Thomas had referred to.

Site 14 was a former laundry facility for the base. It's probably difficult for you to see with the arrows going from there (indicating), but it comes on the mainland of the base, and it's where former Building 46 was located. It now has been demolished, although the foundation was left in place. And the foundation of Building 46 is part of the Removal Action because it too is potentially contaminated.

In addition to some of the ground -- there's a groundwater plume that is underneath that extends a little bit to the north-northeast direction surrounding

Building 46.

Building 46 was constructed as an equipment storage facility, records distribution facility. In the late '40s to early '70s it was used as a laundry facility, and between 1955 and '69 it was used for dry cleaning. And that was the source of contamination, which was perchloroethylene. P.C.E. is the common dry cleaning solvent, and was then released into the environment and had contaminated the soils and subsequently resulted in some groundwater contamination. Since the early '70s it stopped being used as a laundry facility and was used as a storage facility, and then was closed completely when the base was closed, and as I mentioned before, it was recently demolished.

This site also has undergone the CERCLA process. It began with a preliminary assessment, and at that time contamination was found at the site; so that was followed by a site inspection. And the site inspection was intended to delineate the contamination primarily in the soils, and also to some extent in the groundwater. When they found after the site inspection that the contamination wasn't completely delineated, an expanded site inspection was conducted to further delineate the lateral and vertical extended groundwater and soil contamination, and then that led to the Engineering

Evaluation/Cost Analysis, which we at Battelle conducted under the guidance of the Navy.

One very important part of the EE/CA process was to establish cleanup objectives for the site, and which we call Removal Action Objectives. And as Phil Jagucki had described for his site, those were based on three very similar criteria. They were based primarily on protection of human health. They were also based on protection of the environment, particularly water bodies, where the contaminants -- if there was a potential for contaminants to enter a surface water body.

And thirdly there's a third criteria in the middle in which we wanted to make sure that the soils were cleaned up to also protect the groundwater; that is, in the event of leaching or that there is a potential for soil contamination to leach the groundwater. So they not only had to be protective of human health, but they also had to be protective of the groundwater. So those were two criteria that the soils had to meet.

For the human health protection, we based the excess lifetime cancer risk based on 10 to the minus 5, which is the same as a 1 in 10,000 person risk, which was our criteria for carcinogenic contaminants. For non-carcinogenic contaminants, the hazard index was 1.0, very similar to Sites 1 and 2. And also like Sites 1 and

2, this was established as an industrial-use facility, because for as far into the future as we can see at this time, the facilities will be used for industrial purposes.

The EE/CA is somewhat of a more streamline process than the feasibility study, though they're very analogous to each other. And one of the ways that we streamline this process is to go through a pre-screening process rather than going through a detailed evaluation of every potential technology. We screened through a number of technologies to narrow that number down to four soil cleanup technologies and four groundwater cleanup technologies.

The soil technologies that we screened were no further action, institutional controls, excavation to meet the Removal Action Objectives, hot spot excavation -- where we would clean up pre-phase product only, and that that would be combined with soil vapor extraction to meet the Removal Action Objectives -- in situ resistive heating, soil flushing, and chemical oxidation.

Similarly for groundwater we went through a number of different technologies that we screened, and we looked at no further action, institutional controls, monitoring, pump and treat, natural attenuation, enhanced anaerobic dechlorination, in situ air sparging, reactive barriers, chemical oxidation, and in situ resistive

heating.

So after this screening process, which is described in the EE/CA, we then resulted with four groundwater and four soil technologies and one combined technology that could accommodate both groundwater and soils. This is so the soil Removal Action alternatives included no further action, soil excavation -- hot spot excavation should be included there -- hot spot excavation plus soil vapor extraction, and in situ resistive heating.

And for the groundwater technologies that we ended up assessing in detail, we looked at no further action, monitored natural attenuation, enhanced anaerobic dechlorination, and pump and treat.

And lastly we had only one technology that could work for both soils and groundwater, and that was in situ resistive heating. You might notice that this technology was not included for groundwater only. It was seen as too expensive just for groundwater, but it worked well for the combined groundwater and soils, because the soils are encompassed within the area of groundwater. So if one was going to apply the technology to groundwater, it would be a nominal effort to also, then, apply it to soils; and that was why we included it for that as a combined soil and groundwater Removal Action.

For the EE/CA process, if you remember from

Phil's talk, he went through, I think it was, nine criteria that the F.S. goes through. Again, the EE/CA being somewhat more streamlined, it looks primarily at effectiveness, although short- and long-term effectiveness are considered, implementability, and cost. And for cost we also make sure to look at long-term performance monitoring costs, such as long-term groundwater monitoring or any soil performance monitoring.

Which leads me to the proposed Removal Action. The technology that we ended up selecting was in situ resistive heating for soils and groundwater. This technology, as I mentioned earlier, can be used to treat both the soils and groundwater simultaneously, which we saw as a significant advantage, especially for groundwater, since we could try and remediate that relatively rapidly. The technology itself requires only about six months of active remediation. This does not necessarily include extra work plan development or installation, but it's the actual heating process and treatment process itself.

The Removal Action will be followed by one year of groundwater monitoring, and the in situ resistive heating Removal Action should be able to meet the Removal Action Objectives for soils and groundwater. It is a somewhat new technology, although it has been applied at

numerous sites and has been well documented as being effective for chlorinated compounds. Nonetheless, because of the nature of this technology being new, we found it was necessary to select a Contingency Removal Action in the event that this Removal Action was not entirely successful.

The Removal Action -- the in situ resistive heating technology will be staged in the construction process; and by staging it, we will have an opportunity to conduct a very streamlined pilot test to be able to make sure that it works to our satisfaction. And if it meets both the Navy's satisfaction, the Removal Action contractor is satisfied, and of course the regulators and the public, then we would proceed with that technology. If not, we have Contingency Removal Actions for soils and groundwater.

For soils, the Contingency Removal Action was excavation to meet the Removal Action Objectives. And this technology could effectively remove the contaminants, it could meet the removal objectives, and it requires only about a month. Not, again, including work plan development for mobilization, but would require about one month of active remediation.

Groundwater -- for groundwater we selected monitored natural attenuation. This meets the national

contingency plan criteria for overall protectiveness of human health and environment. It can achieve groundwater cleanup water goals, albeit over a long period of time. It requires long-term monitoring, long-term performance monitoring, which we estimated to be on the order of about 20 years.

Now, this technology, because of the length of time that would be involved, may be enhanced by enhanced dechlorination -- enhanced anaerobic dechlorination, which is the addition of nutrients in the groundwater to be able to stimulate the degradation of these contaminants. So we put this alternative in and made sure to include that in the EE/CA to provide some flexibility for the Removal Action contractor and, most importantly, for the Navy, so that the treatment could be accelerated if it was seen as cost effective.

There are several steps remaining, then, in the CERCLA process. Of course, we need to receive public comments on the EE/CA; and once we receive those, we'll also release a Draft Action Memorandum for regulatory review. The Draft Action Memorandum needs to be signed by the Navy Base Environmental Coordinator. Then we will follow that by implementing the Removal Action, and then go into site closure. And that concludes my presentation.

* * *

MR. MACCHIARELLA: Thank you, Victor.

Okay. The next item on the agenda is the Solicitation of Public Comments. As I mentioned, the normal model for a public meeting of this nature under CERCLA would be for us to receive comments and we would write those down and respond to those in writing at a later date.

However, since all of the public members here tonight are RAB members, I think it would be okay for us to conduct as a RAB meeting and have a -- in the event of an easily answerable question where we have the appropriate person here to answer it, we can provide you that answer. Of course, there may be some longer questions that we'll have to stick with answering in writing.

So with that, do we have any comments? Let me also point out that the Proposed Plan itself has a sheet in it. This is one way that you can submit comments. This will be accepted until July 9th. The address is there to mail them.

And let's see. Did I point out all the appropriate details, Michelle? I think I did.

MS. GALLICE: Yes.

MR. MACCHIARELLA: So --

MS. GALLICE: Well, if anybody has any comments

they should state them.

MR. MACCHIARELLA: Right. And please don't forget to sign in, if you haven't already, for those who came in late. And you're free to submit these to us tonight or mail them in. Or we can accept verbal comments right now, if there are any.

MR. TIEDEMANN: Well, seeing that nobody else wants to raise their hand.

Actually, these are just comments --

MR. HAUSLADEN: Woe, woe, woe. You have to give your name for the court reporter.

MR. TIEDEMANN: Oh, okay. My name is Carl A. Tiedemann. I'm a citizen of Long Beach, California. I'm just going to make a comment, really. I don't need any answer to any of this.

All during this whole thing since 1994 I've been watching things happen. This Site 1 and 2, obviously Site 1 is totally within Site 2; so I take it that Site 2 must be the green on this map and Site 1 is the yellow. And some of the things I noticed about it, which may or may not have anything to do with the remediation, but the yellow dot there seems to be located approximately where the toilets were in the recreation area that the Navy was last using this for before they closed the base.

We say "We're remediating it for industrial

use," yet the last thing that the Navy used it for was not industrious or industrial use, which leads one to wonder: Well, how many years down the road is it going to be before somebody decides to put a softball field out there? At that particular point where the little triangle is there used to be a helicopter port there, and then there was a crossover road, and then there were toilets and baseball fields, and people used to go out there and barbecue their food in this contaminated area.

I may be mistaken about this, but it seems to me that Site 14 at one time was used as a movie theater? It was adjacent to it. Okay. So it wasn't the movie theater. I was mistaken on that. It seems like Site 14 they're just going to remove everything, and Site 1 and 2 is going to be kind of like it will eventually go away; right?

So I really don't have any objections to what they're doing with this. I'm glad to be informed of it. It's just that seeing this is a public meeting, I figured it was the public's right to know exactly what the end of that mall was being used for when the Navy closed the base.

Thank you.

MR. MACCHIARELLA: Thank you, Mr. Tiedemann.

Yes.

MR. COOLEY: My name is Cooley. I'm part of the RAB.

As well as Mr. Tiedemann's concern, I would like to know in general what this specific site is, Site 1 and 2, at the end of the mall? Is there going to be any portion at all whatsoever, as far as the remediation, not to reuse, but maybe to reuse as it corresponds to the remediation? Is there going to be any public land at all whatsoever on the 497.65 acres, period, at all, anywhere?

MR. MACCHIARELLA: Do you know that one, John?

MR. HILL: No.

MR. COOLEY: And the answer is "No"?

Okay. So this site that we're speaking of -- the way I understand it, the last I have heard is it's going to be for some kind of a bird sanctuary, but not for human use as far as any kind of picnics or baseball diamond or anything like that in the whole complex. The Naval station, Naval shipyard, Sea Lodge, Site 1 and 2, there are no public lands whatsoever.

MR. HILL: Correct. It's the Night Herrings.

MR. MACCHIARELLA: Thank you. Anything else?

Okay. Don't forget, you're still free to send this in through July 9th. And I think with that, we're ready to adjourn. Thanks for coming, everybody.

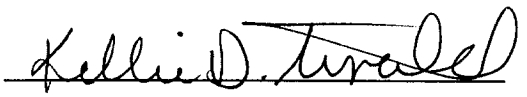
(Proceedings concluded at 7:10 p.m.)

C E R T I F I C A T E

I, KELLIE D. ARNOLD, RPR, CSR NO. 10798, DO HEREBY CERTIFY:

THAT SAID PUBLIC MEETING WAS TAKEN DOWN BY ME IN SHORTHAND AT THE TIME AND PLACE THEREIN NAMED, AND THEREAFTER REDUCED TO PRINT BY MEANS OF COMPUTER-AIDED TRANSCRIPTION UNDER MY DIRECTION, AND THE SAME IS A TRUE, CORRECT, AND COMPLETE TRANSCRIPT OF SAID PROCEEDINGS.

IN WITNESS WHEREOF, I HAVE HEREUNTO SUBSCRIBED MY NAME THIS 12TH DAY OF JULY 1999.



KELLIE D. ARNOLD, RPR, CSR

CORRECTION SHEET

PAGE/LINE	FROM	TO

APPENDIX D

Public Comments and Department of the Navy Responses

Comments Received during the Public Comment Period on the Proposed Plan for NAVSTA Long Beach Installation Restoration Sites 1 and 2

Comment Number	Comment	Response
Richard A. Landgraff	Having served on the LBNC RAB from 1994 to 1998 (finishing my last year as community co-chair) I am quite familiar with Sites 1 & 2. Their location places them far from residential TYPE use and site 1 is now off-limits to all visitors. It was known as Gull Park and provided space for many picnics and leisure activities of Naval Station & Shipyard families. The groundwater below sites 1 & 2 is not tapped for drinking water. Some of it may have been tapped, at one time, as washdown water in the shipyard which is now closed. Therefore I would consider Alternative 2 as more than sufficient for any remedial actions. The total cost (including deed restrictions & long-term monitoring) of $98,000 is far less than the nearly 0.85 million dollar cost of Alternative 3. Containership operations, ship movements, and ship repair projected for the future use of the LBNC will be adding their own contamina-tions. Therefore, past contamination in such a remote site will not be significant enough to warrant the extra cost.	IAS with SVE is not a low-cost remedial action. It is a part of the selected alternative (Alternative 3), however, because contaminants in groundwater at IR Sites 1 and 2 have the potential to migrate to the marine ecosystem in concentrations that exceed California Ocean Plan criteria. Because this potential exists, the DON and the involved regulatory agencies deem it necessary to treat the groundwater at the sites using IAS with SVE. Treatment will remove groundwater contaminants so that they do not migrate into ocean waters in concentrations that exceed California Ocean Plan criteria.

Comments Received during the Public Comment Period on the Proposed Plan for NAVSTA Long Beach Installation Restoration Sites 1 and 2 (continued)

Comment Number	Comment	Response
Clyde Nash Jr.	Human Health Risk Assessment. People who eat fish from a contaminated site may face an increased chance of developing cancer, birth defects, or viral infections. There is a difference of opinion, however, on the degree of danger contaminated fish may pose. While no one can say for sure that these tainted fish are the direct cause of a person's specific cancer, it's a safe bet to say that eating these fish can contribute to the overall decrease in a person's health. An environmental group concerned with coastal waters.	IR Sites 1 and 2 do not include ocean waters. Thus, no contaminated fish are present on IR Sites 1 and 2. West Basin is part of IR Site 7 and is being evaluated separately. Long-term groundwater monitoring is in place at IR Sites 1 and 2. The results of this monitoring confirm that no contaminants in excess of California Ocean Plan criteria are reaching ocean waters. For IR Sites 1 and 2, AOPCs 1 and 4, IAS with SVE will be used to remove groundwater contaminants that may potentially migrate to ocean waters. After treatment (IAS with SVE), long-term groundwater monitoring of IR Sites 1 and 2, AOPCs 1 and 4, will be implemented to verify the success of the treatment, i.e., to verify that no contaminants in excess of California Ocean Plan criteria are reaching ocean waters. Because groundwater will be treated to remove contamination, no contaminants in excess of California Ocean Plan criteria should reach the marine ecosystem.

Comments Received during the Public Comment Period on the Proposed Plan for NAVSTA Long Beach Installation Restoration Sites 1 and 2 (continued)

Comment Number	Comment	Response
Carl A. Tiedemann	All during this whole thing since 1994 I've been watching things happen. This Site 1 and 2, obviously Site 1 is totally within Site 2: so I take it that Site 2 must be the green on this map and Site 1 is the yellow. And some of the things I noticed about it, which may or may not have anything to do with the remediation, but the yellow dot there seems to be located approximately where the toilets were in the recreation area that the Navy was last using this for before they closed the base. We say "We're remediating it for industrial use," yet the last thing that the Navy used it for was not industrious or industrial use, which leads one to wonder: Well, how many years down the road is it going to be before somebody decides to put a softball field out there? At that particular point where the little triangle is, there used to be a helicopter port there, and then there was a crossover road, and then there were toilets and baseball fields, and people used to go out there and barbecue their food in this contaminated area. I may be mistaken about this, but it seems to me that Site 14 at one time was used as a movie theater? It was adjacent to it. Okay, so it wasn't the movie theater. I was mistaken on that. It seems like Site 14 they're just going to remove everything, and Site 1 and 2 is going to be kind of like it will eventually go away; right? So I really don't have any objections to what they're doing with this. I'm glad to be informed of it. It's just that seeing this is a public meeting, I figured it was the public's right to know exactly what the end of that mole was being used for when the Navy closed the base.	Primary activities at IR Sites 1 and 2 included waterfront fleet support and parking. However, in addition to many buildings, IR Sites 1 and 2 once contained recreational areas, including ball fields and a park, which were used by DON staff and their families and by civilian employees at the LBNC. Recreational use of any part of the sites has ceased and will be legally prohibited in the future. Land use controls will be implemented at IR Sites 1 and 2 when the property is transferred to the Port of Long Beach. Restrictive covenants in the deed given to the Port of Long Beach will prohibit residential use of the sites, as well as use of the sites for child care centers, playgrounds, or other structures or functions for children. Instead, the sites will be used for industrial purposes consistent with the California Coastal Act and the Certified Port Master Plan for the Long Beach Harbor District. To ensure long-term effectiveness, the land use controls will provide that, when the property is transferred by deed, the deed will include the requirement that all restrictions be recorded with the deed; that environmental restrictions run with the land; and that state concurrence be obtained prior to removal of any deed restriction.

Comments Received during the Public Comment Period on the Proposed Plan for NAVSTA Long Beach Installation Restoration Sites 1 and 2 (continued)

Comment Number	Comment	Response
Mr. Cooley	As well as Mr. Tiedemann's concern, I would like to know in general what this specific site is, Site 1 and 2, at the end of the mole? Is there going to be any portion at all whatsoever, as far as the remediation, not to reuse, but may be reuse as it corresponds to the remediation? Is there going to be any public land at all whatsoever on the 497.65 acres, period, at all, anywhere? Okay. So this site that we're speaking of – The way I understand it, the last I have heard is it's going to be for some kind of a bird sanctuary, but not for human use as far as any kind of picnics or baseball diamond or anything like that in the whole complex. The Naval station, Naval shipyard, Sea Lodge, Site 1 and 2, there are no public lands whatsoever.	Although IR Sites 1 and 2 once contained recreational areas, including ball fields and a park, which were used by DON staff and their families and by civilian employees at the LBNC, public access to and use of these sites are not permitted and will not be permitted in future. Land use controls will be implemented at IR Sites 1 and 2 when the property is transferred to the Port of Long Beach. Restrictive covenants in the deed given to the Port of Long Beach will restrict the sites to industrial uses consistent with the California Coastal Act and the Certified Port Master Plan for the Long Beach Harbor District.

APPENDIX E

Applicable or Relevant and Appropriate Requirements

TABLE E-1
Federal Chemical-Specific ARARs by Medium
(Sheet 1 of 2)

Requirement	Prerequisite	Citation	ARAR Determination			Comments[a]
			A	RA	TBC	
GROUNDWATER						
Clean Water Act (CWA), 33 USC 1251 et seq.*						
Water quality criteria.	Discharges to waters of the United States and groundwater.	33 USC 1314(a) and 42 USC 9621(d)(2)	Yes	No	No	Water quality critera may be relevant and appropriate because treated groundwater may be discharged to ocean.
Resource Conservation and Recovery Act (RCRA)*						
Toxicity characteristic leaching procedure (TCLP) regulatory levels; Persistent and bioaccumulative toxic substances total threshold limit concentrations (TTLCs) and soluble threshold limit concentrations (STLCs).	Hazardous waste treatment, storage, or disposal.	Title 22 CCR, 66261.24(a)	Yes	No	No	Applicable for determining whether waste is hazardous. Testing will be done, and if hazardous waste characteristic is present, regulations will apply.
Groundwater protection standards: Owners/operators of RCRA treatment, storage, or disposal facilities must comply with conditions in this section that are designed to ensure that hazardous constituents entering the groundwater from a regulated unit do not exceed the concentration limits set forth under Section 66264.94 for contaminants of concern in the uppermost aquifer underlying the waste management area beyond the point of compliance.	RCRA hazardous waste, treatment, storage, or disposal.	22 CCR 66264.94, except 66264.94(a)(2), and 94(b)	No	Yes	No	Not applicable because hazardous waste treatment, storage, and disposal (TSD) facilities are not present at the site. However, relevant and appropriate because waste constituents have been released to groundwater. See NCP criteria at 40 CFR 300.400(g)(2).
SURFACE WATER						
Clean Water Act (CWA), 33 USC 1251 et seq.*						
Water quality standards.	Discharges to waters of the United States.	33 USC 1313 and 57 Federal Register 60920-60921	Yes	No	No	Federal water quality standards would be applicable for any discharges to surface waters. Discharges to surface water (from extracted groundwater or surface runoff) should be evaluated here. Treated groundwater may be discharged to ocean.
Water quality criteria.	Discharges to waters of the United States and groundwater.	33 USC 1314(a) and 42 USC 9621(d)(2)	No	Yes	No	Federal water quality standards may be relevant and appropriate for any discharges to surface water. Discharges to surface water (from extracted groundwater or surface runoff) should be evaluated here. Treated groundwater may be discharged to ocean.
Effluent limitations that meet technology-based requirements, including best conventional pollutant control technology (BCPCT) and best available technology (BAT) economically achievable.	Discharges to waters of the United States.	33 USC 301(b)	Yes	No	No	Treated groundwater may be discharged to ocean.

TABLE E-1
Federal Chemical-Specific ARARs by Medium
(Sheet 2 of 2)

Requirement	Prerequisite	Citation	ARAR Determination A	RA	TBC	Comments[(a)]
SOIL						
Resource Conservation and Recovery Act (RCRA)/Hazardous Waste Control Act (HWCA)*						
Definition of RCRA hazardous waste.	Waste soil.	Title 22 CCR Sections 66261.21, 66261.22(a)(1), 66261.23 66261.24(a)(1), and 662.61.100	Yes	No	No	Applicable for determining whether waste generated as part of remedial action is hazardous.
Toxic Substances Control Act (TSCA)*						
Regulates use and manufacture of toxic substances and storage and disposal of polychlorinated biphenyls (PCBs.)	Soils, debris, sludge, or dredged materials contaminated with PCBs at concentrations greater than 50 parts per million (ppm).	40 CFR 761.60, excluding 761.60(a)(B,and D), 761.60(a)(3)(iii)(3), 761.60(e), 761.60(f); 761.65(a, and b); 761.65(c), except 761.65(c)(9); 761.65(e)(6)(ii and iii); 761.65(e)(7 and 8); 761.79 (15 USC 2601, et seq.)	No	Yes	No	Not applicable because PCBs were detected in surface soils at IR Sites 1 and 2 at concentrations well below 50 ppm. However, relevant and appropriate for these lower levels of PCB contamination.
AIR						
RCRA Air Emissions Requirements*						
Air emission standards for process vents or equipment leaks.	Equipment that contains or contacts hazardous waste with organic concentrations of at least 10 percent by weight or process vents associated with specified operations that manage hazardous wastes with organic concentrations of at least 10 parts per millon by weight (ppmw).	22 CCR 66264.1030 through 1034, excluding 1030(c),1033(j), 1034(c)(2), 1034(d)(2); 22 CCR 66264.1050 through 1063, excluding 1050(c,d), 1057(g)(2), 1061(d), 1063(d)(3)	No	Yes	No	Relevant and appropriate if process waste stream contains more than 10% by weight volatile organic compounds (VOCs) or if process waste contain greater than 10 ppmv VOCs. However, State Air Management ARARs may be more stringent.

(a) Alternatives for Sites 1 and 2: 1 - No action; 2 - Institutional controls (deed restrictions) and long-term groundwater monitoring; 3 - In situ air sparging and soil vapor extraction, institutional controls (deed restrictions) and long-term groundwater monitoring.

* Statutes and policies, and their citations, are provided as headings to identify general categories of potential ARARs for the convenience of the reader. Listing the statutes and policies does not indicate that the Department of the Navy (DON) accepts the entire statutes or policies as potential ARARs. Specific potential ARARs are addressed in the table below each general heading; only substantive requirements of the specific citations are considered potential ARARs.

Reference: [BNI] Bechtel National, Inc. 1996. *Final Remedial Investigation (RI) Report, Installation Restoration Program for Sites 1 through 6A, Naval Station Long Beach, Long Beach, California,* Vols. I-VII. CTO-0015/0415, CTO-0016/0393. July 10.

Chemical-specific concentrations used for feasibility study (FS) evaluation may not be based on ARARs indicated in this table, but may be concentrations based upon other factors. Such factors may include the following:

- Human health risk-based concentrations (risk-based PRGs 40 CFR 300.430[e][A][1] and [2]).
- Ecological risk-based concentrations (40 CFR 300.430[e][G]).
- Practical quantitation limits of contaminants (40 CFR 300.430[e][A][3]).

Many potential action-specific ARARs contain chemical-specific limitations and are addressed in the action-specific ARAR tables.

A = Applicable; CCR = California Code of Regulations; CFR = Code of Federal Regulations; RA = Relevant and appropriate; TBC = To be considered; USC = United States Code.

TABLE E-2
Federal Location-Specific ARARs
(Sheet 1 of 1)

Location	Requirement	Prerequisite	Citation	ARAR Determination			Comments[(a)]
				A	RA	TBC	
Hazardous Waste Control Act (HWCA)*							
Within 100-year floodplain	Facility must be designed, constructed, operated, and maintained to avoid washout.	RCRA hazardous waste; treatment, storage, or disposal of hazardous waste.	22 CCR 66264.18(b)	No	Yes	No	Flooding from Los Angeles River and Dominguez Canal is not a major threat to LBNC. FEMA maps show Terminal Island is not within an area considered susceptible to flooding during a statistical 100- or 500-year flood (BNI, 1996). However, area is subject to storm surge.
Executive Order 11988, Protection of Floodplains*							
Within floodplain	Actions taken should avoid adverse effects, minimize potential harm, restore and preserve natural and beneficial values.	Action that will occur in a floodplain (i.e., lowlands) and relatively flat areas adjoining inland and coastal waters and other flood-prone areas.	40 CFR 6, Appendix A; excluding Sections 6(a)(2), 6(a)(4), 6(a)(6); 40 CFR 6.302	No	Yes	No	Flooding from Los Angeles River and Dominguez Canal is not a major threat to LBNC. FEMA maps show Terminal Island is not within an area considered susceptible to flooding during a statistical 100- or 500-year flood (BNI, 1996). However, area is subject to storm surge.
Endangered Species Act of 1973*							
Critical habitat upon which endangered species or threatened species depend	Action to conserved endangered species or threatened species, including consultation with the Department of the Interior.	Determination of effect upon endangered or threatened species or its habitat.	16 USC 1536(a)	No	Yes	No	Areas are constructed or previously disturbed; however, they may be relevant and appropriate because California least tern, California brown pelican, American peregrine falcon, and western snowy plover are known to reside at or frequent the harbor.
Coastal Zone Management Act*							
Within coastal zone	Conduct activities in a manner consistent with approved state management programs.	Activities affecting the coastal zone including lands thereunder and adjacent shoreland.	Section 307(c) of 16 USC 1456(c); also see 15 CFR 930 and 923.45	No	Yes	No	Sites are in coastal area.
Migratory Bird Treaty Act of 1972*							
Migratory bird area	Protects almost all species of native birds in the U.S. from unregulated "take," which can include poisoning at hazardous waste sites.	Presence of migratory birds.	16 USC Section 703	No	Yes	No	Relevant and appropriate because migratory birds, such as the least tern, are known to frequent the area. None of the proposed remedial actions are expected to affect migratory birds.
Marine Mammal Protection Act*							
Marine mammal area	Protects any marine mammal in the U.S. except as provided by international treaties from unregulated "take."	Presence of marine mammals.	16 USC 1372(2)	No	Yes	No	Mammals (harbor seal, California sea lion) have been sighted in the West Basin. None of the proposed remedial actions are expected to affect marine mammals.

(a) Alternatives for Sites 1 and 2: 1 - No action; 2 - Institutional controls (deed restrictions) and long-term groundwater monitoring; 3 - In situ air sparging and soil vapor extraction, institutional controls (deed restrictions), and long-term groundwater monitoring.

* Statutes and policies, and their citations, are provided as headings to identify general categories of potential ARARs for the convenience of the reader. Listing the statutes and policies does not indicate that the Department of the Navy (DON) accepts the entire statutes or policies as potential ARARs. Specific potential ARARs are addressed in the table below each general heading; only substantive requirements of the specific citations are considered potential ARARs.

Reference: [BNI] Bechtel National, Inc. 1996. *Final Remedial Investigation (RI) Report, Installation Restoration Program for Sites 1 through 6A, Naval Station Long Beach, Long Beach, California,* Vols. I-VII. CTO-0015/0415, CTO-0016/0393. July 10.

A = Applicable; CFR = Code of Federal Regulations; RA = Relevant and appropriate; TBC = To be considered; USC = United States Code.

TABLE E-3
Federal Action-Specific ARARs
IR Sites 1 and 2
Naval Station Long Beach
(Sheet 1 of 5)

Action	Requirement	Prerequisites	Citation	ARAR Determination			Comments[a]
				A	RA	TBC	
Resource Conservation and Recovery Act (RCRA) 42 USC 6901 et seq.*							
On-site waste generation	Person who generates waste shall determine if that waste is a hazardous waste.	Generator of hazardous waste in California.	22 CCR 66262.10(a), 66262.11,	Yes	No	No	Applicable for any operation where waste is generated. Determination of hazardous waste status will be documented.
Hazardous waste accumulation	Generator may accumulate waste on site for 90 days or less or must comply with requirements for operating a storage facility.	Accumulate hazardous waste.	22 CCR 66262.34	Yes	No	No	Accumulation of hazardous wastes on site for longer than 90 days are subject to RCRA requirements for storage facilities.
Recordkeeping	Generator must keep records.	Generate hazardous waste.	22 CCR 66262.40	Yes	No	No	Applicable if hazardous wastes are generated during remedial actions.
Container storage	Containers of RCRA hazardous waste must be: - Maintained in good condition - Compatible with hazardous waste to be stored - Closed during storage except to add or remove waste.	Storage of RCRA hazardous waste not meeting small quantity generator criteria held in a container for a temporary period greater than 90 days before treatment, disposal, or storage elsewhere.	22 CCR 66264.171, 172, 173	Yes	No	No	Applicable if hazardous wastes are generated during remedial actions.
	Inspect container storage areas weekly for deterioration.		22 CCR 66264.174	Yes	No	No	
	Place containers on a sloped, crack-free base, and protect from contact with accumulated liquid. Provide containment system with a capacity of 10 percent of the volume of containers of free liquids. Remove spilled or leaked waste in a timely manner to prevent overflow of the containment system.		22 CCR 66264.175(a) and (b)	Yes	No	No	
	Keep containers of ignitable or reactive waste at least 50 feet from the facility property line.		22 CCR 66264.176	Yes	No	No	
	Keep incompatible materials separate. Separate incompatible materials stored near each other by a dike or other barrier.		22 CCR 66264.177	Yes	No	No	
	At closure, remove all hazardous waste and residues from the containment system, and decontaminate or remove all containers, liners.		22 CCR 66264.178	Yes	No	No	

TABLE E-3
Federal Action-Specific ARARs
IR Sites 1 and 2
Naval Station Long Beach
(Sheet 2 of 5)

Action	Requirement	Prerequisites	Citation	ARAR Determination			Comments[a]
				A	RA	TBC	
Excavation	Movement of excavated materials to new location and placement in or on land will trigger land disposal restrictions for the excavated waste or closure requirements for the unit in which the waste is being placed.	Materials containing RCRA hazardous wastes subject to land disposal restrictions are placed in another unit.	22 CCR 66268.40	Yes	No	No	Applicable if hazardous wastes are generated during remedial actions.
	Area from which materials are excavated may require cleanup to levels established by closure requirements.	RCRA hazardous waste placed at site after the effective date of the requirements.	22 CCR 66264.228(a), (b), (e) through (k), (m), (o) through (q); 22 CCR 66264.258(a) and (b), except as it cross-references procedural requirements.	Yes	No	No	
Waste pile	Use a single liner and leachate collection system. Waste put into waste pile subject to landban regulations.	RCRA hazardous waste, non-containerized accumulation of solid, nonflammable hazardous waste that is used for treatment or storage.	22 CCR 66264.251 (except 251(j), 251(e)(11))	Yes	No	No	Applicable if soils are stockpiled on site prior to treatment or disposal.
Closure of waste piles	At closure, owner shall remove or decontaminate all waste residues, contaminated containment system components, contaminated subsoils, and structures and equipment contaminated with waste and leachate, and manage them as hazardous waste.	Waste pile used to store hazardous waste.	22 CCR 66264.258(a) and (b) except references to procedural requirements	Yes	No	No	Applicable if soils are stockpiled on site prior to treatment or disposal.
Closure with no postclosure care (e.g., clean closure)	General performance standard requires elimination of need for further maintenance and control; elimination of postclosure escape of hazardous waste, hazardous constituents, leachate, contaminated runoff, or hazardous waste decomposition products.	Applies to owners and operators of hazardous waste treatment, storage, and disposal (TSD) facilities.	22 CCR 66264.111 except as it cross-references procedural requirements such as preparation and submittal of closure plans and other notifications.	No	Yes	No	Not applicable because site is not a TSD facility. Relevant and appropriate if hazardous wastes are generated during the remedial action.
Clean closure	Removal or decontamination of all waste residues, contaminated containment system components, contaminated subsoils, and structures and equipment contaminated with waste and leachate, and management of them as hazardous waste.	Applies to owners and operations of hazardous waste TSD facilities.	22 CCR 66264.111 and 66264.228 (a, b, e through k, m, o, p, q), except as it cross-references procedural requirements such as closure plans and annual reports.	No	Yes	No	Not applicable because site is not a TSD facility. Relevant and appropriate if hazardous wastes are generated during the remedial action.
Treatment when waste will be land disposed	Treatment of waste subject to ban on land disposal must attain levels achievable by best demonstrated available treatment (BDAT) technologies for each hazardous constituent in each listed waste, if residual is to be land disposed.	Placement of RCRA hazardous waste in a landfill, surface impoundment, waste pile, injection well, land treatment facility, salt dome formation, or underground mine or cave.	22 CCR 66268.40 and 42	No	Yes	No	Relevant and appropriate if hazardous wastes are generated during the remedial action.

TABLE E-3
Federal Action-Specific ARARs
IR Sites 1 and 2
Naval Station Long Beach
(Sheet 3 of 5)

Action	Requirement	Prerequisites	Citation	ARAR Determination			Comments[a]
				A	RA	TBC	
Treatment when waste will be land disposed	BDAT standards for spent solvent wastes and dioxin-containing wastes are based on one of four technologies or combinations: for waste waters, (1) steam stripping, (2) biological treatment, or (3) carbon absorption; and for all other wastes, (4) incineration. Any technology may be used, however, if it will achieve the concentration levels specified.	Land disposal of spent solvent wastes or dioxin-containing wastes.	22 CCR 66268.30, 31 42 USC 6924(d)(3)(e)(3)	No	Yes	No	
Placement of waste in land disposal unit	Attain land disposal treatment standards before putting waste into landfill in order to comply with landban restrictions.	Placement of RCRA hazardous waste in a landfill, surface impoundment, waste pile, injection well, land treatment facility, salt dome formation, or underground mine or cave.	22 CCR 66268.40	No	Yes	No	Relevant and appropriate if hazardous wastes are generated during the remedial action.
Surface water control	Prevent run-on and control and collect runoff from a 24-hour 25-year storm (waste piles, land treatment facilities, landfills). Prevent over-topping of surface impoundments.	RCRA hazardous waste treated, stored, or disposed after the effective date of the requirements.	22 CCR 66264.251(c, d, f, g, h, k)	No	Yes	No	Relevant and appropriate if hazardous wastes are generated during the remedial action.
			22 CCR 66264.273(c, d, j(1)); 301(c, d, f, g)	No	Yes	No	
			22 CCR 66264.221(c,e,h)	No	Yes	No	
Use of equipment that contacts hazardous waste with organic concentrations greater than 10% by weight.	Air emission standards for process vents or equipment leaks.	Equipment that contains or contacts hazardous waste with organic concentrations of at least 10% by weight or process vents associated with specified operations that manage hazardous wastes with organic concentrations of at least 10 parts per million by weight (ppmw).	22 CCR 66264.1030 through 1034 (excluding 1030(c), 1033(j), 1034(c)(2), 1034(d)(2)); 22 CCR 66264.1050 through 1063 (excluding 1050(c), 1050(d), 1057(g)(2), 1061(d), 1063(d)(3)	No	Yes	No	Relevant and appropriate if process waste stream contains more than 10% by weight volatile organic compounds (VOCs) or if process vents contain greater than 10 ppmw VOCs; however, State Air Management ARARs may be more stringent.
Treatment in a miscellaneous unit	Design and operating standards for unit in which hazardous waste is treated	Treatment of hazardous waste in a unit.	22 CCR 66264.601	Yes	No	No	Applicable to all on-site media-specific treatment technologies.
Discharge to groundwater from regulated unit	Groundwater protection standards: Owners/operators of RCRA treatment, storage, or disposal facilities must comply with conditions in this section that are designed to ensure that hazardous constituents entering the groundwater from a regulated unit do not exceed the concentration limits for contaminants of concern set forth under CCR 66264.94 in the uppermost aquifer underlying the waste management area beyond the point of compliance.	Uppermost aquifer underlying a waste management unit beyond the point of compliance; RCRA hazardous waste, treatment, storage, or disposal.	22 CCR 66264.94(a)(1), (a)(3), (c), (d), and (e)	No	Yes	No	The groundwater standards under RCRA are considered relevant and appropriate for remedial actions because the constituents at the sites are similar to those found in RCRA hazardous waste.

TABLE E-3
Federal Action-Specific ARARs
IR Sites 1 and 2
Naval Station Long Beach
(Sheet 4 of 5)

Action	Requirement	Prerequisites	Citation	ARAR Determination			Comments[a]
				A	RA	TBC	
Discharge to groundwater from regulated unit	Owners/operators of RCRA surface impoundment, waste pile, land treatment unit, or landfill shall conduct a monitoring and response program for each regulated unit.	Surface impoundment, waste pile, land treatment unit, or landfill for which constituents in or derived from the waste in the unit may pose a threat to human health or the environment.	22 CCR 66264.91(a) and (c), except as it cross-references permit requirements	No	Yes	No	Not applicable, because site is not a surface impoundment, land treatment unit, waste pile, or landfill. Relevant and appropriate if hazardous wastes are generated as part of remedial actions.
Clean Water Act (CWA)							
Discharge to surface water	Effluent limits for discharges to surface waters.		40 CFR 100-140, 400-470	Yes	No	No	Applies National Pollutant Discharge Elimination System (NPDES) requirements.
Clean Air Act (CAA) 40 USC 7401 et seq.*							
Discharge to air	No person shall discharge into the atmosphere from any single source of emissions any air contaminant for more than 3 minutes in any 60-minute period which is darker than number 1 on the Ringelmann chart.	Discharge of any air contaminant other than uncombined water vapor.	Air Quality Management District (AQMD) Rule 40(b)(1)	Yes	No	No	Air emissions will result from SVE vapor phase and will be treated prior to discharge to the atmosphere.
New source of discharge to air	Meet standards of performance for new sources and emission standards for hazardous air pollutants.	Stationary source constructed or modified after effective date of requirement. Specified stationary sources of specific hazardous air pollutant(s).	AQMD Regulation 1X	Yes	No	No	
	National Emission Standards for Hazardous Air Pollutants (NESHAPS).	Any stationary source for which a standard is prescribed under this regulation.	L.A. APCD Regulation XI	Yes	No	No	
Operate stationary internal combustion engines	All stationary internal combustion engines shall meet carbon monoxide and oxides of nitrogen emission units.	Applies to all engines with more than 50 rated brake horsepower.	AQMD Rule 1110.1	No	Yes	No	
Discharge to atmosphere	A person treating VOC contaminated soil shall control emission of VOCs and decontaminate soil using best available control technology (BACT).	Soils contain 50 ppm or greater VOCs.	AQMD Rule 1166	No	Yes	No	Prerequisite may be met during debris removal activities.
U.S. Department of Transportation, 49 USC 1802, et seq.*							
Hazardous materials transportation	No person shall represent that a container or package is safe unless it meets the requirements of 49 USC 1802, et seq. or represent that a hazardous material is present in a package or motor vehicle if it is not.	Interstate carriers transporting hazardous waste and substances by motor vehicle. Transportation of hazardous material under contract with any department of the executive branch of the Federal government.	49 CFR 171.2(f)	Yes	No	No	Substantive portions of these requirements are applicable for transport of hazardous materials on site. Off-site transport must comply with both substantive and administrative requirements.
	No person shall unlawfully alter or deface labels, placards, or descriptions, packages, containers, or motor vehicles used for transportation of hazardous materials.		49 CFR 171.2(g)	Yes	No	No	

TABLE E-3
Federal Action-Specific ARARs
IR Sites 1 and 2
Naval Station Long Beach
(Sheet 5 of 5)

Action	Requirement	Prerequisites	Citation	ARAR Determination			Comments[a]
				A	RA	TBC	
Hazardous materials marking, labeling, and placarding	Each person who offers hazardous material for transportation or each carrier that transports it shall mark each package, container, and vehicle in the manner required.	Person who offers hazardous material for transportation; carries hazardous material; or packages, labels, or placards hazardous material.	49 CFR 172.300	Yes	No	No	
Hazardous materials marking, labeling, and placarding	Each person offering nonbulk hazardous materials for transportation shall mark the proper shipping name and identification number (technical name) and consignee's name and address.		49 CFR 172.301	Yes	No	No	
	Hazardous materials for transportation in bulk packages must be labeled with proper identification (ID) number, specified in 49 CFR 172.101 table, with required size of print. Packages must remain marked until cleaned or refilled with material requiring other marking.		49 CFR 172.302	Yes	No	No	
	No package marked with a proper shipping name or ID number may be offered for transport or transported unless the package contains the identified hazardous material or its residue.		49 CFR 172.303	Yes	No	No	
	The markings must be durable, in English, in contrasting colors, unobscured, and away from other markings.		49 CFR 172.304	Yes	No	No	
	Labeling of hazardous material packages shall be as specified in the list.		49 CFR 172.400	Yes	No	No	
	Nonbulk combination packages containing liquid hazardous materials must be packed with closures upward, and marked with arrows pointing upward.		49 CFR 172.312	Yes	No	No	
	Each bulk packaging or transport vehicle containing any quantity of hazardous material must be placarded on each side and each end with the type of placards listed in Tables 1 and 2 of 49 CFR 172.504.	Each person who offers for transport or transports any hazardous materials shall comply with these placarding requirements.	49 CFR 172.504	Yes	No	No	

(a) Alternatives for Sites 1 and 2: 1 - No action; 2 - Institutional controls (deed restrictions) and long-term groundwater monitoring; 3 - In situ air sparging and soil vapor extraction, institutional controls (deed restrictions), and long-term groundwater monitoring.

*Statutes and policies, and their citations, are provided as headings to identify general categories of potential ARARs. Specific potential ARARs are addressed in the table below each general heading.

A = Applicable; CCR = California Code of Regulations; CFR = Code of Federal Regulations; RA = Relevant and appropriate; TBC = To be considered; USC =United States Code.

TABLE E-4
State Chemical-Specific ARARs
IR Sites 1 and 2
Naval Station Long Beach
(Sheet 1 of 2)

Requirement	Prerequisites	Citation	ARAR Determination			Comment[a]
			A	RA	TBC	
Cal-EPA Department of Toxic Substances Control (DTSC)*						
Definition of "non-RCRA hazardous waste."	Waste.	22 CCR 66261.22(a)(3) and (4), 66261.24(a)(2) to (a)(8), 66261.101, 66261.3(a)(2)(C), or 66261.3(a)(2)(F)	Yes	No	No	Applicable for determining whether a waste is a non-RCRA hazardous waste.
Requires that waste be classified and then disposed of in accordance with its classification.	Waste removed from place of release.	Title 23 CCR 2511(d), 2520, and 2521	Yes	No	No	Applicable if waste is removed from the place of release.
Requires that waste be classified and then disposed of in accordance with its classification.	Waste removed from place of release.	Title 27 CCR 20090(d), 20200, 20210, 20220, and 20230	Yes	No	No	Applicable if waste is removed from the place of release.
State and Regional Water Quality Control Board (RWQCB)*						
Authorizes the State and Regional Water Boards to establish in Water Quality Control Plans beneficial uses and numerical and narrative standards to protect both surface and groundwater quality. Authorizes regional water boards to issue permits for discharges to land, surface, or groundwater that could affect water quality, including National Pollutant Discharge Elimination System (NPDES) permits, and to take enforcement action to protect water quality.		California Water Code, Division 7, Sections 13241, 13243, 13263(a), and 13360 (Porter-Cologne Water Quality Control Act)	Yes	No	No	The Regional Water Quality Control Board (RWQCB) has determined that groundwater at the site is of non-beneficial use. Discharges of treated groundwater may occur.
Describes the water basins in Los Angeles region; establishes beneficial uses of ground and surface waters; establishes water quality objectives, including narrative and numerical standards; establishes implementation plans to meeet water quality objectives and protect beneficial uses; and incorporates statewide water quality control plans and policies.			Yes	No	No	Substantive provisions would be ARARs for remedial actions affecting water quality. Discharges of treated groundwater may occur.
Resource Conservation and Recovery Act (RCRA)*						
Toxicity characteristic leaching procedure (TCLP) regulatory levels; Persistent and bioaccumulative toxic substances total threshold limit concentrations (TTLCs) and soluble threshold limit concentrations (STLCs).	Hazardous waste treatment, storage, or disposal.	Title 22 CCR, 66261.24(a)	Yes	No	No	Applicable for determining whether waste is hazardous. Testing will be done, and if hazardous waste characteristic is present, regulations will apply.
Groundwater protection standards: Owners/operators of RCRA treatment, storage, or disposal facilities must comply with conditions in this section that are designed to ensure that hazardous constituents entering the groundwater from a regulated unit do not exceed the concentration limits set forth under Section 66264.94 for contaminants of concern in the uppermost aquifer underlying the waste management area beyond the point of compliance.	RCRA hazardous waste, treatment, storage, or disposal.	22 CCR 66264.94, except 66264.94(a)(2), and 94(b)	No	Yes	No	Not applicable because hazardous waste treatment, storage, and disposal (TSD) facilities are not present at the site. However, relevant and appropriate because waste constituents have been released to groundwater. See NCP criteria at 40 CFR 300.400(g)(2).

TABLE E-4
State Chemical-Specific ARARs
IR Sites 1 and 2
Naval Station Long Beach
(Sheet 2 of 2)

Requirement	Prerequisites	Citation	ARAR Determination			Comment[a]
			A	RA	TBC	
Resource Conservation and Recovery Act (RCRA)/Hazardous Waste Control Act (HWCA)*						
Definition of RCRA hazardous waste.	Waste soil.	Title 22 CCR Sections 66261.21, 66261.22(a)(1), 66261.23 66261.24(a)(1), and 662.61.100	Yes	No	No	Applicable for determining whether waste generated as part of remedial action is hazardous.
RCRA Air Emissions Requirements*						
Air emission standards for process vents or equipment leaks.	Equipment that contains or contacts hazardous waste with organic concentrations of at least 10 percent by weight or process vents associated with specified operations that manage hazardous wastes with organic concentrations of at least 10 parts per millon by weight (ppmw).	22 CCR 66264.1030 through 1034, excluding 1030(c), 1033(j), 1034(c)(2), 1034(d)(2); 22 CCR 66264.1050 through 1063, excluding 1050(c,d), 1057(g)(2), 1061(d), 1063(d)(3)	No	Yes	No	Relevant and appropriate if process waste stream contains more than 10% by weight volatile organic compounds (VOCs) or if process waste contain greater than 10 ppmv VOCs. However, State Air Management ARARs may be more stringent.

(a) Alternatives for Sites 1 and 2: 1 - No action; 2 - Institutional controls (deed restrictions) and long-term groundwater monitoring; 3 - In situ air sparging and soil vapor extraction, institutional controls (deed restrictions), and long-term groundwater monitoring.

* Statutes and policies, and their citations, are provided as headings to identify general categories of potential ARARs for the convenience of the reader. Listing the statutes and policies does not indicate that the Department of the Navy (DON) accepts the entire statutes or policies as potential ARARs. Specific potential ARARs are addressed in the table below each general heading; only substantive requirements of specific citations are considered potential ARARs.

Chemical-specific concentrations used for remedial action alternative evaluation may not be ARARs indicated in this table, but may be concentrations based upon other factors. Such factors may include the following:

- Human health risk-based concentrations (Risk-based PRGs) [40 CFR 300.430(e)(A)(1) and (2)]
- Ecological risk-based concentrations [40 CFR 300.430(e)(G)]
- Practical quantitation limits of contaminants [40 CFR 300.430(e)(A)(3)].

Many potential action-specific ARARs contain chemical-specific limitations and are addressed in the action-specific ARAR tables.

A = Applicable; CCR = California Code of Regulations; RA = Relevant and appropriate; TBC = To be considered.

TABLE E-5
State Location-Specific ARARs
IR Sites 1and 2
Naval Station Long Beach
(Sheet 1 of 1)

Location	Requirement	Prerequisites	Citation	ARAR Determination			Comments[a]
				A	RA	TBC	
California Coastal Act of 1976*							
Coastal zone	Regulates activities associated with development to control direct significant impacts on coastal waters and to protect state and national interests in California coastal resources.		Public Resources Code Sections 30000-30900; 14 CCR 13001-13666.4	Yes	No	No	IR Sites 1 and 2 are within the coastal zone.
***Regional Water Quality Control Board* (RWQCB)**							
	Beneficial use requirement.		Los Angeles Basin Plan	Yes	No	No	Applicable to groundwater migrating to ocean waters.

(a) Alternatives for Sites 1 and 2: 1 - No action; 2 - Institutional controls (deed restrictions) and long-term groundwater monitoring; 3 - In situ air sparging and soil vapor extraction, institutional controls (deed restrictions), and long-term groundwater monitoring.

* Statutes and policies, and their citations, are provided as headings to identify general categories of potential ARARs for the convenience of the reader. Listing the statutes and policies does not indicate that the Department of the Navy (DON) accepts the entire statutes or policies as potential ARARs. Specific potential ARARs follow each general heading; only substantive requirements of the specific citations are considered potential ARARs.

A = Applicable; CCR = California Code of Regulations; RA = Relevant and appropriate; TBC = To be considered.

TABLE E-6
State Action-Specific ARARs
IR Sites 1 and 2
Naval Station Long Beach
(Sheet 1 of 5)

Requirement	Prerequisites	Citation	ARAR Determination			Comments[a]
			A	RA	TBC	
State Water Resources Control Board (SWRCB) and Regional Water Quality Control Board (RWQCB)*						
Authorizes the state and regional water boards to establish in Water Quality Control Plans beneficial uses and numerical and narrative standards to protect both surface and ground water quality. Authorizes regional water boards to issue permits for discharges to land, or surface, or groundwater that could affect water quality, including National Pollutant Discharge Elimination System (NPDES) permits, and to take enforcement action to protect water quality.		California Water Code, Division 7, Section 13241, 13243, 13263(a), and 13360 (Porter-Cologne Water Quality Control Act)	Yes	No	No	Applies to remediation of landfill and groundwater, including discharges of treated groundwater to water. Soil and groundwater must be remediated to levels that protect beneficial uses of and meet water quality objectives for surface water. Prior to discharge from pump and treat system, groundwater must be treated to levels that meet applicable water quality standards, including water quality objectives and antidegradation policy.
Describes the water basins in the Los Angeles (L.A.) region; establishes beneficial uses of ground and surface waters, establishes water quality objectives, including narrative and numerical standards; establishes implementation plans to meet water quality objectives and protect beneficial uses; and incorporates statewide water quality control plans and policies. The Water Quality Control Plan designates beneficial uses to the affected groundwater and provides water quality objectives (narrative and numerical standards) to protect those uses. Any activity that may affect water quality must not result in the water quality exceeding the water quality objectives. The Water Quality Control Plan designates the beneficial uses of groundwater in the L.A. coastal plain to be municipal and domestic supply, agricultural supply, industrial service supply, and industrial process supply.		Comprehensive Water Quality Control Plan for the Los Angeles Basin (Water Code §13240)	Yes	No		Substantive provisions would be ARARs for remedial actions affecting water quality, including soil and groundwater remediation, which must be remediated to a level that protects beneficial uses of and meets water quality objectives for surface water. Discharges of treated groundwater may occur. Discharges of treated groundwater, if they occur, may be subject to an NPDES permit.
Establishes concentration levels for volatile organic constituents and total petroleum hydrocarbons (TPH) for discharge to inland surface waters designated for municipal supply and complies with the Basin Plan and RWQCB Resolution 68-16.		RWQCB Order No. 91-10	Yes	No	No	No discharges to inland surface waters.
Authorizes the RWQCB to implement the SWAT program with respect to water quality. The purpose of the SWAT program is to identify solid waste disposal sites that may be leaking hazardous wastes and threatening water quality.		Water Code Section 13273 (Solid Waste Assessment Test [SWAT] program)	Yes	No	No	Buried debris may be associated with groundwater contaminants.

TABLE E-6
State Action-Specific ARARs
IR Sites 1 and 2
Naval Station Long Beach
(Sheet 2 of 5)

Requirement	Prerequisites	Citation	ARAR Determination			Comments[a]
			A	RA	TBC	
Establishes beneficial uses of ocean waters, numerical and narrative water quality objectives, effluent quality objectives including toxic material limitations, and discharge prohibitions.		Water Code Section 13170.2 (California Ocean Plan)	Yes	No	No	Water quality objectives apply to the groundwater migrating to the ocean and the potential discharge of treated effluent. The proposed action is to remediate groundwater and soil such that groundwater migrating to surface water does not exceed applicable water quality objectives.
California Department of Fish and Game Code*						
Prohibits water pollution with any substance or material deleterious to fish, plant life, or bird life.	Deposit in, permit to pass into, or place where they could pass into waters of the state, listed or deleterious substances.	Fish and Game Code Chapter 2, §5650(a), (b) and (f)	Yes	No	No	Groundwater migrates to ocean. The proposed action will result in compliance with this requirement.
A person is liable and must remove and abate substance or material that threatens to pollute, obstruct, or contaminate waters of the state.	Person is responsible for polluting, contaminating, or obstructing waters of the state or depositing or discharging substance that is or threatens detriment to fish, plant, bird, or animal life.	Fish and Game Code Sections 12015 and 12016	Yes	No	No	Applicable during remedial action activities. The proposed action will result in compliance with this requirement.
Defines use of water for recreation and preservation and enhancement of fish and wildlife resources as a beneficial use of water; and includes policy on appropriation of water.		Water Code Section 1243	Yes	No	No	Applicable during remedial action activities.
Resource Conservation and Recovery Act (RCRA) 42 USC 6901 et seq.*						
On-site waste generation: Person who generates waste shall determine if that waste is a hazardous waste.	Generator of hazardous waste in California.	22 CCR 66262.10(a), 66262.11,	Yes	No	No	Applicable for any operation where waste is generated. Determination of hazardous waste status will be documented.
Hazardous waste accumulation: Generator may accumulate waste on site for 90 days or less or must comply with requirements for operating a storage facility.	Accumulate hazardous waste.	22 CCR 66262.34	Yes	No	No	Accumulation of hazardous wastes on site for longer than 90 days are subject to RCRA requirements for storage facilities.
Recordkeeping: Generator must keep records.	Generate hazardous waste.	22 CCR 66262.40	Yes	No	No	Applicable if hazardous wastes are generated during remedial actions.
Container storage: Containers of RCRA hazardous waste must be: - Maintained in good condition - Compatible with hazardous waste to be stored - Closed during storage except to add or remove waste.	Storage of RCRA hazardous waste not meeting small quantity generator criteria held in a container for a temporary period greater than 90 days before treatment, disposal, or storage elsewhere.	22 CCR 66264.171, 172, 173	Yes	No	No	Applicable if hazardous wastes are generated during remedial actions.

TABLE E-6
State Action-Specific ARARs
IR Sites 1 and 2
Naval Station Long Beach
(Sheet 3 of 5)

Requirement	Prerequisites	Citation	ARAR Determination			Comments[a]
			A	RA	TBC	
Inspect container storage areas weekly for deterioration.	Storage of RCRA hazardous waste not meeting small quantity generator criteria held in a container for a temporary period greater than 90 days before treatment, disposal, or storage elsewhere.	22 CCR 66264.174	Yes	No	No	Applicable if hazardous wastes are generated during remedial actions.
Place containers on a sloped, crack-free base, and protect from contact with accumulated liquid. Provide containment system with a capacity of 10 percent of the volume of containers of free liquids. Remove spilled or leaked waste in a timely manner to prevent overflow of the containment system.		22 CCR 66264.175(a) and (b)	Yes	No	No	
Keep containers of ignitable or reactive waste at least 50 feet from the facility property line.		22 CCR 66264.176	Yes	No	No	
Keep incompatible materials separate. Separate incompatible materials stored near each other by a dike or other barrier.		22 CCR 66264.177	Yes	No	No	
At closure, remove all hazardous waste and residues from the containment system, and decontaminate or remove all containers, liners.		22 CCR 66264.178	Yes	No	No	
Excavation: Movement of excavated materials to new location and placement in or on land will trigger land disposal restrictions for the excavated waste or closure requirements for the unit in which the waste is being placed.	Materials containing RCRA hazardous wastes subject to land disposal restrictions are placed in another unit.	22 CCR 66268.40	Yes	No	No	Applicable if hazardous wastes are generated during remedial actions.
Area from which materials are excavated may require cleanup to levels established by closure requirements.	RCRA hazardous waste placed at site after the effective date of the requirements.	22 CCR 66264.228(a), (b), (e) through (k), (m), (o) through (q); 22 CCR 66264.258(a) and (b), except as it cross-references procedural requirements.	Yes	No	No	
Waste pile: Use a single liner and leachate collection system. Waste put into waste pile subject to landban regulations.	RCRA hazardous waste, non-containerized accumulation of solid, nonflammable hazardous waste that is used for treatment or storage.	22 CCR 66264.251 (except 251(j), 251(e)(11))	Yes	No	No	Applicable if soils are stockpiled on site prior to treatment or disposal.
Closure of waste piles: At closure, owner shall remove or decontaminate all waste residues, contaminated containment system components, contaminated subsoils, and structures and equipment contaminated with waste and leachate, and manage them as hazardous waste.	Waste pile used to store hazardous waste.	22 CCR 66264.258(a) and (b) except references to procedural requirements	Yes	No	No	Applicable if soils are stockpiled on site prior to treatment or disposal.
Closure with no postclosure care (e.g., clean closure): General performance standard requires elimination of need for further maintenance and control; elimination of postclosure escape of hazardous waste, hazardous constituents, leachate, contaminated runoff, or hazardous waste decomposition products.	Applies to owners and operators of hazardous waste treatment, storage, and disposal (TSD) facilities.	22 CCR 66264.111 except as it cross-references procedural requirements such as preparation and submittal of closure plans and other notifications.	No	Yes	No	Not applicable because site is not a TSD facility. Relevant and appropriate if hazardous wastes are generated during the remedial action.

TABLE E-6
State Action-Specific ARARs
IR Sites 1 and 2
Naval Station Long Beach
(Sheet 4 of 5)

Requirement	Prerequisites	Citation	ARAR Determination			Comments[a]
			A	RA	TBC	
Clean closure: Removal or decontamination of all waste residues, contaminated containment system components, contaminated subsoils, and structures and equipment contaminated with waste and leachate, and management of them as hazardous waste.	Applies to owners and operations of hazardous waste TSD facilities.	22 CCR 66264.111 and 66264.228 (a, b, e through k, m, o, p, q), except as it cross-references procedural requirements such as closure plans and annual reports.	No	Yes	No	Not applicable because site is not a TSD facility. Relevant and appropriate if hazardous wastes are generated during the remedial action.
Treatment when waste will be land disposed: Treatment of waste subject to ban on land disposal must attain levels achievable by best demonstrated available treatment (BDAT) technologies for each hazardous constituent in each listed waste, if residual is to be land disposed.	Placement of RCRA hazardous waste in a landfill, surface impoundment, waste pile, injection well, land treatment facility, salt dome formation, or underground mine or cave.	22 CCR 66268.40 and 42	No	Yes	No	Relevant and appropriate if hazardous wastes are generated during the remedial action.
Treatment when waste will be land disposed: BDAT standards for spent solvent wastes and dioxin-containing wastes are based on one of four technologies or combinations: for waste waters, (1) steam stripping, (2) biological treatment, or (3) carbon absorption; and for all other wastes, (4) incineration. Any technology may be used, however, if it will achieve the concentration levels specified.	Land disposal of spent solvent wastes or dioxin-containing wastes.	22 CCR 66268.30, 31 42 USC 6924(d)(3)(e)(3)				
Placement of waste in land disposal unit: Attain land disposal treatment standards before putting waste into landfill in order to comply with landban restrictions.	Placement of RCRA hazardous waste in a landfill, surface impoundment, waste pile, injection well, land treatment facility, salt dome formation, or underground mine or cave.	22 CCR 66268.40	No	Yes	No	Relevant and appropriate if hazardous wastes are generated during the remedial action.
Surface water control: Prevent run-on and control and collect runoff from a 24-hour 25-year storm (waste piles, land treatment facilities, landfills). Prevent over-topping of surface impoundments.	RCRA hazardous waste treated, stored, or disposed after the effective date of the requirements.	22 CCR 66264.251(c, d, f, g, h, k)	No	Yes	No	Relevant and appropriate if hazardous wastes are generated during the remedial action.
		22 CCR 66264.273(c, d, j(1)); 301(c, d, f, g)	No	Yes	No	
		22 CCR 66264.221(c,e,h)	No	Yes	No	
Use of equipment that contacts hazardous waste with organic concentrations greater than 10% by weight: Air emission standards for process vents or equipment leaks.	Equipment that contains or contacts hazardous waste with organic concentrations of at least 10% by weight or process vents associated with specified operations that manage hazardous wastes with organic concentrations of at least 10 parts per million by weight (ppmw).	22 CCR 66264.1030 through 1034 (excluding 1030(c), 1033(j), 1034(c)(2), 1034(d)(2)); 22 CCR 66264.1050 through 1063 (excluding 1050(c), 1050(d), 1057(g)(2), 1061(d), 1063(d)(3)	No	Yes	No	Relevant and appropriate if process waste stream contains more than 10% by weight volatile organic compounds (VOCs) or if process vents contain greater than 10 ppmw VOCs; however, State Air Management ARARs may be more stringent.

TABLE E-6
State Action-Specific ARARs
IR Sites 1 and 2
Naval Station Long Beach
(Sheet 5 of 5)

Requirement	Prerequisites	Citation	ARAR Determination			Comments[a]
			A	RA	TBC	
Treatment in a miscellaneous unit: Design and operating standards for unit in which hazardous waste is treated	Treatment of hazardous waste in a unit.	22 CCR 66264.601	Yes	No	No	Applicable to all on-site media-specific treatment technologies.
Discharge to groundwater from regulated unit: Groundwater protection standards: Owners/operators of RCRA treatment, storage, or disposal facilities must comply with conditions in this section that are designed to ensure that hazardous constituents entering the groundwater from a regulated unit do not exceed the concentration limits for contaminants of concern set forth under CCR 66264.94 in the uppermost aquifer underlying the waste management area beyond the point of compliance.	Uppermost aquifer underlying a waste management unit beyond the point of compliance; RCRA hazardous waste, treatment, storage, or disposal.	22 CCR 66264.94(a)(1), (a)(3), (c), (d), and (e)	No	Yes	No	The groundwater standards under RCRA are considered relevant and appropriate for remedial actions because the constituents at the sites are similar to those found in RCRA hazardous waste.
Discharge to groundwater from regulated unit: Owners/operators of RCRA surface impoundment, waste pile, land treatment unit, or landfill shall conduct a monitoring and response program for each regulated unit.	Surface impoundment, waste pile, land treatment unit, or landfill for which constituents in or derived from the waste in the unit may pose a threat to human health or the environment.	22 CCR 66264.91(a) and (c), except as it cross-references permit requirements	No	Yes	No	Not applicable, because site is not a surface impoundment, land treatment unit, waste pile, or landfill. Relevant and appropriate if hazardous wastes are generated as part of remedial actions.
Fish and Game Code*						
Endangered species habitat: No person shall import, export, take, possess, or sell any endangered or threatened species or part or product thereof.	Threatened or endangered (T/E) species determination on or before January 1, 1985 or a candidate species with proper notification.	Fish and Game Code Section 2080	No	Yes	No	Relevant and appropriate because migratory birds, such as the least tern, are known to frequent the area.
California Civil Code						
Regulates use of land to protect present or future human health and safety or the environment.	Presence on the land of hazardous materials, as defined in California HSC Section 25260.	Section 1471	No	Yes	No	Relevant and appropriate to institutional controls.
California Health and Safety Code						
Restricts specific uses of property.		Sections 25202.5, 25222.1; Paragraph 25233(c); Subparagraphs 25232(b)(1)(A)-(E)	No	Yes	No	Relevant and appropriate to institutional controls.

(a) Alternatives for Sites 1 and 2: 1 - No action; 2 - Institutional controls (deed restrictions) and long-term groundwater monitoring; 3 - In situ air sparging and soil vapor extraction, institutional controls (deed restrictions), and long-term groundwater monitoring.

* Statutes and policies, and their citations, are provided as headings to identify general categories of potential ARARs for the convenience of the reader. Listing the statutes and policies does not indicate that DON accepts the entire statutes or policies as potential ARARs. Specific potential ARARs are addressed in the table below each general heading; only substantive requirements of the specific actions are considered potential ARARs.

A – Applicable; RA = Relevant and appropriate; TBC = To be considered.

APPENDIX F

Memorandum of Agreement Between the United States Department of the Navy and the California Department of Toxic Substances Control and Model Site Mitigation Program Deed Restriction

Memorandum of Agreement Between
The United States Department of the Navy and
The California Department of Toxic Substances Control

Use of Model "Covenant to Restrict Use of Property" at Installations Being Closed and Transferred by the United States Department of the Navy

1. Background

   a. The purpose of this Memorandum of Agreement (MOA) is to formalize the use of two model environmental restriction covenants (attached) that have been drafted during negotiations between representatives of the United States Department of the Navy (DON) and the California Department of Toxic Substances Control (DTSC).

   b. Under CERCLA Sec. 104, as delegated to DON by E.O. 12580, and implemented pursuant to the National Contingency Plan (NCP – 40 CFR Sec. 300 et seq.) and 10 USC Sec. 2701, et seq., the cleanup of hazardous substances, pollutants and contaminants is required to be at a level that protects human health and the environment. As a result, this protection can be achieved at certain sites by the imposition of "institutional controls" (i.e., ICs – legal mechanisms to protect human health and the environment by restricting access or exposure to the contaminants in question) with or without underlying "engineering controls" (i.e., ECs – engineered mechanisms such as a cap on a landfill, designed to physically insure access or exposure to the contaminants in question is prevented). Collectively these ICs and ECs are called "land use controls" (LUCs).

   c. In the case of property being closed and transferred by DON to a nonfederal entity, it is necessary to insure that these LUCs stay in place and are honored by all future owners and occupants of the property in question, for as long as contamination is present at levels that do not permit unrestricted use. One key way such LUCs can be maintained is by DON's retention of sufficient legal title and interest to insure continuing enforcement of the terms of the LUCs. This retention would entail burdening such conveyances of title with deed covenants insuring that the deed transferring such property contain a formal restriction – a restrictive covenant – on the use of the property that will "run with the land," and is enforceable against the "servient estate" (i.e., all future owners of the land) and is retained by the United States, as represented by DON, acting as holder of the "dominant estate." In addition, DON can convey a separate and similar restrictive covenant to DTSC as provided in

Section 2 below.

d. In the State of California, such a restriction on the use of land, to protect human health and the environment is recognized by Section 1471 of the California Civil Code. This statute characterizes such a restrictive covenant as an "environmental restriction" and requires such words to be placed in the title of the document creating such an interest. DON has agreed to include such restrictive language in the deeds it executes where it imposes LUCs as a remedy under applicable law.

e. Similar to CERCLA, State environmental protection laws recognize the availability of using LUCs as remedies to protect human health and the environment. Currently, DTSC's authority under Chapter 6.5 and 6.8 of Division 20 of the California Health and Safety Code, provides statutory avenues to impose LUCs at a cleanup site to insure that the LUCs are honored by future owners. Chapter 6.5 is generally used when the cleanup site in question is one subject to the State's authorities under the hazardous waste facilities law, and Chapter 6.8 is generally used when the cleanup site in question is one subject to the State's equivalent to the federal CERCLA program.

f. In the case of property being closed and transferred to a nonfederal entity by DON where a cleanup remedy has used LUCs as a remedy as described above, DON and DTSC have a mutual interest in insuring that the "environmental restriction" imposed on the land is enforced for however long the protection of public health and the environment requires such restrictions.

g. As a result, DON and DTSC agree that it is in both parties' and the public's interests, that DTSC be in a position to enforce the "environmental restrictions" that the DON will be imposing on these transferring parcels of property. To this end, in addition to retaining the power to enforce protective covenants, DON agrees to convey a separate power to enforce such restrictive covenants to DTSC equivalent to DON's power to enforce any "environmental restrictions" burdening the transferring property by entering into a "Covenant to Restrict Use of Property." Under both Chapter 6.5 and Chapter 6.8, DTSC has the authority to monitor and enforce such "environmental restrictions" conveyed to it by the owner of property on which such an "environmental restriction" has been found necessary. Therefore, in consideration of DON's conveying such an interest, DTSC may implement as appropriate the various statutory authorities it possesses under Chapter 6.5 and Chapter 6.8 (as applicable) to insure these "environmental restrictions" are honored by all future owners and occupants.

2. Terms of Understanding:

a. DON and DTSC agree that in all future property transfers to a nonfederal agency, where DON is acting on behalf of the United States as the transferring or disposing agent, the applicable model "Covenant to Restrict Use of Property" attached to this MOU will be used throughout California when the proposed remedy involves imposing an IC (except those "early transfers" where 1) the transferee will perform the cleanup, and 2) the cleanup includes an IC in the remedy, and 3) has executed an order or enforceable agreement with DTSC or has entered into a Sec. 25222.1 agreement with DTSC, that calls for the transferee entering into a "Covenant to Restrict Use of Property" directly with DTSC).

b. DON and DTSC have entered into a number of Federal Facility Agreements and Federal Site Remediation Agreements for DON property. These Agreements generally call for coordination of the DON's satisfaction of its corrective action obligations under the Resource Conservation and Recovery Act (RCRA) and Health and Safety Code section 25200.10 with its responsibilities under CERCLA section 120(l), EO 12580, the Defense Environmental Restoration Program and the NCP. The Agreements recognize that the DON may satisfy some or all of its corrective action obligations through CERCLA response actions. Where such corrective action at hazardous waste management units is being satisfied through CERCLA, Attachment A shall be used. Attachment B is the model which will be used for hazardous waste management facilities not addressed in Federal Site Remediation or Federal Facility Agreements.

c. When issuing Proposed Plans for public comment, DON will attach a copy of this MOU and the appropriate model "Covenant to Restrict Use of Property" so as to assure the public that the specific LUC being proposed will be enforced, in part, by DON's retained power to enforce the deed covenants and conveyance of the power to enforce protective deed covenants to DTSC contemporaneously with the execution of the deed transferring DON's interests to the new owner.

d. In using these models to draft the appropriate "Covenant to Restrict Use of Property," DON's and DTSC's personnel will work collaboratively to develop the specific information applicable to the given site called for by Articles I (Statement of Facts) and IV (Restrictions) of the attached models. A final "Covenant to Restrict Use of Property" that is ready for signature for a given site, will be prepared in time to allow it to be

executed contemporaneously with the execution of the deed transferring DON's non-retained interests in the property to the new owner. In the case of "early transfers" where DON is performing the cleanup after the transfer, and is imposing an LUC at the time of the "early transfer" in support of its ongoing cleanup activities, the Parties recognize that the contents of Articles I and IV of the model covenants for such sites will likely not be as detailed as that suggested in the attached models. The degree of detail contained within the model covenant will be the information available as to the cleanup site, although the covenants must be adequate to protect human health and the environment to allow an early transfer. The form of remedy and any additional associated IC will be more fully developed once the remedy is selected and implemented.

e. The Parties recognize that given the need to tailor the terms of the "environmental restriction" to the remedy that is finally selected after seeking public comment on the Proposed Plan, the terms of the final "Covenant to Restrict Use of Property" may vary greatly from the draft proposal. The Parties recognize that the public should be given specific notice of this fact in the Proposed Plan.

f. The Parties recognize that remedies proposed by the DON will be submitted to DTSC for concurrence. However, there may be unresolved disagreements at some cleanup sites concerning the remedy being proposed by DON including, in particular, the scope and nature of the LUCs, and the terms of any underlying, proposed "Covenant to Restrict Use of Property." In such situations the Parties will use their best efforts to resolve all disputes informally. If the Parties are ultimately unable to resolve the issue in dispute, DON and DTSC reserve any rights they might have to take any action available under applicable state or federal law.

g. Either Party may terminate its involvement in this Agreement by giving thirty (30) days written notice to the other Party. Upon receipt of notice and the expiration of thirty days termination shall occur by operation of law.

Signed: _____ 10 MARCH 2000

F.R. Ruehe
Rear Admiral
United States Navy
Commander Navy Region Southwest

Date

Signed: Edwin F. Lowry 3/10/00

Edwin F. Lowry — Date

Director

Department of Toxic Substances Control

Attachment A: Model Site Mitigation Program "Environmental Restriction Covenant and Agreement"

Attachment B: Model Hazardous Waste Management Program/State Regulated Unit "Environmental Restriction Covenant and Agreement"

Approved as to form:

Date: 9 March 00 By: Mary Kay Lamyon

Approved as to form:

Date: March 16, 2000 By: [signature]

MODEL SITE MITIGATION PROGRAM

DEED RESTRICTION

RECORDING REQUESTED BY: **[Covenantor's Name]** **[Street Address]** **[City]**, California **[Zip Code]** WHEN RECORDED, MAIL TO: Department of Toxic Substances Control Region ___ **[Street Address]** **[City]**, California **[Zip Code]** Attention: **[Name of Branch Chief]**, Chief **[Branch Designation]**	

SPACE ABOVE THIS LINE RESERVED FOR RECORDER'S USE

COVENANT TO RESTRICT USE OF PROPERTY

ENVIRONMENTAL RESTRICTION

(Re: *[Insert parcel number(s) and name of site property to be restricted.]*)

This Covenant and Agreement ("Covenant") is made by and between the United States of America acting by and through the Department of the Navy ("DON") (the "Covenantor"), the current owner of property situated in *[city]*, County of [ ], State of California, described in Exhibit "A", attached hereto and incorporated herein by this reference (the "Property"), and the State of California acting by and through the Department of Toxic Substances Control (the "Department"). Pursuant to Civil Code section 1471(c), Health and Safety Code Sections 25222.1 and 25355.5 the

Department has determined that this Covenant is reasonably necessary to protect present or future human health or safety or the environment as a result of the presence on the land of hazardous materials as defined in Health and Safety Code ("H&SC") section 25260. In addition, pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 104 (42 USC Section 9604), as delegated to the Covenantor by E.O. 12580, ratified by Congress in 10 USC Sec. 2701, et seq., and implemented by the National Oil and Hazardous Substances Pollution Contingency Plan (NCP – 40 CFR Part 300) and implementing guidances and policies, the Covenantor has also determined that this Covenant is reasonably necessary to protect present or future human health or safety or the environment as the result of the presence on the land of hazardous substances, pollutants and contaminants as defined in CERCLA Section 101 (42 USC Section 9601).

The Covenantor and the Department, collectively referred to as the "Parties", therefore intend that the use of the Property be restricted as set forth in this Covenant, in order to protect human health, safety and the environment.

The Covenantor retains sufficient legal title and interest in the subject property to insure continuing enforcement of the protective covenants and agreements contained within this Covenant to Restrict the Use of Property. Further in any subsequent transfers or conveyance of title to nonfederal entities the DON shall burden the property with additional deed covenants that insure that any subsequent deed or transfer contains the protective covenants and right of access and power to conduct monitoring of wastes retained on site. Those covenants and agreements shall be enforceable against the servient estate in that those protective covenants shall run with the land to

all successors and assigns.

ARTICLE I

STATEMENT OF FACTS

1.01 The Property, totaling approximately [acres] [square yards] is more particularly described and depicted in Exhibit "A", attached hereto and incorporated herein by this reference. ***[Exhibit "A" must include the legal description of the property used by the county recorder. This must include the particular description of the boundaries of the area to be subject to a particular use restriction. If the property does not already have a legal description (it generally will not if it is a portion of a larger piece of property) a survey will be required.]*** The Property is located in the area now generally bounded by ***[include narrative description of the area; this will typically be street names: e.g., Main Street on the north, Maple Street on the east, etc.]*** County of [ ], State of California.

1.02 ***[Use this paragraph if imposing additional restrictions on a portion of the Property, for example on a capped portion, or if for any other reason it is necessary to precisely identify any portion of the property, such as an area with groundwater monitoring wells. The purpose of this paragraph is to give the precise location of such areas where use restrictions generally will apply. Renumber following paragraphs accordingly.]*** A limited portion of the Property is more particularly described in Exhibit "B" which is attached and incorporated by this reference ("Capped Property") as defined below ***[or "(other identified) Property"].*** ***[Exhibit B must include a legal description of the exact area(s) being restricted***

and any necessary diagram(s). This will generally require a legal survey and engineering drawing for the Cap or other area to be further restricted.] The [Capped *(or other description)*] Property is located in the area now generally bounded by [ ]. ***[Include language that generally describes the Capped or other identified Property.]*** The [Capped *(or other identified)* Property is also more specifically described as encompassing [ ] County Assessor's Parcel No.(s) [ ].

1.03 ***[Briefly describe the remedial measures implemented at the Property, including, if applicable, installation of a cap and construction and ongoing operation and maintenance of a groundwater treatment system, in order to identify the remaining contaminants and physical remedial measures on the Property that necessitate this deed restriction. This paragraph should also briefly discuss the regulatory context for the DON facility. Reference should be made to any applicable Federal Facility Agreement (FFA) or Federal Facility Site Remediation Agreement(FFSRA) and any corrective action obligations under RCRA or Chapter 6.5 of Division 20 of the Health and Safety Code covered by the FFA or FFSRA. This paragraph should refer to, and give the approval date for, the RAP, ROD, RAW or other decision document that selected the remedial measures at the Property and required this Covenant.]***

SAMPLE [For a facility which has an FFA or FFSRA and hazardous waste management units]: The DON and the Department entered into a Federal Facility Agreement (FFA) on [date]. Pursuant to that FFA, the DON may satisfy some or all of its corrective action obligations under the Resource Conservation and Recovery Act

(RCRA)(42 USC 6901 et seq)or California Health and Safety Code sectin 25200.10 through CERCLA response actions. ***{Proceed to additional SAMPLES as appropriate.]***

SAMPLE [For a property with remaining contamination, but no cap, O&M, or other ongoing response activities]: The Property is [a portion of a site] being remediated pursuant to a Record of Decision (ROD) pursuant to the Defense Environmental Restoration Program (DERP), 10 U.S.C. section 2701 et seq, and CERCLA; and a Remedial Action Plan (RAP) pursuant to Chapter 6.8 of Division 20 of the H&SC, under the oversight of the Department. The ROD/RAP provides that a deed restriction be required as part of the site remediation, because lead, which is a hazardous substance, as defined in H&SC section 25316, and a hazardous material as defined in H&SC section 25260 remains at depths of 10 feet or more below the surface of the Property. The DON circulated the ROD/RAP, for public review and comment. The ROD/RAP was approved by the DON and concurred in by the Department on [date], pursuant to which the Property was excavated to a depth of 10 feet, graded, then backfilled with clean soil.

SAMPLE [For a property with ongoing operation and maintenance of a monitoring or treatment system and/or cap. The exact provisions of this paragraph will vary depending upon the facts of the particular site or facility. The paragraph below is illustrative of the kind of information that should be included. Note specifically there is reference to a signed Operation and Maintenance Agreement.]: [Covenantor] ***[or party responsible for the activity, if different from***

Covenantor] is remediating the Property under the supervision and authority of the Department. The Property is [a portion of a site] being remediated pursuant to a Record of Decision (ROD) pursuant to the Defense Environmental Restoration Program (DERP), 10 U.S.C. section 2701 et seq; and a Remedial Action Plan (RAP) pursuant to Chapter 6.8 of Division 20 of the H&SC. Because hazardous substances, as defined in H&SC section 25316, which are also hazardous materials as defined in H&SC section 25260, including volatile organic compounds, total petroleum hydrocarbons, chlorinated benzenes and polychlorinated biphenyls, remain in the soil and groundwater in and under portions of the Property, the Remedial Action Plan provides that a deed restriction be required as part of the site remediation. The DON circulated the ROD/RAP for public review and comment. The ROD/RAP were approved by the DON and concurred in by Department on [*date*]. Remediation includes installing and maintaining a synthetic membrane cover ("Cap") over the Capped Property. The Cap consists of a low permeability synthetic membrane and other associated layers, as more particularly described in the engineering drawing attached as Exhibit "B" hereto. The response action also includes the installation and operation of: (1) a passive gas collection system on the Capped Property which removes volatile organic compounds migrating upward from under the Cap, (2) a vapor extraction system, which remediates certain volatile organic compound-impacted soils, and (3) groundwater monitoring wells ("Monitoring Wells"). The location of the gas collection system, vapor extraction system, and Monitoring Wells are shown on Exhibit "B". ***[This exhibit will have been identified in paragraph 1.02.]*** The operation and maintenance of the Cap, gas collection system, vapor extraction system, and Monitoring Wells is pursuant to an Operation and

Maintenance Manual incorporated into the Operation and Maintenance Agreement between [Covenantor] ***[or name of other entity]*** and the Department dated [ ]. ***[If an O&M Agreement has not been signed, the approval date for the O&M Manual or Plan should be referenced.]***

1.04 ***[This paragraph should set out specific information about the risk assessment findings relevant to the contaminants of concern remaining at the property, essentially the basis for the restrictions imposed by this covenant. The Restrictions in Paragraphs 4.01, and any requirement for Soil Management Activity and any Prohibited Activity must be linked to the contaminants and risk assessment as discussed in this paragraph. The following paragraph is given for purposes of illustration. Each site will have different facts; those should be developed in a manner similar to the sample paragraph given here. Land use must be consistent with the approved RAW, RAP or ROD and the health risk assessment.]***

SAMPLE: As detailed in the Final Health Risk Assessment ***[or other appropriate document]*** as proposed by the Covenantor and approved by the Department on [***date***], all or a portion of the surface and subsurface soils within 10 feet of the surface of the Property contain hazardous substances, as defined in H&SC section 25316, which include the following metal contaminants of concern in the ranges set forth below: arsenic (0.3 to 38.1 parts per million ("ppm"), beryllium (2.6 ppm), copper (4.6 to 756 ppm, and nickel (7.3-105 ppm). In addition, there are low pH soils. Based on the Final Risk Assessment the Department and the Covenantor have

concluded that use of the Property as a residence, hospital, school for persons under the age of 21 or day care center would entail an unacceptable cancer risk to the users or occupants of such property operated or occupied. The Department and the Covenantor have further concluded that the Property, as remediated, and operated or occupied subject to the restrictions of this Covenant, does not present an unacceptable threat to human safety or the environment, if limited to ***[as applicable:*** commercial and industrial, parks, open space,***[or other appropriate]]*** use.

SAMPLE: [Note: Groundwater restrictions in Paragraph 3.04 must be based on a discussion of what contaminants are found in groundwater at the site, and what the drinking water standards are.]

Groundwater at the Property is found 15 to 20 feet below ground surface. Contaminants in the groundwater include benzene (50- 123 ppm), chromium (75- 213 ppm) and TCE (350-780 ppm). California drinking water standards are benzene at 0.08 ppm, chromium at 30 ppm and TCE at 5 ppm. The Department and the Covenantor concludes that the groundwater presents an unacceptable threat to human health and safety absent an environmental restriction to eliminate exposure to such levels of groundwater.

ARTICLE II

DEFINITIONS

2.01 Department. "Department" means the State of California by and through the Department of Toxic Substances Control and includes its successor agencies, if

any.

2.02 Owner. "Owner" shall include the Covenantor's successors in interest, and their successors in interest, including heirs and assigns, during his or her ownership of all or any portion of the Property.

2.03 Occupant. "Occupant" means Owners and any person or entity entitled by ownership, leasehold, or other legal relationship to the right to occupy any portion of the Property.

2.04 Covenantor. "Covenantor" shall mean the United States acting through the Department of the Navy (DON).

ARTICLE III

GENERAL PROVISIONS

3.01 Restrictions to Run with the Land. This Covenant sets forth protective provisions, covenants, restrictions, and conditions (collectively referred to as "Restrictions"), subject to which the Property and every portion thereof shall be improved, held, used, occupied, leased, sold, hypothecated, encumbered, and/or conveyed. These Restrictions are consistent with the separate restrictions placed in the deed by and in favor of the Covenantor, conveying the Property from the Convenantor to its successor in interest described above. Each and every Restriction: (a) runs with the land in perpetuity pursuant to H&SC sections 25222.1 25355.5(a)(1)(C) and Civil Code section 1471; (b) inures to the benefit of and passes with each and every portion of the Property; (c) shall apply to and bind all subsequent Occupants of the Property; (d) is for the benefit of, and is enforceable by the Department; and (e) is imposed upon the entire Property unless expressly stated as applicable only to a specific portion thereof.

3.02 Binding upon Owners/Occupants. Pursuant to H&SC sections 25222.1, 25355.5(a)(1)(C), this Covenant binds all Owners of the Property, their heirs, successors, and assignees, and the agents, employees, and lessees of the owners,

heirs, successors, and assignees. Pursuant to Civil Code section 1471(b), all successive owners of the Property are expressly bound hereby for the benefit of the Department.

3.03 Written Notice of Hazardous Substance Release. The Owner shall, prior to the sale, lease, or rental of the Property, give written notice to the subsequent transferee that a release of hazardous substances has come to be located on or beneath the Property, pursuant to Health and Safety Code section 25359.7. Such written notice shall include a copy of this Covenant. *[This last sentence is optional, to be used at sites where it is important that buyers and tenants be specifically aware of the ongoing remediation and their obligations.]*

3.04 Incorporation into Deeds and Leases. The Restrictions set forth herein shall be incorporated by reference in each and all deeds and leases for any portion of the Property.

3.05 Conveyance of Property. The Owner shall provide notice to the Department not later than thirty (30) days after any conveyance of any ownership interest in the Property (excluding mortgages, liens, and other non-possessory encumbrances). The Department shall not, by reason of this Covenant alone, have authority to approve, disapprove, or otherwise affect a conveyance, except as otherwise provided by law, by administrative order, or by a specific provision of this Covenant.

ARTICLE IV

RESTRICTIONS

[The following examples are intended to be illustrative. Not all of them will be

applicable. The restrictions for a particular property should have a direct relationship to what the Health Risk Assessment said was appropriate for use at the site. The restrictions must also protect the integrity and physical accessibility of, and legal rights of access to, any ongoing remediation facilities at the site.]

4.01 Prohibited Uses. The Property shall not be used for any of the following purposes: ***[Note: These prohibitions must be based on the appropriate decision documents as set forth in Paragraphs 1.03 and 1.04]***

[Sample provisions:]

(a) A residence, including any mobile home or factory built housing, constructed or installed for use as residential human habitation.

(b) A hospital for humans.

(c) A public or private school for persons under 21 years of age.

(d) A day care center for children.

4.02. Soil Management ***[Note: The basis for the soil restrictions must be In Paragraphs 1.03 and 1.04]***

[Sample provisions]

(a) No activities that will disturb the soil [at or below [ ] feet below grade] (e.g., excavation, grading, removal, trenching, filling, earth movement or mining) shall be allowed on the Property without a Soil Management Plan and a Health and Safety Plan approved by the Department.

(b) Any contaminated soils brought to the surface by grading, excavation, trenching or backfilling shall be managed in accordance with all applicable provisions of

state and federal law.

(c) The Owner shall provide the Department written notice at least fourteen (14) days prior to any building, filling, grading, mining or excavating in the Property [more than [ ] feet below the soil surface] [which will remove more than [ ] cubic yards of soil].

4.03 Prohibited Activities. ***[This paragraph will not be applicable to all sites. If not used, renumber accordingly. If there are groundwater restrictions, the basis must be in Paragraphs 1.03 and 1.04]*** The following activities shall not be conducted at the Property:

[Sample provisions]

(a) Raising of food (agricultural products intended for human consumption or use, including but not limited to food, cattle, fibers, including cotton).

(b) Drilling for [drinking irrigation] water, oil, or gas [without prior written approval by the Department].

[or] (b) Extraction of groundwater for purposes other than site remediation or construction dewatering.

[The following paragraphs are samples of restrictions that may be applicable when there is a cap, vapor and/or gas collection system, and/or groundwater monitoring system.]

4.04 Non-Interference with Cap [and Vapor Extraction System (VES)] and [Groundwater Capture System (GCS)].

[Sample provisions:]

(a) Activities that may disturb the Cap (e.g. excavation, grading, removal, trenching, filling, earth movement, or mining) shall not be permitted on or within _____ feet of the Capped Property without prior review and approval by the Department. ***[Similar restrictions may be appropriate for other ongoing remediation systems.]***

(b) All uses and development of the Capped Property shall preserve the integrity **[** ***(if appropriate:)*** **and physical accessibility]** of the Cap. ***[Extend to other systems as appropriate.]***

(c) The Cap shall not be altered without written approval by the Department.

(d) The Owner shall notify the Department of each of the following: (i) the type, cause, location and date of any damage to the Cap and (ii) the type and date of repair of such damage. Notification to the Department shall be made as provided below within ten (10) working days of both the discovery of any such disturbance and the completion of any repairs. Timely and accurate notification by any Owner or Occupant shall satisfy this requirement on behalf of all other Owners and Occupants. ***[Extend to other systems as appropriate.]***

4.05 Access for Department. The Department shall have reasonable right of entry and access to the Property for inspection, monitoring, and other activities consistent with the purposes of this Covenant as deemed necessary by the Department in order to protect the public health or safety, or the environment.

ARTICLE V

ENFORCEMENT

5.01 Enforcement. Failure of the Owner or Occupant to comply with any of the

Restrictions specifically applicable to include grounds for the Department to require that the Owner modify or remove any improvements ("Improvements" herein shall mean all buildings, roads, driveways, and paved parking areas), constructed or placed upon any portion of the Property in violation of the Restrictions. Violation of this Covenant by the Owner or Occupant may result in the imposition of civil and/or criminal remedies including nuisance or abatement against the Owner or Occupant as provided by law. The State of California shall have all remedies as provided at in California Civil Code Section 815.7 as that enactment may be from time to time amended.

ARTICLE VI

VARIANCE AND TERMINATION

6.01 Variance. The Owner, or with the Owner's consent, any Occupant, may apply to the Department for a written variance from the provisions of this Covenant. Such application shall be made in accordance with H&SC section 25233. The Department will grant the variance only after finding that such a variance would be protective of human, health, safety and the environment.

6.02 Termination. The Owner, or with the Owner's consent, any Occupant, may apply to the Department for a termination of the Restrictions or other terms of this Covenant as they apply to all or any portion of the Property. Such application shall be made in accordance with H&SC section 25234. No termination or other terms of this Covenant shall extinguish or modify the retained interest held by the United States.

ARTICLE VII

MISCELLANEOUS

7.01 No Dedication Intended. Nothing set forth in this Covenant shall be

construed to be a gift or dedication, or offer of a gift or dedication, of the Property, or any portion thereof to the general public or anyone else for any purpose whatsoever.

7.02 Recordation. The Covenantor shall record this Covenant, with all referenced Exhibits, in the County of [name of county] within ten (10) days of the Covenantor's receipt of a fully executed original.

7.03 Notices. Whenever any person gives or serves any Notice ("Notice" as used herein includes any demand or other communication with respect to this Covenant), each such Notice shall be in writing and shall be deemed effective: (1) when delivered, if personally delivered to the person being served or to an officer of a corporate party being served, or (2) three (3) business days after deposit in the mail, if mailed by United States mail, postage paid, certified, return receipt requested:

To Owner: *[include name and address of Owner and name of person to receive service]*

To Department: *[title and address of Regional Branch Chief.]*

Any party may change its address or the individual to whose attention a Notice is to be sent by giving written Notice in compliance with this paragraph.

7.04 Partial Invalidity. If any portion of the Restrictions or other term set forth herein is determined by a court of competent jurisdiction to be invalid for any reason, the surviving portions of this Covenant shall remain in full force and effect as if such portion found invalid had not been included herein.

7.05 Statutory References. All statutory references include successor provisions.

IN WITNESS WHEREOF, the Parties execute this Covenant.

Covenantor: ***[name of Covenantor]***

By: _____

Title: ***[signatory's name and title]***

Date: _____

Department of Toxic Substances Control

By: _____

Title: ***[signatory's name and title]***

Date: _____

Approved as to form:

Date: 9 March 00 By: Mary Kay Fanyan

Approved as to form:

Date: March 16, 2000 By: Arnold M Thomas

Ratification of Document endorsed 3-2-00

STATE OF CALIFORNIA)
)
COUNTY OF _____)

On this _____ day of _____, in the year _____,

before me _____, personally appeared

_____,

personally known to me (or proved to me on the basis of satisfactory evidence) to be the person(s) whose name(s) is /are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

WITNESS my hand and official seal.

Signature _____

MODEL HAZARDOUS WASTE MANAGEMENT PROGRAM

DEED RESTRICTION

RECORDING REQUESTED BY:
[Covenantor's Name]
[Street Address]
[City], California **[Zip Code]**

WHEN RECORDED, MAIL TO:

Department of Toxic Substances Control
Region ___
[Street Address]
[City], California **[Zip Code]**
Attention: **[Name of Branch Chief]**, Chief
[Branch Designation]

SPACE ABOVE THIS LINE RESERVED FOR RECORDER'S USE

COVENANT TO RESTRICT USE OF PROPERTY

ENVIRONMENTAL RESTRICTION

(Re: *[Insert parcel number(s) and name of site property to be restricted.]*)

This Covenant and Agreement ("Covenant") is made by and between the United States of America acting by and through the Department of Navy or "DON" (the "Covenantor"), the current owner of certain property situated in *[city]*, County of _____, State of California, described in Exhibit "A", attached hereto and incorporated herein by this reference (the "Property"), and the State of California acting by and through the Department of Toxic Substances Control (the "Department"). Pursuant to Civil Code section 1471(c), the Department has determined that this Covenant is reasonably necessary to protect present or future human health or safety or the environment as a

result of the presence on the land of hazardous materials as defined in Health and Safety Code ("H&SC") section 25260. In addition, pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 104 (42 USC Section 9604), as delegated to the Covenantor by E.O. 12580, ratified by Congress in 10 USC Sec. 2701, et seq., and implemented by the National Oil and Hazardous Substances Pollution Contingency Plan (NCP – 40 CFR Part 300) and implementing guidances and policies, the Covenantor (DON) has also determined that this Covenant is reasonably necessary to protect present or future human health and safety and the environment as the result of the presence on the land of hazardous substances, pollutants and contaminants as defined in CERCLA Section 101 (42 USC Section 9601).

The Covenantor and the Department, collectively referred to as the "Parties", therefore intend that the use of the Property be restricted as set forth in this Covenant, in order to protect human health, safety and the environment.

The Covenantor retains sufficient legal title and interest in the subject property to insure continuing enforcement of the protective covenants and agreements contained within this Covenant to Restrict the Use of Property. Further in any subsequent transfers or conveyance of title to nonfederal entities the DON shall burden the property with additional deed covenants that insure that any subsequent deed or transfer contains the protective covenants and right of access and power to conduct monitoring interest contained herein and of wastes retained on site. Those covenants and agreements shall be enforceable against the servient estate in that those protective covenants shall run with the land to all successors and assigns.

ARTICLE I

STATEMENT OF FACTS

1.01 The Property, totaling approximately [acres] [— square yards] is more particularly described and depicted in Exhibit "A", attached hereto and incorporated herein by this reference. *[Exhibit "A" must include the legal description of the property used by the county recorder. This must include the particular description of the boundaries of the area to be subject to a specific use restriction. A survey may be required].* The Property is located in the area now generally bounded by *[include narrative description of the area; this will typically be street names: e.g. Main Street on the north, Maple Street on the east, etc.]* County of [ ], State of California.

1.02 *[Use this paragraph if imposing additional restrictions on a portion of the Property, for example on a capped portion, or if for any other reason it is necessary to precisely identify any portion of the property, such as an area with groundwater monitoring wells. The purpose of this paragraph is to give the precise location of such areas where use restrictions will apply. Renumber following paragraphs accordingly]* A limited portion of the Property is more particularly described in Exhibit "B" which is attached and incorporated by this reference ("Capped Property" or "[*other identified*] Property"). *[Exhibit B must include a legal description of the exact area(s) being restricted and any necessary diagram(s). This will generally require a legal survey and engineering drawing for the Cap or other area to be further restricted.].* The [Capped or {other identified}] Property is located in the area now generally bounded by _____. *[include language that generally describes the Capped or other identified Property]* The

[Capped or {other identified}] Property is also more specifically described as encompassing xxxx County Assessor's Parcel numbers —.

1.03 *[Briefly describe the regulatory oversight of the facility by the Department and the CERCLA decisions including any applicable Federal Facility Agreement (FFA) or Federal Facility site Remediation Agreement (FFSRA) and implementing activities of the Covenantor, the remedial activities that have occurred at the Property, including, if applicable, installation of a cap and construction and ongoing operation and maintenance of a groundwater treatment system. This paragraph should refer to the Closure Report or other decision document such as a ROD which approved the remedial activities at the Property and required this Covenant. The paragraph needs to identify the contaminants and physical remedial measures on the Property which necessitate this deed restriction.]*

Since [*date*] the Department [*or*, the Department's predecessor in interest (California Department of Health Services)] authorized this [treatment], [storage], [disposal] facility ("Facility") pursuant to an [interim status document] [permit]. Under this authorization the Site was a hazardous waste facility, regulated by the Department, subject to the requirements of the California Hazardous Waste Control Law ("HWCL"), at Health and Safety Code ("H&S Code") section 25100 et seq., and the federal Resource Conservation and Recovery Act ("RCRA"), at 42 U.S.C. section 6901 et seq. Pursuant to the closure requirements of the HWCL, including H&S Code section 25246 and post-closure notices provisions of Title 22 California Code of Regulations [section 66265.119(b) for interim status hazardous waste facilities] [*or* 66264.119(b) for permitted hazardous waste facilities]] [*or, if restrictions required for permit:* corrective

action requirements of the HWCL, including H&S Code Section 25200.10] the Department is requiring this Covenant as part of the [facility closure] [corrective action] [permitting] of the facility. The Department circulated a [Closure Plan] [Remedial Measures Study] [*other appropriate document*], which contained a Final Health Risk Assessment [and/or Remedial Goals document], together with a draft [Environmental Impact Report] [Negative Declaration] pursuant to the California Environmental Quality Act, Public Resources Code section 21000 et seq for public review and comment from [*date*] to [*date*]. Because hazardous wastes, which are also hazardous materials as defined in Health and Safety Code sections 25117 and 25260, including [list hazardous wastes] remain in the [soil] and [groundwater] at the Property, the [Closure Plan] [Remedial Measures Study] provided that a deed restriction would be required as part of the facility remediation. The Department approved the [Closure Plan] [Remedial Measures Study] [*other appropriate document*] together with the [*environmental document*] on [*date*].

Pursuant to these documents, the Property was [*describe remedial actions taken which relate to what is left on the property. This description must include installation of any physical remedial measures. The description must identify what contaminants remain on the Property.*]

SAMPLE: Hazardous wastes, which are also hazardous materials as defined in H&S Code sections 25117 and 25260, and are CERCLA hazardous substances, pollutants or contaminant, including xxxx and yyyy, remain in the soil and groundwater at the Property. Remediation includes installing and maintaining a synthetic membrane cover ("Cap") over the Capped Property. The Cap consists of a low permeability

synthetic membrane and other associated layers over the hazardous wastes and materials, as more particularly described in the engineering drawing attached as Exhibit "B" hereto. The Remedial Measure also includes the installation and operation of: (1) a passive gas collection system ("GCS") on the Capped Property which removes miscellaneous gas/vapors migrating upward from under the Cap, (2) a vapor extraction system ("VES"), which remediates certain volatile organic compound-impacted soils, and (3) groundwater monitoring wells ("Monitoring Wells"). The location of the GCS, VES and Monitoring Wells are shown on the map attached as exhibit "--". The operation and maintenance ("O&M") of the Cap, GCS, VES, and Monitoring Wells is pursuant to an O&M Manual incorporated into the O&M Agreement between [Covenantor] *[or name of other entity]* and the Department dated September 20, 1995. *[If an O&M Agreement has not been signed, the approval date for the O&M Manual or Plan should be referenced]*

1.04 *[This paragraph should set out specific information about the risk assessment findings relevant to the contaminants of concern remaining at the property, essentially the basis for the restrictions imposed by this covenant. The Restrictions in Paragraphs 4.01, and any requirement for Soil Management Activity and any Prohibited Activity must be linked to the contaminants and risk assessment as discussed in this paragraph. The following paragraph is given for purposes of illustration. Each site will have different facts; those should be developed in a manner similar to the sample paragraph given here. You must consult with the assigned toxicologist about what are the appropriate land uses.]*

SAMPLE: As detailed in the Final Health Risk Assessment *[or other appropriate*

document] as proposed by the Covenantor and approved by the Department on *[date]*, all or a portion of the surface and subsurface soils within 10 feet of the surface of the Property contain hazardous wastes and hazardous materials, as defined in H&S Code section 25117 and 25260, which include one or more of the following metal contaminants of concern in the ranges set forth below: arsenic (0.3 to 38.1 parts per million ("ppm"), beryllium (2.6 ppm), copper (4.6 to 756 ppm, and nickel (7.3-105 ppm). In addition, there are low pH soils. Based on the Final Risk Assessment the Department and the Covenantor have concluded that use of the Property as a residence, hospital, school for persons under the age of 21 or day care center would entail an unacceptable cancer risk to the users or occupants of such property. The Department and the Covenantor have further concluded that the Property, as remediated, and operated or occupied subject to the restrictions of this Covenant, does not present an unacceptable threat to human safety or the environment, if limited to *[as applicable:* commercial and industrial use, parks, open space, [or other appropriate] use*]*.

SAMPLE [Note: Groundwater restrictions in Paragraph 3.04 must be based on a discussion of what contaminants are found in groundwater at the site, and what drinking water standards are.]: Groundwater at the Property is first found at 15 to 20 feet below ground surface. Contaminants in the groundwater include benzene (50- 123 ppm), chromium (75- 213 ppm) and TCE (350-780 ppm). California drinking water standards are benzene at .08 ppm, chromium at 30 ppm and TCE at 5 ppm. The Department and the Covenantor concludes that the groundwater presents an unacceptable threat to human health and safety absent an environmental restriction to eliminate exposure to such levels of groundwater.

ARTICLE II

DEFINITIONS

2.01 Department. "Department" shall mean the State of California by and through the California Department of Toxic Substances Control and shall include its successor agencies, if any.

2.02 Owner. "Owner" shall include the Covenantor's successor's in interest, and their successors in interest, including heirs and assigns, during his or her ownership of all of any portion of the Property.

2.03 Occupant. "Occupant" shall mean Owners and any person or entity entitled by ownership, leasehold, or other legal relationship to the right to occupy any portion of the Property.

2.04 Covenantor. "Covenantor" shall mean the United States acting through the Department of the Navy (DON).

ARTICLE III

GENERAL PROVISIONS

3.01 Restrictions to Run With the Land. This Covenant sets forth protective provisions, covenants, restrictions, and conditions (collectively referred to as "Restrictions"), upon and subject to which the [Property] [Capped Property] [Restricted Property] and every portion thereof shall be improved, held, used, occupied, leased, sold, hypothecated, encumbered, and/or conveyed. These Restrictions are consistent with the separate restrictions placed in the deed by and in favor of the Covenantor, conveying the Property from the Covenantor to its successor in interest described above. Each and every one of the Restrictions: (a) shall run with the land in perpetuity pursuant to H&SC sections 25202.5, and 25202.6, and Civil Code section 1471; (b) shall inure to the benefit of and pass with each and every portion of the Property; (c) shall apply to and bind all subsequent Occupants of the Property; (d) are for the benefit of, and shall be enforceable by the State of California; and (e) are imposed upon the entire Property unless expressly stated as applicable only to a specific portion thereof.

3.02 Binding Upon Owners/Occupants. Pursuant to Health and Safety Code section 25202.5(b), this Covenant shall be binding upon all of owners of the land, their heirs, successors, and assignees, and the agents, employees, and lessees of the owners, heirs, successors, and assignees. Pursuant to Civil Code section 1471(b), all successive owners of the Property are expressly bound hereby for the benefit of the covenantee(s) herein.

3.03 Written Notice of Hazardous Substance Release. The Owner shall, prior to the sale, lease, or rental of the Property, give written notice to the subsequent

transferee that a release of hazardous substances has come to be located on or beneath the Property, pursuant to Health and Safety Code section 25359.7. Such written notice shall include a copy of this Covenant. *[This last sentence is optional, to be used at sites where it is important that buyers and tenants be specifically aware of the ongoing remediation and their obligations]*

3.04 Incorporation into Deeds and Leases. The Restrictions set forth herein shall be incorporated by reference in each and all deeds and leases for any portion of the Property.

3.05 Conveyance of Property Covenantor agrees that the Owner shall provide notice to the Department not later than thirty (30) days after any conveyance of any ownership interest in the Property (excluding mortgages, liens, and other non-possessory encumbrances). The Department shall not, by reason of this Covenant alone, have authority to approve, disapprove, or otherwise affect such conveyance. *[This paragraph is optional, to be used, for example, at sites with groundwater treatment systems that will require access by the Department and by the entity responsible for O&M.]*

ARTICLE IV

RESTRICTIONS

[The following examples are intended to be illustrative. Not all of them will be applicable. The restrictions for a particular property should have a direct relationship to what the Health Risk Assessment said was ok/appropriate for use at the site. The toxicologist must be involved with drafting the Restrictions. The restrictions must also protect the integrity of, and access to, any ongoing remediation facilities at the site.]

4.01 Prohibited Uses. The Property shall not be used for any of the following purposes: *[Note: These prohibitions must be based on the facts and Health Risk Assessment as set forth in Paragraph 1.04]*

[sample provisions]

(a) A residence, including any mobile home or factory built housing, constructed or installed for use as residential human habitation.

(b) A hospital for humans.

(c) A public or private school for persons under 21 years of age.

(d) A day care center for children.

4.02 Soil Management *[Note: The basis for the soil restrictions must be in Paragraph 1.04]*

[sample provisions]

(a) No activities which will disturb the soil *[*at or below xxx feet below grade*]* (e.g., excavation, grading, removal, trenching, filling, earth movement or mining) shall be permitted on the Property without a Soil Management Plan and a Health and Safety Plan submitted to the Department for review and approval.

(b) Any contaminated soils brought to the surface by grading, excavation, trenching or backfilling shall be managed in accordance with all applicable provisions of state and federal law.

(c) The Owner will provide the Department written notice at least fourteen (14) days prior to any building, filling, grading, mining or excavating in the Property [more than feet below the soil surface] [which will remove more than cubic yards of soil].

4.03 Prohibited Activities. *[This paragraph will not be applicable to all sites. If*

not used, renumber accordingly. If there are groundwater restrictions, the basis must be in Paragraph 1.04] The following activities shall not be conducted at the Property: *[sample provisions]*

(a) No raising of agricultural products intended for human consumption or use, including but not limited to food,cattle, fibers including, cotton) shall be permitted on the property.

(b) No drilling for *[*drinking/IRRIGATION *]* water, oil, or gas shall be permitted on the Property *[*without prior written approval by the Department*]. [or]* (b) No groundwater shall be extracted on the Property for purposes other than site remediation or construction dewatering. *[The following paragraphs are samples of restrictions that may be applicable when there is a cap, vapor and/ or gas collection system, and/or groundwater monitoring system.]*

4.04 Non-Interference with Cap [and VES] and [GCS].

[sample provisions]

(a) No activities which will disturb the Cap (e.g. excavation, grading, removal, trenching, filling, earth movement, or mining) shall be permitted on or within _____feet of the Capped Property without prior review and approval by the Department. *[Similar restrictions may be appropriate for other ongoing remediation systems.]*

(b) All uses and development of the Capped Property shall preserve the integrity of the Cap. *[Extend to other systems as appropriate.]*

(c) Any proposed alteration of the Cap shall require written approval by the Department.

(d) The Owner shall notify the Department of each of the following: (i) The

type, cause, location and date of any disturbance to the Cap which could affect the ability of the Cap to contain subsurface hazardous wastes or hazardous materials in the Capped Property, and (ii) the type and date of repair of such disturbance. Notification to the Department shall be made as provided below within ten (10) working days of both the discovery of any such disturbance(s) and the completion of any repairs. Timely and accurate notification by any Owner or Occupant shall satisfy this requirement on behalf of all other Owners. *[Extend to other systems as appropriate.]*

4.05 Access for Department. The Department shall have reasonable right of entry and access to the Property for inspection, monitoring, and other activities consistent with the purposes of this Covenant as deemed necessary by the Department in order to protect the public health and safety and the environment.

ARTICLE V

ENFORCEMENT

5.01 Enforcement. Failure of the Owner or Occupant to comply with any of the Restrictions specifically applicable to it shall be grounds for the Department, by reason of this Covenant, to require that the Owner modify or remove any improvements ("Improvements" herein shall include all buildings, roads, driveways, and paved parking areas, constructed or placed upon any portion of the Property constructed in violation of the Restrictions). Violation of this Covenant by the Owner or Occupant may result in the imposition of civil and/or criminal remedies including nuisance or abatement against the Owner or Occupant as provided by law. The State of California shall have all remedies as provided in California Civil Code, Section 815.7, as that enactment may

be from time to time amended.

ARTICLE VI

MODIFICATION AND TERMINATION

6.01 Modification. Any Owner or, with the Owner's written consent, any Occupant of the Property or any portion thereof may apply to the Department for a written modification from the provisions of this Covenant. Such application shall be made in accordance with H&S Code section 25202.6. The Department will grant the modification only after finding that such a modification would be protective of human health, safety and the environment.

6.02 Termination. Any Owner, and/or, with the Owner's written consent, any Occupant of the Property, or any portion thereof, may apply to the Department for a termination of the Restrictions or other terms of this Covenant as they apply to all or any portion of the Property. Such application shall be made in accordance with H&S Code section 25202.6. The Department will grant the termination only after finding that such a termination would be protective of human health, safety and the environment. No termination of the Restrictions or other terms of this Covenant shall extinguish or modify the retained interest held by the United States.

ARTICLE VII

MISCELLANEOUS

7.01 No Dedication Intended. Nothing set forth in this Covenant shall be construed to be a gift or dedication, or offer of a gift or dedication, of the Property, or any portion thereof to the general public or anyone else for any purpose whatsoever.

7.02 Recordation In accordance with HSC Section 25235, the Department will record this Covenant, with all referenced Exhibits, in the County of [name of county] within ten (10) days of the Department's receipt of a fully executed original.

7.03 Notices. Whenever any person gives or serves any notice ("Notice" as used herein includes any demand or other communication with respect to this Covenant), each such Notice shall be in writing and shall be deemed effective: (1) when delivered, if personally delivered to the person being served or to an officer of a corporate party being served, or (2) three (3) business days after deposit in the mail, if mailed by United States mail, postage paid, certified, return receipt requested:

To Owner: *[include name and address of Owner and name of person to receive service]*

To Department: *[include name, address, and appropriate name of Department person to be served]*

Any party may change its address or the individual to whose attention a notice is to be sent by giving written notice in compliance with this paragraph.

7.04 Partial Invalidity. If any portion of the Restrictions or other term set forth herein is determined by a court of competent jurisdiction to be invalid for any reason, the surviving portions of this Covenant shall remain in full force and effect as if such portion found invalid had not been included herein.

7.05 Statutory References. All statutory references include successor provisions.

IN WITNESS WHEREOF, the Parties execute this Covenant.

"Covenantor"

Date:_____ By:_____

"Department"

Date:_____ By:_____

Approved as to form:

Date: 9 March 00 By: M X Jaujan

Approved as to form:

Date: March 16, 2000 By: Harold M Thomas

Ratification of Document endorsed 3-2-00

STATE OF CALIFORNIA)
)
COUNTY OF _____)

On this _____ day of _____, in the year _____,

before me _____, personally appeared

_____,

personally known to me (or proved to me on the basis of satisfactory evidence) to be the person(s) whose name(s) is /are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

WITNESS my hand and official seal.

Signature _____