Public Summary: **Final Record of Decision for Parcel G, Hunters Point Shipyard, San Francisco, California, February 18, 2009**

The Department of Navy (Navy) has prepared this final record of decision (ROD) to address remaining contamination at Parcel G at Hunters Point Shipyard in San Francisco, California. The remedial action selected in this ROD is necessary to protect the public health, welfare, and the environment from actual or potential releases of contaminants from the site. The selected remedial action for Parcel G addresses metals (arsenic, lead, and manganese) and polycyclic aromatic hydrocarbons (PAH) in soil, volatile organic compound (VOC) vapors and several metals (chromium VI and nickel) from groundwater in the A-aquifer, and radionuclides in structures (such as buildings) and in soil.

The Navy considered the following remedial alternatives for contaminants in soil: (1) no action; (2) institutional controls (IC) and maintained landscaping; (3) ICs, limited excavation and off-site disposal; (4) ICs and covers; and (5) a combination of ICs, covers, excavation and disposal. The Navy considered the following remedial alternatives for contaminants in groundwater: (1) no action; (2) long-term monitoring and ICs; (3) *in situ* treatment of VOCs using biological compounds or zero-valent iron, monitoring and ICs; and (4) *in situ* treatment of VOCs and metals using biological compounds or zero-valent iron, monitoring and ICs. The Navy considered the following remedial alternatives for radiologically impacted soil or structures: (1) no action; and (2) surveying radiologically impacted areas that may include structures and former building sites, decontaminating (and demolishing if necessary) buildings, excavating storm drain and sanitary sewer lines and soils in impacted areas, and screening, separating, and disposing of radioactive sources and contaminated excavated soil at an off-site low-level radioactive waste facility. The Selected Remedy for Parcel G is Alternative S-5 (excavation, disposal, covers, and ICs) for soil; Alternative GW-4A&B (treatment, monitoring, and ICs) for groundwater; and Alternative R-2 (survey, decontamination, excavation, disposal, and release) for radiologically impacted structures and soil.

Information Repositories: A complete copy of the "Final Record of Decision for Parcel G" dated February 18, 2009, is available to community members at:

San Francisco Main Library
100 Larkin Street
Government Information Center, 5th Floor
San Francisco, CA 94102
Phone: (415) 557-4500

Anna E. Waden Bayview Library
5075 Third Street
San Francisco, CA 94124
Phone: (415) 355-5757

The report is also available to community members on request to the Navy. For more information about environmental investigation and cleanup at Hunters Point Shipyard, contact Sarah Koppel, remedial project manager for the Navy, at:

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Final

Record of Decision for Parcel G

Hunters Point Shipyard
San Francisco, California

February 18, 2009

Prepared by:
Department of the Navy
Base Realignment and Closure
Program Management Office West
San Diego, California

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ACRONYMS AND ABBREVIATIONS

§	Section
µg/L	Microgram per liter
ARAR	Applicable or relevant and appropriate requirement
ARIC	Area requiring institutional controls
bgs	Below ground surface
CDPH	California Department of Public Health
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
cm	Centimeter
COC	Chemical of concern
CSM	Conceptual site model
dpm	Dose per minute
DTSC	Department of Toxic Substances Control
ELCR	Excess lifetime cancer risk
EPA	U.S. Environmental Protection Agency
FFA	Federal Facility Agreement
FS	Feasibility study
GRA	General response action
HHRA	Human health risk assessment
HI	Hazard index
HPS	Hunters Point Shipyard
IC	Institutional control
LUC RD	Land use control remedial design
mg/kg	Milligram per kilogram
NCP	National Contingency Plan
NPL	National Priorities List
NRDL	Naval Radiological Defense Laboratory
O&M	Operation and maintenance

pCi/g	Picocuries per gram
pCi/L	Picocuries per liter
PA	Preliminary assessment
PAH	Polycyclic aromatic hydrocarbon
PCE	Tetrachloroethene
RAB	Restoration Advisory Board
RACR	Removal action completion report
RAO	Remedial action objective
RD	Remedial design
RI	Remedial investigation
RME	Reasonable maximum exposure
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act
SI	Site inspection
SVE	Soil vapor extraction
TCE	Trichloroethene
TCRA	Time-critical removal action
TRC	Technical review committee
VOC	Volatile organic compound
Water Board	San Francisco Bay Regional Water Quality Control Board
ZVI	Zero-valent iron

1. DECLARATION

This Record of Decision (ROD) presents the Selected Remedy for Parcel G at Hunters Point Shipyard (HPS) in San Francisco, California. HPS was placed on the National Priorities List (NPL) in 1989 (U.S. Environmental Protection Agency [EPA] ID: CA71170090087). The remedy was selected in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986 (Title 42 *United States Code* Section (§) 9601, et seq.), and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (Title 40 *Code of Federal Regulations* [CFR] Part 300). This decision is based on information contained in the Administrative Record[1] (Attachment 4) for the site. Information not specifically summarized in this ROD or its references but contained in the Administrative Record has been considered and is relevant to the selection of the remedy at Parcel G. Thus, the ROD is based on and relies on the entire Administrative Record file in making the decision.

The Department of the Navy and EPA jointly selected the remedy for Parcel G and the California EPA's Department of Toxic Substances Control (DTSC) and the San Francisco Bay Regional Water Quality Control Board (Water Board) concur on the remedy for Parcel G. The Navy provides funding for site cleanups at HPS. The Federal Facility Agreement (FFA) for HPS documents how the Navy intends to meet and implement CERCLA in partnership with EPA, DTSC, and the Water Board.

Parcel D is one of six parcels (Parcels A through F) originally designated for environmental restoration. The Navy has divided the former Parcel D into four new parcels: Parcel G, Parcel D-1, Parcel D-2, and Parcel UC-1. Although previous documents focused on the overall Parcel D, referenced information from these documents are also relevant for Parcel G. Long-term uses in specified areas within Parcel G include educational/cultural use, mixed use, open space, and industrial reuse. Environmental investigations began at Parcel D, including Parcel G, in 1988. A Final Remedial Investigation (RI) Report was completed in 1997, and a Revised Final Feasibility Study (FS) Report was completed in 2007. This ROD documents the final remedial action for Parcel G and does not include or affect any other sites at the facility.

[1] **Bold blue text** identifies detailed site information available in the Administrative Record and listed in the References Table (Attachment 3). This ROD is also available on CD whereby **bold blue text** serves as a hyperlink to reference information. The excerpts referenced by the hyperlinks are part of the ROD. The hyperlink will open a text box at the top of the screen. A blue box surrounds applicable information in the hyperlink. To the extent there may be any inconsistencies between the referenced information attached to the ROD via hyperlinks and the information in the basic ROD itself, the language in the basic ROD controls.

1.1 SELECTED REMEDY

The CERCLA remedial action selected in this ROD is necessary to protect the public health, welfare, and the environment from actual or potential releases of contaminants from the site. The selected remedial action for Parcel G addresses metals (arsenic, lead, and manganese) and polycyclic aromatic hydrocarbons (PAH) in soil, volatile organic compound (VOC) vapors and several metals (chromium VI and nickel) from groundwater in the A-aquifer, and radionuclides in structures (such as buildings) and in soil. The remedy consists of excavation and off-site disposal, durable covers, and institutional controls (IC) to address soil contamination; treatment of VOCs with biological substrate or zero-valent iron (ZVI), groundwater monitoring, and ICs to address groundwater contamination; and surveying, decontaminating, and removing radiologically impacted structures and soil.

The selected remedial action is protective of human health and the environment, complies with federal and state statutes and regulations that are applicable or relevant and appropriate to the remedial action, and is cost-effective. The selected remedial action uses permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable and satisfies the statutory preference for remedies employing treatment that reduces the toxicity, mobility, or volume of hazardous substances, pollutants or contaminants as a principal element. A statutory review will be conducted within 5 years after the initiation of remedial action to ensure that the remedy is protective of human health and the environment.

1.2 DATA CERTIFICATION CHECKLIST

The following information is included in Section 2 of this ROD. Additional information can be found in the Administrative Record file for this site:

- Chemicals of concern (COC) and their concentrations (Sections 2.3 and 2.5).
- Baseline risk represented by the COCs (Section 2.5).
- Remediation goals established for COCs and the basis for these goals (Sections 2.5 and 2.7).
- Principal threat wastes (Section 2.6).
- Current and reasonably anticipated future land use assumptions and current and potential future beneficial uses of groundwater (Section 2.4).
- Potential land and groundwater use that will be available at the site as a result of the selected remedy (Section 2.9.3).

- Estimated capital costs, annual operation and maintenance (O&M), and total present-worth costs; discount rate; and the number of years over which the remedy cost estimate is projected (Table 6).

- Key factors that led to selecting the remedy (for example, a description of how the Selected Remedy provides the best balance of tradeoffs with respect to the balancing and modifying criteria, highlighting criteria key to the decision) (Section 2.9.1).

If contamination posing an unacceptable risk to human health or the environment is discovered after execution of this ROD, the Navy will undertake all necessary actions to ensure continued protection of human health and the environment.

1.3 AUTHORIZING SIGNATURES

This signature sheet documents the Navy's and EPA's co-selection of the remedy in this ROD. This signature sheet also documents the State of California's (DTSC and Water Board) concurrence with this ROD.

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Base Realignment and Closure Environmental Coordinator
Base Realignment and Closure Program Management
Office West
Department of the Navy

2/05/09
Date

Mr. Michael M. Montgomery
Assistant Director of Federal Facilities
and Site Cleanup Branch, Region 9
U.S. Environmental Protection Agency

2/18/09
Date

Mr. Daniel E. Murphy, P.E.
Supervising Engineer
Brownfields and Environmental Restoration Program
California Environmental Protection Agency
Department of Toxic Substances Control

2/18/9
Date

Mr. Bruce H. Wolfe
Executive Officer
California Environmental Protection Agency
San Francisco Bay Regional Water Quality Control Board

2/18/09
Date

2. DECISION SUMMARY

2.1 SITE DESCRIPTION AND HISTORY

HPS is located in southeastern San Francisco on a peninsula that extends east into San Francisco Bay (see Figure 1). HPS consists of 866 acres: 420 acres on land and 446 acres under water in the San Francisco Bay. In 1940, the Navy obtained ownership of HPS for shipbuilding, repair, and maintenance activities. After World War II, activities at HPS shifted to submarine maintenance and repair. HPS was also the site of the Naval Radiological Defense Laboratory (NRDL). HPS was deactivated in 1974 and remained relatively unused until 1976. Between 1976 and 1986, the Navy leased most of HPS to Triple A Machine Shop, Inc., a private ship repair company. In 1987, the Navy resumed occupancy of HPS.

Because past shipyard operations left hazardous substances on site, HPS property was placed on the National Priorities List in 1989 pursuant to the CERCLA as amended by the SARA. In 1991, HPS was designated for closure pursuant to the Defense Base Closure and Realignment Act of 1990. Closure activities at HPS involve conducting environmental remediation and making the property available for nondefense use.

Parcel D, which includes about 98 acres in the central portion of the shipyard (see Figure 1), was formerly part of the industrial support area and was used for shipping, ship repair, and office and commercial activities. The docks at Parcel D were formerly part of the industrial production area. Portions of Parcel D were also used by NRDL.

Parcel G(1) is located within the central portion of the former 98-acre Parcel D; the rest of former Parcel D is divided into Parcel D-2, Parcel UC-1, and Parcel D-1 (the remainder of Parcel D) (see Figure 2). In addition, a small area perpendicular to H Street (see notched area in Figure 1) has been added to Parcel G (see Figure 2) so that the boundary is now straight along H Street. This division supports the potential early transfer of Parcel G to the City and County of San Francisco.

The original redevelopment plan developed by the San Francisco Redevelopment Agency in 1997 divided Parcel G into reuse areas. The reuse areas include educational/cultural, mixed use, open space, and industrial reuse. To facilitate discussion of all areas of the parcel in the context of contamination and cleanup issues - the area was divided into redevelopment blocks. Figures 3 and 4 present the planned reuses and redevelopment blocks and the associated **Installation Restoration (IR) sites(2)** that are within Parcel G. As shown, the redevelopment blocks (and associated reuses) on Parcel G are 29 (educational/cultural), 30A (mixed use), 30B (industrial), 37 (industrial), 38 (industrial), 39 (open space), and DOS-1 (open space).

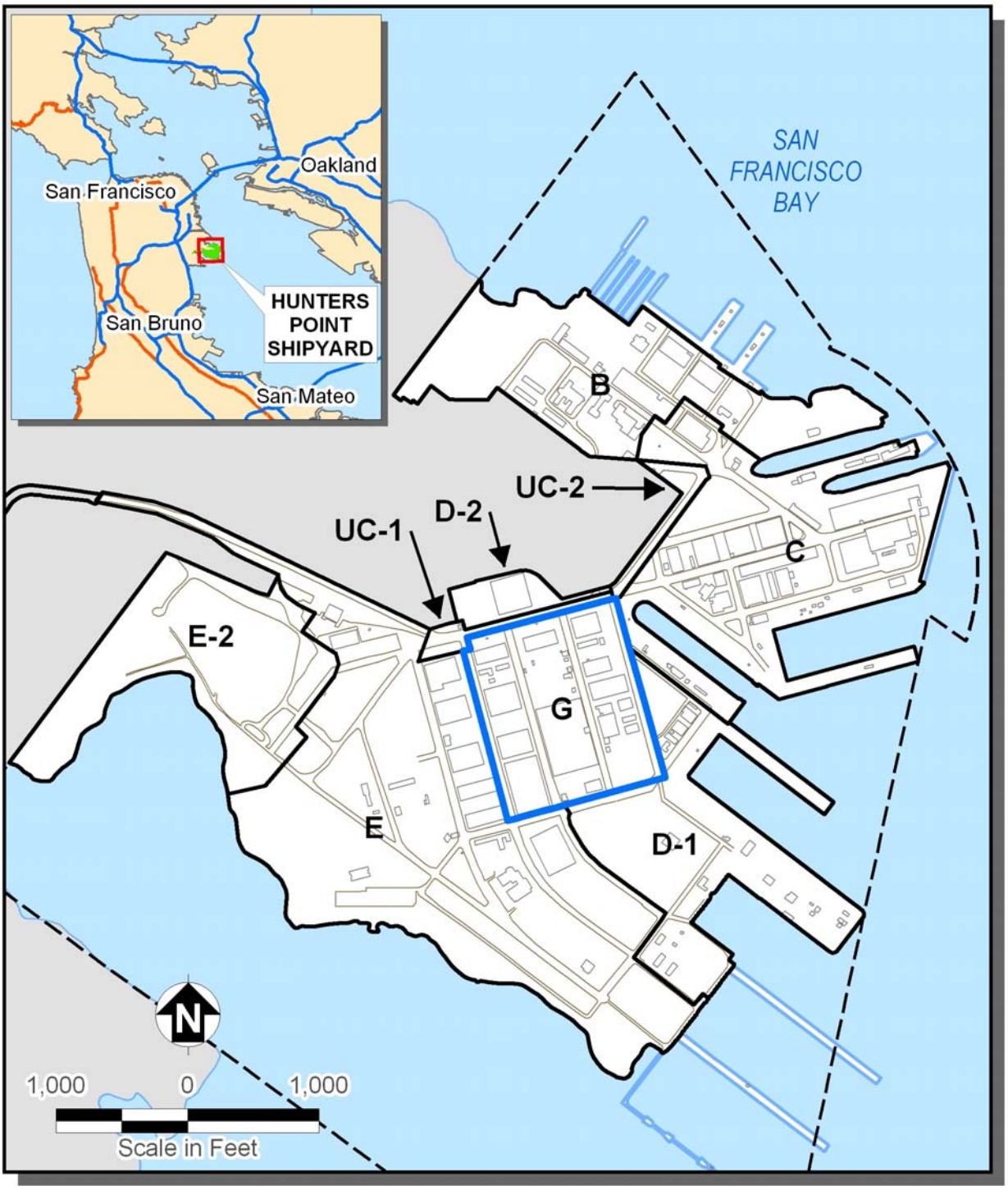


Figure 1. Facility Location Map with the Original Boundary of Parcel D

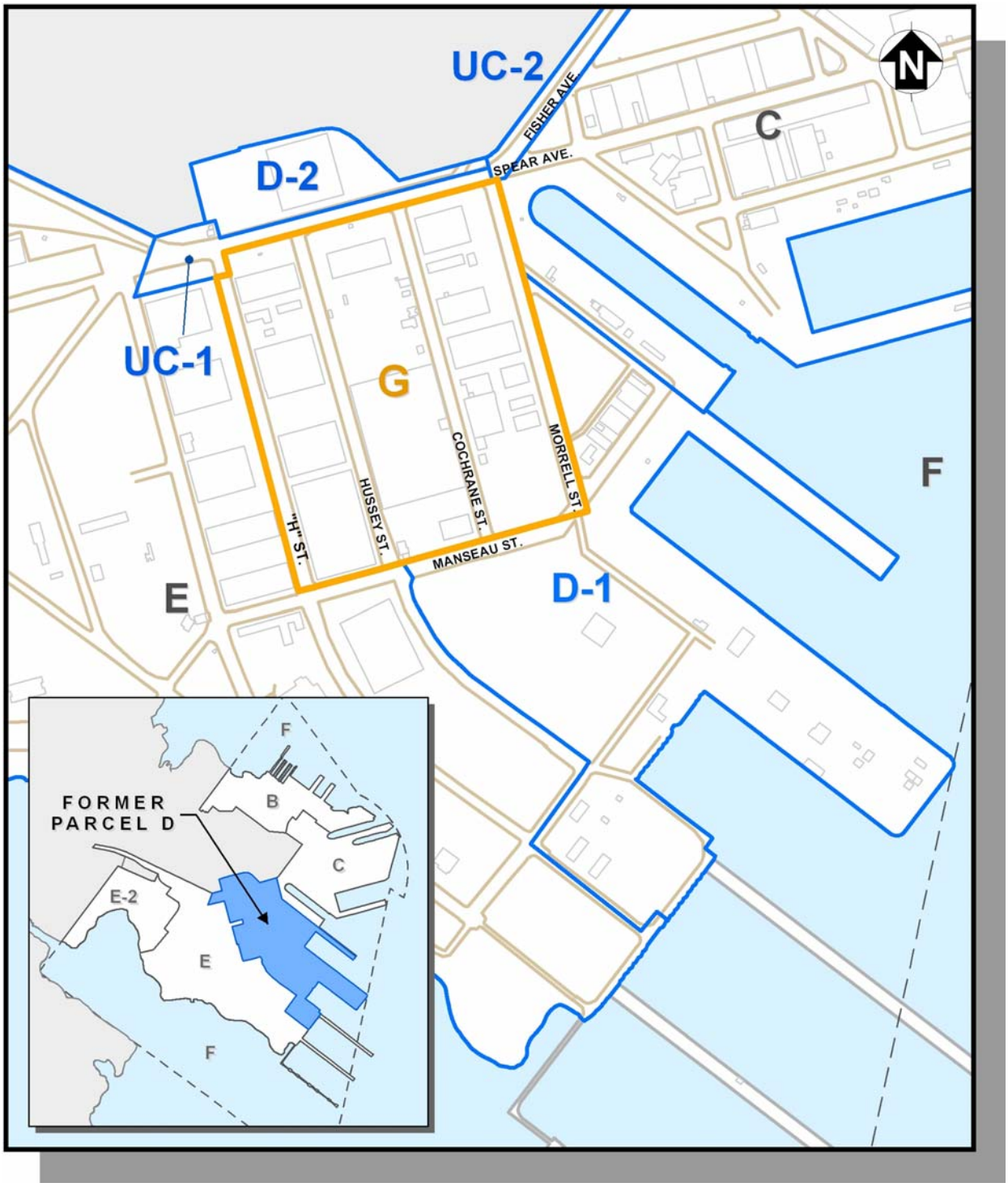


Figure 2. Parcel G Location Map

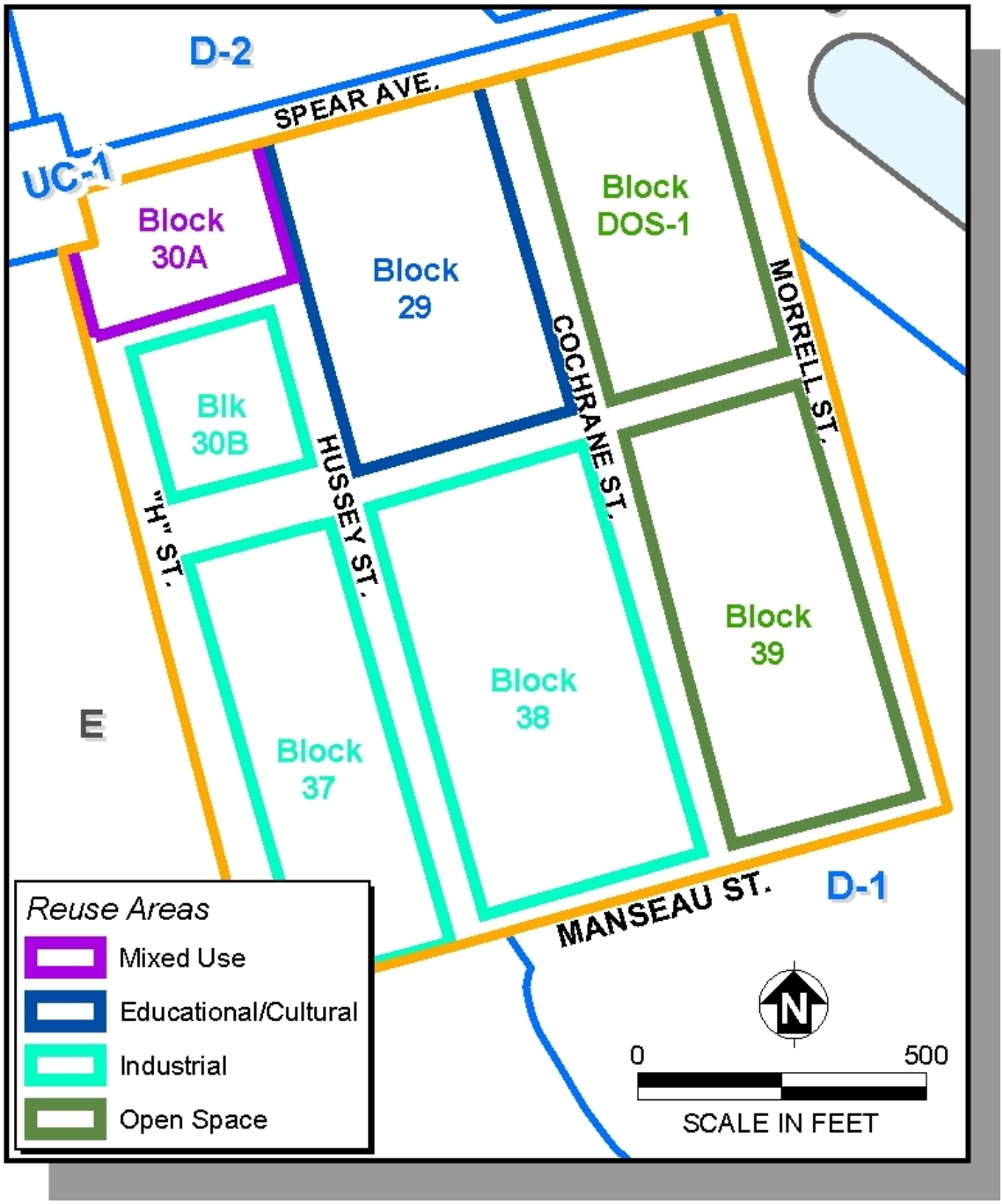


Figure 3. Reuse Areas and Associated Redevelopment Blocks

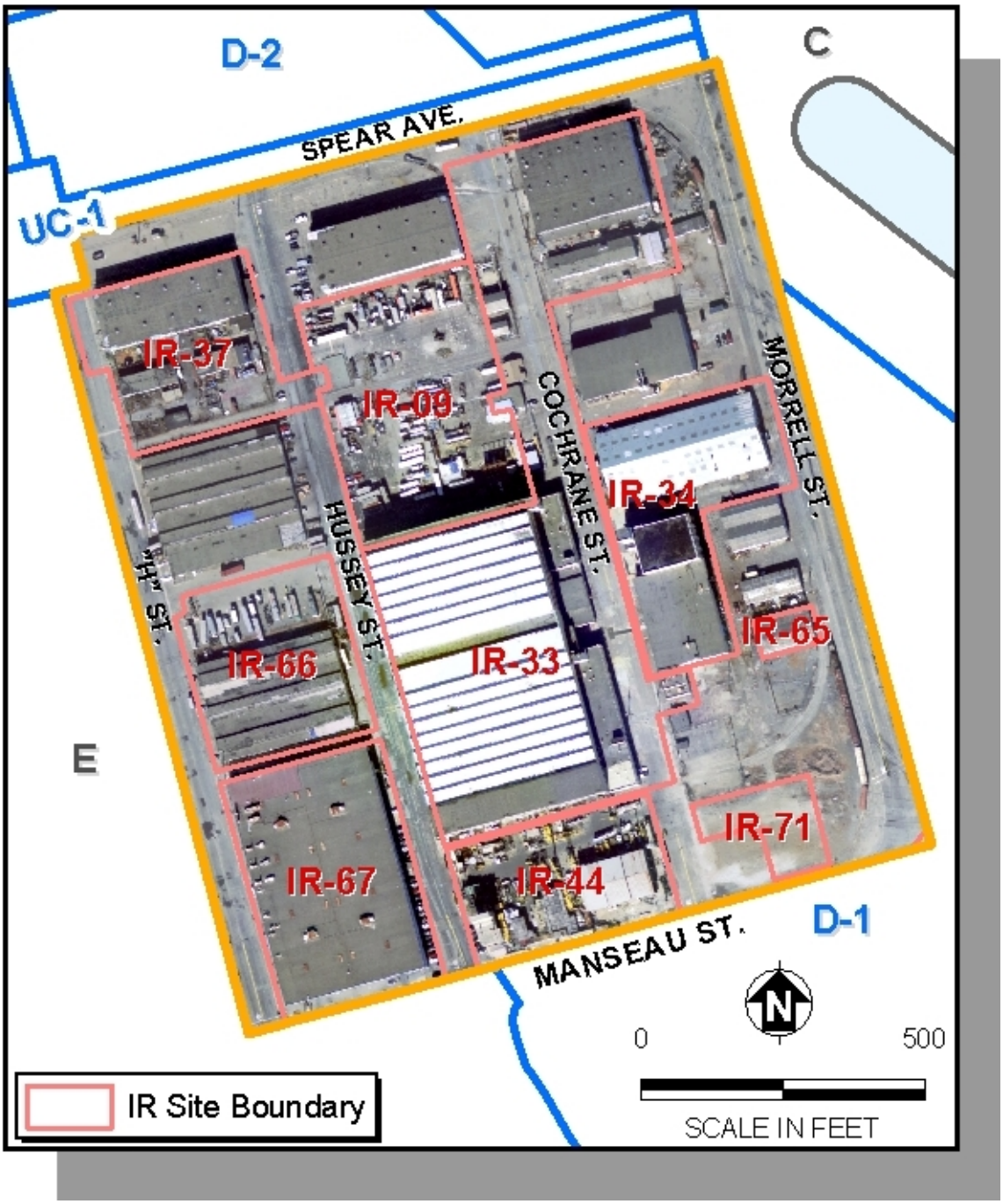


Figure 4. IR Sites

2.2 SITE CHARACTERISTICS

Parcel G consists of flat lowlands that were constructed by placing borrowed fill material from various sources, including crushed serpentinite bedrock from the adjacent highland and dredged sediments with surface elevations between 0 to 10 feet above mean sea level. The serpentinite bedrock and serpentine bedrock-derived fill material consist of minerals that naturally contain asbestos and relatively high concentrations of arsenic, manganese, nickel, and other metals.

The **hydrostratigraphic units**(3) present at Parcel G are the same as at Parcel D: the A-aquifer, the aquitard zone, the B-aquifer, and a bedrock water-bearing zone. Groundwater beneath Parcel G includes the shallow A-aquifer and the deeper B-aquifer; groundwater is not currently used for any purpose at Parcel G. Groundwater in the A-aquifer is not suitable as a potential source of drinking water. Groundwater in the B-aquifer has a low potential as a future source of drinking water.

Groundwater flow patterns at Parcel G are complex because they are potentially affected by (1) a groundwater sink located in adjacent Parcel E; (2) a groundwater mound located near the western boundary of Parcel G (beneath IR-33, IR-44, IR-66, and IR-67); (3) leaks of groundwater into former sanitary sewers or storm drains; (4) recharge from water supply lines; and (5) tides in the Bay. Most groundwater at Parcel G flows toward the Bay, except in the western portion of Parcel G, which historically has flowed away from the mound and toward the groundwater sink in Parcel E, where groundwater elevations are below mean sea level. The sink is believed to have been caused by leaks of groundwater into sanitary sewer lines, which were then pumped off site to the local publicly owned treatment works, thereby lowering groundwater levels in the area. Flow patterns continue to change now that the pumping has been discontinued and as sewer and storm drain lines are removed throughout HPS.

Parcel G ecology(4) is limited to those plant and animal species adapted to the industrial environment. Viable terrestrial habitat is inhibited at Parcel G because nearly all of the ground surface is paved or covered by structures. No threatened or endangered species are known to inhabit Parcel G or its immediate vicinity.

Nearly all of Parcel G is covered with buildings or pavement. A series of storm drains and sanitary sewer lines beneath the parcel have been recently removed. Figure 5 shows these site characteristics for Parcel G.

2.3 PREVIOUS INVESTIGATIONS

Potential contamination at Parcel G is associated with metals and PAHs in soil, metals and VOCs in groundwater, and radiologically impacted structures and soil. Assessment of contamination and risk for Parcel G is based on the Final Revised FS Report for Parcel D, (November 30, 2007) including the revised human health risk assessment (HHRA), and the radiological addendum to the FS Report. The Revised FS Report for Parcel D considered new information associated with several cleanup actions completed within Parcel G and at other adjacent parcels at HPS. Both the FS and HHRA activities are detailed in the Final Revised FS Report for Parcel D. The FS Report and radiological addendum (April 11, 2008) summarize the most recent information available on former Parcel D and provide the basis for the RODs for Parcel G and the other three parcels. Table 1 summarizes the previous studies, investigations, and removal actions conducted at Parcel D, including the area identified as Parcel G.

Figure 5. Parcel G Site Features

Table 1. Previous Investigations and Removal Actions

Previous Investigation/ Removal Action*	Date	Investigation/Removal Action Activities
Investigations and Studies		
Preliminary Assessment (PA)	1990	The PA for Parcel D involved record searches, interviews, and limited field investigations. The PA report concluded that portions of Parcel D, including areas within the new Parcel G, warranted further investigation because of the potential for contamination of soil and groundwater from past site activities.
Site Inspection (SI)	1994	Evaluated whether contamination was present and whether a release to the environment had occurred, evaluated each site for inclusion in the Navy's IR program, and eliminated sites that posed no significant threats to public health or the environment. Based on the results of the SI, all 12 sites within Parcel D, including utilities, were recommended for inclusion in RI activities.
Remedial Investigation	1988-1997	Site conditions were assessed through literature searches; interviews with former on-site employees; geophysical, radiological, and aerial map surveys; installation of soil borings and monitoring wells; and aquifer testing. The following **samples**(5) were collected: 418 surface soil, 1,938 subsurface soil, 429 A-aquifer groundwater samples, 9 B-aquifer groundwater samples, 7 bedrock water-bearing zone groundwater samples, 185 HydroPunch groundwater samples, 77 water and sediment samples (from utility lines, sumps, and floor drains), 8 sandblast samples, 1 asbestos sample, 29 test pit samples, 2 floor scrape samples, and 2 underground storage tank samples. Samples were analyzed for one or a combination of the following chemicals: metals, VOCs, semivolatile organic compounds, pesticides and polychlorinated biphenyls, and petroleum-related products. Based on the RI results, all of Parcel D (except for IR-48 and IR-66) was recommended for further evaluation in an FS.
Feasibility Study	1996-1997	Results and analyses in the RI Report were used to identify, screen, and evaluate remedial alternatives and to define areas for proposed remedial action. Three different cleanup scenarios and associated cleanup goals were considered: cleanup to the industrial land use scenario (10^{-5} excess lifetime cancer risk [ELCR]); cleanup to the industrial land use scenario (10^{-6} ELCR); and cleanup to the residential land use scenario (10^{-6} ELCR). Each scenario also considered cleanup of soils representing a hazard index (HI) greater than 1 and lead concentrations greater than 1,000 milligrams per kilogram (mg/kg). Areas exceeding different cleanup goals for each reuse scenario and cleanup level were delineated, risk drivers were identified, and the extent of the cleanup areas were defined. Twenty IR sites had soil cleanup areas for industrial use (9 IR sites in Parcel G), and 23 IR sites had soil cleanup areas for residential use (9 sites in Parcel G). All soil cleanup areas exceeding at least one of the various cleanup criteria under each reuse scenario were identified.
Proposed Plan/Record of Decision	1997	The Proposed Plan invited the public to review and comment on the Preferred Alternative for addressing environmental contamination at Parcel D prior to the final remedy selection. The Draft ROD presented the following Selected Remedy: excavation and off-site disposal of soils based on the cleanup goals described in the proposed plan. Subsequent to the submittal of the draft ROD, the costs and environmental improvements associated with the selected soil remedy for Parcel D were reviewed by the Navy. Navy concerns about the level of risk reduction, cost effectiveness of the cleanup approach, and discussions with other members of the Base Realignment and Closure Cleanup Team resulted in further review of risk.
Risk Management Review (RMR) Process	1999	The RMR process was developed and conducted during a series of meetings held by the Navy and the regulatory agencies from January through April 1999. The process used various criteria and decision rules to reevaluate whether remedial actions were required at 19 of the 27 IR sites in Parcel D that were originally identified as requiring remedial actions for soil. After completion of the review, all sites fell into one of the following three categories: (1) sites that the team agreed no response action was required, (2) sites that the team agreed response action was required, and (3) sites that the team did not yet agree on the course of action. Based on the **RMR results**(6), the sites and chemicals requiring further evaluation and remedial action were revised.

Table 1. Previous Investigations and Removal Actions (Continued)

Previous Investigation/ Removal Action*	Date	Investigation/Removal Action Activities
Investigations and Studies (Continued)		
Groundwater Data Gaps Investigation	2002	A data gaps investigation was completed to provide additional understanding of the groundwater conditions underlying the parcel. Groundwater samples were collected and analyzed for various chemicals (including metals and VOCs), and results were used to further define the nature and extent of contamination in groundwater.
Historical Radiological Assessment (HRA)	2004	The HRA evaluated and designated sites as radiologically **impacted or non-impacted**(7). A radiologically impacted site is one that has the potential for radioactive contamination based on historical information, or is known to contain or have contained radioactive contamination. A non-impacted site is one, based on historical documentation or results of previous radiological survey information, where there is no reasonable possibility for residual radioactive contamination. Based on the results of the assessment, six buildings, one building site and the sewer and storm drains were identified as radiologically impacted at Parcel G.
Revised Feasibility Study	2007	Existing RI data were combined with new data collected after completion of the 1996 RI Report. The revised FS considered new information associated with several cleanup actions completed within Parcel D and at other adjacent parcels at HPS. New information considered and incorporated into the revised FS included (1) the widespread presence of metals in soil across Parcel D, (2) quarterly monitoring of groundwater since 2004, (3) updates to toxicity criteria used in the 1997 HHRA, and (4) the findings from removal actions conducted to address chemicals identified by a RMR process and radiological contaminants that were identified by the HRA. Data were summarized and evaluated to refine the site conceptual model, further define the nature and extent of contamination, assess potential risks based on existing site conditions, and develop and evaluate revised alternatives. Data evaluation included (1) a comparison of new and existing data with updated screening criteria, (2) a revised evaluation of groundwater beneficial uses and exposure pathways, and (3) a revised assessment of potential risk posed by exposure to soil and groundwater at Parcel D. Revised remedial action objectives (RAO) were developed, which included a risk range rather than specific concentrations for contaminants. Remedial alternatives were developed and a detailed and comparative analysis of alternatives was performed.
Radiological Addendum[2]	2008	The primary purpose of this addendum was to provide decision makers with the information necessary to select a final remedy for radiologically impacted buildings, former building sites, outdoor areas, and soils and piping associated with remediated storm drains and sanitary sewers. This was accomplished through the development and evaluation of appropriate remedial alternatives. After the screening of general response actions and process options, two remedial alternatives were identified: no action, and a combination of surveys, decontamination, excavation, disposal, and release. The two alternatives were analyzed against the nine criteria and against each other.
Proposed Plan	2008	The Proposed Plan invited the public to review and comment on the Preferred Alternatives for addressing environmental contamination at Parcel D prior to the final remedy selection.
Removal Actions		
Phase I and II Underground Storage Tank Removal Action	1991-1993	Nine underground storage tanks were removed and one closed in place.
Sandblast Grit Removal Action	1991-1995	A total of 4,665 tons of discarded sandblast grit was removed throughout HPS.
Pickling and Plate Yard Removal Action	1994-1996	Contaminated equipment and residue were removed at IR-09.
Exploratory Excavation Removal Action	1996-1997	Stained soil, asphalt, and concrete were removed from three IR sites (IR-33, IR-37, and IR-70) within Parcel G.

Table 1. Previous Investigations and Removal Actions (Continued)

Previous Investigation/ Removal Action*	Date	Investigation/Removal Action Activities
Removal Actions (Continued)		
Storm Drain Sediment Removal Action	1996-1997	A total of 1,200 tons of contaminated sediment was removed from storm drain lines and appurtenances.
Time-Critical Removal Action (TCRA)	2000-2001	A total of 81 cubic yards of soil was removed from several IR sites (IR-09, IR-37, and IR-65) within Parcel G.
Industrial Process Equipment Survey, Sampling, Decontamination and Waste Consolidation Action	2002	This action resulted in the removal of equipment and cleanup of buildings, steam lines, fuel pipelines, and impacted soil in areas within Parcel G.
Radiological Time-Critical Removal Action	2001-ongoing	In 2001, soil impacted by a cesium-137 spill was removed from Building 364 and the surrounding area. Radiologically impacted buildings, former building sites, outdoor areas, and soils and piping associated with remediated storm drains and sanitary sewers have been surveyed and in some cases removed. Additional radiological investigation and remediation are ongoing at radiologically impacted sites throughout Parcel G. Each of the radiologically impacted sites will be investigated through the CERCLA process. If the final report of the site investigation is approved by the stakeholders and the site is determined to require no further action, the classification of "radiologically impacted" may be removed. The radiologically impacted classification will not be removed from sites that are addressed in an approved CERCLA containment remedy.
Storm Drain and Sanitary Sewer Removal Action	2007-ongoing	This removal action included radiological investigation and removal of storm drains and sanitary sewers, and is anticipated to be completed in 2008.
Groundwater Treatability Study	2008-ongoing	A groundwater treatability study using zero-valent iron (ZVI) injection points is currently being conducted in several locations within Parcels G and D-1. This study is expected to be completed in spring 2009.

Notes:

1 The documents listed are available in the Administrative Record and provide detailed information used to support remedy selection at Parcel G.

2 After the Radiological Addendum became final, Building 401 and an additional site within Building 439 were found to require radiological remediation and were added to the areas to be remediated.

Although a number of removal actions have been completed within Parcel G, chemical contamination remains. Based on recent studies and investigations, the sources and extent of the remaining contamination in soil and groundwater have been well characterized. Industrial activities have resulted in elevated concentrations of **PAHs(8)** and **lead(9)** in soil (Figure 6). Elevated concentrations of metals other than lead, such as arsenic and manganese, may be related to the bedrock fill quarried to build the shipyard in the 1940s. The fill may have contained elevated concentrations of select metals from the bedrock. Therefore, the Navy has worked with the regulatory agencies to identify remedial alternatives that address metals in soil, regardless of their source.

The Navy also identified the former Pickling and Plate Yard (IR-09) within Parcel G as the source of the elevated concentrations of **chromium VI and possibly nickel(10)** in groundwater (Figure 7). Cultural resource issues have delayed the removal of the pickling and plating sump. Use of solvents during industrial operations also released **VOCs(11)** into groundwater (IR-71). The plume configuration presented in Figure 7 is based on groundwater monitoring information collected before 2004. Recent findings from a treatability study and ongoing groundwater monitoring suggest that there has been a reduction in the contaminant and plume extent since 2004. This reduction will result in a reconfiguration of the plumes presented on Figure 7. The current groundwater sample data will be reviewed during the remedial design (RD) to focus the groundwater remediation activities.

The Navy identified **radiologically impacted sites(12)**, including buildings, equipment, and infrastructure at Parcel D (including areas within Parcel G) associated with the former use of general radioactive materials and decontamination of ships used during atomic weapons testing in the South Pacific. Radiologically impacted buildings (351, 351A, 364, 365, 366/351B, 401, 408, and 411); former building sites (317); and storm drains and sanitary sewers are all of concern in Parcel G (Figure 8). In addition, a focused area in Building 439 was found to require remediation during the radiological investigation. The Navy decided to conduct a time-critical removal action (TCRA) to address potential radioactive contamination in buildings, former building sites, storm drains, and sanitary sewers at Parcel G. The TCRA involves (1) surveying radiologically impacted structures and former building sites; (2) decontaminating (and demolishing if necessary) buildings and former building sites; (3) excavating radiologically impacted storm drain and sanitary sewer lines; and (4) screening, separating, and disposing of radioactively contaminated excavated materials at an off-site, low-level radioactive waste facility.

Activities for the TCRA at Parcel G began in 2006. The Navy excavated more than 47,000 cubic yards of material and disposed of about 5,600 cubic yards off site as low-level radioactive waste. As part of the TCRA, the Navy removed more than 21,800 linear feet of storm drain and sanitary sewer lines for radiological contamination in Parcel G. Removal actions and backfill has been completed for approximately 80% of the storm drain and sanitary sewer trench units. Ongoing TCRA activities will continue post ROD until release criteria have been met. Upon completion of the storm drain and sanitary sewer trench TCRA, Survey Unit Package Reports will be completed and distributed to the BCT and CDPH for all trench units.

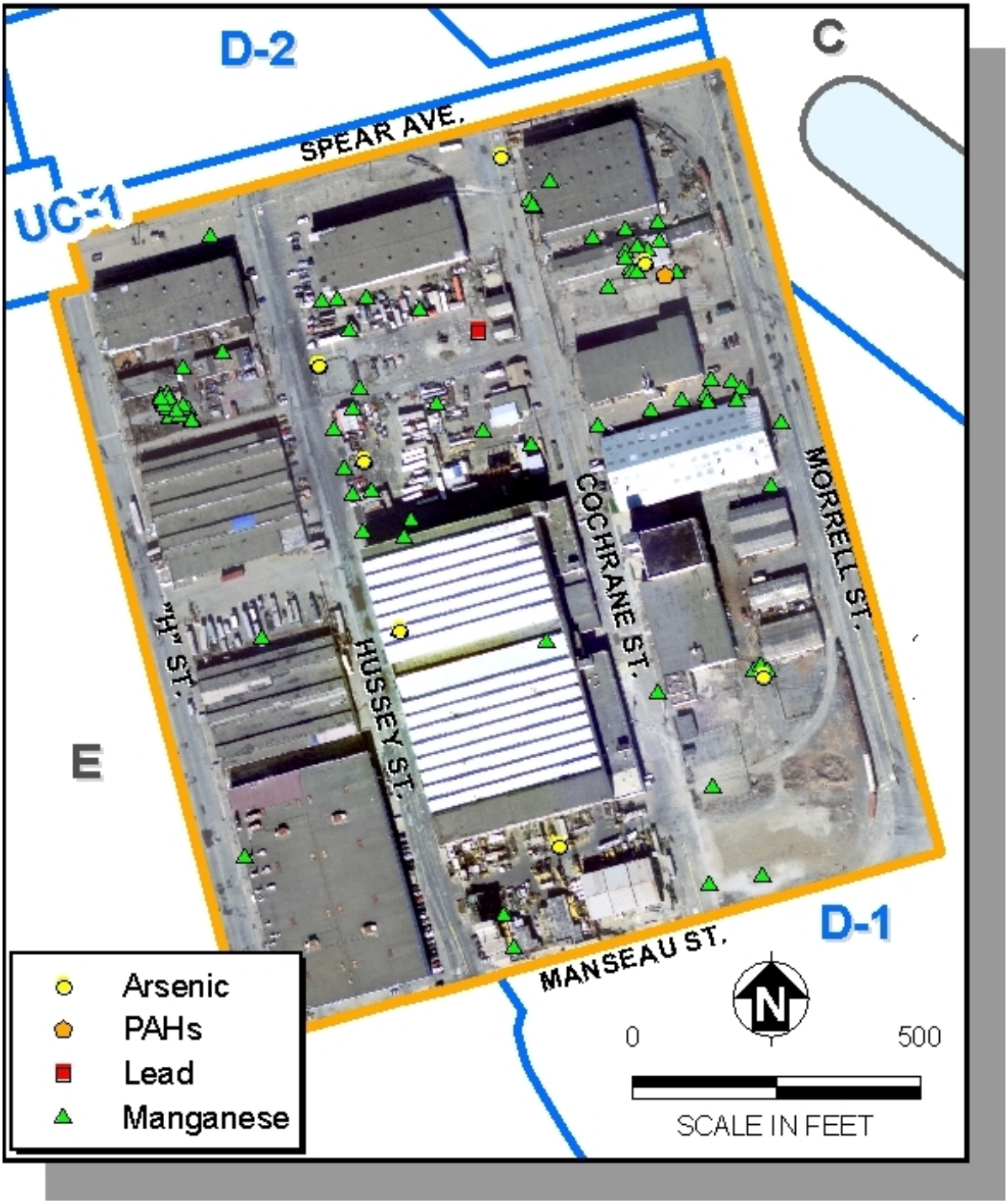


Figure 6. Chemicals in Soil above Remedial Goals

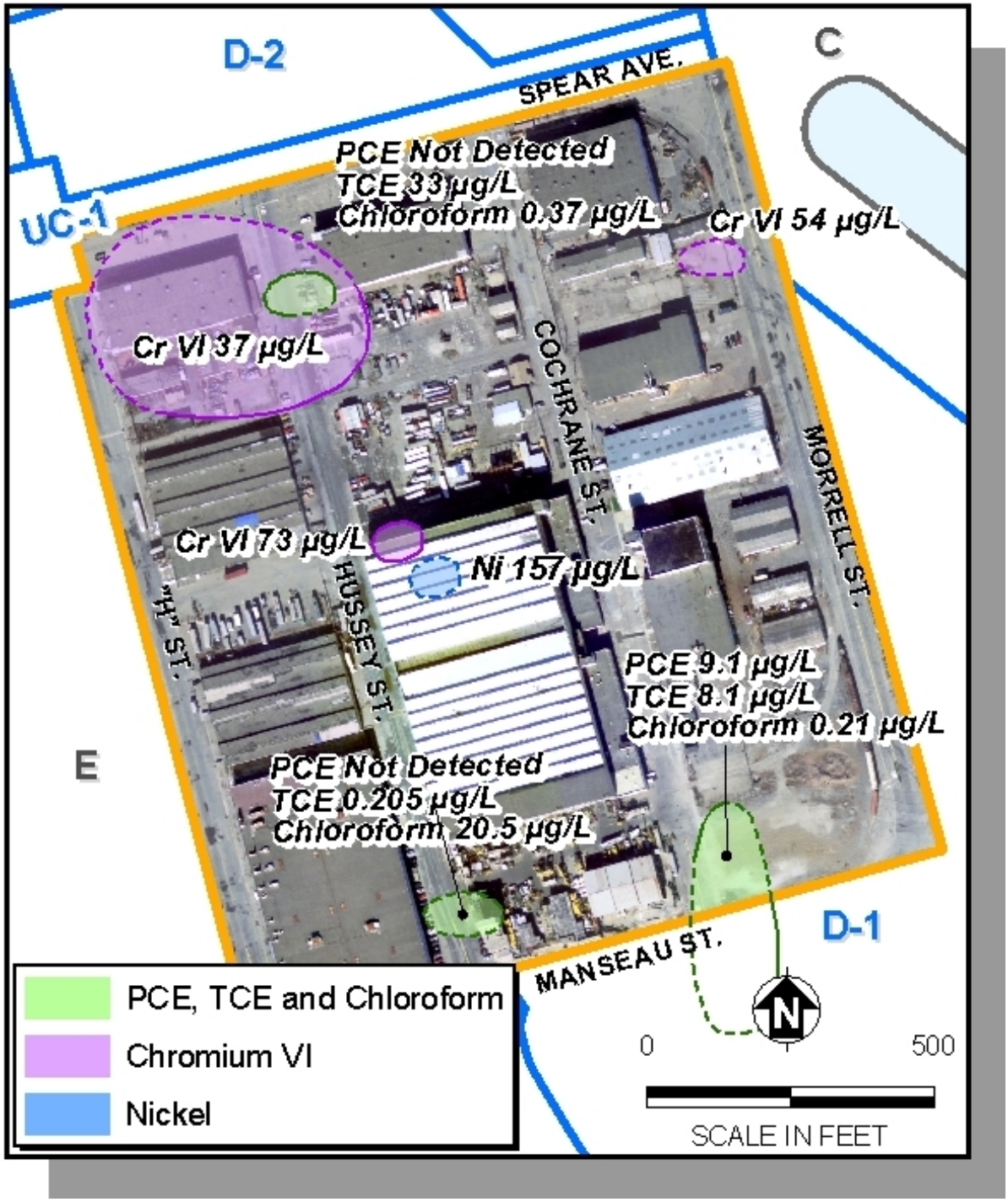


Figure 7. Chemicals in Groundwater above Remedial Goals

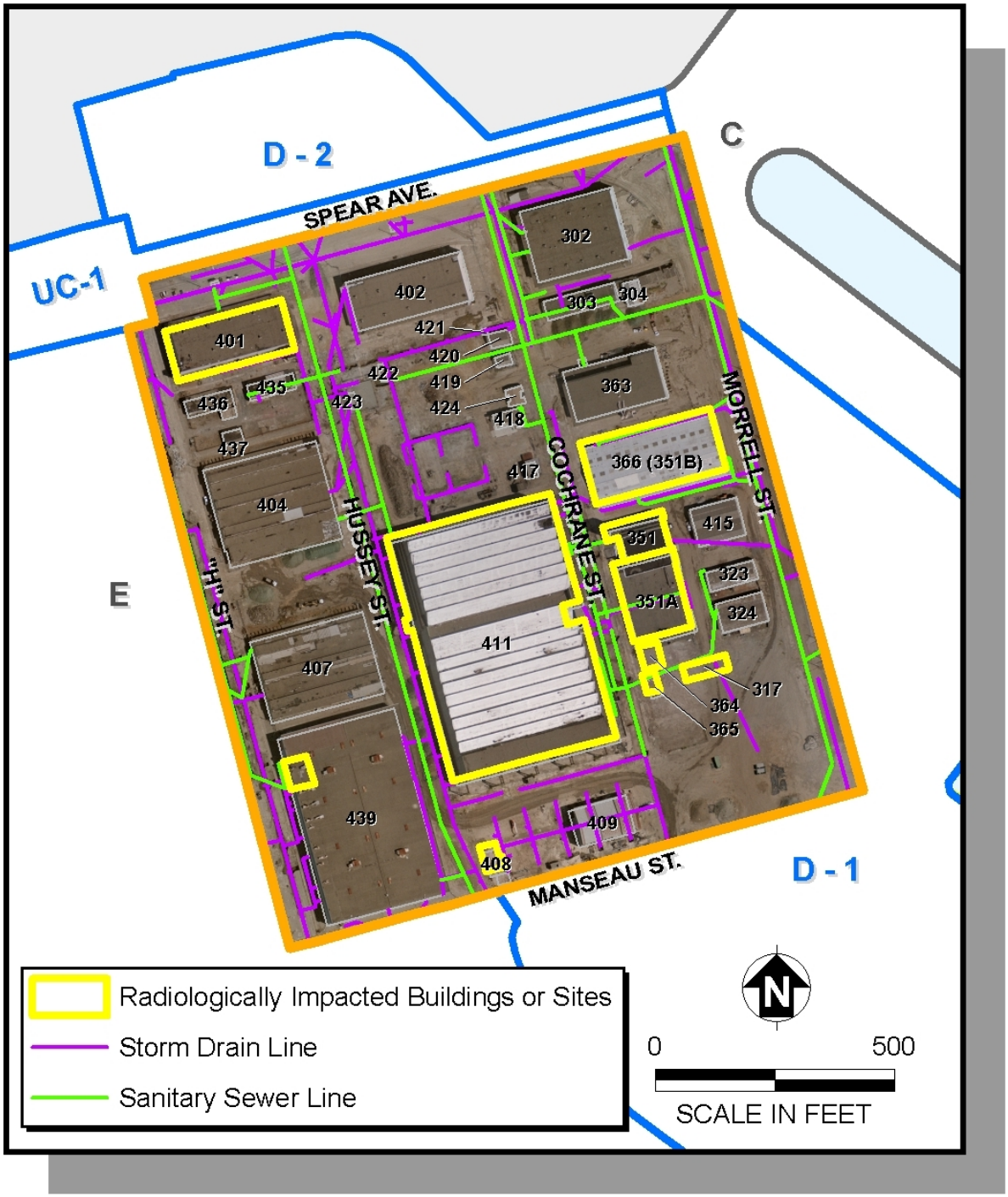


Figure 8. Radiologically Impacted Areas

As of January 2009, 90% of the radiological surveys, remediation, and draft preparation of the final status surveys are complete in all Parcel G Buildings, to include Buildings 351, 351A, 366, 401, 408, 411, and 439. Following building surveys, Buildings 364, 365, and 408 were demolished, and have had their building footprints surveyed and remediated. Materials from Buildings 364, 365, and 408 have had their construction debris appropriately radiologically and chemically screened, and transported to the appropriate disposal facility. TCRA activities continue in the localized area surrounding former Building Sites 364, 365, and 317. Final Status Survey Reports are currently being produced for all radiologically impacted buildings and sites in Parcel G for upcoming distribution.

All Final Status Survey Reports and Survey Unit Package Reports for Parcel G will be summarized in the Parcel G removal action completion report (RACR), which will be reviewed and approved by the BRAC Cleanup Team (BCT) and the California Department of Public Health (CDPH). Although the TCRA may not be completed by the time the ROD is signed, the TCRA is intended to achieve cleanup goals that are identical to the RAOs identified in this ROD. In the event that the TCRA does not achieve its cleanup goals, cleanup will continue in accordance with the remedial action selected in this ROD until the RAOs are achieved.

2.4 CURRENT AND POTENTIAL FUTURE SITE USES

The reuses defined in the San Francisco Redevelopment Agency's 1997 Reuse Plan were evaluated by the following exposure scenarios: residential (mixed-use and research and development blocks), industrial (industrial and educational/cultural blocks), and recreational (open space block). The groundwater in the A aquifer, as discussed in the Feasibility Study, is not suitable for use as (**drinking water**[13]). Exposures to the A aquifer were evaluated based on indoor air inhalation and transport to the Bay. The groundwater in the B-aquifer was evaluated as a drinking water source, though it has low potential for use as drinking water.

2.5 SUMMARY OF SITE RISKS

The source of potential contamination at Parcel G is mostly attributed to industrial activities by the Navy or other tenants, except for several metals such as arsenic, manganese, and nickel found at levels consistent with ambient concentrations in the local serpentine bedrock. Most of the contamination is from identified IR sites with associated spills and leaks. The primary fate and transport mechanisms include root uptake, wind suspension, volatilization, and the migration of contaminants via infiltration and percolation into subsurface soil and groundwater. A general conceptual site model (CSM) for Parcel G is provided on Figure 9. Based on the CSM, Parcel G was evaluated for potential risks to human health and the environment in the Revised FS Report and its radiological addendum. The risk assessment results can be applied by focusing on the redevelopment blocks within the parcel. Results of the HHRA are presented in Section 2.5.1.

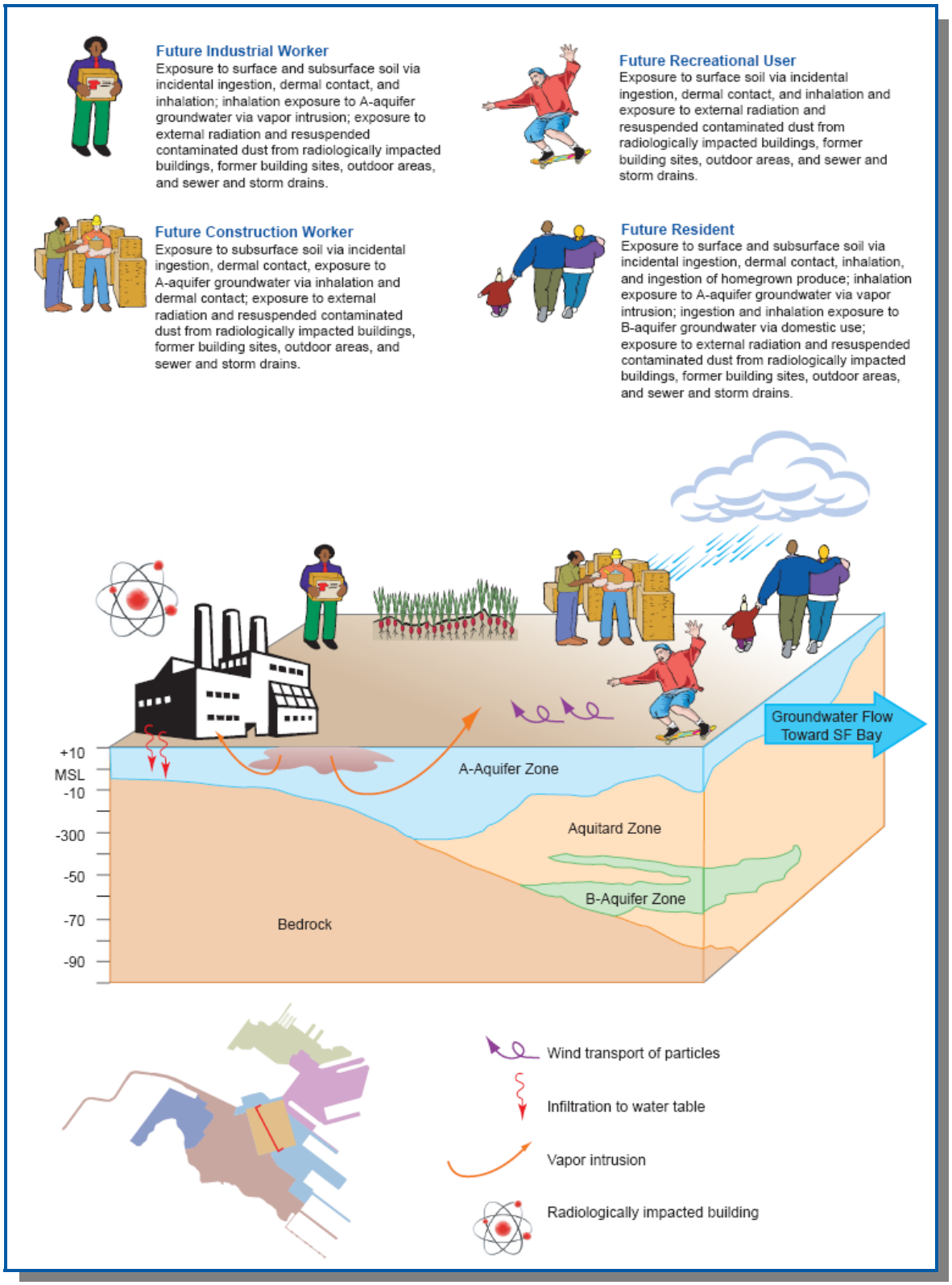


Figure 9. Conceptual Site Model

During the RI, the Navy concluded that limited viable habitat is available for terrestrial wildlife at Parcel D (and thus also Parcel G) because most of the site is covered with pavement. Therefore, ecological risk associated with exposure to soil was not evaluated further. Furthermore, even if the future reuse of Parcel G was to change to open space/recreational, soil covers would protect terrestrial wildlife from risks due to exposure to contaminants left below the cover. A screening evaluation of groundwater was conducted in the Revised FS Report to evaluate potential risks to aquatic wildlife in San Francisco Bay. Results of that evaluation are summarized in Section 2.5.2.

2.5.1 Human Health Risk Assessment

Based on a **human health CSM(14)**, a quantitative **HHRA(15)** was completed for Parcel D (including Parcel G) for exposure to surface soil, subsurface soil, groundwater, and vapor intrusion via groundwater. Potential **cancer risks and noncancer hazards(16)** were calculated based on reasonable maximum exposure (RME) assumptions recommended by EPA and DTSC. These assumptions are based on a reasonable maximum exposure rather than an average or medium-range exposure assumption, and provide a conservative and protective approach that estimates the highest health risks that are reasonably expected to occur at a site. Actual risks from exposures to chemicals in soil and groundwater at Parcel G are likely to be lower.

To help characterize cancer risk, the Navy adopted a conservative approach at Parcel G and evaluated action for risks greater than 10^{-6}. For known or suspected carcinogens, acceptable exposure levels are generally concentration levels that represent an excess upper bound lifetime cancer risk to an individual between 10^{-4} (a 1 in 10,000 chance of developing cancer) and 10^{-6} (a 1 in 1,000,000 chance of developing cancer) using information on the relationship between dose and response. The 10^{-6} risk level is used as the point of departure for determining cleanup goals for alternatives when Applicable or Relevant and Appropriate Requirements (ARARs) are not available or are not sufficiently protective because of the presence of multiple contaminants at a site or multiple pathways of exposure.

Both **total and incremental risks(17)** were evaluated for exposure to soil. For the total risk evaluation, all detected chemicals, including naturally occurring metals from the serpentine bedrock-derived fill material, were included as chemicals of potential concern regardless of their concentration. Only the essential nutrients calcium, magnesium, potassium, and sodium were not included as chemicals of potential concern. The total risk evaluation provides an estimate of the risks posed by chemicals at the site, including those present at concentrations at or below ambient levels. For the incremental risk evaluation, the above essential nutrients were excluded as soil chemicals of potential concern, as well as the detected metals with maximum measured concentrations below the Hunters Point ambient levels. The incremental risk evaluation provides an estimate of risks posed by metals present at the site that are above the estimated ambient levels.

Potential unacceptable risks include cancer risks and noncancer hazards for future receptors from exposure to soil or groundwater as discussed below. Potential unacceptable risk is defined as an excess lifetime cancer risk of greater than 10^{-6} or a segregated hazard index greater than 1 as calculated by the incremental risk evaluation.

Based on the **revised HHRA results**[18] for soil, chemical cancer risks are greater than 10^{-6} at Redevelopment Blocks 29, 30A, 38, and 39 within Parcel G (see Table 2). Noncancer hazards were less than 1 for all redevelopment blocks evaluated for industrial risk. Redevelopment Block 30A, evaluated against the more stringent residential exposure scenario, had a noncancer hazard above 1 (see Table 2).

The risk assessment for groundwater estimated cancer risks greater than 10^{-6} or noncancer hazards greater than 1 in distinct areas within all seven redevelopment blocks within Parcel G where data are available (see Table 2). Potential risks from groundwater are based on breathing VOC vapors in indoor air that may have migrated through the subsurface from groundwater in the A-aquifer. The COCs in groundwater from the vapor intrusion pathway are benzene, carbon tetrachloride, chloroform, methylene chloride, naphthalene, tetrachloroethene, trichloroethene, and xylenes. In addition, the HHRA results for groundwater show that the risk from exposure to the A-aquifer groundwater via dermal exposure and inhalation to the construction workers exceeds the cancer risk threshold of 10^{-6} in areas with elevated concentrations of the COCs. These COCs from this exposure pathway are arsenic, benzene, naphthalene, tetrachloroethene, and xylenes. The B-aquifer was evaluated for all chemicals of potential concern through the domestic use of groundwater pathway. No unacceptable risk was found from this exposure scenario; therefore, no COCs are associated with the B-aquifer.

Table 2. Cancer Risks and Noncancer Hazards

Parcel	Redevelopment Block	Exposure Scenario	Cancer Risk[a]		Noncancer HI
			Chemical	Radiological[b]	
Soil					
G	30B	Industrial	2×10^{-7}	NA	< 1
	37	Industrial	4×10^{-8}	Not Estimated[c]	< 1
	38	Industrial	4×10^{-5}	2×10^{-4}	< 1
	29	Industrial	3×10^{-5}	NA	< 1
	DOS-1	Recreational	4×10^{-6}	NA	< 1
	39	Recreational	1×10^{-4}	4×10^{-5}	< 1
	30A	Residential	2×10^{-7}	1×10^{-6}	6
Groundwater			**Exposure Area[d]**	**Maximum Cancer Risk**	**Noncancer Risk (Total RME HI)**
G	29, 30A, 30B, 37, 38, 39, and DOS-1	Industrial	IR-33 Plume, IR-09, and IR-71 Plumes	1×10^{-4}	9

Notes:

a Listed risk value is maximum in each redevelopment block. These blocks and their associated reuses are based on the "Hunters Point Shipyard Redevelopment Plan." Reuse areas and development blocks may change in the future.

b Radiological risk from ongoing sewer and storm drain removal across Parcels G, D-2, UC-1, and D-1 was assessed at 5 x E-6.

c Risk was not estimated in the radiological addendum for the Building 439 site at the time of the radiological addendum.

d Maximum of the identified risk from all plumes.

NA Not applicable; no radiologically impacted areas or buildings were located in this block.

Additionally, radiological risk was calculated based on estimated concentrations of radiological contamination at radiologically impacted sites, using remediation goals for each radionuclide of concern. Actual calculated risk will be based on field measurements following receipt of final status survey results for each impacted site. **Radiological risks(19)** for soil and building structures are greater than 10^{-6} at Redevelopment Blocks 30A, 38, and 39 (see Table 2). Total and incremental risks were also calculated for radionuclides with Radium-226, the only naturally occurring radionuclide that affected the incremental risk calculation. However, the background concentration of Radium-226 in building materials was assumed to be zero.

Potential risks were primarily based on exposure to metals (arsenic, lead, and manganese) and PAHs in soil, VOC vapors and several metals (chromium VI and nickel) from groundwater in the A-aquifer, and radionuclides in structures (such as buildings) and soil. **Combined chemical and radiological risk(20)** was also summed to determine the overall potential risk to human health associated with a site.

The HHRA specifies the **assumptions and uncertainties(21)** inherent in the risk assessment process due to the number of samples collected or their location, the literature-based exposure and toxicity values used to calculate risk, and risk characterization across multiple media and exposure pathways. The effects of uncertainties are overestimation or underestimation of the actual cancer risk or HI. In general, the risk assessment process is based on the use of conservative (health-protective) assumptions that when combined, are intended to overestimate the actual risk.

2.5.2 Ecological Risk Assessment

As previously stated, the Navy concluded during the RI that limited viable habitat is available for terrestrial wildlife at Parcel D because most of the site is covered with pavement. Specifically, the RI concludes that "Parcels C and D are almost entirely paved except for small pockets of vegetation which are not considered suitable habitat for animal life." In addition, the shoreline habitat is not a concern for Parcel G because of its inland location. Therefore, ecological risk associated with exposure to soil was not evaluated further in the Revised FS Report.

The Navy completed a screening evaluation of **surface water quality(22)** to assess potential exposure by aquatic wildlife to groundwater as it interacts with the surface water of San Francisco Bay. Results of the screening evaluation indicated two metals (**chromium VI and nickel(23)**) in groundwater may pose a potential risk to aquatic wildlife. However, the current areas within Parcel G where chromium VI and nickel are present are not in close proximity to the nearest discharge point on the Bay. Groundwater monitoring data indicated metals migrate at a much slower rate than groundwater flows; thus, discharge of metals to the Bay is not imminent.

Chemicals present in both the A-aquifer and the B-aquifer groundwater at Parcel G were evaluated to assess potential **environmental impacts to the Bay(24)**. This evaluation was completed as part of the derivation of **trigger levels(25)** for chemicals that present a potential impact to the Bay. Based on the evaluation results, chromium VI and nickel in the A-aquifer were identified as COCs that originated in Parcel G.

Chromium VI(26) was identified as a COC because it was detected at concentrations consistently exceeding surface water criteria in both plumes and in individual wells in the A-aquifer. The locations of the elevated chromium VI concentrations are mostly near IR-09 where there was a known source of chromium from pickling and plating operations.

Nickel was identified as a COC because it was detected in a single well at concentrations consistently exceeding surface water criteria, and historical detections of nickel in an adjacent well also exceeded surface water criteria. These nickel concentrations indicate a localized area near IR-09 of nickel-impacted groundwater. The source of the nickel is not known.

2.5.3 Basis for Response Action

The response action selected in this ROD is necessary to protect the public health, welfare, or the environment from actual or potential releases of hazardous substances into the environment. The Navy, in partnership with EPA, DTSC, and the Water Board, considered all pertinent factors in accordance with CERCLA and NCP remedy selection criteria and determined remedial action is necessary to clean up **soil(27)**, **groundwater(28)**, and **radiologically impacted structures and soil(29)** at Parcel G. This determination was made because:

- Based on the HHRA results for soil, chemical cancer risks are greater than 10^{-6} at Redevelopment Blocks 29, 30A, 38, and 39 within Parcel G (see Table 2).
- Radiological risks for soil, building structures and sanitary/storm sewers are greater than 10^{-6} across Parcel G.
- Redevelopment Block 30A, evaluated against the more stringent residential exposure scenario, had a noncancer hazard above 1.
- The risk assessment for groundwater estimated cancer risks greater than 10^{-6} or noncancer hazards greater than 1 in distinct areas within all seven redevelopment blocks within Parcel G.
- Potential risks from groundwater are based on breathing VOC vapors in indoor air that may have migrated through the subsurface from groundwater in the A-aquifer.
- HHRA results for groundwater show that the risk from exposure to the A-aquifer groundwater via dermal exposure and inhalation to the construction workers exceeds the cancer risk threshold of 10^{-6} in areas with elevated concentrations of the COCs.

The concentrations of COCs for soil and groundwater requiring a response action are summarized in Table 3.

Radionuclides of concern(30) were identified by redevelopment block and by specific buildings within each block. There were a number of radiologically impacted buildings within Block 30A, Block 38, and particularly Block 39. Radionuclides of concern included cesium-137, cobalt-60, plutonium-239, radium-226, strontium-90, thorium-232, hydrogen-3, and uranium-235.

Table 3. Chemicals of Concern in Soil and Groundwater Requiring a Response Action

Exposure Scenario	Chemical of Concern	Soil		
		Maximum Detected Concentration	Remediation Goal	Frequency of Exceedance
Soil (mg/kg)				
Residential	Manganese	11,900	1,431	97/474
Recreational	Arsenic	47.2	11.1	8/299
	Benzo(a)pyrene	0.49	0.33	1/16
Industrial	Arsenic	47.2	11.1	8/299
	Benzo(a)pyrene	0.49	0.33	1/16
	Benzo(b)fluoranthene	1	1.76	0/26
	Lead	920	800	1/373
Construction Worker	Arsenic	47.2	11.1	8/299
	Benzo(a)pyrene	0.49	0.65	0/16
	Lead	920	800	1/373
	Manganese	11,900	6,889	6/474
Groundwater (µg/L)				
Residential – Vapor Intrusion	Chloroform	21	1.0	17/39
	Methylene Chloride	45	27	2/2
	Trichloroethene	72	2.9	19/30
Industrial – Vapor Intrusion	Benzene	650	0.63	10/13
	Carbon Tetrachloride	0.9	0.50	1/4
	Chloroform	21	1.2	17/39
	Naphthalene	ND	17	ND
	Tetrachloroethene	25	1.0	8/11
	Trichloroethene	72	4.8	17/30
	Xylene (total)	1,200	337	2/15
Construction Worker – Trench Exposure	Arsenic	76.3	40	2/64
	Benzene	650	17	5/13
	Naphthalene	ND	17	ND
	Tetrachloroethene	25	18	1/11
	Xylene (total)	1,200	861	2/15

Notes: Exposures in the residential, industrial, and construction worker scenarios consider exposure to soil from 0 to 10 feet below ground surface. The recreational exposure scenario considers exposure to soil from 0 to 2 feet below ground surface.

µg/L Micrograms per liter
mg/kg Milligram per kilogram
ND Naphthalene was not detected in Parcel G.

Figures 10 and 11 show the areas where remedial actions for soil and groundwater, respectively, would occur.

Figure 10. Planned Excavation Areas and Stockpiles

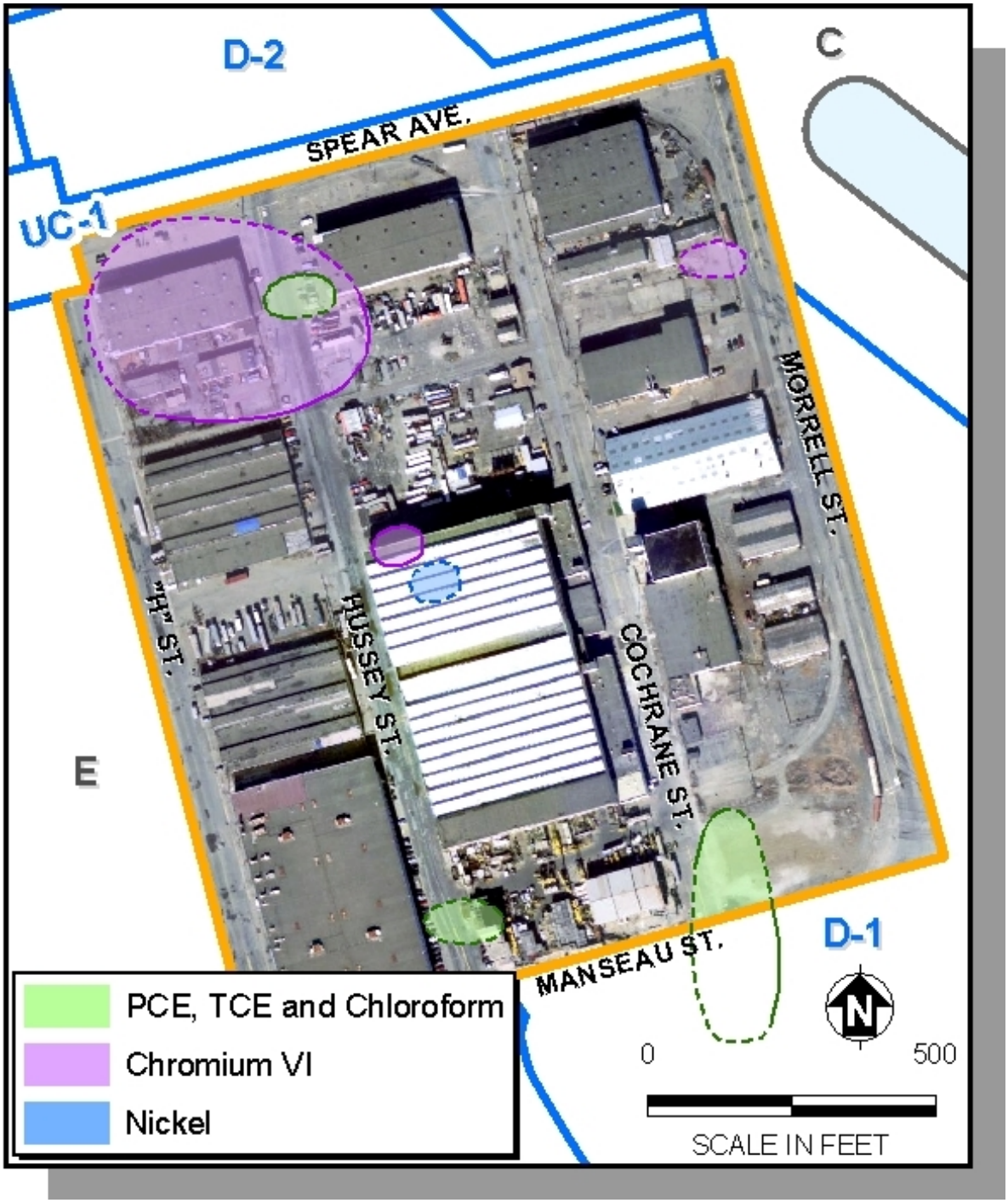


Figure 11. Planned Groundwater Remediation Areas

2.6 PRINCIPAL THREAT WASTE

Although a remedial response action is necessary (Section 2.5.3), there are no wastes in Parcel G that constitute a "principal threat." Principal threat wastes are hazardous or highly toxic source materials that result in ongoing contamination to surrounding media, generally cannot be reliably contained, or present a significant risk to human health or the environment should exposure occur. Although elevated concentrations of metals, PAHs, and radionuclides are present in soil and structures, the potential risks do not suggest there is a principal threat waste in soil at Parcel G. Contaminated groundwater is not generally considered to be source material unless it has the potential to be extremely mobile. Based on a review of the data, VOCs and metals in groundwater at Parcel G appear to be somewhat stable showing a minimal expansion of the associated plumes over time. In addition, a variety of processes occur in the subsurface that serve to reduce chemical concentrations in groundwater as groundwater migrates toward a discharge point such as the Bay. These processes include hydrodynamic dispersion, sorption, chemical and biological transformation, dilution in the tidal mixing zone, and dilution upon discharge to a surface water body. Therefore, VOCs (most significantly, tetrachloroethene [PCE], trichloroethene [TCE] and chloroform) and metals (chromium VI and nickel) in groundwater at Parcel G are not considered a principal threat waste.

2.7 REMEDIAL ACTION OBJECTIVES

RAOs are established based on attainment of regulatory requirements, standards, and guidance; contaminated media; COCs; potential receptors and exposure scenarios; and human health and ecological risks. Ultimately, the success of a remedial action is measured by its ability to meet the RAOs. Planned future land use is an important component in developing RAOs, and the RAOs for Parcel G are based on the San Francisco Redevelopment Agency's 1997 reuse plan. However, the application of the RAOs may need to be revisited if there are significant changes in the planned reuse (for example, a recreational use area becomes a residential use area). The RAOs for Parcel G were developed in conjunction with the regulatory agencies and are listed below by medium.

- **Soil RAOs:**
  1. Prevent exposure to organic and inorganic chemicals in soil at concentrations above remediation goals developed in the HHRA for the following exposure pathways:
     (a) Ingestion of, outdoor inhalation of, and dermal exposure to surface and subsurface soil
     (b) Ingestion of homegrown produce by residents in mixed-use blocks
  2. Prevent exposure to VOCs in soil gas at concentrations that would pose unacceptable risk via indoor inhalation of vapors. Remediation goals for VOCs to address exposure via indoor inhalation of vapors may be superseded based on COC identification information from soil gas surveys that may be conducted in the future. Future action levels would be established for soil gas, would account for vapors from both soil and groundwater, and would be calculated based on a cumulative risk level of 10^{-6} using the accepted methodology for risk assessments at HPS.

- **Groundwater RAOs:**
  1. Prevent exposure to VOCs in the A-aquifer groundwater at concentrations above remediation goals via indoor inhalation of vapors from groundwater.
  2. Prevent direct exposure to the groundwater that may contain COCs through the domestic use pathway (for example, drinking water or showering).
  3. Prevent or minimize exposure of construction workers to metals and VOCs in the A-aquifer groundwater at concentrations above remediation goals from dermal exposure and inhalation of vapors from groundwater.
  4. Prevent or minimize migration to the surface water of San Francisco Bay of chromium VI and nickel in A-aquifer groundwater that would result in concentrations of chromium VI above 50 micrograms per liter (µg/L), and nickel above 96.5 µg/L at the point of discharge to the Bay.

- **Radiologically Impacted Soil and Structures RAOs:**
  1. Prevent exposure to radionuclides of concern in concentrations that exceed remediation goals for all potentially complete exposure pathways.

Remediation goals for soil and groundwater and radiologically impacted sites are listed in Tables 4 and 5, respectively.

2.8 DESCRIPTION AND EVALUATION OF REMEDIAL ALTERNATIVES

To address contamination in soil and groundwater and radiologically impacted structures and soil, preliminary screening of **General Response Actions (GRAs)**(31) and process options was completed to refine the remedy selection process, as detailed in the Revised FS Report. Because the RAOs were developed based on the planned future land use, the GRAs were also developed considering the planned future land use of each redevelopment block. Five soil, four groundwater, and two radiological remedial approaches were retained as combinations of **preliminary remedial alternatives**(32) and were evaluated with respect to implementability, effectiveness, and relative cost (high/moderate/low). Detailed cost analysis was not performed as part of this preliminary screening.

Five remedial alternatives for soil (no action; ICs and maintained landscaping; excavation, disposal, maintained landscaping, and ICs; covers and ICs; and excavation, disposal, covers, and ICs), four remedial alternatives for groundwater (no action; long-term monitoring and ICs; in-situ treatment for VOCs, groundwater monitoring for metals and VOCs, and ICs; and in-situ treatment for VOCs and metals, groundwater monitoring, and ICs), and two remedial alternatives for radiologically impacted structures and soil (no action and survey, decontamination, excavation, disposal, and release) were retained for a detailed comparative analysis in accordance with the NCP.

Table 4. Remediation Goals for Soil and Groundwater

Exposure Scenario	Chemical of Concern	Remediation Goal / Basis
Soil		
Residential	Manganese	1,431 / HPAL
Recreational	Arsenic	11.1 / HPAL
	Benzo(a)pyrene	0.33 / RBC
Industrial	Arsenic	11.1 / HPAL
	Benzo(a)pyrene	0.33 / PQL
	Benzo(b)fluoranthene	1.76 / RBC
	Lead	800 / RBC
Construction Worker	Arsenic	11.1 / HPAL
	Benzo(a)pyrene	0.65 / RBC
	Lead	800 / RBC
	Manganese	6,889 / RBC
Groundwater		
Residential – Vapor Intrusion	Chloroform	1.0 / PQL
	Methylene Chloride	27 / RBC
	Trichloroethene	2.9 / RBC
Industrial – Vapor Intrusion	Benzene	0.63 / RBC
	Carbon Tetrachloride	0.50 / PQL
	Chloroform	1.2 / RBC
	Naphthalene	6.0 / RBC
	Tetrachloroethene	1.0 / PQL
	Trichloroethene	4.8 / RBC
	Xylene (total)	337 / RBC
Construction Worker – Trench Exposure	Arsenic	40 / RBC
	Benzene	17 / RBC
	Naphthalene	17 / RBC
	Tetrachloroethene	18 / RBC
	Xylene (total)	861 / RBC
Migration to Surface Water of Bay	Chromium VI	50 / SWC
	Nickel	96.5 / HGAL

Notes:

Soil remediation goals are in milligrams per kilogram (mg/kg).

Groundwater remediation goals are in micrograms per liter (µg/L).

Groundwater remediation goals for chromium VI and nickel are at the point of discharge to the Bay.

Exposures in the residential, industrial, and construction worker scenarios consider exposure to soil from 0 to 10 feet below ground surface. The recreational exposure scenario considers exposure to soil from 0 to 2 feet below ground surface.

Remediation goals for volatile organic compounds to address exposure via indoor inhalation of vapors may be superseded based on chemicals of concern identification information from soil gas surveys that may be conducted in the future. These future action levels would be established for soil gas, would account for vapors from both soil and groundwater, and would be calculated based on a cumulative risk level of 10^{-6} using the accepted methodology for risk assessments at the Hunters Point Shipyard.

HGAL Hunters Point groundwater ambient level
HPAL Hunters Point ambient level
PQL Practical quantitation limit
RBC Risk-based concentration
SWC Surface water criteria

Table 5. Remediation Goals for Radionuclides

Radionuclide	Surfaces (dpm/100 cm^2)		Soil (pCi/g)		Water (pCi/L)
	Equipment Waste [a]	Structures[b]	Construction Worker	Resident[d]	
Cesium-137	5,000	5,000	0.113	0.113	119
Cobalt-60	5,000	5,000	0.0602	0.0361	100
Plutonium-239	100	100	14	2.59	15
Radium-226	100	100	1[c]	1[c]	5
Strontium-90	1,000	1,000	10.8	0.331	8
Thorium-232	1,000	36.5	19	1.69	15
Hydrogen-3	5,000	5,000	4.23	2.28	20,000
Uranium-235 + daughters	5,000	488	0.398	0.195	30

Notes:

a Limits for removable surface activity are 20 percent of these values.

b Remediation goals are consistent with those issued in the Radiological TCRA Action Memo. Remediation goals meet the 25 millirem per year residual dose level consistent with 10 CFR Section 20.1402. Furthermore, for most radionuclides of concern, goals meet the 15 millirem per year residual dose level consistent with the 1997 EPA OSWER Directive (OSWER No. 9200.4-18). Of exception is the goal for Thorium-232 goal which due to detection limit technical limitations, corresponds to a dose of 25 mrem/yr.

c Goal is 1 pCi/g above background per agreement with EPA.

d All radiologically impacted soils in this parcel will be remediated according to Residential Remediation Goals.

ARAR Applicable or relevant and appropriate requirements
CFR Code of Federal Regulations
dpm/100cm^2 Disintegration per minute per one hundred square centimeters
EPA U.S. Environmental Protection Agency
millirem One thousandth of a rem (10^{-3})
mrem/yr Millirem per year
NRC Nuclear Regulatory Commission
OSWER Office of Solid Waste and Emergency Response
pCi/g Picocurie per gram
pCi/L Picocurie per liter
TCRA Time-Critical Removal Action

2.8.1 Description of Remedial Alternatives

Table 6 provides the major components, details, and cost of each remedial alternative identified for soil, groundwater, and radiologically impacted sites.

2.8.2 Comparative Analysis of Alternatives

A comparative analysis of alternatives with respect to the **nine evaluation criteria**(33) was completed and is provided below. Table 7 depicts a relative ranking of the alternatives.

Table 6. Remedial Alternatives

Remedial Alternative	Components	Details	Cost
Soil Remedial Alternatives			
S-1: No Action *No action for contaminated soil with no restriction on activities.*	▪ Existing soil	▪ No action	No cost
S-2: ICs and Maintained Landscaping *Impose ICs to limit land use and maintain landscaping of bare or disturbed areas with no cover.*	▪ ICs ▪ Maintained landscaping	▪ ICs, including proprietary controls, restrictive covenants, restricted land use, restricted activities, and prohibited activities, will be implemented to prevent exposure to areas where there is potential unacceptable risk posed by COCs in soil. Entire blocks would not be fenced, and areas within a block that are covered with a building footprint or existing cover (such as a parking lot) would not be fenced. ▪ Maintain landscaping for bare or minimally vegetated areas that have been disturbed by excavation or construction activities and not restored with a cover. ▪ Maintained landscaping would prevent exposure to asbestos that may be present in surface soil and transported by wind erosion.	Capital Cost: $155,000 Annual O&M Cost: $132,000 **Present-Worth Cost: $344,000**(34) Discount Rate: 3.1% Timeframe: 30 years Note: The costs presented are the proportion of the Parcel D FS costs allocated to Parcel G, based on land area (42%). The costs associated with this remedial alternative are within the -30/+50 range assumed for the original Parcel D in the FS.
S-3: Excavation, Disposal, Maintained Landscaping, and ICs *Excavation of contaminated soil followed by off-site disposal, maintained landscaping, and ICs.*	▪ Excavation of soils ▪ Off-site disposal ▪ Maintain landscaping ▪ ICs	▪ Excavate two areas within Parcel G where lead or PAHs exceed remediation goals. The two areas to be excavated are a total of approximately 168 cubic yards of soil. Assuming a 20-percent bulking during this removal, approximately 202 cubic yards of soil will be hauled off site for disposal. In addition, 325 cubic yards of existing soil stockpiles within Parcel G. ▪ Depth of excavations is the maximum depth for human health exposure scenarios based on the proposed planned reuse (2 feet for recreational areas; 10 feet for industrial and residential areas).	Capital Cost: $476,000 Annual O&M Cost: $122,000 **Present-Worth Cost: $706,000**(35) Discount Rate: 3.1% Timeframe: 30 years Note: The costs presented are the proportion of the overall Parcel D FS costs allocated to Parcel G. The general costs for Parcel G are based on land area (42% of D) whereas for the excavation, 21% of the areas requiring remediation and 58% of the stockpiles requiring removal were within the boundary of Parcel G. The costs associated with this remedial alternative are within the -30/+50 range assumed for the original Parcel D in the FS.

Table 6. Remedial Alternatives (Continued)

Remedial Alternative	Components	Details	Cost
Soil Remedial Alternatives (Continued)			
S-4: Covers and ICs *Install physical barriers, such as covers, to block exposure pathways to contaminated soil, followed by ICs.*	▪ Install covers ▪ ICs	▪ Install durable covers that will not break, erode, or deteriorate such that the underlying soil becomes exposed. Existing asphalt and concrete surfaces and buildings may be used as covers as long as they meet the durability requirement. ▪ All asphalt covers will be sealed at the start of construction and maintained by resealing once every 10 years or as needed to prevent opening an exposure pathway. ▪ Only ground outside of existing building footprints would be considered for covers. Such ground would be covered with a minimum of 4 inches of asphalt paving (industrial areas) or 2 feet of new soil (residential areas). ▪ Existing soil stockpiles would be hauled off site for disposal. ▪ Impose same ICs as those for Alternative S-2.	Capital Cost: $1,032,000 Annual O&M Cost: $588,000 **Present-Worth Cost: $1,952,000**(36) Discount Rate: 3.1% Timeframe: 30 years Note: The costs presented are the proportion of the Parcel D FS costs allocated to Parcel G, based on land area (42%) and volume of stockpiles (58%) at Parcel G. The costs associated with this remedial alternative are within the -30/+50 range assumed for the original Parcel D in the FS.
S-5: Excavation, Disposal, Covers, and ICs *Excavation of contaminated soil followed by off-site disposal, covers, and ICs.*	▪ Excavation of soil ▪ Off-site disposal ▪ Install covers ▪ ICs	▪ Excavate two areas within Parcel G where lead or PAHs exceed remediation goals. The two areas to be excavated are a total of approximately 168 cubic yards of soil. Assuming a 20-percent bulking during this removal, approximately 202 cubic yards of soil will be hauled off site for disposal. In addition, 325 cubic yards of existing soil stockpiles within Parcel G would also be hauled off site. These stockpiles pre-date the ongoing radiological TCRA. ▪ Depth of excavations is the maximum depth for human health exposure scenarios based on the proposed planned reuse (2 feet for recreational areas; 10 feet for industrial and residential areas). ▪ Install durable covers that would be maintained to minimize breakage, erosion, or deterioration such that the underlying soil becomes exposed. Standard construction practices for roads, sidewalks, and buildings would likely be adequate to meet this performance standard. Other examples of covers could include a minimum 4 inches of asphalt (or 2 inches of asphalt over a 4- to 6-inch base) or a minimum 2 feet of clean imported soil. The covers must achieve a full cover over the entire parcel. The cover design will be provided in the RD.	Capital Cost: $1,290,000 Annual O&M Cost: $599,000 **Present-Worth Cost: $2,555,000**(37) Discount Rate: 3.1% Timeframe: 30 years Note: The costs presented are the proportion of the overall Parcel D FS costs allocated to Parcel G. The general costs for Parcel G are based on land area (42% of D) whereas for the excavation, 21% of the areas requiring remediation and 58% of the stockpiles requiring removal were within the boundary of Parcel G. The costs associated with this remedial alternative are within the -30/+50 range assumed for the original Parcel D in the FS.

Table 6. Remedial Alternatives (Continued)

Remedial Alternative	Components	Details	Cost
Soil Remedial Alternatives (Continued)			
S-5: Excavation, Disposal, Covers, and ICs *Excavation of contaminated soil followed by off-site disposal, covers, and ICs (Continued)*		▪ Existing asphalt and concrete surfaces and buildings may be used as covers as long as they meet the durability requirement ▪ All asphalt covers will be sealed at the start of construction and maintained to meet the performance standard of preventing exposure to soil and being durable. ▪ Only ground outside of existing building footprints would be considered for covers.	
Groundwater Remedial Alternatives			
GW-1: No Action *No action for contaminated groundwater with no restriction on activities.*	▪ Existing groundwater	▪ No action	No cost
GW-2: Long-Term Monitoring and ICs *Implement monitoring to assess migration of chemicals and ambient conditions, followed by ICs.*	▪ Groundwater monitoring ▪ ICs	▪ Monitor VOCs and metals at strategically located monitoring wells to see if plumes are stable or mobile. Frequency and duration will be determined at a later date. ▪ ICs, including proprietary controls, restrictive covenants, restricted land use, restricted activities, and prohibited activities, will be implemented to prevent exposure to groundwater where there is potential unacceptable risk posed by COCs in groundwater.	Capital Cost: $280,000 Annual O&M Cost: $2,655,000 **Present-Worth Cost: $3,520,000**(38) Discount Rate: 3.1% Timeframe: 30 years Note: The costs are primarily associated with the plumes that originate in Parcel G; therefore, it is assumed that the costs associated with this remedial alternative are within the -30/+50 range assumed for the original Parcel D in the FS.

Table 6. Remedial Alternatives (Continued)

Remedial Alternative	Components	Details	Cost
Groundwater Remedial Alternatives (Continued)			
GW-3 (A&B): In-Situ Treatment for VOCs, Groundwater Monitoring for Metals and VOCs, and ICs *Treat groundwater with VOCs with organic compound or ZVI, followed by monitoring and ICs.*	▪ Treatment ▪ Monitoring ▪ ICs	▪ Perform in-situ pilot tests to confirm performance and support design and layout of the groundwater treatment system for VOCs. ▪ Treat groundwater with an in-situ injection of an organic compound (GW-3A) or ZVI (GW-3B) to create conditions where VOCs are reduced in groundwater. ▪ Monitor VOCs and metals at strategically located monitoring wells to see if plumes are stable or mobile. Frequency and duration will be determined at a later date. ▪ Impose same ICs as those for Alternative GW-2. ICs will remain in place until remedial goals are achieved.	Capital Cost: $690,000 (A&B)/$3,110,000 (A&B) Annual O&M Cost: $1,350,000 (both A&B) **Present-Worth Cost: $2,450,000/$5,350,000**(39) Discount Rate: 3.1% Timeframe: 30 years Note: The costs are primarily associated with the plumes that originate in Parcel G; therefore, it is assumed that the costs associated with this remedial alternative are within the -30/+50 range assumed for the original Parcel D in the FS.
GW-4 (A&B): In-Situ Treatment for VOCs and Metals, Groundwater Monitoring, and ICs *Treat groundwater with VOCs and metals with organic compound or ZVI, following by monitoring and ICs.*	▪ Treatment ▪ Monitoring ▪ ICs	▪ Perform in-situ pilot tests to confirm performance and support design and layout of the groundwater treatment system for VOCs and metals. ▪ Treat groundwater with an in-situ injection of an organic compound (GW-4A) or ZVI (GW-4B) to create conditions where both VOCs and metals concentrations are reduced in groundwater to remedial goals. ▪ Monitor VOCs and metals at strategically located monitoring wells to see if plumes are stable or mobile. Frequency and duration will be determined at a later date. ▪ Impose same ICs as those for Alternative GW-2. ICs will remain in place until remedial goals are achieved.	Capital Cost: $1,040,000 (GW-4A)/$6,320,000 (GW-4B) Annual O&M Cost: $1,350,000 (for both A&B) **Present-Worth Cost: $2,870,000/$9,200,000**(40) Discount Rate: 3.1% Timeframe: 30 years Note: The costs are primarily associated with the plumes that originate in Parcel G; therefore, it is assumed that the costs associated with this remedial alternative are within the -30/+50 range assumed for the original Parcel D in the FS. Monitoring frequencies were assumed to estimate costs; the actual monitoring plan for groundwater will be presented in the remedial design.

Table 6. Remedial Alternatives (Continued)

Remedial Alternative	Components	Details	Cost
Radiologically Impacted Structures and Soil Remedial Alternatives			
R-1: No Action *No action for radiologically impacted structures and soil with no restriction on activities.*	▪ Existing structures ▪ Existing soil	▪ No action	No cost
R-2: Survey, Decontamination, Excavation, Disposal, and Release *Survey existing structures, followed by excavation and off-site disposal of contaminated materials and soil.*	▪ Survey ▪ Decontamination ▪ Excavation ▪ Disposal ▪ Release	▪ Survey structures, former building sites, and radiologically impacted areas. ▪ Decontaminate buildings. ▪ Excavate storm drain and sanitary sewer lines, and excavate at outdoor and radiologically impacted areas. ▪ Dispose of excavated materials and soils at off-site facilities. ▪ Conduct surveys to ensure that remediation goals are met for radiologically impacted sites scheduled for unrestricted release.	Capital Cost:: $15,200,000 Annual O&M Cost: None **Present-Worth Cost: $15,200,000**(41) Discount Rate: Not applicable Timeframe: Approximately 1 year Note: The costs presented are the proportion of the Parcel D FS costs that were allocated to Parcel G based on the number of radiological sites identified in Parcel G (50%). The costs associated with this remedial alternative are within the -30/+50 range assumed for the original Parcel D in the radiological addendum to the FS. Additionally, much of the estimated $15 million have already been expended under the Radiological TCRA for Parcel G. Actual post ROD implementation costs are expected to be significantly less assuming the successful attainment of the TCRA's action limits and unrestricted free release designation following the completion of the TCRA.

Table 7. Relative Ranking of Remedial Alternatives

CERCLA Criteria	Soil					Groundwater				Radiologically Impacted Structures and Soil	
	S-1 No Action	S-2 Institutional Controls and Maintained Landscaping	S-3 Excavation, Disposal, Maintained Landscaping, and ICs	S-4 Covers and ICs	S-5*** Excavation, Disposal, Covers, and ICs	GW-1 No Action	GW-2 Long-Term Monitoring and Institutional Controls	GW-3 (A&B) In-Situ Treatment for VOCs, Groundwater Monitoring for Metals and VOCs, and ICs	GW-4 (A&B)*** In-Situ Treatment for VOCs and Metals, Groundwater Monitoring, and ICs	R-1 No Action	R-2*** Survey, Decontamination, Excavation, Disposal, and Release
Threshold Criteria											
Overall Protection of Human Health and the Environment	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes
Compliance with ARARs	N/A	Yes	Yes	Yes	Yes	N/A	Yes	Yes	Yes	N/A	Yes
Balancing Criteria											
Long-Term Effectiveness and Permanence	○	◔	◑	◕	●	○	◑	◕	●	○	●
Reduction in Toxicity, Mobility, or Volume through Treatment	○	○	○	○	○	○	○	◑	●	○	○
Short-Term Effectiveness	◕	◕	◕	◕	●	◑	◕	◕	◕	◕	◕
Implementability	●	◑	◕	◕	◕	●	◕	◕	◕	◕	◕
Present-Worth Cost ($M)	0	0.35	0.7	2	2.3	0	3.5	2.5 (GW-3A) 5.4 (GW-3B)	2.9 (GW-4A) 9.2 (GW-4B)	0	15
Modifying Criteria											
State Acceptance	○	○	○	◑	◕	○	◔	◕	●	○	●
Community Acceptance	○	◔	◔	◔	◕	○	◔	◑	◕	○	●

Notes: Fill symbol by quarters from open (poor) to full (excellent). *** Indicates preferred alternative

Threshold Criteria

Overall Protection of Human Health and the Environment. The no-action alternatives for soil, groundwater, and radiologically impacted structures and soil do not achieve RAOs; therefore, they do not protect human health and the environment and are not considered further in this ROD. For soil, Alternatives S-2 through S-5 are protective of human health and the environment under the anticipated future land use of the site. For groundwater, Alternatives GW-2, GW-3A, GW-3B, GW-4A, and GW-4B are also protective of human health and the environment, although the degree of protection varies between the different alternatives. For radiologically impacted structures and soil, Alternative R-2 is protective of human health and the environment because it includes remediation that reduces exposure to radionuclides of concern.

Compliance with ARARs. ARARs do not apply to the no-action alternatives for soil, groundwater, and radiologically impacted structures and soil. For the remaining soil, groundwater, and radiological alternatives, a given alternative must either comply with ARARs or provide grounds for a waiver. Alternatives S-2 through S-5 complies with all pertinent ARARs. Alternatives GW-4A and GW-4B meet all of the pertinent ARARs. Alternatives GW-2, GW-3A, and GW-3B also meet all the pertinent ARARs, but with potentially less certainty. Alternative R-2 fulfills all ARARs related to radiologically impacted structures or soil.

Primary Balancing Criteria

Criteria Long-Term Effectiveness and Permanence. Alternative S-5 is rated the highest with respect to long-term effectiveness and permanence because it includes the effective and permanent remedies of removal and disposal off site from Alternatives S-3, and the parcel-wide covers and ICs from Alternative S-4. The long-term permanence is lower for Alternatives S-2 and S-4, which rely more heavily on ICs to meet the RAOs for the chemicals that are left in place, and higher for Alternatives S-3 and S-5, which include excavations that reduce the volume of on-site contaminants. Alternatives S-2 through S-5 would also provide long-term effectiveness in meeting the RAOs through reliance on continual enforcement of covenants to restrict use of property to maintain covers and access restrictions. Alternative S-3 provides long-term effectiveness and permanence for lead- and PAH-contaminated soil that is excavated, but relies on access restrictions for other COCs until ICs are implemented. Alternative S-4 provides a permanent cover prior to development, but does not permanently remove any contamination. Since no action will be taken under Alternative S-1, it does not provide a long-term effective or permanent solution to the soil risks present at the site.

Alternatives GW-4A and GW-4B would provide the highest level of long-term effectiveness and permanence, because COCs would be degraded or immobilized. Alternative GW-2 would provide a moderate level of effectiveness and permanence because groundwater plumes would be addressed only through ICs and monitoring to assess the potential migration of contaminants. Alternatives GW-3A and GW-3B would provide a higher level of long-term effectiveness and permanence than Alternative GW-2, because VOCs would be degraded or immobilized but metals would be addressed through ICs and monitoring, using the plume-specific attenuation factors and the chemical-specific trigger levels for metals. All alternatives, except for Alternative GW-1 provide an adequate and reliable level of controls.

Alternative R-2 would provide excellent long-term effectiveness and performance for radiologically impacted sites. Alternative R-1 provides very little long-term effectiveness and performance because it includes no action.

Reduction in Toxicity, Mobility, or Volume through Treatment. None of the alternatives proposed for remediating soils at Parcel D include treatment as a GRA; therefore, all of the alternatives (S-1 through S-5) are rated poor with respect to reducing the mobility, toxicity, or volume through treatment.

Alternatives GW-4A and GW-4B are rated the highest because they both reduce the toxicity and volume of contaminants by active treatment of VOCs, and the chromium VI and nickel plumes. The treatment would also reduce the mobility of the chromium VI and nickel plumes by in-situ precipitation of metals from their dissolved phase. Mobility of these contaminants would be monitored and human health exposure would be eliminated through ICs. Alternatives GW-3A and GW-3B would reduce the toxicity or volume of VOC contaminants through treatment, but would monitor the mobility of metals contamination through the groundwater monitoring program and eliminate exposure through the use of ICs. Alternative GW-2 would not reduce the toxicity or volume of contaminants, and would also monitor the mobility of the contamination through the groundwater monitoring program and eliminate exposure through the use of ICs. Alternative GW-1 does not reduce the mobility, toxicity, or volume of contaminants in groundwater.

Alternatives R-1 and R-2 are both rated poor because they do not include treatment that would result in the destruction, transformation, or irreversible reduction in radionuclides of concern mobility.

Short-Term Effectiveness. Alternative S-1 has the least effect on the community, remedial workers, or the environment by the implementation because it includes no actions. Alternatives S-2 and S-4 introduce less risk to these receptors because they do not include excavation, hauling, and disposal of soil that contains contamination. Alternatives S-3 and S-5 include removing and hauling soils with contamination that would pose potential risk to these receptors, although this risk is considered low and mitigation measures would be implemented.

All of the alternatives scored well in terms of short-term effectiveness according to the criteria. Alternatives GW-3A, GW-3B, GW-4A, and GW-4B pose a slightly greater risk through use of active in-situ treatment compared with Alternative GW-2. Alternatives GW-2, GW-3A, GW-3B, GW-4A, and GW-4B all pose a very low risk to workers during implementation of the groundwater monitoring program. Alternative GW-2 may pose a slightly greater risk than Alternatives GW-3A, GW-3B, GW-4A, and GW-4B because they require active on-site remediation. Alternative GW-1 has an excellent short-term effectiveness rating as no remedial actions are conducted under this alternative.

Alternative R-1 has the least effect on the community, remedial workers, or the environment because it includes no actions; therefore, it would not disturb the radionuclides of concern. Alternative R-2 includes removing and hauling contaminated soil and building materials

from the site. This alternative would pose a potential risk to the community, remedial workers, or the environment, although this risk is considered low and mitigation measures would be implemented.

Implementability. Distinction between the alternatives for implementability is minimal. Alternatives S-2 through S-4 requires implementation of ICs. Installing covers (Alternative S-4) and excavating soil (Alternatives S-3 and S-5) are standard technologies that are easy to implement. Alternative S-1 does not involve remedial technologies or ICs and requires no implementation.

Alternatives GW-1 and GW-2 have the highest rating and are technically the easiest to implement. Alternative GW-2 would require the greater resources to conduct the long-term groundwater monitoring program; however, these resources are readily available. Alternatives GW-3A, GW-3B, GW-4A, and GW-4B are more complex to implement because of the injection treatment; however, this treatment is expected to be a one-time injection that would reduce the resources required for groundwater monitoring as compared to Alternative GW-2. Alternatives GW-3A and GW-4A may be easier to implement because the injected substrates are slow-release compounds that continue to degrade or precipitate COCs over time, which increases the potential to react with contaminants as they disperse in the aquifer.

Alternative R-2 requires the use of standard technologies that are easy to implement. Alternative R-1 does not involve remedial technologies and requires no implementation. Therefore, the distinction between these two alternatives regarding implementability is minimal.

Cost. Alternatives S-1 requires no action; therefore, no costs are associated with this alternative. Alternative S-2 is the least costly ($344,000) because it includes no active remediation prior to property transfer. Alternative S-3 has moderate cost (approximately $706,000), and Alternatives S-4 and S-5 that include the covers as a process option have the greatest cost (approximately $1.95 million and $2.26 million).

Alternative GW-1 is rated the highest because it has no associated cost because no actions would be taken. Alternative GW-3A has a moderate cost (approximately $2.45 million) because of in-situ treatment of VOCs and long-term monitoring of metals. Alternative GW-2 has slightly higher costs (approximately $3.52 million), most of which is for the 30 years of long-term monitoring. Alternatives GW-4A has a similar cost (approximately $2.87 million). Alternative GW-3B has the second highest capital cost because of the cost of the ZVI additive treatment for VOC plumes ($5.35 million). Alternative GW-4B has the highest capital cost because of the cost of the ZVI additive treatment for both VOC and metal plumes ($9.2 million).

Alternative R-1 requires no action; therefore, no costs are associated with this alternative. Alternative R-2 is costly ($15 million) but effectively addresses all radiologically impacted sites. For Alternative R-2, much of the estimated $15 million costs have already been expended under the Radiological TCRA for Parcel G. Actual post ROD implementation costs are expected to be significantly less assuming the successful attainment of the TCRA's action limits and unrestricted free release designation following completion of the TCRA.

Modifying Criteria

State Acceptance. State involvement has been solicited throughout the CERCLA process. The State of California concurs with the Navy's selected remedial alternatives.

Community Acceptance. Community acceptance is evaluated based on comments received from the public during the public comment period for the proposed plan. The proposed plan was presented to the community and discussed during a public meeting on July 30, 2008. Comments were also gathered during the public comment period from July 23 through August 22, 2008. Attachment 2, the responsiveness summary, of this ROD addresses the public's comments and concerns about the selected remedial alternatives at Parcel G.

2.9 SELECTED REMEDY

2.9.1 Rationale for Selected Remedy

The Selected Remedy for Parcel G is Alternative S-5 (excavation, disposal, covers, and ICs) for soil; Alternative GW-4A&B (treatment, monitoring, and ICs) for groundwater; and Alternative R-2 (survey, decontamination, excavation, disposal, and release) for radiologically impacted structures and soil. The Selected Remedy provides the best balance of tradeoffs with respect to the nine criteria. The remedy for soil meets the RAOs by excavating and disposing of contaminated soils with lead and PAHs at concentrations exceeding remediation goals, thus removing the source of contamination. Additionally, the entire parcel will be covered to cut off potential exposure pathways to arsenic, manganese, and any remaining COCs in soils. The remedy for groundwater meets the RAOs by treating groundwater to reduce concentrations of VOCs and metals to below remediation goals, thus removing the source of contamination. Monitoring will be implemented as needed to confirm the treatment was successful for up to 30 years. The remedy for radiologically impacted sites meets the RAOs by identifying and decontaminating any impacted structures. Additionally, remaining contaminated materials, storm drains and sewers, and soils would be excavated and disposed of off site, thereby removing the source of contamination.

ICs, including restrictive covenants regulating restricted land use, restricted activities, and prohibited activities, will be implemented to prevent exposure to areas where there is potential unacceptable risk posed by COCs in soil and groundwater. ICs will remain in place as long as contamination remains at the site above levels that allow for unlimited use and unrestricted exposure.

2.9.2 Description of Selected Remedy

The Selected Remedy for soil consists of removing soil in selected areas where COCs exceed remediation goals and disposing of excavated soil at an off-site facility. Two areas are planned for excavation within Parcel G with a total of approximately 168 cubic yards of soil to be removed. Assuming a 20-percent bulking during this removal, approximately 202 cubic yards of soil will be hauled off site for disposal. In addition, 325 cubic yards of existing soil stockpiles

that may contain hazardous levels of contamination but pre-date the radiological TCRA will be hauled off site for disposal as part of this alternative.

Across all of Parcel G, durable covers will be applied as physical barriers to cut off potential exposure to metals in soil. Existing asphalt and concrete surfaces (repaired as necessary to be durable) and buildings will act as covers. The type of new covers installed will be consistent with the redevelopment plan (for example, soil covers may be used for open space areas or asphalt for industrial areas). The cover design will be provided in the RD and will include plans for inspection and maintenance. Future landowners will need approval from the regulatory agencies to modify the soil covers.

The Selected Remedy for groundwater consists of actively treating VOCs in groundwater using an injected biological substrate or ZVI to destroy the VOCs in the groundwater plumes at IR-09, IR-33, and IR-71. The treatment will also minimize migration of metals in the groundwater plumes at IR-09 and IR-33, within Parcel G (see Figure 7) and discharge of these metals into the bay at levels exceeding remediation goals. A treatability study is currently being conducted in Parcel G using ZVI injection points in the plumes associated with IR-09, IR-33 and IR-71. Groundwater monitoring will occur in and around the remediation areas and also in downgradient locations, as necessary. The locations of monitoring points and the monitoring frequency will be determined in the RD. The RD will use current information on the plume extent and concentration to select the actual injection parameters. The monitoring plan will be flexible to allow modifications as data are collected.

Soil vapor surveys will be conducted after the groundwater cleanup actions for the following purposes:

- to evaluate potential vapor intrusion risks,
- to identify COCs for which risk-based numeric action levels for VOCs in soil gas would be established (based on a cumulative risk of 10^{-6}),
- to identify where the initial areas requiring institutional controls (ARIC) for VOCs would be retained and where they would be released, and
- to evaluate the need for additional remedial action in order to remove ARICs.

The Selected Remedy for radiologically impacted soil and structures consists of surveying radiologically impacted buildings and former building sites with documented radiological impacts for unrestricted release. Unrestricted release means that a property can be used for any residential or commercial purpose once regulatory requirements have been met. Decontamination will be performed and buildings will be dismantled if necessary. Remaining radiologically impacted storm drains and sanitary sewer lines throughout Parcel G will be removed and disposed of off site.

The Navy has continued to conduct its ongoing Hunters Point Shipyard Radiological Removal Action. As of the date of this Record of Decision the Navy has completed the removal of radiologically impacted storm and sanitary sewer piping within Parcel G. Active remediation efforts continue in less than 30% of the trench segments in Parcel G. Draft survey unit project reports are currently being prepared for distribution.

Radiological surveys, remediation, and final status surveys have been completed in all Parcel G buildings. Furthermore, Buildings 364, 365, and 408 were demolished, have had Final Status Surveys completed on their building foundations and are now having appropriate closeout reports written. Remediation efforts continue for soil areas outside the former Building Sites of 364, 365, and 317.

A Removal Action Completion Report will summarize all Building, Storm and Sewer Drain Final Status Survey Reports and Survey Unit Package Reports. Following concurrence on the Radiological Removal Action Completion Report for Parcel G, unrestricted release is to be granted. Should unrestricted release not be achieved, further remedial actions will occur to meet remedial goals established in the ROD.

Each radiologically impacted site will be investigated through the CERCLA process. If the final report of the site investigation is approved by the stakeholders and the site is determined to require no further action, the classification of "radiologically impacted" may be removed.

The survey and removals will occur before any covers are installed as part of Alternative S-5. Buildings, former building sites, and excavated areas will be surveyed after cleanup is completed to ensure that no residual radioactivity is present at levels above the remediation goals. Excavated soil, building materials, and drain material from radiologically impacted sites will be screened and radioactive sources and contaminated soil will be removed and disposed of at an off-site low-level radioactive waste facility.

Institutional Controls(42) (ICs) will be implemented to prevent exposure to areas where potential unacceptable risk is posed by COCs in soil and groundwater. ICs are legal and administrative mechanisms used to implement land use restrictions that are used to limit the exposure of future landowner(s) or user(s) of the property to hazardous substances present on the property, and to ensure the integrity of the remedial action. ICs are required on a property where the selected remedial cleanup levels result in contamination remaining at the property above levels that allow for unlimited use and unrestricted exposure. ICs will be maintained until the concentrations of hazardous substances in soil and groundwater are at such levels to allow for unrestricted use and exposure. Implementation of ICs includes requirements for monitoring and inspections, and reporting to ensure compliance with land use or activity restrictions.

The Navy has determined that it will rely on proprietary controls in the form of environmental restrictive covenants as provided in the "Memorandum of Agreement Between the United States Department of the Navy and the California Department of Toxic Substances Control" and attached covenant models (Navy and DTSC 2000) (hereinafter referred to as the "Navy/DTSC MOA").

More specifically, land use and activity restrictions will be incorporated into two separate legal instruments as provided in the Navy/DTSC MOA:

1. Restrictive covenants included in one or more Quitclaim Deeds from the Navy to the property recipient.
2. Restrictive covenants included in one or more "Covenant to Restrict Use of Property" entered into by the Navy and DTSC as provided in the Navy/DTSC MOA and consistent with the substantive provisions of California Code of Regulations (Cal. Code Regs.) tit. 22 § 67391.1.

The "Covenant(s) to Restrict Use of Property" will incorporate the land use restrictions into environmental restrictive covenants that run with the land and that are enforceable by DTSC against future transferees. The Quitclaim Deed(s) will include the identical land use and activity restrictions in environmental restrictive covenants that run with the land and that will be enforceable by the Navy against future transferees.

The activity restrictions in the "Covenant(s) to Restrict Use of Property" and Deed(s) shall be addressed in the Parcel G Risk Management Plan ("Parcel G RMP") that may be prepared by the City and County of San Francisco and approved by the Navy and FFA signatories and/or the Land Use Control Remedial Design (LUC RD) report that would be reviewed and approved by the FFA signatories. The Parcel G RMP and/or LUC RD shall be referenced in the applicable Covenant to Restrict Use of Property and Deed. The RMP and/or LUC RD shall specify soil and groundwater management procedures for compliance with the remedy selected in the Parcel G ROD. The Parcel G RMP and/or LUC RD shall identify the roles of local, state, and federal government in administering the Parcel G RMP and/or LUC RD and shall include, but not be limited to, procedures for any necessary sampling and analysis requirements, worker health and safety requirements, and any necessary site-specific construction and/or use approvals that may be required.

Land use restrictions will be applied to specified portions of the property and described in findings of suitability to transfer, findings of suitability for early transfer, "Covenant(s) to Restrict Use of Property" between the Navy and DTSC, and any Quitclaim Deed(s) conveying real property containing Parcel G at HPS.

Access

The Deed and Covenant shall provide that the Navy and FFA signatories and their authorized agents, employees, contractors and subcontractors shall have the right to enter upon HPS Parcel G to conduct investigations, tests, or surveys; inspect field activities; or construct, operate, and maintain any response or remedial action as required or necessary under the cleanup program, including but not limited to monitoring wells, pumping wells, treatment facilities, and cap/containment systems.

Implementation

The Navy shall address and describe institutional control implementation and maintenance actions including periodic inspections and reporting requirements in the preliminary and final RD reports to be developed and submitted to the FFA signatories for review pursuant to the FFA (see "Navy Principles and Procedures for Specifying, Monitoring and Enforcement of Land Use Controls and Other Post-ROD Actions" attached to January 16, 2004 Department of Defense memorandum titled "Comprehensive Environmental Response, Compensation and Liability Act [CERCLA] Record of Decision [ROD] and Post-ROD Policy"). The preliminary and final RD reports are primary documents as provided in Section 7.3 of the FFA.

The Navy is responsible for implementing, maintaining, reporting on, and enforcing land use controls. Although the Navy may later transfer these procedural responsibilities to another party by contract, property transfer agreement, or through other means, the Navy shall retain ultimate responsibility for remedy integrity.

Activity Restrictions that Apply throughout Parcel G

The following sections describe the institutional control objectives to be achieved through activity restrictions throughout Parcel G in order to ensure that any necessary measures to protect human health and the environment and the integrity of the remedy have been undertaken.

Restricted Activities

The following restricted activities throughout HPS Parcel G must be conducted in accordance with the "Covenant(s) to Restrict Use of Property", Quitclaim Deed(s), the Parcel G RMP, the LUC RD report, and if required, any other workplan or document approved in accordance with these referenced documents and must be further reviewed and approved by the FFA signatories:

a. "Land disturbing activity" which includes but is not limited to: (1) excavation of soil, (2) construction of roads, utilities, facilities, structures, and appurtenances of any kind, (3) demolition or removal of "hardscape" (for example, concrete roadways, parking lots, foundations, and sidewalks), (4) any activity that involves movement of soil to the surface from below the surface of the land, and (5) any other activity that causes or facilitates the movement of known contaminated groundwater.

b. Alteration, disturbance, or removal of any component of a response or cleanup action (including but not limited to pump-and-treat facilities, shoreline protection, and soil cap/containment systems); groundwater extraction, injection, and monitoring wells and associated piping and equipment; or associated utilities.

c. Extraction of groundwater and installation of new groundwater wells.

d. Removal of or damage to security features (for example, locks on monitoring wells, survey monuments, fencing, signs, or monitoring equipment and associated pipelines and appurtenances).

Prohibited Activities

The following activities are prohibited throughout HPS Parcel G:

a. Growing vegetables or fruits in native soil for human consumption.

b. Use of groundwater.

Proposed Activity Restrictions Relating to VOC Vapors at Specific Locations within Parcel G

Any proposed construction of enclosed structures must be approved in accordance with the "Covenant(s) to Restrict Use of the Property," Quitclaim Deed(s), LUC RD, and the RMP with approval of the FFA signatories prior to the conduct of such activity within the ARIC for VOC vapors to ensure that the risks of potential exposures to VOC vapors are reduced to acceptable levels that are adequately protective of human health. Initially, the ARIC will include all of Parcel G. This can be achieved through engineering controls or other design alternatives that meet the specifications set forth in the ROD, remedial design reports, LUC RD report, and the RMP. The ARIC for VOC vapors may be modified by the FFA signatories as the soil contamination areas and groundwater contaminant plumes that are producing unacceptable vapor inhalation risks are reduced over time to less than 10^{-6}.

Additional Land Use Restrictions for Areas Designated for Open Space, Educational/Cultural, and Industrial Reuse

The following restricted land uses for property areas designated for open space, educational/cultural, and industrial land uses in the San Francisco Redevelopment Agency's reuse plan must be reviewed and approved by the FFA Signatories in accordance with the "Covenants to Restrict Use of the Property," Quitclaim Deed(s), LUC RD, and the RMP for each parcel prior to use of the property for any of the following restricted uses:

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 school for persons under 21 years of age, or

d. A daycare facility for children.

2.9.3 Expected Outcomes of the Selected Remedy

For soil, the expected outcome is that excavation will remove contaminated soil that exceeds remediation goals for lead and PAHs. Residual risks from these and other COCs would be mitigated through the use of durable covers and access restrictions to restrict exposure. Following implementation of the remedy, the property will be suitable for the uses specified in the redevelopment plan.

The groundwater remedy is expected to achieve remediation goals by actively treating VOCs and metals in groundwater to restore the aquifer quality by reducing or immobilizing the mass of contaminants of concern in groundwater to levels that do not pose a threat to human health through the inhalation exposure pathway. A treatability study using ZVI injections is currently underway in Parcel G. Although treatment of groundwater is expected to reduce VOC vapors released from groundwater, ARICs for vapor intrusion may be needed at some locations at Parcel G. Furthermore, the Navy intends to permanently prohibit the use of groundwater at Parcel G through the use of ICs.

For radiological contamination, the remedy includes surveys, decontamination, excavation, and off-site disposal. The removal of contaminants from radiologically impacted buildings and former building sites with documented radiological impacts, and removal of potential radiologically impacted sanitary and storm sewers and soils, are expected to result in a reduction of the potential risks to levels below remediation goals associated with exposure to radionuclides of concern. The HRA classified several buildings, former building sites, and land areas in Parcel G as "radiologically impacted." Each of the radiologically impacted sites were investigated through the CERCLA process. If the final report of the site investigation is approved by the stakeholders and the site is determined to require no further action, the classification of "radiologically impacted" may be removed.

2.9.4 Statutory Determinations

In accordance with the NCP, the Selected Remedy meets the following statutory determinations.

- **Protection of Human Health and the Environment** – The Selected Remedy for soil will protect human health and the environment through excavation of contaminated soil, preventing exposure to remaining metals by installing durable covers, and the implementation of ICs. The Selected Remedy for groundwater will provide long-term protection by reducing concentrations of VOCs and metals through treatment.

- **Compliance with ARARs** – CERCLA § 121(d)(1) states that remedial actions on CERCLA sites must attain (or the decision document must justify the waiver of) any federal or more stringent state environmental standards, requirements, criteria, or limitations that are determined to be legally applicable or relevant and appropriate. Chemical-specific ARARs are health- or risk-based numerical values or methods that, when applied to site-specific conditions, establish the acceptable amount or concentration of a chemical that may be found in, or discharged to, the environment. Location-specific ARARs are restrictions on the concentrations of hazardous substances or on conducting activities solely because they are in specific locations. Specific locations include floodplains, wetlands, historic places, and sensitive ecosystems or habitats. Action-specific ARARs are technology- or activity-based requirements or limitations for remedial activities. These requirements are triggered by the particular remedial activities conducted at the site. The remedial alternatives selected by the Navy will meet all chemical-, location-, and action-specific ARARs. The ARARs that will be met by the preferred alternatives are summarized in Attachment 1.

- **Cost-Effectiveness** – The Selected Remedy would provide overall protectiveness proportional to their costs and are therefore considered cost-effective.

- **Utilization of Permanent Solution and Alternative Treatment Technologies or Resource Recovery Technologies to the Maximum Extent Practicable** – The Navy has determined that because soil contamination is widely dispersed across the installation a containment remedy, combined with excavation of small quantities of more highly contaminated soil, represents the maximum extent to which permanent solutions can be used in a cost effective manner. The in situ treatment of contaminated groundwater meets the preference for alternative treatment technologies. The Selected Remedy is expected to be permanent and effective in light of the anticipated land use.

- **Preference for Treatment as a Principal Element** – The Selected Remedy for soil does not satisfy the statutory preference for treatment as a principal element of the remedy because there is no cost-effective means of treating the large quantity of low-level soil contamination and the small quantities of soil to be excavated cannot be treated in a cost-effective manner. The soil remedy will not reduce the toxicity, mobility, or volume of hazardous substances, pollutants, or contaminants through treatment for the contaminated soil remaining on site but will provide for the off-site disposal of more highly contaminated soil at a facility which will minimize the potential for those hazardous substances to migrate or otherwise pose a threat. The Selected Remedy for groundwater satisfies the statutory preference for treatment as a principal element of the remedy; that is, it reduces the toxicity, mobility, or volume of hazardous substances, pollutants, or contaminants as a principal element through treatment. The Selected Remedy for radiologically impacted soil and remediation of radiologically impacted building materials does not include treatment as a principal element of the remedy because there is no available technology for the reduction in the toxicity or volume of radionuclides in contaminated soil or building materials.

- **Five-Year Review Requirements** – Because the Selected Remedy will result in hazardous substances, pollutants, or contaminants remaining on site above levels that allow for unrestricted use, a statutory review will follow the schedule of the on-going site-wide five year review after the remedial action is initiated to ensure the remedy is protective of human health and the environment.

2.10 COMMUNITY PARTICIPATION

Community participation at HPS includes a Restoration Advisory Board (RAB), public meetings, public information repositories, newsletters and fact sheets, public notices, and an IR Program website. The Community Involvement Plan for HPS provides detailed information on community participation for the IR Program and documents interests, issues, and concerns raised by the community regarding ongoing investigation and cleanup activities at HPS.

In the late 1980s, the Navy formed a technical review committee (TRC) consisting of the Navy, community members, and regulatory agency representatives. The TRC met to discuss environmental issues pertaining to HPS. In 1993, pursuant to the Defense Environmental Restoration Program, Title 10 United States Code § 2705(d), the Navy formed the RAB, which replaced the TRC. The RAB consists of members of the Navy, the community, and the regulatory agencies. RAB meetings are held on the fourth Thursday of every month and are open to the public to provide opportunity for public comment and input. Documents and relevant information relied upon in the remedy selection process will be made available for public review in the public information repositories listed below or on the **IR Program website**[43].

San Francisco Main Library
100 Larkin Street
Government Information Center, 5th Floor
San Francisco, California 94102
Phone: (415) 557-4500

Anna E. Waden Bayview Library
5075 Third Street
San Francisco, California 94124
Phone: (415) 355-5757

For access to the Administrative Record or additional information on the IR Program contact:

Mr. Keith Forman
Hunters Point Shipyard BRAC Environmental Coordinator
Base Realignment and Closure Program Management Office West
1455 Frazee Road, Suite 900
San Diego, California 92108-4310
Phone: (619) 532-0913
e-mail: keith.s.forman@navy.mil

In accordance with CERCLA §§ 113 and 117, the Navy provided a public comment period from July 23, 2008, to August 22, 2008, for the proposed remedial action described in the Proposed Plan for Parcels G, D, D-2, and UC-1. A public meeting to present the Proposed Plan was held at 6:30 to 8:00 p.m. on July 30, 2008. Public notice of the meeting and availability of documents was placed in the *San Francisco Examiner* on July 27, 2008.

3. RESPONSIVENESS SUMMARY

The responsiveness summary is the third component of a ROD; its purpose is to summarize information about the views of the public and support agency on both the remedial alternatives and general concerns about the site submitted during the public comment period. It documents in the record how public comments were integrated into the decision-making process. The participants in the public meeting, held on July 30, 2008, included community members, RAB members, and representatives of the Navy, EPA, DTSC, and the Water Board. Questions and concerns received during the meeting were addressed at the meeting and are documented in the meeting transcript. Responses to comments provided at the meeting and received during the public comment period by the Navy, EPA, DTSC, or the Water Board are included in the responsiveness summary (Attachment 2).

ATTACHMENT 1
APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

Federal Chemical-Specific[a] Applicable or Relevant and Appropriate Requirements
Record of Decision for Parcel G, Hunters Point Shipyard, San Francisco, California

Requirement	Prerequisite	Citation[b]	ARAR Determination	Comments
Soil				
Resource Conservation and Recovery Act (Title 42 U.S.C. Chapter 82, §§ 6901-6991[i])[c]				
Defines RCRA hazardous waste. A solid waste is characterized as toxic, based on TCLP, if the waste exceeds the TCLP maximum concentrations.	Waste	Cal. Code Regs. tit. 22, §§ 66261.21, 66261.22(a)(1), 66261.23, 66261.24(a)(1), and 66261.100	Applicable	These regulations are applicable to activities that generate waste in order to determine if the waste is hazardous. The Navy will determine if the excavated soil meets the definition of non-RCRA hazardous waste when it is generated.
Uranium Mill Tailings Radiation Control Act (42 U.S.C., ch. 88, § 192.02, 192.129[a] and [b], 192.42)[c]				
Standards for Cleanup of Land and Buildings Contaminated with Radium-226, Radium-228, and Thorium from Inactive Uranium Processing Sites. As a result of residual radioactive materials from any designated processing site: (a) The concentration of radium-226 in land averaged over any area of 100 square meters shall not exceed the background level by more than: (1) 5 pCi/g, averaged over the first 15 cm of soil below the surface, and (2) 15 pCi/g, averaged over 15 cm-thick layers of soil more than 15 cm below the surface.	UMTRCA sites (radioactivity above 5 pCi/g).	40 CFR § 192.12(a)	Relevant and Appropriate	This requirement is relevant and appropriate.

Federal Chemical-Specific Applicable or Relevant and Appropriate Requirements
Record of Decision for Parcel G, Hunters Point Shipyard, San Francisco, California (Continued)

Requirement	Prerequisite	Citation[b]	ARAR Determination	Comments
Soil (Continued)				
Radiological Criteria for License Termination				
A site will be considered acceptable for unrestricted use if the residual radioactivity that is distinguishable from background radiation results in TEDE to an average member of the critical group that does not exceed 25 mrem/y, including that from groundwater sources of drinking water, and that the residual radioactivity has been reduced to ALARA.	Existing NRC-licensed radiologically contaminated site.	10 CFR § 20.1402	Relevant and Appropriate	This ARAR is relevant and appropriate for an unrestricted land use scenario. U.S. EPA does not believe this NRC regulation is protective of human health and the environment, and the HPS cleanup goals are more protective. This regulation is an ARAR only for radiologically impacted sites that are undergoing TCRAs and any additional remedial action required for those sites.
Groundwater				
Resource Conservation and Recovery Act (Title 42 United States Code Chapter 82, §§ 6901-6991[i])[c]				
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 Cal. Code Regs. tit. 22, § 66264.94 in the uppermost aquifer underlying the waste management area of concern at the POC.	A regulated unit that receives or has received hazardous waste before July 26, 1982, or regulated units that ceased receiving hazardous waste prior to July 26, 1982 where constituents in or derived from the waste may pose a threat to human health or the environment.	Cal. Code Regs. tit. 22, § 66264.94(a)(1), (a)(3), (c), (d), and (e)	Relevant and appropriate	The lowest concentration determined to be technologically and economically achievable is an ARAR for the A-aquifer. The lowest concentration limit greater than background that is technologically and economically achievable for the A-aquifer is based on unacceptable risk from the vapor intrusion pathway.

Federal Chemical-Specific Applicable or Relevant and Appropriate Requirements
Record of Decision for Parcel G, Hunters Point Shipyard, San Francisco, California (Continued)

Requirement	Prerequisite	Citation[b]	ARAR Determination	Comments
Surface Water				
Clean Water Act of 1977, as Amended (33 U.S.C., ch. 26, §§ 1251–1387)[c]				
Surface water quality standards.	Discharges to waters of the United States.	40 CFR § 131.38	Applicable	These standards, known as the CTR, are applicable surface water ARARs. The Navy has identified the CTR as ARARs for HPS Parcel G because groundwater discharges to the Bay. The Navy will meet these ARARs for contaminants that do not have a promulgated standard in Table 3-3 of the Basin Plan at the interface of the A-aquifer and the Bay. No groundwater response action is necessary for the B-aquifer; therefore, these standards are not ARARs for the B-aquifer.
Air				
Clean Air Act (42 U.S.C., ch. 85, §§ 7401–7671)[c]				
Emissions of radionuclides into the ambient air from Department of Energy facilities shall not exceed those amounts that would cause any member of the public to receive in any year an effective dose equivalent of 10 mrem/y.	Facility owned or operated by the Department of Energy that emits any radionuclide other than radon-222 and radon-220 into the air.	40 CFR § 61.92	Relevant and Appropriate	Not applicable because Parcel G is not a Department of Energy site but may be relevant and appropriate if there is the potential for airborne emissions of radionuclides other than radon. Only an ARAR until cleanup action is completed. Not an ARAR for residual contamination after cleanup.

Requirement	Prerequisite	Citation[b]	ARAR Determination	Comments
		Air (Continued)		
Clean Air Act (42 U.S.C., ch. 85, §§ 7401–7671)[c]				
Emissions of radionuclides, including iodine, into the ambient air from a facility regulated under this subpart shall not exceed those amounts that would cause any member of the public to receive in any year an effective dose equivalent of 10 mrem/y. Emissions of iodine into the ambient air from a facility regulated under this subpart shall not exceed those amounts that would cause any member of the public to receive in any year an effective dose equivalent of 3 mrem/y.	Facilities owned or operated by any federal agency other than the Department of Energy and not licensed by the NRC.	40 CFR § 61.102	Applicable	The requirements are applicable since fugitive dust may be generated during implementation of remedial action at Parcel G. The exposure to the public due to remedial action operations at Parcel G is not likely to exceed 10 mrem/y because of the following reasons: (1) The concentrations of any radionuclide in dust are relatively low as previously measured in air samples, and (2) the concentration of any radionuclide in dust will be reduced by use of engineering controls such as wetting of soils.

Notes:

a Many action-specific ARARs contain chemical-specific limitations are addressed in the action-specific ARAR tables.

b Only the substantive provisions of the requirements cited in this table are ARARs.

c Statutes and policies, and their citations, are provided as headings to identify general categories of ARARs for the convenience of the reader; listing the statutes and policies does not indicate that the Navy accepts the entire statutes or policies as ARARs. Specific ARARs are addressed in the table below each general heading; only substantive requirements of the specific citations are considered ARARs.

§	Section	NRC	Nuclear Regulatory Commission
§§	Sections	pCi/g	PicoCurie per gram
ALARA	As low as reasonably achievable	POC	Point of compliance
ARAR	Applicable or relevant and appropriate requirement	RCRA	Resource Conservation and Recovery Act
Cal. Code Regs.	California Code of Regulations	TBC	To be considered
CFR	Code of Federal Regulations	TCLP	Toxicity characteristic leaching procedure
cm	Centimeter	TEDE	Total effective dose equivalent
CTR	California Toxics Rule	tit	Title
HPS	Hunters Point Shipyard	UMTRCA	Uranium Mill Tailings Radiation Control Act
mrem/y	Millirem per year	U.S.C.	United States Code

State Chemical-Specific[a] Applicable or Relevant and Appropriate Requirements
Record of Decision for Parcel G, Hunters Point Shipyard, San Francisco, California

Requirement	Prerequisite	Citation[b]	Preliminary ARAR Determination	Comments
Groundwater				
State and Regional Water Quality Control Boards[c]				
Incorporated into all regional board basin plans. Designates all groundwater and surface waters of the state as drinking water except where the total dissolved solids are greater than 3,000 parts per million, the well yield is less than 200 gallons per day from a single well, the water is a geothermal resource or in a water conveyance facility, or the water cannot reasonable be treated for domestic use using either best management practices or best economically achievable treatment practices.	Waters of the state	SWRCB Res. 88-63 (Sources of Drinking Water Policy)	Applicable	The Navy has evaluated the groundwater characteristics in the A-aquifer and B-aquifer at HPS Parcel G against the criteria listed in SWRCB Res. 88-63. The Navy has determined that groundwater in the A-aquifer is not a potential source of drinking water and groundwater in the B-aquifer has a low potential for use as a drinking water source. The Water Board has concurred in the Navy's determination that groundwater in the A-aquifer is not a potential drinking water source.
Describes the water basins in the San Francisco Bay Region beneficial uses of groundwater and surface water, establishes water quality objectives, including narrative and numerical standards and establishes implementation plans to meet the water quality objectives and protect beneficial uses, and incorporates statewide water quality control plans and policies.	Waters of the state	Comprehensive Water Quality Control Plan for the San Francisco Region (Basin Plan) Chapters 2 and 3 (California Water Code § 13240), except the MUN designation for the A-aquifer	Applicable	The substantive groundwater provisions of Chapters 2 and 3 of the basin plan, except the MUN designation, are ARARs. According to the basin plan, which incorporates SWRCB Res. 88-63, A-aquifer groundwater at HPS Parcel G is not a potential drinking water source. The only beneficial use of the A-aquifer groundwater is freshwater replenishment of San Francisco Bay. The B-aquifer groundwater has a low potential for use as a drinking water source.
Authorizes SWRCB and the Water Board to establish in water quality control plans, beneficial uses and numerical and narrative standards to protect both surface water and groundwater quality.	Waters of the state	California Water Code, div. 7, §§ 13241, 13243, 13263(a), 13269, and 13360 (Porter-Cologne Act)	Applicable	The Navy accepts the substantive provisions of §§ 13241, 13243, 13263(a), 13269, and 13360 of the Porter-Cologne Act enabling legislation, as implemented through the beneficial uses, water quality objectives, waste discharge requirements, and promulgated policies of the San Francisco Basin Plan as ARARs.

Requirement	Prerequisite	Citation[b]	Preliminary ARAR Determination	Comments
Establishes the policy that high-quality waters of the state "shall be maintained to the maximum extent possible" consistent with the "maximum benefit to the people of the State." It provides that whenever the existing quality of water is better than that required by applicable water quality policies, such existing high-quality water will be maintained until it has been demonstrated to the state that any change will be consistent with maximum benefit to the people of the state, will not unreasonably affect present and anticipated beneficial use of such water, and will not result in water quality less than that prescribed in the policies. It also states that any activity that produces or may produce a waste or increased volume or concentration of waste and that discharges or proposes to discharge to existing high-quality waters will be required to meet waste-discharge requirements that will result in the best practicable treatment or control of the discharge.		Statement of Policy With Respect to Maintaining High Quality of Waters in California, SWRCB Res. 68-16	Not an ARAR	The DON has determined that SWRCB Res. 68-16 is not a chemical-specific ARAR for determining remedial action goals, but it is an action-specific ARAR for regulating discharged treated groundwater to surface water. This remedial action does not include discharge of treated groundwater to surface water. The DON has determined that further migration of VOCs through groundwater is not a discharge governed by the language in Res. 68-16. More specifically, the language of SWRCB Res. 68-16 indicates that it is prospective in intent, applying to new discharges in order to maintain existing high-quality waters. It is not intended to apply to restoration of waters that are already degraded. The state does not agree with the Navy's determination that SWRCB Res. 92-49 and 68-16 are not ARARs for this response action. SWRCB has interpreted the term "discharges" in the *California Water Code* to include the movement of waste from soils to groundwater and from contaminated to uncontaminated water (SWRCB 1994). However, the state agrees that the proposed action would comply with SWRCB Res. 92-49 and 68-16. The state does not intend to dispute the ROD, but reserves its rights if implementation of the provisions at Cal. Code Regs. tit. 22 is not as stringent as state implementation of the provisions at Cal. Code Regs. tit. 23. Because Cal. Code Regs. tit. 22 regulation is part of the state's authorized hazardous waste control program, it is also the state's position that Cal. Code Regs. tit. 22, § 66264.94 is a state ARAR and not a federal ARAR (*United States v. State of Colorado*, 990 F.2d 1565 [1993]).

Requirement	Prerequisite	Citation[b]	Preliminary ARAR Determination	Comments
Describes requirements for Water Board oversight of investigation and cleanup and abatement activities resulting from discharges of hazardous substances. The Water Board may decide on cleanup and abatement goals and objectives for the protection of water quality and beneficial uses of water within each region. Establishes criteria for "containment zones" where cleanup to established water-quality goals is not economically or technically practicable.		Policies and procedures for investigation and cleanup and abatement of discharges under Cal.Water Code § 13304, SWRCB Res. 92-49	Not an ARAR	SWRCB Res. 92-49 is not an ARAR for groundwater cleanup because the provisions of Cal. Code Regs. tit. 22, § 66264.94 (a)(1), (a)(3), (c), (d), and (e) have been determined to be a federal ARAR and SWRCB Res. 92-49 is not more stringent. The state does not agree with the Navy's determination that SWRCB Res. 92-49 and 68-16 are not ARARs for this response action. SWRCB has interpreted the term "discharges" in the *California Water Code* to include the movement of waste from soils to groundwater and from contaminated to uncontaminated water (SWRCB 1994). However, the state agrees that the proposed action would comply with SWRCB Res. 92-49 and 68-16. The state does not intend to dispute the ROD, but reserves its rights if implementation of the provisions at Cal. Code Regs. tit. 22 is not as stringent as state implementation of the provisions at Cal. Code Regs. tit. 23. Because Cal. Code Regs. tit. 22 regulation is part of the state's authorized hazardous waste control program, it is also the state's position that Cal. Code Regs. tit. 22, § 66264.94 is a state ARAR and not a federal ARAR (*United States v. State of Colorado*, 990 F.2d 1565 [1993]).

Requirement	Prerequisite	Citation[b]	Preliminary ARAR Determination	Comments
Surface Water				
Surface water quality standards.	Marine water with salinities equal to or greater than 10 ppt 95 percent of the time	Basin Plan Table 3-3	Applicable	These standards are applicable to the Bay. The Navy has identified Table 3-3 an ARAR for HPS Parcel G because groundwater discharges to the Bay. The Navy will meet these ARARs in the Bay at the interface of the A-aquifer and the Bay. No groundwater response action is necessary for the B-aquifer; therefore, these standards are not ARARs for the B-aquifer.
Soil				
Department of Toxic Substances Control[b]				
Definition of non-RCRA hazardous waste.	Waste	Cal. Code Regs. tit. 22, §§ 66261.3(a)(2)(C) or (a)(2)(F), 66261.22(a)(3) and (a)(4), 66261.24(a)(2) – (a)(8), and 66261.101	Applicable	These regulations are applicable to activities that generate waste in order to determine if the waste is non-RCRA hazardous waste. Some of the alternatives evaluated in this revised feasibility study report include excavation and off-site disposal of soil. The Navy will determine if the excavated soil meets the definition of non-RCRA hazardous waste when it is generated.
State Water Resources Control Board[b]				
Definition of designated waste, nonhazardous waste, and inert waste.	Waste	Cal. Code Regs. tit. 27, §§ 20210, 20220, and 20230	Applicable	These regulations are applicable to activities that generate waste for classifying waste and determining the status of other ARARs. One of the alternatives evaluated in this revised feasibility study report includes excavation and off-site disposal of soil. The Navy will determine if the excavated soil meets these definitions when it is generated.

Notes:

a	Many action-specific ARARs contain chemical-specific limitations are addressed in the action-specific ARAR tables.
b	Only the substantive provisions of the requirements cited in this table are ARARs.
c	Statutes and policies, and their citations, are provided as headings to identify general categories of ARARs for the convenience of the reader; listing the statutes and policies does not indicate that the Navy accepts the entire statutes or policies as ARARs. Specific ARARs are addressed in the table below each general heading; only substantive requirements of the specific citations are considered ARARs.
§	Section
§§	Sections
ARAR	Applicable or relevant and appropriate requirement
div.	Division
Cal. Code Regs.	Code of California Regulations
HPS	Hunters Point Shipyard
MUN	Municipal and domestic supply
ppt	Part per thousand
RCRA	Resource Conservation and Recovery Act
Res.	Resolution
SWRCB	State Water Resources Control Board
tit.	Title
Water Board	San Francisco Bay Regional Water Quality Control Board

Federal Location-Specific Applicable or Relevant and Appropriate Requirements
Record of Decision for Parcel G, Hunters Point Shipyard, San Francisco, California

Location	Requirement	Prerequisite	Citation[a]	Preliminary ARAR Determination	Comments
National Historic Preservation Act of 1966, as Amended (Title 16 U.S.C. §§ 470-470x-6)[b]					
Historic project owned or controlled by federal agency	Action to preserve historic properties; planning of action to minimize harm to properties listed on or eligible for listing on the National Register of Historic Places.	Property included in or eligible for the National Register of Historic Places.	16 U.S.C. §§ 470-470x-6 36, CFR Part 800 40, and CFR § 6.301(b)	Applicable	The Navy has determined that the 450-ton bridge crane is eligible for inclusion on the National Register of Historic Places. None of the remedial alternatives evaluated in this feasibility study report include activities that will have an impact on the crane.
Coastal Zone Management Act (Title 16 USC §§ 1451–1464)[b]					
Within coastal zone	Conduct activities in a manner consistent with approved state management programs.	Activities affecting the coastal zone, including lands thereunder and adjacent shore land.	16 U.S.C. § 1456(c) and 15 CFR § 930	Relevant and appropriate	Federal lands are specifically excluded from the coastal zone; however, the Navy has determined that the Coastal Zone Management Act is relevant and appropriate for activities that will occur within 100 feet of the San Francisco Bay. Any remedial actions taken by the Navy will be consistent with the San Francisco Bay Plan, an approved state management program.

Notes:

a Only the substantive provisions of the requirements cited in this table are ARARs.

b Statutes and policies, and their citations, are provided as headings to identify general categories of ARARs for the convenience of the reader; listing the statutes and policies does not indicate that the Navy accepts the entire statutes or policies as ARARs. Specific ARARs are addressed in the table below each general heading; only substantive requirements of the specific citations are considered ARARs.

§ Section
§§ Sections
ARAR Applicable or relevant and appropriate requirement
CFR Code of Federal Regulations
U.S.C. United States Code

State Location-Specific Applicable or Relevant and Appropriate Requirements
Record of Decision for Parcel G, Hunters Point Shipyard, San Francisco, California

Location	Requirement	Prerequisite	Citation[a]	Preliminary ARAR Determination	Comments
McAteer-Petris Act (California Government Code §§ 66600 through 66661)[b]					
Within the San Francisco Bay coastal zone	Reduce fill and disposal of dredged material in San Francisco Bay, maintain marshes and mudflats to the fullest extent possible to conserve wildlife, abate pollution, and protect the beneficial uses of the San Francisco Bay.	Activities affecting the San Francisco Bay and 100 feet landward of the shoreline.	San Francisco Bay Plan (Bay Plan) at Cal. Code Regs. tit. 14 §§ 10110 through 11990	Relevant and appropriate	The Bay Plan, developed under the authority of the McAteer-Petris Act, is an approved state coastal zone management program. Any remedial actions take by the Navy that will affect San Francisco Bay or that will occur within 100 feet landward of the shoreline will be consistent with the goals of the Bay Plan.

Notes:

a Only the substantive provisions of the requirements cited in this table are ARARs

b Statutes and policies, and their citations, are provided as headings to identify general categories of ARARs for the convenience of the reader; listing the statutes and policies does not indicate that the Navy accepts the entire statutes or policies as ARARs. Specific ARARs are addressed in the table below each general heading; only substantive requirements of the specific citations are considered ARARs.

§§ Sections
ARAR Applicable or relevant and appropriate requirement
Cal. Code Regs. California Code of Regulations
tit. Title

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Excavation and Off-Site Disposal of Soil					
Resource Conservation and Recovery Act (Title 42 U.S.C., Chapter 82, §§ 6901-6991[i])[a]					
On-site generation of waste	Person who generates waste shall determine if the waste is a hazardous waste.	Generator of waste	Cal. Code Regs. tit. 22, §§ 66262.10(a), and 66262.11	Applicable	These regulations are applicable to any operation that generates waste. The excavation and off-site disposal alternative contemplates the generation of waste to be disposed of off site. The Navy will decide whether the waste in RCRA hazardous waste when it is generated.
On-site generation of waste	Requirements for analyzing waste for determining whether waste is hazardous.	Generator of waste	Cal. Code Regs. tit. 22, § 66264.13(a) and (b)	Applicable	These regulations are applicable to any operation that generates waste. The excavation and off-site disposal alternative includes activities that generate waste to be disposed of off site. The Navy will decide whether the waste is RCRA hazardous waste when it is generated.
Stockpiling soil for off-site disposal	Allows generators to accumulate solid remediation waste in an EPA-designated pile for storage only up to 2 years during remedial operations without triggering land disposal restrictions.	Hazardous remediation waste temporarily stored in piles	40 CFR § 264.554 (d)(1)(i) through (ii), (d)(2), (e), (f), (h), (i), (j), and (k)	Relevant and appropriate	The Navy will temporarily stockpile soil in staging piles for off-site disposal. The Navy does not anticipate that all soil will be RCRA hazardous waste; however, the Navy has determined that these requirements are relevant and appropriate for all stockpiled soil.
Clean Air Act (Title 42 U.S.C. §§ 7401-7671)[a]					
Excavate soil	Prohibits emission equal or greater to 20 percent opacity.	Emission from a source	Bay Area Air Quality Management District Rule 6-302	Applicable	This requirement is applicable to the construction required for installation of the soil cover.

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Covering Portions of Soil					
Resource Conservation and Recovery Act (Title 42 U.S.C., Chapter 82, §§ 6901-6991[i])[a]					
Construct a cover	The final cover must accommodate lateral and vertical shear forces generated by the maximum credible earthquake so that the integrity of the final cover is maintained.	RCRA hazardous waste management unit	Cal. Code Regs. tit. 22, § 66264.310(a)(5)	Relevant and appropriate	The Navy has determined that this regulation is an ARAR for covering portions of the soil. This regulation is relevant and appropriate because the soil cover will not be constructed as a landfill waste management unit. Instead, the cover will be constructed solely to prevent human exposure to contaminants in the soil.
Construct a cover	The integrity and effectiveness of the final cover, including making repairs to the cover as necessary to correct the effects of settling, subsidence, erosion, or other events throughout the post-closure period.	RCRA hazardous waste management unit	Cal. Code Regs. tit. 22, § 66264.310(b)(1)	Relevant and appropriate	The Navy has determined that this regulation is an ARAR for covering portions of the soil. This regulation is relevant and appropriate because the soil cover will not be constructed as a landfill waste management unit. Instead, the cover will be constructed solely to prevent human exposure to contaminants in the soil.
Construct a cover	Run-on and run-off must not erode or otherwise damage the final cover.	RCRA hazardous waste management unit	Cal. Code Regs. tit. 22, § 66264.310(b)(4)	Relevant and appropriate	The Navy has determined that this regulation is an ARAR for covering portions of the soil. This regulation is relevant and appropriate because the soil cover will not be constructed as a landfill waste management unit. Instead, the cover will be constructed solely to prevent human exposure to contaminants in the soil.

Federal Action-Specific Applicable or Relevant and Appropriate Requirements
Record of Decision for Parcel G, Hunters Point Shipyard, San Francisco, California (Continued)

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Covering Portions of Soil					
Resource Conservation and Recovery Act (Title 42 U.S.C., Chapter 82, §§ 6901-6991[i])[a]					
Construct a cover	Protect and maintain surveyed benchmarks throughout the postclosure period.	RCRA hazardous waste management unit	Cal. Code Regs. tit. 22, § 66264.310(b)(5)	Relevant and appropriate	The Navy has determined that this regulation is an ARAR for covering portions of the soil. This regulation is relevant and appropriate because the soil cover will not be constructed as a landfill waste management unit. Instead, the cover will be constructed solely to prevent human exposure to contaminants in the soil
Clean Water Act (Title 33 U.S.C., Chapter 26, §§ 1251-1387)[a]					
Construct a cover	Owners and operators of construction activities must be in compliance with discharge standards.	Construction activities at least 1 acre in size	Clean Water Act § 402 (33 U.S.C. Chapter 26, §1342) and 40 CFR § 122.44(k)(2) and (4)	Applicable	The Navy anticipates disturbing more than one acre when constructing the soil covers. The Navy will use the provisions in the state general storm water discharge permit, Order 99-08-DWQ, as TBCs for complying with these storm water discharge requirements under the Clean Water Act.
Clean Air Act (Title 42 U.S.C. §§ 7401-7671)[a]					
Construct a cover	Prohibits emission equal or greater to 20 percent opacity.	Emission from a source	Bay Area Air Quality Management District Rule 6-302	Applicable	This requirement is applicable to construction required for the cover.

Federal Action-Specific Applicable or Relevant and Appropriate Requirements
Record of Decision for Parcel G, Hunters Point Shipyard, San Francisco, California (Continued)

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Groundwater Monitoring					
Resource Conservation and Recovery Act (Title 42 U.S.C., Chapter 82, §§ 6901-6991[i])[a]					
Monitor groundwater	After closure of a regulated unit, water quality monitoring regulations apply during the post-closure care period under Cal. Code Regs. tit. 22, § 66264.117 unless the regulated unit has been in compliance with the water quality protection standard for three consecutive years.	RCRA hazardous waste management unit	Cal. Code Regs. tit. 22, § 66264.90(c)	Relevant and appropriate	These requirements are applicable to RCRA hazardous waste facilities; however, the Navy has determined that they are relevant and appropriate to the monitoring component of the groundwater response action.
Monitor groundwater	Requirement to establish a detection monitoring program.	RCRA hazardous waste management unit	Cal. Code Regs. tit. 22, § 66264.91(a)(1)	Relevant and appropriate	The requirement to establish a detection monitoring program is applicable to RCRA hazardous waste facilities; however, the Navy has determined that it is relevant and appropriate to establishing its detection monitoring program.
Monitor groundwater	Contaminants of concern are the waste constituents, reaction products, and hazardous constituents that are reasonably expected to be in or derived from the waste contained in the regulated unit.	RCRA hazardous waste management unit	Cal. Code Regs. tit. 22, § 66264.93	Relevant and appropriate	These requirements are applicable to RCRA hazardous waste facilities; however, the Navy has determined that they are relevant and appropriate to the monitoring component of the groundwater response action.

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Groundwater Monitoring (Continued)					
Resource Conservation and Recovery Act (Title 42 U.S.C., Chapter 82, §§ 6901-6991[i])[a] (Continued)					
Monitor groundwater	The owner or operator shall establish a groundwater monitoring system for each regulated unit and include a sufficient number of monitoring points installed at appropriate locations and depths to yield groundwater samples from the uppermost aquifer that represent the quality of groundwater passing the point of compliance.	RCRA hazardous waste management unit	Cal. Code Regs. tit. 22, § 66264.97(b)(1)(A), (b)(1)(B), (b)(1)(C), (b)(1)(D)(1), and (b)(1)(D)(2)	Relevant and appropriate	These requirements are applicable to RCRA hazardous waste facilities; however, the Navy has determined that they are relevant and appropriate to the monitoring component of the groundwater response action.
Monitor groundwater	Requirements for monitoring well construction and sampling intervals.	RCRA hazardous waste management unit	Cal. Code Regs. tit. 22, § 66264.97(b)(4), (5), (6), and (7)	Relevant and appropriate	These requirements are applicable to RCRA hazardous waste facilities; however, the Navy has determined that they are relevant and appropriate to the monitoring component of the groundwater response action.
Monitor groundwater	Requirements for groundwater sample collection.	RCRA hazardous waste management unit	Cal. Code Regs. tit. 22, § 66264.97(e)(6), (e)(12)(A), (e)(12)(B), (e)(13), and (e)(15)	Relevant and appropriate	These requirements are applicable to RCRA hazardous waste facilities; however, the Navy has determined that they are relevant and appropriate to the monitoring component of the groundwater response action.

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Groundwater Monitoring (Continued)					
Resource Conservation and Recovery Act (Title 42 U.S.C., Chapter 82, §§ 6901-6991[i])[a] (Continued)					
Monitor groundwater	Requirements for a detection monitoring program.	RCRA hazardous waste management unit	Cal. Code Regs. tit. 22, § 66264.98(e)(1) through (5), (i), (j), (k)(1) through (3), (k)(4)(A), (k)(4)(D), (k)(5), (k)(7)(C), (k)(7)(D), (n)(1), (n)(2)(B), and (n)(2)(C)	Relevant and appropriate	These requirements are applicable to RCRA hazardous waste facilities; however, the Navy has determined that they are relevant and appropriate to the monitoring component of the groundwater response action.
Monitor groundwater	Requirements for an evaluation monitoring program.	RCRA hazardous waste management unit	Cal. Code Regs. tit. 22, § 66264.99(b), (e)(1) through (6), (f)(3), and (g)	Relevant and appropriate	These requirements are applicable to RCRA hazardous waste facilities; however, the Navy has determined that they are relevant and appropriate to the monitoring component of the groundwater response action.
Monitor groundwater	In conjunction with corrective action measures, the owner or operator shall establish and implement a water quality monitoring program to demonstrate the effectiveness of the corrective action program. The program shall be effective in determining compliance and in determining the success of the corrective action measures.	Corrective action for groundwater at RCRA hazardous waste management unit	Cal. Code Regs. tit. 22, § 66264.100(d)	Relevant and appropriate	These requirements are applicable to RCRA hazardous waste facilities; however, the Navy has determined that they are relevant and appropriate to the monitoring component of the groundwater response action.

Federal Action-Specific Applicable or Relevant and Appropriate Requirements
Record of Decision for Parcel G, Hunters Point Shipyard, San Francisco, California (Continued)

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Groundwater Monitoring (Continued)					
Resource Conservation and Recovery Act (Title 42 U.S.C., Chapter 82, §§ 6901-6991[i])[a] (Continued)					
Monitor groundwater	After terminating corrective action measures, the owner or operator must continue corrective action monitoring until compliance with remediation goals for a period of 1 year is demonstrated.	Corrective action for groundwater at a RCRA hazardous waste management unit	Cal. Code Regs. tit. 22, § 66264.100(g)(1)	Relevant and appropriate	These requirements are applicable to RCRA hazardous waste facilities; however, the Navy has determined that they are relevant and appropriate to the monitoring component of the groundwater response action.
Monitor groundwater	DTSC may shorten the post-closure care period if the owner or operator demonstrates that the reduced period is sufficient to protect human health and the environment.	RCRA hazardous waste facility where wastes, waste residues, contaminated materials, and contaminated soils will not be removed during closure	Cal. Code Regs. tit. 22, § 66264.117(b)(2)(A)	Relevant and appropriate	These requirements are applicable to RCRA hazardous waste facilities; however, the Navy has determined that they are relevant and appropriate to the monitoring component of the groundwater response action.

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Groundwater Monitoring (Continued)					
Bioremediation					
Safe Drinking Water Act (Title 42 U.S.C., § 300[f]-300[j]-26)[a]					
Inject metals treatment compound and/or hydrogen treatment compound into groundwater	The underground injection control program prohibits injection activities that allow movement of contaminants into underground sources of drinking water that may result in violations of maximum contaminant levels or adversely affect health.	An approved underground injection control program is required in states listed under SDWA 40 CFR § 144.12. Class I wells and Class IV wells are the relevant classifications for CERCLA sites. Class I wells are used to inject hazardous waste beneath the lowermost formation that contains a USDW within 0.25 mile of the well.	40 CFR § 144.12, excluding the reporting requirements in § 144.12(b), and 144.12(c)(1)	Applicable	This requirement is applicable to the Navy's injection of metals treatment compound and/or hydrogen treatment compound into the groundwater. The Navy will use the basic information requirements contained in 40 CFR §144.83 as TBCs for complying with the requirement in 40 CFR §144.12(a).

Federal Action-Specific Applicable or Relevant and Appropriate Requirements
Record of Decision for Parcel G, Hunters Point Shipyard, San Francisco, California (Continued)

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Disposal of Investigation-Derived Waste Generated in Implementing Groundwater Alternatives					
Resource Conservation and Recovery Act (Title 42 U.S.C., Chapter 82, §§ 6901-6991[i])[a]					
On-site generation of waste	Person who generates waste shall determine if the waste is hazardous waste.	Generator of waste	Cal. Code Regs. tit. 22, §§ 66262.10(a), and 66262.11	Applicable	These regulations are applicable to any operation that generates waste. The Navy will decide whether the waste is RCRA hazardous waste when it is generated.
Disposal of Investigation-Derived Waste Generated in Implementing Groundwater Alternatives					
Resource Conservation and Recovery Act (Title 42 USC, Chapter 82, §§ 6901-6991[i])[a]					
On-site generation of waste	Requirements for analyzing waste for determining whether waste is hazardous.	Generator of waste	Cal. Code Regs. tit. 22, § 66264.13(a) and (b)	Applicable	These regulations are applicable to any operation that generates waste. The Navy will determine whether the waste is RCRA hazardous waste when it is generated.

Notes:

a Statutes and policies, and their citations, are provided as headings to identify general categories of ARARs for the convenience of the reader; listing the statutes and policies does not indicate that the Navy accepts the entire statutes or policies as ARARs. Specific ARARs follow each general heading, and only substantive requirements of the specific citations are considered ARARs.

§ Section
§§ Sections
ARAR Applicable or relevant and appropriate requirement
Cal. Code Regs. California Code of Regulations
CERCLA Comprehensive Environmental Response, Compensation, and Liability Act
CFR Code of Federal Regulations
DTSC Department of Toxic Substances Control
DWQ Department of Water Quality
EPA U.S. Environmental Protection Agency
RCRA Resource Conservation and Recovery Act
SDWA Safe Drinking Water Act
TBC To be considered
tit. Title
U.S.C. United States Code
USDW Underground sources of drinking water

State Action-Specific Applicable or Relevant and Appropriate Requirements
Record of Decision for Parcel G, Hunters Point Shipyard, San Francisco, California (Continued)

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Institutional Controls					
California Civil Code[a]					
Placing a institutional controls on soil and groundwater	Provides conditions under which land-use restrictions will apply to successive owners of land.	Transfer of property from the Navy to a nonfederal agency	California Civil Code §1471	Relevant and appropriate	The Navy is evaluating ICs for soil and groundwater. These requirements are ARARs for those ICs.
California Health and Safety Code[a]					
Placing institutional controls on soil and groundwater	Allows DTSC to enter into an agreement with the owner of a hazardous waste facility to restrict present and future land uses.	Transfer of property from the Navy to a nonfederal agency	California Health and Safety Code § 25202.5	Relevant and appropriate	The Navy is evaluating ICs for soil and groundwater. These requirements are ARARs for those ICs.
Placing institutional controls on soil and groundwater	Provides processes and criteria for obtaining written variances from a land use restriction and for the removal of a land use restriction.	Transfer of property from the Navy to a nonfederal agency	California Health and Safety Code §§ 25233(c) and 25234	Relevant and appropriate	The Navy is evaluating ICs for soil and groundwater. These requirements are ARARs for those ICs.
Placing institutional controls on soil and groundwater	Provides a streamlined process to be used to enter into an agreement to restrict specific use of property in order to implement the substantive use restrictions of California Health & Safety Code § 25232(b)(1)(A)–(E).	Transfer of property from the Navy to a nonfederal agency	California Health and Safety Code §§ 25222.1 and 25355.5(a)(1)(C)	Relevant and appropriate	The Navy is evaluating ICs for soil and groundwater. These requirements are ARARs for those ICs.
Placing institutional controls on soil and groundwater.	Prohibits certain uses of land containing hazardous waste without a specific variance.	Transfer of property from the Navy to a nonfederal agency	California Health and Safety Code § 25232(b)(1)(A) through (E)	Relevant and appropriate	The Navy is evaluating ICs for soil and groundwater. These requirements are ARARs for those ICs.

State Action-Specific Applicable or Relevant and Appropriate Requirements
Record of Decision for Parcel G, Hunters Point Shipyard, San Francisco, California (Continued)

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Institutional Controls (Continued)					
Department of Toxic Substances Control[a]					
Placing institutional controls on soil and groundwater	A land use covenant imposing appropriate limitations on land use shall be executed and recorded when facility closure, corrective action, remedial or removal action, or other response actions are undertaken and hazardous materials, hazardous wastes or constituents, or hazardous substances will remain at the property at levels which are not suitable for unrestricted use of the land.	Property transfer by federal government to a non-federal entity	Cal. Code Regs. tit. 22, § 67391.1	Relevant and appropriate	The Navy is evaluating ICs for soil and groundwater. These requirements are ARARs for those ICs. EPA agrees that the substantive portions of the regulations referenced are ARARs. EPA specifically considers sections (a), (b), (d), and (e) of Cal. Code Regs. tit. 22 § 67391.1, to be ARARs for this ROD. DTSC's position is that all of the state regulation is an ARAR.
Excavation and Off-Site Disposal					
State Water Resources Control Board[a]					
Excavating soil and generating investigation-derived waste	Sampling and analysis of discharges shall be used for accurate characterization of wastes.	Waste	Cal. Code Regs. tit. 27, §20200(c)	Applicable	This requirement is applicable to operations that generate waste. The Navy will accurately characterize waste for off-site disposal.

State Action-Specific Applicable or Relevant and Appropriate Requirements
Record of Decision for Parcel G, Hunters Point Shipyard, San Francisco, California (Continued)

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Excavation and Off-Site Disposal (Continued)					
State Water Resources Control Board[a] (Continued)					
Off-site disposal of soil and investigation derived waste	Requires that designated waste as defined at California Water Code §13173 be discharged to Class I or Class II waste management units.	Discharge of designated waste after July 18, 1997 (nonhazardous waste that could cause degradation of surface or ground waters) to land for treatment, storage, or disposal	Cal. Code Regs. tit. 27, §20210	Applicable	This requirement is applicable to operations that generate waste. The Navy will determine if the waste meets the definition of designated waste for off-site disposal.
Off-site disposal of soil and investigation derived waste	Requires that nonhazardous solid waste as defined at Cal. Code Regs. tit. 27 §20220(a) be discharged to a classified waste management unit.	Discharge of nonhazardous solid waste after July 18, 1997, to land for treatment, storage, or disposal	Cal. Code Regs. tit. 27, §20220(b), (c), and (d)	Applicable	This requirement is applicable to operations that generate waste. The Navy will determine if the waste meets the definition of nonhazardous solid waste for off-site disposal.
Off-site disposal of soil and investigation derived waste	Inert waste as defined at Cal. Code Regs. tit. 27 §20230(a) need not be discharged at a classified unit.	Applies to discharges of inert waste to land after July 18, 1997, for treatment, storage, or disposal	Cal. Code Regs. tit. 27 §20230(b)	Applicable	This requirement is applicable to operations that generate waste. The Navy will determine if the waste meets the definition of inert waste for off-site disposal.

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Covering Portions of the Soil					
State Water Resources Control Board[a]					
Covering portions of the soil	Alternatives to construction or prescriptive standards.	Cal. Code Regs. tit. 27 requirements are only applicable for waste discharged after July 18, 1997 unless otherwise noted	Cal. Code Regs. tit. 27, § 20080(b)	Relevant and appropriate	The Navy has determined that this regulation is an ARAR for covering portions of the soil. This regulation is relevant and appropriate because the soil cover will not be constructed as a landfill waste management unit. Instead, the cover will be constructed solely to prevent human exposure to contaminants in the soil.
Remediation activities	Actions taken by or at the direction of public agencies to clean up or abate conditions of pollution or nuisance resulting from unintentional or unauthorized releases of waste or pollutants to the environment; provided that wastes, pollutants, or contaminated materials removed from the immediate place of release shall be discharged according to the SWRCB-promulgated sections of Article 2, Subchapter 2, Chapter 3, Subdivision 1 of this division (§20200 et seq.); and further provided that remedial actions intended to contain the wastes at the place of release shall implement applicable SWRCB-promulgated provisions of this division to the extent feasible.	Action taken by or at the direction of a public agency to cleanup release of pollutant	Cal. Code Regs. tit. 27 §20090(d)	Relevant and appropriate	This regulation is relevant and appropriate because “public agency” is not defined in the regulations; therefore, it does not specifically apply to the federal government.

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Covering Portions of the Soil (Continued)					
State Water Resources Control Board[a] (Continued)					
Covering portions of the soil	Closed units shall be provided with at least two permanent monuments installed by a licensed land surveyor or a registered civil engineer, from which the location and elevation of containment structures can be determined throughout the post-closure maintenance period.	Waste discharged after July 18, 1997	Cal. Code Regs. tit. 27 §20950(d)	Relevant and appropriate	The Navy has determined that this regulation is an ARAR for covering portions of the soil. This regulation is relevant and appropriate because the soil cover will not be constructed as a landfill waste management unit. Instead, the cover will be constructed solely to prevent human exposure to contaminants in the soil.

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Covering Portions of the Soil (Continued)					
State Water Resources Control Board[a] (Continued)					
Covering portions of the soil	In spite of differential settlement, the final cover of closed landfills (including waste piles and surface impoundments closed as landfills) shall be designed, graded, and maintained to prevent ponding and to prevent soil erosion caused by high run-off velocities. All portions of the final cover shall have a slope of at least 3 percent unless the Water Board allows portions of the final cover to be built with slopes of less than 3 percent when the discharger proposes an effective system for diverting surface drainage from laterally adjacent areas and preventing ponding in the allowed flatter portion. The final grading design shall be designed and approved by a registered civil engineer or certified engineering geologist taking into consideration pertinent natural and constructed topographic features (including any related to the proposed post-closure land use), and climate.	Waste management unit	Cal. Code Regs. tit. 27 §21090(b)(1)	Relevant and appropriate	The Navy has determined that this regulation is an ARAR for covering portions of the soil. This regulation is relevant and appropriate because the soil cover will not be constructed as a landfill waste management unit. Instead, the cover will be constructed solely to prevent human exposure to contaminants in the soil.

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Covering Portions of the Soil (Continued)					
State Water Resources Control Board[a] (Continued)					
Covering portions of the soil	Throughout the post-closure maintenance period, the discharger shall prevent erosion and related damage of the final cover caused by drainage.	Waste management unit	Cal. Code Regs. tit. 27 §21090(c)(4)	Relevant and appropriate	The Navy has determined that this regulation is an ARAR for covering portions of the soil. This regulation is relevant and appropriate because the soil cover will not be constructed as a landfill waste management unit. Instead, the cover will be constructed solely to prevent human exposure to contaminants in the soil.

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Covering Portions of the Soil (Continued)					
State Water Resources Control Board[a] (Continued)					
Covering portions of the soil	When all closure activities are complete for the unit, the discharger shall conduct an aerial photographic survey, or alternative survey under Cal. Code Regs. tit. 27 §21090 (e)(3), of the closed portions of the unit and of its immediate surrounding area, including at least the surveying monuments (of §20950[d]). The data obtained shall be used to produce a topographic map of the site at a scale and contour interval sufficient to depict the as-closed topography of each portion of the unit, and to allow the early identification of any differential settlement. The map produced pursuant to this paragraph shall act as a base-line against which to measure the total settlement, through time, of all portions of the final cover since the date when that landfill, or portion thereof, was closed.	Waste management unit	Cal. Code Regs. tit. 27 §21090(e)(1) and (3)	Relevant and appropriate	The Navy has determined that this regulation is an ARAR for covering portions of the soil. This regulation is relevant and appropriate because the soil cover will not be constructed as a landfill waste management unit. Instead, the cover will be constructed solely to prevent human exposure to contaminants in the soil.

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Covering Portions of the Soil (Continued)					
State Water Resources Control Board[a] (Continued)					
Excavating soil	Construction that disturbs at least 1 acre must use best management practices to control storm water discharges.	Construction activities at least 1 acre in size	SWRCB General Permit for Storm Water Discharges 99-08-DWQ	TBC	The excavation and off-site disposal alternative and the cover alternative will disturb at least 1 acre. Therefore, the Navy has determined that Clean Water Act §402 (33 U.S.C. §1342) and 40 CFR. §122.44(k)(2) and (4) requirements for storm water discharge are federal ARARs. In order to comply with these federal ARARs, the Navy will use the substantive requirements of the state permit as TBCs.
Covering portions of the soil	The final cover shall function with minimum maintenance and shall be compatible with post-closure land use. Alternative final cover designs shall meet the performance requirements of Cal. Code Regs. tit. 27 §21140(a). The Enforcement Authority may require additional thickness, quality, and type of final cover depending on, but not limited to the future reuse of the site.	Waste management unit	Cal. Code Regs. tit. 27 §21140	Relevant and appropriate	The Navy has determined that this regulation is an ARAR for covering portions of the soil. This regulation is relevant and appropriate because the soil cover will not be constructed as a landfill waste management unit. Instead, the cover will be constructed solely to prevent human exposure to contaminants in the soil.

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Covering Portions of the Soil (Continued)					
California Integrated Waste Management Board[a]					
Covering portions of the soil	The operator shall ensure the integrity of final slopes under both static and dynamic conditions to protect public health and safety and prevent damage to post-closure land uses, roads, structures, utilities, and to prevent exposure of waste.	Waste management unit	Cal. Code Regs. tit. 27 §21145(a)	Relevant and appropriate	The Navy has determined that this regulation is an ARAR for covering portions of the soil. This regulation is relevant and appropriate because the soil cover will not be constructed as a landfill waste management unit. Instead, the cover will be constructed solely to prevent human exposure to contaminants in the soil.
Covering portions of the soil	The drainage and erosion control system shall be designed and maintained to ensure integrity of post-closure land uses, roads, and structures; to prevent public contact with waste; to prevent safety hazards; and to prevent exposure of waste. Slopes that are not underlain by waste shall be stabilized to prevent soil erosion. Methods used to protect slopes and control erosion shall include, but are not limited to, terracing, contour furrows, and trenches.	Waste management unit	Cal. Code Regs. tit. 27 §21150	Relevant and appropriate	The Navy has determined that this regulation is an ARAR for covering portions of the soil. This regulation is relevant and appropriate because the soil cover will not be constructed as a landfill waste management unit. Instead, the cover will be constructed solely to prevent human exposure to contaminants in the soil.

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Groundwater Monitoring					
State Water Resources Control Board[a]					
Remediation activities	Actions taken by or at the direction of public agencies to clean up or abate conditions of pollution or nuisance resulting from unintentional or unauthorized releases of waste or pollutants to the environment; provided that wastes, pollutants, or contaminated materials removed from the immediate place of release shall be discharged according to the SWRCB-promulgated sections of Article 2, Subchapter 2, Chapter 3, Subdivision 1 of this division (§20200 et seq.); and further provided that remedial actions intended to contain the wastes at the place of release shall implement applicable SWRCB-promulgated provisions of this division to the extent feasible.	Action taken by or at the direction of a public agency to cleanup release of pollutant	Cal. Code Regs. tit. 27 §20090(d)	Relevant and appropriate	This regulation is relevant and appropriate to the Navy's groundwater remedial action because "public agency" is not defined in the regulations; therefore, it does not specifically apply to the federal government.

Notes:

a Statutes and policies, and their citations, are provided as headings to identify general categories of ARARs for the convenience of the reader; listing the statutes and policies does not indicate that the Navy accepts the entire statutes or policies as ARARs. Specific ARARs follow each general heading, and only substantive requirements of the specific citations are considered ARARs.

§ Section
§§ Sections
ARAR Applicable or relevant and appropriate requirement
Cal. Code Regs. California Code of Regulations
CFR Code of Federal Regulations
DTSC Department of Toxic Substances Control
DWQ Department of Water Quality
EPA U.S. Environmental Protection Agency
HPS Hunters Point Shipyard
IC Institutional control
ROD Record of Decision
SWRCB State Water Resources Control Board
TBC To be considered
tit. Title
U.S.C. United States Code
Water Board San Francisco Bay Regional Water Quality Control Board

ATTACHMENT 2
RESPONSIVENESS SUMMARY

Proposed Plan for Parcel D, Hunters Point Shipyard		
Spoken Comment by Kristine Enea received at the public meeting held July 30, 2008		
Comment Number	**Comment**	**Response**
1	I feel comfortable that the RAD material will not escape the trucks. However, trucks themselves sometimes take dirt out with them. I've seen trucks come out with dirt on the fender. So my request would just be to make sure that the trucks themselves are clean of dirt, not because I'm afraid of radiological contamination, but because I live on Innes Avenue. All the trucks go by my house, and our houses are kind of dirty. [Refer to the transcript of the public meeting beginning on page 38 for the complete comment.]	Appropriate engineering measures (for example, inspecting and cleaning trucks before they leave the site) will be used during remediation to minimize any impact from site soil on the surrounding Bayview Hunters Point community. Furthermore, radiologically impacted material is transported off site in sealed containers to prevent any releases.

Proposed Plan for Parcel D, Hunters Point Shipyard		
Spoken Comments by Ahimsa Sumchai received at the public meeting held July 30, 2008		
Comment Number	**Comment**	**Response**
1	I wanted to go on record as being very, very strongly opposed to a proposal to early transfer. Parcel UC-1, I am strongly opposed to any plan to dirty-transfer a parcel that in its reuse is expected to be a site for residential development. And Parcel UC-1 is slated for mixed-use development under the current redevelopment plan. [Refer to the transcript of the public meeting beginning on page 39 for the complete comment.]	Parcel UC-1 consists mostly of a portion of Spear Avenue. Figure 4 in the Proposed Plan shows a portion of Parcel UC-1 is planned for mixed use. However, residential reuse of this street area is unlikely. Furthermore, no data were collected within Parcel UC-1 because no historical activities with risk concerns took place in this area. Nevertheless, all of Parcel UC-1 will be covered to protect all users from exposure to the surface soil.
2	Additionally, Parcel UC-1 is adjacent to Redevelopment Block 30A, which you have identified as being a region in which the soil concentrations approached 10^{-6}, and that concerns me. The risk, of course, is 10^{-5}. So I really do think that we are identifying a region of Parcel D that is at significant risk for human exposure and that – you've documented that, and I just think it doesn't make common sense to not do a full cleanup of a parcel that is potentially slated for residential development. [Refer to the transcript of the public meeting beginning on page 39 for the complete comment.]	Table 1 in the Proposed Plan shows that the cancer risk at Redevelopment Block 30A based on residential exposure to chemicals is 2×10^{-7} and for exposure to radionuclides is 1×10^{-6}. Both these risk values are less than the range that the Navy and the regulatory agencies consider as acceptable. The goal of the remedial action at Parcel D-1, D-2, G, and UC-1 is to protect human health and the environment to the standards set by the federal and state regulatory agencies. The remedies proposed in the proposed plan, and detailed in this Record of Decision (ROD), address all contamination that resulted from past Navy activities. After all the proposed actions are conducted and operation and maintenance and institutional controls (IC) are implemented, the actions proposed will be protective of human health.
3	Additionally, it violates community acceptance, as documented in Proposition P, which was passed by the overwhelming majority of San Francisco voters in the year 2000 and that called for cleanup of the Shipyard to residential standards. [Refer to the transcript of the public meeting beginning on page 39 for the complete comment.]	The goal of the remedial action at Parcels D-1, D-2, G, and UC-1 is to protect human health and the environment to the standards set by the regulatory agencies. Cleanup goals consider the expected future land use so not all areas will be remediated to residential levels. For example, areas that will become open space will be remediated to standards that consider recreational use. Nevertheless, all of Parcels D-1, D-2, G, and UC-1 will be covered to protect all users from exposure to the surface soil. Community acceptance is considered in the ROD as required by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP).

Proposed Plan for Parcel D, Hunters Point Shipyard		
Written Comments by City and County of San Francisco received August 15, 2008 by email		
Comment Number	**Comment**	**Response**
1	In the Overview of Proposed Institutional Controls, Proposed Activity Restrictions Relating to VOC vapors at Specific Locations within Parcel D-1 and G, it states that "Initially, the ARIC includes all of Parcel D-1 and G". We think this is a misrepresentation of the current state of knowledge about the ARIC for VOC vapors and unnecessarily restricts Parcel D-1 and G. Our request is to phrase the restriction as "Initially, the ARIC will include all areas of the Parcels D-1 and G with soil gas levels above the remediation goals." This sentence more accurately reflects the current state of knowledge about the ARIC for VOC vapors and describes where the ARIC will be required. The soil gas surveys will be performed in areas where past uses and data suggest possible concerns regarding soil gas. However, based on the current knowledge of the site we are certain that there are many areas where: (a) no soil gas sampling will be required and (b) there will be no requirement for an ARIC for VOC vapors.	The area requiring institutional controls (ARIC) for vapor intrusion may be modified as remediation is completed or in response to further sampling and analysis that establishes that areas now in the ARIC do not pose unacceptable potential exposure risk to volatile organic compound (VOC) vapors. The initial ARIC is proposed to include the entire area of Parcels D-1 and G because existing data for soil gas are insufficient to further reduce the size of the ARIC.
2	Soil gas remediation goals need to be established in the Parcel D-1 and G RODs. The language relating to soil gas remediation goals on page 8 of the Proposed Plan, which states that a numerical goal for each VOC will be established *in the remedial design (RD)* and on page 14, that survey results *following remedial actions* will be used to establish risk-based remediation goals for soil gas should be changed to reflect that soil gas remediation goals will be established in the ROD. If the current schedule for the ROD would be impacted by the establishment of these soil gas goals, a mechanism for adding these goals to the ROD should be discussed.	The text on page 8 of the Proposed Plan was incorrect. Remediation goals for soil gas will not be established until after the soil gas survey that will be conducted following soil and groundwater remedial actions, as soil gas concentrations will very likely change as a result of the remedial actions. Further, as potential risks from soil gas are partially dependent on the structures and other modifications that will be constructed for future use of the property, the soil gas risk calculations must wait until decisions are made on the proposed use designs (i.e., structures and ground cover layouts). Results from the soil gas survey will be used to provide data to establish risk-based numeric goals for VOCs in soil gas based on cumulative risk at a 10^{-6} risk level and to evaluate potential vapor intrusion risk. The results of the survey will be used to evaluate the need for additional remedial action and to identify where the initial ARICs for VOCs shall be retained and areas where they shall be released.

Proposed Plan for Parcel D, Hunters Point Shipyard		
Written Comments by City and County of San Francisco received August 15, 2008 by email		
Comment Number	**Comment**	**Response**
3	We appreciate that the Navy has revised the text of the proposed plan to discuss some of the remedy implementation plans in relation to reuse areas instead of redevelopment blocks. In future documents please continue to work towards the goal of dropping the use of the redevelopment blocks to describe areas of the parcel because land planning efforts are anticipating a change to the configuration of the blocks.	The proposed plan was revised to reduce the use of and emphasis on redevelopment blocks to the extent possible. However, a means to clearly and unambiguously identify areas within Parcel D is still needed to explain the proposed remedial actions, and redevelopment blocks still serve that purpose. The Navy would appreciate communication from the city when changes to redevelopment blocks, and especially those changes that affect the reuse exposure, are identified. The Navy will work closely with the city to use the most current plans for land reuses at Parcel D. The Navy will continue to use redevelopment blocks, only when necessary, in the three RODs.
4	We would like to point out for the record, that once the engineering controls and institutional controls are properly installed and maintained the current design of the proposed remedies will cut off pathways for: (a) contact with soil contaminants and (b) inhalation of indoor VOC vapors and this means that the entire property will be health protective for all types of uses.	The proposed remedial alternatives are specific to the reuse identified for each area. Future residents would be protected in areas currently identified for industrial or recreational reuse only by the consistent enforcement of the activity restrictions described by the proposed ICs. For example, the ARIC for vapor intrusion would need to be maintained in areas currently identified as open space (unless the ARIC could be modified by new data for soil gas, as discussed above in the response to comment 1). The Navy believes that the proposed remedy would result in an environment that would not pose health risks for future residents. However, this does not mean that future reuse would be unrestricted. The following text was included on the first page of the proposed plan to note the general protectiveness of the planned revised remedy: "*After all the proposed actions are conducted and operation and maintenance and ICs are implemented, the actions proposed will be protective of human health and the environment and will meet all cleanup objectives*."

Proposed Plan for Parcel D, Hunters Point Shipyard		
Written Comments by J.V. McCarthy received by email on July 31, 2008. **Only comments that specifically reference Parcel D (or the new Parcels G, D-1, D-2, or UC-1) are included in this Responsiveness Summary. All other comments were addressed in the Responsiveness Summary for Parcel B. Comment numbers reflect those used in the Responsiveness Summary for Parcel B.**		
Comment Number	**Comment**	**Response**
6	The basic issues cited for "Parcel G", per notice to Congresswoman N. Pelosi and Supervisor A. Peskin also apply to Covenant Restriction for "Parcel B" (refer to the following page with items # 1.-10.)	The Navy does not have a copy of this notice and cannot respond. However, the Navy team is aware of and is ensuring that there is consistency between land use restrictions being considered and developed for the different parcels.
Introduction to items 1-10	How inappropriate is a linking of "Candlestick Park" development with Hunter's Point Shipyard reuse? If "Parcel 49" of the former Hunter's Point Shipyard is to be considered fit for new stadium construction, the potential liability is worth more than a passing glance. A deferral or covenant agreement required as the waiver to federal conditions of the city's exclusive discretion, to federal conditions in transfer, is specified from CERCLA 120 h(3)(C). This is because the environmental remediation is not without conditions. No matter what the political priorities, the land speculation, or the wishful thinking, parcel areas requiring this kind of covenant agreement will remain so for good reasons (refer to CLEAN II, Department of the Navy, 09/04/98, HPS). "Parcel 49" is not exempt. The local SF CUPA or HAZMAT agency, the involved state agencies, and the title insurance people will all have serious obligations and concerns to be maintained.	Access restrictions on future activities will be contained in "Covenant(s) to Restrict Use of Property", Quitclaim Deed(s), the Risk Management Plan, and if required, any other workplan or document approved in accordance with these referenced documents. The protectiveness of the remedy will be evaluated at least every 5 years to ensure it remains protective. These 5-year reviews are required by law and will include any new information that may become available in the future.
Item 1	Subparcels S-28, S-29, S-38, and S-39 are co-located where "Parcel 49", formerly in Parcel D, has been proposed. All are cited for sandblast waste and radioactive materials, at least some of which are likely to have been left from "Operation Crossroads" (1946-1947, see "Historical Radiological Assessment", 2004).	Parcel D was constructed prior to "Operation Crossroads" and is not expected to have radioactive waste materials from that operation. Radiological surveys have been conducted in all areas and buildings at Parcel G (formerly Parcel 49) that have been identified, based on shipyard activities and work practices, to potentially be radiologically impacted. The areas identified as having radiological risks in the surveys are being addressed and radiologically remediated by the proposed remedy and released for unrestricted future use.

Proposed Plan for Parcel D, Hunters Point Shipyard		
Written Comments by J.V. McCarthy received by email on July 31, 2008. **Only comments that specifically reference Parcel D (or the new Parcels G, D-1, D-2, or UC-1) are included in this Responsiveness Summary. All other comments were addressed in the Responsiveness Summary for Parcel B. Comment numbers reflect those used in the Responsiveness Summary for Parcel B.**		
Comment Number	**Comment**	**Response**
Item 2	It is unlikely that the maximum extent of excavation in the foreseeable future, as sponsored by the Navy, will go any farther than the inconclusive excavation, to be capped, for IR-07 and IR-18 of Parcel B where the radiation at depth will go unresolved. Consider the implications in D for S-28, S-29, S-38, and S-39.	Please see the Responsiveness Summary in the Parcel B amended ROD for discussion of the IR Sites 7 and 18. All of Parcel G will be covered to protect all users from exposure to the soil regardless of the future use. Covers are an effective way to eliminate exposure and protect human health.
Item 3	The materials applied for support piers to penetrate landfill are likely to be what is planned for building foundation support, as under the cap required for “Parcel 49” remediation.	Any construction-related foundation support piers constructed after transfer will be protective of human health and the environment, and will meet the requirements of the remedial design. Any breaching or alteration of the cover post-transfer will be conducted in compliance with the Covenant(s) to Restrict Use of the Property, Quitclaim Deed(s), and the Risk Management Plan, all of which will be reviewed and approved by the regulatory agencies. Materials used during remediation, including the cover material, will be selected during the remedial design phase of the project and will be constructed to be robust and persistent over time.

Proposed Plan for Parcel D, Hunters Point Shipyard		
Written Comments by J.V. McCarthy received by email on August 20, 2008.		
Comment Number	**Comment**	**Response**
1	As an hasty and inadequately addressed parcel transfer proposal, "Parcel G" is a good example of how the City of San Francisco, and some public officials, could bring great harm upon themselves. Who would bear ultimate "responsibility" with consequences (?) once an incomplete and inadequate investigation has been signed off, even with CERCLA 120 (h)(3)(C)? If "Blocks" # 28, 29, 38, and 39 are any example, perhaps it would be where existing documentation would suggest considerable more caution.	If the property in Parcel G is conveyed as an "early transfer" subject to the requirements of Section 120(h)(3)(C) of CERCLA, the Navy must provide assurances approved by EPA and the State of California that there will be interim land use restrictions to ensure the protection of human health and the environment. Access restrictions on future activities will be contained in "Covenant(s) to Restrict Use of Property", Quitclaim Deed(s), the Risk Management Plan, and if required, any other workplan or document approved in accordance with these referenced documents. The protectiveness of the remedy will be evaluated at least every 5 years to ensure it remains protective. These 5-year reviews are required by law and will include any new information that may become available in the future.
2	Of "Block" 28, it appears to be unknown or unclear whether contaminants from IR-34 could include plume discovery, as from, storage tank contents unspecified at the Building 363 site.	There is no Redevelopment Block 28 within Parcel D or the new Parcel G. However, potential contaminants associated with IR-34 were evaluated for Parcel D and are summarized in the Final Revised Feasibility Study for Parcel D (SulTech 2007).
3	Of "Block" 29, it appears to be unknown or unclear whether multiple fluid contaminants or plume discovery, from IR-09 could have come into contact with or mixed with contaminants from IR-33.	Within Redevelopment Block 29, the potential mixing of contaminants between the IR-09 plumes and the IR-33 plumes was considered and is summarized in the Final Revised Feasibility Study for Parcel D (SulTech 2007).
4	Of "Block" 38, it appears to be unknown or unclear whether contaminants from IR-33, by the specified plumes at the Building 411 site, could have been complicated by radiological impact at the Building 364 site.	The contamination associated with Buildings 411 and 364 (they are both within IR-33) were evaluated in conjunction with Block 38. The chemical risks are presented in the Final Revised Feasibility Study for Parcel D (SulTech 2007) and the radiological risks and combined risks are presented in the Final Radiological Addendum to the Revised Feasibility Study for Parcel D (SulTech 2008).
5	Of "Block" 39, it appears to be unknown or unclear whether contaminants from IR-65 or IR-34, could include a plume discovery, as from the Building 324 site, or a radiological impact from the Building 364 site.	The contamination associated with IR-65, IR-34 and specifically the Building 324 site were evaluated as part of Redevelopment Block 39 in the Final Revised Feasibility Study for Parcel D (SulTech 2007). Radiological impacts associated with the Building 364 site are considered in the Final Radiological Addendum to the Revised Feasibility Study for Parcel D (SulTech 2008).

Proposed Plan for Parcel D, Hunters Point Shipyard		
Written Comments by J.V. McCarthy received by email on August 20, 2008.		
Comment Number	**Comment**	**Response**
6	The potential of radiological impact, as in residual unspecified radioactive contamination, is serious in "Parcel G". Is it preferred that waiting for consequences of breaching CERCLA 120 (h)(3)(C), beneath the required "covers" with foundation support piers, will be the expedient "Record of Decision" (?).	If the property in Parcel G is conveyed as an "early transfer" subject to the requirements of Section 120(h)(3)(C) of CERCLA, it is anticipated that the transferee will be responsible for constructing covers after transfer. The covers will be constructed to meet all the requirements of the remedial design, and will be conducted under the oversight of the regulatory agencies. The deed of transfer will contain any necessary interim land use restrictions required to protect covers following construction and comply with Section 120(h)(3)(C) of CERCLA. Please see the response to Comment Number 7 below for a discussion of foundation support piers.
7 (item 1)	Construction related "covers", as well as foundation support piers where required through bay mud and fill, are out of compliance with "… land disturbing activity…" restriction ("Restricted Activities", a.) where this occurs following transfer.	Any construction-related covers or foundation support piers constructed after transfer will be constructed to be protective of human health and the environment, and will meet the requirements of the remedial design.
8 (item 2)	Construction related "alteration, disturbance, or removal…" is likely to be out of compliance where this may involve installation of public utilities for permanent structures, as required by construction activities which follow property transfer.	Any breaching or alteration of the cover post-transfer will be conducted in compliance with the Covenant(s) to Restrict Use of the Property, Quitclaim Deed(s), and the Parcel G risk management plan, all of which will be reviewed and approved by the regulatory agencies.

Proposed Plan for Parcel D, Hunters Point Shipyard		
Written Comments by Michael F. McGowan, Arc Ecology, received by email on August 25, 2008		
Comment Number	**Comment**	**Response**
1	On page 1 the proposed remedy for treating groundwater at Installation Sites IR-09, IR-33, and IR-71 is to use chemicals or biological nutrients to break down contaminants. These methods, zero valent iron (ZVI) treatment and bacterial enhancement, are effective under certain circumstances but are still considered experimental at Hunters Point Shipyard. Please document with a reference to a report or an explanation of the logic that supports the effectiveness of these treatments at the shipyard. If they are not as effective as hoped for, what does the Navy propose to do to remediate the groundwater, or will this problem be passed along to the new owners of the property?	Treatability studies using the proposed in situ biological and chemical treatment technologies have been conducted at other parcels with similar conditions and shown to be effective. Injection of ZVI was studied at Parcel B (Engineering/Remediation Resources Group, Inc. and URS Corporation "Final Cost and Performance Report, Zero-Valent Iron Injection Treatability Study, Building 123, Parcel B, Hunters Point Shipyard" June 2004). Injection of a biological growth medium was studied at Parcel C (Shaw Environmental "Final In Situ Sequential Anaerobic-Aerobic Bioremediation Treatability Study, Remedial Unit C5, Building 134, Installation Restoration Site 25, Hunters Point Shipyard" November 2005).
2	Page 1 last paragraph states that the Navy will consider comments on the Proposed Plan when three Records of Decision (ROD) are prepared for the new sub-parcels within Parcel D. Please explain what opportunity will be provided for public input to the cleanup plans if members of the public are not satisfied with the responses to comments as presented in the RODs.	Members of the public may contact Mr. Keith Forman, the Navy Base Realignment and Closure Environmental Coordinator, directly (see page 16 of the Proposed Plan for contact information). Members of the public may also coordinate with community members of the Restoration Advisory Board (RAB) or attend the RAB meetings which are held on the fourth Thursday of every month (except November and December) and are open to the public (see page 15 of the Proposed Plan for more information about the RAB).
3	Page 6 last paragraph states that action is warranted for cumulative risk of cancer that exceeds a certain probability. Shouldn't that be incremental risk above a background? Please clarify.	Remedial action is proposed for areas where health risks exceed 1 $x10^{-06}$ (one in a million). For the evaluation of health risks from exposure to chemicals in soil, metals with measured concentrations that are less than Hunters Point ambient levels (HPAL) were not included in the calculation of health risks and identification of areas that require remedial action. The approach used in the human health risk assessment (HHRA) to address ambient levels of metals is described in Section 2.5.1 of the ROD for Parcel G.

Proposed Plan for Parcel D, Hunters Point Shipyard		
Written Comments by Michael F. McGowan, Arc Ecology, received by email on August 25, 2008		
Comment Number	**Comment**	**Response**
4	The explanation of risk assessment and cleanup goals with respect to proposed reuse areas is confusing. For example, different exposure scenarios (concentration x time) were used for industrial than for residential. Was it assumed that industrial workers would be exposed fewer hours of the day than residents? What if an industrial worker was employed on Parcel D for 50 years while residents moved away every 5 years? What were the assumptions underlying these scenarios?	Tables B-4 through B-9 of the Final Revised Feasibility Study for Parcel D (SulTech 2007) summarize the exposure assumptions used in the HHRA to calculate health risks for residential, industrial, recreational, and construction worker exposure to chemicals in soil and groundwater at Parcel D. The exposure assumptions used in the HHRA are based on U.S. Environmental Protection Agency (EPA) and California Environmental Protection Agency (Cal/EPA) recommendations for evaluating reasonable maximum exposure, and were also based on agreement with the Base Realignment and Closure Cleanup Team (BCT). Multiple conservative exposure assumptions were combined in the HHRA so that the calculated health risks over-predict actual risks. The HHRA calculated health risks using assumptions for potential exposure that are specific to the planned reuse for each redevelopment block at Parcel D. For example, the planned reuse is industrial for redevelopment blocks 30B, 37, 28, and 29. Therefore, the health risks for each of the exposure areas within these redevelopment blocks were calculated using assumptions for industrial exposure. Likewise, the preliminary remediation goals for each of these redevelopment blocks are protective for exposure during industrial use. As a conservative measure, the HHRA additionally evaluated residential, industrial, recreational, and construction worker risks for each exposure area throughout Parcel D, regardless of the planned reuse. This approach was included to provide information on potential risks for all potential reuses, in the event that revisions are made to the Redevelopment Plan for HPS. The preferred alternative for soil at Parcel G involves removal of soil in selected areas where chemicals exceed reuse-specific remediation goals and application of parcel-wide covers. The use of parcel-wide covers will eliminate the potential for contact with and health risks from exposure to chemicals in soil across all of Parcel D.

Proposed Plan for Parcel D, Hunters Point Shipyard		
Written Comments by Michael F. McGowan, Arc Ecology, received by email on August 25, 2008		
Comment Number	**Comment**	**Response**
5	Do the results of the different risk scenarios mean that the areas designated for industrial can be left more contaminated than those designated for residential?	Use of reuse-specific exposure scenarios for the HHRA (for example, industrial exposure for redevelopment block 30B at Parcel G) and for preliminary remediation goals results in different preliminary remediation goals for residential and industrial reuse areas. As noted in the response to comment 4, the use of parcel-wide covers will eliminate the potential for contact with and health risks from exposure to chemicals in soil across all of Parcel D, regardless of the remediation goals.
6	Will additional cleanup be required and who will be responsible if the future use of an area changes from industrial to residential?	Additional cleanup is not anticipated if future use changes. Covers will block exposure to soil, regardless of whether the exposure scenario is residential or industrial. However, the transferee would be responsible if changes in land reuse required changes in the remedy.
7	Page 7 second full paragraph states that the health risk assessments were based on reasonable exposure assumptions recommended by EPA and DTSC. What were these assumptions?	As stated in the response to comment 4, Tables B-4 through B-9 of the Final Revised Feasibility Study for Parcel D (SulTech 2007) summarize the exposure assumptions used in the HHRA to calculate health risks for residential, industrial, recreational, and construction worker exposure to chemicals in soil and groundwater at Parcel D. The exposure assumptions used in the HHRA are based on EPA and Cal/EPA recommendations for evaluating reasonable maximum exposure, and were also based on agreement with the BCT.
8	Page 7 next to last sentence says that the Remedial Action Objectives will be appropriate if the reuse plan is changed. However, the previous sentence says that the planned future land use was an important component in developing the RAOs. These two statements seem to conflict. Please explain.	The planned future land use was used to help develop the RAOs; however, the RAOs are carefully worded so that there is flexibility in whatever reuse is selected. Therefore, the RAOs presented in the proposed plan and associated RODs can be used for any reuse plan that the San Francisco Redevelopment Agency decides to implement prior to the ROD.

Proposed Plan for Parcel D, Hunters Point Shipyard		
Written Comments by Michael F. McGowan, Arc Ecology, received by email on August 25, 2008		
Comment Number	**Comment**	**Response**
9	Page 14 Radiological Alternative R-2 next to last paragraph states that the Time Critical Removal Action is anticipated to achieve Remedial Action Objectives in the proposed plan. What if there is still residual radiation above the remediation goals? Will the radiation goals for industrial use areas present a problem if the use changes to residential?	Remediation will continue until the remediation goals for radionuclides are achieved. Remediation goals are not set separately for industrial areas. All areas will be cleaned to residential standards for radionuclides.
10	If radiological decontamination of all areas will result in free release, then the future reuse designations should not matter. If this is so, please state that all areas will be cleaned to “residential standards” with regard to radiological materials. The desire for residential standard cleanup is very strong in the local community.	The risk assessment for radionuclides used the residential exposure scenario to bound the risks to industrial workers or recreational users. All areas will be cleaned to residential standards for radionuclides.

REFERENCES

SulTech. 2007. "Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California." November 30.

SulTech. 2008. "Final Radiological Addendum to the Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California." April 11.

ATTACHMENT 3
REFERENCES

(Reference documents provided on CD only)

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
1	**Parcel G**	Section 2.1	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Sections 2.2.1 and 2.2.2. SulTech. November 30, 2007.
2	**Installation Restoration (IR) Sites**	Section 2.1	Parcel D Remedial Investigation Report, Hunters Point Shipyard, San Francisco, California. Sections 4.3, 4.8 to 4.10, 4.15, 4.18, 4.26 to 4.28, and 4.32. PRC Environmental Management, Inc., Levine-Fricke-Recon, and Uribe & Associates. October 25, 1996.
3	**Hydrostratigraphic units**	Section 2.2	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Sections 2.2.7 and 2.2.8. SulTech. November 30, 2007.
4	**Parcel G ecology**	Section 2.2	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Section 2.2.5, paragraphs 1 and 6, pages 2-4 and 2-5. SulTech. November 30, 2007.
5	**Samples**	Table 1	Parcel D Remedial Investigation Report, Hunters Point Shipyard, San Francisco, California. Tables 4.3-1 to 4.3-15, 4.8-1 to 4.8-21, 4.9-1 to 4.9-15, 4.10-1 to 4.10-12, 4.15-1 to 4.15-13, 4.18-1 to 4.18-15, 4.26-1 to 4.26-6, 4.27-1 to 4.27-6, 4.28-1 to 4.28-12, and 4.32-1 to 4.32-12. PRC Environmental Management, Inc., Levine-Fricke-Recon, and Uribe & Associates. October 25, 1996.
6	**RMR results**	Table 1	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Table 2-4. SulTech. November 30, 2007.
7	**Impacted or non-impacted**	Table 1	Final Historical Radiological Assessment, History of the Use of General Radioactive Materials, 1939 – 2003. Section 1.2. Naval Sea Systems Command. August 2004.
8	**PAHs**	Section 2.3	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Figures 2-25, 2-26, 2-27, and 2-28. SulTech. November 30, 2007.
9	**Lead**	Section 2.3	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Figures 2-21 and 2-22. SulTech. November 30, 2007.
10	**Chromium VI and possibly nickel**	Section 2.3	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Figure 2-29. SulTech. November 30, 2007.
11	**VOCs**	Section 2.3	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Figure 2-30. SulTech. November 30, 2007.
12	**Radiologically impacted sites**	Section 2.3	Final Historical Radiological Assessment, History of the Use of General Radioactive Materials, 1939 – 2003. Sections 8.3.4.6, 8.3.4.7, 8.3.4.8, 8.3.4.9, 8.3.4.10, 8.3.4.12, and 8.3.4.13. Naval Sea Systems Command. August 2004.
13	**Drinking water**	Section 2.4	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Section 2.2.9. SulTech. November 30, 2007.
14	**Human health CSM**	Section 2.5.1	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Appendix B, Figure B-1. SulTech. November 30, 2007.
15	**HHRA**	Section 2.5.1	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Appendix B, Section B5.0. SulTech. November 30, 2007.
16	**Cancer risks and noncancer hazards**	Section 2.5.1	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Appendix B, Section B7.1 through B7.4. SulTech. November 30, 2007.
17	**Total and incremental risks**	Section 2.5.1	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Section 3.1. SulTech. November 30, 2007.

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
18	**Revised HHRA results**	Section 2.5.1	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Tables 3-2 through 3-15. SulTech. November 30, 2007.
19	**Radiological risks**	Section 2.5.1	Final Radiological Addendum to the Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Tables 3-3 and 3-4. Tetra Tech EC Inc. April 11, 2008.
20	**Combined chemical and radiological risks**	Section 2.5.1	Final Radiological Addendum to the Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Tables 3-5 and 3-6. Tetra Tech EC Inc. April 11, 2008.
21	**Assumptions and uncertainties**	Section 2.5.1	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Appendix B, Section B9.0. SulTech. November 30, 2007.
22	**Surface water quality**	Section 2.5.2	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Appendix H, Table H-1. SulTech. November 30, 2007.
23	**Chromium VI and nickel**	Section 2.5.2	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Section 3.2. SulTech. November 30, 2007.
24	**Environmental impacts to the Bay**	Section 2.5.2	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Appendix H. SulTech. November 30, 2007.
25	**Trigger levels**	Section 2.5.2	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Appendix I. SulTech. November 30, 2007.
26	**Chromium VI**	Section 2.5.2	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Appendix H, Table H-2. SulTech. November 30, 2007.
27	**Soil**	Section 2.5.3	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Figures 3-2 through 3-7. SulTech. November 30, 2007.
28	**Groundwater**	Section 2.5.3	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Figures 3-8 through 3-10. SulTech. November 30, 2007.
29	**Radiologically impacted structures and soil**	Section 2.5.3	Final Radiological Addendum to the Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Tables 3-3 to 3-6. Tetra Tech EC Inc. April 11, 2008.
30	**Radionuclides of concern**	Section 2.5.3	Final Radiological Addendum to the Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Sections 3.3.1, 3.3.2, and 3.4, pages 3-2 through 3-5. Tetra Tech EC Inc. April 11, 2008.
31	**General response actions (GRAs)**	Section 2.8	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Section 4.3, pages 4-15 and 4-16. SulTech. November 30, 2007.
32	**Preliminary remedial alternatives**	Section 2.8	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Section 5.0, page 5-1. SulTech. November 30, 2007.
33	**Nine evaluation criteria**	Section 2.8.2	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Section 6.0, pages 6-1 and 6-2. SulTech. November 30, 2007.
34	**Present-Worth Cost: $344,000**	Table 6	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Appendix F, Table F-2A. SulTech. November 30, 2007.
35	**Present-Worth Cost: $706,000**	Table 6	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Appendix F, Table F-3A. SulTech. November 30, 2007.

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
36	**Present-Worth Cost: $1,952,000**	Table 6	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Appendix F, Table F-4A. SulTech. November 30, 2007.
37	**Present-Worth Cost: $2,555,000**	Table 6	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Appendix F, Table F-5A. SulTech. November 30, 2007.
38	**Present-Worth Cost: $3,520,000**	Table 6	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Appendix F, Table F-7A. SulTech. November 30, 2007.
39	**Present-Worth Cost: $2,450,000/$5,350,000**	Table 6	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Appendix F, Tables F-8A and F-9A. SulTech. November 30, 2007.
40	**Present-Worth Cost: $2,870,000/$9,200,000**	Table 6	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Appendix F, Tables F-10A and F-11A. SulTech. November 30, 2007.
41	**Present-Worth Cost: $15,200,000**	Table 6	Final Radiological Addendum to the Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Appendix B, Section 6.9, Page B.6-6. Tetra Tech EC Inc. April 11, 2008.
42	**Institutional Controls**	Section 2.9.2	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Section 4.0, pages 4-17 and 4-20. SulTech. November 30, 2007.
43	**IR Program website**	Section 2.10	http://www.bracpmo.navy.mil/

[1]Bold blue text indicates hyperlinks available on reference CD to detailed site information contained in the publicly available Administrative Record.

For access to information contained in the Administrative Record for Hunters Point Shipyard, please contact:

Diane Silva
Code EVR-FISC Bldg. 1, 3rd Floor
NAVFAC Southwest
1220 Pacific Highway
San Diego, CA 92312
619-532-3676

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
1	Parcel G	Section 2.1	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Sections 2.2.1 and 2.2.2. SulTech. November 30, 2007.

In 1974, the Navy ceased shipyard operations at HPS and transferred control of the property to its Office of the Supervisor of Shipbuilding, Conversion, and Repair in San Francisco. The shipyard remained relatively unused until 1976. From 1976 to 1986, the Navy leased 98 percent of HPS to a private ship repair company, Triple A Machine Shop, Inc. (Triple A). Triple A leased the property from July 1, 1976, through June 30, 1986; however, Triple A did not vacate the property until March 1987. During the lease period, Triple A used dry docks, berths, machine shops, power plants, offices, and warehouses to repair commercial and naval vessels. Triple A also subleased portions of the property to other businesses.

In 1987, the Navy resumed occupancy of HPS. Many of the subtenants under Triple A's lease remained as Navy tenants, including those using facilities for maritime, industrial, and artistic purposes. From November 1985 to August 1989, several Navy surface ships were docked at the shipyard.

Because hazardous materials from past shipyard operations had been released into the environment, HPS was included on the National Priorities List in 1989 as a Superfund site pursuant to CERCLA as amended by the Superfund Amendments and Reauthorization Act of 1986. In 1991, HPS was slated for closure under the Defense Base Closure and Realignment Act of 1990. HPS was designated as a "B" site by the Agency for Toxic Substances and Disease Registry (ATSDR) in 1991, which meant that ATSDR determined that HPS posed no imminent threats to human health but had the potential to pose long-term threats to human health (ATSDR 1991). On April 1, 1994, the HPS mission as a shipyard officially ended under the Defense Base Closure and Realignment Act of 1990.

The Naval Facilities Engineering Command, Engineering Field Activities West, in San Bruno, California, had initial oversight of the base closure management. After closure of Engineering Field Activity West in 2000, the oversight authority was transferred to the Naval Facilities Engineering Command, Southwest Division, in San Diego, California. Ongoing work at HPS is currently overseen by BRAC Program Management Office West, in San Diego, California.

2.2 HPS AND PARCEL D SETTING

The following subsections summarize the setting of HPS and Parcel D, including (1) land use, (2) historic areas, (3) climate, (4) topography and surface water drainage, (5) ecology, (6) soils, (7) geology, (8) hydrogeology, and (9) groundwater beneficial use. A detailed description of the HPS setting is presented in Section 3.0 of the draft final Parcel D RI report (PRC, LFR, and U&A 1996). Detailed updates on the geology and hydrogeology of Parcel D are also provided in the Phase II and III groundwater data gaps investigation (GDGI) reports (Tetra Tech EM Inc. [Tetra Tech] 2001b, 2003a).

2.2.1 HPS, Surrounding Area, and Parcel D Land Use

The Bayview/Hunters Point district of San Francisco bounds the HPS promontory on the north and west, and the Bay borders HPS on the south and east. The Bayview/Hunters Point district is

a low-density demographic area where about half the residents own their homes. More than half of the land in the San Francisco Bayview/Hunters Point district is used for industrial purposes.

The land at HPS was formerly divided into three distinct functional areas: (1) the industrial production area, which consisted of the waterfront and shop facilities for the structural machinery, electrical, and HPS service groups; (2) the industrial support area, which consisted of supply and public works facilities; and (3) the nonindustrial area, which consists of former residential facilities for Navy personnel, recreational areas, and a restaurant.

Parcel D is bounded by other portions of HPS and by the Bay. Most land at Parcel D was formerly part of the industrial support area and was used for shipping, ship repair, and office and commercial activities. Portions of Parcel D were also used by the Naval Radiological Defense Laboratory (NRDL). The docks at Parcel D were formerly part of the industrial production area. The historical and current uses of buildings at Parcel D are summarized in Table 2-1. This table also includes the radiological contamination potential at these buildings or building sites, as listed in the Historical Radiological Assessment (Radiological Affairs Support Office [RASO] 2004). According to the Redevelopment Plan (San Francisco Redevelopment Agency 1997), Parcel D will be zoned for the following reuses: educational and cultural, mixed uses, research and development, open space, industrial, and maritime industrial. The proposed reuse areas are shown on Figure ES-1.

2.2.2 Parcel D Historic Areas

The 450-ton bridge crane at the Regunning Pier (IR-32) is the only structure in Parcel D with the potential for inclusion on the National Register of Historic Places (PRC, LFR, and U&A 1996). As a result, any proposed remedial action performed at IR-32 will comply with the substantive requirements of the National Historic Preservation Act.

2.2.3 Parcel D Climate

The climate in the HPS area is characterized by partly cloudy, cool summers with little precipitation and mostly clear, mild winters with moderate precipitation. The prevailing wind direction is west to east (Brown and Caldwell 1995). The average wind speed is 10 miles per hour, and the usual maximum wind speed is 20 miles per hour. Normal annual rainfall in San Francisco, as monitored at the San Francisco Federal Building, is 20 inches (National Oceanic and Atmospheric Administration [NOAA] 2005).

2.2.4 Parcel D Topography and Surface Water Drainage

More than 80 percent of HPS consists of relatively level lowlands, which was mostly constructed by placing borrowed fill material from the surrounding hills along the margin of the Bay. Nearly 100 percent of Parcel D is located in the lowlands, with surface elevations between 0 to 10 feet above mean sea level. Figure 2-2 shows ground surface elevation contours for Parcel D.

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
2	Installation Restoration (IR) Sites	Section 2.1	Parcel D Remedial Investigation Report, Hunters Point Shipyard, San Francisco, California. Sections 4.3, 4.8 to 4.10, 4.15, 4.18, 4.26 to 4.28, and 4.32. PRC Environmental Management, Inc., Levine-Fricke-Recon, and Uribe & Associates. October 25, 1996.

4.3 IR-09: PICKLING AND PLATE YARD

Site IR-09 was initially identified during the IAS conducted in 1984 as IAS Site 8, under the Navy's NACIP program (WESTEC 1984). In 1992, when HPS sites were reclassified into operable units, the Pickling and Plate Yard was placed in OU II as Site IR-09 (PRC 1995).

Site IR-09, which covers approximately 2.75 acres, is located in the north-central portion of Parcel D, at the north end of Hussey Street, between Buildings 411 and 402 (Figure 4.3-1). Structures formerly located at the yard consist of three below-grade, brick-lined pickling tanks, plate drying racks, plate storage racks, and an overhead crane system. The open concrete secondary containment vault that housed the pickling tanks remains at IR-09. Most of the ground surface is covered by concrete or asphalt pavement, which is in poor condition. Underground utilities at the site include a shallow storm drain system for drainage within the yard, and storm drain and sanitary sewer systems beneath Hussey Street. A utility trench containing steam lines is located in the northern portion of the yard (HLA 1992e).

Between 1947 and 1973, the Pickling and Plate Yard was used by the Navy for industrial metal finishing and painting. Chemicals used at IR-09 included zinc chromate (paint primer), sodium dichromate, and sulfuric and phosphoric acids. Steel plates were dipped in acid tanks (pickled), dried on racks, and painted with zinc-chromate-based, corrosion-resistant primer. The painting operations left a residue of zinc chromate primer on the drying racks, the lower part of the overhead crane structure, and the ground surface (HLA 1992e). During plating operations at the site, approximately 15,000 gallons of spent acid rinse water was reportedly discharged, per month, to the (then) combined storm drain and sanitary sewer system (WESTEC 1992e). Currently, several tenants occupy the buildings bordering IR-09 (PRC 1995).

Between November 1994 and January 1996, removal actions were performed at IR-09 under the 1991 removal action plan (RAP). These removal actions included: (1) removing plate storage and drying racks, (2) dismantling and removing three steel pickling tanks, including the brick lining, (3) removing zinc chromate primer residue from racks and structures, (4) removing the overhead crane structure, and (5) removing the vegetation with primer residue. The zinc chromate primer residue, the racks made of concrete, the bricks from the pickling tank lining, and the vegetation growing through the pavement were disposed of at a RCRA hazardous waste facility. The steel racks were cleaned of zinc chromate primer

residue and were sold as scrap. The removal action construction summary report is currently being prepared by HLA.

Asphalt patching of the IR-09 ground surface was completed in March 1996. Prior to completion of the asphalt patching and the removal of the zinc chromate primer residue, runoff from IR-09 was collected in catch basins, stored in tanks, and sampled for metals before it was periodically discharged to the sanitary sewer system. The above ground tanks used for storage of runoff were demobilized from the site upon completion of the removal action tasks.

As part of the removal action, three samples of zinc chromate primer residue were collected from the drying racks and analyzed in June 1990 (Navy 1991). In addition, liquid samples were collected from each of the pickling tanks and from the containment vault. All of the samples were analyzed for pH, hexavalent chromium, SVOCs, and metals. The pickling tank and containment vault samples were also analyzed for TPH-extractable (HLA 1990b, 1992e).

Potential contaminant sources at IR-09 consist of:

- Release of spent acid rinse water from plating operations discharged monthly to the formerly combined sanitary and storm drain sewer system. This rinse water is thought to have contained a variety of metals
- Zinc chromate primer residue from painting operations formerly on the ground surface and various structures at IR-09
- Leakage from pickling tanks or acid dip tanks. The pickling tank liquids are thought to have contained a variety of metals

RI field investigations, physical characteristics, analytical results, the nature and extent of contamination, contaminant fate and transport, a site-specific risk assessment, and conclusions and recommendations for IR-09 are discussed in the following sections.

4.8 IR-33 NORTH: BUILDINGS 302, 302A, AND 304 AND FORMER USTs S-304 AND S-305

IR-33 North was initially identified in 1984 during the initial assessment study (WESTEC 1984). In 1990, the site was designated PA-33 during a preliminary assessment (HLA 1990a). In 1995, the site was redesignated IR-33 North in compliance with the base-wide IR program (PRC 1995).

IR-33 North is located in the northeastern portion of Parcel D, and is bounded by Moreell and Cochrane Streets, and Spear Avenue. The site covers approximately 4.5 acres and consists of Buildings 302, 302A, and 304, and former USTs S-304 and S-305 (Figure 4.8-1).

Building 302 was used by the Navy as a transportation shop for repair of automotive and locomotive equipment. Two hydraulic lifts are located inside the eastern portion of this building; two aboveground, waste oil storage tanks, with an unknown total capacity were located outside the northeast corner of the building; and two dip tanks, filled with a dark, oily liquid are currently located outside the west side of the building. The bottoms of the dip tanks are below grade (HLA 1995b). The BCP indicated that the two aboveground waste oil tanks have been removed but does not list a removal date (PRC 1995). A third aboveground storage tank containing oil, and with an unknown capacity, was also identified in the BCP (PRC 1995). This tank is not currently in use (PRC 1993). Wastewater containing detergent, degreaser, and decarbonizer, generated from cleaning automotive equipment inside Building 302, was regularly discharged from drains inside the building, into the (formerly) combined storm drain and sanitary sewer system (WESTEC 1984). During a 1988 survey, it was noted that an elevated tank (emitting a strong odor), a sump, and a spill area of unknown origin were present at Building 302 (ERM-WEST 1988). Building 302 is currently vacant (PRC 1995).

Building 302A was the former transportation shop annex. This building was used by the Navy for vehicle repair, sandblasting, and painting operations. Hydraulic lifts are present in Building 302A and between Buildings 302A and 304 (HLA 1995b). An interconnected floor drain and sump are located inside Building 302A. Building 302A was formerly occupied by Universal Painting and Sandblasting, a civilian tenant. However, the building is currently vacant (HLA 1994b, PRC 1995). During investigations conducted in 1984 and 1988, waste oil, diesel fuel, antifreeze, paints, and chlorinated solvents were inventoried at Buildings 302 and 302A (ERM-WEST 1988).

Building 304 was formerly used by the Navy as a service station. Petroleum hydrocarbon compounds, including oils, fuels, and hydraulic fluid, were used at this building during operations (HLA 1994b). During a 1988 survey, mobile tanks, with unknown contents, were noted outside this building (ERM-WEST 1988). The BCP indicated that the mobile tanks were removed (PRC 1995). However, a removal date was not listed. During an investigation conducted in 1990, petroleum hydrocarbon staining was noted on the ground surface near the sump located between Buildings 302A and 304 (HLA 1990a). Building 304 is currently vacant (PRC 1995).

Two USTs (S-304 and S-305) were located adjacent to Building 304 (Figure 4.8.1). These tanks were removed in August 1991, during Phase I of the HPS UST program (PRC 1992b, 1994). The two 7,000-gallon tanks were used to store gasoline, and were connected to two sets of dispenser pumps located on a concrete pad near Building 304. Two vent pipes and two product pipes extended from the tanks to Building 304 and the dispenser island, respectively.

Potential contaminant sources identified at IR-33 North include:

- Waste oil storage tanks and sumps at Building 302
- Wastewater containing detergents, degreasers, and decarbonizers at Building 302
- Waste oil, diesel fuel, antifreeze, paints, and solvents stored at Building 302A
- Oils, fuels, and hydraulic fluids used at Building 304
- Gasoline from former USTs S-304 and S-305

RI field investigations, physical characteristics, analytical results, the nature and extent of contamination, contaminant fate and transport, a site-specific risk assessment, and a conclusions and recommendations for IR-33 North are discussed in the following sections.

4.8.1 RI Field Investigations

In 1984, WESTEC conducted the initial assessment study at IR-33 North. The study consisted primarily of assessment of records and visual inspections of chemical handling and disposal practices at HPS. The study concluded that waste chemicals had been discharged from Building 302 into the combined storm

4.9 IR-33 SOUTH: BUILDINGS 364, 365, 411, 417, 418, AND 424

In 1990, the site was designated PA-33 during a preliminary assessment (HLA 1990a). In 1994, during the site inspection, IR-33 was divided into north and south portions for presentation purposes (HLA 1994b). In 1994, sites SA-116 and SA-125 were included within IR-33 South due to their proximity to the site (PRC 1995). In 1995, the site was redesignated IR-33 South in compliance with the basewide IR program (PRC 1995).

Site IR-33 South is located in the central portion of Parcel D, between Hussey and Cochrane Streets. The site covers approximately six acres and consists of Buildings 364, 365, 411, 417, 418, and 424, and the immediate areas surrounding these buildings (HLA 1994b).

Building 364, located in the southeast portion of the site, was formerly a National Radiological Defense Laboratory used for biological experiments. This building contained a radioactive effluent storage tank sump (HLA 1994b). Cesium 137 was identified inside this building (HLA 1994b). Two concrete-lined utility trenches, located outside of this building, lead to a concrete sump outside the building. In 1992, a radiological investigation conducted by PRC indicated that radioactive surface activity in one of the utility trenches exceeded U.S. Atomic Energy Commission guidelines. Access to sumps and trenches were deemed to be too hazardous for additional investigation (PRC 1992a). Currently, Building 364 is used by Young Laboratories as a metallurgy, and metal extraction and analysis shop (HLA 1994b).

SA-125 consists of Building 365, which was formerly used by the Navy as an office for pipe fitters. This building is located in the southeast portion of the site. A radiological survey, conducted at this building, did not indicate elevated radiation levels (RASO 1995). Five small, grated floor drains are located inside Building 365. Underground piping associated with these drains, appear to drain toward the northwest corner of the building, into a sewer vault located outside of Building 365 (HLA 1994a). Currently, Building 365 is unoccupied (PRC 1995).

Building 411, which covers most of IR-33 South, was formerly a steel, shipfitter's, boilermakers, and welder's and burner's shop. The building was used by the Navy for machining and welding operations. During operations in this building, wastewater, generated from rinse water and chemical tanks, was discharged through floor drains, into the combined storm drain and sanitary sewer systems. This

wastewater contained sulfuric acid, sodium chloride, a rust inhibitor, sodium dichromate, phosphoric acid, and cleaner (WESTEC 1984). During the SI in 1993, 10 floor vaults, 11 sumps, and a false floor in the welding area were exposed, when most of the equipment was removed from this building. The integrity of these vaults and sumps, some of which contained unknown liquids and debris when exposed, is unknown (HLA 1994b). Sierra Western Equipment, Eric Lansdown, and Christian Engineering currently occupy Building 411 for storage and a workshop (PRC 1995).

SA-116 consists of Building 417 (Acetylene Manifolding Facility), Building 418 (Welding Facility), and Building 424 (Oxygen Cylinder Charging Facility). Since 1983, Hydro-Chem has used SA-116 as a staging area for hazardous waste hauling activities, steam-clean and perform light maintenance on trucks and trailers, to store equipment and products, and to temporarily store RCRA hazardous waste (HLA 1994a). Only truck exteriors are steam cleaned in the yard (HLA 1994a). A paved area north of Building 418 is used to clean hoses; a storage shed in a vehicle repair area is used to store flammable materials; and a Hydro-Chem storage yard to the south contains drums of RCRA hazardous waste, hazardous product drums, and empty drums stored on both pallets and on asphalt pavement. The asphalt pavement in the Hydro-Chem Storage yard area was observed to be stained, cracked, and degraded, and it was noted that containers staged without secondary containment were stored in the Hydro-Chem Storage yard near storm drains (HLA 1994a).

Potential contaminant sources identified at IR-33 South include metals, VOCs, SVOCs, pesticides/PCBs, and petroleum hydrocarbons associated with the storage of RCRA hazardous wastes, and hazardous products.

RI field investigations, physical characteristics, analytical results, the nature and extent of contamination, contaminant fate and transport, a site-specific risk assessment, and a conclusions and recommendations for IR-33 South are discussed in the following sections.

4.10 IR-34: BUILDINGS 351, 351A AND 366

Site IR-34 was initially identified during the preliminary assessment study in 1990z as PA-34 (HLA 1990a). In 1995, the site was redesignated IR-34 in compliance with the basewide IR program (PRC 1995).

Site IR-34 is located near the central portion of Parcel D, between Cochrane and Morrel Streets. The site covers approximately 5 acres and consists of Buildings 351, 351A, and 366, and the immediate areas surrounding the buildings (Figure 4.10-1).

Building 351 was the former Electronics Shop. The facility was used for maintenance, including cleaning and painting, of electronic equipment. During operations at this facility, detergent containing small quantities of TCE was discharged through floor drains into the combined storm drain and sanitary sewer systems. During a 1988 survey of the building, abandoned paint spray booths, one electrical transformer (not containing PCBs), and chemicals were noted at Building 351. Chemicals inventoried during this survey included TCE. Past tenants occupying Building 351 have included ornament and brass products vendors, a painter/sculptor, and a valve and fitting repair operation. The valve and fitting repair operation housed two 55-gallon solvent drums and two 55-gallon oil drums within the building (WESTEC 1984 and ERM-West 1988). Building 351 is currently vacant (PRC 1995).

Building 351A, the former Naval Radiological Defense Laboratory (NRDL), was used by the Navy for the repair of electronic equipment (PRC 1995). Activities in this building included cleaning electronic equipment, which generated wastewater containing Chem-mist detergent, thinner, and solvent. Wastewater from these operations was discharged, through drains within the building, into the combined storm drain and sanitary sewer systems (WESTEC 1984). Two incidents of radiation-related contamination within Building 351A have been documented, and decontamination of the building from these incidents was accomplished to the level of 200 counts per minute removable activity. The NRDL found beta-emitting contaminants in various portions of (above ground) drain piping associated with this building. Decontamination of these drain pipes has not yet been conducted. Building 351A is currently vacant (PRC 1995). B

In April 1996, a cesium-137 spill area located outside the southern portion of Building 351A was excavated. The excavation of asphalt and soil was conducted by Chem Nuclear. The excavation was approximately 20 by 30 feet with an average depth of 5 inches bgs. The asphalt and soil were placed in two 55-gallon drums. The excavated material was disposed of off-site.

Building 366 was the former Boat and Plastics Shop. The facility was used for boat maintenance and repair, and plastics repair. Batteries were stored in an area north of this building. During operations at this facility, painting and washing wastewater containing epoxies, solvents (ketones), waste oil, and hydraulic fluid was discharged through floor drains into the combined storm drain and sanitary sewer systems. In the past, Dymax Packaging used a portion of the building for paper carton manufacturing (WESTEC 1984). Building 366 is currently used by Christianson Tool Company for metals fabrication (PRC 1995).

Potential contaminant sources identified at IR-34 include:

- Detergents, thinners, solvents, epoxies, waste oil, and hydraulic fluid from operations at Buildings 351, 351A, and 366
- Electrolyte solutions containing metals from battery storage near Building 366

RI field investigations, geology and hydrogeology, analytical results, the nature and extent of contaminants, contaminant fate and transport, the site specific risk assessment, and conclusions and recommendations for IR-34, are discussed in the following sections.

4.10.1 RI Field Investigations

In 1984, WESTEC conducted the initial assessment study at Buildings 351 and 366. The study consisted primarily of assessment of records and visual inspections of chemical handling and disposal practices at buildings located at the site. The study concluded that wastewater from Buildings 351 and 366 was discharged through floor drains into the combined storm drain and sanitary sewer systems. No recommendations for the site were presented in the IAS report (WESTEC 1984).

4.15 IR-37: BUILDINGS 401, 423, 435, 436, AND 437 AND USTs S-435(1) AND S-435(2)

Site IR-37 was initially identified as PA-37 during the 1990 preliminary assessment (HLA 1990a). In 1994, site SA-117, which included Buildings 435 and 437, was included in PA-37 (HLA 1994a). In 1995, the site was redesignated IR-37 in compliance with the basewide IR program (PRC 1995).

Site IR-37 is located in the northwest portion of Parcel D, between "H" and Hussey streets and Spear Avenue. The site covers approximately 3 acres and consists of Buildings 401, 423, 435, 436, and 437 and former USTs S-435(1) and S-435(2) (Figure 4.15-1).

Building 401 was used by the Navy as a Public Works shop until 1974. Specific Navy operations at the building are unknown. During a 1988 survey, minor paint spills were observed inside the building. Currently, portions of the building are used as a cabinet building shop, as a metal fabrication and sheet metal shop, for furniture storage, and as an artist's studio (HLA 1995a).

Building 423 was used by the Navy as a Compressor Hut and for Paint Storage. It is currently not being used (PRC 1995).

Building 435, a wood-frame building with a concrete floor, was used by the Navy for equipment storage until 1974. A paint booth, a small workshop area, and a concrete dry vault in the floor, are located inside Building 435. During the 1993 site assessment, oil-stained asphalt and oil on exposed soil were observed east of Building 435. During Navy operations, wastewater, containing various paints and thinners, was discharged through drains in Building 435 to the combined storm drain and sanitary sewer systems (ERM West 1988). Building 435 has been leased to West Edge for the past 13 years, and is currently used to store furniture, paint, and vehicles (WESTEC 1984, ERM West 1988, and HLA 1994b). The east end of Building 435 is rented by a carpenter for storage (HLA 1994a, PRC 1995).

Building 436 was used by the Navy as a painting and paint storage facility until 1974. Wastewater containing detergent and sodium hydroxide, generated from garbage can cleaning operations, was discharged through drains in Building 436 to the combined storm drain and sanitary sewer systems. Currently, the building is used to store wood, building materials, paints, and solvents (HLA 1995a).

Building 437 is a wood-frame and tin shed with an exposed soil floor. During the 1993 site assessment, stained soil was observed east of this building. Building 437 was used by for pipe storage but is currently not in use (HLA 1994a, PRC 1995).

Two USTs, S-435(1) and S-435(2), were formerly located approximately 15 feet east of Building 435. The tanks, with a combined capacity of 1,500 gallons, were used to store solvents. During removal of the tanks in 1991, soil samples were collected from the UST excavation and analyzed for metals, SVOCs, VOCs, pesticides and PCBs, TPH-d, TPH-g, organic lead, and ethylene dibromide. Groundwater was not encountered in the excavation. Soil sample analytical results indicated that elevated concentrations of copper (160 to 201 mg/kg), lead (22.8 to 30.3 mg/kg), and zinc (153 to 214 mg/kg) were present in the soil at concentrations exceeding screening criteria. Total xylenes were detected in one soil sample at 11 μg/kg and TPH-g and TPH-d were detected at 6.7 and 130 mg/kg, respectively, in one soil sample. Pesticides, PCBs, and SVOCs were not detected in the soil samples. Following the tank removal, alternating layers of PVC liner and soil were used to backfill the excavation (PRC 1992b, 1994).

Potential contaminant sources identified at IR-37 include:

- Paints, thinners, and solvents from operations at Buildings 401 and 453
- Waste oil near Buildings 436 and 437
- Metals in soil near the former USTs

RI field investigations, geology and hydrogeology, analytical results, the nature and extent of contaminants, contaminant fate and transport, the site specific risk assessment, and conclusions and recommendations for IR-37 are discussed in the following sections.

4.15.1 RI Field Investigations

In 1984, WESTEC conducted the initial assessment study at Buildings 435 and 436. The study consisted primarily of assessment of records and visual inspections of chemical handling and disposal practices. The study concluded that waste chemicals had been discharged from these buildings into the combined storm drain and sanitary sewer systems. No recommendations were presented in the IAS report (WESTEC 1984).

4.18 IR-44: BUILDINGS 408, 409, 410, 438, AND LARGE METAL SHED

Site IR-44 was initially identified during the 1990 preliminary assessment as PA-44 (HLA 1990a). Buildings 408, 409, and 438, were identified, during an SA conducted in 1994, as SA-126. In 1995, PA-44 and SA-126 were combined and redesignated IR-44 in compliance with the basewide IR program (PRC 1995).

Site IR-44 is located in the central portion of Parcel D, between Hussey, Manseau, and Cochrane Streets. The site covers approximately 2.5 acres, is entirely paved, and consists of Buildings 408, 409, 410, 438, a large (unnumbered) metal shed located in the eastern portion of the site, and the area surrounding these structures (Figure 4.18-1).

Building 408 was used by the Navy as a furnace shelter and oven drying facility. Buildings 409 and 410 comprised the welder motor hut, and were used to house a welder motor generator that supplied power for the welding stations outside the buildings, to the north and west. Building 438, the metal spray shelter, was used to heat and then spray metal parts with a metal coating (HLA 1994a, 1994b).

A fume-hood structure with two metal spray shelter chambers that vented to the exterior of the building, was located inside Building 438 (HLA 1994a). These chambers were used to spray metal parts with a metal paint coating. Water from a tank reservoir located between Buildings 408 and 438 was used periodically to flush these chambers. The water drained through metal grates in the bottom of the chambers into small tanks which, in turn, appeared to drain outside, east and west of Building 438, onto stained asphalt (HLA 1994a). The spray chambers were removed prior to February 1996.

The large, unnumbered metal shed in the eastern portion of the site was apparently used to store sandblast abrasive. In 1994, large piles of sandblast abrasive were observed inside the four buildings (HLA 1994a). However, a site inspection conducted in February 1996 revealed that the sandblast abrasive piles had been removed. Currently, all five buildings at the site are unoccupied (PRC 1995).

Potential contaminant sources identified at IR-44 include paints and metals used in the spray shelters, and materials used in sandblasting operations.

RI field investigations, geology and hydrogeology, analytical results, the nature and extent of contaminants, contaminant fate and transport, the site-specific risk assessment, and conclusions and recommendations for IR-44 are discussed in the following sections.

4.18.1 RI Field Investigations

In 1990, a preliminary assessment was conducted at PA-44. This assessment involved record reviews and a limited number of site visits. The preliminary assessment recommended IR-44 as a low priority for further investigations (HLA 1990a).

In March 1993, an SI was performed at IR-44. Field activities during this investigation consisted of subsurface soil sample collection, and collection of source characterization samples, including storm drain sediment and sandblast abrasive. Based on the sample analytical results, the SI recommended additional investigation of the storm drains (IR-50, Section 4.21), and that the sandblast abrasive at IR-44 be included in the Navy's sandblast grit fixation program. Because the entire site is paved with concrete and potential leaching of contaminants from the sandblast abrasive through the concrete appeared to be unlikely, investigation of the soil beneath the concrete was deemed unwarranted (HLA 1994b).

Between August and November 1994, an SA was conducted at HPS to identify sites that were not included in the IR program, and that may have previously been contaminated. The SA identified Buildings 408, 409, and 438 (SA-126), and proposed soil and groundwater sample collection at the ends of the discharge pipes from Building 438. During the SA, two soil borings and one monitoring well were drilled within the IR-44 site boundaries, and one monitoring well was drilled within 10 feet, outside of the IR-44 site boundaries. In addition, two borings (PA45HA01 and PA45HA02) were hand-augered adjacent to steam lines, also within the IR-44 site boundaries. Soil samples were not collected from the hand-augered borings because, based on visual observations, releases from the steam lines were not suspected. The analytical results from samples collected from the soil borings and monitoring wells are included in Section 4.18-3 (RI Analytical Results).

Additional investigation of IR-44 was conducted between August 1995 and March 1996. The investigation consisted of source (sediment), soil, and groundwater sampling to evaluate potential contaminants at the site, and aquifer characterization to evaluate specific hydrogeologic parameters. All field activities

4.26 IR-65: CARBON DIOXIDE REFILLING STATION

Site IR-65 was initially identified during the 1994 site assessment as SA-123 (HLA 1994a). In 1995, the site was redesignated IR-65 in compliance with the basewide IR program (PRC 1995).

Site IR-65 is located in the north central portion of Parcel D, near the intersection of Moreell and Manseau Streets. The site covers approximately 0.1 acre, and consists of Building 324 and the immediate area surrounding the building (Figure 4.26-1). Building 324, formerly a carbon dioxide refilling station, was used to clean and fill fire extinguishers. The building, which is divided into northern and southern portions, contains two large unidentified pieces of equipment and a work bench. An empty concrete vault (or sump) is located in the southwest corner, inside the northern portion of the building; the condition of this vault has not been established. During the SA, the northern portion of the building was leased as an art studio (HLA 1994a). The northern and southern portions of the building are currently vacant (PRC 1995).

A small elevated tank and rack, used for cleaning and storing carbon dioxide canisters (fire extinguishers) is located outside and adjacent to the south end of Building 324. During the SA, it was noted that a sign labeled "chlorine solution" was posted near the tank. Drain piping for the elevated tank, which is attached to the storage rack, runs to the west end of Building 324 and is connected to a larger pipe that discharges onto the asphalt surface at the southwest corner of the building. An electrical transformer, without a label indicating PCB testing, is also located outside the southwest corner of the building; no oil staining was noted near the transformer (HLA 1994a). Navy operations at Building 324 ended in 1974.

Potential contaminant sources identified at IR-65 include:

- Solutions used in the elevated cleaning tank
- Leakage and/or spillage of PCBs from the electrical transformer

RI field investigations, geology and hydrogeology, analytical results, the nature and extent of contaminants, contaminant fate and transport, the site specific risk assessment, and conclusions and recommendations for IR-65 are discussed in the following sections.

4.27 IR-66: BUILDING 407 (STOREHOUSE AND VEHICLE STORAGE YARD)

Site IR-66 was initially identified as SA-127 during the 1994 site assessment (HLA 1994a). In 1995, the site was redesignated IR-66 in compliance with the basewide IR program (PRC 1995).

IR-66 is located in the central portion of Parcel D, between Hussey and "H" Streets. The site covers approximately 2 acres, and consists of Building 407, a two-storied concrete structure with a concrete floor, and a soil and gravel covered yard located across the railroad tracks, north of Building 407 (Figure 4.27-1). Building 407 was used by the Navy as a warehouse to store miscellaneous unidentified equipment, and is currently used by Allied Moving and Storage Company to store furniture. The yard was used for vehicle maintenance and storage. During the SA, minor oil staining was observed in this yard (HLA 1994a).

The only potential contaminant sources identified at IR-66 were petroleum hydrocarbons from oil stains in the soil and gravel covered yard.

RI field investigations, geology and hydrogeology, analytical results, the nature and extent of contaminants, contaminant fate and transport, the site specific risk assessment, and conclusions and recommendations for IR-66 are discussed in the following sections.

4.27.1 RI Field Investigations

In 1988, ERM-West conducted a fence-to-fence survey and inventory of known and suspected hazardous materials at HPS (HLA 1990). Navy and tenant facilities, including Building 407, were inspected at this time. The survey did not include sampling or field testing of inventoried materials. During the survey, it was noted that waste oil and paint were stored inside Building 407 (HLA 1994a).

Between March and April 1994, IR-66 was included in the SA, as SA-127. SA field activities included a records and documents search for potential past contaminant releases and an on-site inspection for evidence of potential contaminant releases at the investigated sites. Based on the results of the records search and observed potential releases of contaminants to the environment, IR-66 (SA-127) was recommended for further investigation (HLA 1994b).

4.28 IR-67: BUILDING 439 (SHEET METAL SHOP) AND SURROUNDING AREA

Site IR-67 was initially identified, during a 1994 site assessment, as SA-128 (HLA 1994a). In 1995, the site was redesignated IR-67 in compliance with the basewide IR program (PRC 1995).

Site IR-67 is located in the central portion of Parcel D, between "H", Hussey, and Manseau Streets. The site covers approximately 3.5 acres and consists of Building 439 and the immediate area surrounding this building (Figure 4.28-1) Building 439 is a two-story concrete and metal structure with a concrete floor, constructed in 1974 as a sheet metal shop. However, the building was used by the Navy only as a warehouse. During a 1989 survey, chemicals including chlorinated solvents, PCBs, copper, naphthalene, and waste oil, were identified inside Building 439 (HLA 1994a). A drum containing PCBs, stored inside the building, was noted during the SA. This drum was subsequently removed. However, the removal date is unknown (HLA 1994a).

Five dip tanks (see Figure 4.28-1A), situated 4 feet below grade, and two spray painting booths are located in the northwest portion of Building 439. A large, grate-covered floor sump is located adjacent to the dip tanks, and a sandblasting room is located south of the dip tanks. According to engineering plans, the dip tanks drain through underground piping into two waste USTs located outside the west side of Building 439. During the SA it was noted that the dip tanks, painting booths, and sump appeared to be in new condition (no staining) and to have never been used. Building 439 was used as a cardboard box manufacturing facility and as a warehouse between 1985 and 1990. The building has been vacant since 1990 (HLA 1994a).

The two waste USTs (see Figure 4.28-1A), intended to store acid and alkaline waste, are located outside of Building 439, opposite the dip tank room. The tanks are constructed of 1-foot-thick reinforced concrete and are lined with cast iron. The combined capacity of the two tanks is approximately 13,000 gallons in October 1995, during sampling of the tank contents, it was noted that the acid waste tank contained approximately 5.5 feet of liquid, and the alkaline waste tank contained approximately 0.5 foot of liquid (Uribe 1995). The source of the liquid in the two tanks is unknown, but may be attributed to surface water leaking into the tanks through the tank covers or infiltration of groundwater into the tanks (HLA 1994a).

A below-grade concrete vault is located outside of Building 439 opposite the paint booth room (see Figure 4.28-1A), along the west side of the building. Steam and condensate lines enter the western side of this vault. The portions of the steam and condensate lines leading into Building 439 from the vault were cut and removed on an unknown date. A floor drain is present in the bottom of the vault. According to engineering plans, a pipe leads from the vault drain to the storm drain line running beneath 'H' Street. During the SA, it was noted that no sediment or standing liquid were present on the vault floor (HLA 1994a).

Navy engineering plans indicate that a "flash tank" (see Figure 4.28-1A), with a capacity of approximately 12.5 gallons, was located outside of Building 439, approximately 20 feet north of the concrete vault. This tank was removed on an unknown date. Influent into the flash tank consisted of steam system condensate water from Building 439. Liquids from the flash tank discharged to a drain centered in a concrete pad beneath the flash tank. The liquids, subsequently, drained to the storm drain system line running beneath "H" Street (HLA 1994a).

Potential contaminant sources identified at IR-67 include metals, SVOCs, and petroleum hydrocarbons in the two waste USTs.

RI field investigations, geology and hydrogeology, analytical results, the nature and extent of contaminants, contaminant fate and transport, the site specific risk assessment, and conclusions and recommendations for IR-67 are discussed in the following sections.

4.28.1 RI Field Investigations

In 1988, ERM-West conducted a fence-to-fence survey and inventory of known and suspected hazardous materials at HPS. Navy and tenant facilities, including Building 439, were inspected at this time. The survey did not include sampling or field testing of inventoried materials. Inventoried chemicals stored by the Navy inside Building 439 included chlorinated solvents, PCBs, copper, naphthalene, and waste oil (HLA 1990a).

Between March and April 1994, a site assessment was conducted at IR-67. SA field activities included a records and documents search for potential past contaminant releases and an on-site inspection for evidence

4.32 IR-71: CRANE DISMANTLING AND STORAGE YARD

Site IR-71 was initially identified during a 1994 site assessment as SA-140 (HLA 1994a). In 1995, the site was redesignated IR-71 in compliance with the basewide IR program (PRC 1995).

Site IR-71 is located in the east-central portion of Parcel D, near the intersection of Manseau and Cochrane Streets. The site covers approximately one acre, and consists of an open yard with three metal sheds (Figure 4.32-1). The entire ground surface at the site consists of exposed soil. Site IR-71 is currently used for storage of complete and partially dismantled cranes. The three sheds contain electrical equipment and dismantled crane motors, and crane parts and crane equipment are stored on wood pallets over exposed soil (HLA 1994a).

Site IR-71 has been divided into two areas. The northern portion of the site, nearest Cochrane Street, comprises Area I. Fuel tanks removed from cranes were stored on wood pallets over exposed soil in this area. Fuel stored in the tanks, in addition to lubricating and waste oil from the dismantled crane equipment, reportedly leaked into the soil in Area I. Two metal sheds, used to house crane parts, are located in Area I. The southern portion of the site, nearest Manseau Street, comprises Area II. The soil is stained with oil and fuel from the aboveground tanks believed to have been stored in this area. Black- and tan-colored sand is also present in the single large shed, located in Area II. This sand is believed to be associated with sandblasting operations (HLA 1994a).

Potential contaminant sources identified at IR-71 include:

- Petroleum hydrocarbons from waste and lubricating oils, and fuel
- Metals from possible sandblast abrasive

RI field investigations, geology and hydrogeology, analytical results, the nature and extent of contaminants, contaminant fate and transport, the site specific risk assessment, and conclusions and recommendations for IR-71 are discussed in the following sections.

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
3	Hydrostratigraphic units	Section 2.2	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Sections 2.2.7 and 2.2.8. SulTech. November 30, 2007.

No other potential terrestrial receptors or habitat have been identified at Parcel D. It is unlikely that Parcel D will contain terrestrial habitat in the future because its proposed reuse is primarily industrial.

2.2.6 Parcel D Soils

Soils at HPS are either the result of (1) weathered material from nearby rock formations and sediments from the Bay or (2) imported fill material placed at HPS during its development. The area northwest of Parcel D is primarily covered by upland soils, which are moderate to steeply sloped terrains. Parcel D is primarily lowland soils, which are flat to gently sloped urban developed lands. These lowland soils are susceptible to subsidence by natural compaction or during moderate to strong earthquakes. Soils at HPS are described in detail in Appendix H of the draft final Parcel D RI report (PRC, LFR, and U&A 1996). Figure 2-4 shows the distribution of soils at HPS.

2.2.7 Parcel D Geology

The peninsula forming HPS is within a northwest-trending belt of Franciscan Complex bedrock known as the Hunters Point Shear Zone. In some locations, the Marin Headlands Terrane underlies this shear zone. HPS is underlain by five geologic units, the youngest of Quaternary age, and the oldest, the Franciscan Complex bedrock, of Jurassic-Cretaceous age. In general, the stratigraphic sequence of these geologic units, from youngest (shallowest) to oldest (deepest), is as follows: Artificial Fill; Undifferentiated Upper Sand Deposits; Bay Mud Deposits; Undifferentiated Sedimentary Deposits; and Franciscan Complex Bedrock. The locations of the fill material, the colluvium, alluvium and landslide debris, and the chert, shale, sandstone, volcanic, and serpentine bedrock units at HPS are shown on Figure 2-5.

The Navy believes that the practice of using quarried local rock for fill at HPS is similar to construction practices in the same bedrock formations used elsewhere in San Francisco. The Navy observed that a wide range of concentrations of metals are found in similar chert, basalt, and serpentinite bedrock formations in other areas of San Francisco based on sampling that the Navy conducted in 2003 at areas outside of HPS. This information is summarized in a report titled "Draft Metals Concentrations in Franciscan Bedrock Outcrops" (Tetra Tech and Innovative Technical Solutions, Inc. [ITSI] 2004).

In the Tetra Tech and ITSI 2004 report, the Navy studied the ambient concentrations of metals in bedrock and bedrock-derived soil from three nonindustrial sites in San Francisco. These three sites have a similar geologic setting to HPS and contain serpentinite or chert and basalt bedrock

typical of the Franciscan Complex. The sites included the two Franciscan Complex subunits that form the HPS peninsula: the Hunters Point Shear Zone and the Marin Headlands Terrane. The investigation included about 30 rock and soil samples from each of the three sites (91 samples total) that were analyzed for metals using a standard analytical suite of EPA methods. The study found elevated concentrations of arsenic, iron, and manganese associated with chert bedrock and elevated nickel concentrations associated with serpentinite. The chemical composition of soil at the three sites was found to be similar to the chemical composition of rock. Of the 91 samples collected, none met the cleanup standards for unrestricted residential reuse at HPS because of the elevated ambient concentrations of these metals in the serpentinite bedrock and its derived soils. Based on this study, the Navy believes that the elevated concentrations of metals in the soils at HPS as represented by the HPALs, is also a result of the ambient metals concentrations in a serpentinite sourced fill material.

The draft final Parcel D RI report presented cross sections (see Figures 3.7-10 through 3.7-15 of that report) that depict the relationship of the various geologic units at the site (PRC, LFR, and U&A 1996). The geologic interpretations presented in the cross sections were updated in the 2002 draft Parcel D revised D FS based on data collected during the Phases I and II GDGI (Tetra Tech 2001a, 2001b). The cross section location map and the updated cross sections are presented on Figures 2-6 and 2-7.

The following description of the geologic setting at Parcel D summarizes the information presented on the updated cross sections. The bedrock at Parcel D is mainly composed of serpentinite belonging to the Hunters Point Shear Zone of the Franciscan Complex (Tetra Tech 2001b). The depth to Franciscan Complex Bedrock from the ground surface in Parcel D varies from less than 1 foot in the northern area to more than 120 feet in the southeastern area. Undifferentiated Sedimentary Deposits overlie bedrock over much of Parcel D, occurring beneath Bay Mud Deposits or, rarely, directly beneath Artificial Fill; these deposits range up to 80 feet thick. Bay Mud Deposits underlie most (about 80 percent) of Parcel D, except for a strip along the northern margin of the site. Where present, Bay Mud Deposits are typically 20 to 30 feet thick and are thickest (up to 40 feet) beneath the southeastern part of the parcel. Undifferentiated Upper Sand Deposits are discontinuous beneath Parcel D. These deposits generally overlie Bay Mud, but may interfinger with Bay Mud Deposits and, in a few localities, directly overlie Undifferentiated Sedimentary Deposits. The Undifferentiated Upper Sand Deposits generally range from a few feet to up to 40 feet thick. Artificial Fill overlies all of the naturally occurring units and ranges from approximately 2 feet thick in the north to 40 feet thick in the middle of Parcel D. In most of Parcel D, the artificial fill ranges from 20 to 30 feet thick. The thickness of the Artificial Fill and all sedimentary deposits generally increases toward the Bay. Table 2-2 summarizes the geology at each IR site located within Parcel D.

2.2.8 Parcel D Hydrogeology

This section summarizes the hydrostratigraphic units, groundwater flow patterns, and hydraulic characteristics of the main hydrogeologic units. Detailed descriptions of the hydrogeology at Parcel D are presented in the RI (PRC, LFR, and U&A 1996; PRC and LFR 1997) and Phase II and III GDGI reports (Tetra Tech 2001b, 2003a).

2.2.8.1 Hydrostratigraphic Units

The hydrostratigraphic units at HPS are (1) the A-aquifer, (2) the aquitard, (3) the B-aquifer, and (4) the deep bedrock water-bearing zone. Cross sections presented on Figure 2-7 show the hydrostratigraphic units in different colors, except for the deep (fractured) bedrock water-bearing zone, which is shown in white. The shallow (weathered) bedrock water-bearing zone near the boundary between the non-Navy property to the north and Parcel D (shown on the left side of cross section A-A' on Figure 2-7) and at other locations is hydraulically connected with the A-aquifer and therefore is considered part of the A-aquifer in this location.

Shallow, unconfined groundwater occurs continuously across all of Parcel D in the A-aquifer. The A-aquifer at Parcel D consists mainly of unconsolidated artificial fill material that overlies the aquitard and bedrock. Undifferentiated Upper Sand is also part of the A-aquifer at some locations. Based on the cross sections shown on Figure 2-7, the A-aquifer consists mostly of sandy gravel and gravelly sand with limited zones of low-permeability sandy clay. Significant portions of the A-aquifer are also made up of less permeable fill. The A-aquifer typically ranges from 10 to 40 feet thick, but averages approximately 25 feet thick.

The aquitard is generally made up of silts and clays of the Bay Mud and Undifferentiated Sedimentary deposits. The aquitard ranges from 0 to 100 feet thick, but is most commonly 40 to 80 feet thick (see Figure 2-7). The aquitard is absent in the northern part of Parcel D where the A-aquifer is in direct contact with the bedrock and is thickest in the southeastern part of the parcel. The aquitard inhibits groundwater communication between the A-aquifer and the B-aquifer.

The B-aquifer is associated with the Undifferentiated Sedimentary deposits and consists of small, laterally discontinuous permeable sediment lenses of gravel, sand, silty sand, or clayey sand intermingled with the aquitard. The largest B-aquifer area is present near the center of Parcel D. The B-aquifer area at this location is estimated to be approximately 1,500 feet wide by 1,000 feet long, and is shown at its appropriate depth in cross sections A-A' and C-C' (see Figure 2-7). The B-aquifer varies from 20 to 30 feet thick. Groundwater in the discontinuous B-aquifer areas is under confined conditions. Table 2-2 summarizes the hydrogeologic units underlying each IR site.

2.2.8.2 Groundwater Flow Patterns and Tidal Effects

More than 85 percent of the ground surface at Parcel D is covered by pavement and buildings; as a result, most precipitation is channeled into the storm drain system. Unpaved areas may serve as localized vertical recharge areas. Leaking water lines also serve as limited sources of localized recharge. Base flow from the uplands north of Parcel D provides lateral groundwater recharge across the northern boundary of the parcel. Groundwater discharges directly to the Bay (1) along the shoreline, which is significantly modified by the presence of impermeable dry docks and sea walls in some areas, and (2) through permeable or semipermeable utility line corridors. In the past, groundwater that entered the sanitary sewer was discharged to the local publicly owned treatment works. Currently, the sanitary sewer system has been disconnected, and the sanitary sewers are being removed as part of a radiological removal action.

Groundwater flow patterns at Parcel D are complex because they are affected by (1) a groundwater sink located near the former western boundary of Parcel D (this area is now in Parcel E); (2) a groundwater mound located near the current western boundary of Parcel D (beneath IR-33, IR-44, IR-66, and IR-67); (3) leaks of groundwater into former sanitary sewers or storm drains; (4) recharge from water supply lines; and (5) tides in the Bay. Most groundwater at Parcel D flows toward the Bay, except in the western portion of Parcel D, which historically has flowed away from the mound and toward the groundwater sink in Parcel E (see Figure 2-8), where groundwater elevations are below mean sea level. The sink is believed to be caused by leaks of groundwater into sanitary sewer lines, which was then pumped off site to the local publicly owned treatment works, thereby lowering groundwater levels in the area. Flow patterns are anticipated to change as the sewer and storm drain lines are removed. Figure 2-9 shows the groundwater elevation contours from groundwater monitoring in March 2007.

The investigation of the bedrock underlying Parcel D has been limited and included areas where shallow bedrock and colluvium are hydraulically connected to the A-aquifer. In addition, the deep borings at Parcel D indicate the deeper bedrock underlying the Undifferentiated Sedimentary deposits consists mostly of fractured and moderately to strongly weathered serpentinite. Direct vertical hydraulic communication between the A-aquifer and the B-aquifer is inhibited because of the thick aquitard that separates them (see Figure 2-7). In addition, an upward vertical hydraulic gradient was observed at most well pairs installed at Parcel D (Tetra Tech 2004). Therefore, at Parcel D, migration of groundwater from the A-aquifer to the B-aquifer is considered minimal.

Tidal influence is the periodic fluctuation in the elevation of the groundwater table with time, caused by tide fluctuations in the Bay. Tidal influence may also include mixing or diluting groundwater with bay water, but the mixing usually does not occur as far inland as the fluctuations in groundwater elevation. The tidal influence zone is defined as the area where the maximum tidal fluctuation (difference in groundwater elevation between consecutive high and low tides) exceeds 0.10 foot. Based on tidal influence studies conducted during the RI (PRC, LFR, and U&A 1996) and the phase III GDGI (Tetra Tech 2003a), the tidal influence zone extends inland up to about 500 feet. Storm drains and utility corridors that are submerged below the water table could locally increase the magnitude of the tidal influence and the distance inland that is affected. Figure 2-3 shows the storm and sanitary sewer utility lines that are below the water table. The storm and sanitary sewer utility lines at Parcel D are scheduled for removal during 2007 and 2008.

2.2.8.3 Hydraulic Characteristics

The hydraulic conductivity of the A-aquifer at Parcel D typically ranges from 1 to 21 feet per day. The hydraulic conductivity was estimated based on data from slug and pumping tests performed during the RI (PRC, LFR, and U&A 1996). The minimum and maximum reported hydraulic conductivity values for IR sites located within Parcel D are 0.025 and 580 feet per day. The wide range of reported hydraulic conductivities indicates that the aquifer matrix is very

heterogeneous. The A-aquifer consists primarily of heterogeneous artificial fill materials that vary from clay to silt to sand to gravel.

The estimated groundwater velocities at Parcel D range from 1.5 to 31 feet per year. These velocities were calculated using the typical intermediate value of hydraulic gradient for the A-aquifer throughout Parcel D of 0.001 (PRC, LFR, and U&A 1996) and an assumed effective porosity for the A-aquifer of 0.25. No slug test or pumping test evaluations were performed for the B-aquifer within Parcel D. However, slug tests were performed in two monitoring wells in the underlying fractured bedrock water-bearing zone at IR-09 in the north-central area of Parcel D (PRC, LFR, and U&A 1996), with estimated hydraulic conductivities ranging from 0.025 to 3.7 feet per day. In general, groundwater velocities in the fractured bedrock water-bearing zone is expected to be low because the flow occurs mostly through fractures that are likely filled with residual clays and silts (PRC, LFR, and U&A 1996).

2.2.9 Groundwater Beneficial Use Evaluation

This section summarizes the beneficial use evaluation conducted for groundwater underlying Parcel D. The complete beneficial use evaluation is presented in Appendix D. The potential beneficial uses of Parcel D groundwater have been evaluated several times in the past (see Appendix D; Tetra Tech 2001c). In 2003, the Navy concluded that A-aquifer groundwater at Parcel D is unsuitable for use as a potential source of drinking water based on an evaluation of site-specific factors (Navy 2003). In 2003, the Water Board concurred with the Navy's determination that the A-aquifer at HPS is not a potential drinking water source (Water Board 2003). EPA, however, did not concur and required that federal criteria also be used to assess if Parcel D groundwater could be considered a potential drinking water source.

EPA considers groundwater to be a potential source of drinking water if the following criteria are met:

- The total dissolved solids (TDS) concentration is less than 10,000 milligrams per liter (mg/L)
- A minimum well yield of 150 gallons per day or 0.104 gallon per minute can be achieved

Figure 2-10 presents the maximum TDS concentrations detected in A-aquifer groundwater monitoring wells at Parcel D. As shown on Figure 2-10, TDS concentrations exceed 10,000 mg/L along the Parcel D shoreline and are less than 10,000 mg/L in the central and northwestern part of the parcel. The federal TDS criterion was applied separately to each IR site at Parcel D in this FS report. Based on this criterion, groundwater underlying all or part of the following 17 IR sites could be considered potential sources of drinking water: IR-09, IR-16, IR-17, IR-32, IR-33 North and South, IR-34, IR-37, IR-44, IR-48, IR-53, IR-55, IR-65, IR-66, IR-67, IR-68, IR-69, and IR-70. Based on known hydrogeologic conditions at Parcel D, it is assumed that a minimum well yield of 150 gallons per day could also be achieved from

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
4	Parcel G ecology	Section 2.2	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Section 2.2.5, paragraphs 1 and 6, pages 2-4 and 2-5. SulTech. November 30, 2007.

storm drain system and discharged through outfalls to the Bay. The storm drain system at HPS consists of 10 major drainage areas. Five of these storm water drainage areas are located completely or partially within Parcel D. In addition, eight smaller isolated drainage areas are located in Parcel D, each with an independent outfall (PRC, LFR, and U&A 1996). Approximately 10 percent of the HPS surface is not served by the storm drain system, including the undeveloped shoreline, some pier areas, and a trailer parking lot. No naturally occurring drainage channels remain at HPS. Pre-existing drainage channels were filled in or modified by construction over the years. The location and distribution of the storm drain and sanitary sewer lines at Parcel D are presented on Figure 2-3. The Navy has begun to remove the storm drain and sanitary sewer lines throughout Parcel D; completion is planned for 2008.

2.2.5 Parcel D Ecology

Several hundred types of plants and animals are believed to live at or near HPS, including terrestrial and marine plants and algae; benthic and water column-dwelling marine animals such as clams, mussels, amphipods, and fish; insects; amphibians; reptiles; birds; and mammals. No threatened or endangered species are known to inhabit HPS or its vicinity (Environmental Science Associates 1987). Parcel D ecology is limited to those plant and animal species adapted to the industrial environment. For example, the 450-ton bridge crane could provide nesting locations for peregrine falcons, which would also prey on smaller birds (RASO 2004). Viable terrestrial habitat is inhibited at Parcel D because approximately 85 percent of the ground surface is covered by pavement and industrial buildings. Physical structures at Parcel D, such as docks and piers, may serve as artificial habitats for estuarine life.

In the spring of 2004, an individual burrowing owl (*Athene cunicularia*) was sighted at Parcel D. Burrowing owls are listed as "Species of Special Concern" by the California Department of Fish and Game (2004). Species of special concern status applies to animals not listed under the federal or state Endangered Species Act, but which nonetheless are declining at a rate that could result in listing, or have historically occurred in low numbers and known threats to their persistence currently exist.

The burrowing owl was identified prior to implementing a time-critical removal action (TCRA) for removing stockpiled soil at Parcel D (see Section 2.4). The owl's burrow was observed on the ground in the area of the soil stockpiles and was not within the stockpiled soil. Appropriate measures were taken during the field activities for the TCRA to minimize the impacts to the burrowing owl's habitat (Tetra Tech 2004; Navy 2004).

In March 2005, the Navy surveyed Parcel D and determined that a burrowing owl was present at the site. The Navy decided that the burrowing owl would be relocated because excavation and removals were planned for the summer of 2005 at the adjacent Parcel E and because future remediation of Parcel D could include remedies that potentially could affect the owl.

As a result, in April 2005, the owl was relocated off Parcel D using a passive relocation method. Passive relocation involves installing a one-way door in the burrows, so that the owl can leave but not reenter, and collapsing the burrows 48 hours after the door is in place. The Navy consulted with Peter Bloom of the California Department of Fish and Game to conduct this passive relocation project in accordance with California Department of Fish and Game guidelines.

No other potential terrestrial receptors or habitat have been identified at Parcel D. It is unlikely that Parcel D will contain terrestrial habitat in the future because its proposed reuse is primarily industrial.

2.2.6 Parcel D Soils

Soils at HPS are either the result of (1) weathered material from nearby rock formations and sediments from the Bay or (2) imported fill material placed at HPS during its development. The area northwest of Parcel D is primarily covered by upland soils, which are moderate to steeply sloped terrains. Parcel D is primarily lowland soils, which are flat to gently sloped urban developed lands. These lowland soils are susceptible to subsidence by natural compaction or during moderate to strong earthquakes. Soils at HPS are described in detail in Appendix H of the draft final Parcel D RI report (PRC, LFR, and U&A 1996). Figure 2-4 shows the distribution of soils at HPS.

2.2.7 Parcel D Geology

The peninsula forming HPS is within a northwest-trending belt of Franciscan Complex bedrock known as the Hunters Point Shear Zone. In some locations, the Marin Headlands Terrane underlies this shear zone. HPS is underlain by five geologic units, the youngest of Quaternary age, and the oldest, the Franciscan Complex bedrock, of Jurassic-Cretaceous age. In general, the stratigraphic sequence of these geologic units, from youngest (shallowest) to oldest (deepest), is as follows: Artificial Fill; Undifferentiated Upper Sand Deposits; Bay Mud Deposits; Undifferentiated Sedimentary Deposits; and Franciscan Complex Bedrock. The locations of the fill material, the colluvium, alluvium and landslide debris, and the chert, shale, sandstone, volcanic, and serpentine bedrock units at HPS are shown on Figure 2-5.

The Navy believes that the practice of using quarried local rock for fill at HPS is similar to construction practices in the same bedrock formations used elsewhere in San Francisco. The Navy observed that a wide range of concentrations of metals are found in similar chert, basalt, and serpentinite bedrock formations in other areas of San Francisco based on sampling that the Navy conducted in 2003 at areas outside of HPS. This information is summarized in a report titled "Draft Metals Concentrations in Franciscan Bedrock Outcrops" (Tetra Tech and Innovative Technical Solutions, Inc. [ITSI] 2004).

In the Tetra Tech and ITSI 2004 report, the Navy studied the ambient concentrations of metals in bedrock and bedrock-derived soil from three nonindustrial sites in San Francisco. These three sites have a similar geologic setting to HPS and contain serpentinite or chert and basalt bedrock

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
5	Samples	Table 1	Parcel D Remedial Investigation Report, Hunters Point Shipyard, San Francisco, California. Tables 4.3-1 to 4.3-15, 4.8-1 to 4.8-21, 4.9-1 to 4.9-15, 4.10-1 to 4.10-12, 4.15-1 to 4.15-13, 4.18-1 to 4.18-15, 4.26-1 to 4.26-6, 4.27-1 to 4.27-6, 4.28-1 to 4.28-12, and 4.32-1 to 4.32-12. PRC Environmental Management, Inc., Levine-Fricke-Recon, and Uribe & Associates. October 25, 1996.

TABLE 4.3-1

SUMMARY OF STORM DRAIN SEDIMENT ANALYTICAL TESTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
PA50CB404	9309X927			✓	✓		✓			✓	✓	✓				✓			✓	✓	✓	✓

Notes:

CHROM	CHROMIUM VI
CYAN	Cyanide
DIOXIN	Dioxins and Furans
O&G	Total oil and grease
PAH	Polynuclear aromatic hydrocarbons
PCTMST	Percent moisture
PEST	Pesticides/polychlorinated biphenyls
PHYS	Physical characteristic
SALIN	Salinity
SVOC	Semivolatile organic compounds
SOLIDS	Total dissolved solids
TOC	Total organic carbon
TMICROB	Coliform
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
VOC	Volatile organic compounds

TABLE 4.3-2

STATISTICAL SUMMARY OF STORM DRAIN SEDIMENT ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Residential PRG Value	Above[e] Res PRG	Industrial PRG Value	Above[f] Ind PRG	HPAL Value	Above[g] HPAL
METAL	ALUMINUM	10,700	10,700	10,700	MG/KG	4.3	1	1	76,700	0	100,000	0		
	ARSENIC	3.2	3.2	3.2	MG/KG	0.37	1	1	0.32	1	2.0	1	11.10	0
	BARIUM	122	122	122	MG/KG	0.77	1	1	5,340	0	100,000	0	314.36	0
	BERYLLIUM	0.24	0.24	0.24	MG/KG	0.16	1	1	0.14	1	1.1	0	0.71	0
	CADMIUM	2.0	2.0	2.0	MG/KG	0.56	1	1	9.0	0	852	0	3.14	0
	CALCIUM	8,390	8,390	8,390	MG/KG	15.4	1	1						
	CHROMIUM	210	210	210	MG/KG	0.48	1	1	211	0	1,580	0	h	0
	COBALT	28.8	28.8	28.8	MG/KG	0.80	1	1					h	0
	COPPER	123	123	123	MG/KG	0.05	1	1	2,850	0	63,300	0	124.31	0
	IRON	30,000	30,000	30,000	MG/KG	4.5	1	1						
	LEAD	227	227	227	MG/KG	3.2	1	1	130	1	1,000	0	8.99	1
	MAGNESIUM	52,000	52,000	52,000	MG/KG	24.4	1	1						
	MANGANESE	512	512	512	MG/KG	0.21	1	1	382	1	8,300	0	1431.18	0
	MERCURY	0.13	0.13	0.13	MG/KG	0.07	1	1	23.0	0	511	0	2.28	0
	MOLYBDENUM	4.1	4.1	4.1	MG/KG	0.66	1	1	383	0	8,520	0	2.68	1
	NICKEL	539	539	539	MG/KG	1.2	1	1	150	1	34,100	0	h	0
	POTASSIUM	543	543	543	MG/KG	141	1	1						
	SODIUM	179	179	179	MG/KG	30.6	1	1						
	VANADIUM	39.2	39.2	39.2	MG/KG	0.82	1	1	537	0	11,900	0	117.17	0
	ZINC	329	329	329	MG/KG	0.35	1	1	23,000	0	100,000	0	109.86	1
CYAN	CYANIDE	220	220	220	UG/KG	120	1	1	1,300,000	0	13,600,000	0		
PEST	AROCLOR-1260	890	890	890	UG/KG	88	1	1	66	1	340	1		

TABLE 4.3-2 (Continued)

STATISTICAL SUMMARY OF STORM DRAIN SEDIMENT ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Residential PRG Value	Above[e] Res PRG	Industrial PRG Value	Above[f] Ind PRG	HPAL Value	Above[g] HPAL
TPHEXT	TPH-DIESEL	290	290	290	MG/KG	130	1	1	1,000	0i				
TRPH	TRPH	420	420	420	MG/KG	7	1	1	1,000	0i				

TABLE 4.3-2 (Continued)

STATISTICAL SUMMARY OF STORM DRAIN SEDIMENT ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

CYAN	Cyanide
EPA	U.S. Environmental Protection Agency
HPAL	Hunters Point ambient level
MG/KG	Milligram per kilogram
O&G	Total oil and grease
PCTMST	Percent moisture
PEST	Pesticide/polychlorinated biphenyl
PHYS	Physical characteristic
PRG	Preliminary remediation goal
SALIN	Salinity
SVOC	Semivolatile organic compound
TMICROB	Coliform
TOC	Total organic carbon
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
UG/KG	Microgram per kilogram
VOC	Volatile organic compound

a Organic results of less than 10 are reported to one significant figure, and results of greater than or equal to 10 are reported to two significant figures. Inorganic results of less than 10 are reported to two significant figures, and results of greater than or equal to 10 are reported to three significant figures. Values that are not nondetects are compared to screening criteria before the significant figure rule is applied. Both the value and the screening criteria are then rounded for reporting purposes.

b Blank boxes indicate that screening critera have not been established for these analytes.

c Total number of samples analyzed

d Total number of samples showing concentrations greater than detection limit

e Total number of samples showing concentrations greater than residential PRG

f Total number of samples showing concentrations greater than industrial PRG
California-modified PRGs were used for the following analytes: 1,2-Dibromo-3-chloropropane, benzo[a]pyrene, benzo[k]fluoranthene, cadmium, chromium VI, chrysene, lead, nickel, and tetrachloroethylene (PCE).
For the analytes listed below, Region IX PRGs are not available; therefore, PRGs for similar chemicals were used as follows:

Analyte:	Similar Analyte:
2-Methylnapthalene	Naphthalene
Acenaphthylene	Acenaphthene
Alpha-chlordane	Chlordane
Aroclor-1260	Polychlorinated biphenyls
Benzo(g,h,i)perylene	Naphthalene
Delta BHC	HCH-technical
Endosulfan I	Endosulfan
Endosulfan sulfate	Endosulfan
Endrin aldehyde	Endrin
Endrin ketone	Endrin
Gamma-chlordane	Chlordane
Phenanthrene	Naphthalene

g Total number of samples showing concentrations greater than HPAL

h HPALs for chromium, cobalt, and nickel are based on the concentration of magnesium in each sample; thus, no single value applies to all samples. The range of HPAL values for chromium, cobalt, and nickel are 601.934 to 601.934, 73.722 to 73.722, and 1119.122 to 1119.122 mg/kg respectively.

i Total number of samples showing concentrations greater than TPH, TRPH, or O&G screening level, not PRG value

TABLE 4.3-3

STORM DRAIN SEDIMENT ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	PA50CB404
Sampling Depth (feet bgs)	2.10
Sample Number	9309X927
Sample Date	03/05/93
Metal (mg/kg)	
ALUMINUM	10,700
ARSENIC	3.2 *#
BARIUM	122
BERYLLIUM	0.24 *
CADMIUM	2.0
CALCIUM	8,390
CHROMIUM	210
COBALT	28.8
COPPER	123
IRON	30,000
LEAD	227 *α
MAGNESIUM	52,000
MANGANESE	512 *
MERCURY	0.13
MOLYBDENUM	4.1 α
NICKEL	539 *
POTASSIUM	543
SODIUM	179
VANADIUM	39.2
ZINC	329 α
Cyanide (ug/kg)	
CYANIDE	220
Pesticide/Polychlorinated Biphenyl (ug/kg)	
AROCLOR-1260	890 *#
TPH-Extractable (mg/kg)	
TPH-DIESEL	290
Total Recoverable Petroleum Hydrocarbons (mg/kg)	
TRPH	420

TABLE 4.3-3 (Continued)

STORM DRAIN SEDIMENT ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	PA50CB404
Sampling Depth (feet bgs)	2.10
Sample Number	9309X927
Sample Date	03/05/93
Percent Moisture (%)	
% SOLIDS	75.2
pH (pH units)	
PH	7.4

Notes:

%	Percent
bgs	Below ground surface
mg/kg	Milligram per kilogram
NA	Not analyzed
ND()	Not detected (detection limit in parentheses)
µg/kg	Microgram per kilogram
*	Detected concentration greater than U.S. Environmental Protection Agency Region IX preliminary remediation goals (PRG) for residential use
#	Detected concentration greater than U.S. Environmental Protection Agency Region IX PRG for industrial use
α	Detected concentration greater than the Hunters Point ambient level.
▒	Detected concentration greater than at least one screening criterion.

TABLE 4.3-4

SUMMARY OF SOIL ANALYTICAL TESTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
IR09B002	8939E001			√			√			√	√	√				√			√	√		√
IR09B002	8939E002			√			√			√	√	√				√			√	√		√
IR09B003	8939G001			√			√			√	√	√				√			√	√		√
IR09B003	8939G002			√			√			√	√	√				√			√	√		√
IR09B003	8939G003			√			√			√	√	√				√			√	√		√
IR09B003	8939G004			√			√			√		√										
IR09B003	8939G005			√	√		√			√		√										
IR09B004	8943G101			√			√			√	√	√				√			√	√		√
IR09B004	8943G102			√			√			√	√	√				√			√	√		√
IR09B004	8943G103			√			√			√	√	√				√			√	√		√
IR09B004	8943G104			√			√			√												
IR09B005	8939E006			√			√			√	√	√				√			√	√		√
IR09B005	8939E007			√			√			√	√	√				√			√	√		√
IR09B005	8939E008			√			√			√	√	√				√			√	√		√
IR09B006	8939E016			√			√			√	√	√				√			√	√		√
IR09B006	8939E017			√			√			√	√	√				√			√	√		√
IR09B006	8939E018			√			√			√	√	√				√			√	√		√
IR09B006	8939E019			√	√		√			√		√										
IR09B006	8939E020			√			√			√		√										
IR09B007	8939E011			√			√			√	√	√				√			√	√		√
IR09B007	8939E012			√			√			√	√	√				√			√	√		√
IR09B007	8939E013			√			√			√	√	√				√			√	√		√
IR09B007	8939E014			√			√			√												
IR09B008	8939E003			√			√			√	√	√				√			√	√		√
IR09B008	8939E004			√	√		√			√	√	√				√			√	√		√
IR09B008	8939E005			√			√			√	√	√				√			√	√		√
IR09B009	8939E021			√			√			√	√	√				√			√	√		√
IR09B009	8939E022			√			√			√	√	√				√			√	√		√
IR09B009	8939E023			√			√			√	√	√				√			√	√		√
IR09B010	8941F011			√	√		√			√	√	√				√			√	√		√
IR09B010	8941F012			√			√			√	√	√				√			√	√		√
IR09B010	8941F013			√			√			√	√	√				√			√	√		√
IR09B010	8941F014			√			√			√												
IR09B011	8941G081			√			√			√	√	√				√			√	√		√
IR09B011	8941G082			√	√		√			√	√	√				√			√	√		√
IR09B011	8941G083			√			√			√	√	√				√			√	√		√
IR09B011	8941G084			√			√			√												

TABLE 4.3-4 (Continued)

SUMMARY OF SOIL ANALYTICAL TESTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
IR09B012	8941G075			√			√			√	√	√				√			√	√		√
IR09B012	8941G076			√			√			√	√	√				√			√	√		√
IR09B012	8941G077			√			√			√	√	√				√			√	√		√
IR09B012	8941G078			√			√			√												
IR09B013	8939E024			√			√			√	√	√				√			√	√		√
IR09B013	8939E025			√			√			√	√	√				√			√	√		√
IR09B013	8939E026			√			√			√	√	√				√			√	√		√
IR09B013	8939E027			√			√			√												
IR09B014	8941F002			√			√			√	√	√				√			√	√		√
IR09B014	8941F003			√			√			√	√	√				√			√	√		√
IR09B014	8941F004			√			√			√	√	√				√			√	√		√
IR09B014	8941F005			√			√			√	√	√				√			√	√		√
IR09B015	8939E029			√			√			√	√	√				√			√	√		√
IR09B015	8939E030			√			√			√	√	√				√			√	√		√
IR09B015	8939E031			√			√				√	√				√			√	√		√
IR09B016	8939E054			√							√	√				√			√	√		√
IR09B016	8939E055			√			√			√	√	√				√			√	√		√
IR09B016	8939E056			√			√			√	√	√				√			√	√		√
IR09B016	8939E057			√			√			√												
IR09B017	8939E059			√			√			√	√	√				√			√	√		√
IR09B017	8939E060			√			√			√	√	√				√			√	√		√
IR09B017	8939E061			√			√			√	√	√				√			√	√		√
IR09B017	8939E062			√			√			√												
IR09B018	8939E034			√			√			√	√	√				√			√	√		√
IR09B018	8939E035			√			√			√	√	√				√			√	√		√
IR09B018	8939E036			√			√			√	√	√				√			√	√		√
IR09B018	8939E037			√			√			√												
IR09B019	8939E049			√			√				√	√				√			√	√		√
IR09B019	8939E050			√			√			√	√	√				√			√	√		√
IR09B019	8939E051			√			√			√	√	√				√			√	√		√
IR09B019	8939E052			√			√			√												
IR09B020	8943G107			√			√			√	√	√				√			√	√		√
IR09B020	8943G108						√			√		√										
IR09B020	8943G109						√			√		√										
IR09B020	8943G110			√			√			√	√	√				√			√	√		√
IR09B020	8943G111			√			√			√	√	√				√			√	√		√

TABLE 4.3-4 (Continued)

SUMMARY OF SOIL ANALYTICAL TESTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
IR09B021	8939E039			√			√			√	√	√				√			√	√		√
IR09B021	8939E040			√			√			√	√	√				√			√	√		√
IR09B021	8939E041			√			√			√	√	√				√			√	√		√
IR09B021	8939E042			√			√			√												
IR09B023	8941G070			√	√		√			√	√	√				√			√	√		√
IR09B023	8941G071			√			√			√	√	√				√			√	√		√
IR09B023	8941G072			√			√			√	√	√				√			√	√		√
IR09B023	8941G073				√		√			√		√										
IR09B023	8941G074			√			√			√												
IR09B024	8939E044			√			√			√	√	√				√			√	√		√
IR09B024	8939E045			√			√			√	√	√				√			√	√		√
IR09B024	8939E046			√	√		√			√	√	√				√			√	√		√
IR09B024	8939E047			√			√			√												
IR09B025	8941F007			√			√			√	√	√				√			√	√		√
IR09B025	8941F008			√			√			√	√	√				√			√	√		√
IR09B025	8941F009			√			√			√	√	√				√			√	√		√
IR09B025	8941F010			√			√			√												
IR09B027	9013G159			√			√			√		√				√			√	√		√
IR09B027	9013G160			√			√			√		√				√			√	√		√
IR09B027	9013G161			√			√			√		√				√			√	√		√
IR09B027	9013G162			√			√			√		√										
IR09B027	9013G163			√			√			√		√										
IR09B028	9013G164			√			√			√		√				√			√	√		√
IR09B028	9013G165			√			√			√		√				√			√	√		√
IR09B028	9013G166			√			√			√		√				√			√	√		√
IR09B029	9013F024			√			√			√		√				√			√	√		√
IR09B029	9013F025			√			√			√		√				√			√	√		√
IR09B029	9013F026			√			√			√		√				√			√	√		√
IR09B030	9013G167			√			√			√		√				√			√	√		√
IR09B030	9013G168			√			√			√		√				√			√	√		√
IR09B030	9013G169			√			√			√		√				√			√	√		√
IR09B032	9014H076			√			√			√		√				√			√	√		√
IR09B032	9014H077			√			√			√		√				√			√	√		√
IR09B032	9014H078			√			√			√		√				√			√	√		√
IR09B032	9014H079			√			√			√		√										
IR09B033	9014H086			√			√			√		√				√			√	√		√

TABLE 4.3-4 (Continued)

SUMMARY OF SOIL ANALYTICAL TESTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
IR09B033	9014H087			√			√			√		√				√			√	√		√
IR09B033	9014H088			√			√			√		√				√			√	√		√
IR09B033	9014H089			√			√			√		√										
IR09B033	9014H090			√			√			√		√										
IR09B034	9014H081			√			√			√		√				√			√	√		√
IR09B034	9014H082			√			√			√		√				√			√	√		√
IR09B034	9014H083			√			√			√		√				√			√	√		√
IR09B034	9014H084			√			√			√		√										
IR09B045	9415C141			√						√												
IR09B045	9415C142			√						√												
IR09B045	9415C144			√						√												
IR09B046	9415C134			√						√												
IR09B046	9415C135			√						√												
IR09B046	9415C137			√						√												
IR09B047	9415C138			√						√												
IR09B047	9415C139			√						√												
IR09B047	9415C140			√						√												
IR09B050	9431R489			√						√												
IR09B050	9431R490			√						√												
IR09B050	9431R491			√						√												
IR09B050	9431R492			√						√												
IR09B053	9606G083			√			√			√	√	√				√			√	√	√	
IR09B053	9606G084			√			√			√		√				√			√	√	√	√
IR09B053	9606G085			√			√			√	√	√				√			√	√	√	√
IR09B053	9606G087			√			√			√	√	√				√			√	√	√	√
IR09MW31A	9013F019			√			√			√		√				√			√	√		√
IR09MW31A	9013F020			√			√			√		√				√			√	√		√
IR09MW31A	9013F021			√			√			√		√				√			√	√		√
IR09MW31A	9013F022			√			√			√		√										
IR09MW35A	9015H091			√			√			√		√				√			√	√		√
IR09MW35A	9015H092			√			√			√		√				√			√	√		√
IR09MW35A	9015H093			√			√			√		√				√			√	√		√
IR09MW35A	9015H094			√			√			√		√										
IR09MW35A	9015H095			√			√			√		√										
IR09MW36A	9015G170			√			√			√		√				√			√	√		√
IR09MW36A	9015G171			√			√			√		√				√			√	√		√

TABLE 4.3-4 (Continued)

SUMMARY OF SOIL ANALYTICAL TESTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
IR09MW36A	9015G172			√			√			√		√				√			√	√		√
IR09MW36A	9015G173			√			√			√		√										
IR09MW36A	9015G174			√			√			√		√										
IR09MW37A	9013G152			√			√			√		√				√			√	√		√
IR09MW37A	9013G153			√			√			√		√				√			√	√		√
IR09MW37A	9013G154			√			√			√		√				√			√	√		√
IR09MW37A	9013G155			√			√			√		√										
IR09MW37A	9013G156			√			√			√		√										
IR09MW38A	9015G176			√			√			√		√				√			√	√		√
IR09MW38A	9015G177			√			√			√		√				√			√	√		√
IR09MW38A	9015G178			√			√			√		√				√			√	√		√
IR09MW38A	9015G179			√			√			√		√										
IR09MW38A	9015G180			√			√			√		√										
IR09MW51F	9605G061			√			√			√	√	√				√			√	√	√	
IR09MW52A	9606J844						√			√	√	√				√			√	√	√	√
IR09MW52A	9606J845						√			√	√	√				√			√	√	√	√
IR09MW52A	9606J846						√			√	√	√				√			√	√	√	√
IR09MW52A	9606J847						√			√	√	√				√			√	√	√	√
IR09MW52A	9606J848						√			√	√	√				√			√	√	√	√
IR33B114	9531C069						√			√	√	√				√			√	√	√	
IR33B114	9531C070						√			√	√	√				√			√	√	√	√
IR33B114	9531C071						√			√	√	√				√			√	√	√	√
IR33B114	9531C074						√			√	√	√				√			√	√	√	√
IR33B114	9531C075						√			√	√	√				√			√	√	√	√
IR33B115	9532F020						√			√	√	√				√			√	√	√	
IR33B115	9532F021						√			√	√	√				√			√	√	√	√
IR33B115	9532F022						√			√	√	√				√			√	√	√	√
IR33B115	9532F023						√			√	√	√				√			√	√	√	√
IR33B115	9532F024						√			√	√	√				√			√	√	√	√
IR33MW116A	9531C061						√			√	√	√				√			√	√	√	
IR33MW116A	9531C062						√			√	√	√				√			√	√	√	√
IR33MW116A	9531C063						√			√	√	√				√			√	√	√	√
IR33MW116A	9531C065						√			√	√	√				√			√	√	√	√
IR33MW116A	9531C066						√			√	√	√				√			√	√	√	√
IR33MW116A	9531C067						√			√	√	√				√			√	√	√	√

TABLE 4.3-4 (Continued)

SUMMARY OF SOIL ANALYTICAL TESTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

CHROM	CHROMIUM VI
CYAN	Cyanide
DIOXIN	Dioxins and Furans
O&G	Total oil and grease
PAH	Polynuclear aromatic hydrocarbons
PCTMST	Percent moisture
PEST	Pesticides/polychlorinated biphenyls
PHYS	Physical characteristic
SALIN	Salinity
SVOC	Semivolatile organic compounds
SOLIDS	Total dissolved solids
TOC	Total organic carbon
TMICROB	Coliform
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
VOC	Volatile organic compounds

TABLE 4.3-5

STATISTICAL SUMMARY OF SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Residential PRG Value	Above[e] Res PRG	Industrial PRG Value	Above[f] Ind PRG	HPAL Value	Above[g] HPAL
METAL	ALUMINUM	1,420	62,100	16,300	MG/KG	3.8	166	166	76,700	0	100,000	0		
	ANTIMONY	0.55	37.0	8.4	MG/KG	4.8	165	45	30.7	1	681	0	9.05	21
	ARSENIC	0.29	14.2	3.2	MG/KG	0.70	166	131	0.32	130	2.0	80	11.10	2
	BARIUM	3.5	548	116	MG/KG	0.17	166	166	5,340	0	100,000	0	314.36	13
	BERYLLIUM	0.13	1.3	0.49	MG/KG	0.20	166	90	0.14	89	1.1	2	0.71	15
	CADMIUM	0.76	2.9	1.4	MG/KG	0.86	166	34	9.0	0	852	0	3.14	0
	CALCIUM	229	68,300	9,030	MG/KG	12.3	166	166						
	CHROMIUM	8.6	2,710	443	MG/KG	0.72	166	166	211	101	1,580	6	h	19
	CHROMIUM VI	0.06	1.4	0.24	MG/KG	0.07	156	22	0.20	6	225	0		
	COBALT	5.5	383	55.2	MG/KG	2.4	166	161					h	10
	COPPER	5.3	133	38.9	MG/KG	0.65	166	136	2,850	0	63,300	0	124.31	1
	IRON	9,570	138,000	36,700	MG/KG	2.7	166	166						
	LEAD	0.46	920	21.6	MG/KG	0.71	166	156	130	4	1,000	0	8.99	40
	MAGNESIUM	1,650	243,000	77,300	MG/KG	5.3	166	166						
	MANGANESE	90.1	3,520	949	MG/KG	0.16	166	166	382	138	8,300	0	1431.18	26
	MERCURY	0.05	0.30	0.16	MG/KG	0.09	161	54	23.0	0	511	0	2.28	0
	MOLYBDENUM	3.6	3.6	3.6	MG/KG	0.15	166	1	383	0	8,520	0	2.68	1
	NICKEL	12.6	6,340	897	MG/KG	5.4	166	164	150	127	34,100	0	h	23
	POTASSIUM	93.2	2,850	1,030	MG/KG	68.0	166	128						
	SELENIUM	0.53	0.58	0.55	MG/KG	0.49	166	4	383	0	8,520	0	1.95	0
	SODIUM	64.4	3,170	500	MG/KG	14.3	166	142						
	THALLIUM	0.36	3.4	1.2	MG/KG	0.40	166	13					0.81	5

TABLE 4.3-5 (Continued)

STATISTICAL SUMMARY OF SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Residential PRG Value	Above[e] Res PRG	Industrial PRG Value	Above[f] Ind PRG	HPAL Value	Above[g] HPAL
	VANADIUM	18.2	205	58.6	MG/KG	0.49	166	166	537	0	11,900	0	117.17	2
	ZINC	13.2	148	55.3	MG/KG	0.97	166	156	23,000	0	100,000	0	109.86	2
VOC	1,1,2,2-TETRACHLOROETHANE	7	7	7	UG/KG	6	123	1	900	0	2,400	0		
	2-BUTANONE	2	60	16	UG/KG	9	120	9	8,700,000	0	34,000,000	0		
	BENZENE	120	120	120	UG/KG	6	123	1	1,400	0	3,200	0		
	CARBON DISULFIDE	7	14	11	UG/KG	11	123	3	16,000	0	52,000	0		
	ETHYLBENZENE	1	1	1	UG/KG	5	123	1	2,900,000	0	3,100,000	0		
	TOLUENE	1	150	14	UG/KG	5	123	44	1,900,000	0	2,700,000	0		
	XYLENE (TOTAL)	2	13	7	UG/KG	6	123	2	980,000	0	980,000	0		
SVOC	2-METHYLNAPHTHALENE	39	390	140	UG/KG	540	131	19	800,000	0	800,000	0		
	BENZO(A)ANTHRACENE	36	110	64	UG/KG	340	131	3	610	0	2,600	0		
	BENZO(A)PYRENE	72	300	190	UG/KG	340	130	2	61	2	260	1		
	BENZO(B)FLUORANTHENE	39	50	44	UG/KG	360	130	5	610	0	2,600	0		
	BENZO(K)FLUORANTHENE	49	49	49	UG/KG	360	130	1	610	0	26,000	0		
	BUTYLBENZYLPHTHALATE	43	43	43	UG/KG	380	131	1	13,000,000	0	100,000,00	0		
	CHRYSENE	37	490	100	UG/KG	390	131	11	6,100	0	24,000	0		
	DI-N-BUTYLPHTHALATE	40	81	62	UG/KG	370	131	5	6,500,000	0	68,000,000	0		
	DIBENZOFURAN	44	74	57	UG/KG	370	131	4	260,000	0	2,700,000	0		
	FLUORANTHENE	40	79	61	UG/KG	360	131	6	2,600,000	0	27,000,000	0		
	FLUORENE	39	63	47	UG/KG	370	131	3	300,000	0	300,000	0		
	NAPHTHALENE	37	240	87	UG/KG	360	131	13	800,000	0	800,000	0		
	PHENANTHRENE	40	320	100	UG/KG	460	131	19	800,000	0	800,000	0		

TABLE 4.3-5 (Continued)

STATISTICAL SUMMARY OF SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Residential PRG Value	Above[e] Res PRG	Industrial PRG Value	Above[f] Ind PRG	HPAL Value	Above[g] HPAL
	PHENOL	110	110	110	UG/KG	390	125	1	39,000,000	0	100,000,00	0		
	PYRENE	38	250	88	UG/KG	370	131	8	2,000,000	0	20,000,000	0		
PEST	DELTA-BHC	4	6	5	UG/KG	9	94	2	250	0	1,100	0		
TPHEXT	TPH-DIESEL	6	530	60	MG/KG	49	131	15	1,000	0i				
	TPH-MOTOR OIL	6	6,500	730	MG/KG	120	26	9	1,000	1i				
TRPH	TRPH	14	9,800	3,400	MG/KG	150	26	3	1,000	1i				

TABLE 4.3-5 (Continued)

STATISTICAL SUMMARY OF SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

CYAN	Cyanide
EPA	U.S. Environmental Protection Agency
HPAL	Hunters Point ambient level
MG/KG	Milligram per kilogram
O&G	Total oil and grease
PCTMST	Percent moisture
PEST	Pesticide/polychlorinated biphenyl
PHYS	Physical characteristic
PRG	Preliminary remediation goal
SALIN	Salinity
SVOC	Semivolatile organic compound
TMICROB	Coliform
TOC	Total organic carbon
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
UG/KG	Microgram per kilogram
VOC	Volatile organic compound

a Organic results of less than 10 are reported to one significant figure, and results of greater than or equal to 10 are reported to two significant figures. Inorganic results of less than 10 are reported to two significant figures, and results of greater than or equal to 10 are reported to three significant figures. Values that are not nondetects are compared to screening criteria before the significant figure rule is applied. Both the value and the screening criteria are then rounded for reporting purposes.

b Blank boxes indicate that screening critera have not been established for these analytes.

c Total number of samples analyzed

d Total number of samples showing concentrations greater than detection limit

e Total number of samples showing concentrations greater than residential PRG

f Total number of samples showing concentrations greater than industrial PRG
California-modified PRGs were used for the following analytes: 1,2-Dibromo-3-chloropropane, benzo[a]pyrene, benzo[k]fluoranthene, cadmium, chromium VI, chrysene, lead, nickel, and tetrachloroethylene (PCE).
For the analytes listed below, Region IX PRGs are not available; therefore, PRGs for similar chemicals were used as follows:

Analyte:	Similar Analyte:
2-Methylnapthalene	Naphthalene
Acenaphthylene	Acenaphthene
Alpha-chlordane	Chlordane
Aroclor-1260	Polychlorinated biphenyls
Benzo(g,h,i)perylene	Naphthalene
Delta BHC	HCH-technical
Endosulfan I	Endosulfan
Endosulfan sulfate	Endosulfan
Endrin aldehyde	Endrin
Endrin ketone	Endrin
Gamma-chlordane	Chlordane
Phenanthrene	Naphthalene

g Total number of samples showing concentrations greater than HPAL

h HPALs for chromium, cobalt, and nickel are based on the concentration of magnesium in each sample; thus, no single value applies to all samples. The range of HPAL values for chromium, cobalt, and nickel are 55.850 to 1743.823, 12.344 to 163.992, and 42.467 to 4835.920 mg/kg respectively.

i Total number of samples showing concentrations greater than TPH, TRPH, or O&G screening level, not PRG value

TABLE 4.3-6

SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09B002	IR09B002	IR09B003	IR09B003	IR09B003	IR09B003	IR09B003
Sampling Depth (feet bgs)	0.75	3.25	1.75	3.25	5.75	10.25	14.75
Sample Number	8939E001	8939E002	8939G001	8939G002	8939G003	8939G004	8939G005
Sample Date	09/25/89	09/25/89	09/25/89	09/25/89	09/25/89	09/25/89	09/25/89
Metal (mg/kg)							
ALUMINUM	62,100	14,500	10,200	6,590	16,700	2,880	1,420
ANTIMONY	ND (8.3)	ND (6.2)	ND (7.2)	ND (7.1)	ND (10.5)	ND (6.9)	ND (7.0)
ARSENIC	2.0 *	0.34 *	2.1 *#	3.4 *#	0.47 *	0.38 *	0.40 *
BARIUM	109	37.8	77.1	59.9	124	26.1	29.0
BERYLLIUM	ND (0.77)	ND (0.58)	ND (0.67)	ND (0.67)	ND (0.98)	ND (0.65)	ND (0.65)
CADMIUM	ND (1.1)	ND (0.80)	ND (0.93)	ND (0.92)	ND (1.4)	ND (0.89)	ND (0.90)
CALCIUM	17,100	10,400	2,080	1,260	3,290	447	335
CHROMIUM	289 *	101	127 α	82.8	1,700 *#α	736 *	390 *
CHROMIUM VI	ND (0.07)	ND (0.05)	0.06	ND (0.06)	ND (0.08)	ND (0.06)	ND (0.06)
COBALT	55.1	12.4	26.6 α	19.1 α	201 α	90.4	119
COPPER	ND (18.0)	33.3	58.9	27.8	45.8	23.4	27.9
IRON	80,100	17,300	23,900	16,800	91,000	47,200	39,400
LEAD	0.58	0.47	2.3	2.5	0.62	ND (0.20)	ND (0.20)
MAGNESIUM	92,800	11,100	3,930	3,370	186,000	187,000	185,000
MANGANESE	2,220 *α	240	353	406 *	1,680 *α	976 *	1,480 *α
MERCURY	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	0.10	ND (0.10)	ND (0.10)
MOLYBDENUM	ND (8.0)	ND (6.0)	ND (6.9)	ND (6.9)	ND (10.1)	ND (6.7)	ND (6.7)
NICKEL	1,660 *	290 *α	198 *α	190 *α	4,320 *α	1,820 *	2,290 *
POTASSIUM	ND (158)	ND (109)	590	ND (373)	ND (125)	ND (68.3)	ND (68.8)
SELENIUM	ND (0.59)	ND (0.44)	ND (0.51)	ND (0.51)	ND (0.74)	ND (0.49)	ND (0.49)
SODIUM	436	183	175	143	368	108	64.4
THALLIUM	ND (0.40)	ND (0.30)	ND (0.35)	ND (0.35)	ND (0.51)	ND (0.33)	ND (0.34)
VANADIUM	205 α	35.6	74.8	55.7	45.6	30.9	26.2
ZINC	83.4	22.3	33.4	28.0	58.6	37.7	33.2
Volatile Organic Compound (ug/kg)							
1,1,2,2-TETRACHLOROETHANE	ND (7)	ND (5)	ND (6)	ND (6)	ND (8)	NA	NA
2-BUTANONE	11	ND (10)	ND (12)	ND (12)	ND (17)	NA	NA
BENZENE	ND (7)	ND (5)	ND (6)	ND (6)	ND (8)	NA	NA
CARBON DISULFIDE	ND (7)	ND (5)	14	ND (6)	ND (8)	NA	NA
ETHYLBENZENE	ND (7)	ND (5)	ND (6)	ND (6)	ND (8)	NA	NA
TOLUENE	ND (7)	ND (5)	ND (6)	ND (6)	ND (8)	NA	NA
XYLENE (TOTAL)	ND (7)	ND (5)	ND (6)	ND (6)	ND (8)	NA	NA

TABLE 4.3-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09B002	IR09B002	IR09B003	IR09B003	IR09B003	IR09B003	IR09B003
Sampling Depth (feet bgs)	0.75	3.25	1.75	3.25	5.75	10.25	14.75
Sample Number	8939E001	8939E002	8939G001	8939G002	8939G003	8939G004	8939G005
Sample Date	09/25/89	09/25/89	09/25/89	09/25/89	09/25/89	09/25/89	09/25/89
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (440)	ND (330)	ND (380)	ND (380)	ND (560)	NA	NA
BENZO(A)ANTHRACENE	ND (440)	ND (330)	ND (380)	ND (380)	ND (560)	NA	NA
BENZO(A)PYRENE	ND (440)	ND (330)	ND (380)	ND (380)	ND (560)	NA	NA
BENZO(B)FLUORANTHENE	ND (440)	ND (330)	ND (380)	ND (380)	ND (560)	NA	NA
BENZO(K)FLUORANTHENE	ND (440)	ND (330)	ND (380)	ND (380)	ND (560)	NA	NA
BUTYLBENZYLPHTHALATE	ND (440)	ND (330)	ND (380)	ND (380)	ND (560)	NA	NA
CHRYSENE	ND (440)	ND (330)	ND (380)	ND (380)	ND (560)	NA	NA
DI-N-BUTYLPHTHALATE	ND (440)	ND (330)	ND (380)	ND (380)	ND (560)	NA	NA
DIBENZOFURAN	ND (440)	ND (330)	ND (380)	ND (380)	ND (560)	NA	NA
FLUORANTHENE	ND (440)	ND (330)	ND (380)	ND (380)	ND (560)	NA	NA
FLUORENE	ND (440)	ND (330)	ND (380)	ND (380)	ND (560)	NA	NA
NAPHTHALENE	ND (440)	ND (330)	ND (380)	ND (380)	ND (560)	NA	NA
PHENANTHRENE	ND (440)	ND (330)	ND (380)	ND (380)	ND (560)	NA	NA
PHENOL	ND (440)	ND (330)	ND (380)	ND (380)	ND (560)	NA	NA
PYRENE	ND (440)	ND (330)	ND (380)	ND (380)	ND (560)	NA	NA
Pesticide/Polychlorinated Biphenyl (ug/kg)							
DELTA-BHC	ND (11)	ND (8)	ND (9)	ND (9)	ND (14)	NA	NA
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (7)	ND (5)	ND (6)	ND (6)	ND (8)	NA	NA
TPH-MOTOR OIL	NA	NA	NA	NA	NA	NA	NA
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	74.9	100	86.4	86.9	59.2	89.6	89.0
pH (pH units)							
PH	7.4	7.9	7.0	7.1	7.3	8.0	8.2

TABLE 4.3-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09B004	IR09B004	IR09B004	IR09B004	IR09B005	IR09B005	IR09B005
Sampling Depth (feet bgs)	1.25	3.25	5.25	10.25	0.75	2.75	5.75
Sample Number	8943G101	8943G102	8943G103	8943G104	8939E006	8939E007	8939E008
Sample Date	10/26/89	10/26/89	10/26/89	10/26/89	09/26/89	09/26/89	09/26/89
Metal (mg/kg)							
ALUMINUM	22,300	10,000	8,120	3,860	19,400	24,300	8,990
ANTIMONY	ND (6.8)	ND (6.7)	ND (7.3)	ND (7.5)	ND (7.0)	ND (12.7)	ND (7.6)
ARSENIC	0.40 *	3.2 *#	1.9 *	1.2 *	2.7 *#	3.4 *#	2.5 *#
BARIUM	44.7	62.5	18.7	22.5	260	429 α	40.0
BERYLLIUM	0.18 *	0.37 *	0.19 *	0.19 *	ND (0.64)	0.74 *α	ND (0.71)
CADMIUM	ND (0.79)	ND (0.77)	ND (0.85)	ND (0.86)	1.3	ND (0.94)	ND (0.98)
CALCIUM	22,500	5,020	4,990	1,710	24,700	14,200	6,430
CHROMIUM	20.2	108	158	311 *	157	166	213 *
CHROMIUM VI	ND (0.05)	ND (0.05)	ND (0.06)	0.17	ND (0.11)	0.57 *	1.4 *
COBALT	11.2	15.2	24.1	96.6	27.9	44.7	34.6
COPPER	93.9	21.0	8.7	37.0	50.6	27.1	ND (16.8)
IRON	22,000	24,400	27,100	32,400	30,800	45,700	35,800
LEAD	0.93	8.1	1.3	ND (0.23)	11.6 α	6.7	2.6
MAGNESIUM	9,300	16,100	24,600	89,200	20,300	38,000	18,100
MANGANESE	437 *	706 *	288	803 *	1,170 *	1,090 *	310 *
MERCURY	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	0.20	ND (0.10)
MOLYBDENUM	ND (1.3)	ND (1.2)	ND (1.4)	ND (1.4)	ND (6.7)	ND (7.1)	ND (7.3)
NICKEL	12.6	140	407 *	1,240 *	194 *	494 *	479 *α
POTASSIUM	1,060	1,020	546	ND (90.1)	875	1,340	609
SELENIUM	ND (0.47)	ND (0.46)	ND (0.51)	ND (0.51)	ND (0.49)	ND (0.52)	ND (0.54)
SODIUM	898	235	165	325	244	237	141
THALLIUM	ND (0.49)	ND (0.48)	ND (0.53)	ND (0.54)	ND (0.33)	ND (0.35)	ND (0.37)
VANADIUM	65.5	49.4	52.3	26.4	72.2	88.0	78.2
ZINC	36.6	52.1	26.5	25.0	62.8	76.8	42.2
Volatile Organic Compound (ug/kg)							
1,1,2,2-TETRACHLOROETHANE	ND (5)	ND (5)	ND (6)	NA	ND (6)	ND (6)	ND (6)
2-BUTANONE	ND (11)	ND (10)	ND (11)	NA	ND (11)	ND (12)	ND (12)
BENZENE	ND (5)	ND (5)	ND (6)	NA	ND (6)	ND (6)	ND (6)
CARBON DISULFIDE	ND (5)	ND (5)	ND (6)	NA	ND (6)	ND (6)	ND (6)
ETHYLBENZENE	ND (5)	ND (5)	ND (6)	NA	ND (6)	ND (6)	ND (6)
TOLUENE	ND (5)	36	ND (6)	NA	ND (6)	ND (6)	ND (6)
XYLENE (TOTAL)	ND (5)	ND (5)	ND (6)	NA	ND (6)	ND (6)	ND (6)

TABLE 4.3-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09B004	IR09B004	IR09B004	IR09B004	IR09B005	IR09B005	IR09B005
Sampling Depth (feet bgs)	1.25	3.25	5.25	10.25	0.75	2.75	5.75
Sample Number	8943G101	8943G102	8943G103	8943G104	8939E006	8939E007	8939E008
Sample Date	10/26/89	10/26/89	10/26/89	10/26/89	09/26/89	09/26/89	09/26/89
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	370	100	ND (380)	NA	ND (370)	ND (390)	ND (400)
BENZO(A)ANTHRACENE	ND (3,500)	ND (690)	ND (380)	NA	ND (370)	ND (390)	ND (400)
BENZO(A)PYRENE	ND (3,500)	ND (690)	ND (380)	NA	ND (370)	ND (390)	ND (400)
BENZO(B)FLUORANTHENE	ND (3,500)	ND (690)	ND (380)	NA	ND (370)	ND (390)	ND (400)
BENZO(K)FLUORANTHENE	ND (3,500)	ND (690)	ND (380)	NA	ND (370)	ND (390)	ND (400)
BUTYLBENZYLPHTHALATE	ND (3,500)	ND (690)	ND (380)	NA	ND (370)	ND (390)	ND (400)
CHRYSENE	ND (3,500)	160	ND (380)	NA	ND (370)	ND (390)	ND (400)
DI-N-BUTYLPHTHALATE	ND (3,500)	ND (690)	ND (380)	NA	ND (370)	ND (390)	ND (400)
DIBENZOFURAN	ND (3,500)	ND (690)	ND (380)	NA	ND (370)	ND (390)	ND (400)
FLUORANTHENE	ND (3,500)	ND (690)	ND (380)	NA	ND (370)	ND (390)	ND (400)
FLUORENE	ND (3,500)	ND (690)	ND (380)	NA	ND (370)	ND (390)	ND (400)
NAPHTHALENE	ND (3,500)	ND (690)	ND (380)	NA	ND (370)	ND (390)	ND (400)
PHENANTHRENE	ND (3,500)	81	ND (380)	NA	ND (370)	ND (390)	ND (400)
PHENOL	ND (3,500)	ND (690)	ND (380)	NA	ND (370)	ND (390)	ND (400)
PYRENE	ND (3,500)	ND (690)	ND (380)	NA	ND (370)	ND (390)	ND (400)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
DELTA-BHC	ND (85)	ND (83)	ND (9)	NA	ND (9)	ND (9)	ND (10)
TPH-Extractable (mg/kg)							
TPH-DIESEL	530	ND (520)	ND (570)	NA	ND (6)	ND (6)	ND (6)
TPH-MOTOR OIL	NA	NA	NA	NA	NA	NA	NA
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	93.9	96.1	87.1	85.9	90.0	84.8	81.9
pH (pH units)							
PH	8.3	8.1	7.9	NA	7.8	7.6	7.3

TABLE 4.3-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09B006	IR09B006	IR09B006	IR09B006	IR09B006	IR09B007	IR09B007
Sampling Depth (feet bgs)	0.75	3.25	5.75	10.25	15.75	3.25	1.25
Sample Number	8939E016	8939E017	8939E018	8939E019	8939E020	8939E011	8939E012
Sample Date	09/26/89	09/26/89	09/26/89	09/26/89	09/26/89	09/26/89	09/26/89
Metal (mg/kg)							
ALUMINUM	7,760	17,700	12,000	3,720	3,520	13,500	18,000
ANTIMONY	ND (6.9)	ND (7.7)	ND (40.7)	ND (26.6)	ND (7.5)	ND (7.0)	ND (6.9)
ARSENIC	1.7 *	4.7 *#	2.7 *#	1.4 *	0.58 *	2.5 *#	12.7 *#α
BARIUM	65.7	143	65.2	185	11.4	50.8	68.1
BERYLLIUM	ND (0.65)	ND (0.72)	ND (1.1)	ND (0.74)	ND (0.70)	ND (0.65)	1.2 *#α
CADMIUM	ND (0.89)	ND (0.99)	2.6	ND (1.0)	ND (0.96)	1.5	2.4
CALCIUM	68,300	4,590	3,660	617	328	7,090	3,090
CHROMIUM	102 α	536 *α	2,040 *#α	851 *	620 *	142 α	54.9
CHROMIUM VI	ND (0.11)	ND (0.12)	ND (0.19)	ND (0.13)	ND (0.12)	0.25 *	ND (0.10)
COBALT	13.7	167 α	383 α	153	91.8	14.0	21.3
COPPER	ND (12.0)	ND (20.5)	41.7	ND (7.1)	ND (66.8)	ND (10.9)	22.6
IRON	17,800	51,800	138,000	64,900	33,800	28,000	38,000
LEAD	15.1 α	3.6	1.4	ND (0.23)	1.3	3.5	9.2 α
MAGNESIUM	3,220	9,090	66,400	216,000	188,000	3,810	11,200
MANGANESE	354	1,350 *	3,400 *α	3,520 *α	681 *	406 *	1,200 *
MERCURY	ND (0.10)	ND (0.10)	0.20	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)
MOLYBDENUM	ND (6.7)	ND (7.4)	ND (11.6)	ND (7.7)	ND (1.4)	ND (6.8)	ND (6.0)
NICKEL	72.7	1,240 *α	6,340 *α	3,230 *	2,140 *	141 α	44.8
POTASSIUM	775	756	ND (303)	ND (78.2)	ND (73.6)	606	1,840
SELENIUM	ND (0.49)	ND (0.55)	ND (0.85)	ND (0.56)	ND (0.53)	ND (0.50)	ND (0.44)
SODIUM	599	535	1,290	200	ND (103)	211	216
THALLIUM	ND (0.33)	ND (0.37)	ND (0.58)	ND (0.38)	ND (0.36)	ND (0.34)	0.66
VANADIUM	45.4	105	58.9	42.7	35.2	71.9	53.9
ZINC	32.9	47.3	73.4	36.9	ND (32.7)	27.8	60.1
Volatile Organic Compound (ug/kg)							
1,1,2,2-TETRACHLOROETHANE	ND (6)	ND (6)	ND (10)	NA	NA	ND (6)	ND (5)
2-BUTANONE	ND (11)	ND (12)	ND (19)	NA	NA	ND (11)	ND (10)
BENZENE	ND (6)	ND (6)	ND (10)	NA	NA	ND (6)	ND (5)
CARBON DISULFIDE	ND (6)	ND (6)	ND (10)	NA	NA	ND (6)	ND (5)
ETHYLBENZENE	ND (6)	ND (6)	ND (10)	NA	NA	ND (6)	ND (5)
TOLUENE	ND (6)	ND (6)	ND (10)	NA	NA	ND (6)	ND (5)
XYLENE (TOTAL)	ND (6)	ND (6)	ND (10)	NA	NA	ND (6)	ND (5)

TABLE 4.3-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09B006	IR09B006	IR09B006	IR09B006	IR09B006	IR09B007	IR09B007
Sampling Depth (feet bgs)	0.75	3.25	5.75	10.25	15.75	3.25	1.25
Sample Number	8939E016	8939E017	8939E018	8939E019	8939E020	8939E011	8939E012
Sample Date	09/26/89	09/26/89	09/26/89	09/26/89	09/26/89	09/26/89	09/26/89
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (370)	ND (410)	ND (640)	NA	NA	ND (370)	ND (660)
BENZO(A)ANTHRACENE	ND (370)	ND (410)	ND (640)	NA	NA	ND (370)	ND (660)
BENZO(A)PYRENE	ND (370)	ND (410)	ND (640)	NA	NA	ND (370)	ND (660)
BENZO(B)FLUORANTHENE	ND (370)	ND (410)	ND (640)	NA	NA	ND (370)	ND (660)
BENZO(K)FLUORANTHENE	ND (370)	ND (410)	ND (640)	NA	NA	ND (370)	ND (660)
BUTYLBENZYLPHTHALATE	ND (370)	ND (410)	ND (640)	NA	NA	ND (370)	ND (660)
CHRYSENE	ND (370)	ND (410)	ND (640)	NA	NA	ND (370)	ND (660)
DI-N-BUTYLPHTHALATE	ND (370)	ND (410)	ND (640)	NA	NA	ND (370)	ND (660)
DIBENZOFURAN	ND (370)	ND (410)	ND (640)	NA	NA	ND (370)	ND (660)
FLUORANTHENE	ND (370)	ND (410)	ND (640)	NA	NA	ND (370)	ND (660)
FLUORENE	ND (370)	ND (410)	ND (640)	NA	NA	ND (370)	ND (660)
NAPHTHALENE	ND (370)	ND (410)	ND (640)	NA	NA	ND (370)	ND (660)
PHENANTHRENE	ND (370)	ND (410)	ND (640)	NA	NA	ND (370)	ND (660)
PHENOL	ND (370)	ND (410)	ND (640)	NA	NA	ND (370)	ND (660)
PYRENE	ND (370)	ND (410)	ND (640)	NA	NA	ND (370)	ND (660)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
DELTA-BHC	ND (9)	ND (10)	ND (15)	NA	NA	ND (9)	ND (8)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (6)	ND (6)	ND (10)	NA	NA	ND (6)	ND (5)
TPH-MOTOR OIL	NA	NA	NA	NA	NA	NA	NA
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	89.8	80.7	51.9	78.3	83.2	88.8	100
pH (pH units)							
PH	8.0	7.5	7.4	8.1	7.4	7.5	5.5

TABLE 4.3-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09B007	IR09B007	IR09B008	IR09B008	IR09B008	IR09B009	IR09B009
Sampling Depth (feet bgs)	5.25	10.25	1.25	2.75	5.25	1.25	3.25
Sample Number	8939E013	8939E014	8939E003	8939E004	8939E005	8939E021	8939E022
Sample Date	09/26/89	09/26/89	09/26/89	09/26/89	09/26/89	09/27/89	09/27/89
Metal (mg/kg)							
ALUMINUM	15,800	2,560	16,100	18,800	15,600	19,300	10,500
ANTIMONY	ND (12.1)	12.6 α	ND (6.8)	ND (6.7)	ND (6.2)	ND (7.1)	ND (6.9)
ARSENIC	3.2 *#	0.97 *	1.0 *	1.8 *	0.70 *	2.1 *#	2.2 *#
BARIUM	49.0	5.4	151	147	34.3	130	48.2
BERYLLIUM	ND (0.69)	0.13	0.69 *	ND (0.62)	ND (0.58)	ND (0.67)	ND (0.64)
CADMIUM	ND (0.95)	ND (0.87)	ND (0.88)	ND (0.86)	ND (0.80)	ND (0.92)	ND (0.89)
CALCIUM	7,640	373	8,640	24,900	16,200	11,700	9,630
CHROMIUM	783 *α	872 *	131	62.6	46.0	325 *	96.4 α
CHROMIUM VI	0.62 *	0.12	0.44 *	ND (0.11)	ND (0.10)	ND (0.06)	ND (0.06)
COBALT	16.5	138	19.9	21.4	17.2	33.7	ND (10.6)
COPPER	22.9	20.1	21.2	42.6	ND (13.8)	ND (42.0)	ND (18.7)
IRON	29,100	51,700	26,700	26,400	14,600	36,000	23,700
LEAD	3.5	ND (1.2)	14.9 α	4.1	0.98	14.8 α	2.9
MAGNESIUM	3,460	200,000	14,600	14,900	9,710	54,400	3,600
MANGANESE	259	568 *	769 *	613 *	640 *	947 *	343
MERCURY	ND (0.10)	NA	0.20	0.30	ND (0.10)	ND (0.10)	ND (0.10)
MOLYBDENUM	ND (7.1)	ND (1.4)	ND (6.6)	ND (6.4)	ND (6.0)	ND (1.4)	ND (1.3)
NICKEL	147 α	2,610 *	146	79.4	264 *α	554 *	103 α
POTASSIUM	574	123	758	1,100	ND (337)	ND (1,280)	ND (673)
SELENIUM	ND (0.52)	ND (0.52)	ND (0.49)	ND (0.47)	ND (0.44)	ND (0.51)	ND (0.49)
SODIUM	161	534	99.2	205	183	ND (207)	ND (157)
THALLIUM	ND (0.36)	ND (0.54)	ND (0.33)	ND (0.32)	ND (0.30)	ND (0.35)	ND (0.33)
VANADIUM	64.5	59.3	54.1	61.4	27.6	72.7	58.2
ZINC	70.3	40.7	90.6	54.7	20.9	57.9	ND (27.2)
Volatile Organic Compound (ug/kg)							
1,1,2,2-TETRACHLOROETHANE	ND (6)	NA	ND (6)	ND (5)	ND (5)	ND (1)	ND (1)
2-BUTANONE	ND (12)	NA	ND (11)	ND (11)	ND (10)	ND (1)	ND (1)
BENZENE	ND (6)	NA	ND (6)	ND (5)	ND (5)	ND (1)	ND (1)
CARBON DISULFIDE	ND (6)	NA	ND (6)	ND (5)	ND (5)	ND (1)	ND (1)
ETHYLBENZENE	ND (6)	NA	ND (6)	ND (5)	ND (5)	ND (1)	ND (1)
TOLUENE	ND (6)	NA	ND (6)	ND (5)	ND (5)	ND (1)	ND (1)
XYLENE (TOTAL)	ND (6)	NA	ND (6)	ND (5)	ND (5)	ND (1)	ND (1)

TABLE 4.3-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09B007	IR09B007	IR09B008	IR09B008	IR09B008	IR09B009	IR09B009
Sampling Depth (feet bgs)	5.25	10.25	1.25	2.75	5.25	1.25	3.25
Sample Number	8939E013	8939E014	8939E003	8939E004	8939E005	8939E021	8939E022
Sample Date	09/26/89	09/26/89	09/26/89	09/26/89	09/26/89	09/27/89	09/27/89
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (390)	NA	ND (360)	ND (350)	ND (330)	ND (380)	ND (370)
BENZO(A)ANTHRACENE	ND (390)	NA	ND (360)	ND (350)	ND (330)	ND (380)	ND (370)
BENZO(A)PYRENE	ND (390)	NA	ND (360)	ND (350)	ND (330)	ND (380)	ND (370)
BENZO(B)FLUORANTHENE	ND (390)	NA	ND (360)	ND (350)	ND (330)	ND (380)	ND (370)
BENZO(K)FLUORANTHENE	ND (390)	NA	ND (360)	ND (350)	ND (330)	ND (380)	ND (370)
BUTYLBENZYLPHTHALATE	ND (390)	NA	ND (360)	ND (350)	ND (330)	ND (380)	ND (370)
CHRYSENE	ND (390)	NA	ND (360)	ND (350)	ND (330)	ND (380)	ND (370)
DI-N-BUTYLPHTHALATE	ND (390)	NA	ND (360)	ND (350)	ND (330)	ND (380)	ND (370)
DIBENZOFURAN	ND (390)	NA	ND (360)	ND (350)	ND (330)	ND (380)	ND (370)
FLUORANTHENE	ND (390)	NA	ND (360)	ND (350)	ND (330)	ND (380)	ND (370)
FLUORENE	ND (390)	NA	ND (360)	ND (350)	ND (330)	ND (380)	ND (370)
NAPHTHALENE	ND (390)	NA	ND (360)	ND (350)	ND (330)	ND (380)	ND (370)
PHENANTHRENE	ND (390)	NA	ND (360)	ND (350)	ND (330)	ND (380)	ND (370)
PHENOL	ND (390)	NA	ND (360)	ND (350)	ND (330)	ND (380)	ND (370)
PYRENE	ND (390)	NA	ND (360)	ND (350)	ND (330)	ND (380)	ND (370)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
DELTA-BHC	ND (10)	NA	ND (44)	ND (9)	ND (8)	ND (9)	ND (9)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (6)	NA	8	ND (5)	ND (5)	ND (580)	ND (560)
TPH-MOTOR OIL	NA	NA	NA	NA	NA	NA	NA
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	84.3	84.6	90.7	93.1	100	86.9	90.0
pH (pH units)							
PH	6.0	NA	7.8	9.3	8.8	7.6	7.3

TABLE 4.3-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09B009	IR09B010	IR09B010	IR09B010	IR09B010	IR09B011	IR09B011
Sampling Depth (feet bgs)	5.75	1.25	3.25	5.75	10.75	1.25	3.25
Sample Number	8939E023	8941F011	8941F012	8941F013	8941F014	8941G081	8941G082
Sample Date	09/27/89	10/11/89	10/11/89	10/11/89	10/11/89	10/12/89	10/12/89
Metal (mg/kg)							
ALUMINUM	9,470	22,500	3,730	19,200	4,170	26,700	5,200
ANTIMONY	ND (6.9)	ND (6.7)	8.1	ND (7.6)	ND (7.4)	ND (7.1)	ND (6.6)
ARSENIC	1.4 *	ND (0.44)	ND (0.59)	ND (0.64)	3.8 *#	ND (1.4)	ND (2.3)
BARIUM	56.9	30.4	8.7	65.5	20.5	412 α	14.8
BERYLLIUM	ND (0.64)	0.15 *	0.18 *	0.34 *	ND (0.13)	0.72 *α	0.20 *
CADMIUM	ND (0.93)	ND (0.78)	ND (0.91)	1.5	ND (0.85)	1.8	0.91
CALCIUM	8,350	19,900	755	15,900	3,520	17,700	4,710
CHROMIUM	100 α	8.6	814 *	282 *	56.5 α	159	54.9
CHROMIUM VI	ND (0.06)	0.14	0.10	ND (0.06)	ND (0.05)	0.06	ND (0.05)
COBALT	ND (10.6)	12.1	116	34.6	5.5	34.5	6.4
COPPER	ND (17.2)	88.9	15.9	43.4	5.3	57.0	ND (4.4)
IRON	19,500	19,500	34,900	36,500	12,300	40,500	17,700
LEAD	3.2	1.4	0.95	0.81	4.3	7.2	3.0
MAGNESIUM	2,800	8,090	198,000	31,700	1,650	28,800	3,110
MANGANESE	280	342	862 *	679 *	90.1	1,900 *α	162
MERCURY	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	0.20	ND (0.10)
MOLYBDENUM	ND (1.3)	ND (1.3)	ND (1.5)	ND (1.4)	ND (1.4)	ND (1.3)	ND (1.2)
NICKEL	85.5 α	ND (7.3)	2,160 *	434 *	45.2 α	225 *	22.6
POTASSIUM	ND (692)	839	ND (95.3)	638	327	1,420	633
SELENIUM	ND (0.49)	ND (0.46)	ND (0.54)	ND (0.52)	ND (0.51)	ND (0.49)	ND (0.45)
SODIUM	ND (138)	965	122	325	285	294	193
THALLIUM	ND (0.33)	ND (0.48)	ND (0.57)	ND (0.54)	ND (0.53)	ND (0.51)	ND (0.47)
VANADIUM	54.9	52.4	24.2	74.5	30.6	96.4	54.1
ZINC	ND (26.3)	33.2	38.6	44.4	13.2	91.3	22.3
Volatile Organic Compound (ug/kg)							
1,1,2,2-TETRACHLOROETHANE	ND (1)	ND (5)	ND (6)	ND (6)	NA	ND (6)	ND (5)
2-BUTANONE	ND (1)	21	ND (12)	15	NA	ND (11)	ND (10)
BENZENE	ND (1)	ND (5)	ND (6)	ND (6)	NA	ND (6)	ND (5)
CARBON DISULFIDE	ND (1)	ND (5)	ND (6)	ND (6)	NA	ND (6)	ND (5)
ETHYLBENZENE	ND (1)	1	ND (6)	ND (6)	NA	ND (6)	ND (5)
TOLUENE	ND (1)	150	2	5	NA	2	1
XYLENE (TOTAL)	ND (1)	13	ND (6)	ND (6)	NA	ND (6)	ND (5)

TABLE 4.3-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09B009	IR09B010	IR09B010	IR09B010	IR09B010	IR09B011	IR09B011
Sampling Depth (feet bgs)	5.75	1.25	3.25	5.75	10.75	1.25	3.25
Sample Number	8939E023	8941F011	8941F012	8941F013	8941F014	8941G081	8941G082
Sample Date	09/27/89	10/11/89	10/11/89	10/11/89	10/11/89	10/12/89	10/12/89
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (370)	56	ND (400)	ND (390)	NA	ND (370)	ND (340)
BENZO(A)ANTHRACENE	ND (370)	ND (350)	ND (400)	ND (390)	NA	ND (370)	ND (340)
BENZO(A)PYRENE	ND (370)	ND (350)	ND (400)	ND (390)	NA	ND (370)	ND (340)
BENZO(B)FLUORANTHENE	ND (370)	ND (350)	ND (400)	ND (390)	NA	ND (370)	ND (340)
BENZO(K)FLUORANTHENE	ND (370)	ND (350)	ND (400)	ND (390)	NA	ND (370)	ND (340)
BUTYLBENZYLPHTHALATE	ND (370)	ND (350)	ND (400)	ND (390)	NA	ND (370)	ND (340)
CHRYSENE	ND (370)	49	ND (400)	ND (390)	NA	ND (370)	ND (340)
DI-N-BUTYLPHTHALATE	ND (370)	ND (350)	ND (400)	ND (390)	NA	ND (370)	ND (340)
DIBENZOFURAN	ND (370)	ND (350)	ND (400)	ND (390)	NA	ND (370)	ND (340)
FLUORANTHENE	ND (370)	ND (350)	ND (400)	ND (390)	NA	ND (370)	ND (340)
FLUORENE	ND (370)	ND (350)	ND (400)	ND (390)	NA	ND (370)	ND (340)
NAPHTHALENE	ND (370)	ND (350)	ND (400)	ND (390)	NA	ND (370)	ND (340)
PHENANTHRENE	ND (370)	ND (350)	ND (400)	ND (390)	NA	ND (370)	ND (340)
PHENOL	ND (370)	ND (350)	ND (400)	ND (390)	NA	ND (370)	ND (340)
PYRENE	ND (370)	ND (350)	ND (400)	ND (390)	NA	ND (370)	ND (340)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
DELTA-BHC	ND (9)	ND (84)	ND (10)	ND (9)	NA	ND (9)	ND (8)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (550)	ND (530)	ND (61)	ND (590)	NA	ND (560)	14
TPH-MOTOR OIL	NA	NA	NA	NA	NA	NA	NA
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	90.1	94.9	81.2	84.5	86.6	90.2	97.4
pH (pH units)							
PH	7.2	8.2	7.4	7.3	NA	7.4	8.4

TABLE 4.3-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09B011	IR09B011	IR09B012	IR09B012	IR09B012	IR09B012	IR09B013
Sampling Depth (feet bgs)	5.75	15.75	1.25	3.25	5.75	10.75	1.75
Sample Number	8941G083	8941G084	8941G075	8941G076	8941G077	8941G078	8939E024
Sample Date	10/12/89	10/12/89	10/11/89	10/11/89	10/11/89	10/11/89	09/27/89
Metal (mg/kg)							
ALUMINUM	11,500	6,380	22,900	19,000	4,720	5,880	35,700
ANTIMONY	22.2 α	37.0 *α	ND (7.0)	ND (7.0)	16.7 α	25.3 α	ND (7.0)
ARSENIC	ND (0.58)	3.8 *#	3.8 *#	ND (1.2)	ND (0.54)	0.85 *	1.9 *
BARIUM	41.0	39.1	386 α	64.7	14.7	13.0	356 α
BERYLLIUM	0.24 *	0.30 *	0.68 *	0.25 *	0.23 *	0.22 *	0.81 *α
CADMIUM	ND (1.0)	ND (1.1)	1.6	1.2	ND (1.1)	ND (1.1)	ND (0.90)
CALCIUM	3,560	2,390	14,200	12,700	731	1,940	29,800
CHROMIUM	1,460 *α	2,620 *#α	142	351 *	1,360 *	1,630 *#α	181
CHROMIUM VI	0.07	ND (0.05)	0.08	ND (0.05)	0.14	ND (0.05)	ND (0.06)
COBALT	106	200 α	31.3	64.0	122	95.7	34.2
COPPER	25.5	43.3	64.4	50.5	15.7	17.0	112
IRON	54,100	84,100	38,300	36,800	40,600	54,600	57,400
LEAD	3.4	2.8	7.4	0.80	0.46	1.8	2.4
MAGNESIUM	128,000	130,000	28,500	59,000	203,000	166,000	40,800
MANGANESE	981 *	1,650 *α	2,210 *α	1,060 *	1,000 *	432 *	3,190 *α
MERCURY	0.20	ND (0.10)	0.20	ND (0.10)	0.10	ND (0.10)	ND (0.10)
MOLYBDENUM	ND (1.7)	ND (1.8)	ND (1.3)	ND (1.3)	ND (1.8)	ND (1.8)	ND (1.3)
NICKEL	2,310 *	4,460 *α	223 *	730 *	2,590 *	2,760 *	284 *
POTASSIUM	572	677	1,510	121	ND (116)	515	ND (1,390)
SELENIUM	ND (0.61)	ND (0.65)	ND (0.48)	ND (0.48)	ND (0.66)	ND (0.65)	ND (0.49)
SODIUM	541	876	326	296	170	289	378
THALLIUM	ND (0.63)	ND (0.68)	ND (0.50)	ND (0.50)	ND (0.69)	ND (0.68)	ND (0.34)
VANADIUM	49.9	63.3	89.4	72.4	38.1	38.0	136 α
ZINC	52.7	69.4	84.7	45.9	38.1	43.0	107
Volatile Organic Compound (ug/kg)							
1,1,2,2-TETRACHLOROETHANE	ND (7)	NA	ND (5)	ND (5)	ND (8)	NA	ND (1)
2-BUTANONE	ND (14)	NA	ND (11)	16	60	NA	ND (1)
BENZENE	ND (7)	NA	ND (5)	ND (5)	ND (8)	NA	ND (1)
CARBON DISULFIDE	ND (7)	NA	ND (5)	ND (5)	ND (8)	NA	ND (1)
ETHYLBENZENE	ND (7)	NA	ND (5)	ND (5)	ND (8)	NA	ND (1)
TOLUENE	ND (7)	NA	13	5	16	NA	2
XYLENE (TOTAL)	ND (7)	NA	ND (5)	ND (5)	ND (8)	NA	ND (1)

TABLE 4.3-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09B011	IR09B011	IR09B012	IR09B012	IR09B012	IR09B012	IR09B013
Sampling Depth (feet bgs)	5.75	15.75	1.25	3.25	5.75	10.75	1.75
Sample Number	8941G083	8941G084	8941G075	8941G076	8941G077	8941G078	8939E024
Sample Date	10/12/89	10/12/89	10/11/89	10/11/89	10/11/89	10/11/89	09/27/89
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (450)	NA	ND (360)	ND (360)	ND (490)	NA	ND (370)
BENZO(A)ANTHRACENE	ND (450)	NA	ND (360)	ND (360)	ND (490)	NA	ND (370)
BENZO(A)PYRENE	ND (450)	NA	ND (360)	ND (360)	ND (490)	NA	ND (370)
BENZO(B)FLUORANTHENE	ND (450)	NA	ND (360)	ND (360)	ND (490)	NA	ND (370)
BENZO(K)FLUORANTHENE	ND (450)	NA	ND (360)	ND (360)	ND (490)	NA	ND (370)
BUTYLBENZYLPHTHALATE	ND (450)	NA	ND (360)	ND (360)	ND (490)	NA	ND (370)
CHRYSENE	ND (450)	NA	ND (360)	ND (360)	ND (490)	NA	ND (370)
DI-N-BUTYLPHTHALATE	ND (450)	NA	ND (360)	ND (360)	ND (490)	NA	ND (370)
DIBENZOFURAN	ND (450)	NA	ND (360)	ND (360)	ND (490)	NA	ND (370)
FLUORANTHENE	ND (450)	NA	ND (360)	ND (360)	ND (490)	NA	ND (370)
FLUORENE	ND (450)	NA	ND (360)	ND (360)	ND (490)	NA	ND (370)
NAPHTHALENE	ND (450)	NA	ND (360)	ND (360)	ND (490)	NA	ND (370)
PHENANTHRENE	ND (450)	NA	ND (360)	ND (360)	ND (490)	NA	ND (370)
PHENOL	ND (450)	NA	ND (360)	ND (360)	ND (490)	NA	ND (370)
PYRENE	ND (450)	NA	ND (360)	ND (360)	ND (490)	NA	ND (370)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
DELTA-BHC	ND (11)	NA	ND (9)	ND (9)	ND (12)	NA	ND (9)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (34)	NA	16	ND (540)	ND (37)	NA	ND (560)
TPH-MOTOR OIL	NA	NA	NA	NA	NA	NA	NA
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	72.7	68.0	91.2	91.1	66.7	68.1	89.0
pH (pH units)							
PH	7.2	NA	8.0	7.5	7.5	NA	7.2

TABLE 4.3-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09B013	IR09B013	IR09B013	IR09B014	IR09B014	IR09B014	IR09B014
Sampling Depth (feet bgs)	2.75	5.25	10.75	1.25	2.75	5.75	10.75
Sample Number	8939E025	8939E026	8939E027	8941F002	8941F003	8941F004	8941F005
Sample Date	09/27/89	09/27/89	09/27/89	10/10/89	10/10/89	10/10/89	10/10/89
Metal (mg/kg)							
ALUMINUM	28,000	6,480	29,500	6,740	5,190	18,400	27,600
ANTIMONY	ND (6.9)	ND (7.7)	10.9 α	ND (6.7)	ND (6.6)	10.1 α	ND (7.9)
ARSENIC	ND (1.6)	1.1 *	0.96 *	6.5 *#	5.6 *#	ND (2.8)	4.8 *#
BARIUM	74.7	25.0	164	39.8	13.3	132	181
BERYLLIUM	0.77 *α	ND (0.72)	0.54 *	0.21 *	0.17 *	0.40 *	0.60 *
CADMIUM	ND (0.89)	ND (0.99)	1.3	ND (0.77)	0.77	1.1	1.6
CALCIUM	5,100	1,700	7,450	4,470	4,650	7,830	9,320
CHROMIUM	289 *	996 *	867 *	101	45.8	566 *	501 *
CHROMIUM VI	ND (0.06)	ND (0.06)	ND (0.05)	ND (0.05)	0.10	ND (0.06)	ND (0.06)
COBALT	35.5	70.4	103	13.3	6.3	56.1	72.7
COPPER	ND (49.9)	ND (17.1)	46.8	54.7	32.4	68.0	82.0
IRON	41,200	41,200	60,300	19,800	12,400	39,400	47,000
LEAD	11.2 α	2.3	4.9	10.9 α	3.7	8.1	6.0
MAGNESIUM	48,300	149,000	131,000	16,200	3,310	82,000	63,300
MANGANESE	741 *	632 *	956 *	348	151	1,040 *	1,200 *
MERCURY	ND (0.10)	ND (0.10)	0.30	ND (0.10)	ND (0.10)	ND (0.10)	0.20
MOLYBDENUM	ND (1.3)	ND (1.5)	ND (1.7)	ND (1.3)	ND (1.2)	ND (1.5)	ND (1.5)
NICKEL	426 *	1,770 *	1,390 *	152 *	24.2	946 *	710 *
POTASSIUM	ND (2,140)	ND (323)	1,100	752	541	846	1,200
SELENIUM	ND (0.49)	ND (0.54)	ND (0.62)	ND (0.46)	ND (0.46)	ND (0.54)	ND (0.54)
SODIUM	ND (203)	ND (246)	619	163	183	643	593
THALLIUM	ND (0.33)	ND (0.37)	ND (0.65)	ND (0.48)	ND (0.48)	ND (0.57)	ND (0.57)
VANADIUM	59.2	42.3	70.6	35.1	35.6	61.5	75.9
ZINC	82.0	ND (42.5)	74.5	47.8	24.9	55.9	77.2
Volatile Organic Compound (ug/kg)							
1,1,2,2-TETRACHLOROETHANE	ND (1)	ND (1)	NA	ND (5)	ND (5)	ND (6)	ND (6)
2-BUTANONE	ND (1)	7	NA	ND (10)	ND (10)	ND (12)	ND (12)
BENZENE	ND (1)	ND (1)	NA	ND (5)	ND (5)	ND (6)	ND (6)
CARBON DISULFIDE	ND (1)	ND (1)	NA	ND (5)	ND (5)	ND (6)	ND (6)
ETHYLBENZENE	ND (1)	ND (1)	NA	ND (5)	ND (5)	ND (6)	ND (6)
TOLUENE	5	2	NA	39	4	32	14
XYLENE (TOTAL)	ND (1)	ND (1)	NA	ND (5)	ND (5)	ND (6)	ND (6)

TABLE 4.3-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09B013	IR09B013	IR09B013	IR09B014	IR09B014	IR09B014	IR09B014
Sampling Depth (feet bgs)	2.75	5.25	10.75	1.25	2.75	5.75	10.75
Sample Number	8939E025	8939E026	8939E027	8941F002	8941F003	8941F004	8941F005
Sample Date	09/27/89	09/27/89	09/27/89	10/10/89	10/10/89	10/10/89	10/10/89
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (370)	ND (410)	NA	ND (340)	ND (340)	ND (410)	ND (410)
BENZO(A)ANTHRACENE	ND (370)	ND (410)	NA	ND (340)	ND (340)	ND (410)	ND (410)
BENZO(A)PYRENE	ND (370)	ND (410)	NA	ND (340)	ND (340)	ND (410)	ND (410)
BENZO(B)FLUORANTHENE	ND (370)	ND (410)	NA	ND (340)	ND (340)	ND (410)	ND (410)
BENZO(K)FLUORANTHENE	ND (370)	ND (410)	NA	ND (340)	ND (340)	ND (410)	ND (410)
BUTYLBENZYLPHTHALATE	ND (370)	ND (410)	NA	ND (340)	ND (340)	ND (410)	ND (410)
CHRYSENE	ND (370)	ND (410)	NA	ND (340)	ND (340)	ND (410)	ND (410)
DI-N-BUTYLPHTHALATE	ND (370)	ND (410)	NA	ND (340)	ND (340)	ND (410)	ND (410)
DIBENZOFURAN	ND (370)	ND (410)	NA	ND (340)	ND (340)	ND (410)	ND (410)
FLUORANTHENE	ND (370)	ND (410)	NA	ND (340)	ND (340)	ND (410)	ND (410)
FLUORENE	ND (370)	ND (410)	NA	ND (340)	ND (340)	ND (410)	ND (410)
NAPHTHALENE	ND (370)	ND (410)	NA	ND (340)	ND (340)	ND (410)	ND (410)
PHENANTHRENE	ND (370)	ND (410)	NA	ND (340)	ND (340)	ND (410)	ND (410)
PHENOL	ND (370)	ND (410)	NA	ND (340)	ND (340)	ND (410)	ND (410)
PYRENE	ND (370)	ND (410)	NA	ND (340)	ND (340)	ND (410)	ND (410)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
DELTA-BHC	ND (9)	ND (49)	NA	ND (8)	ND (8)	6	ND (10)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (550)	ND (62)	NA	ND (520)	ND (520)	ND (31)	ND (31)
TPH-MOTOR OIL	NA	NA	NA	NA	NA	NA	NA
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	90.2	80.9	71.2	95.6	96.7	80.9	80.8
pH (pH units)							
PH	7.5	7.9	NA	7.9	7.7	7.5	7.2

TABLE 4.3-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09B015	IR09B015	IR09B015	IR09B016	IR09B016	IR09B016	IR09B016
Sampling Depth (feet bgs)	1.75	3.25	5.75	1.25	3.25	5.25	10.75
Sample Number	8939E029	8939E030	8939E031	8939E054	8939E055	8939E056	8939E057
Sample Date	09/27/89	09/27/89	09/27/89	09/29/89	09/29/89	09/29/89	09/29/89
Metal (mg/kg)							
ALUMINUM	6,170	5,520	10,000	NA	10,900	31,600	3,300
ANTIMONY	ND (6.6)	ND (6.3)	ND (6.2)	NA	ND (7.1)	ND (8.0)	15.7 α
ARSENIC	1.6 *	2.7 *#	5.1 *#	NA	5.3 *#	1.3 *	0.37 *
BARIUM	9.6	12.0	38.8	NA	363 α	331 α	8.1
BERYLLIUM	ND (0.62)	ND (0.59)	ND (0.58)	NA	ND (0.64)	0.55 *	0.17 *
CADMIUM	ND (0.86)	ND (0.81)	ND (0.80)	NA	ND (0.82)	1.1	ND (1.0)
CALCIUM	2,800	4,940	2,260	NA	5,430	5,650	272
CHROMIUM	618 *	59.4	703 *	NA	201	682 *	1,020 *
CHROMIUM VI	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.06)	ND (0.06)	ND (0.05)
COBALT	52.1	ND (5.9)	72.7	NA	42.0	74.0	92.5
COPPER	ND (18.0)	ND (6.1)	ND (15.7)	NA	84.3	55.8	13.3
IRON	26,800	19,700	44,200	NA	21,800	51,700	37,800
LEAD	1.9	2.0	3.0	NA	12.8 α	4.6	0.62
MAGNESIUM	98,400	2,990	73,400	NA	43,900	153,000	185,000
MANGANESE	482 *	169	913 *	NA	1,700 *α	1,230 *	738 *
MERCURY	ND (0.10)	ND (0.10)	0.10	NA	0.10	ND (0.10)	NA
MOLYBDENUM	ND (1.3)	ND (1.2)	ND (1.2)	NA	ND (1.3)	ND (1.5)	ND (1.7)
NICKEL	986 *	ND (23.2)	1,590 *α	NA	398 *	1,210 *	2,100 *
POTASSIUM	ND (235)	ND (578)	ND (1,110)	NA	1,720	910	120
SELENIUM	ND (0.47)	ND (0.45)	ND (0.44)	NA	ND (0.49)	ND (0.55)	ND (0.62)
SODIUM	ND (127)	ND (149)	ND (159)	NA	212	485	544
THALLIUM	ND (0.32)	ND (0.30)	0.48	NA	ND (0.51)	ND (0.57)	ND (0.65)
VANADIUM	40.6	64.0	43.2	NA	31.6	62.9	23.6
ZINC	ND (29.4)	ND (23.4)	61.6	NA	43.7	69.4	39.6
Volatile Organic Compound (ug/kg)							
1,1,2,2-TETRACHLOROETHANE	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	NA
2-BUTANONE	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	NA
BENZENE	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	NA
CARBON DISULFIDE	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	NA
ETHYLBENZENE	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	NA
TOLUENE	ND (1)	ND (1)	ND (1)	3	ND (1)	ND (1)	NA
XYLENE (TOTAL)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	NA

TABLE 4.3-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09B015	IR09B015	IR09B015	IR09B016	IR09B016	IR09B016	IR09B016
Sampling Depth (feet bgs)	1.75	3.25	5.75	1.25	3.25	5.25	10.75
Sample Number	8939E029	8939E030	8939E031	8939E054	8939E055	8939E056	8939E057
Sample Date	09/27/89	09/27/89	09/27/89	09/29/89	09/29/89	09/29/89	09/29/89
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (350)	ND (340)	ND (330)	160	ND (370)	ND (410)	NA
BENZO(A)ANTHRACENE	ND (350)	ND (340)	ND (330)	ND (330)	ND (370)	ND (410)	NA
BENZO(A)PYRENE	ND (350)	ND (340)	ND (330)	300 *#	ND (370)	ND (410)	NA
BENZO(B)FLUORANTHENE	ND (350)	ND (340)	ND (330)	ND (330)	ND (370)	ND (410)	NA
BENZO(K)FLUORANTHENE	ND (350)	ND (340)	ND (330)	ND (330)	ND (370)	ND (410)	NA
BUTYLBENZYLPHTHALATE	ND (350)	ND (340)	ND (330)	ND (330)	ND (370)	ND (410)	NA
CHRYSENE	ND (350)	ND (340)	ND (330)	490	ND (370)	ND (410)	NA
DI-N-BUTYLPHTHALATE	ND (350)	ND (340)	ND (330)	ND (330)	ND (370)	ND (410)	NA
DIBENZOFURAN	ND (350)	ND (340)	ND (330)	ND (330)	ND (370)	ND (410)	NA
FLUORANTHENE	ND (350)	ND (340)	ND (330)	72	ND (370)	ND (410)	NA
FLUORENE	ND (350)	ND (340)	ND (330)	ND (330)	ND (370)	ND (410)	NA
NAPHTHALENE	ND (350)	ND (340)	ND (330)	ND (330)	ND (370)	ND (410)	NA
PHENANTHRENE	ND (350)	ND (340)	ND (330)	99	ND (370)	ND (410)	NA
PHENOL	ND (350)	ND (340)	ND (330)	ND (330)	ND (370)	ND (410)	NA
PYRENE	ND (350)	ND (340)	ND (330)	86	ND (370)	ND (410)	NA
Pesticide/Polychlorinated Biphenyl (ug/kg)							
DELTA-BHC	ND (9)	ND (8)	ND (40)	ND (120)	ND (9)	ND (10)	NA
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (530)	ND (510)	ND (500)	ND (500)	ND (550)	44	NA
TPH-MOTOR OIL	NA	NA	NA	NA	NA	NA	NA
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	93.5	98.5	NA	NA	90.4	80.3	70.9
pH (pH units)							
PH	7.4	7.5	7.1	6.3	7.6	7.7	NA

TABLE 4.3-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09B017	IR09B017	IR09B017	IR09B017	IR09B018	IR09B018	IR09B018
Sampling Depth (feet bgs)	1.25	3.25	5.25	10.75	1.25	3.25	5.75
Sample Number	8939E059	8939E060	8939E061	8939E062	8939E034	8939E035	8939E036
Sample Date	09/29/89	09/29/89	09/29/89	09/29/89	09/27/89	09/27/89	09/27/89
Metal (mg/kg)							
ALUMINUM	21,500	38,400	6,380	3,770	17,100	33,400	8,540
ANTIMONY	ND (7.0)	10.5 α	14.9 α	13.2 α	NA	ND (7.2)	ND (8.0)
ARSENIC	14.2 *#α	1.6 *	0.88 *	0.52 *	3.5 *#	ND (3.2)	0.44 *
BARIUM	46.8	166	34.9	8.1	141	376 α	79.8
BERYLLIUM	1.3 *#α	0.80 *α	0.18 *	ND (0.15)	ND (0.66)	0.76 *α	ND (0.75)
CADMIUM	ND (0.81)	1.4	ND (0.99)	ND (1.0)	ND (0.90)	ND (0.92)	ND (1.0)
CALCIUM	2,070	8,490	1,050	263	10,500	13,600	1,450
CHROMIUM	74.5	583 *	1,300 *	956 *	378 *	325 *	824 *
CHROMIUM VI	ND (0.06)	ND (0.06)	ND (0.07)	ND (0.05)	ND (0.06)	ND (0.58)	ND (0.65)
COBALT	19.4	53.6	114	94.8	44.3	41.2	87.8
COPPER	40.3	89.0	21.8	12.5	ND (40.5)	ND (59.7)	ND (15.1)
IRON	46,700	52,800	49,000	38,200	38,900	44,800	40,000
LEAD	26.2 α	3.3	5.4	ND (0.27)	455 *α	5.0	0.77
MAGNESIUM	13,100	90,600	199,000	191,000	71,800	66,400	169,000
MANGANESE	1,480 *α	1,120 *	1,010 *	901 *	937 *	1,140 *	1,080 *
MERCURY	0.30	0.10	ND (0.10)	NA	ND (0.10)	ND (0.10)	ND (0.10)
MOLYBDENUM	ND (1.3)	ND (1.4)	ND (1.6)	ND (1.6)	ND (1.4)	ND (1.4)	ND (1.6)
NICKEL	39.7	770 *	2,380 *	2,130 *	704 *	507 *	1,600 *
POTASSIUM	1,660	1,120	316	162	ND (1,140)	ND (1,820)	ND (585)
SELENIUM	ND (0.48)	ND (0.51)	ND (0.59)	ND (6.0)	ND (0.50)	ND (0.51)	ND (0.57)
SODIUM	102	280	335	425	ND (205)	443	2,120
THALLIUM	0.66	ND (0.54)	ND (0.61)	ND (0.63)	ND (0.34)	ND (0.35)	ND (0.39)
VANADIUM	65.5	93.1	38.5	22.0	64.1	86.8	30.6
ZINC	69.2	98.6	54.4	40.1	83.7	82.4	ND (35.6)
Volatile Organic Compound (ug/kg)							
1,1,2,2-TETRACHLOROETHANE	ND (1)	ND (1)	ND (1)	NA	ND (1)	ND (1)	ND (1)
2-BUTANONE	ND (1)	ND (1)	2	NA	ND (1)	5	ND (1)
BENZENE	ND (1)	ND (1)	ND (1)	NA	ND (1)	ND (1)	ND (1)
CARBON DISULFIDE	ND (1)	ND (1)	ND (1)	NA	ND (1)	ND (1)	ND (1)
ETHYLBENZENE	ND (1)	ND (1)	ND (1)	NA	ND (1)	ND (1)	ND (1)
TOLUENE	2	ND (1)	ND (1)	NA	2	ND (1)	ND (1)
XYLENE (TOTAL)	ND (1)	ND (1)	ND (1)	NA	ND (1)	ND (1)	ND (1)

TABLE 4.3-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09B017	IR09B017	IR09B017	IR09B017	IR09B018	IR09B018	IR09B018
Sampling Depth (feet bgs)	1.25	3.25	5.25	10.75	1.25	3.25	5.75
Sample Number	8939E059	8939E060	8939E061	8939E062	8939E034	8939E035	8939E036
Sample Date	09/29/89	09/29/89	09/29/89	09/29/89	09/27/89	09/27/89	09/27/89
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (360)	ND (390)	ND (440)	NA	ND (370)	ND (380)	ND (430)
BENZO(A)ANTHRACENE	ND (360)	ND (390)	ND (440)	NA	ND (370)	ND (380)	ND (430)
BENZO(A)PYRENE	ND (360)	ND (390)	ND (440)	NA	ND (370)	ND (380)	ND (430)
BENZO(B)FLUORANTHENE	ND (360)	ND (390)	ND (440)	NA	ND (370)	ND (380)	ND (430)
BENZO(K)FLUORANTHENE	ND (360)	ND (390)	ND (440)	NA	ND (370)	ND (380)	ND (430)
BUTYLBENZYLPHTHALATE	ND (360)	ND (390)	ND (440)	NA	ND (370)	ND (380)	ND (430)
CHRYSENE	ND (360)	ND (390)	ND (440)	NA	ND (370)	ND (380)	ND (430)
DI-N-BUTYLPHTHALATE	ND (360)	ND (390)	ND (440)	NA	ND (370)	ND (380)	ND (430)
DIBENZOFURAN	ND (360)	ND (390)	ND (440)	NA	ND (370)	ND (380)	ND (430)
FLUORANTHENE	ND (360)	ND (390)	ND (440)	NA	ND (370)	ND (380)	ND (430)
FLUORENE	ND (360)	ND (390)	ND (440)	NA	ND (370)	ND (380)	ND (430)
NAPHTHALENE	ND (360)	ND (390)	ND (440)	NA	ND (370)	ND (380)	ND (430)
PHENANTHRENE	ND (360)	ND (390)	ND (440)	NA	ND (370)	ND (380)	ND (430)
PHENOL	ND (360)	ND (390)	ND (440)	NA	ND (370)	ND (380)	ND (430)
PYRENE	ND (360)	ND (390)	ND (440)	NA	ND (370)	ND (380)	ND (430)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
DELTA-BHC	ND (9)	ND (9)	ND (11)	NA	ND (45)	ND (9)	ND (10)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (550)	30	21	NA	ND (560)	ND (290)	ND (650)
TPH-MOTOR OIL	NA	NA	NA	NA	NA	NA	NA
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	91.0	85.6	75.0	72.9	88.5	86.7	77.1
pH (pH units)							
PH	4.7	7.7	7.7	NA	7.4	7.8	7.9

TABLE 4.3-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09B018	IR09B019	IR09B019	IR09B019	IR09B019	IR09B020	IR09B020
Sampling Depth (feet bgs)	10.75	1.25	2.75	5.75	11.25	5.25	10.25
Sample Number	8939E037	8939E049	8939E050	8939E051	8939E052	8943G107	8943G108
Sample Date	09/29/89	09/28/89	09/28/89	09/28/89	09/28/89	10/27/89	10/27/89
Metal (mg/kg)							
ALUMINUM	19,000	17,600	20,800	3,950	4,620	2,330	21,600
ANTIMONY	10.9 α	ND (6.2)	ND (6.4)	14.2 α	11.0 α	10.6 α	ND (8.0)
ARSENIC	0.53 *	5.8 *#	4.2 *#	0.47 *	1.3 *	ND (0.31)	1.8 *
BARIUM	166	143	278	30.8	18.0	7.3	147
BERYLLIUM	0.34 *	0.78 *α	0.69 *	ND (0.14)	0.19 *	0.21 *	0.57 *
CADMIUM	1.2	ND (0.92)	1.2	ND (0.92)	ND (1.2)	ND (0.87)	1.5
CALCIUM	13,800	5,940	13,500	653	698	229	8,190
CHROMIUM	692 *	55.8	116	730 *	697 *	634 *	235 *
CHROMIUM VI	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.06)	ND (0.05)	0.18	NA
COBALT	49.3	ND (18.1)	25.4	110	146 α	90.7	35.0
COPPER	38.9	ND (32.8)	99.5	50.6	16.8	ND (17.3)	38.6
IRON	45,100	32,200	35,500	40,100	49,300	27,100	33,500
LEAD	0.91	35.8 α	8.7	9.0 α	6.0	ND (0.24)	5.0
MAGNESIUM	98,600	11,500	24,700	211,000	193,000	199,000	25,300
MANGANESE	641 *	1,070 *	1,570 *α	1,230 *	2,040 *α	699 *	1,280 *
MERCURY	NA	0.20	0.10	0.10	0.20	ND (0.10)	ND (0.10)
MOLYBDENUM	ND (1.4)	ND (1.2)	ND (1.2)	ND (1.5)	ND (2.0)	ND (2.4)	ND (1.5)
NICKEL	953 *	67.9	183 *	2,380 *	2,950 *	1,900 *	286 *
POTASSIUM	804	ND (1,990)	1,210	188	294	ND (91.4)	996
SELENIUM	ND (0.53)	ND (0.44)	ND (0.44)	ND (0.55)	ND (0.72)	ND (0.52)	ND (0.55)
SODIUM	1,050	ND (187)	242	396	573	106	423
THALLIUM	ND (0.55)	0.36	ND (0.46)	ND (0.57)	ND (0.75)	ND (0.54)	ND (0.58)
VANADIUM	78.1	59.0	69.1	25.4	30.7	18.2	76.0
ZINC	46.1	56.0	68.3	55.0	52.0	38.1	46.3
Volatile Organic Compound (ug/kg)							
1,1,2,2-TETRACHLOROETHANE	NA	ND (1)	ND (1)	ND (1)	NA	ND (6)	NA
2-BUTANONE	NA	ND (1)	ND (1)	ND (1)	NA	ND (12)	NA
BENZENE	NA	ND (1)	ND (1)	ND (1)	NA	ND (6)	NA
CARBON DISULFIDE	NA	ND (1)	ND (1)	ND (1)	NA	ND (6)	NA
ETHYLBENZENE	NA	ND (1)	ND (1)	ND (1)	NA	ND (6)	NA
TOLUENE	NA	ND (1)	3	ND (1)	NA	9	NA
XYLENE (TOTAL)	NA	ND (1)	ND (1)	ND (1)	NA	ND (6)	NA

TABLE 4.3-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09B018	IR09B019	IR09B019	IR09B019	IR09B019	IR09B020	IR09B020
Sampling Depth (feet bgs)	10.75	1.25	2.75	5.75	11.25	5.25	10.25
Sample Number	8939E037	8939E049	8939E050	8939E051	8939E052	8943G107	8943G108
Sample Date	09/29/89	09/28/89	09/28/89	09/28/89	09/28/89	10/27/89	10/27/89
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	NA	300	ND (330)	ND (410)	NA	ND (390)	NA
BENZO(A)ANTHRACENE	NA	110	ND (330)	ND (410)	NA	ND (390)	NA
BENZO(A)PYRENE	NA	ND (330)	ND (330)	ND (410)	NA	ND (390)	NA
BENZO(B)FLUORANTHENE	NA	ND (330)	ND (330)	ND (410)	NA	ND (390)	NA
BENZO(K)FLUORANTHENE	NA	ND (330)	ND (330)	ND (410)	NA	ND (390)	NA
BUTYLBENZYLPHTHALATE	NA	ND (330)	ND (330)	ND (410)	NA	ND (390)	NA
CHRYSENE	NA	98	ND (330)	ND (410)	NA	ND (390)	NA
DI-N-BUTYLPHTHALATE	NA	ND (330)	ND (330)	ND (410)	NA	ND (390)	NA
DIBENZOFURAN	NA	ND (330)	ND (330)	ND (410)	NA	ND (390)	NA
FLUORANTHENE	NA	ND (330)	ND (330)	ND (410)	NA	ND (390)	NA
FLUORENE	NA	ND (330)	ND (330)	ND (410)	NA	ND (390)	NA
NAPHTHALENE	NA	62	38	ND (410)	NA	ND (390)	NA
PHENANTHRENE	NA	63	ND (330)	ND (410)	NA	ND (390)	NA
PHENOL	NA	ND (330)	ND (330)	ND (410)	NA	ND (390)	NA
PYRENE	NA	ND (330)	ND (330)	ND (410)	NA	ND (390)	NA
Pesticide/Polychlorinated Biphenyl (ug/kg)							
DELTA-BHC	NA	ND (8)	ND (8)	ND (10)	NA	ND (9)	NA
TPH-Extractable (mg/kg)							
TPH-DIESEL	NA	ND (500)	ND (500)	27	NA	ND (59)	NA
TPH-MOTOR OIL	NA	NA	NA	NA	NA	NA	NA
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	83.4	NA		80.2	61.5	84.6	79.7
pH (pH units)							
PH	NA	6.5	7.6	7.9	NA	7.7	8.3

TABLE 4.3-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09B020	IR09B020	IR09B020	IR09B021	IR09B021	IR09B021	IR09B021
Sampling Depth (feet bgs)	15.75	1.25	2.75	1.25	3.25	5.75	10.75
Sample Number	8943G109	8943G110	8943G111	8939E039	8939E040	8939E041	8939E042
Sample Date	10/27/89	10/27/89	10/27/89	09/28/89	09/28/89	09/28/89	09/28/89
Metal (mg/kg)							
ALUMINUM	18,300	20,000	10,900	17,100	5,090	33,200	36,900
ANTIMONY	ND (7.7)	ND (7.0)	10.7 α	ND (7.1)	ND (7.3)	ND (7.2)	8.7
ARSENIC	3.6 *#	4.0 *#	0.60 *	1.7 *	1.3 *	ND (3.3)	5.5 *#
BARIUM	81.9	387 α	24.0	90.3	23.3	108	98.8
BERYLLIUM	0.52 *	0.71 *	0.30 *	ND (0.66)	ND (0.69)	0.68 *	0.71 *
CADMIUM	ND (0.89)	ND (0.81)	ND (0.86)	ND (0.91)	ND (0.95)	ND (0.93)	1.5
CALCIUM	5,020	9,510	2,620	8,020	941	11,000	11,900
CHROMIUM	191	183	758 *	604 *	617 *	346 *	451 *
CHROMIUM VI	NA	0.09	ND (0.06)	ND (0.06)	ND (0.06)	ND (0.06)	ND (0.05)
COBALT	28.9	33.3	70.1	60.8	94.7	33.4	50.2
COPPER	36.8	84.1	30.4	ND (25.6)	ND (12.4)	ND (42.8)	42.7
IRON	28,000	39,100	31,300	44,500	45,300	43,000	46,000
LEAD	7.2	206 *α	126 α	3.5	1.7	6.3	6.9
MAGNESIUM	35,200	38,100	165,000	132,000	186,000	71,900	103,000
MANGANESE	639 *	2,570 *α	841 *	755 *	1,010 *	828 *	1,200 *
MERCURY	ND (0.10)	0.10	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	NA
MOLYBDENUM	ND (1.5)	ND (1.5)	ND (1.9)	ND (1.4)	ND (1.4)	ND (1.4)	ND (1.5)
NICKEL	282 *	344 *	1,440 *	1,120 *	1,940 *	536 *	801 *
POTASSIUM	1,120	1,510	101	ND (736)	ND (122)	ND (1,320)	1,210
SELENIUM	ND (0.53)	ND (0.48)	ND (0.51)	ND (0.50)	ND (0.52)	ND (0.51)	ND (0.54)
SODIUM	683	204	109	ND (107)	ND (53.2)	343	1,090
THALLIUM	ND (0.56)	ND (0.51)	ND (0.53)	ND (0.34)	ND (0.36)	ND (0.35)	ND (0.56)
VANADIUM	43.3	67.8	39.3	55.1	27.4	73.2	72.7
ZINC	57.6	79.9	35.3	ND (49.0)	ND (39.7)	76.3	74.4
Volatile Organic Compound (ug/kg)							
1,1,2,2-TETRACHLOROETHANE	NA	ND (6)	ND (6)	ND (1)	ND (1)	ND (1)	NA
2-BUTANONE	NA	ND (11)	ND (11)	NA	ND (1)	ND (1)	NA
BENZENE	NA	ND (6)	ND (6)	ND (1)	ND (1)	ND (1)	NA
CARBON DISULFIDE	NA	ND (6)	ND (6)	ND (1)	ND (1)	ND (1)	NA
ETHYLBENZENE	NA	ND (6)	ND (6)	ND (1)	ND (1)	ND (1)	NA
TOLUENE	NA	19	15	2	9	ND (1)	NA
XYLENE (TOTAL)	NA	ND (6)	ND (6)	ND (1)	ND (1)	ND (1)	NA

TABLE 4.3-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09B020	IR09B020	IR09B020	IR09B021	IR09B021	IR09B021	IR09B021
Sampling Depth (feet bgs)	15.75	1.25	2.75	1.25	3.25	5.75	10.75
Sample Number	8943G109	8943G110	8943G111	8939E039	8939E040	8939E041	8939E042
Sample Date	10/27/89	10/27/89	10/27/89	09/28/89	09/28/89	09/28/89	09/28/89
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	NA	ND (360)	ND (380)	ND (380)	ND (390)	ND (380)	NA
BENZO(A)ANTHRACENE	NA	ND (360)	ND (380)	ND (380)	ND (390)	ND (380)	NA
BENZO(A)PYRENE	NA	ND (360)	ND (380)	ND (380)	ND (390)	ND (380)	NA
BENZO(B)FLUORANTHENE	NA	ND (360)	ND (380)	ND (380)	ND (390)	ND (380)	NA
BENZO(K)FLUORANTHENE	NA	ND (360)	ND (380)	ND (380)	ND (390)	ND (380)	NA
BUTYLBENZYLPHTHALATE	NA	ND (360)	43	ND (380)	ND (390)	ND (380)	NA
CHRYSENE	NA	ND (360)	ND (380)	ND (380)	ND (390)	ND (380)	NA
DI-N-BUTYLPHTHALATE	NA	67	56	ND (380)	ND (390)	ND (380)	NA
DIBENZOFURAN	NA	ND (360)	ND (380)	ND (380)	ND (390)	ND (380)	NA
FLUORANTHENE	NA	ND (360)	ND (380)	ND (380)	ND (390)	ND (380)	NA
FLUORENE	NA	ND (360)	ND (380)	ND (380)	ND (390)	ND (380)	NA
NAPHTHALENE	NA	ND (360)	ND (380)	ND (380)	ND (390)	ND (380)	NA
PHENANTHRENE	NA	ND (360)	ND (380)	ND (380)	ND (390)	ND (380)	NA
PHENOL	NA	ND (360)	ND (380)	ND (380)	ND (390)	ND (380)	NA
PYRENE	NA	ND (360)	ND (380)	ND (380)	ND (390)	ND (380)	NA
Pesticide/Polychlorinated Biphenyl (ug/kg)							
DELTA-BHC	NA	ND (9)	ND (46)	ND (9)	ND (10)	ND (9)	NA
TPH-Extractable (mg/kg)							
TPH-DIESEL	NA	ND (550)	ND (57)	ND (280)	ND (59)	ND (58)	NA
TPH-MOTOR OIL	NA	NA	NA	NA	NA	NA	NA
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	82.8	90.9	86.2	87.8	84.4	85.9	82.0
pH (pH units)							
PH	7.9	5.0	7.5	7.6	7.4	7.9	NA

TABLE 4.3-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09B023	IR09B023	IR09B023	IR09B023	IR09B023	IR09B024	IR09B024
Sampling Depth (feet bgs)	0.75	3.25	5.75	11.25	16.25	1.25	3.25
Sample Number	8941G070	8941G071	8941G072	8941G073	8941G074	8939E044	8939E045
Sample Date	10/11/89	10/11/89	10/11/89	10/11/89	10/11/89	09/28/89	09/28/89
Metal (mg/kg)							
ALUMINUM	17,400	6,160	29,700	30,700	36,300	24,300	4,320
ANTIMONY	ND (7.0)	11.5 α	9.5 α	9.6 α	9.6 α	ND (6.8)	ND (7.2)
ARSENIC	9.5 *#	ND (0.51)	ND (3.7)	4.2 *#	2.7 *#	ND (1.5)	ND (0.33)
BARIUM	95.9	6.8	126	131	94.4	206	3.5
BERYLLIUM	0.99 *α	0.23 *	0.59 *	0.72 *α	0.71 *	ND (0.64)	ND (0.68)
CADMIUM	2.9	ND (0.82)	1.2	1.1	2.1	ND (0.88)	ND (0.93)
CALCIUM	6,490	660	18,300	10,700	11,600	16,200	280
CHROMIUM	56.6	807 *	394 *	932 *	481 *	555 *	922 *
CHROMIUM VI	0.08	0.35 *	0.19	NA	ND (0.05)	ND (0.06)	0.08
COBALT	25.6	84.6	48.8	75.1	63.5	42.4	89.5
COPPER	44.9	21.0	46.0	38.6	49.3	ND (61.8)	ND (15.4)
IRON	37,400	32,800	43,400	49,800	51,600	42,900	35,300
LEAD	72.0 α	0.75	3.4	2.7	4.3	5.6	ND (0.21)
MAGNESIUM	12,900	187,000	84,300	141,000	101,000	66,900	187,000
MANGANESE	1,640 *α	649 *	900 *	877 *	961 *	1,510 *α	683 *
MERCURY	0.20	ND (0.10)	0.10	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)
MOLYBDENUM	ND (1.3)	ND (1.3)	ND (1.4)	ND (1.4)	ND (1.5)	ND (1.3)	ND (1.4)
NICKEL	72.3	1,590 *	744 *	1,330 *	937 *	608 *	1,850 *
POTASSIUM	1,750	ND (85.7)	1,120	977	1,400	ND (1,330)	ND (71.4)
SELENIUM	ND (0.48)	ND (0.49)	ND (0.52)	ND (0.50)	ND (0.55)	ND (0.49)	ND (0.51)
SODIUM	202	187	403	372	622	438	ND (118)
THALLIUM	0.70	ND (0.51)	ND (0.54)	ND (0.52)	ND (0.57)	ND (0.33)	ND (0.35)
VANADIUM	50.6	19.8	69.0	73.0	83.9	106	25.3
ZINC	73.0	35.7	71.8	64.5	74.0	79.6	ND (27.6)
Volatile Organic Compound (ug/kg)							
1,1,2,2-TETRACHLOROETHANE	ND (5)	ND (6)	ND (6)	NA	NA	ND (1)	ND (1)
2-BUTANONE	ND (11)	ND (11)	ND (12)	NA	NA	ND (1)	ND (1)
BENZENE	ND (5)	ND (6)	ND (6)	NA	NA	ND (1)	ND (1)
CARBON DISULFIDE	ND (5)	ND (6)	ND (6)	NA	NA	ND (1)	ND (1)
ETHYLBENZENE	ND (5)	ND (6)	ND (6)	NA	NA	ND (1)	ND (1)
TOLUENE	110	38	29	NA	NA	8	ND (1)
XYLENE (TOTAL)	ND (5)	ND (6)	ND (6)	NA	NA	ND (1)	ND (1)

TABLE 4.3-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09B023	IR09B023	IR09B023	IR09B023	IR09B023	IR09B024	IR09B024
Sampling Depth (feet bgs)	0.75	3.25	5.75	11.25	16.25	1.25	3.25
Sample Number	8941G070	8941G071	8941G072	8941G073	8941G074	8939E044	8939E045
Sample Date	10/11/89	10/11/89	10/11/89	10/11/89	10/11/89	09/28/89	09/28/89
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	140	ND (360)	ND (390)	NA	NA	ND (360)	ND (390)
BENZO(A)ANTHRACENE	ND (360)	ND (360)	ND (390)	NA	NA	ND (360)	ND (390)
BENZO(A)PYRENE	ND (360)	ND (360)	ND (390)	NA	NA	ND (360)	ND (390)
BENZO(B)FLUORANTHENE	ND (360)	ND (360)	ND (390)	NA	NA	ND (360)	ND (390)
BENZO(K)FLUORANTHENE	ND (360)	ND (360)	ND (390)	NA	NA	ND (360)	ND (390)
BUTYLBENZYLPHTHALATE	ND (360)	ND (360)	ND (390)	NA	NA	ND (360)	ND (390)
CHRYSENE	ND (360)	ND (360)	ND (390)	NA	NA	ND (360)	ND (390)
DI-N-BUTYLPHTHALATE	ND (360)	ND (360)	ND (390)	NA	NA	ND (360)	ND (390)
DIBENZOFURAN	ND (360)	ND (360)	44	NA	NA	ND (360)	ND (390)
FLUORANTHENE	ND (360)	ND (360)	ND (390)	NA	NA	ND (360)	ND (390)
FLUORENE	ND (360)	ND (360)	ND (390)	NA	NA	ND (360)	ND (390)
NAPHTHALENE	43	ND (360)	ND (390)	NA	NA	ND (360)	ND (390)
PHENANTHRENE	ND (360)	ND (360)	62	NA	NA	ND (360)	ND (390)
PHENOL	ND (360)	ND (360)	ND (390)	NA	NA	ND (360)	ND (390)
PYRENE	ND (360)	ND (360)	ND (390)	NA	NA	ND (360)	ND (390)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
DELTA-BHC	ND (9)	4	ND (9)	NA	NA	ND (9)	ND (9)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (2,700)	ND (55)	ND (59)	NA	NA	ND (550)	ND (58)
TPH-MOTOR OIL	NA	NA	NA	NA	NA	NA	NA
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	91.6	90.3	84.5	87.8	80.4	90.7	85.7
pH (pH units)							
PH	8.2	7.8	7.8	8.7	NA	7.4	7.5

TABLE 4.3-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09B024	IR09B024	IR09B025	IR09B025	IR09B025	IR09B025	IR09B027
Sampling Depth (feet bgs)	5.25	10.75	1.25	3.75	5.75	10.75	0.75
Sample Number	8939E046	8939E047	8941F007	8941F008	8941F009	8941F010	9013G159
Sample Date	09/28/89	09/28/89	10/11/89	10/11/89	10/11/89	10/11/89	03/30/90
Metal (mg/kg)							
ALUMINUM	36,600	33,000	7,930	19,200	14,900	14,300	15,700
ANTIMONY	ND (7.8)	12.9 α	ND (7.4)	ND (7.0)	ND (7.4)	8.0	ND (4.2)
ARSENIC	ND (3.5)	4.9 *#	ND (1.4)	4.7 *#	ND (2.8)	3.3 *#	9.8 *#
BARIUM	150	89.3	51.7	203	87.8	79.7	71.9
BERYLLIUM	0.90 *α	0.59 *	0.26 *	0.43 *	0.35 *	0.32 *	0.99 *α
CADMIUM	ND (1.0)	ND (0.90)	ND (0.86)	1.6	1.1	ND (0.89)	0.76
CALCIUM	27,700	11,600	4,000	14,200	8,470	5,290	2,380
CHROMIUM	376 *	412 *	454 *	234 *	585 *	155 α	38.3
CHROMIUM VI	ND (0.06)	ND (0.05)	ND (0.06)	ND (0.05)	ND (0.06)	ND (0.05)	ND (0.06)
COBALT	40.3	41.4	88.2	34.5	60.5	15.5	21.2
COPPER	ND (42.8)	61.4	29.2	55.3	44.3	16.5	32.8
IRON	43,400	37,200	36,500	32,500	38,900	27,900	33,500
LEAD	5.1	7.9	91.6 α	60.1 α	66.9 α	13.6 α	7.7
MAGNESIUM	81,500	69,600	144,000	51,900	68,500	4,390	9,290
MANGANESE	932 *	869 *	854 *	1,010 *	820 *	317	1,660 *α
MERCURY	ND (0.10)	0.10	ND (0.10)	0.30	ND (0.10)	ND (0.10)	0.20
MOLYBDENUM	ND (1.5)	ND (1.5)	ND (1.4)	ND (1.3)	ND (1.4)	ND (1.4)	ND (1.3)
NICKEL	593 *	556 *	1,780 *	437 *	1,010 *	132 α	38.1
POTASSIUM	ND (2,200)	586	424	1,220	942	1,070	1,060
SELENIUM	ND (0.55)	ND (5.4)	ND (0.51)	ND (0.48)	ND (0.51)	ND (0.53)	ND (0.56)
SODIUM	433	168	128	263	255	236	244
THALLIUM	ND (0.38)	ND (0.56)	ND (0.53)	ND (0.50)	ND (0.53)	ND (0.55)	ND (0.49)
VANADIUM	81.2	76.0	45.7	63.3	56.1	76.4	45.5
ZINC	81.7	71.4	66.8	62.9	56.8	34.8	56.4
Volatile Organic Compound (ug/kg)							
1,1,2,2-TETRACHLOROETHANE	ND (1)	NA	ND (6)	ND (5)	7	NA	ND (6)
2-BUTANONE	NA	NA	ND (11)	ND (11)	ND (11)	NA	ND (11)
BENZENE	ND (1)	NA	ND (6)	ND (5)	ND (6)	NA	ND (6)
CARBON DISULFIDE	ND (1)	NA	ND (6)	ND (5)	ND (6)	NA	ND (6)
ETHYLBENZENE	ND (1)	NA	ND (6)	ND (5)	ND (6)	NA	ND (6)
TOLUENE	ND (1)	NA	14	2	9	NA	ND (6)
XYLENE (TOTAL)	ND (1)	NA	ND (6)	ND (5)	ND (6)	NA	ND (6)

TABLE 4.3-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09B024	IR09B024	IR09B025	IR09B025	IR09B025	IR09B025	IR09B027
Sampling Depth (feet bgs)	5.25	10.75	1.25	3.75	5.75	10.75	0.75
Sample Number	8939E046	8939E047	8941F007	8941F008	8941F009	8941F010	9013G159
Sample Date	09/28/89	09/28/89	10/11/89	10/11/89	10/11/89	10/11/89	03/30/90
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (410)	NA	ND (380)	ND (360)	ND (1,900)	NA	ND (370)
BENZO(A)ANTHRACENE	ND (410)	NA	ND (380)	ND (360)	ND (1,900)	NA	ND (370)
BENZO(A)PYRENE	ND (410)	NA	ND (380)	ND (360)	ND (1,900)	NA	ND (370)
BENZO(B)FLUORANTHENE	ND (410)	NA	ND (380)	ND (360)	ND (1,900)	NA	ND (370)
BENZO(K)FLUORANTHENE	ND (410)	NA	ND (380)	ND (360)	ND (1,900)	NA	ND (370)
BUTYLBENZYLPHTHALATE	ND (410)	NA	ND (380)	ND (360)	ND (1,900)	NA	ND (370)
CHRYSENE	ND (410)	NA	ND (380)	ND (360)	ND (1,900)	NA	ND (370)
DI-N-BUTYLPHTHALATE	ND (410)	NA	ND (380)	ND (360)	ND (1,900)	NA	ND (370)
DIBENZOFURAN	ND (410)	NA	ND (380)	ND (360)	ND (1,900)	NA	ND (370)
FLUORANTHENE	ND (410)	NA	ND (380)	45	ND (1,900)	NA	ND (370)
FLUORENE	ND (410)	NA	ND (380)	ND (360)	ND (1,900)	NA	ND (370)
NAPHTHALENE	ND (410)	NA	ND (380)	ND (360)	ND (1,900)	NA	ND (370)
PHENANTHRENE	54	NA	ND (380)	66	320	NA	ND (370)
PHENOL	NA	NA	ND (380)	ND (360)	ND (1,900)	NA	ND (370)
PYRENE	ND (410)	NA	ND (380)	38	ND (1,900)	NA	ND (370)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
DELTA-BHC	ND (10)	NA	ND (9)	ND (9)	ND (9)	NA	NA
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (63)	NA	ND (570)	ND (540)	ND (2,900)	NA	ND (11)
TPH-MOTOR OIL	NA	NA	NA	NA	NA	NA	NA
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	79.8	82.1	86.4	91.3	86.2	83.6	89.7
pH (pH units)							
PH	8.2	NA	7.5	7.6	7.5	NA	6.0

TABLE 4.3-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09B027	IR09B027	IR09B027	IR09B027	IR09B028	IR09B028	IR09B028
Sampling Depth (feet bgs)	2.75	5.25	10.25	15.25	0.75	2.75	5.25
Sample Number	9013G160	9013G161	9013G162	9013G163	9013G164	9013G165	9013G166
Sample Date	03/30/90	03/30/90	03/30/90	03/30/90	03/30/90	03/30/90	03/30/90
Metal (mg/kg)							
ALUMINUM	10,500	13,500	10,500	26,900	23,400	4,720	5,090
ANTIMONY	ND (4.3)	ND (3.9)	ND (4.4)	ND (4.9)	6.8	ND (4.4)	ND (4.4)
ARSENIC	2.7 *#	ND (1.8)	7.5 *#	3.3 *#	3.1 *#	ND (2.0)	ND (0.40)
BARIUM	74.4	38.7	114	122	199	25.1	8.7
BERYLLIUM	0.23 *	ND (0.19)	0.21 *	0.49 *	0.52 *	ND (0.21)	ND (0.21)
CADMIUM	ND (0.73)	ND (0.67)	ND (0.75)	1.4	1.0	1.1	ND (0.75)
CALCIUM	3,060	22,600	3,940	16,100	13,700	727	2,850
CHROMIUM	92.2	67.4	96.3	760 *α	205	742 *	496 *
CHROMIUM VI	ND (0.57)	ND (0.05)	ND (0.12)	ND (0.07)	ND (0.06)	ND (0.06)	ND (0.06)
COBALT	12.0	11.8	9.9	109 α	31.7	89.0	79.4
COPPER	15.3	29.6	12.8	54.1	58.3	16.2	14.1
IRON	21,900	18,500	20,600	62,100	37,700	27,100	31,500
LEAD	16.2 α	15.4 α	1.9	2.2	134 *α	23.2 α	ND (0.35)
MAGNESIUM	3,900	9,810	4,920	45,200	33,000	159,000	142,000
MANGANESE	364	293	230	1,480 *α	1,210 *	756 *	836 *
MERCURY	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	0.30	ND (0.10)	ND (0.10)
MOLYBDENUM	ND (1.4)	ND (1.2)	ND (1.4)	ND (1.6)	ND (1.4)	ND (1.4)	ND (1.4)
NICKEL	95.4	44.5	79.9	1,320 *α	295 *	1,740 *	1,270 *
POTASSIUM	621	1,280	1,270	955	1,210	ND (75.1)	ND (74.4)
SELENIUM	ND (0.57)	ND (0.52)	ND (0.58)	ND (0.65)	ND (0.57)	ND (0.59)	ND (0.58)
SODIUM	465	875	1,480	2,150	293	165	207
THALLIUM	ND (0.50)	ND (0.46)	ND (0.51)	ND (0.57)	ND (0.50)	ND (0.52)	ND (0.51)
VANADIUM	53.0	49.4	51.3	97.4	83.6	20.4	20.2
ZINC	31.2	42.0	34.5	53.1	77.0	32.0	13.9
Volatile Organic Compound (ug/kg)							
1,1,2,2-TETRACHLOROETHANE	ND (6)	ND (5)	NA	NA	ND (6)	ND (6)	ND (6)
2-BUTANONE	ND (11)	ND (10)	NA	NA	ND (11)	ND (12)	ND (12)
BENZENE	ND (6)	ND (5)	NA	NA	120	ND (6)	ND (6)
CARBON DISULFIDE	ND (6)	ND (5)	NA	NA	ND (6)	ND (6)	ND (6)
ETHYLBENZENE	ND (6)	ND (5)	NA	NA	ND (6)	ND (6)	ND (6)
TOLUENE	ND (6)	1	NA	NA	ND (6)	3	ND (6)
XYLENE (TOTAL)	ND (6)	ND (5)	NA	NA	ND (6)	ND (6)	ND (6)

TABLE 4.3-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09B027	IR09B027	IR09B027	IR09B027	IR09B028	IR09B028	IR09B028
Sampling Depth (feet bgs)	2.75	5.25	10.25	15.25	0.75	2.75	5.25
Sample Number	9013G160	9013G161	9013G162	9013G163	9013G164	9013G165	9013G166
Sample Date	03/30/90	03/30/90	03/30/90	03/30/90	03/30/90	03/30/90	03/30/90
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (380)	ND (340)	NA	NA	160	ND (390)	ND (390)
BENZO(A)ANTHRACENE	ND (380)	36	NA	NA	ND (370)	ND (390)	ND (390)
BENZO(A)PYRENE	ND (380)	ND (340)	NA	NA	ND (370)	ND (390)	ND (390)
BENZO(B)FLUORANTHENE	ND (380)	44	NA	NA	45	ND (390)	ND (390)
BENZO(K)FLUORANTHENE	ND (380)	ND (340)	NA	NA	ND (370)	ND (390)	ND (390)
BUTYLBENZYLPHTHALATE	ND (380)	ND (340)	NA	NA	ND (370)	ND (390)	ND (390)
CHRYSENE	ND (380)	37	NA	NA	ND (370)	ND (390)	ND (390)
DI-N-BUTYLPHTHALATE	ND (380)	ND (340)	NA	NA	ND (370)	ND (390)	ND (390)
DIBENZOFURAN	ND (380)	ND (340)	NA	NA	49	ND (390)	ND (390)
FLUORANTHENE	40	60	NA	NA	ND (370)	ND (390)	ND (390)
FLUORENE	ND (380)	ND (340)	NA	NA	ND (370)	ND (390)	ND (390)
NAPHTHALENE	ND (380)	ND (340)	NA	NA	240	ND (390)	ND (390)
PHENANTHRENE	ND (380)	120	NA	NA	140	ND (390)	ND (390)
PHENOL	ND (380)	ND (340)	NA	NA	NA	ND (390)	ND (390)
PYRENE	43	89	NA	NA	ND (370)	ND (390)	ND (390)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
DELTA-BHC	NA	NA	NA	NA	NA	NA	NA
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (11)	ND (10)	NA	NA	ND (11)	ND (12)	ND (12)
TPH-MOTOR OIL	NA	NA	NA	NA	NA	NA	NA
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	87.7	96.2	85.6	76.9	88.0	85.0	85.7
pH (pH units)							
PH	5.7	8.7	8.5	7.5	7.3	7.8	7.8

TABLE 4.3-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09B029	IR09B029	IR09B029	IR09B030	IR09B030	IR09B030	IR09B032
Sampling Depth (feet bgs)	1.25	2.75	5.25	1.25	2.75	5.25	1.75
Sample Number	9013F024	9013F025	9013F026	9013G167	9013G168	9013G169	9014H076
Sample Date	03/29/90	03/29/90	03/29/90	03/30/90	03/30/90	03/30/90	04/02/90
Metal (mg/kg)							
ALUMINUM	17,500	13,600	3,430	28,300	30,600	2,530	25,500
ANTIMONY	4.7	ND (4.2)	ND (3.9)	ND (4.2)	ND (4.4)	ND (4.5)	ND (4.3)
ARSENIC	0.59 *	1.5 *	2.9 *#	8.2 *#	0.46 *	ND (0.45)	7.8 *#
BARIUM	189	141	9.7	317 α	49.7	7.9	197
BERYLLIUM	0.32 *	0.25 *	ND (0.19)	0.86 *α	0.55 *	ND (0.11)	0.60 *
CADMIUM	0.92	0.81	ND (0.67)	ND (0.78)	ND (0.81)	ND (0.83)	ND (0.80)
CALCIUM	9,830	7,760	2,420	16,700	16,900	242	10,200
CHROMIUM	222 *	225 *	29.7	85.9	497 *	539 *	276 *
CHROMIUM VI	ND (0.06)	ND (0.06)	ND (0.05)	ND (0.05)	ND (0.06)	ND (0.06)	ND (0.05)
COBALT	37.0	64.4	ND (5.9)	21.4	62.7	78.6	30.7
COPPER	133 α	34.7	6.1	45.4	40.0	12.3	59.0
IRON	32,800	35,700	9,570	38,700	39,300	24,300	38,500
LEAD	28.3 α	2.2	2.1	920 *α	20.1 α	ND (0.36)	7.7
MAGNESIUM	41,800	82,600	2,930	16,800	145,000	167,000	41,800
MANGANESE	1,290 *	1,410 *	113	930 *	843 *	808 *	906 *
MERCURY	ND (0.10)	ND (0.10)	ND (0.10)	0.20	ND (0.10)	ND (0.10)	0.10
MOLYBDENUM	ND (1.4)	ND (1.4)	ND (1.3)	ND (0.59)	ND (0.61)	ND (0.63)	ND (0.60)
NICKEL	439 *	896 *	26.1	113	1,040 *	1,560 *	400 *
POTASSIUM	628	519	349	1,810	359	ND (83.6)	1,900
SELENIUM	ND (0.57)	ND (0.57)	ND (0.52)	ND (0.46)	ND (0.48)	ND (0.49)	ND (0.47)
SODIUM	154	218	111	372	279	185	238
THALLIUM	ND (0.50)	ND (0.50)	ND (0.46)	ND (0.36)	ND (0.37)	ND (0.38)	ND (0.37)
VANADIUM	62.6	62.3	23.8	99.2	63.5	20.0	65.1
ZINC	92.6	45.2	16.0	72.0	54.7	18.8	82.2
Volatile Organic Compound (ug/kg)							
1,1,2,2-TETRACHLOROETHANE	ND (6)	ND (6)	ND (5)	ND (5)	ND (6)	ND (6)	ND (5)
2-BUTANONE	ND (11)	ND (11)	ND (10)	ND (11)	ND (11)	ND (11)	ND (11)
BENZENE	ND (6)	ND (6)	ND (5)	ND (5)	ND (6)	ND (6)	ND (5)
CARBON DISULFIDE	ND (6)	ND (6)	ND (5)	ND (5)	ND (6)	ND (6)	ND (5)
ETHYLBENZENE	ND (6)	ND (6)	ND (5)	ND (5)	ND (6)	ND (6)	ND (5)
TOLUENE	ND (6)	ND (6)	ND (5)	2	3	ND (6)	ND (5)
XYLENE (TOTAL)	ND (6)	ND (6)	ND (5)	ND (5)	ND (6)	ND (6)	ND (5)

TABLE 4.3-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09B029	IR09B029	IR09B029	IR09B030	IR09B030	IR09B030	IR09B032
Sampling Depth (feet bgs)	1.25	2.75	5.25	1.25	2.75	5.25	1.75
Sample Number	9013F024	9013F025	9013F026	9013G167	9013G168	9013G169	9014H076
Sample Date	03/29/90	03/29/90	03/29/90	03/30/90	03/30/90	03/30/90	04/02/90
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	50	ND (370)	ND (350)	ND (350)	ND (360)	ND (370)	180
BENZO(A)ANTHRACENE	ND (370)	ND (370)	ND (350)	ND (350)	ND (360)	ND (370)	ND (360)
BENZO(A)PYRENE	ND (370)	ND (370)	ND (350)	ND (350)	ND (360)	ND (370)	ND (360)
BENZO(B)FLUORANTHENE	ND (370)	ND (370)	ND (350)	ND (350)	ND (360)	ND (370)	39
BENZO(K)FLUORANTHENE	ND (370)	ND (370)	ND (350)	ND (350)	ND (360)	ND (370)	ND (360)
BUTYLBENZYLPHTHALATE	ND (370)	ND (370)	ND (350)	ND (350)	ND (360)	ND (370)	ND (360)
CHRYSENE	ND (370)	ND (370)	ND (350)	ND (350)	ND (360)	ND (370)	ND (360)
DI-N-BUTYLPHTHALATE	ND (370)	ND (370)	ND (350)	ND (350)	ND (360)	ND (370)	ND (360)
DIBENZOFURAN	ND (370)	ND (370)	ND (350)	ND (350)	ND (360)	ND (370)	74
FLUORANTHENE	ND (370)	ND (370)	ND (350)	ND (350)	ND (360)	ND (370)	ND (360)
FLUORENE	ND (370)	ND (370)	ND (350)	ND (350)	ND (360)	ND (370)	39
NAPHTHALENE	73	ND (370)	ND (350)	43	ND (360)	ND (370)	230
PHENANTHRENE	66	ND (370)	ND (350)	ND (350)	ND (360)	ND (370)	110
PHENOL	ND (370)	ND (370)	ND (350)	ND (350)	NA	ND (370)	NA
PYRENE	ND (370)	ND (370)	ND (350)	ND (350)	ND (360)	ND (370)	41
Pesticide/Polychlorinated Biphenyl (ug/kg)							
DELTA-BHC	NA	NA	NA	NA	NA	NA	NA
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (11)	ND (11)	ND (10)	ND (11)	ND (11)	ND (11)	ND (11)
TPH-MOTOR OIL	NA	NA	NA	NA	NA	NA	NA
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	88.2	88.0	95.3	94.9	91.1	89.5	92.8
pH (pH units)							
PH	7.8	8.0	8.2	6.8	7.7	7.5	8.3

TABLE 4.3-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09B032	IR09B032	IR09B032	IR09B033	IR09B033	IR09B033	IR09B033
Sampling Depth (feet bgs)	2.75	5.25	9.75	0.75	2.75	5.25	10.25
Sample Number	9014H077	9014H078	9014H079	9014H086	9014H087	9014H088	9014H089
Sample Date	04/02/90	04/02/90	04/02/90	04/02/90	04/02/90	04/02/90	04/02/90
Metal (mg/kg)							
ALUMINUM	31,300	11,500	19,800	17,500	28,300	18,900	26,800
ANTIMONY	ND (4.5)	ND (4.6)	ND (4.6)	ND (4.4)	ND (4.6)	ND (4.2)	ND (4.8)
ARSENIC	2.9 *#	2.4 *#	2.3 *#	3.8 *#	5.4 *#	7.3 *#	4.0 *#
BARIUM	218	86.4	173	108	92.5	114	333 α
BERYLLIUM	0.72 *α	ND (0.31)	0.53 *	0.45 *	0.56 *	0.65 *	0.52 *
CADMIUM	ND (0.83)	ND (0.86)	ND (0.85)	ND (0.81)	ND (0.85)	ND (0.78)	ND (0.89)
CALCIUM	5,830	2,790	5,660	17,200	7,090	8,290	36,400
CHROMIUM	372 *	623 *	371 *	158	361 *	178	335 *
CHROMIUM VI	ND (0.06)	ND (0.06)	ND (0.06)	ND (0.06)	ND (0.06)	ND (0.05)	ND (0.06)
COBALT	41.7	60.8	47.7	25.0	46.5	26.0	37.0
COPPER	50.8	31.5	58.2	37.9	53.1	39.1	37.8
IRON	44,600	33,400	39,900	32,900	42,100	35,100	40,000
LEAD	7.6	13.0 α	24.3 α	111 α	7.9	113 α	23.7 α
MAGNESIUM	73,100	109,000	84,200	33,100	80,500	30,500	49,800
MANGANESE	870 *	815 *	1,200 *	880 *	863 *	924 *	1,910 *α
MERCURY	0.10	ND (0.10)	0.10	0.20	0.20	0.20	ND (0.10)
MOLYBDENUM	ND (0.62)	ND (0.65)	ND (0.64)	ND (0.61)	ND (0.64)	ND (0.59)	ND (0.68)
NICKEL	586 *	1,150 *	800 *	252 *	697 *	242 *	420 *
POTASSIUM	1,120	818	1,680	1,050	1,030	1,110	1,340
SELENIUM	0.54	ND (0.51)	ND (0.50)	ND (0.48)	0.53	ND (0.46)	ND (0.53)
SODIUM	233	144	246	222	225	219	678
THALLIUM	0.42	ND (0.39)	ND (0.39)	ND (0.37)	ND (0.39)	0.59	ND (0.41)
VANADIUM	65.6	37.4	60.0	65.4	68.2	60.4	95.6
ZINC	76.3	44.2	69.0	77.3	71.4	73.2	50.6
Volatile Organic Compound (ug/kg)							
1,1,2,2-TETRACHLOROETHANE	ND (6)	ND (6)	NA	ND (6)	ND (6)	ND (26)	NA
2-BUTANONE	ND (11)	ND (12)	NA	NA	ND (11)	ND (53)	NA
BENZENE	ND (6)	ND (6)	NA	ND (6)	ND (6)	ND (26)	NA
CARBON DISULFIDE	ND (6)	ND (6)	NA	ND (6)	ND (6)	ND (26)	NA
ETHYLBENZENE	ND (6)	ND (6)	NA	ND (6)	ND (6)	ND (26)	NA
TOLUENE	1	ND (6)	NA	ND (6)	ND (6)	ND (26)	NA
XYLENE (TOTAL)	ND (6)	ND (6)	NA	ND (6)	ND (6)	ND (26)	NA

TABLE 4.3-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09B032	IR09B032	IR09B032	IR09B033	IR09B033	IR09B033	IR09B033
Sampling Depth (feet bgs)	2.75	5.25	9.75	0.75	2.75	5.25	10.25
Sample Number	9014H077	9014H078	9014H079	9014H086	9014H087	9014H088	9014H089
Sample Date	04/02/90	04/02/90	04/02/90	04/02/90	04/02/90	04/02/90	04/02/90
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (370)	ND (380)	NA	54	ND (380)	96	NA
BENZO(A)ANTHRACENE	ND (370)	ND (380)	NA	46	ND (380)	ND (350)	NA
BENZO(A)PYRENE	ND (370)	ND (380)	NA	ND (360)	ND (380)	72 *	NA
BENZO(B)FLUORANTHENE	ND (370)	ND (380)	NA	ND (360)	ND (380)	ND (350)	NA
BENZO(K)FLUORANTHENE	ND (370)	ND (380)	NA	49	ND (380)	ND (350)	NA
BUTYLBENZYLPHTHALATE	ND (370)	ND (380)	NA	ND (360)	ND (380)	ND (350)	NA
CHRYSENE	ND (370)	ND (380)	NA	49	ND (380)	44	NA
DI-N-BUTYLPHTHALATE	ND (370)	ND (380)	NA	ND (360)	ND (380)	ND (350)	NA
DIBENZOFURAN	ND (370)	ND (380)	NA	ND (360)	ND (380)	ND (350)	NA
FLUORANTHENE	ND (370)	ND (380)	NA	ND (360)	ND (380)	ND (350)	NA
FLUORENE	ND (370)	ND (380)	NA	ND (360)	ND (380)	ND (350)	NA
NAPHTHALENE	ND (370)	ND (380)	NA	37	ND (380)	47	NA
PHENANTHRENE	ND (370)	ND (380)	NA	45	ND (380)	40	NA
PHENOL	ND (370)	ND (380)	NA	ND (360)	ND (380)	ND (350)	NA
PYRENE	ND (370)	ND (380)	NA	ND (360)	ND (380)	ND (350)	NA
Pesticide/Polychlorinated Biphenyl (ug/kg)							
DELTA-BHC	NA	NA	NA	NA	NA	NA	NA
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (11)	ND (12)	NA	13	ND (11)	27	NA
TPH-MOTOR OIL	NA	NA	NA	NA	NA	NA	NA
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	89.6	86.3	87.3	91.5	87.1	94.8	82.9
pH (pH units)							
PH	8.3	8.2	8.3	8.1	8.1	8.1	8.2

TABLE 4.3-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09B033	IR09B034	IR09B034	IR09B034	IR09B034	IR09B045	IR09B045
Sampling Depth (feet bgs)	15.25	1.25	3.25	5.25	10.75	6.25	11.25
Sample Number	9014H090	9014H081	9014H082	9014H083	9014H084	9415C141	9415C142
Sample Date	04/02/90	04/02/90	04/02/90	04/02/90	04/02/90	04/14/94	04/14/94
Metal (mg/kg)							
ALUMINUM	11,500	25,200	20,200	28,900	29,500	NA	NA
ANTIMONY	ND (5.5)	ND (4.2)	ND (4.2)	ND (4.3)	ND (4.7)	NA	NA
ARSENIC	0.91 *	ND (2.1)	3.3 *#	5.5 *#	6.8 *#	NA	NA
BARIUM	74.4	140	80.6	405 a	187	NA	NA
BERYLLIUM	ND (0.26)	ND (0.24)	ND (0.29)	0.68 *	0.52 *	NA	NA
CADMIUM	ND (1.0)	ND (0.78)	ND (0.77)	ND (0.80)	ND (0.87)	NA	NA
CALCIUM	3,300	17,600	13,800	11,300	8,880	NA	NA
CHROMIUM	467 *	154	78.3	294 *	437 *	NA	NA
CHROMIUM VI	ND (0.07)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.06)	ND (0.05)	ND (0.08)
COBALT	56.4	29.1	18.8	33.9	55.0	NA	NA
COPPER	20.4	60.1	41.9	41.2	40.9	NA	NA
IRON	32,000	36,100	27,600	41,000	41,300	NA	NA
LEAD	6.0	4.7	26.4 a	8.3	2.5	NA	NA
MAGNESIUM	98,000	26,800	13,100	66,900	97,700	NA	NA
MANGANESE	615 *	987 *	601 *	849 *	827 *	NA	NA
MERCURY	0.20	ND (0.10)	0.10	0.20	0.10	NA	NA
MOLYBDENUM	ND (0.77)	ND (0.59)	ND (0.58)	ND (0.61)	ND (0.66)	NA	NA
NICKEL	1,060 *	173 *	54.4	491 *	948 *	NA	NA
POTASSIUM	638	475	490	1,890	1,140	NA	NA
SELENIUM	ND (0.61)	ND (0.46)	0.58	ND (0.48)	ND (0.52)	NA	NA
SODIUM	915	375	276	224	237	NA	NA
THALLIUM	ND (0.47)	ND (0.36)	ND (0.35)	ND (0.37)	ND (0.40)	NA	NA
VANADIUM	37.4	86.1	61.0	65.7	65.4	NA	NA
ZINC	36.0	58.0	66.3	74.8	62.4	NA	NA
Volatile Organic Compound (ug/kg)							
1,1,2,2-TETRACHLOROETHANE	NA	ND (5)	ND (5)	ND (5)	NA	NA	NA
2-BUTANONE	NA	ND (11)	ND (10)	ND (11)	NA	NA	NA
BENZENE	NA	ND (5)	ND (5)	ND (5)	NA	NA	NA
CARBON DISULFIDE	NA	ND (5)	ND (5)	ND (5)	NA	NA	NA
ETHYLBENZENE	NA	ND (5)	ND (5)	ND (5)	NA	NA	NA
TOLUENE	NA	ND (5)	ND (5)	ND (5)	NA	NA	NA
XYLENE (TOTAL)	NA	ND (5)	ND (5)	ND (5)	NA	NA	NA

TABLE 4.3-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09B033	IR09B034	IR09B034	IR09B034	IR09B034	IR09B045	IR09B045
Sampling Depth (feet bgs)	15.25	1.25	3.25	5.25	10.75	6.25	11.25
Sample Number	9014H090	9014H081	9014H082	9014H083	9014H084	9415C141	9415C142
Sample Date	04/02/90	04/02/90	04/02/90	04/02/90	04/02/90	04/14/94	04/14/94
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	NA	ND (350)	43	ND (360)	NA	NA	NA
BENZO(A)ANTHRACENE	NA	ND (350)	ND (340)	ND (360)	NA	NA	NA
BENZO(A)PYRENE	NA	ND (350)	ND (340)	ND (360)	NA	NA	NA
BENZO(B)FLUORANTHENE	NA	ND (350)	ND (340)	ND (360)	NA	NA	NA
BENZO(K)FLUORANTHENE	NA	ND (350)	ND (340)	ND (360)	NA	NA	NA
BUTYLBENZYLPHTHALATE	NA	ND (350)	ND (340)	ND (360)	NA	NA	NA
CHRYSENE	NA	ND (350)	ND (340)	ND (360)	NA	NA	NA
DI-N-BUTYLPHTHALATE	NA	ND (350)	ND (340)	ND (360)	NA	NA	NA
DIBENZOFURAN	NA	ND (350)	ND (340)	ND (360)	NA	NA	NA
FLUORANTHENE	NA	ND (350)	ND (340)	ND (360)	NA	NA	NA
FLUORENE	NA	ND (350)	ND (340)	ND (360)	NA	NA	NA
NAPHTHALENE	NA	ND (350)	ND (340)	ND (360)	NA	NA	NA
PHENANTHRENE	NA	ND (350)	ND (340)	ND (360)	NA	NA	NA
PHENOL	NA	ND (350)	ND (340)	NA	NA	NA	NA
PYRENE	NA	ND (350)	ND (340)	ND (360)	NA	NA	NA
Pesticide/Polychlorinated Biphenyl (ug/kg)							
DELTA-BHC	NA	NA	NA	NA	NA	NA	NA
TPH-Extractable (mg/kg)							
TPH-DIESEL	NA	ND (11)	ND (10)	ND (11)	NA	NA	NA
TPH-MOTOR OIL	NA	NA	NA	NA	NA	NA	NA
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	72.5	94.8	96.0	92.0	85.0	26.6	16.1
pH (pH units)							
PH	8.0	8.1	8.1	8.6	8.4	NA	NA

TABLE 4.3-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09B045	IR09B046	IR09B046	IR09B046	IR09B047	IR09B047	IR09B047
Sampling Depth (feet bgs)	16.25	6.25	11.25	21.25	6.25	11.25	16.25
Sample Number	9415C144	9415C134	9415C135	9415C137	9415C138	9415C139	9415C140
Sample Date	04/14/94	04/13/94	04/13/94	04/13/94	04/14/94	04/14/94	04/14/94
Metal (mg/kg)							
ALUMINUM	NA	NA	NA	NA	NA	NA	NA
ANTIMONY	NA	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA	NA
BARIUM	NA	NA	NA	NA	NA	NA	NA
BERYLLIUM	NA	NA	NA	NA	NA	NA	NA
CADMIUM	NA	NA	NA	NA	NA	NA	NA
CALCIUM	NA	NA	NA	NA	NA	NA	NA
CHROMIUM	NA	NA	NA	NA	NA	NA	NA
CHROMIUM VI	ND (0.05)	ND (0.10)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.07)
COBALT	NA	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA
MAGNESIUM	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA	NA	NA
MOLYBDENUM	NA	NA	NA	NA	NA	NA	NA
NICKEL	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	NA	NA	NA	NA	NA	NA	NA
SELENIUM	NA	NA	NA	NA	NA	NA	NA
SODIUM	NA	NA	NA	NA	NA	NA	NA
THALLIUM	NA	NA	NA	NA	NA	NA	NA
VANADIUM	NA	NA	NA	NA	NA	NA	NA
ZINC	NA	NA	NA	NA	NA	NA	NA
Volatile Organic Compound (ug/kg)							
1,1,2,2-TETRACHLOROETHANE	NA	NA	NA	NA	NA	NA	NA
2-BUTANONE	NA	NA	NA	NA	NA	NA	NA
BENZENE	NA	NA	NA	NA	NA	NA	NA
CARBON DISULFIDE	NA	NA	NA	NA	NA	NA	NA
ETHYLBENZENE	NA	NA	NA	NA	NA	NA	NA
TOLUENE	NA	NA	NA	NA	NA	NA	NA
XYLENE (TOTAL)	NA	NA	NA	NA	NA	NA	NA

TABLE 4.3-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09B045	IR09B046	IR09B046	IR09B046	IR09B047	IR09B047	IR09B047
Sampling Depth (feet bgs)	16.25	6.25	11.25	21.25	6.25	11.25	16.25
Sample Number	9415C144	9415C134	9415C135	9415C137	9415C138	9415C139	9415C140
Sample Date	04/14/94	04/13/94	04/13/94	04/13/94	04/14/94	04/14/94	04/14/94
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	NA	NA	NA	NA	NA	NA	NA
BENZO(A)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA
BENZO(A)PYRENE	NA	NA	NA	NA	NA	NA	NA
BENZO(B)FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA
BENZO(K)FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA
BUTYLBENZYLPHTHALATE	NA	NA	NA	NA	NA	NA	NA
CHRYSENE	NA	NA	NA	NA	NA	NA	NA
DI-N-BUTYLPHTHALATE	NA	NA	NA	NA	NA	NA	NA
DIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA
FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA
FLUORENE	NA	NA	NA	NA	NA	NA	NA
NAPHTHALENE	NA	NA	NA	NA	NA	NA	NA
PHENANTHRENE	NA	NA	NA	NA	NA	NA	NA
PHENOL	NA	NA	NA	NA	NA	NA	NA
PYRENE	NA	NA	NA	NA	NA	NA	NA
Pesticide/Polychlorinated Biphenyl (ug/kg)							
DELTA-BHC	NA	NA	NA	NA	NA	NA	NA
TPH-Extractable (mg/kg)							
TPH-DIESEL	NA	NA	NA	NA	NA	NA	NA
TPH-MOTOR OIL	NA	NA	NA	NA	NA	NA	NA
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	12.1	84.5	89.5	86.1	15.7	21.3	10.0
pH (pH units)							
PH	NA	NA	NA	NA	NA	NA	NA

TABLE 4.3-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09B050	IR09B050	IR09B050	IR09B050	IR09B053	IR09B053	IR09B053
Sampling Depth (feet bgs)	1.75	3.75	6.25	11.25	1.25	3.00	7.00
Sample Number	9431R489	9431R490	9431R491	9431R492	9606G083	9606G084	9606G085
Sample Date	08/03/94	08/03/94	08/03/94	08/03/94	02/06/96	02/06/96	02/06/96
Metal (mg/kg)							
ALUMINUM	NA	NA	NA	NA	9,270	9,690	6,700
ANTIMONY	NA	NA	NA	NA	0.81	0.64	ND (0.37)
ARSENIC	NA	NA	NA	NA	3.0 *#	2.4 *#	2.3 *#
BARIUM	NA	NA	NA	NA	49.7	47.4	56.8
BERYLLIUM	NA	NA	NA	NA	ND (0.02)	ND (0.02)	ND (0.02)
CADMIUM	NA	NA	NA	NA	ND (0.05)	ND (0.05)	ND (0.05)
CALCIUM	NA	NA	NA	NA	2,830	2,490	1,410
CHROMIUM	NA	NA	NA	NA	163 α	114	67.8
CHROMIUM VI	ND (0.05)	ND (0.50)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
COBALT	NA	NA	NA	NA	10.1	9.0	10.6
COPPER	NA	NA	NA	NA	9.5	7.3	6.4
IRON	NA	NA	NA	NA	20,100	16,900	14,300
LEAD	NA	NA	NA	NA	3.4	2.7	2.6
MAGNESIUM	NA	NA	NA	NA	6,370	5,150	4,310
MANGANESE	NA	NA	NA	NA	242	250	191
MERCURY	NA	NA	NA	NA	ND (0.06)	ND (0.06)	0.06
MOLYBDENUM	NA	NA	NA	NA	ND (0.14)	ND (0.14)	ND (0.14)
NICKEL	NA	NA	NA	NA	195 *α	149 α	135 α
POTASSIUM	NA	NA	NA	NA	433	491	462
SELENIUM	NA	NA	NA	NA	ND (0.54)	ND (0.54)	ND (0.53)
SODIUM	NA	NA	NA	NA	ND (19.6)	ND (19.6)	ND (82.7)
THALLIUM	NA	NA	NA	NA	ND (0.44)	ND (0.44)	ND (0.44)
VANADIUM	NA	NA	NA	NA	48.8	37.4	36.2
ZINC	NA	NA	NA	NA	39.9	27.7	28.8
Volatile Organic Compound (ug/kg)							
1,1,2,2-TETRACHLOROETHANE	NA	NA	NA	NA	NA	NA	NA
2-BUTANONE	NA	NA	NA	NA	NA	NA	NA
BENZENE	NA	NA	NA	NA	NA	NA	NA
CARBON DISULFIDE	NA	NA	NA	NA	NA	NA	NA
ETHYLBENZENE	NA	NA	NA	NA	NA	NA	NA
TOLUENE	NA	NA	NA	NA	NA	NA	NA
XYLENE (TOTAL)	NA	NA	NA	NA	NA	NA	NA

TABLE 4.3-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09B050	IR09B050	IR09B050	IR09B050	IR09B053	IR09B053	IR09B053
Sampling Depth (feet bgs)	1.75	3.75	6.25	11.25	1.25	3.00	7.00
Sample Number	9431R489	9431R490	9431R491	9431R492	9606G083	9606G084	9606G085
Sample Date	08/03/94	08/03/94	08/03/94	08/03/94	02/06/96	02/06/96	02/06/96
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	NA	NA	NA	NA	ND (380)	ND (380)	ND (380)
BENZO(A)ANTHRACENE	NA	NA	NA	NA	ND (380)	ND (380)	ND (380)
BENZO(A)PYRENE	NA	NA	NA	NA	ND (380)	ND (380)	ND (380)
BENZO(B)FLUORANTHENE	NA	NA	NA	NA	ND (380)	ND (380)	ND (380)
BENZO(K)FLUORANTHENE	NA	NA	NA	NA	ND (380)	ND (380)	ND (380)
BUTYLBENZYLPHTHALATE	NA	NA	NA	NA	ND (380)	ND (380)	ND (380)
CHRYSENE	NA	NA	NA	NA	ND (380)	ND (380)	ND (380)
DI-N-BUTYLPHTHALATE	NA	NA	NA	NA	ND (380)	ND (380)	ND (380)
DIBENZOFURAN	NA	NA	NA	NA	ND (380)	ND (380)	ND (380)
FLUORANTHENE	NA	NA	NA	NA	ND (380)	ND (380)	ND (380)
FLUORENE	NA	NA	NA	NA	ND (380)	ND (380)	ND (380)
NAPHTHALENE	NA	NA	NA	NA	ND (380)	ND (380)	ND (380)
PHENANTHRENE	NA	NA	NA	NA	ND (380)	ND (380)	ND (380)
PHENOL	NA	NA	NA	NA	ND (380)	ND (380)	ND (380)
PYRENE	NA	NA	NA	NA	ND (380)	ND (380)	ND (380)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
DELTA-BHC	NA	NA	NA	NA	ND (2)	NA	ND (2)
TPH-Extractable (mg/kg)							
TPH-DIESEL	NA	NA	NA	NA	ND (12)	ND (12)	ND (12)
TPH-MOTOR OIL	NA	NA	NA	NA	ND (12)	ND (12)	ND (12)
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	NA	NA	NA	NA	ND (12)	ND (12)	ND (12)
Percent Moisture (%)							
% SOLIDS	86.8	88.5	88.3	80.9	85.7	85.8	86.5
pH (pH units)							
PH	NA	NA	NA	NA	8.0	8.1	8.1

TABLE 4.3-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09B053	IR09MW31A	IR09MW31A	IR09MW31A	IR09MW31A	IR09MW35A	IR09MW35A
Sampling Depth (feet bgs)	10.50	2.75	0.75	5.25	10.25	1.25	2.25
Sample Number	9606G087	9013F019	9013F020	9013F021	9013F022	9015H091	9015H092
Sample Date	02/06/96	03/28/90	03/28/90	03/28/90	03/28/90	04/10/90	04/10/90
Metal (mg/kg)							
ALUMINUM	10,200	28,100	21,300	3,710	10,900	23,300	17,700
ANTIMONY	1.1	ND (4.5)	ND (4.1)	ND (4.5)	ND (4.8)	ND (4.5)	ND (4.6)
ARSENIC	2.0 *	2.5 *#	5.4 *#	1.2 *	2.6 *#	5.7 *#	2.7 *#
BARIUM	181	157	548 α	16.5	232	284	202
BERYLLIUM	ND (0.02)	0.60 *	0.47 *	ND (0.22)	0.36 *	0.68 *	0.40 *
CADMIUM	ND (0.05)	0.83	ND (0.71)	0.91	ND (0.83)	ND (0.82)	ND (0.84)
CALCIUM	2,850	6,370	14,400	552	4,350	9,240	10,900
CHROMIUM	260 *α	506 *	196	764 *	477 *	546 *	727 *
CHROMIUM VI	ND (0.05)	ND (0.12)	ND (0.11)	ND (0.12)	ND (0.13)	ND (0.06)	ND (0.06)
COBALT	125 α	50.0	35.9	77.4	57.5	47.8	47.5
COPPER	14.4	62.8	98.3	20.6	50.5	43.9	36.0
IRON	23,000	42,100	41,900	25,300	29,900	47,600	40,800
LEAD	6.1	6.5	14.5 α	2.9	34.0 α	25.1 α	22.2 α
MAGNESIUM	13,300	90,800	28,400	169,000	79,700	75,600	92,400
MANGANESE	2,200 *α	954 *	2,440 *α	582 *	1,640 *α	1,940 *α	1,260 *
MERCURY	0.09	0.10	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	0.30
MOLYBDENUM	ND (0.15)	ND (1.4)	ND (1.3)	ND (1.4)	ND (1.6)	ND (0.62)	ND (0.63)
NICKEL	999 *α	741 *	194 *	1,570 *	991 *	675 *	903 *
POTASSIUM	422	1,130	1,040	93.2	616	1,770	1,400
SELENIUM	ND (0.57)	ND (0.60)	ND (0.55)	ND (0.60)	ND (0.65)	ND (0.49)	ND (0.50)
SODIUM	ND (188)	262	360	110	243	311	298
THALLIUM	ND (0.86)	ND (0.53)	ND (0.49)	ND (0.53)	ND (0.57)	0.45	ND (0.39)
VANADIUM	42.6	67.6	106	21.5	52.1	95.1	77.3
ZINC	32.9	67.2	74.1	21.7	48.9	85.0	112 α
Volatile Organic Compound (ug/kg)							
1,1,2,2-TETRACHLOROETHANE	NA	ND (6)	ND (6)	ND (6)	NA	ND (6)	ND (6)
2-BUTANONE	NA	ND (12)	ND (11)	ND (12)	NA	ND (11)	ND (11)
BENZENE	NA	ND (6)	ND (6)	ND (6)	NA	ND (6)	ND (6)
CARBON DISULFIDE	NA	ND (6)	ND (6)	ND (6)	NA	ND (6)	ND (6)
ETHYLBENZENE	NA	ND (6)	ND (6)	ND (6)	NA	ND (6)	ND (6)
TOLUENE	NA	ND (6)	ND (6)	4	NA	ND (6)	1
XYLENE (TOTAL)	NA	ND (6)	ND (6)	2	NA	ND (6)	ND (6)

TABLE 4.3-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09B053	IR09MW31A	IR09MW31A	IR09MW31A	IR09MW31A	IR09MW35A	IR09MW35A
Sampling Depth (feet bgs)	10.50	2.75	0.75	5.25	10.25	1.25	2.25
Sample Number	9606G087	9013F019	9013F020	9013F021	9013F022	9015H091	9015H092
Sample Date	02/06/96	03/28/90	03/28/90	03/28/90	03/28/90	04/10/90	04/10/90
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (410)	ND (400)	49	ND (390)	NA	53	59
BENZO(A)ANTHRACENE	ND (410)	ND (400)	ND (370)	ND (390)	NA	ND (370)	ND (370)
BENZO(A)PYRENE	ND (410)	ND (400)	ND (370)	ND (390)	NA	ND (370)	ND (370)
BENZO(B)FLUORANTHENE	ND (410)	ND (400)	ND (370)	ND (390)	NA	ND (370)	50
BENZO(K)FLUORANTHENE	ND (410)	ND (400)	ND (370)	ND (390)	NA	ND (370)	ND (370)
BUTYLBENZYLPHTHALATE	ND (410)	ND (400)	ND (370)	ND (390)	NA	ND (370)	ND (370)
CHRYSENE	ND (410)	ND (400)	ND (370)	ND (390)	NA	ND (370)	53
DI-N-BUTYLPHTHALATE	ND (410)	ND (400)	ND (370)	ND (390)	NA	ND (370)	ND (370)
DIBENZOFURAN	ND (410)	ND (400)	ND (370)	ND (390)	NA	ND (370)	ND (370)
FLUORANTHENE	ND (410)	ND (400)	ND (370)	ND (390)	NA	ND (370)	79
FLUORENE	ND (410)	ND (400)	ND (370)	ND (390)	NA	ND (370)	ND (370)
NAPHTHALENE	ND (410)	ND (400)	55	ND (390)	NA	ND (370)	ND (370)
PHENANTHRENE	ND (410)	42	60	ND (390)	NA	ND (370)	100
PHENOL	ND (410)	ND (400)	ND (370)	ND (390)	NA	ND (370)	ND (370)
PYRENE	ND (410)	ND (400)	ND (370)	ND (390)	NA	ND (370)	76
Pesticide/Polychlorinated Biphenyl (ug/kg)							
DELTA-BHC	ND (2)	NA	NA	NA	NA	NA	NA
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (12)	ND (12)	ND (11)	ND (12)	NA	ND (11)	ND (11)
TPH-MOTOR OIL	ND (12)	NA	NA	NA	NA	NA	NA
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	ND (12)	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	80.5	83.1	90.2	83.6	77.4	89.7	88.2
pH (pH units)							
PH	8.5	8.0	8.5	8.1	8.3	7.8	8.0

TABLE 4.3-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09MW35A	IR09MW35A	IR09MW35A	IR09MW36A	IR09MW36A	IR09MW36A	IR09MW36A
Sampling Depth (feet bgs)	5.25	10.75	14.75	0.75	2.75	4.75	9.75
Sample Number	9015H093	9015H094	9015H095	9015G170	9015G171	9015G172	9015G173
Sample Date	04/10/90	04/10/90	04/10/90	04/09/90	04/09/90	04/09/90	04/09/90
Metal (mg/kg)							
ALUMINUM	22,600	14,900	31,000	18,200	27,600	30,000	24,000
ANTIMONY	ND (4.6)	ND (4.5)	ND (4.4)	ND (4.4)	ND (4.4)	ND (4.6)	ND (4.4)
ARSENIC	3.3 *#	3.5 *#	6.6 *#	1.7 *	5.8 *#	7.1 *#	4.4 *#
BARIUM	282	246	115	493 α	310	135	227
BERYLLIUM	0.53 *	0.34 *	0.67 *	0.58 *	0.56 *	0.50 *	0.52 *
CADMIUM	ND (0.84)	ND (0.84)	ND (0.81)	ND (0.81)	ND (0.81)	ND (0.84)	ND (0.82)
CALCIUM	10,400	6,620	11,900	10,200	15,200	18,100	14,800
CHROMIUM	569 *	303 *	338 *	70.4	240 *	311 *	167
CHROMIUM VI	ND (0.06)	ND (0.06)	ND (0.06)	ND (0.06)	ND (0.05)	ND (0.06)	ND (0.06)
COBALT	52.3	27.7	33.7	18.5	29.5	31.7	25.3
COPPER	39.6	ND (24.5)	42.3	81.4	47.9	47.7	53.1
IRON	46,400	31,700	41,600	36,800	36,900	38,100	34,000
LEAD	17.8 α	6.5	5.7	5.5	7.3	6.1	8.3
MAGNESIUM	88,900	49,300	59,000	14,100	47,300	62,400	34,700
MANGANESE	1,350 *	1,540 *α	836 *	1,320 *	1,150 *	872 *	921 *
MERCURY	0.10	ND (0.10)	0.10	0.20	0.20	0.10	0.10
MOLYBDENUM	ND (0.64)	ND (0.63)	ND (0.62)	ND (0.61)	ND (0.61)	ND (0.64)	ND (0.62)
NICKEL	793 *	456 *	453 *	102	344 *	460 *	241 *
POTASSIUM	1,590	1,460	2,320	2,850	1,540	1,170	1,840
SELENIUM	ND (0.50)	ND (0.50)	ND (0.57)	ND (0.48)	ND (0.48)	0.55	ND (0.49)
SODIUM	337	222	704	353	411	288	401
THALLIUM	ND (0.39)	ND (0.38)	ND (0.37)	ND (0.37)	ND (0.37)	ND (0.39)	ND (0.37)
VANADIUM	85.4	57.6	84.6	71.0	73.1	70.6	80.5
ZINC	107	53.5	78.0	52.0	63.4	57.2	55.0
Volatile Organic Compound (ug/kg)							
1,1,2,2-TETRACHLOROETHANE	ND (6)	NA	NA	ND (6)	ND (5)	ND (6)	NA
2-BUTANONE	ND (11)	NA	NA	ND (11)	ND (11)	ND (11)	NA
BENZENE	ND (6)	NA	NA	ND (6)	ND (5)	ND (6)	NA
CARBON DISULFIDE	ND (6)	NA	NA	ND (6)	ND (5)	ND (6)	NA
ETHYLBENZENE	ND (6)	NA	NA	ND (6)	ND (5)	ND (6)	NA
TOLUENE	2	NA	NA	2	3	7	NA
XYLENE (TOTAL)	ND (6)	NA	NA	ND (6)	ND (5)	ND (6)	NA

TABLE 4.3-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09MW35A	IR09MW35A	IR09MW35A	IR09MW36A	IR09MW36A	IR09MW36A	IR09MW36A
Sampling Depth (feet bgs)	5.25	10.75	14.75	0.75	2.75	4.75	9.75
Sample Number	9015H093	9015H094	9015H095	9015G170	9015G171	9015G172	9015G173
Sample Date	04/10/90	04/10/90	04/10/90	04/09/90	04/09/90	04/09/90	04/09/90
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	150	NA	NA	39	390	200	NA
BENZO(A)ANTHRACENE	ND (380)	NA	NA	ND (360)	ND (360)	ND (380)	NA
BENZO(A)PYRENE	ND (380)	NA	NA	ND (360)	ND (360)	ND (380)	NA
BENZO(B)FLUORANTHENE	41	NA	NA	ND (360)	ND (360)	ND (380)	NA
BENZO(K)FLUORANTHENE	ND (380)	NA	NA	ND (360)	ND (360)	ND (380)	NA
BUTYLBENZYLPHTHALATE	ND (380)	NA	NA	ND (360)	ND (360)	ND (380)	NA
CHRYSENE	71	NA	NA	ND (360)	41	46	NA
DI-N-BUTYLPHTHALATE	ND (380)	NA	NA	ND (360)	40	65	NA
DIBENZOFURAN	ND (380)	NA	NA	ND (360)	61	ND (380)	NA
FLUORANTHENE	68	NA	NA	ND (360)	ND (360)	ND (380)	NA
FLUORENE	ND (380)	NA	NA	ND (360)	63	40	NA
NAPHTHALENE	44	NA	NA	ND (360)	150	68	NA
PHENANTHRENE	110	NA	NA	ND (360)	200	140	NA
PHENOL	NA	NA	NA	ND (360)	ND (360)	ND (380)	NA
PYRENE	79	NA	NA	ND (360)	ND (360)	ND (380)	NA
Pesticide/Polychlorinated Biphenyl (ug/kg)							
DELTA-BHC	NA	NA	NA	NA	NA	NA	NA
TPH-Extractable (mg/kg)							
TPH-DIESEL	14	NA	NA	ND (11)	84	52	NA
TPH-MOTOR OIL	NA	NA	NA	NA	NA	NA	NA
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	87.8	88.6	91.0	91.2	91.8	87.9	90.7
pH (pH units)							
PH	8.3	7.8	8.2	7.9	8.2	8.1	8.1

TABLE 4.3-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09MW36A	IR09MW37A	IR09MW37A	IR09MW37A	IR09MW37A	IR09MW37A	IR09MW38A
Sampling Depth (feet bgs)	15.25	1.25	2.75	5.25	10.75	13.75	1.25
Sample Number	9015G174	9013G152	9013G153	9013G154	9013G155	9013G156	9015G176
Sample Date	04/09/90	03/29/90	03/29/90	03/29/90	03/29/90	03/29/90	04/10/90
Metal (mg/kg)							
ALUMINUM	23,300	16,200	13,100	17,200	4,720	11,800	29,500
ANTIMONY	ND (5.0)	ND (4.0)	ND (4.3)	ND (4.0)	ND (5.1)	ND (4.6)	ND (4.3)
ARSENIC	4.2 *#	ND (1.8)	1.7 *	1.3 *	0.92 *	0.86 *	1.1 *
BARIUM	253	54.4	198	184	16.6	67.8	126
BERYLLIUM	0.55 *	ND (0.19)	0.27 *	0.36 *	ND (0.24)	0.22 *	ND (0.07)
CADMIUM	ND (0.92)	ND (0.68)	1.3	ND (0.68)	ND (0.87)	ND (0.79)	ND (0.80)
CALCIUM	12,000	14,100	7,640	10,500	784	2,630	22,200
CHROMIUM	145	39.2	473 *	70.0	931 *	133	22.2
CHROMIUM VI	ND (0.06)	ND (0.05)	ND (0.06)	ND (0.05)	ND (0.07)	ND (0.06)	ND (0.05)
COBALT	22.4	19.1	94.6	17.8	92.2	23.2	11.9
COPPER	64.8	49.5	23.5	40.4	20.6	13.3	69.9
IRON	33,100	20,900	29,800	28,200	29,000	27,000	30,600
LEAD	5.6	1.4	4.0	4.8	0.54	2.3	6.5
MAGNESIUM	29,400	10,200	161,000	15,700	185,000	6,320	14,400
MANGANESE	906 *	610 *	997 *	1,070 *	847 *	189	450 *
MERCURY	ND (0.10)	ND (0.10)	ND (0.10)	0.10	ND (0.10)	ND (0.10)	0.10
MOLYBDENUM	ND (0.70)	ND (1.3)	ND (1.4)	ND (1.3)	ND (1.6)	ND (1.5)	ND (0.60)
NICKEL	208 *	27.9	1,350 *	89.9	2,030 *	216 *α	43.3
POTASSIUM	2,400	591	446	1,160	ND (86.3)	546	2,470
SELENIUM	ND (0.55)	ND (0.53)	ND (0.58)	ND (0.53)	ND (0.68)	ND (0.62)	ND (0.48)
SODIUM	383	241	103	251	123	378	1,180
THALLIUM	ND (0.42)	ND (0.47)	ND (0.51)	ND (0.47)	ND (0.60)	ND (0.54)	ND (0.37)
VANADIUM	80.2	47.8	35.3	62.0	29.0	53.8	108
ZINC	57.1	40.7	34.1	49.8	25.4	25.7	54.7
Volatile Organic Compound (ug/kg)							
1,1,2,2-TETRACHLOROETHANE	NA	ND (5)	ND (6)	ND (5)	NA	NA	ND (5)
2-BUTANONE	NA	ND (11)	ND (12)	ND (11)	NA	NA	9
BENZENE	NA	ND (5)	ND (6)	ND (5)	NA	NA	ND (5)
CARBON DISULFIDE	NA	ND (5)	ND (6)	ND (5)	NA	NA	ND (5)
ETHYLBENZENE	NA	ND (5)	ND (6)	ND (5)	NA	NA	ND (5)
TOLUENE	NA	ND (5)	ND (6)	2	NA	NA	ND (5)
XYLENE (TOTAL)	NA	ND (5)	ND (6)	ND (5)	NA	NA	ND (5)

TABLE 4.3-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09MW36A	IR09MW37A	IR09MW37A	IR09MW37A	IR09MW37A	IR09MW37A	IR09MW38A
Sampling Depth (feet bgs)	15.25	1.25	2.75	5.25	10.75	13.75	1.25
Sample Number	9015G174	9013G152	9013G153	9013G154	9013G155	9013G156	9015G176
Sample Date	04/09/90	03/29/90	03/29/90	03/29/90	03/29/90	03/29/90	04/10/90
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	NA	ND (350)	ND (380)	ND (350)	NA	NA	ND (360)
BENZO(A)ANTHRACENE	NA	ND (350)	ND (380)	ND (350)	NA	NA	ND (360)
BENZO(A)PYRENE	NA	ND (350)	ND (380)	ND (350)	NA	NA	ND (360)
BENZO(B)FLUORANTHENE	NA	ND (350)	ND (380)	ND (350)	NA	NA	ND (360)
BENZO(K)FLUORANTHENE	NA	ND (350)	ND (380)	ND (350)	NA	NA	ND (360)
BUTYLBENZYLPHTHALATE	NA	ND (350)	ND (380)	ND (350)	NA	NA	ND (360)
CHRYSENE	NA	ND (350)	ND (380)	ND (350)	NA	NA	ND (360)
DI-N-BUTYLPHTHALATE	NA	81	ND (380)	ND (350)	NA	NA	ND (360)
DIBENZOFURAN	NA	ND (350)	ND (380)	ND (350)	NA	NA	ND (360)
FLUORANTHENE	NA	ND (350)	ND (380)	ND (350)	NA	NA	ND (360)
FLUORENE	NA	ND (350)	ND (380)	ND (350)	NA	NA	ND (360)
NAPHTHALENE	NA	ND (350)	ND (380)	ND (350)	NA	NA	ND (360)
PHENANTHRENE	NA	ND (350)	ND (380)	ND (350)	NA	NA	ND (360)
PHENOL	NA	ND (350)	ND (380)	ND (350)	NA	NA	ND (360)
PYRENE	NA	ND (350)	ND (380)	ND (350)	NA	NA	ND (360)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
DELTA-BHC	NA	NA	NA	NA	NA	NA	NA
TPH-Extractable (mg/kg)							
TPH-DIESEL	NA	ND (11)	ND (12)	12	NA	NA	ND (11)
TPH-MOTOR OIL	NA	NA	NA	NA	NA	NA	NA
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	80.2	93.8	86.5	94.3	73.9	81.0	92.6
pH (pH units)							
PH	7.9	8.1	8.5	8.5	8.3	7.8	8.3

TABLE 4.3-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09MW38A	IR09MW38A	IR09MW38A	IR09MW38A	IR09MW51F	IR09MW52A	IR09MW52A
Sampling Depth (feet bgs)	2.75	5.25	10.75	12.25	1.88	1.25	5.50
Sample Number	9015G177	9015G178	9015G179	9015G180	9605G061	9606J844	9606J845
Sample Date	04/10/90	04/10/90	04/10/90	04/10/90	01/31/96	02/06/96	02/06/96
Metal (mg/kg)							
ALUMINUM	21,800	19,800	8,570	6,410	2,790	29,300	15,200
ANTIMONY	ND (4.9)	ND (4.8)	ND (6.4)	ND (5.7)	1.3	0.99	1.7
ARSENIC	3.2 *#	3.0 *#	1.2 *	1.1 *	0.29	ND (0.30)	ND (0.33)
BARIUM	140	172	29.7	21.4	70.6	84.3	250
BERYLLIUM	0.33 *	0.36 *	ND (0.11)	ND (0.09)	ND (0.02)	ND (0.02)	ND (0.02)
CADMIUM	ND (0.91)	ND (0.88)	ND (1.2)	ND (1.1)	ND (0.04)	ND (0.04)	ND (0.05)
CALCIUM	8,350	8,460	2,220	2,100	794	33,200	1,830
CHROMIUM	1,080 *	599 *	1,820 *#α	2,710 *#α	392 *	71.6	516 *
CHROMIUM VI	ND (0.06)	ND (0.06)	ND (0.08)	ND (0.07)	0.10	NA	NA
COBALT	93.6	63.3	146 α	93.3	72.9	29.8	67.9
COPPER	40.8	28.2	ND (16.7)	45.6	6.3	51.7	25.3
IRON	61,100	46,500	68,500	55,500	32,900	36,300	37,300
LEAD	5.2	4.2	7.7	3.2	3.8	1.2	5.4
MAGNESIUM	134,000	111,000	162,000	166,000	217,000	32,900	181,000
MANGANESE	1,180 *	910 *	1,060 *	441 *	1,580 *α	1,050 *	802 *
MERCURY	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	0.05	ND (0.05)	ND (0.13)
MOLYBDENUM	ND (0.69)	ND (0.66)	ND (0.89)	ND (0.80)	ND (0.13)	ND (0.13)	ND (0.14)
NICKEL	1,760 *	1,080 *	3,140 *	2,230 *	1,400 *	122	1,150 *
POTASSIUM	1,670	1,500	1,200	220	138	425	786
SELENIUM	ND (0.54)	ND (0.52)	ND (0.70)	ND (0.63)	ND (0.48)	ND (0.49)	ND (0.54)
SODIUM	600	511	428	266	279	ND (17.9)	ND (87.2)
THALLIUM	ND (0.42)	ND (0.40)	ND (0.54)	ND (0.49)	ND (0.40)	ND (0.41)	ND (0.44)
VANADIUM	89.2	79.2	63.9	59.7	19.2	79.3	41.4
ZINC	71.1	54.6	64.7	148 α	30.7	47.3	54.0
Volatile Organic Compound (ug/kg)							
1,1,2,2-TETRACHLOROETHANE	ND (6)	ND (6)	NA	NA	NA	ND (11)	ND (12)
2-BUTANONE	ND (12)	ND (12)	NA	NA	NA	ND (11)	ND (12)
BENZENE	ND (6)	ND (6)	NA	NA	NA	ND (11)	ND (12)
CARBON DISULFIDE	ND (6)	ND (6)	NA	NA	NA	ND (11)	ND (12)
ETHYLBENZENE	ND (6)	ND (6)	NA	NA	NA	ND (11)	ND (12)
TOLUENE	ND (6)	ND (6)	NA	NA	NA	ND (11)	ND (12)
XYLENE (TOTAL)	ND (6)	ND (6)	NA	NA	NA	ND (11)	ND (12)

TABLE 4.3-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09MW38A	IR09MW38A	IR09MW38A	IR09MW38A	IR09MW51F	IR09MW52A	IR09MW52A
Sampling Depth (feet bgs)	2.75	5.25	10.75	12.25	1.88	1.25	5.50
Sample Number	9015G177	9015G178	9015G179	9015G180	9605G061	9606J844	9606J845
Sample Date	04/10/90	04/10/90	04/10/90	04/10/90	01/31/96	02/06/96	02/06/96
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (400)	ND (390)	NA	NA	ND (3,400)	ND (350)	ND (380)
BENZO(A)ANTHRACENE	ND (400)	ND (390)	NA	NA	ND (3,400)	ND (350)	ND (380)
BENZO(A)PYRENE	ND (400)	ND (390)	NA	NA	NA	ND (350)	ND (380)
BENZO(B)FLUORANTHENE	ND (400)	ND (390)	NA	NA	NA	ND (350)	ND (380)
BENZO(K)FLUORANTHENE	ND (400)	ND (390)	NA	NA	NA	ND (350)	ND (380)
BUTYLBENZYLPHTHALATE	ND (400)	ND (390)	NA	NA	ND (3,400)	ND (350)	ND (380)
CHRYSENE	ND (400)	ND (390)	NA	NA	ND (3,400)	ND (350)	ND (380)
DI-N-BUTYLPHTHALATE	ND (400)	ND (390)	NA	NA	ND (3,400)	ND (350)	ND (380)
DIBENZOFURAN	ND (400)	ND (390)	NA	NA	ND (3,400)	ND (350)	ND (380)
FLUORANTHENE	ND (400)	ND (390)	NA	NA	ND (3,400)	ND (350)	ND (380)
FLUORENE	ND (400)	ND (390)	NA	NA	ND (3,400)	ND (350)	ND (380)
NAPHTHALENE	ND (400)	ND (390)	NA	NA	ND (3,400)	ND (350)	ND (380)
PHENANTHRENE	ND (400)	ND (390)	NA	NA	ND (3,400)	ND (350)	ND (380)
PHENOL	ND (400)	ND (390)	NA	NA	ND (3,400)	ND (350)	ND (380)
PYRENE	ND (400)	ND (390)	NA	NA	ND (3,400)	ND (350)	ND (380)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
DELTA-BHC	NA	NA	NA	NA	ND (35)	ND (2)	ND (2)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (12)	ND (12)	NA	NA	ND (1,000)	ND (11)	ND (12)
TPH-MOTOR OIL	NA	NA	NA	NA	6,500	7	ND (12)
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	NA	NA	NA	NA	9,800	330	ND (12)
Percent Moisture (%)							
% SOLIDS	81.6	84.3	62.7	70.0	95.7	93.8	85.8
pH (pH units)							
PH	8.1	8.0	8.0	7.2	8.2	8.8	8.4

TABLE 4.3-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09MW52A	IR09MW52A	IR09MW52A	IR33B114	IR33B114	IR33B114	IR33B114
Sampling Depth (feet bgs)	10.50	15.25	20.50	1.25	6.25	10.25	16.25
Sample Number	9606J846	9606J847	9606J848	9531C069	9531C070	9531C071	9531C074
Sample Date	02/06/96	02/06/96	02/06/96	08/02/95	08/02/95	08/02/95	08/02/95
Metal (mg/kg)							
ALUMINUM	3,310	11,500	22,600	23,200	5,350	5,160	12,600
ANTIMONY	2.0	1.5	1.5	2.0	6.1	4.1	4.8
ARSENIC	ND (0.36)	3.2 *#	5.8 *#	4.1 *#	ND (0.67)	ND (0.74)	ND (0.67)
BARIUM	9.4	186	71.8	90.1	31.6	23.8	31.3
BERYLLIUM	ND (0.03)	ND (0.03)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.03)	ND (0.02)
CADMIUM	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.04)	ND (0.05)	ND (0.05)	ND (0.05)
CALCIUM	407	2,450	13,000	7,290	677	1,370	7,990
CHROMIUM	697 *	387 *	245 *	204	984 *	634 *	710 *
CHROMIUM VI	NA	NA	NA	NA	NA	NA	NA
COBALT	92.7	74.2	43.9	30.6	100	80.9	49.7
COPPER	10.3	34.9	46.3	36.9	10.1	11.2	28.3
IRON	37,300	40,000	37,100	33,500	43,500	39,400	34,700
LEAD	4.9	7.5	9.6 α	8.1	5.3	4.9	4.9
MAGNESIUM	242,000	133,000	65,700	54,400	243,000	225,000	105,000
MANGANESE	742 *	1,380 *	681 *	696 *	922 *	729 *	548 *
MERCURY	ND (0.09)	ND (0.07)	ND (0.06)	0.09	ND (0.06)	ND (0.07)	ND (0.06)
MOLYBDENUM	ND (0.15)	ND (0.16)	3.6 α	ND (0.20)	ND (0.22)	ND (0.24)	ND (0.22)
NICKEL	1,930 *	1,240 *	517 *	331 *	1,840 *	1,780 *	997 *
POTASSIUM	191	1,120	2,210	1,350	357	506	1,000
SELENIUM	ND (0.59)	ND (0.61)	ND (0.56)	ND (0.74)	ND (0.81)	ND (0.90)	ND (0.81)
SODIUM	245	776	3,170	ND (27.9)	197	402	951
THALLIUM	ND (0.49)	ND (0.50)	ND (0.46)	1.4 α	2.1 α	ND (0.53)	1.9 α
VANADIUM	27.7	54.8	65.4	66.5	29.4	28.9	50.1
ZINC	40.2	64.2	79.5	68.0	45.3	53.4	45.8
Volatile Organic Compound (ug/kg)							
1,1,2,2-TETRACHLOROETHANE	ND (13)	ND (13)	ND (12)	NA	ND (12)	ND (13)	ND (12)
2-BUTANONE	ND (13)	ND (13)	ND (12)	NA	ND (12)	ND (13)	ND (12)
BENZENE	ND (13)	ND (13)	ND (12)	NA	ND (12)	ND (13)	ND (12)
CARBON DISULFIDE	ND (13)	ND (13)	ND (12)	NA	ND (12)	ND (13)	ND (12)
ETHYLBENZENE	ND (13)	ND (13)	ND (12)	NA	ND (12)	ND (13)	ND (12)
TOLUENE	ND (13)	ND (13)	ND (12)	NA	ND (12)	ND (13)	ND (12)
XYLENE (TOTAL)	ND (13)	ND (13)	ND (12)	NA	ND (12)	ND (13)	ND (12)

TABLE 4.3-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09MW52A	IR09MW52A	IR09MW52A	IR33B114	IR33B114	IR33B114	IR33B114
Sampling Depth (feet bgs)	10.50	15.25	20.50	1.25	6.25	10.25	16.25
Sample Number	9606J846	9606J847	9606J848	9531C069	9531C070	9531C071	9531C074
Sample Date	02/06/96	02/06/96	02/06/96	08/02/95	08/02/95	08/02/95	08/02/95
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (420)	ND (440)	ND (400)	ND (360)	ND (400)	ND (440)	ND (400)
BENZO(A)ANTHRACENE	ND (420)	ND (440)	ND (400)	ND (360)	ND (400)	ND (440)	ND (400)
BENZO(A)PYRENE	ND (420)	ND (440)	ND (400)	ND (360)	ND (400)	ND (440)	ND (400)
BENZO(B)FLUORANTHENE	ND (420)	ND (440)	ND (400)	ND (360)	ND (400)	ND (440)	ND (400)
BENZO(K)FLUORANTHENE	ND (420)	ND (440)	ND (400)	ND (360)	ND (400)	ND (440)	ND (400)
BUTYLBENZYLPHTHALATE	ND (420)	ND (440)	ND (400)	ND (360)	ND (400)	ND (440)	ND (400)
CHRYSENE	ND (420)	ND (440)	ND (400)	ND (360)	ND (400)	ND (440)	ND (400)
DI-N-BUTYLPHTHALATE	ND (420)	ND (440)	ND (400)	ND (360)	ND (400)	ND (440)	ND (400)
DIBENZOFURAN	ND (420)	ND (440)	ND (400)	ND (360)	ND (400)	ND (440)	ND (400)
FLUORANTHENE	ND (420)	ND (440)	ND (400)	ND (360)	ND (400)	ND (440)	ND (400)
FLUORENE	ND (420)	ND (440)	ND (400)	ND (360)	ND (400)	ND (440)	ND (400)
NAPHTHALENE	ND (420)	ND (440)	ND (400)	ND (360)	ND (400)	ND (440)	ND (400)
PHENANTHRENE	ND (420)	ND (440)	ND (400)	ND (360)	ND (400)	ND (440)	ND (400)
PHENOL	ND (420)	ND (440)	ND (400)	ND (360)	ND (400)	ND (440)	ND (400)
PYRENE	ND (420)	ND (440)	ND (400)	ND (360)	ND (400)	ND (440)	ND (400)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
DELTA-BHC	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (13)	ND (13)	ND (12)	6	ND (12)	ND (13)	ND (12)
TPH-MOTOR OIL	7	ND (13)	ND (12)	7	ND (12)	ND (13)	ND (12)
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	ND (13)	ND (13)	ND (12)	ND (11)	ND (12)	ND (13)	ND (12)
Percent Moisture (%)							
% SOLIDS	78.2	75.3	82.2	91.6	83.7	75.8	83.5
pH (pH units)							
PH	8.0	7.8	9.0	8.2	8.2	8.0	8.3

TABLE 4.3-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B114	IR33B115	IR33B115	IR33B115	IR33B115	IR33B115	IR33MW116A
Sampling Depth (feet bgs)	21.25	1.75	5.75	11.25	16.25	20.25	1.25
Sample Number	9531C075	9532F020	9532F021	9532F022	9532F023	9532F024	9531C061
Sample Date	08/02/95	08/08/95	08/08/95	08/08/95	08/08/95	08/08/95	07/31/95
Metal (mg/kg)							
ALUMINUM	9,660	22,300	16,400	5,660	10,900	6,620	26,300
ANTIMONY	0.76	3.4	ND (1.7)	5.4	ND (0.54)	ND (0.51)	ND (2.5)
ARSENIC	ND (2.2)	4.4 *#	4.0 *#	ND (0.75)	7.0 *#	6.1 *#	2.0 *
BARIUM	27.5	99.8	214	17.0	22.5	12.5	130
BERYLLIUM	ND (0.03)	ND (0.12)	ND (0.02)	ND (0.03)	ND (0.03)	ND (0.02)	ND (0.02)
CADMIUM	ND (0.05)	ND (0.04)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
CALCIUM	2,660	12,400	22,300	908	20,300	22,900	14,800
CHROMIUM	69.8	192	143	847 *	60.2	50.9	294 *
CHROMIUM VI	NA	NA	NA	NA	NA	NA	NA
COBALT	10.5	31.4	20.2	90.1	10.7	7.7	43.3
COPPER	8.1	34.6	18.4	11.7	11.3	8.9	48.3
IRON	16,900	32,900	27,200	42,700	18,800	12,000	40,600
LEAD	3.4	5.5	6.4	11.5 α	5.0	2.9	5.9
MAGNESIUM	4,980	39,700	17,000	196,000	9,790	5,360	51,600
MANGANESE	230	680 *	1,690 *α	653 *	181	134	1,050 *
MERCURY	ND (0.06)	0.13	0.14	ND (0.07)	ND (0.06)	ND (0.06)	ND (0.06)
MOLYBDENUM	ND (0.23)	ND (0.24)	ND (0.21)	ND (0.24)	ND (1.2)	ND (0.55)	ND (0.21)
NICKEL	100	284 *	155 *	2,010 *	64.2	43.9	433 *
POTASSIUM	1,310	1,500	927	851	2,670	1,500	1,200
SELENIUM	ND (0.86)	ND (0.74)	ND (0.80)	ND (0.91)	ND (0.87)	ND (0.83)	ND (0.78)
SODIUM	2,230	ND (27.8)	199	1,210	2,500	1,780	ND (29.2)
THALLIUM	1.9 α	ND (3.9)	3.4 α	ND (0.53)	ND (0.51)	ND (0.49)	ND (1.8)
VANADIUM	44.0	62.6	73.7	31.1	39.7	29.6	102
ZINC	37.6	73.4	39.5	56.1	39.6	27.6	72.3
Volatile Organic Compound (ug/kg)							
1,1,2,2-TETRACHLOROETHANE	ND (13)	NA	ND (12)	ND (13)	ND (13)	ND (12)	NA
2-BUTANONE	ND (13)	NA	ND (12)	ND (14)	ND (13)	ND (12)	NA
BENZENE	ND (13)	NA	ND (12)	ND (13)	ND (13)	ND (12)	NA
CARBON DISULFIDE	ND (13)	NA	ND (12)	13	ND (13)	ND (12)	NA
ETHYLBENZENE	ND (13)	NA	ND (12)	ND (13)	ND (13)	ND (12)	NA
TOLUENE	ND (13)	NA	ND (12)	ND (13)	ND (13)	ND (12)	NA
XYLENE (TOTAL)	ND (13)	NA	ND (12)	ND (13)	ND (13)	ND (12)	NA

TABLE 4.3-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B114	IR33B115	IR33B115	IR33B115	IR33B115	IR33B115	IR33MW116A
Sampling Depth (feet bgs)	21.25	1.75	5.75	11.25	16.25	20.25	1.25
Sample Number	9531C075	9532F020	9532F021	9532F022	9532F023	9532F024	9531C061
Sample Date	08/02/95	08/08/95	08/08/95	08/08/95	08/08/95	08/08/95	07/31/95
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (420)	ND (360)	ND (390)	ND (440)	ND (430)	ND (410)	ND (380)
BENZO(A)ANTHRACENE	ND (420)	ND (360)	ND (390)	ND (440)	ND (430)	ND (410)	ND (380)
BENZO(A)PYRENE	ND (420)	ND (360)	ND (390)	ND (440)	ND (430)	ND (410)	ND (380)
BENZO(B)FLUORANTHENE	ND (420)	ND (360)	ND (390)	ND (440)	ND (430)	ND (410)	ND (380)
BENZO(K)FLUORANTHENE	ND (420)	ND (360)	ND (390)	ND (440)	ND (430)	ND (410)	ND (380)
BUTYLBENZYLPHTHALATE	ND (420)	ND (360)	ND (390)	ND (440)	ND (430)	ND (410)	ND (380)
CHRYSENE	ND (420)	ND (360)	ND (390)	ND (440)	ND (430)	ND (410)	ND (380)
DI-N-BUTYLPHTHALATE	ND (420)	ND (360)	ND (390)	ND (440)	ND (430)	ND (410)	ND (380)
DIBENZOFURAN	ND (420)	ND (360)	ND (390)	ND (440)	ND (430)	ND (410)	ND (380)
FLUORANTHENE	ND (420)	ND (360)	ND (390)	ND (440)	ND (430)	ND (410)	ND (380)
FLUORENE	ND (420)	ND (360)	ND (390)	ND (440)	ND (430)	ND (410)	ND (380)
NAPHTHALENE	ND (420)	ND (360)	ND (390)	ND (440)	ND (430)	ND (410)	ND (380)
PHENANTHRENE	ND (420)	ND (360)	ND (390)	ND (440)	ND (430)	ND (410)	ND (380)
PHENOL	ND (420)	ND (360)	110	ND (440)	ND (430)	ND (410)	ND (380)
PYRENE	ND (420)	ND (360)	ND (390)	ND (440)	ND (430)	ND (410)	ND (380)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
DELTA-BHC	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (13)	ND (11)	ND (12)	ND (13)	ND (13)	ND (12)	ND (11)
TPH-MOTOR OIL	ND (13)	6	ND (12)	17	9	ND (12)	27
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	ND (13)	ND (11)	ND (12)	ND (13)	ND (13)	ND (12)	ND (11)
Percent Moisture (%)							
% SOLIDS	79.4	92.0	85.1	74.9	78.1	81.9	87.5
pH (pH units)							
PH	8.0	8.2	8.5	8.4	9.1	8.9	7.2

TABLE 4.3-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33MW116A	IR33MW116A	IR33MW116A	IR33MW116A	IR33MW116A
Sampling Depth (feet bgs)	6.25	10.25	16.25	21.25	26.25
Sample Number	9531C062	9531C063	9531C065	9531C066	9531C067
Sample Date	07/31/95	07/31/95	07/31/95	07/31/95	07/31/95
Metal (mg/kg)					
ALUMINUM	30,700	28,000	11,500	8,190	6,440
ANTIMONY	ND (2.0)	ND (2.5)	1.3	0.55	1.2
ARSENIC	4.4 *#	2.0 *	7.8 *#	4.0 *#	ND (2.1)
BARIUM	98.7	94.8	31.4	14.0	11.2
BERYLLIUM	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.03)	ND (0.02)
CADMIUM	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
CALCIUM	11,400	6,600	31,100	38,100	1,450
CHROMIUM	229 *	329 *	89.7	54.0	62.3
CHROMIUM VI	NA	NA	NA	NA	NA
COBALT	35.1	40.3	14.3	8.6	13.1
COPPER	44.7	65.4	15.8	12.3	6.1
IRON	40,600	37,800	21,200	15,900	13,400
LEAD	7.4	7.8	12.5 a	3.6	3.0
MAGNESIUM	63,700	73,900	11,500	6,880	3,380
MANGANESE	834 *	850 *	195	192	305
MERCURY	ND (0.06)	ND (0.08)	0.19	ND (0.07)	ND (0.06)
MOLYBDENUM	ND (0.21)	ND (0.21)	ND (0.26)	ND (0.42)	ND (0.22)
NICKEL	377 *	505 *	83.5	45.8	98.6 a
POTASSIUM	1,690	1,330	2,380	2,170	1,000
SELENIUM	ND (0.78)	ND (0.80)	ND (0.84)	ND (0.89)	ND (0.82)
SODIUM	ND (29.2)	489	2,430	2,800	2,080
THALLIUM	ND (0.46)	ND (0.53)	ND (0.50)	ND (0.52)	ND (0.48)
VANADIUM	78.7	65.3	53.5	39.7	36.6
ZINC	79.9	76.0	49.5	31.5	27.4
Volatile Organic Compound (ug/kg)					
1,1,2,2-TETRACHLOROETHANE	ND (11)	ND (12)	ND (12)	ND (13)	ND (12)
2-BUTANONE	ND (11)	ND (12)	ND (12)	ND (13)	ND (12)
BENZENE	ND (11)	ND (12)	ND (12)	ND (13)	ND (12)
CARBON DISULFIDE	ND (11)	ND (12)	ND (12)	7	ND (12)
ETHYLBENZENE	ND (11)	ND (12)	ND (12)	ND (13)	ND (12)
TOLUENE	ND (11)	ND (12)	ND (12)	ND (13)	ND (12)
XYLENE (TOTAL)	ND (11)	ND (12)	ND (12)	ND (13)	ND (12)

TABLE 4.3-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33MW116A	IR33MW116A	IR33MW116A	IR33MW116A	IR33MW116A
Sampling Depth (feet bgs)	6.25	10.25	16.25	21.25	26.25
Sample Number	9531C062	9531C063	9531C065	9531C066	9531C067
Sample Date	07/31/95	07/31/95	07/31/95	07/31/95	07/31/95
Semivolatile Organic Compound (ug/kg)					
2-METHYLNAPHTHALENE	ND (380)	ND (390)	ND (420)	ND (430)	ND (400)
BENZO(A)ANTHRACENE	ND (380)	ND (390)	ND (420)	ND (430)	ND (400)
BENZO(A)PYRENE	ND (380)	ND (390)	ND (420)	ND (430)	ND (400)
BENZO(B)FLUORANTHENE	ND (380)	ND (390)	ND (420)	ND (430)	ND (400)
BENZO(K)FLUORANTHENE	ND (380)	ND (390)	ND (420)	ND (430)	ND (400)
BUTYLBENZYLPHTHALATE	ND (380)	ND (390)	ND (420)	ND (430)	ND (400)
CHRYSENE	ND (380)	ND (390)	ND (420)	ND (430)	ND (400)
DI-N-BUTYLPHTHALATE	ND (380)	ND (390)	ND (420)	ND (430)	ND (400)
DIBENZOFURAN	ND (380)	ND (390)	ND (420)	ND (430)	ND (400)
FLUORANTHENE	ND (380)	ND (390)	ND (420)	ND (430)	ND (400)
FLUORENE	ND (380)	ND (390)	ND (420)	ND (430)	ND (400)
NAPHTHALENE	ND (380)	ND (390)	ND (420)	ND (430)	ND (400)
PHENANTHRENE	ND (380)	ND (390)	ND (420)	ND (430)	ND (400)
PHENOL	ND (380)	ND (390)	ND (420)	ND (430)	ND (400)
PYRENE	ND (380)	ND (390)	250	ND (430)	ND (400)
Pesticide/Polychlorinated Biphenyl (ug/kg)					
DELTA-BHC	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
TPH-Extractable (mg/kg)					
TPH-DIESEL	ND (11)	ND (12)	ND (12)	ND (13)	ND (12)
TPH-MOTOR OIL	ND (11)	ND (12)	8	ND (13)	ND (12)
Total Recoverable Petroleum Hydrocarbons (mg/kg)					
TRPH	ND (11)	ND (12)	14	ND (13)	ND (12)
Percent Moisture (%)					
% SOLIDS	87.6	85.5	80.5	76.8	83.2
pH (pH units)					
PH	8.3	8.2	8.4	8.6	7.8

TABLE 4.3-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

%	Percent
bgs	Below ground surface
mg/kg	Milligram per kilogram
NA	Not analyzed
ND()	Not detected (detection limit in parentheses)
µg/kg	Microgram per kilogram
*	Detected concentration greater than U.S. Environmental Protection Agency Region IX preliminary remediation goals (PRG) for residential use
#	Detected concentration greater than U.S. Environmental Protection Agency Region IX PRG for industrial use
α	Detected concentration greater than the Hunters Point ambient level.
▒	Detected concentration greater than at least one screening criterion.

TABLE 4.3-7

SUMMARY OF MONITORING WELL GROUNDWATER ANALYTICAL TESTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
IR09MW31A	9017E112	√		√	√		√					√			√	√			√	√		√
IR09MW31A	9101J116	√		√	√	√	√		√			√			√					√		√
IR09MW31A	9128X086	√		√	√	√	√		√			√			√				√	√		√
IR09MW31A	9151X338	√		√	√	√	√		√			√			√				√	√		√
IR09MW31A	9345X074																					√
IR09MW31A	9345X082			√	√		√									√						
IR09MW31A	9408X227			√	√		√									√						√
IR09MW31A	9419X281			√	√		√									√						√
IR09MW31A	9436X450			√	√		√									√						√
IR09MW35A	9017J001	√		√	√		√					√			√	√			√	√		√
IR09MW35A	9017J002	√		√	√		√					√			√	√			√	√		√
IR09MW35A	9101J114	√		√	√	√	√		√			√			√					√		√
IR09MW35A	9101J115	√		√	√	√	√		√			√			√					√		√
IR09MW35A	9128X081	√		√	√	√	√		√			√			√				√	√		√
IR09MW35A	9128X082	√		√	√	√	√		√			√			√				√	√		√
IR09MW35A	9143X221													√	√							
IR09MW35A	9143X224													√	√							
IR09MW35A	9151X332	√		√	√	√	√		√			√			√				√	√		√
IR09MW35A	9151X333	√		√	√	√	√		√			√			√				√	√		√
IR09MW35A	9208H098													√	√							
IR09MW35A	9208H099													√	√							
IR09MW35A	9345X072			√	√		√									√						√
IR09MW35A	9408X220			√	√		√									√						√
IR09MW35A	9419M551			√	√		√									√						√
IR09MW35A	9419M552			√	√		√									√						√
IR09MW35A	9435E165			√	√		√									√						√
IR09MW35A	9435E166			√	√		√									√						√
IR09MW35A	9530X900						√															
IR09MW35A	9530X901			√																		
IR09MW36A	9017J003	√		√	√		√					√			√	√			√	√		√
IR09MW36A	9101J111	√		√	√	√	√		√			√			√					√		√
IR09MW36A	9128X090	√		√	√	√	√		√			√			√				√	√		√
IR09MW36A	9151X334	√		√	√	√	√		√			√			√				√	√		√
IR09MW36A	9345X086																					√
IR09MW36A	9345X093			√	√		√									√						
IR09MW36A	9408X231																					√
IR09MW36A	9408X234			√	√		√									√						

TABLE 4.3-7 (Continued)

SUMMARY OF MONITORING WELL GROUNDWATER ANALYTICAL TESTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
IR09MW36A	9419X282			✓	✓		✓									✓						✓
IR09MW36A	9436X451			✓	✓		✓									✓						✓
IR09MW37A	9017J006	✓		✓	✓		✓					✓			✓	✓			✓	✓		✓
IR09MW37A	9101J113																			✓		✓
IR09MW37A	9101X025	✓		✓	✓		✓		✓			✓			✓							
IR09MW37A	9128X080	✓		✓	✓	✓	✓		✓			✓			✓				✓	✓		✓
IR09MW37A	9151X331																			✓		✓
IR09MW37A	9151X339	✓		✓	✓	✓	✓		✓			✓			✓				✓			
IR09MW37A	9345X085																					✓
IR09MW37A	9345X092			✓	✓		✓									✓						
IR09MW37A	9408X230																					✓
IR09MW37A	9408X233			✓	✓		✓									✓						
IR09MW37A	9419M549			✓	✓		✓									✓						✓
IR09MW37A	9436X452																					✓
IR09MW37A	9436X454			✓	✓		✓									✓						
IR09MW38A	9017E108	✓		✓	✓		✓					✓			✓	✓			✓	✓		✓
IR09MW38A	9017E109	✓		✓	✓		✓					✓			✓	✓			✓	✓		✓
IR09MW38A	9101J117																			✓		✓
IR09MW38A	9101X026	✓		✓	✓		✓		✓			✓			✓							
IR09MW38A	9128X083	✓		✓	✓	✓	✓		✓			✓			✓							✓
IR09MW38A	9143X222													✓	✓							
IR09MW38A	9151X340	✓		✓	✓	✓	✓		✓			✓			✓				✓	✓		✓
IR09MW38A	9208H100													✓	✓							
IR09MW38A	9345X075																					✓
IR09MW38A	9345X083			✓	✓		✓									✓						
IR09MW38A	9408X224			✓	✓		✓									✓						✓
IR09MW38A	9408X225			✓	✓		✓									✓						✓
IR09MW38A	9419X283			✓	✓		✓									✓						✓
IR09MW38A	9419X284			✓	✓		✓									✓						✓
IR09MW38A	9436X447			✓	✓		✓									✓						✓
IR09MW38A	9436X448			✓	✓		✓									✓						✓
IR09MW39A	9141X201	✓		✓	✓	✓	✓		✓			✓			✓				✓	✓		✓
IR09MW39A	9151X345	✓		✓	✓	✓	✓		✓			✓			✓				✓	✓		✓
IR09MW39A	9345X084																					✓
IR09MW39A	9345X091			✓	✓		✓									✓						
IR09MW39A	9408X226			✓	✓		✓									✓						✓

TABLE 4.3-7 (Continued)

SUMMARY OF MONITORING WELL GROUNDWATER ANALYTICAL TESTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
IR09MW39A	9419M550			✓	✓		✓									✓						✓
IR09MW39A	9436X449			✓	✓		✓									✓						✓
IR09MW45F	9432E106						✓				✓	✓				✓			✓	✓	✓	✓
IR09MW45F	9605W047			✓			✓				✓	✓				✓			✓	✓	✓	✓
IR09MW45F	9609J896			✓			✓				✓	✓				✓			✓	✓	✓	✓
IR09MW51F	9607W102			✓			✓					✓				✓			✓	✓	✓	✓
IR09MW51F	9612W167	✓		✓			✓				✓	✓		✓	✓	✓			✓	✓	✓	✓
IR09MW51F	9612W168	✓		✓			✓				✓	✓		✓	✓	✓			✓	✓	✓	✓
IR09MW51F	9615Z043	✓		✓							✓	✓		✓						✓		
IR09MW51F	9620J114	✓		✓			✓					✓		✓	✓	✓			✓	✓	✓	✓
IR09MW52A	9607W101			✓			✓					✓				✓			✓	✓	✓	✓
IR09MW52A	9612W169	✓		✓			✓				✓	✓		✓	✓	✓			✓	✓	✓	✓
IR09MW52A	9615Z042	✓		✓							✓	✓		✓						✓		
IR09MW52A	9620J110	✓		✓			✓					✓		✓	✓	✓			✓	✓	✓	✓
IR09P041A	9141X202	✓		✓	✓	✓	✓		✓			✓			✓				✓	✓		✓
IR09P041A	9151X343	✓		✓	✓	✓	✓		✓			✓			✓				✓	✓		✓
IR09P041A	9345X076			✓	✓		✓									✓						✓
IR09P041A	9408X239			✓	✓		✓									✓						✓
IR09P041A	9419X270			✓	✓		✓									✓						✓
IR09P041A	9419X271			✓	✓		✓									✓						✓
IR09P041A	9435E167			✓	✓		✓									✓						✓
IR09PPY1	9017E113	✓		✓	✓		✓					✓			✓	✓			✓	✓		✓
IR09PPY1	9101X028	✓		✓	✓		✓		✓			✓			✓					✓		✓
IR09PPY1	9128X087	✓		✓	✓	✓	✓		✓			✓			✓				✓	✓		✓
IR09PPY1	9128X088	✓		✓	✓	✓	✓		✓			✓			✓				✓	✓		✓
IR09PPY1	9151X336	✓		✓	✓	✓	✓		✓			✓			✓				✓	✓		✓
IR09PPY1	9408X228			✓	✓		✓									✓						✓
IR09PPY1	9419X273			✓	✓		✓									✓						✓
IR09PPY1	9436X455			✓	✓		✓									✓						✓
IR33MW116A	9543Z006						✓				✓	✓				✓			✓	✓	✓	✓
IR33MW116A	9609J892			✓			✓				✓	✓				✓			✓	✓	✓	✓
IR33MW116A	9614Z025	✓		✓			✓				✓	✓		✓	✓	✓			✓	✓	✓	✓
PA50MW12A	9317B100																			✓		✓
PA50MW12A	9317B107			✓	✓		✓									✓	✓		✓		✓	
PA50MW12A	9607J863			✓			✓				✓	✓				✓			✓	✓	✓	✓
PA50MW12A	9612J936																			✓		✓

TABLE 4.3-7 (Continued)

SUMMARY OF MONITORING WELL GROUNDWATER ANALYTICAL TESTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
PA50MW12A	9612J937																✓					
PA50MW12A	9612J938	✓		✓	✓		✓				✓	✓		✓	✓	✓			✓		✓	

Notes:

CHROM	CHROMIUM VI
CYAN	Cyanide
DIOXIN	Dioxins and Furans
O&G	Total oil and grease
PAH	Polynuclear aromatic hydrocarbons
PCTMST	Percent moisture
PEST	Pesticides/polychlorinated biphenyls
PHYS	Physical characteristic
SALIN	Salinity
SVOC	Semivolatile organic compounds
SOLIDS	Total dissolved solids
TOC	Total organic carbon
TMICROB	Coliform
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
VOC	Volatile organic compounds

TABLE 4.3-8A

STATISTICAL SUMMARY OF MONITORING WELL GROUNDWATER A-AQUIFER ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Tap Water PRG Value	Above[e] PRG	MCL Value[f]	Above[g] MCL	NAWQC Value	Above[h] NAWQC
METAL	ALUMINUM	16.6	1,430	493	UG/L	22.2	38	3	37,000	0				
	ANTIMONY	15.8	26.9	20.3	UG/L	15.7	38	3	15.0	3	6.0	3	500	0
	ARSENIC	2.0	11.4	5.4	UG/L	2.0	38	18	0.04	18	50.0	0	36.0	0
	BARIUM	31.6	471	146	UG/L	0.62	38	36	2,600	0	1,000	0		
	CADMIUM	1.9	1.9	1.9	UG/L	0.20	38	1	18.0	0	5.0	0	9.3	0
	CALCIUM	1,390	232,000	68,900	UG/L	20.7	38	38						
	CHROMIUM	4.6	386	109	UG/L	1.9	69	28			50.0	16		
	CHROMIUM VI	15.5	493	152	UG/L	11.2	69	22	0.16	22			50.0	17
	COBALT	1.2	14.7	7.9	UG/L	2.5	38	12						
	COPPER	1.6	14.2	4.9	UG/L	1.8	38	8	1,400	0			2.4	7
	IRON	13.3	2,330	308	UG/L	13.6	38	10						
	LEAD	1.3	1.3	1.3	UG/L	1.6	38	1	4.0	0	50.0	0	8.1	0
	MAGNESIUM	1,940	878,000	286,000	UG/L	34.8	38	38						
	MANGANESE	3.3	2,330	950	UG/L	0.39	38	38	180	31				
	MERCURY	0.15	0.15	0.15	UG/L	0.20	38	1	11.0	0	2.0	0	0.03	1
	MOLYBDENUM	1.2	21.7	13.5	UG/L	2.2	26	12	180	0				
	NICKEL	3.1	127	44.1	UG/L	8.1	69	46	730	0	100	5	8.2	41
	POTASSIUM	2,820	187,000	24,600	UG/L	640	38	38						
	SELENIUM	2.4	4.8	3.3	UG/L	2.7	38	5	180	0	50.0	0	71.0	0
	SILVER	1.5	1.5	1.5	UG/L	1.1	38	1	180	0			0.92	1
	SODIUM	89,100	5,080,000	805,000	UG/L	226	38	38						
	VANADIUM	2.5	36.5	11.2	UG/L	2.0	38	22	260	0				

TABLE 4.3-8A (Continued)

STATISTICAL SUMMARY OF MONITORING WELL GROUNDWATER A-AQUIFER ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Tap Water PRG Value	Above[e] PRG	MCL Value[f]	Above[g] MCL	NAWQC Value	Above[h] NAWQC
	ZINC	2.1	38.7	9.9	UG/L	2.5	38	15	11,000	0			81.0	0
CYAN	CYANIDE	0.08	12.0	4.2	UG/L	3.6	61	7	730	0	200	0		
VOC	1,2-DICHLOROBENZENE	0.5	0.5	0.5	UG/L	1	42	1	370	0	600	0		
	1,4-DICHLOROBENZENE	0.3	0.3	0.3	UG/L	1	42	1	0.5	0	5	0		
	CHLOROFORM	0.6	1	1	UG/L	0.5	68	2	0.2	2	100	0		
SVOC	ACENAPHTHYLENE	83	83	83	UG/L	2	68	1	370	0				
	BENZO(A)PYRENE	0.06	0.1	0.09	UG/L	0.05	68	2	0.002	2	0.2	0		
	BENZO(B)FLUORANTHENE	0.03	0.06	0.04	UG/L	0.02	68	4	0.09	0				
	BENZO(K)FLUORANTHENE	0.03	0.03	0.03	UG/L	0.02	68	1	0.9	0				
	BIS(2-ETHYLHEXYL)PHTHALATE	21	28	24	UG/L	4	46	2	5	2	4	2	360	0
	FLUORENE	0.3	0.6	0.4	UG/L	0.2	68	4	240	0				
TPHEXT	TPH-MOTOR OIL	70	70	70	UG/L	100	8	1	100	0i				
ANION	CHLORIDE	104,000	5,170,000	1,300,000	UG/L	111,000	33	33						
	FLUORIDE	150	600	302	UG/L	180	7	5			1,400	0		
	NITRATE	170	33,700	3,650	UG/L	190	33	16	58,000	0				
	ORTHOPHOSPHATE	250	4,600	1,010	UG/L	333	33	6						
	SULFATE	50,400	661,000	214,000	UG/L	20,800	33	33						
SOLIDS	TOTAL DISSOLVED SOLIDS	640,000	14,000,000	2,900,000	UG/L	21,000	36	36						
DIOXIN	DIBENZOFURAN	0.01	0.01	0.01	UG/L	0.001	9	3	150	0				
SALIN	SALINITY	1.4	5.1	3.9	PPT	0.005	5	5						

TABLE 4.3-8A (Continued)

STATISTICAL SUMMARY OF MONITORING WELL GROUNDWATER A-AQUIFER ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

CYAN	Cyanide
EPA	U.S. Environmental Protection Agency
MCL	Maximum contaminant level
NAWQC	National Ambient Water Quality Criteria
O&G	Total oil and grease
PCTMST	Percent moisture
PEST	Pesticide/polychlorinated biphenyl
PPT	Parts per thousand
PRG	Preliminary remediation goal
SALIN	Salinity
SVOC	Semivolatile organic compound
TMICROB	Coliform
TOC	Total organic carbon
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
UG/L	Microgram per liter
VOC	Volatile organic compound

a Organic results of less than 10 are reported to one significant figure, and results of greater than or equal to 10 are reported to two significant figures. Inorganic results of less than 10 are reported to two significant figures, and results of greater than or equal to 10 are reported to three significant figures. Values that are not nondetects are compared to screening criteria before the significant figure rule is applied. Both the value and the screening criteria are then rounded for reporting purposes.

b Blank boxes indicate that screening critera have not been established for these analytes.

c Total number of samples analyzed

d Total number of samples showing concentrations greater than detection limit

e Total number of samples showing concentrations greater than tap water PRG
California-modified PRGs were used for the following analytes: 1,2-Dibromo-3-chloropropane, benzo[a]pyrene, benzo[k]fluoranthene, cadmium, chromium VI, chrysene, lead, nickel, and tetrachloroethylene (PCE).
For the analytes listed below, Region IX PRGs are not available; therefore, PRGs for similar chemicals were used as follows:

Analyte:	Similar Analyte:
2-Methylnapthalene	Naphthalene
Acenaphthylene	Acenaphthene
Alpha-chlordane	Chlordane
Aroclor-1260	Polychlorinated biphenyls
Benzo(g,h,i)perylene	Naphthalene
Delta BHC	HCH-technical
Endosulfan I	Endosulfan
Endosulfan sulfate	Endosulfan
Endrin aldehyde	Endrin
Endrin ketone	Endrin
Gamma-chlordane	Chlordane
Phenanthrene	Naphthalene

f EPA Title 40 Code of Federal Regulations or California Code of Regulations Title 22 MCL used, whichever is more stringent

g Total number of samples showing concentrations greater than MCL

h Total number of samples showing concentrations greater than NAWQC;
NAWQC based on 4-day average study of saltwater aquatic life

i Total number of samples showing concentrations greater than TPH, TRPH, or O&G screening level, not PRG value

j Most probable number of organisms per 100 milliliters (mpn/100 mL)

TABLE 4.3-8B

STATISTICAL SUMMARY OF MONITORING WELL GROUNDWATER BEDROCK WATER-BEARING ZONE ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Tap Water PRG Value	Above[e] PRG	MCL Value[f]	Above[g] MCL	NAWQC Value	Above[h] NAWQC
METAL	ALUMINUM	36.4	36.4	36.4	UG/L	18.0	6	1	37,000	0				
	ANTIMONY	9.1	9.1	9.1	UG/L	1.2	6	1	15.0	0	6.0	1	500	0
	ARSENIC	1.6	2.4	2.0	UG/L	1.5	6	2	0.04	2	50.0	0	36.0	0
	BARIUM	17.8	41.0	27.5	UG/L	1.0	6	6	2,600	0	1,000	0		
	CALCIUM	16,900	56,600	34,800	UG/L	34.4	6	6						
	CHROMIUM	10.1	60.7	34.3	UG/L	0.50	6	6			50.0	2		
	CHROMIUM VI	47.0	56.0	49.8	UG/L	10.0	6	4	0.16	4			50.0	1
	COBALT	0.85	0.85	0.85	UG/L	0.40	6	1						
	COPPER	1.1	23.4	12.2	UG/L	1.1	6	2	1,400	0			2.4	1
	IRON	23.2	44.3	36.1	UG/L	11.5	6	3						
	MAGNESIUM	67,100	142,000	93,100	UG/L	26.5	6	6						
	MANGANESE	1.3	20.8	8.0	UG/L	0.16	6	5	180	0				
	NICKEL	2.0	8.1	5.4	UG/L	1.2	6	4	730	0	100	0	8.2	0
	POTASSIUM	1,210	4,390	2,810	UG/L	465	6	6						
	SILVER	0.58	0.58	0.58	UG/L	0.50	6	1	180	0			0.92	0
	SODIUM	88,700	143,000	102,000	UG/L	58.3	6	6						
	VANADIUM	2.7	11.5	7.6	UG/L	0.60	6	5	260	0				
	ZINC	9.2	9.2	9.2	UG/L	3.1	6	1	11,000	0			81.0	0
VOC	CHLOROFORM	0.6	2	1	UG/L	0.5	6	3	0.2	3	100	0		
	METHYLENE CHLORIDE	45	45	45	UG/L	1	6	1	4	1	5	1		
	TRICHLOROETHENE	27	72	49	UG/L	0.8	6	3	2	3	5	3		
TPHPRG	TPH-GASOLINE	28	55	42	UG/L	50	7	4	100	0i				

TABLE 4.3-8B (Continued)

STATISTICAL SUMMARY OF MONITORING WELL GROUNDWATER BEDROCK WATER-BEARING ZONE ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Tap Water PRG Value	Above[e] PRG	MCL Value[f]	Above[g] MCL	NAWQC Value	Above[h] NAWQC
ANION	CHLORIDE	204,000	260,000	228,000	UG/L	4,000	3	3						
	FLUORIDE	85.0	110	98.3	UG/L	100	3	3			1,400	0		
	NITRATE	14,300	22,000	17,700	UG/L	200	3	3	58,000	0				
	NITRITE	40.0	40.0	40.0	UG/L	30.0	3	1	3,700	0				
	SULFATE	59,600	61,700	60,500	UG/L	333	3	3						
SOLIDS	TOTAL DISSOLVED SOLIDS	740,000	940,000	840,000	UG/L	10,000	2	2						
SALIN	SALINITY	0.63	0.69	0.66	PPT	0.005	3	3						

TABLE 4.3-8B (Continued)

STATISTICAL SUMMARY OF MONITORING WELL GROUNDWATER BEDROCK WATER-BEARING ZONE ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

CYAN	Cyanide
EPA	U.S. Environmental Protection Agency
MCL	Maximum contaminant level
NAWQC	National Ambient Water Quality Criteria
O&G	Total oil and grease
PCTMST	Percent moisture
PEST	Pesticide/polychlorinated biphenyl
PPT	Parts per thousand
PRG	Preliminary remediation goal
SALIN	Salinity
SVOC	Semivolatile organic compound
TMICROB	Coliform
TOC	Total organic carbon
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
UG/L	Microgram per liter
VOC	Volatile organic compound

a Organic results of less than 10 are reported to one significant figure, and results of greater than or equal to 10 are reported to two significant figures. Inorganic results of less than 10 are reported to two significant figures, and results of greater than or equal to 10 are reported to three significant figures. Values that are not nondetects are compared to screening criteria before the significant figure rule is applied. Both the value and the screening criteria are then rounded for reporting purposes.

b Blank boxes indicate that screening critera have not been established for these analytes.

c Total number of samples analyzed

d Total number of samples showing concentrations greater than detection limit

e Total number of samples showing concentrations greater than tap water PRG
California-modified PRGs were used for the following analytes: 1,2-Dibromo-3-chloropropane, benzo[a]pyrene, benzo[k]fluoranthene, cadmium, chromium VI, chrysene, lead, nickel, and tetrachloroethylene (PCE).
For the analytes listed below, Region IX PRGs are not available; therefore, PRGs for similar chemicals were used as follows:

Analyte:	Similar Analyte:
2-Methylnapthalene	Naphthalene
Acenaphthylene	Acenaphthene
Alpha-chlordane	Chlordane
Aroclor-1260	Polychlorinated biphenyls
Benzo(g,h,i)perylene	Naphthalene
Delta BHC	HCH-technical
Endosulfan I	Endosulfan
Endosulfan sulfate	Endosulfan
Endrin aldehyde	Endrin
Endrin ketone	Endrin
Gamma-chlordane	Chlordane
Phenanthrene	Naphthalene

f EPA Title 40 Code of Federal Regulations or California Code of Regulations Title 22 MCL used, whichever is more stringent

g Total number of samples showing concentrations greater than MCL

h Total number of samples showing concentrations greater than NAWQC;
NAWQC based on 4-day average study of saltwater aquatic life

i Total number of samples showing concentrations greater than TPH, TRPH, or O&G screening level, not PRG value

TABLE 4.3-9

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09MW31A	IR09MW31A	IR09MW31A	IR09MW31A	IR09MW31A	IR09MW31A	IR09MW31A
Sample Number	9017E112	9101J116	9128X086	9151X338	9345X082	9419X281	9436X450
Sample Date	04/24/90	01/02/91	07/09/91	12/17/91	11/11/93	05/11/94	09/06/94
Metal (ug/L)							
ALUMINUM	ND (21.3)	ND (14.6)	ND (20.7)	ND (15.3)	NA	NA	NA
ANTIMONY	ND (20.1)	ND (23.8)	ND (16.7)	ND (27.6)	NA	NA	NA
ARSENIC	4.5 *	6.3 *	ND (4.2)	5.1 *	NA	NA	NA
BARIUM	61.9	60.1	47.5	61.0	NA	NA	NA
CADMIUM	ND (3.7)	ND (4.1)	ND (1.6)	ND (2.3)	NA	NA	NA
CALCIUM	23,900	19,400	18,000	16,900	NA	NA	NA
CHROMIUM	4.6	ND (2.8)	ND (1.7)	ND (3.0)	ND (2.5)	ND (0.90)	ND (1.6)
CHROMIUM VI	ND (10.0)	ND (10.0)	ND (10.0)	ND (10.0)	ND (10.0)	ND (10.0)	ND (10.0)
COBALT	ND (7.0)	ND (8.4)	ND (6.3)	10.5	NA	NA	NA
COPPER	ND (12.7)	ND (2.3)	2.8 B	ND (5.9)	NA	NA	NA
IRON	ND (27.3)	ND (14.0)	ND (9.4)	ND (23.4)	NA	NA	NA
LEAD	ND (1.6)	ND (1.4)	ND (1.6)	ND (2.0)	NA	NA	NA
MAGNESIUM	215,000	208,000	138,000	156,000	NA	NA	NA
MANGANESE	937 *	1,100 *	945 *	1,140 *	NA	NA	NA
MERCURY	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.40)	NA	NA	NA
MOLYBDENUM	NA	NA	15.1	16.6	NA	NA	NA
NICKEL	84.1 B	ND (82.9)	64.6 B	57.2 B	47.5 B	31.2 B	36.0 B
POTASSIUM	9,400	8,610	10,700	8,180	NA	NA	NA
SELENIUM	ND (2.2)	ND (2.1)	ND (3.4)	ND (2.5)	NA	NA	NA
SILVER	ND (1.1)	ND (1.5)	1.5 B	ND (4.9)	NA	NA	NA
SODIUM	431,000	699,000	308,000	393,000	NA	NA	NA
VANADIUM	21.3	ND (17.6)	ND (12.6)	8.3	NA	NA	NA
ZINC	38.7	2.1	ND (1.3)	11.3	NA	NA	NA
Cyanide (ug/L)							
CYANIDE	ND (10.0)	ND (10.0)	ND (10.0)	ND (10.0)	ND (0.8)	ND (1.2)	ND (1.1)
Volatile Organic Compound (ug/L)							
1,2-DICHLOROBENZENE	NA	ND (1)	ND (1)	NA	NA	ND (0.5)	ND (0.5)
1,4-DICHLOROBENZENE	NA	ND (1)	ND (1)	NA	NA	ND (0.5)	ND (0.5)
CHLOROFORM	ND (5)	ND (0.5)	ND (0.5)	ND (5)	NA	ND (0.5)	ND (0.5)
METHYLENE CHLORIDE	ND (5)	ND (5)	ND (5)	ND (5)	NA	ND (0.5)	ND (0.5)
TRICHLOROETHENE	ND (5)	ND (0.5)	ND (0.5)	ND (5)	NA	ND (0.5)	ND (0.5)

TABLE 4.3-9 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09MW31A	IR09MW31A	IR09MW31A	IR09MW31A	IR09MW31A	IR09MW31A	IR09MW31A
Sample Number	9017E112	9101J116	9128X086	9151X338	9345X082	9419X281	9436X450
Sample Date	04/24/90	01/02/91	07/09/91	12/17/91	11/11/93	05/11/94	09/06/94
Semivolatile Organic Compound (ug/L)							
ACENAPHTHYLENE	ND (10)	ND (2)	ND (2)	ND (2)	ND (10)	ND (10)	ND (10)
BENZO(A)PYRENE	ND (10)	ND (0.05)	ND (0.05)	ND (0.05)	ND (10)	ND (10)	ND (10)
BENZO(B)FLUORANTHENE	ND (10)	ND (0.02)	ND (0.02)	ND (0.02)	ND (10)	ND (10)	ND (10)
BENZO(K)FLUORANTHENE	ND (10)	ND (0.02)	ND (0.02)	ND (0.02)	ND (10)	ND (10)	ND (10)
BIS(2-ETHYLHEXYL)PHTHALATE	ND (10)	NA	NA	NA	ND (10)	ND (0.7)	ND (32)
FLUORENE	ND (10)	0.4	ND (0.2)	ND (0.2)	ND (10)	ND (10)	ND (10)
TPH-Purgeable (ug/L)							
TPH-GASOLINE	ND (500)	ND (500)	ND (500)	ND (500)	NA	NA	NA
TPH-Extractable (ug/L)							
TPH-MOTOR OIL	NA	NA	NA	NA	NA	NA	NA
Anion (ug/L)							
CHLORIDE	648,000	588,000	257,000	341,000	NA	NA	NA
FLUORIDE	NA	NA	NA	NA	NA	NA	NA
NITRATE	ND (50.0)	ND (500)	ND (50.0)	ND (50.0)	NA	NA	NA
NITRITE	NA	NA	NA	ND (1,000)	NA	NA	NA
ORTHOPHOSPHATE	ND (200)	ND (2,000)	270	250	NA	NA	NA
SULFATE	90,600	115,000	61,000	67,600	NA	NA	NA
Solids (ug/L)							
TOTAL DISSOLVED SOLIDS	2,100,000	2,100,000	1,400,000	1,700,000	NA	NA	NA
Dioxins and Furans (ug/L)							
DIBENZOFURAN	NA	ND (0.01)	ND (0.005)	NA	NA	NA	NA
pH (pH units)							
PH	7.4	7.5	7.6	7.3	NA	NA	NA
Salinity (ppt)							
SALINITY	NA	NA	NA	NA	NA	NA	NA

TABLE 4.3-9 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09MW35A	IR09MW35A	IR09MW35A	IR09MW35A	IR09MW35A	IR09MW35A	IR09MW35A
Sample Number	9017J001	9017J002	9101J114	9101J115	9128X081	9128X082	9143X221
Sample Date	04/25/90	04/25/90	01/02/91	01/02/91	07/08/91	07/08/91	10/25/91
Metal (ug/L)							
ALUMINUM	ND (21.3)	ND (21.3)	ND (14.6)	ND (14.6)	ND (20.7)	ND (20.7)	NA
ANTIMONY	ND (20.1)	ND (20.1)	ND (23.8)	ND (23.8)	18.3 *δ	18.3 *δ	NA
ARSENIC	3.4 *	4.5 *	5.3 *	4.0 *	ND (4.2)	ND (4.4)	NA
BARIUM	33.5	35.1	73.0	72.6	120	116	NA
CADMIUM	ND (3.7)	ND (3.7)	ND (4.1)	ND (4.1)	ND (1.6)	ND (1.6)	NA
CALCIUM	36,600	37,200	46,200	46,700	72,200	70,900	NA
CHROMIUM	90.5 δ	95.3 δ	59.9 δ	60.8 δ	92.8 δ	92.4 δ	NA
CHROMIUM VI	63.0 *B	56.0 *B	63.0 *B	50.0 *	97.0 *B	100 *B	NA
COBALT	ND (7.0)	ND (7.0)	ND (8.4)	ND (8.4)	ND (6.3)	ND (6.3)	NA
COPPER	ND (9.8)	ND (6.6)	ND (2.3)	ND (2.3)	4.5 B	5.3 B	NA
IRON	ND (21.2)	ND (22.9)	ND (14.0)	ND (14.0)	ND (16.3)	ND (17.3)	NA
LEAD	ND (1.6)	ND (1.6)	ND (1.4)	ND (1.4)	ND (1.6)	ND (1.6)	NA
MAGNESIUM	125,000	128,000	179,000	178,000	245,000	242,000	NA
MANGANESE	36.7	34.9	104	93.7	4.0	2.8	NA
MERCURY	0.20 B	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	NA
MOLYBDENUM	NA	NA	NA	NA	6.3	4.4	NA
NICKEL	112 Bδ	107 Bδ	130 Bδ	111 Bδ	130 Bδ	124 Bδ	NA
POTASSIUM	20,800	21,800	23,400	23,400	34,700	34,300	NA
SELENIUM	ND (2.2)	ND (2.2)	2.8	3.0	ND (3.4)	3.5	NA
SILVER	ND (1.1)	ND (1.1)	ND (1.5)	ND (1.5)	ND (1.1)	ND (1.1)	NA
SODIUM	627,000	666,000	799,000	796,000	1,090,000	1,030,000	NA
VANADIUM	8.0	6.4	ND (12.6)	ND (13.6)	ND (9.3)	ND (7.9)	NA
ZINC	ND (8.9)	ND (6.9)	5.3	4.0	30.4	ND (21.2)	NA
Cyanide (ug/L)							
CYANIDE	ND (10.0)	ND (10.0)	12.0	11.0	ND (10.0)	ND (10.0)	NA
Volatile Organic Compound (ug/L)							
1,2-DICHLOROBENZENE	NA	NA	ND (1)	ND (1)	ND (1)	ND (1)	NA
1,4-DICHLOROBENZENE	NA	NA	ND (1)	ND (1)	ND (1)	ND (1)	NA
CHLOROFORM	ND (5)	ND (5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	NA
METHYLENE CHLORIDE	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	NA
TRICHLOROETHENE	ND (5)	ND (5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	NA

TABLE 4.3-9 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09MW35A	IR09MW35A	IR09MW35A	IR09MW35A	IR09MW35A	IR09MW35A	IR09MW35A
Sample Number	9017J001	9017J002	9101J114	9101J115	9128X081	9128X082	9143X221
Sample Date	04/25/90	04/25/90	01/02/91	01/02/91	07/08/91	07/08/91	10/25/91
Semivolatile Organic Compound (ug/L)							
ACENAPHTHYLENE	ND (10)	ND (10)	ND (2)	ND (2)	ND (2)	ND (2)	NA
BENZO(A)PYRENE	ND (10)	ND (10)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	NA
BENZO(B)FLUORANTHENE	ND (10)	ND (10)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	NA
BENZO(K)FLUORANTHENE	ND (10)	ND (10)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	NA
BIS(2-ETHYLHEXYL)PHTHALATE	ND (10)	ND (10)	NA	NA	NA	NA	NA
FLUORENE	ND (10)	ND (10)	0.2	0.3	ND (0.2)	ND (0.2)	NA
TPH-Purgeable (ug/L)							
TPH-GASOLINE	ND (500)	ND (500)	ND (500)	ND (500)	ND (500)	ND (500)	NA
TPH-Extractable (ug/L)							
TPH-MOTOR OIL	NA	NA	NA	NA	NA	NA	NA
Anion (ug/L)							
CHLORIDE	1,220,000	1,240,000	1,370,000	1,430,000	2,070,000	2,000,000	NA
FLUORIDE	NA	NA	NA	NA	NA	NA	NA
NITRATE	2,400	65,000 *	1,700	1,600	2,400	2,400	NA
NITRITE	NA	NA	NA	NA	NA	NA	NA
ORTHOPHOSPHATE	ND (2,000)	ND (2,000)	ND (2,000)	ND (2,000)	ND (2,000)	ND (2,000)	NA
SULFATE	237,000	243,000	272,000	276,000	349,000	354,000	NA
Solids (ug/L)							
TOTAL DISSOLVED SOLIDS	2,400,000	2,300,000	3,000,000	3,000,000	4,300,000	4,100,000	7,900,000
Dioxins and Furans (ug/L)							
DIBENZOFURAN	NA	NA	ND (0.01)	ND (0.008)	ND (0.002)	ND (0.003)	NA
pH (pH units)							
PH	7.6	6.9	7.4	7.5	7.6	7.7	NA
Salinity (ppt)							
SALINITY	NA	NA	NA	NA	NA	NA	NA

TABLE 4.3-9 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09MW35A	IR09MW35A	IR09MW35A	IR09MW35A	IR09MW35A	IR09MW35A	IR09MW35A
Sample Number	9143X224	9151X332	9151X333	9208H098	9208H099	9345X072	9408X220
Sample Date	10/25/91	12/16/91	12/16/91	02/21/92	02/21/92	11/09/93	02/22/94
Metal (ug/L)							
ALUMINUM	NA	ND (15.3)	ND (15.3)	NA	NA	NA	NA
ANTIMONY	NA	ND (27.6)	ND (27.6)	NA	NA	NA	NA
ARSENIC	NA	3.8 *	2.7 *	NA	NA	NA	NA
BARIUM	NA	318	323	NA	NA	NA	NA
CADMIUM	NA	ND (2.3)	ND (2.3)	NA	NA	NA	NA
CALCIUM	NA	178,000	185,000	NA	NA	NA	NA
CHROMIUM	NA	87.6 δ	90.7 δ	NA	NA	69.1 δ	70.5 δ
CHROMIUM VI	NA	130 *B	120 *B	NA	NA	76.4 *B	70.0 *B
COBALT	NA	ND (10.4)	ND (10.4)	NA	NA	NA	NA
COPPER	NA	ND (6.0)	ND (5.1)	NA	NA	NA	NA
IRON	NA	ND (6.3)	ND (6.3)	NA	NA	NA	NA
LEAD	NA	ND (2.0)	ND (2.0)	NA	NA	NA	NA
MAGNESIUM	NA	658,000	675,000	NA	NA	NA	NA
MANGANESE	NA	3.4	3.1	NA	NA	NA	NA
MERCURY	NA	ND (0.40)	ND (0.40)	NA	NA	NA	NA
MOLYBDENUM	NA	ND (3.1)	ND (3.4)	NA	NA	NA	NA
NICKEL	NA	112 Bδ	108 Bδ	NA	NA	114 Bδ	55.7 B
POTASSIUM	NA	55,200	56,400	NA	NA	NA	NA
SELENIUM	NA	ND (25.0)	ND (25.0)	NA	NA	NA	NA
SILVER	NA	ND (4.9)	ND (4.9)	NA	NA	NA	NA
SODIUM	NA	1,670,000	2,070,000	NA	NA	NA	NA
VANADIUM	NA	ND (3.9)	ND (3.9)	NA	NA	NA	NA
ZINC	NA	ND (6.1)	ND (6.1)	NA	NA	NA	NA
Cyanide (ug/L)							
CYANIDE	NA	ND (10.0)	ND (10.0)	NA	NA	ND (0.8)	ND (2)
Volatile Organic Compound (ug/L)							
1,2-DICHLOROBENZENE	NA	NA	NA	NA	NA	ND (1)	ND (1)
1,4-DICHLOROBENZENE	NA	NA	NA	NA	NA	ND (1)	ND (1)
CHLOROFORM	NA	ND (5)	ND (5)	NA	NA	ND (1)	ND (1)
METHYLENE CHLORIDE	NA	ND (5)	ND (5)	NA	NA	ND (1)	ND (1)
TRICHLOROETHENE	NA	ND (5)	ND (5)	NA	NA	ND (1)	ND (1)

TABLE 4.3-9 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09MW35A	IR09MW35A	IR09MW35A	IR09MW35A	IR09MW35A	IR09MW35A	IR09MW35A
Sample Number	9143X224	9151X332	9151X333	9208H098	9208H099	9345X072	9408X220
Sample Date	10/25/91	12/16/91	12/16/91	02/21/92	02/21/92	11/09/93	02/22/94
Semivolatile Organic Compound (ug/L)							
ACENAPHTHYLENE	NA	ND (2)	ND (2)	NA	NA	ND (10)	ND (10)
BENZO(A)PYRENE	NA	ND (0.05)	ND (0.05)	NA	NA	ND (10)	ND (10)
BENZO(B)FLUORANTHENE	NA	ND (0.02)	ND (0.02)	NA	NA	ND (10)	ND (10)
BENZO(K)FLUORANTHENE	NA	ND (0.02)	ND (0.02)	NA	NA	ND (10)	ND (10)
BIS(2-ETHYLHEXYL)PHTHALATE	NA	NA	NA	NA	NA	ND (3)	ND (10)
FLUORENE	NA	ND (0.2)	ND (0.2)	NA	NA	ND (10)	ND (10)
TPH-Purgeable (ug/L)							
TPH-GASOLINE	NA	ND (500)	ND (500)	NA	NA	NA	NA
TPH-Extractable (ug/L)							
TPH-MOTOR OIL	NA	NA	NA	NA	NA	NA	NA
Anion (ug/L)							
CHLORIDE	NA	4,440,000	4,440,000	NA	NA	NA	NA
FLUORIDE	NA	NA	NA	NA	NA	NA	NA
NITRATE	NA	1,800	1,600	NA	NA	NA	NA
NITRITE	NA	ND (5,000)	ND (5,000)	NA	NA	NA	NA
ORTHOPHOSPHATE	NA	ND (2,000)	ND (2,000)	NA	NA	NA	NA
SULFATE	NA	666,000	656,000	NA	NA	NA	NA
Solids (ug/L)							
TOTAL DISSOLVED SOLIDS	8,100,000	9,900,000	9,900,000	14,000,000	14,000,000	NA	NA
Dioxins and Furans (ug/L)							
DIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA
pH (pH units)							
PH	NA	7.2	7.2	NA	NA	NA	NA
Salinity (ppt)							
SALINITY	NA	NA	NA	NA	NA	NA	NA

TABLE 4.3-9 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09MW35A	IR09MW35A	IR09MW35A	IR09MW35A	IR09MW35A	IR09MW35A	IR09MW36A
Sample Number	9419M551	9419M552	9435E165	9435E166	9530X900	9530X901	9017J003
Sample Date	05/12/94	05/12/94	09/02/94	09/02/94	07/28/95	07/28/95	04/25/90
Metal (ug/L)							
ALUMINUM	NA	NA	NA	NA	ND (26.5)	NA	ND (21.3)
ANTIMONY	NA	NA	NA	NA	ND (2.1)	NA	ND (20.1)
ARSENIC	NA	NA	NA	NA	11.4 *	NA	5.7 *
BARIUM	NA	NA	NA	NA	33.4	NA	43.8
CADMIUM	NA	NA	NA	NA	ND (0.20)	NA	ND (3.7)
CALCIUM	NA	NA	NA	NA	22,800	NA	53,300
CHROMIUM	82.9 δ	83.4 δ	68.0 δ	66.8 δ	121 δ	NA	ND (1.7)
CHROMIUM VI	94.3 *B	106 *B	78.3 *B	78.3 *B	NA	120 *B	ND (10.0)
COBALT	NA	NA	NA	NA	1.2	NA	ND (7.0)
COPPER	NA	NA	NA	NA	5.9 B	NA	ND (3.3)
IRON	NA	NA	NA	NA	ND (15.7)	NA	ND (21.2)
LEAD	NA	NA	NA	NA	ND (1.5)	NA	ND (1.6)
MAGNESIUM	NA	NA	NA	NA	78,500	NA	156,000
MANGANESE	NA	NA	NA	NA	4.1	NA	213 *
MERCURY	NA	NA	NA	NA	ND (0.11)	NA	ND (0.20)
MOLYBDENUM	NA	NA	NA	NA	16.0	NA	NA
NICKEL	51.3 B	52.3 B	61.5 B	58.8 B	35.5 B	NA	ND (20.2)
POTASSIUM	NA	NA	NA	NA	24,700	NA	6,630
SELENIUM	NA	NA	NA	NA	ND (3.4)	NA	ND (2.2)
SILVER	NA	NA	NA	NA	ND (0.60)	NA	ND (1.1)
SODIUM	NA	NA	NA	NA	722,000	NA	225,000
VANADIUM	NA	NA	NA	NA	4.4	NA	15.8
ZINC	NA	NA	NA	NA	ND (23.8)	NA	ND (3.4)
Cyanide (ug/L)							
CYANIDE	ND (1.2)	2.0	ND (1.1)	ND (1.1)	NA	NA	ND (10.0)
Volatile Organic Compound (ug/L)							
1,2-DICHLOROBENZENE	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	NA	NA	NA
1,4-DICHLOROBENZENE	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	NA	NA	NA
CHLOROFORM	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	NA	NA	ND (5)
METHYLENE CHLORIDE	ND (0.4)	ND (0.5)	ND (0.5)	ND (0.5)	NA	NA	ND (5)
TRICHLOROETHENE	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	NA	NA	ND (5)

TABLE 4.3-9 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09MW35A	IR09MW35A	IR09MW35A	IR09MW35A	IR09MW35A	IR09MW35A	IR09MW36A
Sample Number	9419M551	9419M552	9435E165	9435E166	9530X900	9530X901	9017J003
Sample Date	05/12/94	05/12/94	09/02/94	09/02/94	07/28/95	07/28/95	04/25/90
Semivolatile Organic Compound (ug/L)							
ACENAPHTHYLENE	ND (10)	ND (10)	ND (10)	ND (10)	NA	NA	ND (10)
BENZO(A)PYRENE	ND (10)	ND (10)	ND (10)	ND (10)	NA	NA	ND (10)
BENZO(B)FLUORANTHENE	ND (10)	ND (10)	ND (10)	ND (10)	NA	NA	ND (10)
BENZO(K)FLUORANTHENE	ND (10)	ND (10)	ND (10)	ND (10)	NA	NA	ND (10)
BIS(2-ETHYLHEXYL)PHTHALATE	ND (4)	39 *6	ND (4)	ND (4)	NA	NA	ND (10)
FLUORENE	ND (10)	ND (10)	ND (10)	ND (10)	NA	NA	ND (10)
TPH-Purgeable (ug/L)							
TPH-GASOLINE	NA	NA	NA	NA	NA	NA	ND (500)
TPH-Extractable (ug/L)							
TPH-MOTOR OIL	NA	NA	NA	NA	NA	NA	NA
Anion (ug/L)							
CHLORIDE	NA	NA	NA	NA	NA	NA	513,000
FLUORIDE	NA	NA	NA	NA	NA	NA	NA
NITRATE	NA	NA	NA	NA	NA	NA	ND (50.0)
NITRITE	NA	NA	NA	NA	NA	NA	NA
ORTHOPHOSPHATE	NA	NA	NA	NA	NA	NA	ND (200)
SULFATE	NA	NA	NA	NA	NA	NA	172,000
Solids (ug/L)							
TOTAL DISSOLVED SOLIDS	NA	NA	NA	NA	NA	NA	1,400,000
Dioxins and Furans (ug/L)							
DIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA
pH (pH units)							
PH	NA	NA	NA	NA	NA	NA	7.7
Salinity (ppt)							
SALINITY	NA	NA	NA	NA	NA	NA	NA

TABLE 4.3-9 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09MW36A	IR09MW36A	IR09MW36A	IR09MW36A	IR09MW36A	IR09MW37A	IR09MW37A
Sample Number	9101J111	9128X090	9151X334	9345X093	9436X451	9017J006	9101X025
Sample Date	01/02/91	07/09/91	12/16/91	11/12/93	09/06/94	04/25/90	01/03/91
Metal (ug/L)							
ALUMINUM	ND (14.6)	ND (20.7)	ND (15.3)	NA	NA	ND (21.3)	ND (14.6)
ANTIMONY	ND (23.8)	26.9 *B	ND (27.6)	NA	NA	ND (20.1)	ND (23.8)
ARSENIC	5.1 *	ND (6.5)	7.7 *	NA	NA	2.5 *	3.0 *
BARIUM	127	471	407	NA	NA	161	425
CADMIUM	ND (4.1)	ND (1.6)	ND (2.3)	NA	NA	ND (3.7)	ND (4.1)
CALCIUM	98,800	207,000	193,000	NA	NA	22,900	36,300
CHROMIUM	ND (2.8)	ND (1.7)	ND (3.0)	ND (2.5)	ND (0.70)	ND (3.3)	ND (2.8)
CHROMIUM VI	ND (10.0)	ND (10.0)	ND (10.0)	ND (10.0)	ND (10.0)	ND (10.0)	ND (10.0)
COBALT	ND (8.4)	ND (6.3)	ND (10.4)	NA	NA	ND (7.0)	14.7
COPPER	ND (2.3)	3.4 B	ND (3.8)	NA	NA	ND (1.7)	ND (2.3)
IRON	ND (24.4)	ND (9.4)	ND (7.2)	NA	NA	ND (21.2)	ND (21.5)
LEAD	ND (1.4)	ND (1.6)	ND (2.0)	NA	NA	ND (1.6)	ND (1.4)
MAGNESIUM	337,000	878,000	824,000	NA	NA	131,000	190,000
MANGANESE	484 *	1,470 *	1,430 *	NA	NA	843 *	2,330 *
MERCURY	ND (0.20)	ND (0.20)	ND (0.40)	NA	NA	ND (0.20)	ND (0.20)
MOLYBDENUM	NA	21.7	19.9	NA	NA	NA	NA
NICKEL	ND (22.9)	23.8 B	ND (17.8)	13.2 B	14.0 B	47.4 B	ND (91.1)
POTASSIUM	12,800	50,300	36,400	NA	NA	3,450	3,800
SELENIUM	ND (2.1)	3.8	ND (25.0)	NA	NA	ND (2.2)	ND (2.1)
SILVER	ND (1.5)	ND (1.1)	ND (4.9)	NA	NA	ND (1.1)	ND (1.5)
SODIUM	553,000	1,820,000	1,600,000	NA	NA	183,000	381,000
VANADIUM	34.6	ND (1.6)	6.9	NA	NA	11.9	ND (19.7)
ZINC	5.2	ND (1.3)	ND (6.1)	NA	NA	ND (4.1)	11.8
Cyanide (ug/L)							
CYANIDE	ND (10.0)	ND (10.0)	ND (10.0)	ND (0.8)	1.3	ND (10.0)	12.0
Volatile Organic Compound (ug/L)							
1,2-DICHLOROBENZENE	ND (1)	ND (1)	NA	NA	ND (0.5)	NA	NA
1,4-DICHLOROBENZENE	ND (1)	ND (1)	NA	NA	ND (0.5)	NA	NA
CHLOROFORM	ND (0.5)	ND (0.5)	ND (5)	NA	ND (0.5)	ND (5)	NA
METHYLENE CHLORIDE	ND (5)	ND (5)	ND (5)	NA	ND (0.5)	ND (5)	NA
TRICHLOROETHENE	ND (0.5)	ND (0.5)	ND (5)	NA	ND (0.5)	ND (5)	NA

TABLE 4.3-9 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09MW36A	IR09MW36A	IR09MW36A	IR09MW36A	IR09MW36A	IR09MW37A	IR09MW37A
Sample Number	9101J111	9128X090	9151X334	9345X093	9436X451	9017J006	9101X025
Sample Date	01/02/91	07/09/91	12/16/91	11/12/93	09/06/94	04/25/90	01/03/91
Semivolatile Organic Compound (ug/L)							
ACENAPHTHYLENE	ND (2)	ND (2)	ND (2)	ND (10)	ND (10)	ND (10)	ND (2)
BENZO(A)PYRENE	ND (0.05)	ND (0.05)	ND (0.05)	ND (10)	ND (10)	ND (10)	ND (0.05)
BENZO(B)FLUORANTHENE	ND (0.02)	ND (0.02)	ND (0.02)	ND (10)	ND (10)	ND (10)	ND (0.02)
BENZO(K)FLUORANTHENE	ND (0.02)	ND (0.02)	ND (0.02)	ND (10)	ND (10)	ND (10)	ND (0.02)
BIS(2-ETHYLHEXYL)PHTHALATE	NA	NA	NA	ND (10)	ND (2)	ND (10)	NA
FLUORENE	ND (0.2)	ND (0.2)	ND (0.2)	ND (10)	ND (10)	ND (10)	0.4
TPH-Purgeable (ug/L)							
TPH-GASOLINE	ND (500)	ND (500)	ND (500)	NA	NA	ND (500)	NA
TPH-Extractable (ug/L)							
TPH-MOTOR OIL	NA	NA	NA	NA	NA	NA	NA
Anion (ug/L)							
CHLORIDE	3,980,000	3,700,000	3,580,000	NA	NA	222,000	613,000
FLUORIDE	NA	NA	NA	NA	NA	NA	NA
NITRATE	ND (500)	ND (500)	ND (500)	NA	NA	1,700	950
NITRITE	NA	NA	ND (5,000)	NA	NA	NA	NA
ORTHOPHOSPHATE	ND (2,000)	ND (2,000)	ND (2,000)	NA	NA	ND (200)	ND (2,000)
SULFATE	169,000	171,000	170,000	NA	NA	56,800	89,000
Solids (ug/L)							
TOTAL DISSOLVED SOLIDS	6,600,000	6,600,000	7,700,000	NA	NA	1,000,000	1,900,000
Dioxins and Furans (ug/L)							
DIBENZOFURAN	ND (0.01)	0.01	NA	NA	NA	NA	NA
pH (pH units)							
PH	7.2	7.6	7.3	NA	NA	7.7	7.4
Salinity (ppt)							
SALINITY	NA	NA	NA	NA	NA	NA	NA

TABLE 4.3-9 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09MW37A	IR09MW37A	IR09MW37A	IR09MW37A	IR09MW37A	IR09MW37A	IR09MW38A
Sample Number	9128X080	9151X339	9345X092	9408X233	9419M549	9436X454	9017E108
Sample Date	07/09/91	12/17/91	11/12/93	02/24/94	05/12/94	09/07/94	04/24/90
Metal (ug/L)							
ALUMINUM	ND (20.7)	ND (15.3)	NA	NA	NA	NA	ND (21.3)
ANTIMONY	ND (16.7)	ND (27.6)	NA	NA	NA	NA	ND (20.1)
ARSENIC	ND (2.3)	3.6 *	NA	NA	NA	NA	ND (2.0)
BARIUM	259	341	NA	NA	NA	NA	55.3
CADMIUM	ND (1.6)	ND (2.3)	NA	NA	NA	NA	ND (3.7)
CALCIUM	28,100	29,100	NA	NA	NA	NA	39,700
CHROMIUM	7.8	ND (3.0)	ND (2.5)	34.9	18.7	ND (8.8)	ND (1.7)
CHROMIUM VI	ND (10.0)	ND (10.0)	ND (18.2)	ND (54.1)	15.5 *	34.1 *	ND (10.0)
COBALT	ND (6.3)	ND (10.4)	NA	NA	NA	NA	ND (7.0)
COPPER	3.0 B	ND (2.6)	NA	NA	NA	NA	27.5 B
IRON	ND (9.4)	ND (6.3)	NA	NA	NA	NA	223
LEAD	ND (1.6)	ND (2.0)	NA	NA	NA	NA	ND (1.6)
MAGNESIUM	147,000	161,000	NA	NA	NA	NA	80,500
MANGANESE	1,400 *	1,840 *	NA	NA	NA	NA	1,100 *
MERCURY	ND (0.20)	ND (0.40)	NA	NA	NA	NA	ND (0.20)
MOLYBDENUM	5.5	ND (6.7)	NA	NA	NA	NA	NA
NICKEL	51.8 B	54.3 B	65.1 B	7.2	29.0 B	23.8 B	21.5 B
POTASSIUM	2,820	4,320	NA	NA	NA	NA	11,500
SELENIUM	ND (3.4)	ND (2.5)	NA	NA	NA	NA	ND (2.2)
SILVER	ND (1.1)	ND (4.9)	NA	NA	NA	NA	ND (1.1)
SODIUM	216,000	249,000	NA	NA	NA	NA	154,000
VANADIUM	ND (13.1)	8.1	NA	NA	NA	NA	ND (2.3)
ZINC	ND (1.3)	ND (6.1)	NA	NA	NA	NA	14.7
Cyanide (ug/L)							
CYANIDE	ND (10.0)	ND (10.0)	0.08	ND (2)	ND (1.2)	ND (1.1)	ND (10.0)
Volatile Organic Compound (ug/L)							
1,2-DICHLOROBENZENE	ND (1)	NA	NA	NA	ND (0.5)	NA	NA
1,4-DICHLOROBENZENE	ND (1)	NA	NA	NA	ND (0.5)	NA	NA
CHLOROFORM	ND (0.5)	NA	NA	NA	ND (0.5)	NA	ND (5)
METHYLENE CHLORIDE	ND (5)	NA	NA	NA	ND (0.4)	NA	ND (5)
TRICHLOROETHENE	ND (0.5)	NA	NA	NA	ND (0.5)	NA	ND (5)

TABLE 4.3-9 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09MW37A	IR09MW37A	IR09MW37A	IR09MW37A	IR09MW37A	IR09MW37A	IR09MW38A
Sample Number	9128X080	9151X339	9345X092	9408X233	9419M549	9436X454	9017E108
Sample Date	07/09/91	12/17/91	11/12/93	02/24/94	05/12/94	09/07/94	04/24/90
Semivolatile Organic Compound (ug/L)							
ACENAPHTHYLENE	ND (2)	ND (2)	ND (20)	ND (10)	ND (10)	ND (10)	ND (10)
BENZO(A)PYRENE	ND (0.05)	ND (0.05)	ND (20)	ND (10)	ND (10)	ND (10)	ND (10)
BENZO(B)FLUORANTHENE	ND (0.02)	ND (0.02)	ND (20)	ND (10)	ND (10)	ND (10)	ND (10)
BENZO(K)FLUORANTHENE	ND (0.02)	ND (0.02)	ND (20)	ND (10)	ND (10)	ND (10)	ND (10)
BIS(2-ETHYLHEXYL)PHTHALATE	NA	NA	ND (67)	ND (10)	ND (2)	ND (9)	ND (10)
FLUORENE	ND (0.2)	ND (0.2)	ND (20)	ND (10)	ND (10)	ND (10)	ND (10)
TPH-Purgeable (ug/L)							
TPH-GASOLINE	ND (500)	NA	NA	NA	NA	NA	ND (500)
TPH-Extractable (ug/L)							
TPH-MOTOR OIL	NA	NA	NA	NA	NA	NA	NA
Anion (ug/L)							
CHLORIDE	296,000	309,000	NA	NA	NA	NA	138,000
FLUORIDE	NA	NA	NA	NA	NA	NA	NA
NITRATE	1,100	870	NA	NA	NA	NA	ND (50.0)
NITRITE	NA	ND (1,000)	NA	NA	NA	NA	NA
ORTHOPHOSPHATE	ND (200)	ND (200)	NA	NA	NA	NA	260
SULFATE	70,200	56,800	NA	NA	NA	NA	261,000
Solids (ug/L)							
TOTAL DISSOLVED SOLIDS	1,300,000	1,300,000	NA	NA	NA	NA	910,000
Dioxins and Furans (ug/L)							
DIBENZOFURAN	0.01	NA	NA	NA	NA	NA	NA
pH (pH units)							
PH	7.6	7.4	NA	NA	NA	NA	7.2
Salinity (ppt)							
SALINITY	NA	NA	NA	NA	NA	NA	NA

TABLE 4.3-9 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09MW38A	IR09MW38A	IR09MW38A	IR09MW38A	IR09MW38A	IR09MW38A	IR09MW38A
Sample Number	9017E109	9101X026	9128X083	9143X222	9151X340	9208H100	9345X083
Sample Date	04/24/90	01/03/91	07/08/91	10/25/91	12/17/91	02/21/92	11/11/93
Metal (ug/L)							
ALUMINUM	ND (21.3)	ND (14.6)	ND (20.7)	NA	ND (15.3)	NA	NA
ANTIMONY	ND (20.1)	ND (23.8)	ND (16.7)	NA	ND (27.6)	NA	NA
ARSENIC	ND (2.0)	ND (2.5)	ND (1.6)	NA	ND (1.4)	NA	NA
BARIUM	53.9	48.3	48.0	NA	53.0	NA	NA
CADMIUM	ND (3.7)	ND (4.1)	ND (1.6)	NA	ND (2.3)	NA	NA
CALCIUM	39,200	35,800	41,100	NA	38,700	NA	NA
CHROMIUM	ND (1.7)	ND (2.8)	ND (1.7)	NA	ND (3.0)	NA	ND (2.5)
CHROMIUM VI	ND (10.0)	ND (10.0)	ND (10.0)	NA	ND (10.0)	NA	ND (10.0)
COBALT	ND (7.0)	ND (8.4)	ND (6.3)	NA	ND (10.4)	NA	NA
COPPER	ND (1.7)	ND (2.3)	ND (2.5)	NA	ND (3.8)	NA	NA
IRON	189	ND (14.0)	104	NA	ND (39.6)	NA	NA
LEAD	ND (1.9)	ND (1.4)	ND (1.6)	NA	ND (2.0)	NA	NA
MAGNESIUM	79,800	74,700	83,100	NA	86,900	NA	NA
MANGANESE	1,090 *	879 *	1,140 *	NA	1,120 *	NA	NA
MERCURY	ND (0.20)	ND (0.20)	ND (0.20)	NA	ND (0.40)	NA	NA
MOLYBDENUM	NA	NA	ND (2.7)	NA	ND (3.1)	NA	NA
NICKEL	25.3 B	ND (35.0)	33.4 B	NA	19.0 B	NA	36.7 B
POTASSIUM	11,500	12,500	11,500	NA	12,600	NA	NA
SELENIUM	ND (2.2)	ND (2.1)	ND (3.4)	NA	ND (2.5)	NA	NA
SILVER	ND (1.1)	ND (1.5)	ND (1.1)	NA	ND (4.9)	NA	NA
SODIUM	150,000	174,000	130,000	NA	136,000	NA	NA
VANADIUM	4.0	ND (4.4)	ND (6.0)	NA	ND (3.9)	NA	NA
ZINC	16.3	4.7	ND (2.8)	NA	6.6	NA	NA
Cyanide (ug/L)							
CYANIDE	ND (10.0)	ND (10.0)	ND (10.0)	NA	ND (10.0)	NA	ND (0.8)
Volatile Organic Compound (ug/L)							
1,2-DICHLOROBENZENE	NA	NA	ND (1)	NA	NA	NA	NA
1,4-DICHLOROBENZENE	NA	NA	ND (1)	NA	NA	NA	NA
CHLOROFORM	ND (5)	NA	ND (0.5)	NA	ND (5)	NA	NA
METHYLENE CHLORIDE	ND (1)	NA	ND (5)	NA	ND (5)	NA	NA
TRICHLOROETHENE	ND (5)	NA	ND (0.5)	NA	ND (5)	NA	NA

TABLE 4.3-9 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09MW38A	IR09MW38A	IR09MW38A	IR09MW38A	IR09MW38A	IR09MW38A	IR09MW38A
Sample Number	9017E109	9101X026	9128X083	9143X222	9151X340	9208H100	9345X083
Sample Date	04/24/90	01/03/91	07/08/91	10/25/91	12/17/91	02/21/92	11/11/93
Semivolatile Organic Compound (ug/L)							
ACENAPHTHYLENE	ND (10)	ND (2)	ND (2)	NA	83	NA	ND (50)
BENZO(A)PYRENE	ND (10)	ND (0.05)	ND (0.05)	NA	ND (0.05)	NA	ND (50)
BENZO(B)FLUORANTHENE	ND (10)	ND (0.02)	ND (0.02)	NA	ND (0.02)	NA	ND (50)
BENZO(K)FLUORANTHENE	ND (10)	ND (0.02)	ND (0.02)	NA	ND (0.02)	NA	ND (50)
BIS(2-ETHYLHEXYL)PHTHALATE	ND (10)	NA	NA	NA	NA	NA	ND (50)
FLUORENE	ND (10)	0.6	ND (0.2)	NA	ND (0.2)	NA	ND (50)
TPH-Purgeable (ug/L)							
TPH-GASOLINE	ND (500)	NA	NA	NA	ND (500)	NA	NA
TPH-Extractable (ug/L)							
TPH-MOTOR OIL	NA	NA	NA	NA	NA	NA	NA
Anion (ug/L)							
CHLORIDE	138,000	125,000	104,000	NA	131,000	NA	NA
FLUORIDE	NA	NA	NA	NA	NA	NA	NA
NITRATE	ND (50.0)	ND (500)	ND (50.0)	NA	ND (50.0)	NA	NA
NITRITE	NA	NA	NA	NA	ND (500)	NA	NA
ORTHOPHOSPHATE	240	ND (2,000)	370	NA	ND (200)	NA	NA
SULFATE	259,000	231,000	203,000	NA	210,000	NA	NA
Solids (ug/L)							
TOTAL DISSOLVED SOLIDS	920,000	910,000	860,000	840,000	900,000	810,000	NA
Dioxins and Furans (ug/L)							
DIBENZOFURAN	NA	NA	ND (0.004)	NA	NA	NA	NA
pH (pH units)							
PH	7.2	7.2	7.4	NA	7.1	NA	NA
Salinity (ppt)							
SALINITY	NA	NA	NA	NA	NA	NA	NA

TABLE 4.3-9 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09MW38A	IR09MW38A	IR09MW38A	IR09MW38A	IR09MW39A	IR09MW39A	IR09MW39A
Sample Number	9419X283	9419X284	9436X447	9436X448	9141X201	9151X345	9345X091
Sample Date	05/11/94	05/11/94	09/06/94	09/06/94	10/07/91	12/18/91	11/12/93
Metal (ug/L)							
ALUMINUM	NA	NA	NA	NA	32.0	16.6	NA
ANTIMONY	NA	NA	NA	NA	ND (14.3)	ND (27.6)	NA
ARSENIC	NA	NA	NA	NA	8.2 *	9.6 *	NA
BARIUM	NA	NA	NA	NA	ND (1.8)	ND (2.1)	NA
CADMIUM	NA	NA	NA	NA	ND (3.4)	ND (2.3)	NA
CALCIUM	NA	NA	NA	NA	1,450	1,390	NA
CHROMIUM	ND (0.90)	ND (0.90)	ND (0.70)	ND (2.4)	19.0	17.8	21.8
CHROMIUM VI	ND (10.0)	ND (10.0)	ND (10.0)	ND (13.8)	60.0 *B	ND (10.0)	23.0 *
COBALT	NA	NA	NA	NA	ND (4.9)	ND (10.4)	NA
COPPER	NA	NA	NA	NA	ND (1.3)	ND (4.2)	NA
IRON	NA	NA	NA	NA	65.5	ND (42.1)	NA
LEAD	NA	NA	NA	NA	ND (1.2)	ND (2.0)	NA
MAGNESIUM	NA	NA	NA	NA	2,060	1,940	NA
MANGANESE	NA	NA	NA	NA	4.6	3.7	NA
MERCURY	NA	NA	NA	NA	ND (0.20)	ND (0.40)	NA
MOLYBDENUM	NA	NA	NA	NA	16.9	19.1	NA
NICKEL	27.1 B	26.5 B	36.0 B	37.1 B	ND (15.2)	ND (17.8)	6.9
POTASSIUM	NA	NA	NA	NA	6,630	6,710	NA
SELENIUM	NA	NA	NA	NA	ND (2.9)	ND (2.5)	NA
SILVER	NA	NA	NA	NA	ND (1.7)	ND (4.9)	NA
SODIUM	NA	NA	NA	NA	205,000	204,000	NA
VANADIUM	NA	NA	NA	NA	30.4	36.5	NA
ZINC	NA	NA	NA	NA	2.5	ND (6.1)	NA
Cyanide (ug/L)							
CYANIDE	ND (1.2)	ND (1.2)	ND (1.1)	ND (1.1)	ND (10.0)	ND (10.0)	ND (0.8)
Volatile Organic Compound (ug/L)							
1,2-DICHLOROBENZENE	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	NA	NA	NA
1,4-DICHLOROBENZENE	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	NA	NA	NA
CHLOROFORM	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	1 *	ND (5)	NA
METHYLENE CHLORIDE	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (5)	ND (5)	NA
TRICHLOROETHENE	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (5)	NA

TABLE 4.3-9 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09MW38A	IR09MW38A	IR09MW38A	IR09MW38A	IR09MW39A	IR09MW39A	IR09MW39A
Sample Number	9419X283	9419X284	9436X447	9436X448	9141X201	9151X345	9345X091
Sample Date	05/11/94	05/11/94	09/06/94	09/06/94	10/07/91	12/18/91	11/12/93
Semivolatile Organic Compound (ug/L)							
ACENAPHTHYLENE	ND (10)	ND (10)	ND (10)	ND (10)	ND (2)	ND (2)	ND (10)
BENZO(A)PYRENE	ND (10)	ND (10)	ND (10)	ND (10)	ND (0.05)	ND (0.05)	ND (10)
BENZO(B)FLUORANTHENE	ND (10)	ND (10)	ND (10)	ND (10)	ND (0.02)	0.03	ND (10)
BENZO(K)FLUORANTHENE	ND (10)	ND (10)	ND (10)	ND (10)	ND (0.02)	ND (0.02)	ND (10)
BIS(2-ETHYLHEXYL)PHTHALATE	ND (0.8)	ND (0.6)	ND (5)	ND (3)	NA	NA	ND (49)
FLUORENE	ND (10)	ND (10)	ND (10)	ND (10)	ND (0.2)	ND (0.2)	ND (10)
TPH-Purgeable (ug/L)							
TPH-GASOLINE	NA	NA	NA	NA	ND (500)	ND (500)	NA
TPH-Extractable (ug/L)							
TPH-MOTOR OIL	NA	NA	NA	NA	NA	NA	NA
Anion (ug/L)							
CHLORIDE	NA	NA	NA	NA	121,000	110,000	NA
FLUORIDE	NA	NA	NA	NA	600	NA	NA
NITRATE	NA	NA	NA	NA	2,800	3,000	NA
NITRITE	NA	NA	NA	NA	ND (500)	ND (50.0)	NA
ORTHOPHOSPHATE	NA	NA	NA	NA	ND (200)	310	NA
SULFATE	NA	NA	NA	NA	52,400	50,400	NA
Solids (ug/L)							
TOTAL DISSOLVED SOLIDS	NA	NA	NA	NA	660,000	640,000	NA
Dioxins and Furans (ug/L)							
DIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA
pH (pH units)							
PH	NA	NA	NA	NA	8.3	8.5	NA
Salinity (ppt)							
SALINITY	NA	NA	NA	NA	NA	NA	NA

TABLE 4.3-9 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09MW39A	IR09MW39A	IR09MW39A	IR09MW45F	IR09MW45F	IR09MW45F	IR09MW51F
Sample Number	9408X226	9419M550	9436X449	9432E106	9605W047	9609J896	9607W102
Sample Date	02/23/94	05/12/94	09/06/94	08/10/94	01/29/96	02/29/96	02/15/96
Metal (ug/L)							
ALUMINUM	NA	NA	NA	ND (35.3)	36.4	ND (19.1)	ND (62.7)
ANTIMONY	NA	NA	NA	9.1 δ	ND (1.6)	ND (1.6)	ND (1.6)
ARSENIC	NA	NA	NA	2.4 *	ND (2.2)	ND (2.9)	ND (1.4)
BARIUM	NA	NA	NA	41.0	19.5	26.5	37.7
CADMIUM	NA	NA	NA	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)
CALCIUM	NA	NA	NA	41,400	56,600	53,000	23,300
CHROMIUM	25.2	18.8	20.6	22.3	10.1	13.2	60.7 δ
CHROMIUM VI	ND (48.8)	25.1 *	ND (28.8)	NA	ND (20.0)	ND (20.0)	56.0 *8
COBALT	NA	NA	NA	ND (0.70)	ND (0.40)	ND (0.40)	0.85
COPPER	NA	NA	NA	23.4 8	ND (0.67)	1.1	ND (2.3)
IRON	NA	NA	NA	ND (18.8)	44.3	ND (11.0)	40.9
LEAD	NA	NA	NA	ND (1.0)	ND (0.80)	ND (0.80)	ND (2.0)
MAGNESIUM	NA	NA	NA	67,100	87,400	87,500	142,000
MANGANESE	NA	NA	NA	11.1	1.4	ND (0.83)	5.4
MERCURY	NA	NA	NA	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)
MOLYBDENUM	NA	NA	NA	ND (1.6)	ND (0.98)	ND (0.60)	ND (0.60)
NICKEL	ND (7.2)	ND (2.7)	3.1	4.9	2.0	ND (2.1)	8.1
POTASSIUM	NA	NA	NA	4,390	2,050	1,210	1,770
SELENIUM	NA	NA	NA	ND (2.3)	ND (2.3)	ND (2.3)	ND (2.3)
SILVER	NA	NA	NA	ND (0.60)	ND (0.50)	ND (0.50)	0.58
SODIUM	NA	NA	NA	90,000	93,900	95,800	143,000
VANADIUM	NA	NA	NA	8.7	11.4	11.5	3.5
ZINC	NA	NA	NA	9.2	ND (7.9)	ND (6.7)	ND (37.1)
Cyanide (ug/L)							
CYANIDE	ND (1)	ND (1.2)	ND (1.1)	NA	NA	NA	NA
Volatile Organic Compound (ug/L)							
1,2-DICHLOROBENZENE	ND (1)	ND (0.5)	ND (0.5)	NA	NA	NA	NA
1,4-DICHLOROBENZENE	ND (1)	ND (0.5)	ND (0.5)	NA	NA	NA	NA
CHLOROFORM	ND (1)	ND (0.5)	ND (0.5)	ND (10)	ND (0.5)	ND (0.5)	0.6 *
METHYLENE CHLORIDE	ND (1)	ND (0.4)	ND (0.5)	ND (10)	ND (0.5)	ND (0.5)	ND (0.5)
TRICHLOROETHENE	ND (1)	ND (0.5)	ND (0.5)	ND (10)	ND (0.5)	ND (0.5)	72 *6

TABLE 4.3-9 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09MW39A	IR09MW39A	IR09MW39A	IR09MW45F	IR09MW45F	IR09MW45F	IR09MW51F
Sample Number	9408X226	9419M550	9436X449	9432E106	9605W047	9609J896	9607W102
Sample Date	02/23/94	05/12/94	09/06/94	08/10/94	01/29/96	02/29/96	02/15/96
Semivolatile Organic Compound (ug/L)							
ACENAPHTHYLENE	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
BENZO(A)PYRENE	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
BENZO(B)FLUORANTHENE	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
BENZO(K)FLUORANTHENE	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
BIS(2-ETHYLHEXYL)PHTHALATE	ND (5)	ND (4)	ND (4)	ND (8)	ND (4)	ND (4)	ND (4)
FLUORENE	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
TPH-Purgeable (ug/L)							
TPH-GASOLINE	NA	NA	NA	ND (50)	ND (50)	ND (50)	47
TPH-Extractable (ug/L)							
TPH-MOTOR OIL	NA	NA	NA	ND (100)	ND (100)	ND (100)	ND (100)
Anion (ug/L)							
CHLORIDE	NA	NA	NA	NA	NA	NA	NA
FLUORIDE	NA	NA	NA	NA	NA	NA	NA
NITRATE	NA	NA	NA	NA	NA	NA	NA
NITRITE	NA	NA	NA	NA	NA	NA	NA
ORTHOPHOSPHATE	NA	NA	NA	NA	NA	NA	NA
SULFATE	NA	NA	NA	NA	NA	NA	NA
Solids (ug/L)							
TOTAL DISSOLVED SOLIDS	NA	NA	NA	NA	NA	NA	NA
Dioxins and Furans (ug/L)							
DIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA
pH (pH units)							
PH	NA	NA	NA	7.7	7.6	7.7	7.6
Salinity (ppt)							
SALINITY	NA	NA	NA	NA	NA	NA	NA

TABLE 4.3-9 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09MW51F	IR09MW51F	IR09MW51F	IR09MW51F	IR09MW52A	IR09MW52A	IR09MW52A
Sample Number	9612W167	9612W168	9615Z043	9620J114	9607W101	9612W169	9615Z042
Sample Date	03/18/96	03/18/96	04/09/96	05/14/96	02/15/96	03/18/96	04/09/96
Metal (ug/L)							
ALUMINUM	ND (46.3)	ND (44.7)	NA	ND (27.2)	ND (20.0)	ND (48.0)	NA
ANTIMONY	ND (1.6)	ND (1.6)	NA	ND (1.2)	ND (1.6)	ND (1.6)	NA
ARSENIC	2.5 *	ND (1.4)	NA	ND (1.3)	ND (1.7)	2.0 *	NA
BARIUM	22.4	22.1	NA	17.8	295	255	NA
CADMIUM	ND (0.20)	ND (0.20)	NA	ND (0.30)	ND (0.20)	ND (0.20)	NA
CALCIUM	17,900	17,800	NA	16,900	74,200	70,900	NA
CHROMIUM	48.4	47.6	NA	51.3 δ	ND (0.40)	ND (0.40)	NA
CHROMIUM VI	48.0 *	46.0 *	49.0 *	47.0 *	ND (10.0)	ND (10.0)	ND (10.0)
COBALT	ND (0.77)	ND (0.55)	NA	ND (0.50)	13.9	10.7	NA
COPPER	ND (1.7)	ND (0.99)	NA	ND (0.80)	ND (0.50)	ND (0.52)	NA
IRON	ND (16.6)	ND (34.8)	NA	23.2	13.3	ND (41.1)	NA
LEAD	ND (0.80)	ND (0.80)	NA	ND (1.0)	ND (0.80)	ND (0.80)	NA
MAGNESIUM	89,100	88,600	NA	85,800	641,000	612,000	NA
MANGANESE	20.9	20.6	NA	1.3	2,140 *	1,980 *	NA
MERCURY	ND (0.10)	ND (0.10)	NA	ND (0.10)	ND (0.10)	ND (0.10)	NA
MOLYBDENUM	ND (0.60)	ND (1.5)	NA	ND (0.70)	ND (1.6)	ND (0.77)	NA
NICKEL	ND (7.7)	ND (7.4)	NA	6.5	58.9 B	51.7 B	NA
POTASSIUM	4,190	3,720	NA	3,480	21,100	20,000	NA
SELENIUM	ND (2.3)	ND (2.3)	NA	ND (2.2)	ND (2.3)	ND (2.3)	NA
SILVER	ND (0.50)	ND (0.58)	NA	ND (0.70)	ND (0.50)	ND (0.50)	NA
SODIUM	88,900	88,400	NA	98,700	1,120,000	933,000	NA
VANADIUM	ND (3.4)	ND (3.3)	NA	2.7	5.5	ND (3.1)	NA
ZINC	ND (11.4)	ND (7.6)	NA	ND (3.9)	ND (8.9)	ND (11.2)	NA
Cyanide (ug/L)							
CYANIDE	NA	NA	NA	NA	NA	NA	NA
Volatile Organic Compound (ug/L)							
1,2-DICHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA
1,4-DICHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA
CHLOROFORM	2 *	2 *	NA	1 *	ND (0.5)	ND (0.5)	NA
METHYLENE CHLORIDE	45 *δ	45 *δ	NA	ND (0.5)	ND (0.5)	ND (0.5)	NA
TRICHLOROETHENE	44 *δ	50 *δ	NA	27 *δ	ND (0.5)	ND (0.5)	NA

TABLE 4.3-9 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09MW51F	IR09MW51F	IR09MW51F	IR09MW51F	IR09MW52A	IR09MW52A	IR09MW52A
Sample Number	9612W167	9612W168	9615Z043	9620J114	9607W101	9612W169	9615Z042
Sample Date	03/18/96	03/18/96	04/09/96	05/14/96	02/15/96	03/18/96	04/09/96
Semivolatile Organic Compound (ug/L)							
ACENAPHTHYLENE	ND (10)	ND (10)	NA	ND (10)	ND (10)	ND (10)	NA
BENZO(A)PYRENE	ND (10)	ND (10)	NA	ND (10)	ND (10)	ND (10)	NA
BENZO(B)FLUORANTHENE	ND (10)	ND (10)	NA	ND (10)	ND (10)	ND (10)	NA
BENZO(K)FLUORANTHENE	ND (10)	ND (10)	NA	ND (10)	ND (10)	ND (10)	NA
BIS(2-ETHYLHEXYL)PHTHALATE	ND (4)	ND (4)	NA	ND (4)	ND (4)	ND (4)	NA
FLUORENE	ND (10)	ND (10)	NA	ND (10)	ND (10)	ND (10)	NA
TPH-Purgeable (ug/L)							
TPH-GASOLINE	54	55	37	28	ND (50)	ND (50)	ND (50)
TPH-Extractable (ug/L)							
TPH-MOTOR OIL	ND (100)	ND (100)	NA	ND (100)	ND (100)	ND (100)	NA
Anion (ug/L)							
CHLORIDE	218,000	222,000	204,000	260,000	NA	3,070,000	2,820,000
FLUORIDE	ND (100)	120	100	110	NA	170	150
NITRATE	14,200	14,400	16,700	22,000	NA	ND (40.0)	ND (100)
NITRITE	44.0	36.0	ND (30.0)	ND (750)	NA	ND (1,500)	ND (3,000)
ORTHOPHOSPHATE	ND (50.0)	ND (50.0)	ND (250)	ND (250)	NA	ND (50.0)	ND (250)
SULFATE	61,000	62,300	59,600	60,100	NA	281,000	210,000
Solids (ug/L)							
TOTAL DISSOLVED SOLIDS	740,000	740,000	NA	940,000	NA	5,500,000	NA
Dioxins and Furans (ug/L)							
DIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA
pH (pH units)							
PH	7.5	7.6	7.6	7.5	7.2	7.2	7.2
Salinity (ppt)							
SALINITY	0.66	0.65	0.63	0.69	NA	5.1	4.7

TABLE 4.3-9 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09MW52A	IR09P041A	IR09P041A	IR09P041A	IR09P041A	IR09PPY1	IR09PPY1
Sample Number	9620J110	9141X202	9151X343	9408X239	9435E167	9017E113	9101X028
Sample Date	05/13/96	10/07/91	12/17/91	02/24/94	09/02/94	04/24/90	01/03/91
Metal (ug/L)							
ALUMINUM	ND (33.3)	1,430	ND (15.3)	NA	NA	ND (21.3)	ND (14.6)
ANTIMONY	ND (1.4)	ND (14.3)	ND (27.6)	NA	NA	ND (20.1)	ND (23.8)
ARSENIC	ND (2.0)	ND (2.5)	ND (1.4)	NA	NA	ND (2.0)	ND (2.5)
BARIUM	194	45.4	38.0	NA	NA	43.1	42.7
CADMIUM	ND (0.30)	ND (3.4)	ND (2.3)	NA	NA	ND (3.7)	ND (4.1)
CALCIUM	61,300	56,000	57,600	NA	NA	49,700	43,600
CHROMIUM	ND (0.70)	7.8	ND (3.0)	ND (2.3)	ND (0.70)	198 δ	339 δ
CHROMIUM VI	ND (10.0)	ND (10.0)	ND (10.0)	ND (34.4)	ND (36.1)	100 *B	320 *B
COBALT	10.0	6.1	ND (10.4)	NA	NA	ND (7.0)	ND (8.4)
COPPER	ND (0.80)	3.6 B	ND (7.2)	NA	NA	ND (3.9)	ND (2.3)
IRON	65.7	2,330	ND (7.8)	NA	NA	90.1	ND (14.0)
LEAD	ND (1.0)	ND (1.2)	ND (2.0)	NA	NA	ND (1.8)	ND (1.4)
MAGNESIUM	610,000	83,200	82,600	NA	NA	70,000	87,500
MANGANESE	1,980 *	1,020 *	1,290 *	NA	NA	339 *	399 *
MERCURY	ND (0.10)	ND (0.20)	ND (0.40)	NA	NA	ND (0.20)	ND (0.20)
MOLYBDENUM	1.2	ND (5.3)	ND (3.1)	NA	NA	NA	NA
NICKEL	46.5 B	ND (29.7)	ND (17.8)	8.0	7.4	21.6 B	ND (22.9)
POTASSIUM	19,100	9,760	7,740	NA	NA	4,700	4,210
SELENIUM	ND (2.2)	ND (2.9)	ND (2.5)	NA	NA	ND (2.2)	ND (2.1)
SILVER	ND (0.70)	ND (1.7)	ND (4.9)	NA	NA	ND (1.1)	ND (1.5)
SODIUM	898,000	618,000	563,000	NA	NA	89,100	95,400
VANADIUM	3.7	7.6	ND (3.9)	NA	NA	8.5	ND (11.0)
ZINC	ND (6.5)	4.8	ND (6.1)	NA	NA	9.6	2.9
Cyanide (ug/L)							
CYANIDE	NA	ND (10.0)	ND (10.0)	ND (0.6)	1.5	ND (10.0)	ND (10.0)
Volatile Organic Compound (ug/L)							
1,2-DICHLOROBENZENE	NA	NA	NA	ND (1)	ND (0.5)	NA	ND (1)
1,4-DICHLOROBENZENE	NA	NA	NA	ND (1)	ND (0.5)	NA	ND (1)
CHLOROFORM	ND (0.5)	0.6 *	ND (5)	ND (1)	ND (0.5)	ND (5)	ND (0.5)
METHYLENE CHLORIDE	ND (0.5)	ND (5)	ND (5)	ND (1)	ND (0.5)	ND (1)	ND (5)
TRICHLOROETHENE	ND (0.5)	ND (0.5)	ND (5)	ND (1)	ND (0.5)	ND (5)	ND (0.5)

TABLE 4.3-9 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09MW52A	IR09P041A	IR09P041A	IR09P041A	IR09P041A	IR09PPY1	IR09PPY1
Sample Number	9620J110	9141X202	9151X343	9408X239	9435E167	9017E113	9101X028
Sample Date	05/13/96	10/07/91	12/17/91	02/24/94	09/02/94	04/24/90	01/03/91
Semivolatile Organic Compound (ug/L)							
ACENAPHTHYLENE	ND (10)	ND (2)	ND (2)	ND (10)	ND (10)	ND (10)	ND (2)
BENZO(A)PYRENE	ND (10)	0.06 *	0.1 *	ND (10)	ND (10)	ND (10)	ND (0.5)
BENZO(B)FLUORANTHENE	ND (10)	0.04	0.06	ND (10)	ND (10)	ND (10)	ND (0.2)
BENZO(K)FLUORANTHENE	ND (10)	ND (0.02)	0.03	ND (10)	ND (10)	ND (10)	ND (0.2)
BIS(2-ETHYLHEXYL)PHTHALATE	ND (9)	NA	NA	ND (10)	ND (4)	ND (10)	NA
FLUORENE	ND (10)	ND (0.2)	ND (0.2)	ND (10)	ND (10)	ND (10)	ND (0.2)
TPH-Purgeable (ug/L)							
TPH-GASOLINE	ND (50)	ND (500)	ND (500)	NA	NA	ND (500)	ND (500)
TPH-Extractable (ug/L)							
TPH-MOTOR OIL	ND (100)	NA	NA	NA	NA	NA	NA
Anion (ug/L)							
CHLORIDE	5,170,000	736,000	817,000	NA	NA	113,000	173,000
FLUORIDE	350	ND (5,000)	NA	NA	NA	NA	NA
NITRATE	ND (400)	ND (500)	170	NA	NA	1,000	1,600
NITRITE	ND (6,000)	ND (5,000)	ND (1,000)	NA	NA	NA	NA
ORTHOPHOSPHATE	4,600	ND (2,000)	ND (200)	NA	NA	ND (200)	ND (200)
SULFATE	357,000	296,000	247,000	NA	NA	269,000	220,000
Solids (ug/L)							
TOTAL DISSOLVED SOLIDS	790,000	2,200,000	2,000,000	NA	NA	790,000	810,000
Dioxins and Furans (ug/L)							
DIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA
pH (pH units)							
PH	7.3	7.2	7.3	NA	NA	7.1	7.2
Salinity (ppt)							
SALINITY	1.4	NA	NA	NA	NA	NA	NA

TABLE 4.3-9 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09PPY1	IR09PPY1	IR09PPY1	IR09PPY1	IR09PPY1	IR09PPY1	IR33MW116A
Sample Number	9128X087	9128X088	9151X336	9408X228	9419X273	9436X455	95432006
Sample Date	07/09/91	07/09/91	12/16/91	02/23/94	05/09/94	09/07/94	10/26/95
Metal (ug/L)							
ALUMINUM	ND (20.7)	ND (20.7)	ND (15.3)	NA	NA	NA	ND (18.8)
ANTIMONY	ND (16.7)	ND (16.7)	ND (27.6)	NA	NA	NA	ND (3.0)
ARSENIC	ND (1.6)	ND (1.6)	ND (1.4)	NA	NA	NA	ND (2.8)
BARIUM	38.8	38.8	53.5	NA	NA	NA	119
CADMIUM	ND (1.6)	ND (1.6)	ND (2.3)	NA	NA	NA	1.9
CALCIUM	45,100	45,400	51,200	NA	NA	NA	232,000
CHROMIUM	395 δ	377 δ	310 δ	345 δ	309 δ	193 δ	ND (0.50)
CHROMIUM VI	380 *B	370 *B	460 *B	409 *B	493 *B	221 *B	NA
COBALT	ND (6.3)	ND (6.3)	ND (10.4)	NA	NA	NA	4.7
COPPER	ND (2.5)	ND (2.5)	ND (6.4)	NA	NA	NA	ND (0.80)
IRON	ND (25.4)	ND (9.4)	ND (6.3)	NA	NA	NA	43.6
LEAD	ND (1.6)	1.8	ND (2.0)	NA	NA	NA	ND (1.2)
MAGNESIUM	82,600	85,700	117,000	NA	NA	NA	739,000
MANGANESE	317 *	323 *	446 *	NA	NA	NA	1,880 *
MERCURY	ND (0.20)	ND (0.20)	ND (0.40)	NA	NA	NA	ND (0.12)
MOLYBDENUM	ND (2.7)	ND (2.7)	ND (3.1)	NA	NA	NA	ND (6.2)
NICKEL	ND (14.1)	ND (14.1)	ND (17.8)	ND (11.5)	ND (18.0)	17.9 B	10.6 B
POTASSIUM	4,060	4,030	4,630	NA	NA	NA	187,000
SELENIUM	ND (3.4)	ND (3.4)	ND (2.5)	NA	NA	NA	ND (3.9)
SILVER	ND (1.1)	ND (1.1)	ND (4.9)	NA	NA	NA	ND (0.70)
SODIUM	97,600	97,400	110,000	NA	NA	NA	5,080,000
VANADIUM	ND (11.7)	ND (10.1)	8.6	NA	NA	NA	3.1
ZINC	ND (2.3)	ND (2.2)	ND (6.1)	NA	NA	NA	ND (14.8)
Cyanide (ug/L)							
CYANIDE	ND (10.0)	ND (10.0)	ND (10.0)	ND (3)	ND (4.3)	1.6	NA
Volatile Organic Compound (ug/L)							
1,2-DICHLOROBENZENE	ND (1)	ND (1)	NA	ND (1)	ND (0.5)	0.5	NA
1,4-DICHLOROBENZENE	ND (1)	ND (1)	NA	ND (1)	ND (0.5)	0.3	NA
CHLOROFORM	ND (0.5)	ND (0.5)	ND (5)	ND (1)	ND (0.5)	ND (0.5)	ND (0.5)
METHYLENE CHLORIDE	ND (5)	ND (5)	ND (5)	ND (1)	ND (0.5)	ND (0.5)	ND (0.5)
TRICHLOROETHENE	ND (0.5)	ND (0.5)	ND (5)	ND (1)	ND (0.5)	ND (0.5)	ND (0.5)

TABLE 4.3-9 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09PPY1	IR09PPY1	IR09PPY1	IR09PPY1	IR09PPY1	IR09PPY1	IR33MW116A
Sample Number	9128X087	9128X088	9151X336	9408X228	9419X273	9436X455	95432006
Sample Date	07/09/91	07/09/91	12/16/91	02/23/94	05/09/94	09/07/94	10/26/95
Semivolatile Organic Compound (ug/L)							
ACENAPHTHYLENE	ND (2)	ND (2)	ND (2)	ND (10)	ND (10)	ND (10)	ND (10)
BENZO(A)PYRENE	ND (0.5)	ND (0.5)	ND (0.5)	ND (10)	ND (10)	ND (10)	ND (10)
BENZO(B)FLUORANTHENE	ND (0.2)	ND (0.2)	0.03	ND (10)	ND (10)	ND (10)	ND (10)
BENZO(K)FLUORANTHENE	ND (0.2)	ND (0.2)	ND (0.02)	ND (10)	ND (10)	ND (10)	ND (10)
BIS(2-ETHYLHEXYL)PHTHALATE	NA	NA	NA	ND (4)	ND (16)	ND (10)	ND (4)
FLUORENE	ND (0.2)	ND (0.7)	ND (0.2)	ND (10)	ND (10)	ND (10)	ND (10)
TPH-Purgeable (ug/L)							
TPH-GASOLINE	ND (500)	ND (500)	ND (500)	NA	NA	NA	ND (50)
TPH-Extractable (ug/L)							
TPH-MOTOR OIL	NA	NA	NA	NA	NA	NA	ND (100)
Anion (ug/L)							
CHLORIDE	139,000	129,000	202,000	NA	NA	NA	NA
FLUORIDE	NA	NA	NA	NA	NA	NA	NA
NITRATE	2,200	1,900	2,800	NA	NA	NA	NA
NITRITE	NA	NA	ND (500)	NA	NA	NA	NA
ORTHOPHOSPHATE	ND (200)	ND (200)	ND (200)	NA	NA	NA	NA
SULFATE	196,000	202,000	296,000	NA	NA	NA	NA
Solids (ug/L)							
TOTAL DISSOLVED SOLIDS	780,000	750,000	1,100,000	NA	NA	NA	NA
Dioxins and Furans (ug/L)							
DIBENZOFURAN	0.009	0.01	NA	NA	NA	NA	NA
pH (pH units)							
PH	7.5	7.6	7.3	NA	NA	NA	7.4
Salinity (ppt)							
SALINITY	NA	NA	NA	NA	NA	NA	NA

TABLE 4.3-9 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33MW116A	IR33MW116A	PA50MW12A	PA50MW12A	PA50MW12A
Sample Number	9609J892	9614Z025	9317B107	9607J863	9612J938
Sample Date	02/28/96	04/04/96	04/28/93	02/12/96	03/19/96
Metal (ug/L)					
ALUMINUM	ND (19.1)	ND (20.4)	ND (35.5)	ND (18.0)	ND (45.6)
ANTIMONY	ND (1.6)	ND (1.2)	15.8 *δ	ND (1.6)	ND (1.6)
ARSENIC	ND (5.8)	ND (4.0)	7.5 *	ND (4.0)	4.1 *
BARIUM	34.7	31.6	254	273	299
CADMIUM	ND (0.20)	ND (0.30)	ND (1.0)	ND (0.20)	ND (0.20)
CALCIUM	103,000	71,000	188,000	124,000	126,000
CHROMIUM	ND (0.40)	ND (0.70)	23.2	ND (0.54)	ND (1.4)
CHROMIUM VI	ND (20.0)	ND (10.0)	ND (10.0)	ND (10.0)	30.0 *
COBALT	2.4	ND (1.4)	4.2	9.2	7.6
COPPER	1.6	ND (2.0)	ND (4.1)	ND (1.6)	ND (0.88)
IRON	119	46.6	ND (18.8)	ND (164)	ND (19.8)
LEAD	ND (0.80)	ND (1.0)	ND (13.0)	ND (0.80)	ND (0.80)
MAGNESIUM	297,000	214,000	761,000	630,000	666,000
MANGANESE	908 *	532 *	938 *	1,820 *	1,580 *
MERCURY	ND (0.22)	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)
MOLYBDENUM	10.9	13.5	ND (4.2)	ND (3.0)	ND (2.6)
NICKEL	17.0 B	12.3 B	50.9 B	51.2 B	53.1 B
POTASSIUM	89,700	118,000	25,200	20,200	20,900
SELENIUM	ND (2.3)	ND (2.2)	ND (2.2)	2.4	4.8
SILVER	ND (0.50)	ND (0.70)	ND (1.3)	ND (0.50)	ND (0.50)
SODIUM	2,490,000	1,830,000	1,180,000	1,150,000	1,190,000
VANADIUM	4.1	3.3	2.5	10.4	ND (5.6)
ZINC	ND (11.3)	7.3	ND (27.7)	ND (8.4)	ND (10.5)
Cyanide (ug/L)					
CYANIDE	NA	NA	ND (0.40)	NA	ND (0.80)
Volatile Organic Compound (ug/L)					
1,2-DICHLOROBENZENE	NA	NA	NA	NA	NA
1,4-DICHLOROBENZENE	NA	NA	NA	NA	NA
CHLOROFORM	ND (0.5)	ND (0.5)	NA	ND (0.5)	NA
METHYLENE CHLORIDE	ND (0.5)	ND (0.5)	NA	ND (0.5)	NA
TRICHLOROETHENE	ND (0.5)	ND (0.5)	NA	ND (0.5)	NA

TABLE 4.3-9 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33MW116A	IR33MW116A	PA50MW12A	PA50MW12A	PA50MW12A
Sample Number	9609J892	9614Z025	9317B107	9607J863	9612J938
Sample Date	02/28/96	04/04/96	04/28/93	02/12/96	03/19/96
Semivolatile Organic Compound (ug/L)					
ACENAPHTHYLENE	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
BENZO(A)PYRENE	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
BENZO(B)FLUORANTHENE	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
BENZO(K)FLUORANTHENE	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
BIS(2-ETHYLHEXYL)PHTHALATE	ND (4)	28 *δ	ND (10)	ND (4)	ND (4)
FLUORENE	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
TPH-Purgeable (ug/L)					
TPH-GASOLINE	ND (50)	ND (50)	NA	ND (50)	NA
TPH-Extractable (ug/L)					
TPH-MOTOR OIL	ND (100)	ND (100)	NA	ND (100)	70
Anion (ug/L)					
CHLORIDE	NA	2,110,000	NA	NA	2,560,000
FLUORIDE	NA	240	NA	NA	ND (100)
NITRATE	NA	ND (30.0)	NA	NA	890
NITRITE	NA	ND (300)	NA	NA	ND (30,000)
ORTHOPHOSPHATE	NA	ND (500)	NA	NA	ND (250)
SULFATE	NA	404,000	NA	NA	461,000
Solids (ug/L)					
TOTAL DISSOLVED SOLIDS	NA	4,200,000	NA	NA	5,100,000
Dioxins and Furans (ug/L)					
DIBENZOFURAN	NA	NA	NA	NA	NA
pH (pH units)					
PH	7.4	7.8	NA	7.4	7.3
Salinity (ppt)					
SALINITY	NA	3.9	NA	NA	4.5

TABLE 4.3-9 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

NA	Not analyzed
ND()	Not detected (detection limit in parentheses)
ppt	Parts per thousand
µg/L	Microgram per liter
*	Detected concentration greater than U.S. Environmental Protection Agency Region IX preliminary remediation goals (PRG) for tap water
β	Detected concentration greater than National Ambient Water Quality Criteria (NAWQC) based on 4-day average study of saltwater aquatic life
δ	Detected concentration greater than maximum contaminant level (MCL) U.S. Environmental Protection Agency Title 40 Code of Federal Regulations or California Code of Regulations Title 22 MCL used, whichever is more stringent
▒	Detected concentration greater than at least one screening criterion.

TABLE 4.3-10

SUMMARY OF HYDROPUNCH GROUNDWATER ANALYTICAL TESTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
IR09B045	9415C143			√																		
IR09B046	9415C136			√																		
IR09B048	9430A990			√																		
IR09B049	9430A991			√																		
IR33B114	9531C072																		√	√		√
IR33MW116A	9531C064																		√	√		√

Notes:

CHROM	CHROMIUM VI
CYAN	Cyanide
DIOXIN	Dioxins and Furans
O&G	Total oil and grease
PAH	Polynuclear aromatic hydrocarbons
PCTMST	Percent moisture
PEST	Pesticides/polychlorinated biphenyls
PHYS	Physical characteristic
SALIN	Salinity
SVOC	Semivolatile organic compounds
SOLIDS	Total dissolved solids
TOC	Total organic carbon
TMICROB	Coliform
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
VOC	Volatile organic compounds

TABLE 4.3-11

STATISTICAL SUMMARY OF HYDROPUNCH GROUNDWATER ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Tap Water PRG Value	Above[e] PRG	MCL Value[f]	Above[g] MCL	NAWQC Value	Above[h] NAWQC
TPHEXT	TPH-DIESEL	140	1,800	970	UG/L	300	2	2	100	2i				
	TPH-MOTOR OIL	3,700	3,700	3,700	UG/L	500	2	1	100	1i				

TABLE 4.3-11 (Continued)

STATISTICAL SUMMARY OF HYDROPUNCH GROUNDWATER ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

CYAN	Cyanide
EPA	U.S. Environmental Protection Agency
MCL	Maximum contaminant level
NAWQC	National Ambient Water Quality Criteria
O&G	Total oil and grease
PCTMST	Percent moisture
PEST	Pesticide/polychlorinated biphenyl
PPT	Parts per thousand
PRG	Preliminary remediation goal
SALIN	Salinity
SVOC	Semivolatile organic compound
TMICROB	Coliform
TOC	Total organic carbon
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
UG/L	Microgram per liter
VOC	Volatile organic compound

a Organic results of less than 10 are reported to one significant figure, and results of greater than or equal to 10 are reported to two significant figures. Inorganic results of less than 10 are reported to two significant figures, and results of greater than or equal to 10 are reported to three significant figures. Values that are not nondetects are compared to screening criteria before the significant figure rule is applied. Both the value and the screening criteria are then rounded for reporting purposes.

b Blank boxes indicate that screening critera have not been established for these analytes.

c Total number of samples analyzed

d Total number of samples showing concentrations greater than detection limit

e Total number of samples showing concentrations greater than tap water PRG
California-modified PRGs were used for the following analytes: 1,2-Dibromo-3-chloropropane, benzo[a]pyrene, benzo[k]fluoranthene, cadmium, chromium VI, chrysene, lead, nickel, and tetrachloroethylene (PCE).
For the analytes listed below, Region IX PRGs are not available; therefore, PRGs for similar chemicals were used as follows:

Analyte:	Similar Analyte:
2-Methylnapthalene	Naphthalene
Acenaphthylene	Acenaphthene
Alpha-chlordane	Chlordane
Aroclor-1260	Polychlorinated biphenyls
Benzo(g,h,i)perylene	Naphthalene
Delta BHC	HCH-technical
Endosulfan I	Endosulfan
Endosulfan sulfate	Endosulfan
Endrin aldehyde	Endrin
Endrin ketone	Endrin
Gamma-chlordane	Chlordane
Phenanthrene	Naphthalene

f EPA Title 40 Code of Federal Regulations or California Code of Regulations Title 22 MCL used, whichever is more stringent

g Total number of samples showing concentrations greater than MCL

h Total number of samples showing concentrations greater than NAWQC;
NAWQC based on 4-day average study of saltwater aquatic life

i Total number of samples showing concentrations greater than TPH, TRPH, or O&G screening level, not PRG value

TABLE 4.3-12

HYDROPUNCH GROUNDWATER ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B114	IR33MW116A
Sample Number	9531C072	9531C064
Sample Date	08/02/95	07/31/95
TPH-Extractable (ug/L)		
TPH-DIESEL	140	1,800
TPH-MOTOR OIL	ND (100)	3,700

Notes:

NA	Not analyzed
ND()	Not detected (detection limit in parentheses)
ppt	Parts per thousand
µg/L	Microgram per liter

TABLE 4.3-13

SUMMARY OF GRAB GROUNDWATER ANALYTICAL TESTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
IR09B047	9415C145			√																		
IR09B050	9431R493			√																		
IR09B053	9606G086			√			√															
IR09MW45F	9430A989			√																		

Notes:

CHROM	CHROMIUM VI
CYAN	Cyanide
DIOXIN	Dioxins and Furans
O&G	Total oil and grease
PAH	Polynuclear aromatic hydrocarbons
PCTMST	Percent moisture
PEST	Pesticides/polychlorinated biphenyls
PHYS	Physical characteristic
SALIN	Salinity
SVOC	Semivolatile organic compounds
SOLIDS	Total dissolved solids
TOC	Total organic carbon
TMICROB	Coliform
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
VOC	Volatile organic compounds

TABLE 4.3-14

STATISTICAL SUMMARY OF GRAB GROUNDWATER ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Tap Water PRG Value	Above[e] PRG	MCL Value[f]	Above[g] MCL	NAWQC Value	Above[h] NAWQC
METAL	BARIUM	30.8	30.8	30.8	UG/L	0.30	1	1	2,600	0	1,000	0		
	CALCIUM	12,200	12,200	12,200	UG/L	14.2	1	1						
	CHROMIUM	16.0	16.0	16.0	UG/L	0.40	1	1			50.0	0		
	CHROMIUM VI	13.7	42.9	24.9	UG/L	10.0	4	3	0.16	3			50.0	0
	COBALT	0.40	0.40	0.40	UG/L	0.40	1	1						
	MAGNESIUM	48,500	48,500	48,500	UG/L	16.3	1	1						
	POTASSIUM	812	812	812	UG/L	21.8	1	1						
	SODIUM	80,400	80,400	80,400	UG/L	168	1	1						
	VANADIUM	6.9	6.9	6.9	UG/L	0.40	1	1	260	0				

TABLE 4.3-14 (Continued)

STATISTICAL SUMMARY OF GRAB GROUNDWATER ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

CYAN	Cyanide
EPA	U.S. Environmental Protection Agency
MCL	Maximum contaminant level
NAWQC	National Ambient Water Quality Criteria
O&G	Total oil and grease
PCTMST	Percent moisture
PEST	Pesticide/polychlorinated biphenyl
PPT	Parts per thousand
PRG	Preliminary remediation goal
SALIN	Salinity
SVOC	Semivolatile organic compound
TMICROB	Coliform
TOC	Total organic carbon
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
UG/L	Microgram per liter
VOC	Volatile organic compound

a Organic results of less than 10 are reported to one significant figure, and results of greater than or equal to 10 are reported to two significant figures. Inorganic results of less than 10 are reported to two significant figures, and results of greater than or equal to 10 are reported to three significant figures. Values that are not nondetects are compared to screening criteria before the significant figure rule is applied. Both the value and the screening criteria are then rounded for reporting purposes.

b Blank boxes indicate that screening critera have not been established for these analytes.

c Total number of samples analyzed

d Total number of samples showing concentrations greater than detection limit

e Total number of samples showing concentrations greater than tap water PRG
California-modified PRGs were used for the following analytes: 1,2-Dibromo-3-chloropropane, benzo[a]pyrene, benzo[k]fluoranthene, cadmium, chromium VI, chrysene, lead, nickel, and tetrachloroethylene (PCE).
For the analytes listed below, Region IX PRGs are not available; therefore, PRGs for similar chemicals were used as follows:

Analyte:	Similar Analyte:
2-Methylnapthalene	Naphthalene
Acenaphthylene	Acenaphthene
Alpha-chlordane	Chlordane
Aroclor-1260	Polychlorinated biphenyls
Benzo(g,h,i)perylene	Naphthalene
Delta BHC	HCH-technical
Endosulfan I	Endosulfan
Endosulfan sulfate	Endosulfan
Endrin aldehyde	Endrin
Endrin ketone	Endrin
Gamma-chlordane	Chlordane
Phenanthrene	Naphthalene

f EPA Title 40 Code of Federal Regulations or California Code of Regulations Title 22 MCL used, whichever is more stringent

g Total number of samples showing concentrations greater than MCL

h Total number of samples showing concentrations greater than NAWQC;
NAWQC based on 4-day average study of saltwater aquatic life

i Total number of samples showing concentrations greater than TPH, TRPH, or O&G screening level, not PRG value

TABLE 4.3-15

GRAB GROUNDWATER ANALYTICAL RESULTS - IR-09
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09B047	IR09B050	IR09B053
Sample Number	9415C145	9431R493	9606G086
Sample Date	04/14/94	08/04/94	02/06/96
Metal (ug/L)			
BARIUM	NA	NA	30.8
CALCIUM	NA	NA	12,200
CHROMIUM	NA	NA	16.0
CHROMIUM VI	13.7 *	42.9 *	18.0 *
COBALT	NA	NA	0.40
MAGNESIUM	NA	NA	48,500
POTASSIUM	NA	NA	812
SODIUM	NA	NA	80,400
VANADIUM	NA	NA	6.9

Notes:

NA	Not analyzed
ND()	Not detected (detection limit in parentheses)
ppt	Parts per thousand
µg/L	Microgram per liter
*	Detected concentration greater than U.S. Environmental Protection Agency Region IX preliminary remediation goals (PRG) for tap water
▒	Detected concentration greater than at least one screening criterion.

TABLE 4.8-1

SUMMARY OF OTHER SEDIMENT ANALYTICAL TESTS - IR-33 NORTH HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
PA33FD17	9312X948						✓	✓		✓	✓	✓				✓			✓	✓		✓
PA33FS20	9308A621			✓			✓			✓												
PA33SU15	9308A622			✓			✓	✓		✓	✓					✓			✓	✓		✓

Notes:

CHROM	CHROMIUM VI
CYAN	Cyanide
DIOXIN	Dioxins and Furans
O&G	Total oil and grease
PAH	Polynuclear aromatic hydrocarbons
PCTMST	Percent moisture
PEST	Pesticides/polychlorinated biphenyls
PHYS	Physical characteristic
SALIN	Salinity
SVOC	Semivolatile organic compounds
SOLIDS	Total dissolved solids
TOC	Total organic carbon
TMICROB	Coliform
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
VOC	Volatile organic compounds

TABLE 4.8-2

STATISTICAL SUMMARY OF OTHER SEDIMENT ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Residential PRG Value	Above[e] Res PRG	Industrial PRG Value	Above[f] Ind PRG	HPAL Value	Above[g] HPAL
METAL	ALUMINUM	8,020	22,700	15,900	MG/KG	4.4	3	3	76,700	0	100,000	0		
	ANTIMONY	28.3	111	63.5	MG/KG	4.0	3	3	30.7	2	681	0	9.05	3
	ARSENIC	5.7	32.7	20.0	MG/KG	0.50	3	3	0.32	3	2.0	3	11.10	2
	BARIUM	356	876	582	MG/KG	0.79	3	3	5,340	0	100,000	0	314.36	3
	BERYLLIUM	0.77	0.77	0.77	MG/KG	0.14	3	1	0.14	1	1.1	0	0.71	1
	CADMIUM	9.2	13.8	12.1	MG/KG	0.57	3	3	9.0	3	852	0	3.14	3
	CALCIUM	48,200	69,600	58,900	MG/KG	15.1	3	2						
	CHROMIUM	196	3,760	1,710	MG/KG	0.49	3	3	211	2	1,580	1	h	2
	COBALT	26.2	78.1	48.5	MG/KG	0.82	3	3					h	2
	COPPER	1,370	2,220	1,770	MG/KG	0.06	3	3	2,850	0	63,300	0	124.31	3
	IRON	33,100	86,800	67,900	MG/KG	4.6	3	3						
	LEAD	907	4,490	2,890	MG/KG	3.2	3	3	130	3	1,000	2	8.99	3
	MAGNESIUM	9,310	13,400	11,400	MG/KG	25.0	3	3						
	MANGANESE	328	1,430	990	MG/KG	0.22	3	3	382	2	8,300	0	1431.18	0
	MERCURY	0.40	6.0	2.3	MG/KG	0.07	3	3	23.0	0	511	0	2.28	1
	MOLYBDENUM	13.0	137	85.7	MG/KG	0.68	3	3	383	0	8,520	0	2.68	3
	NICKEL	64.6	163	101	MG/KG	1.2	3	3	150	1	34,100	0	h	0
	POTASSIUM	799	5,660	2,820	MG/KG	144	3	3						
	SILVER	3.3	4.1	3.7	MG/KG	0.50	3	2	383	0	8,520	0	1.43	2
	SODIUM	613	10,700	5,650	MG/KG	29.9	3	2						
	VANADIUM	52.6	66.7	58.9	MG/KG	0.84	3	3	537	0	11,900	0	117.17	0
	ZINC	2,550	22,100	9,160	MG/KG	0.36	3	3	23,000	0	100,000	0	109.86	3

TABLE 4.8-2 (Continued)

STATISTICAL SUMMARY OF OTHER SEDIMENT ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Residential PRG Value	Above[e] Res PRG	Industrial PRG Value	Above[f] Ind PRG	HPAL Value	Above[g] HPAL
VOC	1,2-DICHLOROETHENE (TOTAL)	620	620	620	UG/KG	1,800	2	1	75,000	0	270,000	0		
	TETRACHLOROETHENE	4,300	4,300	4,300	UG/KG	1,800	2	1	7,000	0	25,000	0		
	XYLENE (TOTAL)	7,600	7,600	7,600	UG/KG	19,000	2	1	980,000	0	980,000	0		
SVOC	2-METHYLNAPHTHALENE	11,000	36,000	24,000	UG/KG	85,000	2	2	800,000	0	800,000	0		
	FLUORANTHENE	56,000	56,000	56,000	UG/KG	140,000	2	1	2,600,000	0	27,000,000	0		
	NAPHTHALENE	8,800	64,000	37,000	UG/KG	85,000	2	2	800,000	0	800,000	0		
	PHENANTHRENE	100,000	100,000	100,000	UG/KG	140,000	2	1	800,000	0	800,000	0		
	PYRENE	82,000	82,000	82,000	UG/KG	140,000	2	1	2,000,000	0	20,000,000	0		
PEST	AROCLOR-1260	610	3,000	1,800	UG/KG	71	2	2	66	2	340	2		
TPHPRG	TPH-GASOLINE	480	480	480	MG/KG	75	2	1	100	1i				
TPHEXT	TPH-DIESEL	3,000	5,000	4,000	MG/KG	510	2	2	1,000	2i				
O&G	TOTAL OIL & GREASE	11,000	80,000	46,000	MG/KG	36	2	2	1,000	2i				

TABLE 4.8-2 (Continued)

STATISTICAL SUMMARY OF OTHER SEDIMENT ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

CYAN	Cyanide
EPA	U.S. Environmental Protection Agency
HPAL	Hunters Point ambient level
MG/KG	Milligram per kilogram
O&G	Total oil and grease
PCTMST	Percent moisture
PEST	Pesticide/polychlorinated biphenyl
PHYS	Physical characteristic
PRG	Preliminary remediation goal
SALIN	Salinity
SVOC	Semivolatile organic compound
TMICROB	Coliform
TOC	Total organic carbon
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
UG/KG	Microgram per kilogram
VOC	Volatile organic compound

a Organic results of less than 10 are reported to one significant figure, and results of greater than or equal to 10 are reported to two significant figures. Inorganic results of less than 10 are reported to two significant figures, and results of greater than or equal to 10 are reported to three significant figures. Values that are not nondetects are compared to screening criteria before the significant figure rule is applied. Both the value and the screening criteria are then rounded for reporting purposes.

b Blank boxes indicate that screening critera have not been established for these analytes.

c Total number of samples analyzed

d Total number of samples showing concentrations greater than detection limit

e Total number of samples showing concentrations greater than residential PRG

f Total number of samples showing concentrations greater than industrial PRG
California-modified PRGs were used for the following analytes: 1,2-Dibromo-3-chloropropane, benzo[a]pyrene, benzo[k]fluoranthene, cadmium, chromium VI, chrysene, lead, nickel, and tetrachloroethylene (PCE).
For the analytes listed below, Region IX PRGs are not available; therefore, PRGs for similar chemicals were used as follows:

Analyte:	Similar Analyte:
2-Methylnapthalene	Naphthalene
Acenaphthylene	Acenaphthene
Alpha-chlordane	Chlordane
Aroclor-1260	Polychlorinated biphenyls
Benzo(g,h,i)perylene	Naphthalene
Delta BHC	HCH-technical
Endosulfan I	Endosulfan
Endosulfan sulfate	Endosulfan
Endrin aldehyde	Endrin
Endrin ketone	Endrin
Gamma-chlordane	Chlordane
Phenanthrene	Naphthalene

g Total number of samples showing concentrations greater than HPAL

h HPALs for chromium, cobalt, and nickel are based on the concentration of magnesium in each sample; thus, no single value applies to all samples. The range of HPAL values for chromium, cobalt, and nickel are 184.041 to 236.341, 30.252 to 36.510, and 219.147 to 309.178 mg/kg respectively.

i Total number of samples showing concentrations greater than TPH, TRPH, or O&G screening level, not PRG value

TABLE 4.8-3

OTHER SEDIMENT ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	PA33FD17	PA33FS20	PA33SU15
Sampling Depth (feet bgs)	0.00	0.00	0.00
Sample Number	9312X948	9308A621	9308A622
Sample Date	03/23/93	02/25/93	02/25/93
Metal (mg/kg)			
ALUMINUM	8,020	22,700	16,900
ANTIMONY	28.3 α	111 *α	51.1 *α
ARSENIC	5.7 *#	32.7 *#α	21.6 *#α
BARIUM	356 α	876 α	513 α
BERYLLIUM	ND (0.20)	0.77 *α	ND (0.85)
CADMIUM	9.2 *α	13.8 *α	13.2 *α
CALCIUM	ND (7,890)	69,600	48,200
CHROMIUM	1,180 *α	3,760 *#α	196
COBALT	26.2	78.1 α	41.2 α
COPPER	1,370 α	1,730 α	2,220 α
IRON	33,100	83,700	86,800
LEAD	4,490 *#α	3,270 *#α	907 *α
MAGNESIUM	9,310	13,400	11,400
MANGANESE	328	1,430 *	1,210 *
MERCURY	6.0 α	0.54	0.40
MOLYBDENUM	13.0 α	107 α	137 α
NICKEL	163 *	64.6	76.2
POTASSIUM	799	5,660	1,990
SILVER	ND (0.56)	3.3 α	4.1 α
SODIUM	ND (321)	10,700	613
VANADIUM	52.6	66.7	57.2
ZINC	2,550 α	22,100 α	2,770 α
Volatile Organic Compound (ug/kg)			
1,2-DICHLOROETHENE (TOTAL)	ND (19,000)	NA	620
TETRACHLOROETHENE	ND (19,000)	NA	4,300
XYLENE (TOTAL)	7,600	NA	ND (1,800)
Semivolatile Organic Compound (ug/kg)			
2-METHYLNAPHTHALENE	11,000	NA	36,000
FLUORANTHENE	ND (30,000)	NA	56,000
NAPHTHALENE	8,800	NA	64,000
PHENANTHRENE	ND (30,000)	NA	100,000
PYRENE	ND (30,000)	NA	82,000

TABLE 4.8-3 (Continued)

OTHER SEDIMENT ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	PA33FD17	PA33FS20	PA33SU15
Sampling Depth (feet bgs)	0.00	0.00	0.00
Sample Number	9312X948	9308A621	9308A622
Sample Date	03/23/93	02/25/93	02/25/93
Pesticide/Polychlorinated Biphenyl (ug/kg)			
AROCLOR-1260	3,000 *#	NA	610 *#
TPH-Purgeable (mg/kg)			
TPH-GASOLINE	480	NA	ND (7)
TPH-Extractable (mg/kg)			
TPH-DIESEL	5,000	NA	3,000
Oil and Grease (mg/kg)			
TOTAL OIL & GREASE	80,000	NA	11,000
Percent Moisture (%)			
% SOLIDS	67.3	84.8	70.6
pH (pH units)			
PH	7.1	NA	NA

Notes:

%	Percent
bgs	Below ground surface
mg/kg	Milligram per kilogram
NA	Not analyzed
ND()	Not detected (detection limit in parentheses)
µg/kg	Microgram per kilogram
*	Detected concentration greater than U.S. Environmental Protection Agency Region IX preliminary remediation goals (PRG) for residential use
#	Detected concentration greater than U.S. Environmental Protection Agency Region IX PRG for industrial use
α	Detected concentration greater than the Hunters Point ambient level.
▒	Detected concentration greater than at least one screening criterion.

TABLE 4.8-4

SUMMARY OF STORM DRAIN SEDIMENT ANALYTICAL TESTS - IR-33 NORTH HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
PA33SW12	9308A624			√			√	√		√	√		√			√			√	√		√
PA33SW14	9308A623			√			√	√		√	√					√			√	√		√

Notes:

CHROM	CHROMIUM VI
CYAN	Cyanide
DIOXIN	Dioxins and Furans
O&G	Total oil and grease
PAH	Polynuclear aromatic hydrocarbons
PCTMST	Percent moisture
PEST	Pesticides/polychlorinated biphenyls
PHYS	Physical characteristic
SALIN	Salinity
SVOC	Semivolatile organic compounds
SOLIDS	Total dissolved solids
TOC	Total organic carbon
TMICROB	Coliform
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
VOC	Volatile organic compounds

TABLE 4.8-5

STATISTICAL SUMMARY OF STORM DRAIN SEDIMENT ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Residential PRG Value	Above[e] Res PRG	Industrial PRG Value	Above[f] Ind PRG	HPAL Value	Above[g] HPAL
METAL	ALUMINUM	5,880	10,200	8,040	MG/KG	4.5	2	2	76,700	0	100,000	0		
	ANTIMONY	14.8	18.2	16.5	MG/KG	4.2	2	2	30.7	0	681	0	9.05	2
	ARSENIC	3.8	6.1	5.0	MG/KG	0.40	2	2	0.32	2	2.0	2	11.10	0
	BARIUM	1,010	1,080	1,050	MG/KG	0.82	2	2	5,340	0	100,000	0	314.36	2
	BERYLLIUM	0.19	0.37	0.28	MG/KG	0.17	2	2	0.14	2	1.1	0	0.71	0
	CADMIUM	4.6	11.9	8.2	MG/KG	0.60	2	2	9.0	1	852	0	3.14	2
	CALCIUM	7,050	11,200	9,140	MG/KG	16.5	2	2						
	CHROMIUM	115	244	179	MG/KG	0.51	2	2	211	1	1,580	0	h	1
	COBALT	14.3	18.2	16.3	MG/KG	0.86	2	2					h	0
	COPPER	746	829	788	MG/KG	0.06	2	2	2,850	0	63,300	0	124.31	2
	IRON	34,200	37,400	35,800	MG/KG	4.8	2	2						
	LEAD	1,790	2,050	1,920	MG/KG	3.4	2	2	130	2	1,000	2	8.99	2
	MAGNESIUM	9,840	12,900	11,400	MG/KG	26.1	2	2						
	MANGANESE	398	515	456	MG/KG	0.23	2	2	382	2	8,300	0	1431.18	0
	MERCURY	0.23	2.0	1.1	MG/KG	0.07	2	2	23.0	0	511	0	2.28	0
	MOLYBDENUM	8.1	71.2	39.7	MG/KG	0.71	2	2	383	0	8,520	0	2.68	2
	NICKEL	129	130	129	MG/KG	1.3	2	2	150	0	34,100	0	h	0
	POTASSIUM	509	1,030	770	MG/KG	150	2	2						
	SILVER	6.4	6.4	6.4	MG/KG	0.45	2	1	383	0	8,520	0	1.43	1
	SODIUM	343	667	505	MG/KG	32.7	2	2						
	VANADIUM	21.2	43.6	32.4	MG/KG	0.88	2	2	537	0	11,900	0	117.17	0
	ZINC	937	1,810	1,370	MG/KG	0.37	2	2	23,000	0	100,000	0	109.86	2

TABLE 4.8-5 (Continued)

STATISTICAL SUMMARY OF STORM DRAIN SEDIMENT ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Residential PRG Value	Above[e] Res PRG	Industrial PRG Value	Above[f] Ind PRG	HPAL Value	Above[g] HPAL
VOC	TETRACHLOROETHENE	62	62	62	UG/KG	83	2	1	7,000	0	25,000	0		
PEST	AROCLOR-1260	380	1,400	890	UG/KG	94	2	2	66	2	340	2		
TPHPRG	TPH-GASOLINE	9	9,900	5,000	MG/KG	1,500	2	2	100	1i				
TPHEXT	TPH-DIESEL	1,200	1,400	1,300	MG/KG	230	2	2	1,000	2i				
O&G	TOTAL OIL & GREASE	10,000	25,000	18,000	MG/KG	36	2	2	1,000	2i				

TABLE 4.8-5 (Continued)

STATISTICAL SUMMARY OF STORM DRAIN SEDIMENT ANALYTICAL RESULTS - IR-33 NORTH HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

CYAN	Cyanide
EPA	U.S. Environmental Protection Agency
HPAL	Hunters Point ambient level
MG/KG	Milligram per kilogram
O&G	Total oil and grease
PCTMST	Percent moisture
PEST	Pesticide/polychlorinated biphenyl
PHYS	Physical characteristic
PRG	Preliminary remediation goal
SALIN	Salinity
SVOC	Semivolatile organic compound
TMICROB	Coliform
TOC	Total organic carbon
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
UG/KG	Microgram per kilogram
VOC	Volatile organic compound

a Organic results of less than 10 are reported to one significant figure, and results of greater than or equal to 10 are reported to two significant figures. Inorganic results of less than 10 are reported to two significant figures, and results of greater than or equal to 10 are reported to three significant figures. Values that are not nondetects are compared to screening criteria before the significant figure rule is applied. Both the value and the screening criteria are then rounded for reporting purposes.

b Blank boxes indicate that screening critera have not been established for these analytes.

c Total number of samples analyzed

d Total number of samples showing concentrations greater than detection limit

e Total number of samples showing concentrations greater than residential PRG

f Total number of samples showing concentrations greater than industrial PRG

California-modified PRGs were used for the following analytes: 1,2-Dibromo-3-chloropropane, benzo[a]pyrene, benzo[k]fluoranthene, cadmium, chromium VI, chrysene, lead, nickel, and tetrachloroethylene (PCE).

For the analytes listed below, Region IX PRGs are not available; therefore, PRGs for similar chemicals were used as follows:

Analyte:	Similar Analyte:
2-Methylnapthalene	Naphthalene
Acenaphthylene	Acenaphthene
Alpha-chlordane	Chlordane
Aroclor-1260	Polychlorinated biphenyls
Benzo(g,h,i)perylene	Naphthalene
Delta BHC	HCH-technical
Endosulfan I	Endosulfan
Endosulfan sulfate	Endosulfan
Endrin aldehyde	Endrin
Endrin ketone	Endrin
Gamma-chlordane	Chlordane
Phenanthrene	Naphthalene

g Total number of samples showing concentrations greater than HPAL

h HPALs for chromium, cobalt, and nickel are based on the concentration of magnesium in each sample; thus, no single value applies to all samples. The range of HPAL values for chromium, cobalt, and nickel are 191.152 to 230.013, 31.127 to 35.773, and 230.882 to 297.844 mg/kg respectively.

i Total number of samples showing concentrations greater than TPH, TRPH, or O&G screening level, not PRG value

TABLE 4.8-6

STORM DRAIN SEDIMENT ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	PA33SW12	PA33SW14
Sampling Depth (feet bgs)	2.10	2.10
Sample Number	9308A624	9308A623
Sample Date	02/25/93	02/25/93
Metal (mg/kg)		
ALUMINUM	5,880	10,200
ANTIMONY	14.8 α	18.2 α
ARSENIC	3.8 *#	6.1 *#
BARIUM	1,010 α	1,080 α
BERYLLIUM	0.19 *	0.37 *
CADMIUM	11.9 *α	4.6 α
CALCIUM	7,050	11,200
CHROMIUM	115	244 *α
COBALT	14.3	18.2
COPPER	746 α	829 α
IRON	34,200	37,400
LEAD	1,790 *#α	2,050 *#α
MAGNESIUM	9,840	12,900
MANGANESE	398 *	515 *
MERCURY	0.23	2.0
MOLYBDENUM	71.2 α	8.1 α
NICKEL	129	130
POTASSIUM	509	1,030
SILVER	6.4 α	ND (1.9)
SODIUM	667	343
VANADIUM	21.2	43.6
ZINC	937 α	1,810 α
Volatile Organic Compound (ug/kg)		
TETRACHLOROETHENE	ND (15,000)	62
Pesticide/Polychlorinated Biphenyl (ug/kg)		
AROCLOR-1260	380 *#	1,400 *#
TPH-Purgeable (mg/kg)		
TPH-GASOLINE	9,900	9

TABLE 4.8-6 (Continued)

STORM DRAIN SEDIMENT ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	PA33SW12	PA33SW14
Sampling Depth (feet bgs)	2.10	2.10
Sample Number	9308A624	9308A623
Sample Date	02/25/93	02/25/93
TPH-Extractable (mg/kg)		
TPH-DIESEL	1,400	1,200
Oil and Grease (mg/kg)		
TOTAL OIL & GREASE	10,000	25,000
Percent Moisture (%)		
% SOLIDS	84.9	60.2

Notes:

%	Percent
bgs	Below ground surface
mg/kg	Milligram per kilogram
NA	Not analyzed
ND()	Not detected (detection limit in parentheses)
µg/kg	Microgram per kilogram
*	Detected concentration greater than U.S. Environmental Protection Agency Region IX preliminary remediation goals (PRG) for residential use
#	Detected concentration greater than U.S. Environmental Protection Agency Region IX PRG for industrial use
α	Detected concentration greater than the Hunters Point ambient level.
	Detected concentration greater than at least one screening criterion.

TABLE 4.8-7

SUMMARY OF OTHER WATER ANALYTICAL TESTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
PA50SN405	9317B103			✓	✓		✓				✓					✓	✓		✓	✓	✓	✓
PA50SN405	9317B104			✓	✓		✓				✓					✓	✓		✓	✓	✓	✓

Notes:

CHROM	CHROMIUM VI
CYAN	Cyanide
DIOXIN	Dioxins and Furans
O&G	Total oil and grease
PAH	Polynuclear aromatic hydrocarbons
PCTMST	Percent moisture
PEST	Pesticides/polychlorinated biphenyls
PHYS	Physical characteristic
SALIN	Salinity
SVOC	Semivolatile organic compounds
SOLIDS	Total dissolved solids
TOC	Total organic carbon
TMICROB	Coliform
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
VOC	Volatile organic compounds

TABLE 4.8-8

STATISTICAL SUMMARY OF OTHER WATER ANALYTICAL RESULTS - IR-33 NORTH HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Tap Water PRG Value	Above[e] PRG	MCL Value[f]	Above[g] MCL	NAWQC Value	Above[h] NAWQC
METAL	ANTIMONY	13.8	13.8	13.8	UG/L	13.8	1	1	15.0	0	6.0	1	500	0
	BARIUM	62.9	62.9	62.9	UG/L	4.9	1	1	2,600	0	1,000	0		
	CALCIUM	109,000	109,000	109,000	UG/L	39.7	1	1						
	IRON	225	225	225	UG/L	18.8	1	1						
	LEAD	4.2	4.2	4.2	UG/L	1.3	1	1	4.0	1	50.0	0	8.1	0
	MAGNESIUM	432,000	432,000	432,000	UG/L	43.9	1	1						
	MANGANESE	735	735	735	UG/L	0.60	1	1	180	1				
	POTASSIUM	117,000	117,000	117,000	UG/L	315	1	1						
	SELENIUM	18.1	18.1	18.1	UG/L	2.2	1	1	180	0	50.0	0	71.0	0
	SODIUM	3,270,000	3,270,000	3,270,000	UG/L	51.3	1	1						
	VANADIUM	2.9	2.9	2.9	UG/L	1.9	1	1	260	0				
SVOC	4-METHYLPHENOL	17	17	17	UG/L	10	1	1	180	0				
TMICROB	FECAL COLIFORM	1,600	1,600	1,600	j	2	1	1						

TABLE 4.8-8 (Continued)

STATISTICAL SUMMARY OF OTHER WATER ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

CYAN	Cyanide
EPA	U.S. Environmental Protection Agency
MCL	Maximum contaminant level
NAWQC	National Ambient Water Quality Criteria
O&G	Total oil and grease
PCTMST	Percent moisture
PEST	Pesticide/polychlorinated biphenyl
PPT	Parts per thousand
PRG	Preliminary remediation goal
SALIN	Salinity
SVOC	Semivolatile organic compound
TMICROB	Coliform
TOC	Total organic carbon
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
UG/L	Microgram per liter
VOC	Volatile organic compound

a Organic results of less than 10 are reported to one significant figure, and results of greater than or equal to 10 are reported to two significant figures. Inorganic results of less than 10 are reported to two significant figures, and results of greater than or equal to 10 are reported to three significant figures. Values that are not nondetects are compared to screening criteria before the significant figure rule is applied. Both the value and the screening criteria are then rounded for reporting purposes.

b Blank boxes indicate that screening critera have not been established for these analytes.

c Total number of samples analyzed

d Total number of samples showing concentrations greater than detection limit

e Total number of samples showing concentrations greater than tap water PRG
California-modified PRGs were used for the following analytes: 1,2-Dibromo-3-chloropropane, benzo[a]pyrene, benzo[k]fluoranthene, cadmium, chromium VI, chrysene, lead, nickel, and tetrachloroethylene (PCE).
For the analytes listed below, Region IX PRGs are not available; therefore, PRGs for similar chemicals were used as follows:

Analyte:	Similar Analyte:
2-Methylnapthalene	Naphthalene
Acenaphthylene	Acenaphthene
Alpha-chlordane	Chlordane
Aroclor-1260	Polychlorinated biphenyls
Benzo(g,h,i)perylene	Naphthalene
Delta BHC	HCH-technical
Endosulfan I	Endosulfan
Endosulfan sulfate	Endosulfan
Endrin aldehyde	Endrin
Endrin ketone	Endrin
Gamma-chlordane	Chlordane
Phenanthrene	Naphthalene

f EPA Title 40 Code of Federal Regulations or California Code of Regulations Title 22 MCL used, whichever is more stringent

g Total number of samples showing concentrations greater than MCL

h Total number of samples showing concentrations greater than NAWQC;
NAWQC based on 4-day average study of saltwater aquatic life

i Total number of samples showing concentrations greater than TPH, TRPH, or O&G screening level, not PRG value

j Most probable number of organisms per 100 milliliters (mpn/100 mL)

TABLE 4.8-9

OTHER WATER ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	PA50SN405	PA50SN405
Sample Number	9317B103	9317B104
Sample Date	04/27/93	04/27/93
Metal (ug/L)		
ANTIMONY	20.6 *δ	ND (13.8)
BARIUM	57.0	68.8
CALCIUM	ND (39.7)	218,000
IRON	212	238
LEAD	4.2 *	ND (13.0)
MAGNESIUM	277,000	587,000
MANGANESE	846 *	623 *
POTASSIUM	59,700	173,000
SELENIUM	25.2	ND (22.0)
SODIUM	2,070,000	4,470,000
VANADIUM	4.8	ND (1.9)
Semivolatile Organic Compound (ug/L)		
4-METHYLPHENOL	ND (10)	28
Coliform (mpn/100 mL)		
FECAL COLIFORM	1,600	1,600

Notes:

mpn/100 mL	Most probable number of organisms per 100 milliliters
NA	Not analyzed
ND()	Not detected (detection limit in parentheses)
µg/L	Microgram per liter
*	Detected concentration greater than U.S. Environmental Protection Agency Region IX preliminary remediation goals (PRG) for tap water
δ	Detected concentration greater than maximum contaminant level (MCL) U.S. Environmental Protection Agency Title 40 Code of Federal Regulations or California Code of Regulations Title 22 MCL used, whichever is more stringent
▒	Detected concentration greater than at least one screening criterion.

TABLE 4.8-10

SUMMARY OF SOIL ANALYTICAL TESTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
IR33B060A	9419L442						√			√	√	√				√			√	√	√	√
IR33B060A	9419L443						√			√	√	√				√			√	√	√	√
IR33B060A	9419L444						√			√	√	√				√			√	√	√	√
IR33B060A	9419L445						√			√	√	√				√			√	√	√	√
IR33B060B	9423R229						√			√	√	√				√			√	√	√	√
IR33B060B	9423R230						√			√	√	√				√			√	√	√	√
IR33B060B	9423R231						√			√	√	√				√			√	√	√	√
IR33B060B	9423R232						√			√	√	√				√			√	√	√	√
IR33B060B	9423R233						√			√	√	√				√			√	√	√	√
IR33B061	9415A789						√			√	√	√				√			√	√	√	√
IR33B061	9415A790						√			√	√	√				√			√	√	√	√
IR33B061	9415A792						√			√	√	√				√			√	√	√	√
IR33B061	9415A794						√			√	√	√				√			√	√	√	√
IR33B062	9414H569						√			√	√	√				√			√	√	√	√
IR33B062	9414H570						√			√	√	√				√			√	√	√	√
IR33B062	9414H571						√			√	√	√				√			√	√	√	√
IR33B063	9414H565						√			√	√	√				√			√	√	√	√
IR33B063	9414H566						√			√	√	√				√			√	√	√	√
IR33B063	9414H567						√			√	√	√				√			√	√	√	√
IR33B063	9414H568						√			√	√	√				√			√	√	√	√
IR33B064	9420C232						√			√	√	√				√			√	√	√	√
IR33B064	9420C233						√			√	√	√				√			√	√	√	√
IR33B064	9420C234						√			√	√	√				√			√	√	√	√
IR33B064	9420C235						√			√	√	√				√			√	√	√	√
IR33B064	9420C236						√			√	√	√				√			√	√	√	√
IR33B065	9420C240						√			√	√	√				√			√	√	√	√
IR33B065	9420C241						√			√	√	√				√			√	√	√	√
IR33B065	9420C242						√			√	√	√				√			√	√	√	√
IR33B066	9420C237						√			√	√	√				√			√	√	√	√
IR33B066	9420C238						√			√	√	√				√			√	√	√	√
IR33B066	9420C239						√			√	√	√				√			√	√	√	√
IR33B068	9419L432						√			√	√	√				√			√	√	√	√
IR33B068	9419L434						√			√	√	√				√			√	√	√	√
IR33B069	9419L438						√			√	√	√				√			√	√	√	√
IR33B069	9419L439						√			√	√	√				√			√	√	√	√
IR33B070	9415C127						√			√	√	√				√			√	√	√	√
IR33B070	9415C128						√			√	√	√				√			√	√	√	√

TABLE 4.8-10 (Continued)

SUMMARY OF SOIL ANALYTICAL TESTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
IR33B070	9415C130						√			√	√	√				√			√	√	√	√
IR33B078	9414A748						√			√	√	√				√			√	√	√	√
IR33B078	9414A749						√			√	√	√				√			√	√	√	√
IR33B078	9414A750						√			√	√	√				√			√	√	√	√
IR33B079	9434K050						√			√	√	√				√			√	√	√	√
IR33B079	9434K051						√			√	√	√				√			√	√	√	√
IR33B079	9434K052						√			√	√	√				√			√	√	√	√
IR33B079	9434K053						√			√	√	√				√			√	√	√	√
IR33B079	9435C500						√			√	√	√				√			√	√	√	√
IR33B080	9414A751						√			√	√	√				√			√	√	√	√
IR33B081	9427R393						√				√	√				√			√	√	√	√
IR33B081	9427R394						√				√	√				√			√	√	√	√
IR33B082	9427R390						√				√	√				√			√	√	√	√
IR33B082	9427R391						√				√	√				√			√	√	√	√
IR33B082	9427R392						√				√	√				√			√	√	√	√
IR33B083	9413L176						√			√	√	√				√			√	√	√	√
IR33B083	9413L177						√			√	√	√				√			√	√	√	√
IR33B083	9413L178						√			√	√	√				√			√	√	√	√
IR33B083	9413L179						√			√	√	√				√			√	√	√	√
IR33B083	9413L180						√			√	√	√				√			√	√	√	√
IR33B085	9413L183						√			√	√	√				√			√	√	√	√
IR33B085	9413L184						√			√	√	√				√			√	√	√	√
IR33B085	9413L185						√			√	√	√				√			√	√	√	√
IR33B085	9413L186						√			√	√	√				√			√	√	√	√
IR33B085	9413L187						√			√	√	√				√			√	√	√	√
IR33B085	9413L188						√			√	√	√				√			√	√	√	√
IR33B085	9413L189						√			√	√	√				√			√	√	√	√
IR33B086	9413A718						√			√	√	√				√			√	√	√	√
IR33B086	9413A719						√			√	√	√				√			√	√	√	√
IR33B086	9413A721						√			√	√	√				√			√	√	√	√
IR33B087	9413L193						√			√	√	√				√			√	√	√	√
IR33B087	9413L194						√			√	√	√				√			√	√	√	√
IR33B087	9413L195						√			√	√	√				√			√	√	√	√
IR33B087	9413L197						√			√	√	√				√			√	√	√	√
IR33B087	9413L198						√			√	√	√				√			√	√	√	√
IR33B087	9413L199						√			√	√	√				√			√	√	√	√

TABLE 4.8-10 (Continued)

SUMMARY OF SOIL ANALYTICAL TESTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
IR33B089	9413L163						√			√	√	√				√			√	√	√	√
IR33B089	9413L164						√			√	√	√				√			√	√	√	√
IR33B089	9413L165						√			√	√	√				√			√	√	√	√
IR33B089	9413L168						√			√	√	√				√			√	√	√	√
IR33B090	9431R494						√			√	√	√				√			√	√	√	√
IR33B090	9431R495						√			√	√	√				√			√	√	√	√
IR33B090	9431R496						√			√	√	√				√			√	√	√	√
IR33B090	9431R498						√			√	√	√				√			√	√	√	√
IR33B091	9413L170						√			√	√	√				√			√	√	√	√
IR33B091	9413L171						√			√	√	√				√			√	√	√	√
IR33B091	9413L172						√			√	√	√				√			√	√	√	√
IR33B091	9413L174						√			√	√	√				√			√	√	√	√
IR33B105	9423R243						√			√	√	√				√			√	√	√	√
IR33B105	9423R244						√			√	√	√				√			√	√	√	√
IR33B105	9423R245						√			√	√	√				√			√	√	√	√
IR33B106	9423R240						√			√	√	√				√			√		√	√
IR33B106	9423R241						√			√	√	√				√			√		√	√
IR33B106	9423R242						√			√	√	√				√			√	√	√	√
IR33B107	9423R249						√			√	√	√				√			√	√	√	√
IR33B107	9423R250						√			√	√	√				√			√	√	√	√
IR33B107	9423R251						√			√	√	√				√			√	√	√	√
IR33B108	9423R246						√			√	√	√				√			√	√	√	√
IR33B108	9423R247						√			√	√	√				√			√	√	√	√
IR33B108	9423R248						√			√	√	√				√			√	√	√	√
IR33MW61A	9431R476																		√	√		√
IR33MW62A	9431R485						√				√	√				√			√	√	√	√
IR50B022	9422R216						√			√	√	√				√			√	√	√	√
IR50B022	9422R217						√			√	√	√				√			√	√	√	√
PA33B013	9313N182						√	√		√	√	√				√			√	√		√
PA33B013	9313N183						√	√		√	√	√				√			√	√		√
PA33B013	9313N184						√	√		√	√	√				√			√	√		√
PA33B018	9309A651						√	√			√	√				√			√	√		√
PA33B018	9309A652						√	√			√	√				√			√	√		√
PA33B018	9309A653						√				√	√				√				√		√
PA33B060	9309A683						√	√			√		√			√			√	√		√
PA33B060	9309A684						√	√			√		√			√			√	√		√

TABLE 4.8-10 (Continued)

SUMMARY OF SOIL ANALYTICAL TESTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
PA33B060	9309A685						✓	✓			✓		✓			✓			✓	✓		✓
PA33SS11	9308A620						✓	✓			✓	✓	✓			✓			✓	✓		✓
PA33SS42	9310J386			✓			✓	✓		✓	✓	✓				✓			✓	✓		✓
PA33SS43	9310J379						✓	✓		✓	✓	✓				✓			✓	✓		✓
PA33SS46	9310J387						✓	✓		✓	✓	✓				✓			✓	✓		✓
PA33SS47	9310J370						✓	✓		✓	✓	✓				✓			✓	✓		✓
PA33SS48	9310J371						✓	✓		✓	✓	✓				✓			✓	✓		✓
PA33SS59	9310J388			✓			✓	✓		✓	✓	✓				✓			✓	✓		✓
PA50TA05	9324A057			✓	✓		✓			✓	✓	✓				✓			✓	✓	✓	✓

Notes:

CHROM	CHROMIUM VI
CYAN	Cyanide
DIOXIN	Dioxins and Furans
O&G	Total oil and grease
PAH	Polynuclear aromatic hydrocarbons
PCTMST	Percent moisture
PEST	Pesticides/polychlorinated biphenyls
PHYS	Physical characteristic
SALIN	Salinity
SVOC	Semivolatile organic compounds
SOLIDS	Total dissolved solids
TOC	Total organic carbon
TMICROB	Coliform
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
VOC	Volatile organic compounds

TABLE 4.8-11

STATISTICAL SUMMARY OF SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Residential PRG Value	Above[e] Res PRG	Industrial PRG Value	Above[f] Ind PRG	HPAL Value	Above[g] HPAL
METAL	ALUMINUM	766	47,800	22,000	MG/KG	4.8	117	117	76,700	0	100,000	0		
	ANTIMONY	0.47	14.8	3.7	MG/KG	0.59	115	42	30.7	0	681	0	9.05	3
	ARSENIC	0.41	24.0	5.5	MG/KG	0.31	117	87	0.32	87	2.0	67	11.10	5
	BARIUM	11.7	2,510	225	MG/KG	0.98	117	117	5,340	0	100,000	0	314.36	18
	BERYLLIUM	0.11	1.1	0.39	MG/KG	0.03	117	69	0.14	67	1.1	0	0.71	2
	CADMIUM	0.03	18.8	1.1	MG/KG	0.08	117	78	9.0	1	852	0	3.14	2
	CALCIUM	551	104,000	15,600	MG/KG	15.4	117	113						
	CHROMIUM	11.0	1,720	306	MG/KG	0.20	117	117	211	44	1,580	1	h	4
	COBALT	6.6	107	38.3	MG/KG	0.23	117	113					h	4
	COPPER	4.4	1,350	60.2	MG/KG	0.20	117	111	2,850	0	63,300	0	124.31	2
	IRON	12,600	74,500	40,000	MG/KG	4.6	117	116						
	LEAD	0.98	1,820	30.3	MG/KG	0.37	117	94	130	1	1,000	1	8.99	29
	MAGNESIUM	3,090	245,000	63,000	MG/KG	23.6	117	116						
	MANGANESE	268	8,770	1,140	MG/KG	0.13	117	116	382	111	8,300	1	1431.18	28
	MERCURY	0.02	19.0	0.48	MG/KG	0.05	117	50	23.0	0	511	0	2.28	1
	MOLYBDENUM	0.20	28.3	2.1	MG/KG	0.20	117	30	383	0	8,520	0	2.68	2
	NICKEL	15.0	2,470	492	MG/KG	0.76	117	117	150	61	34,100	0	h	1
	POTASSIUM	74.5	3,350	1,240	MG/KG	30.5	117	94						
	SELENIUM	0.39	1.3	0.80	MG/KG	0.40	117	15	383	0	8,520	0	1.95	0
	SILVER	0.70	8.3	2.6	MG/KG	0.44	117	6	383	0	8,520	0	1.43	4
	SODIUM	91.8	1,880	616	MG/KG	30.1	111	49						
	THALLIUM	0.49	0.93	0.75	MG/KG	0.38	117	3					0.81	2

TABLE 4.8-11 (Continued)

STATISTICAL SUMMARY OF SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection Frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Residential PRG Value	Above[e] Res PRG	Industrial PRG Value	Above[f] Ind PRG	HPAL Value	Above[g] HPAL
	VANADIUM	7.4	318	72.6	MG/KG	0.26	117	117	537	0	11,900	0	117.17	15
	ZINC	17.6	3,660	98.3	MG/KG	0.64	117	117	23,000	0	100,000	0	109.86	7
VOC	1,1,1-TRICHLOROETHANE	58	58	58	UG/KG	11	118	1	3,200,000	0	3,000,000	0		
	1,1,2-TRICHLOROETHANE	9	9	9	UG/KG	10	118	1	1,400	0	3,300	0		
	1,1-DICHLOROETHENE	2	3	3	UG/KG	11	118	2	38	0	82	0		
	1,2-DICHLOROETHANE	3	3	3	UG/KG	10	118	1	440	0	980	0		
	4-METHYL-2-PENTANONE	3	26	12	UG/KG	11	116	4	5,200,000	0	55,000,000	0		
	ACETONE	2	150	46	UG/KG	10	118	5	2,000,000	0	8,400,000	0		
	BENZENE	2	290	55	UG/KG	13	118	15	1,400	0	3,200	0		
	CARBON DISULFIDE	2	7	4	UG/KG	10	118	3	16,000	0	52,000	0		
	CHLOROFORM	4	5	5	UG/KG	11	118	2	530	0	1,100	0		
	ETHYLBENZENE	7	7	7	UG/KG	10	116	1	2,900,000	0	3,100,000	0		
	METHYLENE CHLORIDE	34	140	81	UG/KG	20	118	4	11,000	0	25,000	0		
	TETRACHLOROETHENE	1	110	24	UG/KG	16	116	8	7,000	0	25,000	0		
	TOLUENE	3	130	30	UG/KG	13	116	16	1,900,000	0	2,700,000	0		
	TRICHLOROETHENE	2	63	15	UG/KG	11	118	5	7,100	0	17,000	0		
	XYLENE (TOTAL)	1	48	11	UG/KG	13	116	14	980,000	0	980,000	0		
SVOC	2-METHYLNAPHTHALENE	20	4,500	260	UG/KG	420	117	35	800,000	0	800,000	0		
	2-METHYLPHENOL	28	37	34	UG/KG	360	116	3	3,300,000	0	34,000,000	0		
	4-METHYLPHENOL	45	50	48	UG/KG	360	116	3	330,000	0	3,400,000	0		
	ACENAPHTHENE	14	180	97	UG/KG	1,300	117	2	360,000	0	360,000	0		
	ANTHRACENE	2	170	35	UG/KG	390	117	11	19,000	0	19,000	0		

TABLE 4.8-11 (Continued)

STATISTICAL SUMMARY OF SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Residential PRG Value	Above[e] Res PRG	Industrial PRG Value	Above[f] Ind PRG	HPAL Value	Above[g] HPAL
	BENZO(A)ANTHRACENE	18	480	71	UG/KG	390	117	13	610	0	2,600	0		
	BENZO(A)PYRENE	17	490	70	UG/KG	450	115	20	61	2	260	2		
	BENZO(B)FLUORANTHENE	18	340	67	UG/KG	450	115	19	610	0	2,600	0		
	BENZO(G,H,I)PERYLENE	22	160	53	UG/KG	390	115	13	800,000	0	800,000	0		
	BENZO(K)FLUORANTHENE	2	290	56	UG/KG	420	115	7	610	0	26,000	0		
	BIS(2-ETHYLHEXYL)PHTHALATE	17	2,400	1,200	UG/KG	360	117	2	32,000	0	140,000	0		
	CARBAZOLE	22	40	30	UG/KG	370	117	11	22,000	0	95,000	0		
	CHRYSENE	19	1,100	160	UG/KG	740	117	24	6,100	0	24,000	0		
	DIBENZOFURAN	18	130	60	UG/KG	360	117	27	260,000	0	2,700,000	0		
	FLUORANTHENE	8	1,900	140	UG/KG	630	117	27	2,600,000	0	27,000,000	0		
	FLUORENE	37	460	88	UG/KG	440	117	17	300,000	0	300,000	0		
	INDENO(1,2,3-CD)PYRENE	18	140	59	UG/KG	460	115	4	610	0	2,600	0		
	NAPHTHALENE	20	2,100	310	UG/KG	430	117	21	800,000	0	800,000	0		
	PHENANTHRENE	21	1,200	150	UG/KG	420	117	40	800,000	0	800,000	0		
	PYRENE	8	1,600	150	UG/KG	610	117	36	2,000,000	0	20,000,000	0		
PEST	4,4'-DDD	0.07	0.07	0.07	UG/KG	4	116	1	1,900	0	7,900	0		
	4,4'-DDE	3	4	3	UG/KG	4	117	3	1,300	0	5,600	0		
	4,4'-DDT	2	18	10	UG/KG	5	117	2	1,300	0	5,600	0		
	ALDRIN	0.5	0.9	0.7	UG/KG	2	116	2	26	0	110	0		
	ALPHA-CHLORDANE	2	13	7	UG/KG	2	117	2	340	0	1,500	0		
	DIELDRIN	0.3	0.3	0.3	UG/KG	4	116	1	28	0	120	0		
	ENDOSULFAN I	14	14	14	UG/KG	2	116	1	3,300	0	34,000	0		

TABLE 4.8-11 (Continued)

STATISTICAL SUMMARY OF SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Residential PRG Value	Above[e] Res PRG	Industrial PRG Value	Above[f] Ind PRG	HPAL Value	Above[g] HPAL
	ENDRIN	0.9	0.9	0.9	UG/KG	4	116	1	20,000	0	200,000	0	.	
	ENDRIN ALDEHYDE	2	4	3	UG/KG	4	116	2	20,000	0	200,000	0		
	ENDRIN KETONE	0.06	3	1	UG/KG	4	116	2	20,000	0	200,000	0		
	GAMMA-CHLORDANE	0.02	6	2	UG/KG	2	116	3	340	0	1,500	0		
	HEPTACHLOR	2	2	2	UG/KG	2	116	1	99	0	420	0		
	HEPTACHLOR EPOXIDE	1	1	1	UG/KG	2	116	1	49	0	210	0		
	AROCLOR-1260	41	85	63	UG/KG	49	117	2	66	1	340	0		
TPHPRG	TPH-GASOLINE	0.3	58	23	MG/KG	6	116	6	100	0i				
TPHEXT	TPH-DIESEL	9	2,800	150	MG/KG	26	117	26	1,000	1i				
	TPH-EXTRACTABLE UNKNOWN HYDRO.	1,800	1,800	1,800	MG/KG	54	6	1	1,000	1i				
	TPH-MOTOR OIL	7	9,000	650	MG/KG	210	104	36	1,000	4i				
TRPH	TRPH	3	27,000	1,400	MG/KG	100	101	55	1,000	4i				
O&G	TOTAL OIL & GREASE	32	24,000	4,100	MG/KG	37	15	15	1,000	4i				

TABLE 4.8-11 (Continued)

STATISTICAL SUMMARY OF SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

CYAN	Cyanide
EPA	U.S. Environmental Protection Agency
HPAL	Hunters Point ambient level
MG/KG	Milligram per kilogram
O&G	Total oil and grease
PCTMST	Percent moisture
PEST	Pesticide/polychlorinated biphenyl
PHYS	Physical characteristic
PRG	Preliminary remediation goal
SALIN	Salinity
SVOC	Semivolatile organic compound
TMICROB	Coliform
TOC	Total organic carbon
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
UG/KG	Microgram per kilogram
VOC	Volatile organic compound

a Organic results of less than 10 are reported to one significant figure, and results of greater than or equal to 10 are reported to two significant figures. Inorganic results of less than 10 are reported to two significant figures, and results of greater than or equal to 10 are reported to three significant figures. Values that are not nondetects are compared to screening criteria before the significant figure rule is applied. Both the value and the screening criteria are then rounded for reporting purposes.

b Blank boxes indicate that screening critera have not been established for these analytes.

c Total number of samples analyzed

d Total number of samples showing concentrations greater than detection limit

e Total number of samples showing concentrations greater than residential PRG

f Total number of samples showing concentrations greater than industrial PRG
California-modified PRGs were used for the following analytes: 1,2-Dibromo-3-chloropropane, benzo[a]pyrene, benzo[k]fluoranthene, cadmium, chromium VI, chrysene, lead, nickel, and tetrachloroethylene (PCE).
For the analytes listed below, Region IX PRGs are not available; therefore, PRGs for similar chemicals were used as follows:

Analyte:	Similar Analyte:
2-Methylnapthalene	Naphthalene
Acenaphthylene	Acenaphthene
Alpha-chlordane	Chlordane
Aroclor-1260	Polychlorinated biphenyls
Benzo(g,h,i)perylene	Naphthalene
Delta BHC	HCH-technical
Endosulfan I	Endosulfan
Endosulfan sulfate	Endosulfan
Endrin aldehyde	Endrin
Endrin ketone	Endrin
Gamma-chlordane	Chlordane
Phenanthrene	Naphthalene

g Total number of samples showing concentrations greater than HPAL

h HPALs for chromium, cobalt, and nickel are based on the concentration of magnesium in each sample; thus, no single value applies to all samples. The range of HPAL values for chromium, cobalt, and nickel are 86.078 to 1753.710, 17.087 to 164.690, and 77.017 to 4873.683 mg/kg respectively.

i Total number of samples showing concentrations greater than TPH, TRPH, or O&G screening level, not PRG value

TABLE 4.8-12

SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B060A	IR33B060A	IR33B060A	IR33B060A	IR33B060B	IR33B060B	IR33B060B
Sampling Depth (feet bgs)	2.25	6.25	11.25	16.25	1.75	6.25	11.25
Sample Number	9419L442	9419L443	9419L444	9419L445	9423R229	9423R230	9423R231
Sample Date	05/12/94	05/12/94	05/12/94	05/12/94	06/06/94	06/06/94	06/06/94
Metal (mg/kg)							
ALUMINUM	23,900	2,600	766	37,500	42,800	44,500	19,500
ANTIMONY	ND (3.7)	ND (8.5)	ND (3.2)	ND (2.7)	ND (3.2)	ND (4.7)	ND (0.98)
ARSENIC	2.5 *#	ND (0.31)	ND (0.29)	9.7 *#	5.3 *#	6.7 *#	9.1 *#
BARIUM	249	194	225	396 α	136	167	108
BERYLLIUM	0.37 *	ND (0.08)	ND (0.09)	0.45 *	0.40 *	0.43 *	0.24 *
CADMIUM	0.57	0.84	0.65	0.61	0.65	0.66	0.12
CALCIUM	15,700	2,280	832	12,000	11,900	8,250	53,400
CHROMIUM	336 *	994 *	450 *	228 *	343 *	483 *	50.6
COBALT	38.8	66.1	59.7	32.3	31.2	49.7	15.6
COPPER	40.7	ND (0.12)	ND (0.11)	31.9	32.7	38.9	39.8
IRON	39,600	28,700	21,500	41,400	42,000	47,300	33,900
LEAD	6.3	2.8	ND (1.4)	11.8 α	5.5	8.6	6.9
MAGNESIUM	65,500	218,000	189,000	103,000	107,000	108,000	16,600
MANGANESE	928 *	647 *	505 *	732 *	719 *	776 *	734 *
MERCURY	ND (0.06)	ND (0.06)	ND (0.23)	ND (0.14)	ND (0.11)	ND (0.07)	ND (0.19)
MOLYBDENUM	ND (0.15)	ND (0.17)	ND (0.16)	ND (0.15)	0.57	0.55	0.64
NICKEL	507 *	1,880 *	1,960 *	425 *	573 *	918 *	66.6
POTASSIUM	1,340	ND (11.5)	ND (11.1)	612	744	758	2,050
SELENIUM	ND (0.66)	ND (0.71)	ND (0.68)	ND (0.66)	ND (0.33)	0.64	ND (0.59)
SILVER	ND (0.18)	ND (0.19)	ND (0.18)	ND (0.18)	ND (0.06)	ND (0.07)	ND (0.11)
SODIUM	669	215	196	1,620	408	460	ND (322)
THALLIUM	ND (0.44)	ND (0.47)	ND (0.45)	ND (0.44)	ND (0.18)	ND (0.22)	ND (0.15)
VANADIUM	72.0	14.4	7.4	71.2	75.4	80.2	50.0
ZINC	73.5	26.3	25.6	63.2	74.9	81.5	69.1
Volatile Organic Compound (ug/kg)							
1,1,1-TRICHLOROETHANE	ND (11)	ND (12)	ND (11)	ND (55)	ND (10)	ND (10)	ND (11)
1,1,2-TRICHLOROETHANE	ND (11)	ND (12)	ND (11)	ND (55)	ND (10)	ND (10)	ND (11)
1,1-DICHLOROETHENE	ND (11)	ND (12)	ND (11)	ND (55)	ND (10)	ND (10)	2
1,2-DICHLOROETHANE	ND (11)	ND (12)	ND (11)	ND (55)	ND (10)	ND (10)	ND (11)
4-METHYL-2-PENTANONE	ND (11)	ND (12)	ND (11)	ND (55)	ND (10)	ND (10)	ND (11)
ACETONE	ND (17)	ND (12)	ND (11)	ND (36)	ND (6)	ND (20)	ND (4)
BENZENE	ND (11)	ND (12)	ND (11)	290	ND (10)	37	76
CARBON DISULFIDE	ND (11)	ND (12)	ND (11)	ND (55)	ND (10)	ND (10)	ND (11)
CHLOROFORM	ND (11)	ND (12)	ND (11)	ND (55)	ND (10)	ND (10)	ND (11)
ETHYLBENZENE	ND (11)	ND (12)	ND (11)	ND (55)	ND (10)	ND (10)	ND (11)

TABLE 4.8-12 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B060A	IR33B060A	IR33B060A	IR33B060A	IR33B060B	IR33B060B	IR33B060B
Sampling Depth (feet bgs)	2.25	6.25	11.25	16.25	1.75	6.25	11.25
Sample Number	9419L442	9419L443	9419L444	9419L445	9423R229	9423R230	9423R231
Sample Date	05/12/94	05/12/94	05/12/94	05/12/94	06/06/94	06/06/94	06/06/94
Volatile Organic Compound (ug/kg)							
METHYLENE CHLORIDE	83	ND (26)	ND (14)	140	ND (10)	ND (7)	ND (11)
TETRACHLOROETHENE	ND (11)	ND (12)	ND (11)	ND (55)	ND (10)	ND (10)	ND (11)
TOLUENE	ND (11)	ND (12)	ND (11)	130	ND (10)	53	39
TRICHLOROETHENE	ND (11)	ND (12)	ND (11)	ND (55)	ND (10)	ND (10)	ND (11)
XYLENE (TOTAL)	ND (11)	ND (12)	ND (11)	27	ND (10)	11	8
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	30	ND (390)	ND (380)	320	140	540	570
2-METHYLPHENOL	ND (370)	ND (390)	ND (380)	ND (370)	ND (360)	28	36
4-METHYLPHENOL	ND (370)	ND (390)	ND (380)	ND (370)	ND (360)	50	49
ACENAPHTHENE	ND (370)	ND (390)	ND (380)	ND (370)	ND (360)	ND (360)	ND (370)
ANTHRACENE	2	ND (390)	ND (380)	13	ND (360)	ND (360)	24
BENZO(A)ANTHRACENE	ND (370)	ND (390)	ND (380)	18	ND (360)	25	48
BENZO(A)PYRENE	ND (370)	ND (390)	ND (380)	17	ND (360)	30	40
BENZO(B)FLUORANTHENE	ND (370)	ND (390)	ND (380)	18	ND (360)	25	49
BENZO(G,H,I)PERYLENE	ND (370)	ND (390)	ND (380)	ND (370)	ND (360)	ND (360)	59
BENZO(K)FLUORANTHENE	ND (370)	ND (390)	ND (380)	2	ND (360)	ND (360)	ND (370)
BIS(2-ETHYLHEXYL)PHTHALATE	ND (230)	ND (620)	ND (520)	ND (470)	ND (360)	ND (360)	ND (370)
CARBAZOLE	ND (370)	ND (390)	ND (380)	ND (370)	ND (360)	34	40
CHRYSENE	ND (370)	ND (390)	ND (380)	26	ND (360)	55	58
DIBENZOFURAN	ND (370)	ND (390)	ND (380)	67	34	120	120
FLUORANTHENE	ND (370)	ND (390)	ND (380)	19	ND (360)	32	80
FLUORENE	ND (370)	ND (390)	ND (380)	53	ND (360)	76	100
INDENO(1,2,3-CD)PYRENE	ND (370)	ND (390)	ND (380)	ND (370)	ND (360)	ND (360)	ND (370)
NAPHTHALENE	26	ND (390)	ND (380)	400	190	640	680
PHENANTHRENE	26	ND (390)	ND (380)	160	92	270	230
PYRENE	8	ND (390)	ND (380)	26	ND (360)	48	85
Pesticide/Polychlorinated Biphenyl (ug/kg)							
4,4'-DDD	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
4,4'-DDE	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
4,4'-DDT	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ALDRIN	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
ALPHA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
DIELDRIN	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ENDOSULFAN I	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)

TABLE 4.8-12 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B060A	IR33B060A	IR33B060A	IR33B060A	IR33B060B	IR33B060B	IR33B060B
Sampling Depth (feet bgs)	2.25	6.25	11.25	16.25	1.75	6.25	11.25
Sample Number	9419L442	9419L443	9419L444	9419L445	9423R229	9423R230	9423R231
Sample Date	05/12/94	05/12/94	05/12/94	05/12/94	06/06/94	06/06/94	06/06/94
Pesticide/Polychlorinated Biphenyl (ug/kg)							
ENDRIN	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ENDRIN ALDEHYDE	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ENDRIN KETONE	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
GAMMA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
HEPTACHLOR	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
HEPTACHLOR EPOXIDE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
AROCLOR-1260	ND (37)	ND (39)	ND (38)	ND (37)	ND (36)	ND (36)	ND (37)
TPH-Purgeable (mg/kg)							
TPH-GASOLINE	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.6)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (11)	ND (12)	ND (11)	ND (11)	ND (11)	ND (11)	ND (12)
TPH-EXTRACTABLE UNKNOWN HYDROCARBON	NA	NA	NA	NA	NA	NA	NA
TPH-MOTOR OIL	38	ND (12)	ND (11)	11	ND (110)	ND (110)	ND (120)
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	20	ND (4)	ND (4)	ND (5)	37	ND (29)	ND (31)
Oil and Grease (mg/kg)							
TOTAL OIL & GREASE	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	90.9	84.8	88.2	90.9	91.1	91.1	90.3
pH (pH units)							
PH	9.4	9.4	9.4	10.2	9.6	9.6	9.7

TABLE 4.8-12 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B060B	IR33B060B	IR33B061	IR33B061	IR33B061	IR33B061	IR33B062
Sampling Depth (feet bgs)	16.25	21.25	2.75	7.75	12.75	17.75	2.25
Sample Number	9423R232	9423R233	9415A789	9415A790	9415A792	9415A794	9414H569
Sample Date	06/06/94	06/06/94	04/14/94	04/14/94	04/14/94	04/15/94	04/06/94
Metal (mg/kg)							
ALUMINUM	36,900	41,800	21,700	14,000	20,700	24,000	8,190
ANTIMONY	ND (3.6)	ND (5.7)	1.6	1.4	ND (1.8)	ND (2.0)	0.89
ARSENIC	6.7 *#	4.5 *#	0.55 *	2.2 *#	3.4 *#	6.9 *#	24.0 *#α
BARIUM	199	241	209	397 α	267	223	2,510 α
BERYLLIUM	0.30 *	ND (0.02)	0.35 *	0.38 *	0.43 *	0.59 *	1.1 *α
CADMIUM	0.45	0.04	0.50	0.47	ND (0.06)	ND (0.08)	0.98
CALCIUM	9,160	20,500	13,700	7,970	11,900	13,700	7,320
CHROMIUM	317 *	98.0	112	77.3	110	111	18.0
COBALT	31.9	52.7	33.6	23.6	25.6	23.0	24.3 α
COPPER	41.3	71.8	60.6	61.8	51.0	48.5	139 α
IRON	47,500	70,700	38,500	32,200	36,900	36,700	41,100
LEAD	7.5	4.5	2.4	6.1	12.6 α	10.9 α	22.2 α
MAGNESIUM	66,500	66,300	20,900	11,600	18,700	24,900	3,090
MANGANESE	806 *	1,000 *	2,160 *α	2,810 *α	1,480 *α	899 *	8,770 *#α
MERCURY	ND (0.08)	ND (0.04)	0.05	0.05	0.08	0.11	0.05
MOLYBDENUM	0.47	0.39	ND (0.15)	ND (0.16)	ND (0.15)	ND (0.39)	ND (0.15)
NICKEL	445 *	153 *	129	109	115	138	129 α
POTASSIUM	1,160	282	382	561	1,210	2,230	2,590
SELENIUM	0.87	0.93	ND (0.64)	0.91	ND (0.65)	ND (0.77)	ND (6.4)
SILVER	ND (0.08)	ND (0.09)	ND (0.17)	ND (0.18)	ND (0.17)	ND (0.21)	ND (0.17)
SODIUM	484	669	299	271	ND (121)	ND (656)	315
THALLIUM	ND (0.18)	ND (0.17)	ND (0.43)	ND (0.44)	ND (0.43)	ND (0.51)	ND (4.3)
VANADIUM	79.2	318 α	98.8	75.0	77.9	72.0	107
ZINC	87.9	83.9	62.0	59.1	64.2	67.5	108
Volatile Organic Compound (ug/kg)							
1,1,1-TRICHLOROETHANE	ND (10)	ND (10)	ND (11)	ND (11)	ND (11)	ND (13)	ND (11)
1,1,2-TRICHLOROETHANE	ND (10)	ND (10)	ND (11)	ND (11)	ND (11)	ND (13)	ND (11)
1,1-DICHLOROETHENE	ND (10)	ND (10)	ND (11)	ND (11)	ND (11)	ND (13)	ND (11)
1,2-DICHLOROETHANE	ND (10)	ND (10)	ND (11)	ND (11)	ND (11)	ND (13)	ND (11)
4-METHYL-2-PENTANONE	ND (10)	ND (10)	ND (11)	ND (11)	ND (11)	ND (13)	ND (11)
ACETONE	ND (10)	ND (10)	ND (15)	ND (16)	ND (13)	150	ND (16)
BENZENE	64	40	ND (11)	ND (11)	ND (11)	ND (13)	ND (11)
CARBON DISULFIDE	ND (10)	ND (10)	ND (11)	ND (11)	ND (11)	4	ND (11)
CHLOROFORM	ND (10)	ND (10)	ND (11)	ND (11)	ND (11)	ND (13)	ND (11)
ETHYLBENZENE	ND (10)	ND (10)	ND (11)	ND (11)	ND (11)	ND (13)	ND (11)

TABLE 4.8-12 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B060B	IR33B060B	IR33B061	IR33B061	IR33B061	IR33B061	IR33B062
Sampling Depth (feet bgs)	16.25	21.25	2.75	7.75	12.75	17.75	2.25
Sample Number	9423R232	9423R233	9415A789	9415A790	9415A792	9415A794	9414H569
Sample Date	06/06/94	06/06/94	04/14/94	04/14/94	04/14/94	04/15/94	04/06/94
Volatile Organic Compound (ug/kg)							
METHYLENE CHLORIDE	ND (10)	ND (10)	ND (7)	ND (12)	67	34	ND (9)
TETRACHLOROETHENE	ND (10)	ND (10)	ND (11)	ND (11)	ND (11)	ND (13)	ND (11)
TOLUENE	24	17	ND (11)	ND (11)	ND (11)	ND (13)	ND (11)
TRICHLOROETHENE	ND (10)	ND (10)	ND (11)	ND (11)	ND (11)	ND (13)	ND (11)
XYLENE (TOTAL)	4	1	ND (11)	ND (11)	ND (11)	ND (13)	ND (11)
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	490	140	ND (360)	ND (370)	20	ND (430)	ND (360)
2-METHYLPHENOL	37	ND (350)	ND (360)	ND (370)	ND (360)	ND (430)	ND (360)
4-METHYLPHENOL	45	ND (350)	ND (360)	ND (370)	ND (360)	ND (430)	ND (360)
ACENAPHTHENE	ND (350)	ND (350)	ND (360)	ND (370)	ND (360)	ND (430)	ND (360)
ANTHRACENE	27	ND (350)	ND (360)	ND (370)	ND (360)	ND (430)	ND (360)
BENZO(A)ANTHRACENE	ND (350)	ND (350)	ND (360)	ND (370)	ND (360)	ND (430)	ND (360)
BENZO(A)PYRENE	ND (350)	ND (350)	ND (360)	ND (370)	ND (360)	ND (430)	ND (360)
BENZO(B)FLUORANTHENE	ND (350)	ND (350)	ND (360)	ND (370)	ND (360)	ND (430)	ND (360)
BENZO(G,H,I)PERYLENE	ND (350)	ND (350)	ND (360)	ND (370)	ND (360)	ND (430)	ND (360)
BENZO(K)FLUORANTHENE	ND (350)	ND (350)	ND (360)	ND (370)	ND (360)	ND (430)	ND (360)
BIS(2-ETHYLHEXYL)PHTHALATE	ND (350)	ND (350)	ND (360)	17	ND (100)	ND (150)	ND (360)
CARBAZOLE	29	ND (350)	ND (360)	ND (370)	ND (360)	ND (430)	ND (360)
CHRYSENE	ND (350)	ND (350)	ND (360)	ND (370)	ND (360)	ND (430)	ND (360)
DIBENZOFURAN	100	31	ND (360)	ND (370)	ND (360)	ND (430)	ND (360)
FLUORANTHENE	44	ND (350)	ND (360)	ND (370)	10	ND (430)	ND (360)
FLUORENE	71	ND (350)	ND (360)	ND (370)	ND (360)	ND (430)	ND (360)
INDENO(1,2,3-CD)PYRENE	ND (350)	ND (350)	ND (360)	ND (370)	ND (360)	ND (430)	ND (360)
NAPHTHALENE	630	210	ND (360)	ND (370)	ND (360)	ND (430)	ND (360)
PHENANTHRENE	170	52	ND (360)	ND (370)	27	21	ND (360)
PYRENE	51	ND (350)	ND (360)	ND (370)	13	8	ND (360)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
4,4'-DDD	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
4,4'-DDE	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
4,4'-DDT	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ALDRIN	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
ALPHA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
DIELDRIN	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ENDOSULFAN I	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)

TABLE 4.8-12 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B060B	IR33B060B	IR33B061	IR33B061	IR33B061	IR33B061	IR33B062
Sampling Depth (feet bgs)	16.25	21.25	2.75	7.75	12.75	17.75	2.25
Sample Number	9423R232	9423R233	9415A789	9415A790	9415A792	9415A794	9414H569
Sample Date	06/06/94	06/06/94	04/14/94	04/14/94	04/14/94	04/15/94	04/06/94
Pesticide/Polychlorinated Biphenyl (ug/kg)							
ENDRIN	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ENDRIN ALDEHYDE	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ENDRIN KETONE	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
GAMMA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
HEPTACHLOR	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
HEPTACHLOR EPOXIDE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
AROCLOR-1260	ND (35)	ND (35)	ND (36)	ND (37)	ND (36)	ND (43)	ND (36)
TPH-Purgeable (mg/kg)							
TPH-GASOLINE	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.6)	ND (0.5)	ND (0.6)	ND (0.5)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	ND (13)	ND (11)
TPH-EXTRACTABLE UNKNOWN HYDROCARBON	NA	NA	NA	NA	NA	NA	NA
TPH-MOTOR OIL	ND (110)	ND (110)	ND (11)	ND (11)	ND (11)	ND (13)	ND (11)
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	ND (31)	ND (30)	ND (6)	ND (5)	ND (3)	ND (6)	6
Oil and Grease (mg/kg)							
TOTAL OIL & GREASE	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	93.3	95.2	6.4	9.9	92.8	77.8	93.6
pH (pH units)							
PH	9.7	9.8	7.5	8.2	8.7	7.0	8.6

TABLE 4.8-12 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B062	IR33B062	IR33B063	IR33B063	IR33B063	IR33B063	IR33B064
Sampling Depth (feet bgs)	7.75	10.75	1.75	6.25	12.25	15.75	3.25
Sample Number	9414H570	9414H571	9414H565	9414H566	9414H567	9414H568	9420C232
Sample Date	04/06/94	04/06/94	04/06/94	04/06/94	04/06/94	04/06/94	05/18/94
Metal (mg/kg)							
ALUMINUM	27,300	14,400	28,700	25,500	19,600	20,600	14,400
ANTIMONY	1.1	1.1	ND (1.3)	ND (0.99)	ND (0.93)	1.1	0.98
ARSENIC	3.2 *#	2.8 *#	5.5 *#	2.1 *#	13.5 *#α	8.2 *#	0.66 *
BARIUM	318 α	296	374 α	261	63.3	42.5	57.7
BERYLLIUM	0.50 *	ND (0.37)	ND (0.23)	ND (0.21)	ND (0.26)	0.54 *	ND (0.01)
CADMIUM	1.2	0.66	2.2	1.9	1.4	0.70	ND (0.02)
CALCIUM	20,100	11,600	16,700	16,000	6,210	6,240	13,600
CHROMIUM	117	115	183	142	55.3	44.9	29.7
COBALT	33.9	22.2	40.6	42.8	22.5	19.0	17.9
COPPER	78.9	47.3	103	65.8	60.1	60.1	33.0
IRON	49,000	28,000	52,500	47,200	38,000	37,800	19,600
LEAD	2.9	12.1 α	4.2	3.3	91.9 α	5.5	ND (0.75)
MAGNESIUM	19,900	12,100	24,600	22,800	14,600	15,000	7,160
MANGANESE	2,430 *α	2,200 *α	2,510 *α	2,670 *α	692 *	555 *	595 *
MERCURY	ND (0.05)	ND (0.06)	0.09	ND (0.06)	0.13	0.09	0.12
MOLYBDENUM	ND (0.15)	ND (0.16)	ND (0.16)	ND (0.16)	ND (0.16)	ND (0.16)	ND (0.25)
NICKEL	130	111	149	207 *	69.3	59.4	24.9
POTASSIUM	678	1,090	553	415	2,200	2,910	774
SELENIUM	ND (0.64)	ND (0.68)	ND (0.69)	ND (0.70)	ND (0.67)	ND (0.67)	ND (0.45)
SILVER	ND (0.17)	ND (0.18)	ND (0.18)	ND (0.19)	ND (0.18)	ND (0.18)	ND (0.16)
SODIUM	ND (259)	793	418	378	774	708	ND (35.9)
THALLIUM	ND (0.42)	ND (0.45)	ND (0.46)	ND (0.46)	ND (0.45)	ND (0.44)	ND (0.21)
VANADIUM	136 α	100	138 α	104	55.9	62.4	48.2
ZINC	79.0	53.5	83.1	75.8	79.4	80.4	36.0
Volatile Organic Compound (ug/kg)							
1,1,1-TRICHLOROETHANE	ND (11)	ND (11)	ND (11)	ND (12)	ND (11)	ND (11)	ND (11)
1,1,2-TRICHLOROETHANE	ND (11)	ND (11)	ND (11)	ND (12)	ND (11)	ND (11)	ND (11)
1,1-DICHLOROETHENE	ND (11)	ND (11)	ND (11)	ND (12)	ND (11)	ND (11)	ND (11)
1,2-DICHLOROETHANE	ND (11)	ND (11)	ND (11)	ND (12)	ND (11)	ND (11)	ND (11)
4-METHYL-2-PENTANONE	ND (11)	ND (11)	4	ND (12)	ND (11)	3	ND (11)
ACETONE	ND (19)	ND (18)	ND (26)	ND (13)	ND (37)	ND (15)	ND (11)
BENZENE	ND (11)	ND (11)	ND (11)	ND (12)	ND (11)	ND (11)	ND (11)
CARBON DISULFIDE	ND (11)	ND (11)	ND (11)	ND (12)	ND (11)	ND (11)	ND (11)
CHLOROFORM	ND (11)	ND (11)	ND (11)	ND (12)	ND (11)	ND (11)	ND (11)
ETHYLBENZENE	ND (11)	ND (11)	ND (11)	ND (12)	ND (11)	ND (11)	ND (11)

TABLE 4.8-12 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B062	IR33B062	IR33B063	IR33B063	IR33B063	IR33B063	IR33B064
Sampling Depth (feet bgs)	7.75	10.75	1.75	6.25	12.25	15.75	3.25
Sample Number	9414H570	9414H571	9414H565	9414H566	9414H567	9414H568	9420C232
Sample Date	04/06/94	04/06/94	04/06/94	04/06/94	04/06/94	04/06/94	05/18/94
Volatile Organic Compound (ug/kg)							
METHYLENE CHLORIDE	ND (11)	ND (22)	ND (13)	ND (9)	ND (81)	ND (17)	ND (2)
TETRACHLOROETHENE	ND (11)	ND (11)	ND (11)	ND (12)	ND (11)	ND (11)	ND (11)
TOLUENE	ND (11)	ND (11)	ND (11)	ND (12)	ND (11)	ND (11)	ND (11)
TRICHLOROETHENE	ND (11)	ND (11)	ND (11)	ND (12)	ND (11)	ND (11)	ND (11)
XYLENE (TOTAL)	ND (11)	ND (11)	ND (11)	ND (12)	ND (11)	ND (11)	ND (11)
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (350)	ND (380)	ND (380)	ND (390)	ND (370)	57	ND (380)
2-METHYLPHENOL	ND (350)	ND (380)	ND (380)	ND (390)	ND (370)	ND (370)	ND (380)
4-METHYLPHENOL	ND (350)	ND (380)	ND (380)	ND (390)	ND (370)	ND (370)	ND (380)
ACENAPHTHENE	ND (350)	ND (380)	ND (380)	ND (390)	ND (370)	ND (370)	ND (380)
ANTHRACENE	ND (350)	ND (380)	ND (380)	ND (390)	ND (370)	ND (370)	ND (380)
BENZO(A)ANTHRACENE	ND (350)	ND (380)	ND (380)	ND (390)	ND (370)	ND (370)	ND (380)
BENZO(A)PYRENE	ND (350)	ND (380)	ND (380)	ND (390)	ND (370)	ND (370)	ND (380)
BENZO(B)FLUORANTHENE	ND (350)	ND (380)	ND (380)	ND (390)	ND (370)	98	ND (380)
BENZO(G,H,I)PERYLENE	ND (350)	ND (380)	ND (380)	ND (390)	ND (370)	ND (370)	ND (380)
BENZO(K)FLUORANTHENE	ND (350)	ND (380)	ND (380)	ND (390)	ND (370)	ND (370)	ND (380)
BIS(2-ETHYLHEXYL)PHTHALATE	ND (350)	ND (380)	ND (380)	ND (390)	ND (370)	ND (120)	ND (380)
CARBAZOLE	ND (350)	ND (380)	ND (380)	ND (390)	ND (370)	ND (370)	ND (380)
CHRYSENE	ND (350)	ND (380)	ND (380)	ND (390)	ND (370)	52	ND (380)
DIBENZOFURAN	ND (350)	ND (380)	ND (380)	ND (390)	ND (370)	ND (370)	ND (380)
FLUORANTHENE	ND (350)	ND (380)	ND (380)	ND (390)	ND (370)	68	ND (380)
FLUORENE	ND (350)	ND (380)	ND (380)	ND (390)	ND (370)	50	ND (380)
INDENO(1,2,3-CD)PYRENE	ND (350)	ND (380)	ND (380)	ND (390)	ND (370)	ND (370)	ND (380)
NAPHTHALENE	ND (350)	ND (380)	ND (380)	ND (390)	ND (370)	ND (370)	ND (380)
PHENANTHRENE	ND (350)	ND (380)	ND (380)	ND (390)	ND (370)	150	ND (380)
PYRENE	ND (350)	ND (380)	ND (380)	ND (390)	ND (370)	80	ND (380)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
4,4'-DDD	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
4,4'-DDE	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
4,4'-DDT	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ALDRIN	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
ALPHA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
DIELDRIN	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ENDOSULFAN I	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)

TABLE 4.8-12 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B062	IR33B062	IR33B063	IR33B063	IR33B063	IR33B063	IR33B064
Sampling Depth (feet bgs)	7.75	10.75	1.75	6.25	12.25	15.75	3.25
Sample Number	9414H570	9414H571	9414H565	9414H566	9414H567	9414H568	9420C232
Sample Date	04/06/94	04/06/94	04/06/94	04/06/94	04/06/94	04/06/94	05/18/94
Pesticide/Polychlorinated Biphenyl (ug/kg)							
ENDRIN	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ENDRIN ALDEHYDE	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ENDRIN KETONE	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
GAMMA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
HEPTACHLOR	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
HEPTACHLOR EPOXIDE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
AROCLOR-1260	ND (35)	ND (38)	ND (38)	ND (39)	ND (37)	ND (37)	ND (37)
TPH-Purgeable (mg/kg)							
TPH-GASOLINE	ND (0.5)	ND (0.6)	0.3	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.6)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (11)	ND (11)	ND (11)	ND (12)	15	18	ND (12)
TPH-EXTRACTABLE UNKNOWN HYDROCARBON	NA	NA	NA	NA	NA	NA	NA
TPH-MOTOR OIL	9	ND (11)	37	ND (12)	11	10	ND (120)
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	7	4	39	6	6	ND (6)	77
Oil and Grease (mg/kg)							
TOTAL OIL & GREASE	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	94.3	88.4	87.0	86.2	89.6	90.1	88.3
pH (pH units)							
PH	9.3	9.5	8.1	8.1	9.9	10.0	7.4

TABLE 4.8-12 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B064	IR33B064	IR33B064	IR33B064	IR33B065	IR33B065	IR33B065
Sampling Depth (feet bgs)	6.25	11.25	21.25	25.75	0.75	11.25	20.75
Sample Number	9420C233	9420C234	9420C235	9420C236	9420C240	9420C241	9420C242
Sample Date	05/18/94	05/18/94	05/18/94	05/18/94	05/19/94	05/19/94	05/19/94
Metal (mg/kg)							
ALUMINUM	25,400	17,100	35,400	35,000	23,100	35,400	34,900
ANTIMONY	2.5	0.89	4.2	3.3	ND (1.8)	3.8	ND (2.8)
ARSENIC	6.0 *#	8.7 *#	6.1 *#	7.0 *#	10.7 *#	5.0 *#	7.3 *#
BARIUM	1,470 α	50.2	80.4	59.9	56.1	59.6	90.5
BERYLLIUM	ND (0.25)	ND (0.18)	ND (0.30)	0.25 *	0.29 *	0.27 *	0.29 *
CADMIUM	0.45	0.38	0.83	0.72	0.49	1.1	0.41
CALCIUM	27,500	29,100	16,000	21,200	6,400	63,800	18,600
CHROMIUM	110	43.5	328 *	196	34.5	307 *	186
COBALT	32.7	15.3	39.2	32.2	22.9	36.2	26.3
COPPER	99.6	35.3	50.8	47.6	83.8	35.4	37.2
IRON	49,400	33,400	43,400	45,200	43,600	44,300	44,600
LEAD	7.0	7.2	5.6	6.1	10.2 α	5.8	7.7
MAGNESIUM	15,400	15,900	89,900	58,600	20,000	68,900	74,000
MANGANESE	3,560 *α	638 *	763 *	778 *	675 *	740 *	689 *
MERCURY	0.06	0.12	0.08	ND (0.07)	ND (0.04)	ND (0.10)	ND (0.08)
MOLYBDENUM	2.3	ND (0.40)	0.62	ND (0.45)	ND (0.31)	ND (0.53)	ND (0.69)
NICKEL	96.6	60.0	510 *	271 *	33.6	528 *	354 *
POTASSIUM	1,670	1,070	1,310	2,340	3,310	1,410	2,370
SELENIUM	ND (0.43)	ND (0.36)	ND (0.55)	ND (0.34)	ND (0.28)	ND (0.28)	ND (0.21)
SILVER	ND (0.12)	ND (0.11)	ND (0.10)	ND (0.14)	ND (0.11)	ND (0.12)	ND (0.08)
SODIUM	ND (26.3)	ND (25.9)	ND (23.0)	ND (31.9)	ND (25.3)	ND (26.2)	ND (19.2)
THALLIUM	ND (0.15)	ND (0.19)	ND (0.21)	ND (0.17)	ND (0.20)	ND (0.17)	ND (0.12)
VANADIUM	116	48.5	84.3	101	68.6	76.7	70.0
ZINC	88.4	65.6	71.6	78.5	100	74.0	70.8
Volatile Organic Compound (ug/kg)							
1,1,1-TRICHLOROETHANE	ND (11)	ND (11)	ND (11)	ND (11)	ND (10)	ND (11)	ND (11)
1,1,2-TRICHLOROETHANE	ND (11)	ND (11)	ND (11)	ND (11)	ND (10)	ND (11)	ND (11)
1,1-DICHLOROETHENE	ND (11)	ND (11)	ND (11)	ND (11)	ND (10)	ND (11)	ND (11)
1,2-DICHLOROETHANE	ND (11)	ND (11)	ND (11)	ND (11)	ND (10)	ND (11)	ND (11)
4-METHYL-2-PENTANONE	ND (11)	ND (11)	NA	NA	ND (10)	ND (11)	ND (11)
ACETONE	ND (33)	ND (22)	ND (23)	ND (9)	ND (27)	ND (7)	ND (5)
BENZENE	ND (11)	ND (11)	ND (11)	ND (11)	ND (10)	ND (11)	ND (11)
CARBON DISULFIDE	ND (11)	ND (11)	ND (11)	ND (11)	ND (10)	ND (11)	ND (11)
CHLOROFORM	ND (11)	ND (11)	ND (11)	ND (11)	ND (10)	ND (11)	ND (11)
ETHYLBENZENE	ND (11)	ND (11)	NA	NA	ND (10)	ND (11)	ND (11)

TABLE 4.8-12 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B064	IR33B064	IR33B064	IR33B064	IR33B065	IR33B065	IR33B065
Sampling Depth (feet bgs)	6.25	11.25	21.25	25.75	0.75	11.25	20.75
Sample Number	9420C233	9420C234	9420C235	9420C236	9420C240	9420C241	9420C242
Sample Date	05/18/94	05/18/94	05/18/94	05/18/94	05/19/94	05/19/94	05/19/94
Volatile Organic Compound (ug/kg)							
METHYLENE CHLORIDE	ND (2)	ND (16)	ND (17)	ND (11)	ND (8)	ND (7)	ND (5)
TETRACHLOROETHENE	ND (11)	ND (11)	NA	NA	ND (10)	ND (11)	ND (11)
TOLUENE	ND (11)	ND (11)	NA	NA	ND (10)	ND (11)	ND (11)
TRICHLOROETHENE	ND (11)	ND (11)	ND (11)	ND (11)	ND (10)	ND (11)	ND (11)
XYLENE (TOTAL)	ND (11)	ND (11)	NA	NA	ND (10)	ND (11)	ND (11)
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (360)	160	180	41	ND (350)	98	32
2-METHYLPHENOL	ND (360)	ND (360)	ND (380)	ND (370)	ND (350)	ND (360)	ND (350)
4-METHYLPHENOL	ND (360)	ND (360)	ND (380)	ND (370)	ND (350)	ND (360)	ND (350)
ACENAPHTHENE	ND (360)	ND (360)	ND (380)	ND (370)	ND (350)	ND (360)	ND (350)
ANTHRACENE	ND (360)	31	ND (380)	ND (370)	ND (350)	ND (360)	ND (350)
BENZO(A)ANTHRACENE	ND (360)	66	25	51	ND (350)	27	ND (350)
BENZO(A)PYRENE	ND (360)	54	18	40	21	54	30
BENZO(B)FLUORANTHENE	ND (360)	50	20	57	39	46	ND (350)
BENZO(G,H,I)PERYLENE	ND (360)	100	32	44	ND (350)	56	22
BENZO(K)FLUORANTHENE	ND (360)	24	ND (380)	ND (370)	ND (350)	ND (360)	ND (350)
BIS(2-ETHYLHEXYL)PHTHALATE	ND (180)	ND (360)	ND (380)	ND (120)	2,400	ND (38)	ND (33)
CARBAZOLE	ND (360)	40	26	ND (370)	ND (350)	32	22
CHRYSENE	ND (360)	86	32	59	ND (350)	30	ND (350)
DIBENZOFURAN	ND (360)	74	46	33	34	120	78
FLUORANTHENE	ND (360)	110	40	67	56	35	ND (350)
FLUORENE	ND (360)	110	60	51	ND (350)	72	47
INDENO(1,2,3-CD)PYRENE	ND (360)	50	ND (380)	ND (370)	ND (350)	ND (360)	ND (350)
NAPHTHALENE	ND (360)	ND (360)	80	ND (370)	ND (350)	42	ND (350)
PHENANTHRENE	ND (360)	280	130	180	92	100	72
PYRENE	ND (360)	130	35	89	42	62	28
Pesticide/Polychlorinated Biphenyl (ug/kg)							
4,4'-DDD	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
4,4'-DDE	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
4,4'-DDT	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ALDRIN	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
ALPHA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
DIELDRIN	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ENDOSULFAN I	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)

TABLE 4.8-12 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B064	IR33B064	IR33B064	IR33B064	IR33B065	IR33B065	IR33B065
Sampling Depth (feet bgs)	6.25	11.25	21.25	25.75	0.75	11.25	20.75
Sample Number	9420C233	9420C234	9420C235	9420C236	9420C240	9420C241	9420C242
Sample Date	05/18/94	05/18/94	05/18/94	05/18/94	05/19/94	05/19/94	05/19/94
Pesticide/Polychlorinated Biphenyl (ug/kg)							
ENDRIN	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ENDRIN ALDEHYDE	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ENDRIN KETONE	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
GAMMA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
HEPTACHLOR	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
HEPTACHLOR EPOXIDE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
AROCLOR-1260	ND (36)	ND (36)	ND (38)	ND (37)	ND (35)	ND (36)	ND (35)
TPH-Purgeable (mg/kg)							
TPH-GASOLINE	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.5)	ND (0.6)	ND (0.5)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (11)	ND (11)	ND (12)	12	13	23	ND (11)
TPH-EXTRACTABLE UNKNOWN HYDROCARBON	NA	NA	NA	NA	NA	NA	NA
TPH-MOTOR OIL	ND (110)	ND (110)	ND (120)	ND (120)	ND (110)	ND (110)	ND (110)
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	100	38	ND (29)	ND (28)	53	ND (29)	ND (28)
Oil and Grease (mg/kg)							
TOTAL OIL & GREASE	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	90.7	91.2	87.3	90.3	95.1	90.8	93.6
pH (pH units)							
PH	10.0	10.3	9.4	9.6	9.9	10.1	10.1

TABLE 4.8-12 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B066	IR33B066	IR33B066	IR33B068	IR33B068	IR33B069	IR33B069
Sampling Depth (feet bgs)	5.75	16.75	20.25	5.75	11.25	6.25	11.25
Sample Number	9420C237	9420C238	9420C239	9419L432	9419L434	9419L438	9419L439
Sample Date	05/19/94	05/19/94	05/19/94	05/11/94	05/11/94	05/11/94	05/11/94
Metal (mg/kg)							
ALUMINUM	43,000	45,900	34,000	6,200	23,400	11,600	3,840
ANTIMONY	5.2	4.7	ND (2.7)	ND (0.68)	1.9	ND (1.1)	ND (0.60)
ARSENIC	6.7 *#	6.0 *#	9.0 *#	6.1 *#	10.8 *#	4.9 *#	7.0 *#
BARIUM	114	88.9	78.5	24.3	2,260 α	150	20.2
BERYLLIUM	0.23 *	0.29 *	0.24 *	ND (0.12)	0.43 *	0.30 *	ND (0.07)
CADMIUM	0.98	1.1	0.75	ND (0.06)	0.20	0.23	ND (0.02)
CALCIUM	13,100	13,000	11,900	13,200	14,000	45,100	10,900
CHROMIUM	425 *	388 *	184	41.2	51.7	57.8	36.8
COBALT	39.9	38.5	27.4	8.3	21.6	10.9	6.6
COPPER	41.3	36.5	50.3	8.8	48.5	37.2	5.6
IRON	49,900	49,000	43,500	15,000	38,400	21,500	12,600
LEAD	5.5	5.0	8.4	3.8	11.5 α	47.3 α	4.3
MAGNESIUM	102,000	121,000	63,700	5,500	20,700	9,190	4,910
MANGANESE	853 *	894 *	827 *	353	747 *	353	268
MERCURY	ND (0.07)	ND (0.09)	ND (0.06)	ND (0.02)	ND (0.07)	ND (0.35)	0.54
MOLYBDENUM	ND (0.80)	ND (0.67)	ND (0.45)	0.24	1.3	0.52	0.20
NICKEL	662 *	640 *	281 *	36.1	64.5	69.6	36.7
POTASSIUM	1,570	1,350	2,110	622	2,660	1,440	480
SELENIUM	ND (0.36)	ND (0.31)	ND (0.44)	ND (0.34)	ND (0.31)	ND (0.28)	ND (0.35)
SILVER	ND (0.15)	ND (0.13)	ND (0.15)	ND (0.14)	ND (0.13)	ND (0.12)	ND (0.15)
SODIUM	ND (33.9)	ND (28.5)	ND (33.1)	ND (37.6)	ND (34.8)	823	269
THALLIUM	ND (0.16)	ND (0.17)	ND (0.19)	ND (0.15)	ND (0.20)	ND (0.16)	ND (0.16)
VANADIUM	85.0	84.1	74.8	29.6	63.3	46.9	22.0
ZINC	80.1	75.5	87.2	22.1	77.1	75.0	20.1
Volatile Organic Compound (ug/kg)							
1,1,1-TRICHLOROETHANE	ND (11)	ND (10)	ND (10)	ND (11)	ND (12)	ND (11)	ND (11)
1,1,2-TRICHLOROETHANE	ND (11)	ND (10)	ND (10)	ND (11)	ND (12)	ND (11)	ND (11)
1,1-DICHLOROETHENE	ND (11)	ND (10)	ND (10)	ND (11)	ND (12)	ND (11)	ND (11)
1,2-DICHLOROETHANE	ND (11)	ND (10)	ND (10)	ND (11)	ND (12)	ND (11)	ND (11)
4-METHYL-2-PENTANONE	ND (11)	ND (10)	ND (10)	ND (11)	ND (12)	ND (11)	ND (11)
ACETONE	ND (6)	ND (5)	ND (20)	ND (3)	ND (6)	ND (10)	ND (24)
BENZENE	ND (11)	ND (10)	ND (10)	ND (11)	ND (12)	ND (11)	ND (11)
CARBON DISULFIDE	ND (11)	ND (10)	ND (10)	ND (11)	ND (12)	ND (11)	ND (11)
CHLOROFORM	ND (11)	ND (10)	ND (10)	ND (11)	ND (12)	ND (11)	ND (11)
ETHYLBENZENE	ND (11)	ND (10)	ND (10)	ND (11)	ND (12)	ND (11)	ND (11)

TABLE 4.8-12 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B066	IR33B066	IR33B066	IR33B068	IR33B068	IR33B069	IR33B069
Sampling Depth (feet bgs)	5.75	16.75	20.25	5.75	11.25	6.25	11.25
Sample Number	9420C237	9420C238	9420C239	9419L432	9419L434	9419L438	9419L439
Sample Date	05/19/94	05/19/94	05/19/94	05/11/94	05/11/94	05/11/94	05/11/94
Volatile Organic Compound (ug/kg)							
METHYLENE CHLORIDE	ND (11)	ND (3)	ND (10)	ND (11)	ND (12)	ND (11)	ND (11)
TETRACHLOROETHENE	ND (11)	ND (10)	ND (10)	1	ND (12)	3	ND (11)
TOLUENE	ND (11)	ND (10)	ND (10)	ND (11)	ND (12)	ND (11)	ND (11)
TRICHLOROETHENE	ND (11)	ND (10)	ND (10)	ND (11)	ND (12)	ND (11)	ND (11)
XYLENE (TOTAL)	ND (11)	ND (10)	ND (10)	ND (11)	ND (12)	ND (11)	ND (11)
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	49	ND (360)	ND (360)	ND (340)	62	ND (730)	150
2-METHYLPHENOL	ND (370)	ND (360)	ND (360)	ND (340)	ND (380)	ND (730)	ND (380)
4-METHYLPHENOL	ND (370)	ND (360)	ND (360)	ND (340)	ND (380)	ND (730)	ND (380)
ACENAPHTHENE	ND (370)	ND (360)	ND (360)	ND (340)	ND (380)	ND (730)	ND (380)
ANTHRACENE	ND (370)	ND (360)	ND (360)	ND (340)	ND (380)	170	ND (380)
BENZO(A)ANTHRACENE	ND (370)	ND (360)	ND (360)	ND (340)	ND (380)	480	ND (380)
BENZO(A)PYRENE	ND (370)	ND (360)	36	ND (340)	ND (380)	330 *#	ND (380)
BENZO(B)FLUORANTHENE	ND (370)	ND (360)	ND (360)	ND (340)	ND (380)	230	ND (380)
BENZO(G,H,I)PERYLENE	ND (370)	ND (360)	38	ND (340)	ND (380)	160	ND (380)
BENZO(K)FLUORANTHENE	ND (370)	ND (360)	ND (360)	ND (340)	ND (380)	290	ND (380)
BIS(2-ETHYLHEXYL)PHTHALATE	ND (370)	ND (33)	ND (36)	ND (160)	ND (300)	ND (640)	ND (110)
CARBAZOLE	23	ND (360)	26	ND (340)	ND (380)	ND (730)	ND (380)
CHRYSENE	28	ND (360)	ND (360)	ND (340)	ND (380)	550	ND (380)
DIBENZOFURAN	91	22	64	ND (340)	30	ND (730)	ND (380)
FLUORANTHENE	ND (370)	ND (360)	ND (360)	ND (340)	ND (380)	1,900	ND (380)
FLUORENE	60	ND (360)	69	ND (340)	ND (380)	ND (730)	ND (380)
INDENO(1,2,3-CD)PYRENE	ND (370)	ND (360)	ND (360)	ND (340)	ND (380)	140	ND (380)
NAPHTHALENE	41	ND (360)	ND (360)	ND (340)	ND (380)	ND (730)	170
PHENANTHRENE	95	41	48	ND (340)	77	460	ND (380)
PYRENE	45	24	30	ND (340)	42	1,600	46
Pesticide/Polychlorinated Biphenyl (ug/kg)							
4,4'-DDD	ND (4)	ND (4)	ND (4)	ND (3)	ND (4)	ND (4)	ND (4)
4,4'-DDE	ND (4)	ND (4)	ND (4)	ND (3)	ND (4)	3	ND (4)
4,4'-DDT	ND (4)	ND (4)	ND (4)	2	ND (4)	ND (4)	ND (4)
ALDRIN	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	0.9	ND (2)
ALPHA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	13	ND (2)
DIELDRIN	ND (4)	ND (4)	ND (4)	ND (3)	ND (4)	ND (4)	ND (4)
ENDOSULFAN I	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	14	ND (2)

TABLE 4.8-12 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B066	IR33B066	IR33B066	IR33B068	IR33B068	IR33B069	IR33B069
Sampling Depth (feet bgs)	5.75	16.75	20.25	5.75	11.25	6.25	11.25
Sample Number	9420C237	9420C238	9420C239	9419L432	9419L434	9419L438	9419L439
Sample Date	05/19/94	05/19/94	05/19/94	05/11/94	05/11/94	05/11/94	05/11/94
Pesticide/Polychlorinated Biphenyl (ug/kg)							
ENDRIN	ND (4)	ND (4)	ND (4)	ND (3)	ND (4)	ND (4)	ND (4)
ENDRIN ALDEHYDE	ND (4)	ND (4)	ND (4)	ND (3)	ND (4)	ND (4)	ND (4)
ENDRIN KETONE	ND (4)	ND (4)	ND (4)	ND (3)	ND (4)	ND (4)	ND (4)
GAMMA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	6	ND (2)
HEPTACHLOR	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	2	ND (2)
HEPTACHLOR EPOXIDE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
AROCLOR-1260	ND (37)	ND (36)	ND (36)	ND (34)	ND (38)	ND (37)	ND (37)
TPH-Purgeable (mg/kg)							
TPH-GASOLINE	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.5)	ND (0.6)	ND (0.6)	34
TPH-Extractable (mg/kg)							
TPH-DIESEL	14	14	14	ND (11)	ND (12)	ND (23)	44
TPH-EXTRACTABLE UNKNOWN HYDROCARBON	NA	NA	NA	NA	NA	NA	NA
TPH-MOTOR OIL	ND (120)	ND (110)	ND (110)	ND (110)	ND (120)	850	ND (120)
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	ND (28)	ND (29)	ND (30)	ND (27)	ND (31)	1,100	ND (32)
Oil and Grease (mg/kg)							
TOTAL OIL & GREASE	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	90.0	91.2	91.3	96.4	86.8	90.4	87.7
pH (pH units)							
PH	10.0	10.1	10.1	9.1	10.8	11.8	8.6

TABLE 4.8-12 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B070	IR33B070	IR33B070	IR33B078	IR33B078	IR33B078	IR33B079
Sampling Depth (feet bgs)	6.25	11.25	16.25	1.75	5.75	10.75	1.75
Sample Number	9415C127	9415C128	9415C130	9414A748	9414A749	9414A750	9434K050
Sample Date	04/12/94	04/12/94	04/12/94	04/05/94	04/05/94	04/05/94	08/27/94
Metal (mg/kg)							
ALUMINUM	33,000	26,900	22,500	21,700	18,500	38,400	25,900
ANTIMONY	2.9	2.9	1.5	1.6	1.5	14.3 α	1.9
ARSENIC	2.7 *#	2.0 *	15.5 *#α	12.5 *#α	10.5 *#	6.4 *#	3.2 *#
BARIUM	151	217	52.3	79.1	88.7	80.0	249
BERYLLIUM	0.33 *	0.32 *	0.30 *	0.30 *	0.31 *	0.30 *	0.51 *
CADMIUM	ND (0.08)	ND (0.02)	ND (0.02)	ND (0.10)	ND (0.02)	0.41	1.3
CALCIUM	34,400	16,100	4,660	9,910	4,470	10,000	19,400
CHROMIUM	186	172	51.3	49.4	47.2	1,330 *α	264 *
COBALT	35.5	35.1	23.6	22.7	18.2	107 α	32.4
COPPER	80.2	53.5	59.5	66.9	40.0	47.8	37.0
IRON	58,300	54,600	42,800	40,300	36,800	53,000	42,000
LEAD	77.3 α	1.9	12.8 α	13.6 α	9.9 α	4.9	7.7
MAGNESIUM	28,300	19,500	16,700	22,100	15,700	91,900	57,800
MANGANESE	1,590 *α	1,920 *α	530 *	554 *	377	724 *	923 *
MERCURY	ND (0.01)	ND (0.05)	ND (0.14)	ND (0.05)	ND (0.05)	ND (0.10)	0.09
MOLYBDENUM	ND (0.60)	ND (0.50)	1.8	2.1	0.81	1.2	ND (0.10)
NICKEL	193 *	107	64.6	62.0	57.9	1,680 *	426 *
POTASSIUM	540	634	2,410	2,620	2,060	1,260	1,520
SELENIUM	0.86	0.63	1.3	0.46	0.62	ND (0.31)	ND (0.55)
SILVER	ND (0.12)	ND (0.14)	ND (0.12)	ND (0.13)	ND (0.14)	ND (0.13)	ND (0.14)
SODIUM	ND (27.6)	302	ND (27.8)	ND (28.4)	ND (32.1)	ND (29.3)	677
THALLIUM	ND (0.19)	ND (0.23)	ND (0.16)	ND (0.17)	ND (0.14)	0.83 α	ND (0.48)
VANADIUM	124 α	119 α	62.0	52.2	55.9	93.2	71.2
ZINC	138 α	89.1	84.0	92.8	70.9	88.1	86.3
Volatile Organic Compound (ug/kg)							
1,1,1-TRICHLOROETHANE	ND (11)	ND (12)	ND (10)	ND (11)	ND (11)	ND (11)	ND (12)
1,1,2-TRICHLOROETHANE	ND (11)	ND (12)	ND (10)	ND (11)	ND (11)	ND (11)	ND (12)
1,1-DICHLOROETHENE	ND (11)	ND (12)	ND (10)	ND (11)	ND (11)	ND (11)	ND (12)
1,2-DICHLOROETHANE	ND (11)	ND (12)	ND (10)	ND (11)	ND (11)	ND (11)	ND (12)
4-METHYL-2-PENTANONE	ND (11)	ND (12)	ND (10)	ND (11)	ND (11)	ND (11)	ND (12)
ACETONE	ND (11)	ND (5)	ND (10)	ND (11)	ND (11)	ND (11)	ND (29)
BENZENE	ND (11)	ND (12)	ND (10)	ND (11)	ND (11)	ND (11)	ND (12)
CARBON DISULFIDE	ND (11)	ND (12)	ND (10)	ND (11)	ND (11)	ND (11)	ND (12)
CHLOROFORM	ND (11)	ND (12)	ND (10)	ND (11)	ND (11)	ND (11)	ND (12)
ETHYLBENZENE	ND (11)	ND (12)	ND (10)	ND (11)	ND (11)	ND (11)	ND (12)

TABLE 4.8-12 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B070	IR33B070	IR33B070	IR33B078	IR33B078	IR33B078	IR33B079
Sampling Depth (feet bgs)	6.25	11.25	16.25	1.75	5.75	10.75	1.75
Sample Number	9415C127	9415C128	9415C130	9414A748	9414A749	9414A750	9434K050
Sample Date	04/12/94	04/12/94	04/12/94	04/05/94	04/05/94	04/05/94	08/27/94
Volatile Organic Compound (ug/kg)							
METHYLENE CHLORIDE	ND (11)	ND (12)	ND (7)	ND (11)	ND (11)	ND (11)	ND (13)
TETRACHLOROETHENE	ND (11)	ND (12)	ND (10)	ND (11)	ND (11)	ND (11)	ND (12)
TOLUENE	ND (11)	ND (12)	ND (10)	ND (11)	ND (11)	ND (11)	ND (12)
TRICHLOROETHENE	ND (11)	ND (12)	2	ND (11)	ND (11)	ND (11)	ND (12)
XYLENE (TOTAL)	ND (11)	ND (12)	ND (10)	ND (11)	ND (11)	ND (11)	ND (12)
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (380)	ND (400)	78	27	ND (350)	65	ND (400)
2-METHYLPHENOL	ND (380)	ND (400)	ND (350)	ND (350)	NA	ND (370)	ND (400)
4-METHYLPHENOL	ND (380)	ND (400)	ND (350)	ND (350)	NA	ND (370)	ND (400)
ACENAPHTHENE	ND (380)	ND (400)	ND (350)	ND (350)	ND (350)	ND (370)	ND (400)
ANTHRACENE	ND (380)	ND (400)	45	ND (350)	ND (350)	ND (370)	ND (400)
BENZO(A)ANTHRACENE	ND (380)	ND (400)	63	ND (350)	ND (350)	ND (370)	ND (400)
BENZO(A)PYRENE	ND (380)	ND (400)	34	33	ND (350)	27	ND (400)
BENZO(B)FLUORANTHENE	ND (380)	ND (400)	53	28	32	ND (370)	ND (400)
BENZO(G,H,I)PERYLENE	ND (380)	ND (400)	49	ND (350)	32	ND (370)	ND (400)
BENZO(K)FLUORANTHENE	ND (380)	ND (400)	23	ND (350)	ND (350)	ND (370)	ND (400)
BIS(2-ETHYLHEXYL)PHTHALATE	ND (380)	ND (37)	ND (350)	ND (350)	ND (350)	ND (370)	ND (400)
CARBAZOLE	ND (380)	ND (400)	ND (350)	ND (350)	ND (350)	29	ND (400)
CHRYSENE	ND (380)	ND (400)	80	38	29	ND (370)	ND (400)
DIBENZOFURAN	ND (380)	ND (400)	63	22	20	22	ND (400)
FLUORANTHENE	ND (380)	ND (400)	93	48	41	19	ND (400)
FLUORENE	ND (380)	ND (400)	ND (350)	ND (350)	ND (350)	ND (370)	ND (400)
INDENO(1,2,3-CD)PYRENE	ND (380)	ND (400)	18	ND (350)	ND (350)	ND (370)	ND (400)
NAPHTHALENE	ND (380)	ND (400)	ND (350)	ND (350)	ND (350)	ND (370)	ND (400)
PHENANTHRENE	ND (380)	ND (400)	240	110	96	76	ND (400)
PYRENE	ND (380)	ND (400)	140	64	71	51	ND (400)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
4,4'-DDD	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
4,4'-DDE	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
4,4'-DDT	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ALDRIN	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	0.5
ALPHA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
DIELDRIN	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ENDOSULFAN I	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)

TABLE 4.8-12 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B070	IR33B070	IR33B070	IR33B078	IR33B078	IR33B078	IR33B079
Sampling Depth (feet bgs)	6.25	11.25	16.25	1.75	5.75	10.75	1.75
Sample Number	9415C127	9415C128	9415C130	9414A748	9414A749	9414A750	9434K050
Sample Date	04/12/94	04/12/94	04/12/94	04/05/94	04/05/94	04/05/94	08/27/94
Pesticide/Polychlorinated Biphenyl (ug/kg)							
ENDRIN	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ENDRIN ALDEHYDE	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ENDRIN KETONE	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
GAMMA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
HEPTACHLOR	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
HEPTACHLOR EPOXIDE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
AROCLOR-1260	ND (37)	ND (40)	ND (35)	ND (35)	ND (35)	ND (37)	ND (40)
TPH-Purgeable (mg/kg)							
TPH-GASOLINE	ND (0.6)	ND (0.6)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.6)	ND (0.6)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (12)	ND (13)	ND (11)	44	20	15	ND (12)
TPH-EXTRACTABLE UNKNOWN HYDROCARBON	NA	NA	NA	NA	NA	NA	NA
TPH-MOTOR OIL	ND (120)	ND (130)	ND (110)	ND (110)	ND (110)	ND (120)	8
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	71	ND (30)	38	39	52	ND (30)	ND (3)
Oil and Grease (mg/kg)							
TOTAL OIL & GREASE	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	87.6	83.2	94.4	93.9	93.2	90.3	83.9
pH (pH units)							
PH	8.2	8.7	9.9	8.7	9.6	9.6	8.8

TABLE 4.8-12 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B079	IR33B079	IR33B079	IR33B079	IR33B080	IR33B081	IR33B081
Sampling Depth (feet bgs)	6.25	10.75	15.75	18.75	1.75	1.75	5.25
Sample Number	9434K051	9434K052	9434K053	9435C500	9414A751	9427R393	9427R394
Sample Date	08/27/94	08/27/94	08/27/94	08/28/94	04/05/94	07/07/94	07/07/94
Metal (mg/kg)							
ALUMINUM	2,550	13,300	38,000	35,100	18,000	18,000	25,000
ANTIMONY	6.2	ND (0.56)	2.2	2.7	0.95	ND (0.28)	ND (1.2)
ARSENIC	ND (0.34)	9.3 *#	9.2 *#	10.0 *#	0.68 *	ND (0.47)	ND (0.33)
BARIUM	224	140	327 α	354 α	187	29.0	99.8
BERYLLIUM	ND (0.11)	0.34 *	0.58 *	0.52 *	ND (0.17)	ND (0.12)	ND (0.14)
CADMIUM	1.6	0.76	1.3	1.2	0.90	0.30	0.13
CALCIUM	6,400	7,860	13,800	25,400	17,600	13,900	ND (7,140)
CHROMIUM	989 *	26.9	248 *	325 *	35.9	11.0	70.8
COBALT	79.9	13.0	30.6	33.4	22.9	12.7	32.9
COPPER	4.4	37.4	40.3	34.8	63.3	76.4	87.9
IRON	35,300	24,700	43,700	37,200	29,000	26,500	48,200
LEAD	2.1	10.3 α	7.4	6.2	1.9	1.9	1.1
MAGNESIUM	151,000	16,800	83,200	81,000	13,700	11,800	34,100
MANGANESE	667 *	296	802 *	803 *	714 *	466 *	776 *
MERCURY	0.12	0.06	ND (0.06)	0.06	ND (0.05)	ND (0.05)	ND (0.05)
MOLYBDENUM	ND (0.09)	ND (0.08)	ND (0.09)	6.7 α	ND (0.14)	ND (0.16)	ND (0.08)
NICKEL	1,700 *	45.1	438 *	513 *	46.4	15.0	50.1
POTASSIUM	122	1,400	1,410	811	887	622	874
SELENIUM	ND (0.53)	ND (0.48)	ND (0.51)	ND (0.53)	ND (0.62)	ND (0.48)	ND (0.47)
SILVER	ND (0.14)	ND (0.13)	ND (0.13)	ND (0.14)	ND (0.16)	ND (0.12)	ND (0.12)
SODIUM	378	334	676	828	377	ND (293)	ND (27.9)
THALLIUM	ND (0.46)	ND (0.42)	ND (0.44)	ND (0.46)	ND (0.41)	ND (0.42)	ND (0.41)
VANADIUM	18.0	34.2	86.1	84.7	63.8	76.8	74.3
ZINC	25.2	52.7	74.4	60.3	45.9	42.3	76.5
Volatile Organic Compound (ug/kg)							
1,1,1-TRICHLOROETHANE	ND (11)	ND (11)	ND (11)	ND (11)	ND (10)	ND (10)	ND (10)
1,1,2-TRICHLOROETHANE	ND (11)	ND (11)	ND (11)	ND (11)	ND (10)	ND (10)	ND (10)
1,1-DICHLOROETHENE	ND (11)	ND (11)	ND (11)	ND (11)	ND (10)	ND (10)	ND (10)
1,2-DICHLOROETHANE	ND (11)	ND (11)	ND (11)	ND (11)	ND (10)	ND (10)	ND (10)
4-METHYL-2-PENTANONE	ND (11)	ND (11)	ND (11)	ND (11)	ND (10)	ND (10)	ND (10)
ACETONE	ND (47)	58	ND (48)	ND (6)	ND (16)	ND (10)	ND (7)
BENZENE	ND (11)	ND (11)	50	77	ND (10)	ND (10)	ND (10)
CARBON DISULFIDE	ND (11)	ND (11)	ND (11)	ND (11)	ND (10)	ND (10)	ND (10)
CHLOROFORM	ND (11)	ND (11)	ND (11)	ND (11)	ND (10)	ND (10)	ND (10)
ETHYLBENZENE	ND (11)	ND (11)	ND (11)	ND (11)	ND (10)	ND (10)	ND (10)

TABLE 4.8-12 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B079	IR33B079	IR33B079	IR33B079	IR33B080	IR33B081	IR33B081
Sampling Depth (feet bgs)	6.25	10.75	15.75	18.75	1.75	1.75	5.25
Sample Number	9434K051	9434K052	9434K053	9435C500	9414A751	9427R393	9427R394
Sample Date	08/27/94	08/27/94	08/27/94	08/28/94	04/05/94	07/07/94	07/07/94
Volatile Organic Compound (ug/kg)							
METHYLENE CHLORIDE	ND (15)	ND (9)	ND (15)	ND (10)	ND (15)	ND (2)	ND (9)
TETRACHLOROETHENE	ND (11)	ND (11)	ND (11)	ND (11)	42	5	ND (10)
TOLUENE	ND (11)	ND (11)	35	49	ND (10)	ND (10)	ND (10)
TRICHLOROETHENE	ND (11)	ND (11)	ND (11)	ND (11)	ND (10)	ND (10)	ND (10)
XYLENE (TOTAL)	ND (11)	ND (11)	9	9	6	ND (10)	ND (10)
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (380)	ND (350)	170	ND (380)	ND (340)	ND (690)	ND (340)
2-METHYLPHENOL	ND (380)	ND (350)	ND (370)	ND (380)	ND (340)	ND (690)	ND (340)
4-METHYLPHENOL	ND (380)	ND (350)	ND (370)	ND (380)	ND (340)	ND (690)	ND (340)
ACENAPHTHENE	ND (380)	ND (350)	ND (370)	ND (380)	ND (340)	ND (690)	ND (340)
ANTHRACENE	ND (380)	17	ND (370)	ND (380)	ND (340)	ND (690)	ND (340)
BENZO(A)ANTHRACENE	ND (380)	ND (350)	ND (370)	ND (380)	ND (340)	ND (690)	ND (340)
BENZO(A)PYRENE	ND (380)	ND (350)	ND (370)	ND (380)	ND (340)	NA	ND (340)
BENZO(B)FLUORANTHENE	ND (380)	ND (350)	ND (370)	ND (380)	ND (340)	NA	ND (340)
BENZO(G,H,I)PERYLENE	ND (380)	ND (350)	ND (370)	ND (380)	ND (340)	NA	ND (340)
BENZO(K)FLUORANTHENE	ND (380)	ND (350)	ND (370)	ND (380)	ND (340)	NA	ND (340)
BIS(2-ETHYLHEXYL)PHTHALATE	ND (180)	ND (350)	ND (370)	ND (380)	ND (460)	ND (1,500)	ND (400)
CARBAZOLE	ND (380)	ND (350)	ND (370)	ND (380)	ND (340)	ND (690)	ND (340)
CHRYSENE	ND (380)	ND (350)	ND (370)	ND (380)	76	ND (690)	ND (340)
DIBENZOFURAN	ND (380)	ND (350)	ND (370)	ND (380)	ND (340)	ND (690)	ND (340)
FLUORANTHENE	ND (380)	ND (350)	ND (370)	ND (380)	ND (340)	ND (690)	ND (340)
FLUORENE	ND (380)	ND (350)	ND (370)	ND (380)	ND (340)	ND (690)	ND (340)
INDENO(1,2,3-CD)PYRENE	ND (380)	ND (350)	ND (370)	ND (380)	ND (340)	NA	ND (340)
NAPHTHALENE	ND (380)	ND (350)	250	ND (380)	ND (340)	ND (690)	ND (340)
PHENANTHRENE	ND (380)	91	ND (370)	ND (380)	ND (340)	ND (690)	ND (340)
PYRENE	ND (380)	ND (350)	ND (370)	ND (380)	ND (340)	ND (690)	ND (340)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
4,4'-DDD	ND (4)	ND (4)	ND (4)	ND (4)	ND (17)	ND (35)	ND (3)
4,4'-DDE	ND (4)	ND (4)	ND (4)	ND (4)	ND (17)	ND (35)	ND (3)
4,4'-DDT	ND (4)	ND (4)	ND (4)	ND (4)	ND (17)	ND (35)	ND (3)
ALDRIN	ND (2)	ND (2)	ND (2)	ND (2)	ND (9)	ND (17)	ND (2)
ALPHA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	ND (9)	ND (17)	ND (2)
DIELDRIN	ND (4)	ND (4)	ND (4)	ND (4)	ND (17)	ND (35)	ND (3)
ENDOSULFAN I	ND (2)	ND (2)	ND (2)	ND (2)	ND (9)	ND (17)	ND (2)

TABLE 4.8-12 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B079	IR33B079	IR33B079	IR33B079	IR33B080	IR33B081	IR33B081
Sampling Depth (feet bgs)	6.25	10.75	15.75	18.75	1.75	1.75	5.25
Sample Number	9434K051	9434K052	9434K053	9435C500	9414A751	9427R393	9427R394
Sample Date	08/27/94	08/27/94	08/27/94	08/28/94	04/05/94	07/07/94	07/07/94
Pesticide/Polychlorinated Biphenyl (ug/kg)							
ENDRIN	ND (4)	ND (4)	ND (4)	ND (4)	ND (17)	ND (35)	ND (3)
ENDRIN ALDEHYDE	ND (4)	ND (4)	ND (4)	ND (4)	ND (17)	ND (35)	ND (3)
ENDRIN KETONE	ND (4)	ND (4)	ND (4)	ND (4)	ND (17)	ND (35)	ND (3)
GAMMA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	ND (9)	ND (17)	ND (2)
HEPTACHLOR	ND (2)	ND (2)	ND (2)	ND (2)	ND (9)	ND (17)	ND (2)
HEPTACHLOR EPOXIDE	ND (2)	ND (2)	ND (2)	ND (2)	ND (9)	ND (17)	ND (2)
AROCLOR-1260	ND (38)	ND (35)	ND (37)	ND (38)	ND (170)	ND (350)	ND (34)
TPH-Purgeable (mg/kg)							
TPH-GASOLINE	ND (0.6)	ND (0.5)	ND (0.6)	ND (0.6)	ND (0.5)	ND (0.5)	ND (0.5)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (11)	ND (11)	ND (11)	ND (11)	ND (10)	ND (100)	ND (10)
TPH-EXTRACTABLE UNKNOWN HYDROCARBON	NA	NA	NA	NA	NA	NA	NA
TPH-MOTOR OIL	ND (11)	29	11	9	17	970	36
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	ND (4)	ND (5)	ND (3)	ND (3)	18	540	21
Oil and Grease (mg/kg)							
TOTAL OIL & GREASE	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	87.6	95.2	90.7	87.1	97.1	NA	NA
pH (pH units)							
PH	9.3	10.1	10.1	9.8	8.7	8.8	8.8

TABLE 4.8-12 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B082	IR33B082	IR33B082	IR33B083	IR33B083	IR33B083	IR33B083
Sampling Depth (feet bgs)	3.25	6.25	11.25	1.25	6.25	10.25	15.25
Sample Number	9427R390	9427R391	9427R392	9413L176	9413L177	9413L178	9413L179
Sample Date	07/07/94	07/07/94	07/07/94	03/29/94	03/29/94	03/29/94	03/29/94
Metal (mg/kg)							
ALUMINUM	7,400	20,100	29,700	28,200	27,800	34,100	47,000
ANTIMONY	ND (0.98)	ND (2.1)	ND (2.5)	ND (3.7)	ND (2.7)	ND (2.1)	ND (4.2)
ARSENIC	ND (1.8)	ND (1.7)	3.8 *#	6.2 *#	2.4 *#	0.51 *	1.5 *
BARIUM	101	177	539 α	185	241	49.1	125
BERYLLIUM	ND (0.17)	0.35 *	0.46 *	0.26 *	0.22 *	ND (0.01)	ND (0.01)
CADMIUM	4.7 α	0.04	0.19	0.49	0.52	0.31	0.55
CALCIUM	8,910	15,300	18,600	10,600	18,700	5,780	82,400
CHROMIUM	68.2	181	246 *	286 *	112	81.3	221 *
COBALT	11.6	30.0	27.7	45.2	37.7	37.2	36.5
COPPER	19.9	37.0	36.3	54.8	54.0	58.7	69.1
IRON	14,600	35,600	37,000	44,900	59,900	46,400	43,100
LEAD	12.9 α	9.3 α	7.4	6.0	2.2	ND (0.16)	ND (0.10)
MAGNESIUM	13,200	29,300	64,600	79,800	16,300	58,800	43,200
MANGANESE	415 *	1,140 *	672 *	1,090 *	2,000 *α	628 *	725 *
MERCURY	ND (0.05)	ND (0.06)	0.08	ND (0.03)	ND (0.06)	ND (0.04)	ND (0.06)
MOLYBDENUM	ND (0.21)	ND (0.09)	ND (0.09)	ND (0.83)	ND (0.85)	1.0	2.3
NICKEL	134	223 *	411 *	579 *	92.7	219 *	154 *
POTASSIUM	1,160	1,050	1,230	1,410	487	1,110	97.0
SELENIUM	ND (0.47)	ND (0.52)	ND (0.51)	ND (0.32)	ND (0.24)	ND (0.34)	ND (0.21)
SILVER	ND (0.49)	ND (0.13)	ND (0.13)	ND (0.13)	ND (0.10)	ND (0.14)	ND (0.09)
SODIUM	ND (164)	ND (30.6)	ND (946)	NA	NA	636	NA
THALLIUM	ND (0.41)	ND (0.45)	ND (0.45)	ND (0.21)	ND (0.19)	ND (0.20)	ND (0.15)
VANADIUM	33.7	81.3	64.3	70.5	136 α	63.1	153 α
ZINC	47.9	56.2	61.6	75.5	101	55.8	54.1
Volatile Organic Compound (ug/kg)							
1,1,1-TRICHLOROETHANE	ND (10)	ND (11)	ND (11)	ND (11)	ND (12)	ND (11)	ND (11)
1,1,2-TRICHLOROETHANE	ND (10)	ND (11)	ND (11)	ND (11)	ND (12)	ND (11)	ND (11)
1,1-DICHLOROETHENE	ND (10)	ND (11)	ND (11)	ND (11)	ND (12)	ND (11)	ND (11)
1,2-DICHLOROETHANE	ND (10)	ND (11)	ND (11)	ND (11)	ND (12)	ND (11)	ND (11)
4-METHYL-2-PENTANONE	ND (10)	ND (11)	ND (11)	ND (11)	ND (12)	ND (11)	ND (11)
ACETONE	ND (20)	ND (8)	ND (11)	ND (11)	ND (6)	ND (4)	ND (8)
BENZENE	ND (10)	ND (11)	ND (11)	2	ND (12)	ND (11)	ND (11)
CARBON DISULFIDE	ND (10)	ND (11)	ND (11)	2	ND (12)	ND (11)	ND (11)
CHLOROFORM	ND (10)	ND (11)	ND (11)	4	ND (12)	ND (11)	ND (11)
ETHYLBENZENE	7	ND (11)	ND (11)	ND (11)	ND (12)	ND (11)	ND (11)

TABLE 4.8-12 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B082	IR33B082	IR33B082	IR33B083	IR33B083	IR33B083	IR33B083
Sampling Depth (feet bgs)	3.25	6.25	11.25	1.25	6.25	10.25	15.25
Sample Number	9427R390	9427R391	9427R392	9413L176	9413L177	9413L178	9413L179
Sample Date	07/07/94	07/07/94	07/07/94	03/29/94	03/29/94	03/29/94	03/29/94
Volatile Organic Compound (ug/kg)							
METHYLENE CHLORIDE	ND (4)	ND (2)	ND (10)	ND (11)	ND (12)	ND (11)	ND (11)
TETRACHLOROETHENE	ND (10)	ND (11)	ND (11)	ND (11)	ND (12)	ND (11)	ND (11)
TOLUENE	ND (10)	ND (11)	ND (11)	ND (11)	ND (12)	ND (11)	ND (11)
TRICHLOROETHENE	ND (10)	ND (11)	ND (11)	ND (11)	ND (12)	ND (11)	ND (11)
XYLENE (TOTAL)	48	ND (11)	ND (11)	ND (11)	ND (12)	ND (11)	ND (11)
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (6,900)	ND (370)	ND (370)	55	ND (390)	ND (350)	ND (350)
2-METHYLPHENOL	ND (6,900)	ND (370)	ND (370)	ND (380)	ND (390)	ND (350)	ND (350)
4-METHYLPHENOL	ND (6,900)	ND (370)	ND (370)	ND (380)	ND (390)	ND (350)	ND (350)
ACENAPHTHENE	ND (6,900)	ND (370)	ND (370)	ND (380)	ND (390)	ND (350)	ND (350)
ANTHRACENE	ND (6,900)	ND (370)	ND (370)	ND (380)	ND (390)	ND (350)	ND (350)
BENZO(A)ANTHRACENE	ND (6,900)	ND (370)	ND (370)	ND (380)	ND (390)	ND (350)	ND (350)
BENZO(A)PYRENE	NA	ND (370)	ND (370)	ND (380)	ND (390)	ND (350)	ND (350)
BENZO(B)FLUORANTHENE	NA	ND (370)	ND (370)	ND (380)	ND (390)	ND (350)	ND (350)
BENZO(G,H,I)PERYLENE	NA	ND (370)	ND (370)	ND (380)	ND (390)	ND (350)	ND (350)
BENZO(K)FLUORANTHENE	NA	ND (370)	ND (370)	21	ND (390)	ND (350)	ND (350)
BIS(2-ETHYLHEXYL)PHTHALATE	ND (4,700)	ND (26)	ND (400)	ND (34)	ND (29)	ND (27)	ND (89)
CARBAZOLE	ND (6,900)	ND (370)	ND (370)	ND (380)	ND (390)	ND (350)	ND (350)
CHRYSENE	ND (6,900)	ND (370)	ND (370)	ND (380)	ND (390)	ND (350)	ND (350)
DIBENZOFURAN	ND (6,900)	ND (370)	ND (370)	18	ND (390)	ND (350)	ND (350)
FLUORANTHENE	ND (6,900)	ND (370)	21	ND (380)	ND (390)	ND (350)	ND (350)
FLUORENE	ND (6,900)	ND (370)	ND (370)	ND (380)	ND (390)	ND (350)	ND (350)
INDENO(1,2,3-CD)PYRENE	NA	ND (370)	ND (370)	ND (380)	ND (390)	ND (350)	ND (350)
NAPHTHALENE	ND (6,900)	ND (370)	ND (370)	42	ND (390)	ND (350)	ND (350)
PHENANTHRENE	ND (6,900)	ND (370)	72	43	ND (390)	ND (350)	ND (350)
PYRENE	360	ND (370)	38	ND (380)	ND (390)	ND (350)	ND (350)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
4,4'-DDD	ND (34)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
4,4'-DDE	ND (34)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
4,4'-DDT	ND (34)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ALDRIN	ND (17)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
ALPHA-CHLORDANE	ND (17)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
DIELDRIN	ND (34)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ENDOSULFAN I	ND (17)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)

TABLE 4.8-12 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B082	IR33B082	IR33B082	IR33B083	IR33B083	IR33B083	IR33B083
Sampling Depth (feet bgs)	3.25	6.25	11.25	1.25	6.25	10.25	15.25
Sample Number	9427R390	9427R391	9427R392	9413L176	9413L177	9413L178	9413L179
Sample Date	07/07/94	07/07/94	07/07/94	03/29/94	03/29/94	03/29/94	03/29/94
Pesticide/Polychlorinated Biphenyl (ug/kg)							
ENDRIN	ND (34)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ENDRIN ALDEHYDE	ND (34)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ENDRIN KETONE	ND (34)	ND (4)	ND (4)	3	ND (4)	ND (4)	ND (4)
GAMMA-CHLORDANE	ND (17)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
HEPTACHLOR	ND (17)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
HEPTACHLOR EPOXIDE	ND (17)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
AROCLOR-1260	ND (340)	ND (37)	ND (37)	ND (38)	ND (39)	ND (35)	ND (35)
TPH-Purgeable (mg/kg)							
TPH-GASOLINE	ND (0.5)	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.5)	ND (0.5)
TPH-Extractable (mg/kg)							
TPH-DIESEL	56	ND (11)	ND (11)	ND (12)	ND (12)	ND (11)	ND (11)
TPH-EXTRACTABLE UNKNOWN HYDROCARBON	NA	NA	NA	NA	NA	NA	NA
TPH-MOTOR OIL	1,200	13	ND (11)	290	ND (120)	ND (110)	ND (110)
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	22,000	48	ND (4)	490	70	ND (30)	ND (27)
Oil and Grease (mg/kg)							
TOTAL OIL & GREASE	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	NA	NA	NA	87.4	85.1	93.0	94.3
pH (pH units)							
PH	8.6	8.0	9.6	9.0	9.5	10.5	10.0

TABLE 4.8-12 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B083	IR33B085	IR33B085	IR33B085	IR33B085	IR33B085	IR33B085
Sampling Depth (feet bgs)	21.25	1.25	6.25	10.75	15.75	21.25	26.25
Sample Number	9413L180	9413L183	9413L184	9413L185	9413L186	9413L187	9413L188
Sample Date	03/29/94	03/30/94	03/30/94	03/30/94	03/30/94	03/30/94	03/30/94
Metal (mg/kg)							
ALUMINUM	47,800	25,700	21,300	21,200	16,900	24,400	24,200
ANTIMONY	ND (3.6)	ND (4.0)	ND (0.70)	ND (0.92)	ND (0.88)	ND (0.95)	ND (0.85)
ARSENIC	2.4 *#	3.7 *#	6.9 *#	5.0 *#	7.7 *#	6.9 *#	5.6 *#
BARIUM	123	252	139	163	222	221	287
BERYLLIUM	0.11	0.38 *	0.34 *	0.35 *	ND (0.31)	0.39 *	0.48 *
CADMIUM	0.90	1.5	1.2	1.2	1.0	1.9	1.6
CALCIUM	13,800	9,210	13,100	6,230	6,700	33,700	8,860
CHROMIUM	305 *	523 *	63.4	39.0	23.3	76.0	43.2
COBALT	79.1	46.8	20.5	19.7	15.0	45.6	22.8
COPPER	60.7	53.1	51.6	57.5	47.6	56.8	74.7
IRON	58,800	43,800	35,600	39,500	34,500	42,200	40,300
LEAD	ND (0.15)	7.6	7.5	8.3	11.2 α	8.5	9.8 α
MAGNESIUM	131,000	74,000	22,800	19,500	12,200	25,700	18,000
MANGANESE	943 *	1,560 *α	614 *	678 *	514 *	843 *	644 *
MERCURY	ND (0.06)	0.10	0.05	0.04	0.06	0.10	0.06
MOLYBDENUM	1.1	ND (0.16)	ND (0.15)	ND (0.15)	ND (0.15)	ND (0.15)	ND (0.15)
NICKEL	804 *	632 *	117	46.4	33.8	510 *	82.7
POTASSIUM	ND (19.0)	1,400	1,480	1,920	1,760	2,000	3,330
SELENIUM	ND (0.33)	ND (0.69)	ND (0.66)	ND (0.64)	ND (0.64)	ND (0.65)	ND (0.63)
SILVER	ND (0.13)	ND (0.18)	ND (0.17)	ND (0.17)	ND (0.17)	ND (0.17)	ND (0.17)
SODIUM	NA	ND (44.1)	ND (57.5)	ND (40.7)	ND (75.8)	ND (117)	ND (99.6)
THALLIUM	ND (0.19)	ND (0.46)	ND (0.44)	ND (0.43)	ND (0.43)	ND (0.43)	ND (0.42)
VANADIUM	42.5	78.3	53.5	64.1	41.5	57.0	56.0
ZINC	65.2	75.6	73.3	85.5	66.8	85.7	94.3
Volatile Organic Compound (ug/kg)							
1,1,1-TRICHLOROETHANE	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	ND (10)
1,1,2-TRICHLOROETHANE	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	ND (10)
1,1-DICHLOROETHENE	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	ND (10)
1,2-DICHLOROETHANE	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	ND (10)
4-METHYL-2-PENTANONE	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	ND (10)
ACETONE	ND (4)	ND (56)	ND (13)	ND (13)	ND (11)	ND (11)	ND (27)
BENZENE	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	5
CARBON DISULFIDE	ND (11)	7	ND (11)	ND (11)	ND (11)	ND (11)	ND (10)
CHLOROFORM	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	ND (10)
ETHYLBENZENE	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	ND (10)

TABLE 4.8-12 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B083	IR33B085	IR33B085	IR33B085	IR33B085	IR33B085	IR33B085
Sampling Depth (feet bgs)	21.25	1.25	6.25	10.75	15.75	21.25	26.25
Sample Number	9413L180	9413L183	9413L184	9413L185	9413L186	9413L187	9413L188
Sample Date	03/29/94	03/30/94	03/30/94	03/30/94	03/30/94	03/30/94	03/30/94
Volatile Organic Compound (ug/kg)							
METHYLENE CHLORIDE	ND (11)	ND (6)	ND (7)	ND (11)	ND (17)	ND (17)	ND (5)
TETRACHLOROETHENE	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	ND (10)
TOLUENE	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	14
TRICHLOROETHENE	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	ND (10)
XYLENE (TOTAL)	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	7
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (370)	ND (380)	110	ND (350)	ND (350)	ND (360)	230
2-METHYLPHENOL	ND (370)	ND (380)	ND (360)	ND (350)	ND (350)	ND (360)	ND (350)
4-METHYLPHENOL	ND (370)	ND (380)	ND (360)	ND (350)	ND (350)	ND (360)	ND (350)
ACENAPHTHENE	ND (370)	ND (380)	ND (360)	ND (350)	ND (350)	ND (360)	ND (350)
ANTHRACENE	ND (370)	ND (380)	ND (360)	23	ND (350)	ND (360)	ND (350)
BENZO(A)ANTHRACENE	ND (370)	ND (380)	ND (360)	ND (350)	ND (350)	ND (360)	ND (350)
BENZO(A)PYRENE	ND (370)	ND (380)	ND (360)	ND (350)	ND (350)	ND (360)	ND (350)
BENZO(B)FLUORANTHENE	ND (370)	ND (380)	ND (360)	ND (350)	ND (350)	ND (360)	ND (350)
BENZO(G,H,I)PERYLENE	ND (370)	ND (380)	ND (360)	ND (350)	ND (350)	ND (360)	ND (350)
BENZO(K)FLUORANTHENE	ND (370)	ND (380)	ND (360)	ND (350)	ND (350)	ND (360)	ND (350)
BIS(2-ETHYLHEXYL)PHTHALATE	ND (59)	ND (1,900)	ND (460)	ND (570)	ND (730)	ND (360)	ND (1,100)
CARBAZOLE	ND (370)	ND (380)	ND (360)	ND (350)	ND (350)	ND (360)	ND (350)
CHRYSENE	ND (370)	ND (380)	ND (360)	ND (350)	ND (350)	ND (360)	ND (350)
DIBENZOFURAN	ND (370)	ND (380)	65	130	ND (350)	ND (360)	ND (350)
FLUORANTHENE	ND (370)	ND (380)	21	42	ND (350)	ND (360)	ND (350)
FLUORENE	ND (370)	ND (380)	ND (360)	70	ND (350)	ND (360)	ND (350)
INDENO(1,2,3-CD)PYRENE	ND (370)	ND (380)	ND (360)	ND (350)	ND (350)	ND (360)	ND (350)
NAPHTHALENE	ND (370)	ND (380)	110	ND (350)	ND (350)	ND (360)	270
PHENANTHRENE	ND (370)	ND (380)	110	120	ND (350)	ND (360)	ND (350)
PYRENE	ND (370)	ND (380)	25	38	ND (350)	ND (360)	ND (350)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
4,4'-DDD	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
4,4'-DDE	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
4,4'-DDT	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ALDRIN	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
ALPHA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
DIELDRIN	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ENDOSULFAN I	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)

TABLE 4.8-12 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B083	IR33B085	IR33B085	IR33B085	IR33B085	IR33B085	IR33B085
Sampling Depth (feet bgs)	21.25	1.25	6.25	10.75	15.75	21.25	26.25
Sample Number	9413L180	9413L183	9413L184	9413L185	9413L186	9413L187	9413L188
Sample Date	03/29/94	03/30/94	03/30/94	03/30/94	03/30/94	03/30/94	03/30/94
Pesticide/Polychlorinated Biphenyl (ug/kg)							
ENDRIN	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ENDRIN ALDEHYDE	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ENDRIN KETONE	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
GAMMA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
HEPTACHLOR	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
HEPTACHLOR EPOXIDE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (0.4)	ND (2)
AROCLOR-1260	ND (37)	ND (38)	ND (36)	ND (35)	ND (35)	ND (18)	ND (35)
TPH-Purgeable (mg/kg)							
TPH-GASOLINE	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (12)	ND (12)	11	9	ND (11)	ND (11)	10
TPH-EXTRACTABLE UNKNOWN HYDROCARBON	NA	NA	NA	NA	NA	NA	NA
TPH-MOTOR OIL	ND (120)	11	ND (11)	ND (11)	ND (11)	ND (11)	ND (10)
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	ND (29)	3	4	5	3	7	4
Oil and Grease (mg/kg)							
TOTAL OIL & GREASE	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	89.4	86.7	91.6	94.0	94.1	92.4	95.9
pH (pH units)							
PH	10.0	8.7	9.2	9.9	10.2	10.1	10.2

TABLE 4.8-12 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B085	IR33B086	IR33B086	IR33B086	IR33B087	IR33B087	IR33B087
Sampling Depth (feet bgs)	30.75	2.25	6.25	11.25	1.25	6.25	11.25
Sample Number	9413L189	9413A718	9413A719	9413A721	9413L193	9413L194	9413L195
Sample Date	03/30/94	03/31/94	03/31/94	03/31/94	03/30/94	03/30/94	03/30/94
Metal (mg/kg)							
ALUMINUM	16,900	3,650	1,970	3,880	7,500	10,700	7,250
ANTIMONY	ND (0.80)	ND (2.4)	ND (5.1)	ND (5.2)	ND (10.2)	ND (5.4)	ND (3.4)
ARSENIC	7.5 *#	ND (0.27)	ND (0.32)	9.2 *#	ND (0.29)	ND (0.31)	ND (0.31)
BARIUM	204	113	152	134	165	136	107
BERYLLIUM	ND (0.31)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)
CADMIUM	1.3	1.2	1.5	2.0	2.3	2.3	1.4
CALCIUM	8,450	ND (521)	ND (163)	22,400	1,670	3,410	1,720
CHROMIUM	30.6	493 *	947 *	911 *	1,500 *α	818 *	675 *
COBALT	22.8	63.3	85.8	65.2	85.7	80.7	67.6
COPPER	55.8	13.0	ND (10.1)	ND (8.2)	20.2	19.4	16.2
IRON	32,200	24,300	29,400	37,700	39,700	41,900	31,400
LEAD	12.4 α	ND (0.18)	ND (0.22)	ND (0.21)	ND (0.20)	ND (0.21)	ND (0.22)
MAGNESIUM	11,700	110,000	176,000	177,000	185,000	163,000	156,000
MANGANESE	710 *	486 *	579 *	687 *	735 *	723 *	489 *
MERCURY	0.04	ND (0.05)	0.08	0.22	0.03	0.05	ND (0.06)
MOLYBDENUM	ND (0.14)	ND (0.14)	ND (0.17)	ND (0.16)	ND (0.16)	ND (0.16)	ND (0.17)
NICKEL	50.7	1,390 *	1,990 *	1,440 *	2,220 *	1,680 *	1,430 *
POTASSIUM	1,710	ND (91.3)	ND (12.0)	ND (11.4)	ND (11.0)	ND (11.5)	ND (11.8)
SELENIUM	ND (0.62)	ND (0.62)	ND (0.74)	ND (0.70)	ND (0.68)	ND (0.71)	ND (0.72)
SILVER	ND (0.17)	ND (0.16)	ND (0.20)	ND (0.19)	ND (0.18)	ND (0.19)	ND (0.19)
SODIUM	ND (131)	ND (285)	ND (483)	ND (338)	ND (116)	ND (336)	ND (692)
THALLIUM	ND (0.41)	ND (0.41)	ND (0.49)	ND (0.47)	ND (0.45)	ND (0.47)	0.49
VANADIUM	39.4	19.1	21.4	19.5	39.7	31.4	27.7
ZINC	76.3	22.8	37.9	22.8	32.7	36.9	28.6
Volatile Organic Compound (ug/kg)							
1,1,1-TRICHLOROETHANE	ND (10)	ND (10)	ND (12)	ND (12)	ND (11)	ND (12)	ND (12)
1,1,2-TRICHLOROETHANE	ND (10)	ND (10)	ND (12)	9	ND (11)	ND (12)	ND (12)
1,1-DICHLOROETHENE	ND (10)	ND (10)	ND (12)	ND (12)	ND (11)	ND (12)	ND (12)
1,2-DICHLOROETHANE	ND (10)	ND (10)	ND (12)	3	ND (11)	ND (12)	ND (12)
4-METHYL-2-PENTANONE	ND (10)	ND (10)	ND (12)	ND (12)	ND (11)	ND (12)	ND (12)
ACETONE	ND (15)	ND (11)	ND (11)	ND (25)	ND (13)	ND (10)	ND (20)
BENZENE	ND (10)	ND (10)	ND (12)	ND (12)	ND (11)	ND (12)	ND (12)
CARBON DISULFIDE	ND (10)	ND (10)	ND (12)	ND (12)	ND (11)	ND (12)	ND (12)
CHLOROFORM	ND (10)	ND (10)	ND (12)	ND (12)	ND (11)	ND (12)	ND (12)
ETHYLBENZENE	ND (10)	ND (10)	ND (12)	ND (12)	ND (11)	ND (12)	ND (12)

TABLE 4.8-12 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B085	IR33B086	IR33B086	IR33B086	IR33B087	IR33B087	IR33B087
Sampling Depth (feet bgs)	30.75	2.25	6.25	11.25	1.25	6.25	11.25
Sample Number	9413L189	9413A718	9413A719	9413A721	9413L193	9413L194	9413L195
Sample Date	03/30/94	03/31/94	03/31/94	03/31/94	03/30/94	03/30/94	03/30/94
Volatile Organic Compound (ug/kg)							
METHYLENE CHLORIDE	ND (11)	ND (5)	ND (8)	ND (4)	ND (5)	ND (4)	ND (7)
TETRACHLOROETHENE	ND (10)	ND (10)	ND (12)	ND (12)	ND (11)	ND (12)	ND (12)
TOLUENE	ND (10)	ND (10)	ND (12)	ND (12)	ND (11)	ND (12)	ND (12)
TRICHLOROETHENE	ND (10)	ND (10)	ND (12)	63	ND (11)	ND (12)	ND (12)
XYLENE (TOTAL)	ND (10)	ND (10)	ND (12)	ND (12)	3	ND (12)	ND (12)
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (340)	ND (340)	ND (410)	ND (390)	ND (380)	ND (390)	ND (400)
2-METHYLPHENOL	ND (340)	ND (340)	ND (410)	ND (390)	ND (380)	ND (390)	ND (400)
4-METHYLPHENOL	ND (340)	ND (340)	ND (410)	ND (390)	ND (380)	ND (390)	ND (400)
ACENAPHTHENE	ND (340)	ND (340)	ND (410)	ND (390)	ND (380)	ND (390)	ND (400)
ANTHRACENE	ND (340)	ND (340)	ND (410)	ND (390)	ND (380)	ND (390)	ND (400)
BENZO(A)ANTHRACENE	ND (340)	ND (340)	ND (410)	ND (390)	ND (380)	ND (390)	ND (400)
BENZO(A)PYRENE	ND (340)	ND (340)	ND (410)	ND (390)	ND (380)	ND (390)	ND (400)
BENZO(B)FLUORANTHENE	ND (340)	ND (340)	ND (410)	ND (390)	ND (380)	ND (390)	ND (400)
BENZO(G,H,I)PERYLENE	ND (340)	ND (340)	ND (410)	ND (390)	ND (380)	ND (390)	ND (400)
BENZO(K)FLUORANTHENE	ND (340)	ND (340)	ND (410)	ND (390)	ND (380)	ND (390)	ND (400)
BIS(2-ETHYLHEXYL)PHTHALATE	ND (790)	ND (340)	ND (410)	ND (390)	ND (1,100)	ND (350)	ND (400)
CARBAZOLE	ND (340)	ND (340)	ND (410)	ND (390)	ND (380)	ND (390)	ND (400)
CHRYSENE	ND (340)	ND (340)	ND (410)	ND (390)	ND (380)	ND (390)	ND (400)
DIBENZOFURAN	ND (340)	ND (340)	ND (410)	ND (390)	ND (380)	ND (390)	ND (400)
FLUORANTHENE	ND (340)	ND (340)	ND (410)	ND (390)	ND (380)	ND (390)	ND (400)
FLUORENE	ND (340)	ND (340)	ND (410)	ND (390)	ND (380)	ND (390)	ND (400)
INDENO(1,2,3-CD)PYRENE	ND (340)	ND (340)	ND (410)	ND (390)	ND (380)	ND (390)	ND (400)
NAPHTHALENE	ND (340)	ND (340)	ND (410)	ND (390)	ND (380)	ND (390)	ND (400)
PHENANTHRENE	ND (340)	ND (340)	ND (410)	ND (390)	ND (380)	ND (390)	ND (400)
PYRENE	ND (340)	ND (340)	ND (410)	ND (390)	ND (380)	ND (390)	ND (400)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
4,4'-DDD	ND (3)	ND (3)	ND (4)	ND (4)	ND (4)	ND (8)	ND (4)
4,4'-DDE	ND (3)	ND (3)	ND (4)	ND (4)	ND (4)	ND (8)	ND (4)
4,4'-DDT	ND (3)	ND (3)	ND (4)	ND (4)	ND (4)	ND (8)	ND (4)
ALDRIN	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (4)	ND (2)
ALPHA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (4)	ND (2)
DIELDRIN	ND (3)	ND (3)	ND (4)	ND (4)	ND (4)	ND (8)	ND (4)
ENDOSULFAN I	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (4)	ND (2)

TABLE 4.8-12 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B085	IR33B086	IR33B086	IR33B086	IR33B087	IR33B087	IR33B087
Sampling Depth (feet bgs)	30.75	2.25	6.25	11.25	1.25	6.25	11.25
Sample Number	9413L189	9413A718	9413A719	9413A721	9413L193	9413L194	9413L195
Sample Date	03/30/94	03/31/94	03/31/94	03/31/94	03/30/94	03/30/94	03/30/94
Pesticide/Polychlorinated Biphenyl (ug/kg)							
ENDRIN	ND (3)	ND (3)	ND (4)	ND (4)	ND (4)	ND (8)	ND (4)
ENDRIN ALDEHYDE	ND (3)	ND (3)	ND (4)	ND (4)	ND (4)	ND (8)	ND (4)
ENDRIN KETONE	ND (3)	ND (3)	ND (4)	ND (4)	ND (4)	ND (8)	ND (4)
GAMMA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (4)	ND (2)
HEPTACHLOR	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (4)	ND (2)
HEPTACHLOR EPOXIDE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (4)	ND (2)
AROCLOR-1260	ND (34)	ND (34)	ND (41)	ND (39)	ND (38)	ND (78)	ND (40)
TPH-Purgeable (mg/kg)							
TPH-GASOLINE	ND (0.5)	ND (0.5)	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.6)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (10)	ND (100)	ND (12)	ND (12)	ND (11)	ND (12)	ND (12)
TPH-EXTRACTABLE UNKNOWN HYDROCARBON	NA	NA	NA	NA	NA	NA	NA
TPH-MOTOR OIL	ND (10)	350	ND (12)	7	ND (11)	ND (12)	ND (12)
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	4	28	9	8	7	5	7
Oil and Grease (mg/kg)							
TOTAL OIL & GREASE	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	96.7	97.3	81.6	85.4	88.4	85.1	82.8
pH (pH units)							
PH	10.2	8.6	8.2	8.7	8.2	8.1	8.7

TABLE 4.8-12 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B087	IR33B087	IR33B087	IR33B089	IR33B089	IR33B089	IR33B089
Sampling Depth (feet bgs)	16.25	21.25	26.25	1.25	6.25	11.25	16.25
Sample Number	9413L197	9413L198	9413L199	9413L163	9413L164	9413L165	9413L168
Sample Date	03/30/94	03/30/94	03/30/94	03/28/94	03/28/94	03/28/94	03/28/94
Metal (mg/kg)							
ALUMINUM	16,200	36,300	21,500	25,100	30,100	33,300	29,100
ANTIMONY	ND (1.3)	ND (2.4)	ND (1.2)	1.3	2.0	2.1	2.0
ARSENIC	9.6 *#	4.3 *#	6.1 *#	ND (1.6)	ND (1.9)	ND (1.8)	6.6 *#
BARIUM	113	71.6	602 α	88.5	118	139	35.7
BERYLLIUM	0.64 *	0.50 *	0.36 *	ND (0.05)	0.28 *	ND (0.17)	0.30 *
CADMIUM	0.78	1.5	1.0	ND (0.02)	ND (0.02)	ND (0.01)	ND (0.02)
CALCIUM	6,750	8,580	10,900	19,200	25,500	22,800	46,200
CHROMIUM	49.6	401 *	89.6	58.9	73.2	98.4	158
COBALT	20.0	36.0	19.0	27.0	30.2	28.9	26.4
COPPER	48.8	37.5	43.2	51.9	49.3	65.3	40.0
IRON	29,000	42,300	32,500	38,200	49,700	55,300	38,200
LEAD	8.9	4.7	4.7	ND (0.16)	ND (0.13)	ND (0.12)	4.2
MAGNESIUM	14,300	72,400	32,200	17,400	18,300	20,500	50,300
MANGANESE	417 *	678 *	501 *	903 *	1,490 *α	910 *	727 *
MERCURY	0.08	0.10	0.05	0.02	0.02	0.17	0.05
MOLYBDENUM	ND (0.15)	ND (0.16)	ND (0.15)	ND (0.64)	0.95	0.94	1.3
NICKEL	56.6	562 *	131	52.9	57.1	55.3	290 *
POTASSIUM	1,790	1,070	1,650	434	422	784	1,320
SELENIUM	ND (0.63)	ND (0.68)	ND (0.65)	ND (0.34)	ND (0.27)	ND (0.24)	ND (0.28)
SILVER	ND (0.17)	ND (0.18)	ND (0.17)	ND (0.14)	ND (0.11)	ND (0.10)	ND (0.11)
SODIUM	1,480	1,340	ND (130)	ND (32.1)	ND (25.1)	ND (22.8)	1,410
THALLIUM	ND (0.42)	ND (0.45)	ND (0.44)	ND (0.20)	ND (0.16)	ND (0.15)	ND (0.19)
VANADIUM	60.2	73.8	70.3	90.7	114	141 α	66.9
ZINC	64.6	71.9	67.3	49.3	89.8	82.3	67.9
Volatile Organic Compound (ug/kg)							
1,1,1-TRICHLOROETHANE	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	ND (12)	ND (11)
1,1,2-TRICHLOROETHANE	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	ND (12)	ND (11)
1,1-DICHLOROETHENE	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	ND (12)	ND (11)
1,2-DICHLOROETHANE	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	ND (12)	ND (11)
4-METHYL-2-PENTANONE	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	ND (12)	ND (11)
ACETONE	ND (8)	ND (14)	ND (12)	ND (11)	ND (6)	ND (12)	ND (12)
BENZENE	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	ND (12)	ND (11)
CARBON DISULFIDE	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	ND (12)	ND (11)
CHLOROFORM	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	ND (12)	ND (11)
ETHYLBENZENE	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	ND (12)	ND (11)

TABLE 4.8-12 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B087	IR33B087	IR33B087	IR33B089	IR33B089	IR33B089	IR33B089
Sampling Depth (feet bgs)	16.25	21.25	26.25	1.25	6.25	11.25	16.25
Sample Number	9413L197	9413L198	9413L199	9413L163	9413L164	9413L165	9413L168
Sample Date	03/30/94	03/30/94	03/30/94	03/28/94	03/28/94	03/28/94	03/28/94
Volatile Organic Compound (ug/kg)							
METHYLENE CHLORIDE	ND (17)	ND (12)	ND (15)	ND (11)	ND (11)	ND (12)	ND (11)
TETRACHLOROETHENE	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	ND (12)	ND (11)
TOLUENE	ND (11)	ND (11)	ND (11)	ND (2)	ND (11)	ND (12)	ND (11)
TRICHLOROETHENE	ND (11)	ND (11)	ND (11)	2	ND (11)	ND (12)	ND (11)
XYLENE (TOTAL)	ND (11)	ND (11)	ND (11)	8	ND (11)	ND (12)	ND (11)
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (350)	250	ND (360)	ND (380)	ND (370)	ND (400)	91
2-METHYLPHENOL	ND (350)	ND (380)	ND (360)	ND (380)	ND (370)	ND (400)	ND (350)
4-METHYLPHENOL	ND (350)	ND (380)	ND (360)	ND (380)	ND (370)	ND (400)	ND (350)
ACENAPHTHENE	ND (350)	14	ND (360)	ND (380)	ND (370)	ND (400)	ND (350)
ANTHRACENE	ND (350)	4	ND (360)	ND (380)	ND (370)	ND (400)	ND (350)
BENZO(A)ANTHRACENE	ND (350)	ND (380)	ND (360)	ND (380)	ND (370)	ND (400)	ND (350)
BENZO(A)PYRENE	ND (350)	ND (380)	ND (360)	ND (380)	ND (370)	37	20
BENZO(B)FLUORANTHENE	ND (350)	ND (380)	ND (360)	ND (380)	ND (370)	29	29
BENZO(G,H,I)PERYLENE	ND (350)	ND (380)	ND (360)	ND (380)	ND (370)	44	29
BENZO(K)FLUORANTHENE	ND (350)	ND (380)	ND (360)	ND (380)	ND (370)	27	ND (350)
BIS(2-ETHYLHEXYL)PHTHALATE	ND (350)	ND (380)	ND (360)	ND (20)	ND (260)	ND (72)	ND (73)
CARBAZOLE	ND (350)	27	ND (360)	ND (380)	ND (370)	ND (400)	ND (350)
CHRYSENE	ND (350)	ND (380)	ND (360)	19	ND (370)	20	36
DIBENZOFURAN	ND (350)	48	ND (360)	ND (380)	ND (370)	ND (400)	48
FLUORANTHENE	ND (350)	9	8	ND (380)	ND (370)	51	39
FLUORENE	ND (350)	51	ND (360)	ND (380)	ND (370)	ND (400)	55
INDENO(1,2,3-CD)PYRENE	ND (350)	ND (380)	ND (360)	ND (380)	ND (370)	26	ND (350)
NAPHTHALENE	ND (350)	170	ND (360)	ND (380)	ND (370)	ND (400)	ND (350)
PHENANTHRENE	ND (350)	89	53	ND (380)	ND (370)	ND (400)	130
PYRENE	ND (350)	36	33	ND (380)	ND (370)	85	51
Pesticide/Polychlorinated Biphenyl (ug/kg)							
4,4'-DDD	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
4,4'-DDE	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
4,4'-DDT	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ALDRIN	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
ALPHA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
DIELDRIN	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ENDOSULFAN I	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)

TABLE 4.8-12 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B087	IR33B087	IR33B087	IR33B089	IR33B089	IR33B089	IR33B089
Sampling Depth (feet bgs)	16.25	21.25	26.25	1.25	6.25	11.25	16.25
Sample Number	9413L197	9413L198	9413L199	9413L163	9413L164	9413L165	9413L168
Sample Date	03/30/94	03/30/94	03/30/94	03/28/94	03/28/94	03/28/94	03/28/94
Pesticide/Polychlorinated Biphenyl (ug/kg)							
ENDRIN	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ENDRIN ALDEHYDE	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ENDRIN KETONE	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
GAMMA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
HEPTACHLOR	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
HEPTACHLOR EPOXIDE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
AROCLOR-1260	ND (35)	ND (38)	ND (36)	ND (37)	ND (37)	ND (40)	ND (35)
TPH-Purgeable (mg/kg)							
TPH-GASOLINE	ND (0.5)	ND (0.5)	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.5)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (11)	9	ND (11)	14	ND (12)	ND (13)	ND (11)
TPH-EXTRACTABLE UNKNOWN HYDROCARBON	NA	NA	NA	NA	NA	NA	NA
TPH-MOTOR OIL	ND (11)	8	30	310	ND (120)	ND (130)	ND (110)
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	3	4	4	450	30	ND (33)	62
Oil and Grease (mg/kg)							
TOTAL OIL & GREASE	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	94.8	88.4	91.7	88.1	90.3	82.2	93.2
pH (pH units)							
PH	9.2	9.1	9.1	8.0	8.1	8.3	10.4

TABLE 4.8-12 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B090	IR33B090	IR33B090	IR33B090	IR33B091	IR33B091	IR33B091
Sampling Depth (feet bgs)	1.75	6.25	11.25	16.25	1.25	6.25	11.25
Sample Number	9431R494	9431R495	9431R496	9431R498	9413L170	9413L171	9413L172
Sample Date	08/04/94	08/04/94	08/04/94	08/04/94	03/29/94	03/29/94	03/29/94
Metal (mg/kg)							
ALUMINUM	40,100	24,800	28,400	21,500	8,710	27,000	29,800
ANTIMONY	ND (2.9)	ND (1.4)	ND (1.8)	ND (0.90)	0.54	1.9	ND (2.8)
ARSENIC	1.3 *	1.8 *	0.99 *	7.8 *#	2.7 *#	2.3 *#	2.2 *#
BARIUM	261	301	434 α	104	94.6	311	110
BERYLLIUM	0.44 *	0.48 *	0.50 *	0.54 *	ND (0.13)	0.23 *	0.11
CADMIUM	0.77	ND (0.06)	ND (0.05)	ND (0.04)	0.03	ND (0.02)	0.38
CALCIUM	29,200	17,500	19,300	5,780	17,300	16,600	18,100
CHROMIUM	274 *	127	161	40.5	33.2	111	119
COBALT	58.0	34.2	38.4	19.5	8.2	35.0	33.7 α
COPPER	123	67.4	60.0	63.6	20.1	73.7	51.5
IRON	53,800	44,400	50,600	40,600	15,000	49,300	45,400
LEAD	26.1 α	12.3 α	4.6	10.4 α	11.9 α	1.5	2.8
MAGNESIUM	39,600	17,600	20,300	14,900	7,860	19,100	11,000
MANGANESE	2,570 *α	2,200 *α	2,810 *α	538 *	394 *	2,270 *α	655 *
MERCURY	0.10	0.06	ND (0.06)	0.08	0.06	0.03	ND (0.01)
MOLYBDENUM	ND (0.09)	ND (0.09)	ND (0.09)	ND (0.08)	ND (0.58)	1.0	ND (0.45)
NICKEL	318 *	119	127	48.5	49.8	123	55.4
POTASSIUM	943	826	564	2,990	1,140	580	1,210
SELENIUM	ND (0.52)	ND (0.52)	ND (0.54)	ND (0.48)	ND (0.23)	ND (0.31)	ND (0.23)
SILVER	ND (0.14)	ND (0.14)	ND (0.14)	ND (0.13)	ND (0.09)	ND (0.13)	ND (0.09)
SODIUM	ND (98.2)	ND (31.0)	ND (31.8)	768	ND (21.1)	ND (28.7)	NA
THALLIUM	ND (0.46)	ND (0.45)	0.93 α	ND (0.42)	ND (0.11)	ND (0.21)	ND (0.14)
VANADIUM	134 α	105	113	52.3	24.5	117	148 α
ZINC	138 α	83.7	80.0	88.3	36.4	66.4	60.1
Volatile Organic Compound (ug/kg)							
1,1,1-TRICHLOROETHANE	ND (11)	ND (11)	ND (12)	ND (11)	ND (11)	ND (11)	ND (12)
1,1,2-TRICHLOROETHANE	ND (11)	ND (11)	ND (12)	ND (11)	ND (11)	ND (11)	ND (12)
1,1-DICHLOROETHENE	ND (11)	ND (11)	ND (12)	ND (11)	ND (11)	ND (11)	ND (12)
1,2-DICHLOROETHANE	ND (11)	ND (11)	ND (12)	ND (11)	ND (11)	ND (11)	ND (12)
4-METHYL-2-PENTANONE	ND (11)	ND (11)	ND (12)	ND (11)	ND (11)	ND (11)	ND (12)
ACETONE	ND (10)	ND (9)	ND (12)	ND (12)	ND (12)	ND (4)	ND (7)
BENZENE	ND (11)	ND (11)	ND (12)	ND (11)	3	ND (11)	ND (12)
CARBON DISULFIDE	ND (11)	ND (11)	ND (12)	ND (11)	ND (11)	ND (11)	ND (12)
CHLOROFORM	ND (11)	ND (11)	ND (12)	ND (11)	ND (11)	ND (11)	ND (12)
ETHYLBENZENE	ND (11)	ND (11)	ND (12)	ND (11)	ND (11)	ND (11)	ND (12)

TABLE 4.8-12 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B090	IR33B090	IR33B090	IR33B090	IR33B091	IR33B091	IR33B091
Sampling Depth (feet bgs)	1.75	6.25	11.25	16.25	1.25	6.25	11.25
Sample Number	9431R494	9431R495	9431R496	9431R498	9413L170	9413L171	9413L172
Sample Date	08/04/94	08/04/94	08/04/94	08/04/94	03/29/94	03/29/94	03/29/94
Volatile Organic Compound (ug/kg)							
METHYLENE CHLORIDE	ND (6)	ND (6)	ND (7)	ND (8)	ND (11)	ND (11)	ND (12)
TETRACHLOROETHENE	ND (11)	ND (11)	ND (12)	ND (11)	ND (11)	ND (11)	ND (12)
TOLUENE	ND (11)	ND (11)	ND (12)	ND (11)	ND (11)	ND (11)	ND (12)
TRICHLOROETHENE	ND (11)	ND (11)	ND (12)	ND (11)	ND (11)	ND (11)	ND (12)
XYLENE (TOTAL)	ND (11)	ND (11)	ND (12)	ND (11)	7	ND (11)	ND (12)
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (380)	ND (380)	ND (390)	34	4,500	ND (380)	ND (400)
2-METHYLPHENOL	ND (380)	ND (380)	ND (390)	ND (350)	ND (1,700)	ND (380)	ND (400)
4-METHYLPHENOL	ND (380)	ND (380)	ND (390)	ND (350)	ND (1,700)	ND (380)	ND (400)
ACENAPHTHENE	ND (380)	ND (380)	ND (390)	ND (350)	180	ND (380)	ND (400)
ANTHRACENE	ND (380)	ND (380)	ND (390)	ND (350)	ND (1,700)	ND (380)	ND (400)
BENZO(A)ANTHRACENE	ND (380)	ND (380)	ND (390)	29	ND (1,700)	ND (380)	ND (400)
BENZO(A)PYRENE	ND (380)	ND (380)	ND (390)	38	490 *#	ND (380)	ND (400)
BENZO(B)FLUORANTHENE	ND (380)	ND (380)	ND (390)	38	340	ND (380)	ND (400)
BENZO(G,H,I)PERYLENE	ND (380)	ND (380)	ND (390)	ND (350)	ND (1,700)	ND (380)	ND (400)
BENZO(K)FLUORANTHENE	ND (380)	ND (380)	ND (390)	7	ND (1,700)	ND (380)	ND (400)
BIS(2-ETHYLHEXYL)PHTHALATE	ND (460)	ND (1,300)	ND (350)	ND (380)	ND (1,700)	ND (380)	ND (30)
CARBAZOLE	ND (380)	ND (380)	ND (390)	ND (350)	ND (1,700)	ND (380)	ND (400)
CHRYSENE	ND (380)	ND (380)	ND (390)	35	1,100	ND (380)	ND (400)
DIBENZOFURAN	ND (380)	ND (380)	ND (390)	ND (350)	ND (1,700)	ND (380)	ND (400)
FLUORANTHENE	ND (380)	ND (380)	ND (390)	46	ND (1,700)	ND (380)	ND (400)
FLUORENE	ND (380)	ND (380)	ND (390)	ND (350)	460	ND (380)	ND (400)
INDENO(1,2,3-CD)PYRENE	ND (380)	ND (380)	ND (390)	ND (350)	ND (1,700)	ND (380)	ND (400)
NAPHTHALENE	ND (380)	ND (380)	ND (390)	ND (350)	2,100	ND (380)	ND (400)
PHENANTHRENE	ND (380)	ND (380)	ND (390)	95	1,200	ND (380)	ND (400)
PYRENE	ND (380)	ND (380)	ND (390)	49	380	ND (380)	ND (400)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
4,4'-DDD	ND (4)	ND (4)	ND (4)	ND (4)	ND (3)	ND (4)	ND (4)
4,4'-DDE	ND (4)	ND (4)	ND (4)	ND (4)	ND (3)	ND (4)	ND (4)
4,4'-DDT	ND (4)	ND (4)	ND (4)	ND (4)	ND (3)	ND (4)	ND (4)
ALDRIN	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
ALPHA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
DIELDRIN	ND (4)	ND (4)	ND (4)	ND (4)	ND (3)	ND (4)	ND (4)
ENDOSULFAN I	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)

TABLE 4.8-12 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B090	IR33B090	IR33B090	IR33B090	IR33B091	IR33B091	IR33B091
Sampling Depth (feet bgs)	1.75	6.25	11.25	16.25	1.25	6.25	11.25
Sample Number	9431R494	9431R495	9431R496	9431R498	9413L170	9413L171	9413L172
Sample Date	08/04/94	08/04/94	08/04/94	08/04/94	03/29/94	03/29/94	03/29/94
Pesticide/Polychlorinated Biphenyl (ug/kg)							
ENDRIN	ND (4)	ND (4)	ND (4)	ND (4)	ND (3)	ND (4)	ND (4)
ENDRIN ALDEHYDE	ND (4)	ND (4)	ND (4)	ND (4)	4	ND (4)	ND (4)
ENDRIN KETONE	ND (4)	ND (4)	ND (4)	ND (4)	ND (3)	ND (4)	ND (4)
GAMMA-CHLORDANE	0.5	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
HEPTACHLOR	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
HEPTACHLOR EPOXIDE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
AROCLOR-1260	ND (38)	ND (38)	ND (39)	ND (35)	ND (34)	ND (37)	ND (40)
TPH-Purgeable (mg/kg)							
TPH-GASOLINE	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.5)	ND (0.5)	ND (0.6)	ND (0.6)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (11)	ND (11)	ND (12)	ND (10)	2,800	ND (12)	ND (13)
TPH-EXTRACTABLE UNKNOWN HYDROCARBON	NA	NA	NA	NA	NA	NA	NA
TPH-MOTOR OIL	95	31	29	32	7,000	ND (120)	ND (130)
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	30	27	6	10	27,000	ND (32)	ND (30)
Oil and Grease (mg/kg)							
TOTAL OIL & GREASE	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	87.9	88.0	85.7	95.3	95.5	87.6	82.8
pH (pH units)							
PH	8.4	7.8	7.7	9.9	8.3	7.3	8.1

TABLE 4.8-12 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B091	IR33B105	IR33B105	IR33B105	IR33B106	IR33B106	IR33B106
Sampling Depth (feet bgs)	16.25	1.75	3.75	7.25	1.75	3.75	6.75
Sample Number	9413L174	9423R243	9423R244	9423R245	9423R240	9423R241	9423R242
Sample Date	03/29/94	06/07/94	06/07/94	06/07/94	06/07/94	06/07/94	06/07/94
Metal (mg/kg)							
ALUMINUM	34,200	13,400	4,700	6,710	4,570	5,680	21,700
ANTIMONY	ND (3.1)	0.47	8.2	14.8 α	ND (9.7)	10.7 α	1.2
ARSENIC	16.3 *#α	4.4 *#	0.41 *	1.2 *	0.47 *	0.97 *	0.98 *
BARIUM	26.5	44.3	11.7	61.2	60.0	48.2	354 α
BERYLLIUM	0.24 *	0.35 *	ND (0.02)	ND (0.03)	ND (0.02)	ND (0.02)	0.33 *
CADMIUM	0.33	0.21	0.38	0.40	0.54	0.41	ND (0.04)
CALCIUM	8,090	3,740	744	925	551	1,950	10,100
CHROMIUM	110	49.0	974 *	1,720 *#α	1,160 *	1,270 *α	31.1
COBALT	33.1	10.7	60.2	87.3	75.3	74.1	24.0
COPPER	83.6	18.1	7.7	9.3	5.5	19.9	53.2
IRON	59,700	26,400	26,300	31,900	37,200	35,000	32,100
LEAD	19.0 α	5.9	ND (0.16)	ND (0.16)	ND (0.18)	ND (0.18)	4.5
MAGNESIUM	32,400	13,900	212,000	227,000	217,000	135,000	26,900
MANGANESE	1,000 *	564 *	637 *	629 *	599 *	499 *	780 *
MERCURY	ND (0.06)	ND (0.01)	ND (0.03)	ND (0.11)	ND (0.01)	ND (0.07)	ND (0.03)
MOLYBDENUM	ND (0.71)	ND (0.71)	ND (0.16)	ND (0.13)	0.29	0.25	ND (0.13)
NICKEL	122	78.7	1,340 *	1,940 *	1,740 *	1,550 *	39.5
POTASSIUM	3,090	958	ND (8.4)	ND (8.6)	ND (160)	ND (169)	3,350
SELENIUM	0.39	1.0	ND (0.48)	ND (0.49)	ND (0.53)	0.73	0.81
SILVER	ND (0.14)	ND (0.08)	ND (0.09)	ND (0.09)	ND (0.10)	ND (0.10)	ND (0.09)
SODIUM	NA	ND (15.3)	154	91.8	ND (298)	ND (222)	ND (18.4)
THALLIUM	ND (0.17)	ND (0.15)	ND (0.19)	ND (0.12)	ND (0.23)	ND (0.15)	ND (0.14)
VANADIUM	88.9	53.8	23.0	45.1	26.4	30.8	43.5
ZINC	113 α	47.7	27.6	37.0	38.5	27.2	83.5
Volatile Organic Compound (ug/kg)							
1,1,1-TRICHLOROETHANE	ND (11)	ND (11)	ND (11)	ND (10)	ND (12)	ND (11)	ND (10)
1,1,2-TRICHLOROETHANE	ND (11)	ND (11)	ND (11)	ND (10)	ND (12)	ND (11)	ND (10)
1,1-DICHLOROETHENE	ND (11)	ND (11)	ND (11)	ND (10)	ND (12)	ND (11)	ND (10)
1,2-DICHLOROETHANE	ND (11)	ND (11)	ND (11)	ND (10)	ND (12)	ND (11)	ND (10)
4-METHYL-2-PENTANONE	ND (11)	ND (11)	ND (11)	ND (10)	ND (12)	ND (11)	ND (10)
ACETONE	ND (5)	ND (26)	ND (10)	ND (5)	ND (10)	ND (4)	ND (6)
BENZENE	ND (11)	ND (11)	ND (11)	18	ND (12)	ND (11)	14
CARBON DISULFIDE	ND (11)	ND (11)	ND (11)	ND (10)	ND (12)	ND (11)	ND (10)
CHLOROFORM	ND (11)	ND (11)	ND (11)	ND (10)	5	ND (11)	ND (10)
ETHYLBENZENE	ND (11)	ND (11)	ND (11)	ND (10)	ND (12)	ND (11)	ND (10)

TABLE 4.8-12 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B091	IR33B105	IR33B105	IR33B105	IR33B106	IR33B106	IR33B106
Sampling Depth (feet bgs)	16.25	1.75	3.75	7.25	1.75	3.75	6.75
Sample Number	9413L174	9423R243	9423R244	9423R245	9423R240	9423R241	9423R242
Sample Date	03/29/94	06/07/94	06/07/94	06/07/94	06/07/94	06/07/94	06/07/94
Volatile Organic Compound (ug/kg)							
METHYLENE CHLORIDE	ND (11)	ND (11)	ND (11)	ND (10)	ND (12)	ND (11)	ND (10)
TETRACHLOROETHENE	ND (11)	ND (11)	ND (11)	ND (10)	ND (12)	ND (11)	ND (10)
TOLUENE	ND (11)	ND (11)	ND (11)	26	ND (12)	ND (11)	23
TRICHLOROETHENE	2	ND (11)	ND (11)	ND (10)	ND (12)	ND (11)	ND (10)
XYLENE (TOTAL)	ND (11)	ND (11)	ND (11)	3	ND (12)	ND (11)	ND (10)
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	28	85	ND (360)	ND (360)	ND (390)	ND (350)	62
2-METHYLPHENOL	ND (350)	ND (890)	ND (360)	ND (360)	ND (390)	ND (350)	ND (350)
4-METHYLPHENOL	ND (350)	ND (890)	ND (360)	ND (360)	ND (390)	ND (350)	ND (350)
ACENAPHTHENE	ND (350)	ND (890)	ND (360)	ND (360)	ND (390)	ND (350)	ND (350)
ANTHRACENE	27	ND (890)	ND (360)	ND (360)	ND (390)	ND (350)	ND (350)
BENZO(A)ANTHRACENE	32	ND (890)	ND (360)	ND (360)	ND (390)	ND (350)	ND (350)
BENZO(A)PYRENE	22	ND (890)	ND (360)	ND (360)	ND (390)	ND (350)	ND (350)
BENZO(B)FLUORANTHENE	46	ND (890)	ND (360)	ND (360)	ND (390)	ND (350)	ND (350)
BENZO(G,H,I)PERYLENE	26	ND (890)	ND (360)	ND (360)	ND (390)	ND (350)	ND (350)
BENZO(K)FLUORANTHENE	ND (350)	ND (890)	ND (360)	ND (360)	ND (390)	ND (350)	ND (350)
BIS(2-ETHYLHEXYL)PHTHALATE	ND (22)	ND (890)	ND (57)	ND (35)	ND (62)	ND (18)	ND (120)
CARBAZOLE	ND (350)	ND (890)	ND (360)	ND (360)	ND (390)	ND (350)	ND (350)
CHRYSENE	40	480	ND (360)	ND (360)	ND (390)	ND (350)	ND (350)
DIBENZOFURAN	72	ND (890)	ND (360)	ND (360)	ND (390)	ND (350)	ND (350)
FLUORANTHENE	56	ND (890)	ND (360)	ND (360)	ND (390)	ND (350)	ND (350)
FLUORENE	37	ND (890)	ND (360)	ND (360)	ND (390)	ND (350)	ND (350)
INDENO(1,2,3-CD)PYRENE	ND (350)	ND (890)	ND (360)	ND (360)	ND (390)	ND (350)	ND (350)
NAPHTHALENE	ND (350)	ND (890)	ND (360)	ND (360)	ND (390)	ND (350)	84
PHENANTHRENE	180	280	ND (360)	ND (360)	ND (390)	ND (350)	ND (350)
PYRENE	58	ND (890)	ND (360)	ND (360)	ND (390)	ND (350)	ND (350)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
4,4'-DDD	ND (4)	ND (7)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
4,4'-DDE	ND (4)	ND (7)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
4,4'-DDT	ND (4)	ND (7)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ALDRIN	ND (2)	ND (4)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
ALPHA-CHLORDANE	ND (2)	ND (4)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
DIELDRIN	ND (4)	ND (7)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ENDOSULFAN I	ND (2)	ND (4)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)

TABLE 4.8-12 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B091	IR33B105	IR33B105	IR33B105	IR33B106	IR33B106	IR33B106
Sampling Depth (feet bgs)	16.25	1.75	3.75	7.25	1.75	3.75	6.75
Sample Number	9413L174	9423R243	9423R244	9423R245	9423R240	9423R241	9423R242
Sample Date	03/29/94	06/07/94	06/07/94	06/07/94	06/07/94	06/07/94	06/07/94
Pesticide/Polychlorinated Biphenyl (ug/kg)							
ENDRIN	ND (4)	ND (7)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ENDRIN ALDEHYDE	ND (4)	ND (7)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ENDRIN KETONE	ND (4)	ND (7)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
GAMMA-CHLORDANE	ND (2)	ND (4)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
HEPTACHLOR	ND (2)	ND (4)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
HEPTACHLOR EPOXIDE	ND (2)	ND (4)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
AROCLOR-1260	ND (35)	ND (71)	ND (36)	ND (36)	ND (39)	ND (35)	ND (35)
TPH-Purgeable (mg/kg)							
TPH-GASOLINE	ND (0.5)	1	ND (0.6)	ND (0.6)	NA	NA	ND (0.5)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (11)	ND (540)	ND (11)	ND (11)	ND (12)	ND (11)	ND (11)
TPH-EXTRACTABLE UNKNOWN HYDROCARBON	NA	NA	NA	NA	NA	NA	NA
TPH-MOTOR OIL	ND (110)	9,000	ND (110)	ND (110)	ND (120)	ND (110)	ND (110)
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	ND (27)	23,000	ND (28)	ND (26)	ND (32)	ND (29)	ND (27)
Oil and Grease (mg/kg)							
TOTAL OIL & GREASE	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	93.7	93.0	90.7	90.9	83.6	92.7	95.0
pH (pH units)							
PH	10.1	9.1	9.6	9.9	9.7	8.5	10.2

TABLE 4.8-12 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B107	IR33B107	IR33B107	IR33B108	IR33B108	IR33B108	IR33MW61A
Sampling Depth (feet bgs)	1.75	3.75	6.25	1.75	3.75	6.25	18.75
Sample Number	9423R249	9423R250	9423R251	9423R246	9423R247	9423R248	9431R476
Sample Date	06/08/94	06/08/94	06/08/94	06/08/94	06/08/94	06/08/94	08/01/94
Metal (mg/kg)							
ALUMINUM	3,980	34,600	39,000	5,170	1,370	1,930	NA
ANTIMONY	ND (9.9)	ND (3.2)	ND (2.9)	ND (7.5)	ND (3.0)	ND (8.3)	NA
ARSENIC	ND (0.30)	1.4 *	2.6 *#	ND (0.29)	ND (0.29)	ND (0.29)	NA
BARIUM	185	404 α	404 α	167	182	209	NA
BERYLLIUM	ND (0.04)	0.34 *	0.47 *	ND (0.05)	ND (0.09)	ND (0.13)	NA
CADMIUM	ND (0.36)	ND (0.22)	ND (0.13)	ND (0.27)	ND (0.39)	ND (0.39)	NA
CALCIUM	6,490	9,630	12,900	1,080	12,900	5,830	NA
CHROMIUM	1,190 *	353 *	327 *	905 *	369 *	1,030 *	NA
COBALT	58.0	29.1	32.4	62.2	32.7	94.3	NA
COPPER	4.4	22.5	28.9	8.0	ND (0.11)	ND (0.11)	NA
IRON	31,400	43,200	43,300	26,600	28,400	34,800	NA
LEAD	1.4	4.4	5.6	1.4	1.3	1.7	NA
MAGNESIUM	187,000	113,000	110,000	153,000	154,000	151,000	NA
MANGANESE	733 *	506 *	734 *	566 *	1,470 *α	472 *	NA
MERCURY	ND (0.06)	ND (0.06)	0.05	ND (0.06)	ND (0.06)	ND (0.06)	NA
MOLYBDENUM	ND (0.16)	ND (0.16)	ND (0.15)	ND (0.15)	ND (0.15)	ND (0.15)	NA
NICKEL	1,420 *	636 *	637 *	1,330 *	677 *	1,910 *	NA
POTASSIUM	98.2	268	493	74.5	ND (18.7)	ND (20.2)	NA
SELENIUM	ND (0.70)	ND (0.67)	ND (0.66)	ND (0.66)	ND (0.66)	ND (0.66)	NA
SILVER	ND (0.19)	ND (0.18)	ND (0.18)	ND (0.18)	ND (0.18)	ND (0.18)	NA
SODIUM	ND (153)	1,880	1,370	ND (86.9)	ND (226)	ND (142)	NA
THALLIUM	ND (0.47)	ND (0.45)	ND (0.44)	ND (0.44)	ND (0.44)	ND (0.44)	NA
VANADIUM	23.3	65.2	75.5	27.7	8.6	12.4	NA
ZINC	22.9	48.2	63.3	22.2	17.6	23.0	NA
Volatile Organic Compound (ug/kg)							
1,1,1-TRICHLOROETHANE	ND (12)	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)
1,1,2-TRICHLOROETHANE	ND (12)	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)
1,1-DICHLOROETHENE	ND (12)	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)
1,2-DICHLOROETHANE	ND (12)	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)
4-METHYL-2-PENTANONE	ND (12)	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)
ACETONE	ND (26)	ND (23)	ND (20)	ND (26)	ND (11)	ND (31)	11
BENZENE	ND (12)	110	32	ND (11)	ND (11)	7	ND (11)
CARBON DISULFIDE	ND (12)	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)
CHLOROFORM	ND (12)	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)
ETHYLBENZENE	ND (12)	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)

TABLE 4.8-12 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B107	IR33B107	IR33B107	IR33B108	IR33B108	IR33B108	IR33MW61A
Sampling Depth (feet bgs)	1.75	3.75	6.25	1.75	3.75	6.25	18.75
Sample Number	9423R249	9423R250	9423R251	9423R246	9423R247	9423R248	9431R476
Sample Date	06/08/94	06/08/94	06/08/94	06/08/94	06/08/94	06/08/94	08/01/94
Volatile Organic Compound (ug/kg)							
METHYLENE CHLORIDE	ND (3)	ND (8)	ND (16)	ND (2)	ND (4)	ND (8)	ND (6)
TETRACHLOROETHENE	ND (12)	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)
TOLUENE	ND (12)	19	35	ND (11)	ND (11)	3	ND (11)
TRICHLOROETHENE	ND (12)	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)
XYLENE (TOTAL)	ND (12)	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (390)	90	150	ND (370)	ND (370)	ND (370)	NA
2-METHYLPHENOL	ND (390)	ND (370)	ND (370)	ND (370)	ND (370)	ND (370)	NA
4-METHYLPHENOL	ND (390)	ND (370)	ND (370)	ND (370)	ND (370)	ND (370)	NA
ACENAPHTHENE	ND (390)	ND (370)	ND (370)	ND (370)	ND (370)	ND (370)	NA
ANTHRACENE	ND (390)	ND (370)	ND (370)	ND (370)	ND (370)	ND (370)	NA
BENZO(A)ANTHRACENE	ND (390)	ND (370)	ND (370)	ND (370)	38	ND (370)	NA
BENZO(A)PYRENE	ND (390)	ND (370)	ND (370)	ND (370)	ND (370)	ND (370)	NA
BENZO(B)FLUORANTHENE	ND (390)	ND (370)	ND (370)	ND (370)	ND (370)	ND (370)	NA
BENZO(G,H,I)PERYLENE	ND (390)	ND (370)	ND (370)	ND (370)	ND (370)	ND (370)	NA
BENZO(K)FLUORANTHENE	ND (390)	ND (370)	ND (370)	ND (370)	ND (370)	ND (370)	NA
BIS(2-ETHYLHEXYL)PHTHALATE	ND (390)	ND (370)	ND (370)	ND (120)	ND (500)	ND (290)	NA
CARBAZOLE	ND (390)	ND (370)	ND (370)	ND (370)	ND (370)	ND (370)	NA
CHRYSENE	ND (390)	ND (370)	ND (370)	ND (370)	22	ND (370)	NA
DIBENZOFURAN	ND (390)	ND (370)	ND (370)	ND (370)	ND (370)	ND (370)	NA
FLUORANTHENE	ND (390)	ND (370)	ND (370)	ND (370)	ND (370)	ND (370)	NA
FLUORENE	ND (390)	ND (370)	ND (370)	ND (370)	ND (370)	ND (370)	NA
INDENO(1,2,3-CD)PYRENE	ND (390)	ND (370)	ND (370)	ND (370)	ND (370)	ND (370)	NA
NAPHTHALENE	ND (390)	140	250	ND (370)	ND (370)	ND (370)	NA
PHENANTHRENE	ND (390)	38	79	ND (370)	ND (370)	ND (370)	NA
PYRENE	ND (390)	ND (370)	ND (370)	ND (370)	ND (370)	ND (370)	NA
Pesticide/Polychlorinated Biphenyl (ug/kg)							
4,4'-DDD	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (37)	NA
4,4'-DDE	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (37)	NA
4,4'-DDT	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (37)	NA
ALDRIN	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (18)	NA
ALPHA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (18)	NA
DIELDRIN	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (37)	NA
ENDOSULFAN I	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (18)	NA

TABLE 4.8-12 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B107	IR33B107	IR33B107	IR33B108	IR33B108	IR33B108	IR33MW61A
Sampling Depth (feet bgs)	1.75	3.75	6.25	1.75	3.75	6.25	18.75
Sample Number	9423R249	9423R250	9423R251	9423R246	9423R247	9423R248	9431R476
Sample Date	06/08/94	06/08/94	06/08/94	06/08/94	06/08/94	06/08/94	08/01/94
Pesticide/Polychlorinated Biphenyl (ug/kg)							
ENDRIN	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (37)	NA
ENDRIN ALDEHYDE	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (37)	NA
ENDRIN KETONE	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (37)	NA
GAMMA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (18)	NA
HEPTACHLOR	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (18)	NA
HEPTACHLOR EPOXIDE	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.4)	ND (4)	NA
AROCLOR-1260	ND (19)	ND (19)	ND (18)	ND (18)	ND (18)	ND (180)	NA
TPH-Purgeable (mg/kg)							
TPH-GASOLINE	ND (0.6)	ND (0.6)	ND (0.6)	34	58	ND (0.6)	ND (0.5)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (12)	ND (110)	ND (11)	ND (11)	ND (11)	ND (110)	ND (10)
TPH-EXTRACTABLE UNKNOWN HYDROCARBON	NA	NA	NA	NA	NA	NA	NA
TPH-MOTOR OIL	49	780	ND (11)	12	23	2,000	28
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	170	ND (6)	ND (12)	ND (200)	990	ND (160)	NA
Oil and Grease (mg/kg)							
TOTAL OIL & GREASE	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	14.2	11.1	8.9	9.3	9.3	9.6	NA
pH (pH units)							
PH	8.9	10.2	10.1	9.0	9.2	9.5	NA

TABLE 4.8-12 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33MW62A	IR50B022	IR50B022	PA33B013	PA33B013	PA33B013	PA33B018
Sampling Depth (feet bgs)	15.75	1.75	5.75	1.75	6.25	10.25	2.25
Sample Number	9431R485	9422R216	9422R217	9313N182	9313N183	9313N184	9309A651
Sample Date	08/02/94	06/02/94	06/02/94	04/01/93	04/01/93	04/01/93	03/03/93
Metal (mg/kg)							
ALUMINUM	18,200	25,500	20,200	33,100	28,400	31,800	36,600
ANTIMONY	4.9	ND (2.1)	ND (0.89)	ND (3.1)	ND (3.2)	ND (3.6)	ND (6.7)
ARSENIC	0.91 *	2.3 *#	10.0 *#	ND (0.59)	ND (0.61)	ND (0.92)	1.2 *
BARIUM	107	255	38.3	199	240	167	182
BERYLLIUM	ND (0.02)	0.20 *	0.37 *	ND (0.46)	ND (0.43)	ND (0.22)	0.33 *
CADMIUM	1.5	0.45	0.33	ND (0.23)	ND (0.23)	ND (0.26)	ND (1.1)
CALCIUM	18,200	15,600	4,050	21,800	15,800	16,900	23,500
CHROMIUM	688 *	133	40.9	113	126	148	190
COBALT	50.1	36.2	20.5	47.0 α	41.9	39.3	ND (45.2)
COPPER	23.2	60.8	73.8	81.3	58.0	51.2	76.5
IRON	31,600	47,800	41,800	53,600	52,000	52,100	62,100
LEAD	ND (1.7)	4.4	9.0 α	3.1	2.0	36.1 α	0.98
MAGNESIUM	117,000	17,400	15,600	21,500	21,500	34,300	29,000
MANGANESE	634 *	2,200 *α	597 *	2,000 *α	2,420 *α	1,060 *	2,020 *α
MERCURY	ND (0.06)	0.07	0.04	ND (0.08)	ND (0.11)	ND (0.08)	ND (0.06)
MOLYBDENUM	ND (2.4)	ND (0.24)	1.6	ND (0.63)	ND (0.65)	ND (0.73)	1.5
NICKEL	974 *	122	57.4	125	176 *	247 *	103
POTASSIUM	89.6	560	1,890	777	ND (400)	671	347
SELENIUM	ND (0.51)	0.72	1.2	ND (0.50)	ND (5.2)	ND (0.58)	ND (0.78)
SILVER	ND (0.13)	ND (0.07)	ND (0.08)	1.8 α	2.0 α	2.1 α	0.90
SODIUM	1,330	ND (14.7)	ND (16.3)	626	505	1,030	965
THALLIUM	ND (0.44)	ND (0.20)	ND (0.19)	ND (0.63)	ND (0.65)	ND (0.73)	ND (0.71)
VANADIUM	43.5	125 α	51.8	136 α	109	91.3	196 α
ZINC	29.7	76.4	92.5	78.5	60.5	62.4	84.5
Volatile Organic Compound (ug/kg)							
1,1,1-TRICHLOROETHANE	ND (11)	ND (11)	ND (11)	ND (11)	ND (12)	ND (13)	ND (11)
1,1,2-TRICHLOROETHANE	ND (11)	ND (11)	ND (11)	ND (11)	ND (12)	ND (13)	ND (11)
1,1-DICHLOROETHENE	ND (11)	ND (11)	ND (11)	ND (11)	ND (12)	ND (13)	ND (11)
1,2-DICHLOROETHANE	ND (11)	ND (11)	ND (11)	ND (11)	ND (12)	ND (13)	ND (11)
4-METHYL-2-PENTANONE	ND (11)	ND (11)	ND (11)	26	ND (12)	14	ND (11)
ACETONE	7	ND (9)	ND (6)	ND (32)	ND (17)	ND (23)	2
BENZENE	ND (11)	ND (11)	ND (11)	ND (11)	ND (12)	ND (13)	ND (11)
CARBON DISULFIDE	ND (11)	ND (11)	ND (11)	ND (11)	ND (12)	ND (13)	ND (11)
CHLOROFORM	ND (11)	ND (11)	ND (11)	ND (11)	ND (12)	ND (13)	ND (11)
ETHYLBENZENE	ND (11)	ND (11)	ND (11)	ND (11)	ND (12)	ND (13)	ND (11)

TABLE 4.8-12 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33MW62A	IR50B022	IR50B022	PA33B013	PA33B013	PA33B013	PA33B018
Sampling Depth (feet bgs)	15.75	1.75	5.75	1.75	6.25	10.25	2.25
Sample Number	9431R485	9422R216	9422R217	9313N182	9313N183	9313N184	9309A651
Sample Date	08/02/94	06/02/94	06/02/94	04/01/93	04/01/93	04/01/93	03/03/93
Volatile Organic Compound (ug/kg)							
METHYLENE CHLORIDE	ND (9)	ND (11)	ND (2)	ND (3)	ND (12)	ND (5)	ND (11)
TETRACHLOROETHENE	ND (11)	ND (11)	1	ND (11)	8	ND (13)	ND (11)
TOLUENE	ND (11)	ND (11)	ND (11)	4	5	ND (13)	ND (11)
TRICHLOROETHENE	ND (11)	ND (11)	ND (11)	ND (11)	ND (12)	ND (13)	ND (11)
XYLENE (TOTAL)	ND (11)	ND (11)	ND (11)	ND (11)	ND (12)	ND (13)	ND (11)
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (370)	ND (370)	31	ND (380)	ND (390)	ND (440)	ND (370)
2-METHYLPHENOL	ND (370)	ND (370)	ND (350)	ND (380)	ND (390)	ND (440)	ND (370)
4-METHYLPHENOL	ND (370)	ND (370)	ND (350)	ND (380)	ND (390)	ND (440)	ND (370)
ACENAPHTHENE	ND (370)	ND (370)	ND (350)	ND (380)	ND (390)	ND (440)	ND (370)
ANTHRACENE	ND (370)	ND (370)	ND (350)	ND (380)	ND (390)	ND (440)	ND (370)
BENZO(A)ANTHRACENE	ND (370)	ND (370)	26	ND (380)	ND (390)	ND (440)	ND (370)
BENZO(A)PYRENE	ND (370)	ND (370)	33	ND (380)	ND (390)	ND (440)	ND (370)
BENZO(B)FLUORANTHENE	ND (370)	ND (370)	ND (350)	ND (380)	ND (390)	ND (440)	51
BENZO(G,H,I)PERYLENE	ND (370)	ND (370)	ND (350)	ND (380)	ND (390)	ND (440)	ND (370)
BENZO(K)FLUORANTHENE	ND (370)	ND (370)	ND (350)	ND (380)	ND (390)	ND (440)	ND (370)
BIS(2-ETHYLHEXYL)PHTHALATE	ND (370)	ND (99)	ND (350)	ND (380)	ND (430)	ND (440)	ND (370)
CARBAZOLE	ND (370)	ND (370)	ND (350)	ND (380)	ND (390)	ND (440)	ND (370)
CHRYSENE	ND (370)	ND (370)	41	ND (380)	ND (390)	ND (440)	ND (370)
DIBENZOFURAN	ND (370)	ND (370)	41	ND (380)	ND (390)	ND (440)	ND (370)
FLUORANTHENE	ND (370)	ND (370)	42	ND (380)	ND (390)	ND (440)	ND (370)
FLUORENE	ND (370)	ND (370)	ND (350)	ND (380)	ND (390)	ND (440)	ND (370)
INDENO(1,2,3-CD)PYRENE	ND (370)	ND (370)	ND (350)	ND (380)	ND (390)	ND (440)	ND (370)
NAPHTHALENE	ND (370)	20	ND (350)	ND (380)	ND (390)	ND (440)	ND (370)
PHENANTHRENE	ND (370)	ND (370)	100	ND (380)	ND (390)	ND (440)	ND (370)
PYRENE	ND (370)	ND (370)	ND (350)	ND (380)	ND (390)	ND (440)	ND (370)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
4,4'-DDD	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
4,4'-DDE	ND (4)	ND (4)	3	ND (4)	ND (4)	ND (4)	ND (4)
4,4'-DDT	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ALDRIN	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
ALPHA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
DIELDRIN	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ENDOSULFAN I	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)

TABLE 4.8-12 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33MW62A	IR50B022	IR50B022	PA33B013	PA33B013	PA33B013	PA33B018
Sampling Depth (feet bgs)	15.75	1.75	5.75	1.75	6.25	10.25	2.25
Sample Number	9431R485	9422R216	9422R217	9313N182	9313N183	9313N184	9309A651
Sample Date	08/02/94	06/02/94	06/02/94	04/01/93	04/01/93	04/01/93	03/03/93
Pesticide/Polychlorinated Biphenyl (ug/kg)							
ENDRIN	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ENDRIN ALDEHYDE	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ENDRIN KETONE	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
GAMMA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
HEPTACHLOR	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
HEPTACHLOR EPOXIDE	ND (2)	ND (2)	1	ND (2)	ND (2)	ND (2)	ND (2)
AROCLOR-1260	ND (37)	ND (37)	ND (35)	ND (38)	ND (39)	ND (44)	ND (37)
TPH-Purgeable (mg/kg)							
TPH-GASOLINE	ND (0.6)	ND (0.6)	ND (0.5)	ND (6)	ND (6)	ND (7)	ND (1)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (11)	ND (12)	23	ND (11)	28	ND (13)	ND (11)
TPH-EXTRACTABLE UNKNOWN HYDROCARBON	NA	NA	NA	NA	NA	NA	ND (11)
TPH-MOTOR OIL	ND (11)	ND (120)	ND (110)	NA	NA	NA	NA
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	4	150	110	NA	NA	NA	NA
Oil and Grease (mg/kg)							
TOTAL OIL & GREASE	NA	NA	NA	94	660	130	73
Percent Moisture (%)							
% SOLIDS	NA	88.7	94.0	88.5	85.5	76.5	NA
pH (pH units)							
PH	8.4	8.2	8.8	8.0	8.2	8.6	8.2

TABLE 4.8-12 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	PA33B018	PA33B018	PA33B060	PA33B060	PA33B060	PA33SS11	PA33SS42
Sampling Depth (feet bgs)	6.75	10.25	2.25	6.75	10.25	0.00	1.85
Sample Number	9309A652	9309A653	9309A683	9309A684	9309A685	9308A620	9310J386
Sample Date	03/03/93	03/03/93	03/05/93	03/05/93	03/05/93	02/24/93	03/10/93
Metal (mg/kg)							
ALUMINUM	31,100	26,700	6,830	2,060	1,980	9,950	19,100
ANTIMONY	ND (6.8)	7.6	ND (18.3)	NA	NA	ND (10.6)	ND (4.8)
ARSENIC	1.1 *	1.7 *	ND (0.46)	ND (2.0)	ND (0.46)	9.9 *#	ND (1.5)
BARIUM	200	232	80.4	66.9	60.5	444 α	120
BERYLLIUM	0.70 *	0.31 *	ND (0.23)	ND (0.21)	ND (0.23)	ND (0.25)	0.29 *
CADMIUM	ND (1.1)	ND (1.0)	ND (0.93)	ND (0.86)	ND (0.91)	18.8 *α	ND (0.48)
CALCIUM	19,800	36,700	2,010	2,740	2,570	19,200	13,300
CHROMIUM	127	95.0	1,340 *	586 *	1,450 *	169	382 *
COBALT	ND (35.2)	ND (31.1)	81.0	100	84.5	20.8	60.6
COPPER	41.8	58.2	8.5	9.0	7.0	1,350 α	42.3
IRON	74,500	38,200	25,100	31,000	36,500	70,500	38,900
LEAD	1.3	1.4	ND (0.88)	ND (0.82)	ND (0.44)	1,820 *#α	2.9
MAGNESIUM	25,000	19,900	245,000	241,000	200,000	8,710	90,500
MANGANESE	2,170 *α	1,870 *α	845 *	871 *	663 *	814 *	1,380 *
MERCURY	ND (0.06)	ND (0.05)	ND (0.12)	0.53	0.14	19.0 α	ND (0.06)
MOLYBDENUM	ND (0.89)	ND (0.80)	ND (0.70)	ND (0.64)	ND (0.68)	28.3 α	ND (0.57)
NICKEL	171 *	117	1,980 *	2,470 *	2,140 *	157 *	861 *
POTASSIUM	485	478	ND (145)	ND (134)	ND (143)	ND (1,290)	ND (254)
SELENIUM	ND (0.80)	ND (0.71)	ND (0.70)	ND (0.64)	ND (0.68)	ND (1.2)	ND (0.41)
SILVER	0.70	ND (0.44)	ND (0.46)	ND (0.43)	ND (0.46)	8.3 α	ND (0.43)
SODIUM	219	216	204	188	197	409	ND (122)
THALLIUM	ND (0.73)	ND (0.65)	ND (0.70)	ND (0.64)	ND (0.68)	ND (1.1)	ND (0.39)
VANADIUM	100	88.7	37.9	16.4	16.1	40.4	68.0
ZINC	135 α	54.3	26.9	24.0	26.8	3,660 α	48.9
Volatile Organic Compound (ug/kg)							
1,1,1-TRICHLOROETHANE	ND (12)	ND (10)	ND (12)	ND (11)	ND (11)	ND (18)	ND (11)
1,1,2-TRICHLOROETHANE	ND (12)	ND (10)	ND (12)	ND (11)	ND (11)	ND (18)	ND (11)
1,1-DICHLOROETHENE	ND (12)	ND (10)	ND (12)	ND (11)	ND (11)	ND (18)	ND (11)
1,2-DICHLOROETHANE	ND (12)	ND (10)	ND (12)	ND (11)	ND (11)	ND (18)	ND (11)
4-METHYL-2-PENTANONE	ND (12)	ND (10)	ND (12)	ND (11)	ND (11)	ND (18)	ND (11)
ACETONE	ND (12)	ND (10)	ND (10)	ND (4)	ND (11)	ND (13)	ND (30)
BENZENE	ND (12)	ND (10)	ND (6)	ND (5)	ND (6)	ND (18)	ND (11)
CARBON DISULFIDE	ND (12)	ND (10)	ND (12)	ND (11)	ND (11)	ND (18)	ND (11)
CHLOROFORM	ND (12)	ND (10)	ND (12)	ND (11)	ND (11)	ND (18)	ND (11)
ETHYLBENZENE	ND (12)	ND (10)	ND (6)	ND (5)	ND (6)	ND (18)	ND (11)

TABLE 4.8-12 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	PA33B018	PA33B018	PA33B060	PA33B060	PA33B060	PA33SS11	PA33SS42
Sampling Depth (feet bgs)	6.75	10.25	2.25	6.75	10.25	0.00	1.85
Sample Number	9309A652	9309A653	9309A683	9309A684	9309A685	9308A620	9310J386
Sample Date	03/03/93	03/03/93	03/05/93	03/05/93	03/05/93	02/24/93	03/10/93
Volatile Organic Compound (ug/kg)							
METHYLENE CHLORIDE	ND (12)	ND (10)	ND (12)	ND (2)	ND (11)	ND (16)	ND (11)
TETRACHLOROETHENE	ND (12)	ND (10)	ND (12)	ND (11)	ND (11)	ND (18)	ND (11)
TOLUENE	ND (12)	ND (10)	ND (6)	ND (5)	ND (6)	ND (18)	ND (11)
TRICHLOROETHENE	ND (12)	ND (10)	ND (12)	ND (11)	ND (11)	ND (18)	ND (11)
XYLENE (TOTAL)	ND (12)	ND (10)	ND (6)	ND (5)	ND (6)	ND (18)	ND (11)
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (390)	ND (340)	37	ND (350)	ND (370)	ND (7,200)	ND (380)
2-METHYLPHENOL	ND (390)	ND (340)	ND (380)	ND (350)	ND (370)	ND (7,200)	ND (380)
4-METHYLPHENOL	ND (390)	ND (340)	ND (380)	ND (350)	ND (370)	ND (7,200)	ND (380)
ACENAPHTHENE	ND (390)	ND (340)	ND (380)	ND (350)	ND (370)	ND (7,200)	ND (380)
ANTHRACENE	ND (390)	ND (340)	ND (380)	ND (350)	ND (370)	ND (7,200)	ND (380)
BENZO(A)ANTHRACENE	ND (390)	ND (340)	ND (380)	ND (350)	ND (370)	ND (7,200)	ND (380)
BENZO(A)PYRENE	ND (390)	ND (340)	ND (380)	ND (350)	ND (370)	ND (7,200)	ND (380)
BENZO(B)FLUORANTHENE	ND (390)	ND (340)	ND (380)	ND (350)	ND (370)	ND (7,200)	ND (380)
BENZO(G,H,I)PERYLENE	ND (390)	ND (340)	ND (380)	ND (350)	ND (370)	ND (7,200)	ND (380)
BENZO(K)FLUORANTHENE	ND (390)	ND (340)	ND (380)	ND (350)	ND (370)	ND (7,200)	ND (380)
BIS(2-ETHYLHEXYL)PHTHALATE	ND (390)	ND (49)	ND (380)	ND (350)	ND (370)	ND (4,300)	ND (380)
CARBAZOLE	ND (390)	ND (340)	ND (380)	ND (350)	ND (370)	ND (7,200)	ND (380)
CHRYSENE	ND (390)	ND (340)	ND (380)	ND (350)	ND (370)	810	ND (380)
DIBENZOFURAN	ND (390)	ND (340)	ND (380)	ND (350)	ND (370)	ND (7,200)	ND (380)
FLUORANTHENE	ND (390)	ND (340)	ND (380)	ND (350)	ND (370)	750	ND (380)
FLUORENE	ND (390)	ND (340)	ND (380)	ND (350)	ND (370)	ND (7,200)	ND (380)
INDENO(1,2,3-CD)PYRENE	ND (390)	ND (340)	ND (380)	ND (350)	ND (370)	ND (7,200)	ND (380)
NAPHTHALENE	ND (390)	ND (340)	ND (380)	ND (350)	ND (370)	ND (7,200)	ND (380)
PHENANTHRENE	ND (390)	ND (340)	ND (380)	ND (350)	ND (370)	ND (7,200)	ND (380)
PYRENE	ND (390)	ND (340)	ND (380)	ND (350)	ND (370)	1,400	ND (380)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
4,4'-DDD	ND (4)	ND (3)	ND (4)	ND (4)	0.07	NA	ND (4)
4,4'-DDE	ND (4)	ND (3)	ND (4)	ND (4)	ND (4)	4	ND (4)
4,4'-DDT	ND (4)	ND (3)	ND (4)	ND (4)	ND (4)	18	ND (4)
ALDRIN	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	NA	ND (2)
ALPHA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	2	ND (2)
DIELDRIN	ND (4)	ND (3)	ND (4)	ND (4)	0.3	NA	ND (4)
ENDOSULFAN I	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	NA	ND (2)

TABLE 4.8-12 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	PA33B018	PA33B018	PA33B060	PA33B060	PA33B060	PA33SS11	PA33SS42
Sampling Depth (feet bgs)	6.75	10.25	2.25	6.75	10.25	0.00	1.85
Sample Number	9309A652	9309A653	9309A683	9309A684	9309A685	9308A620	9310J386
Sample Date	03/03/93	03/03/93	03/05/93	03/05/93	03/05/93	02/24/93	03/10/93
Pesticide/Polychlorinated Biphenyl (ug/kg)							
ENDRIN	ND (4)	ND (3)	ND (4)	ND (4)	0.9	NA	ND (4)
ENDRIN ALDEHYDE	ND (4)	ND (3)	ND (4)	ND (4)	2	NA	ND (4)
ENDRIN KETONE	ND (4)	ND (3)	ND (4)	ND (4)	0.06	NA	ND (4)
GAMMA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	0.02	NA	ND (2)
HEPTACHLOR	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	NA	ND (2)
HEPTACHLOR EPOXIDE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	NA	ND (2)
AROCLOR-1260	ND (39)	ND (34)	ND (38)	ND (35)	85 *	41	ND (38)
TPH-Purgeable (mg/kg)							
TPH-GASOLINE	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (2)	ND (6)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (12)	NA	ND (1)	ND (1)	ND (1)	ND (54)	ND (11)
TPH-EXTRACTABLE UNKNOWN HYDROCARBON	ND (12)	NA	ND (1)	ND (1)	ND (1)	1,800	NA
TPH-MOTOR OIL	NA	NA	11	ND (11)	ND (11)	NA	NA
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	NA	NA	NA	NA	NA	NA	NA
Oil and Grease (mg/kg)							
TOTAL OIL & GREASE	110	NA	76	32	51	17,000	100
Percent Moisture (%)							
% SOLIDS	NA	NA	NA	NA	NA	NA	87.8
pH (pH units)							
PH	7.8	8.0	NA	NA	NA	6.8	7.9

TABLE 4.8-12 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	PA33SS43	PA33SS46	PA33SS47	PA33SS48	PA33SS59	PA50TA05
Sampling Depth (feet bgs)	1.45	1.25	0.75	0.75	1.25	7.75
Sample Number	9310J379	9310J387	9310J370	9310J371	9310J388	9324A057
Sample Date	03/10/93	03/10/93	03/08/93	03/08/93	03/11/93	06/18/93
Metal (mg/kg)						
ALUMINUM	27,900	24,200	13,400	9,650	26,900	8,500
ANTIMONY	ND (5.4)	9.0	8.1	ND (3.2)	6.6	ND (5.4)
ARSENIC	ND (1.5)	ND (9.4)	ND (4.4)	ND (2.3)	4.8 *#	2.0 *
BARIUM	430 α	51.5	146	81.5	589 α	22.3
BERYLLIUM	0.78 *α	0.68 *	0.37 *	0.35 *	0.59 *	ND (0.19)
CADMIUM	ND (0.51)	ND (0.47)	1.1	0.66	ND (0.49)	ND (0.33)
CALCIUM	12,800	16,800	104,000	1,610	16,000	ND (5,600)
CHROMIUM	195	98.2	54.0	50.4	191	75.5 α
COBALT	44.6	29.7	15.1	11.0	47.6	ND (16.4)
COPPER	105	53.3	42.5	65.8	90.5	17.7
IRON	52,600	40,300	21,500	28,000	52,800	ND (38,700)
LEAD	2.2	9.0	56.0 α	130 α	6.4	ND (2.3)
MAGNESIUM	20,200	33,200	11,100	6,360	30,800	ND (6,130)
MANGANESE	3,010 *α	810 *	3,130 *α	662 *	4,050 *α	ND (326)
MERCURY	ND (0.06)	ND (0.06)	0.13	0.07	0.11	ND (0.05)
MOLYBDENUM	ND (0.61)	ND (0.56)	0.76	ND (0.54)	1.1	ND (0.69)
NICKEL	192 *	172 *	72.0	39.7	239 *	36.7 α
POTASSIUM	ND (338)	1,330	1,090	672	967	ND (498)
SELENIUM	ND (0.44)	ND (4.1)	ND (0.40)	ND (0.39)	ND (0.42)	ND (0.46)
SILVER	ND (0.46)	ND (0.43)	ND (1.5)	ND (0.84)	ND (0.44)	ND (12.1)
SODIUM	686	ND (204)	329	310	482	ND (487)
THALLIUM	ND (0.41)	ND (0.38)	ND (0.38)	ND (0.37)	ND (0.40)	ND (0.59)
VANADIUM	98.4	68.0	45.2	35.5	138 α	126 α
ZINC	138 α	81.0	85.0	271 α	108	35.5
Volatile Organic Compound (ug/kg)						
1,1,1-TRICHLOROETHANE	ND (12)	58	ND (55)	ND (11)	ND (12)	ND (10)
1,1,2-TRICHLOROETHANE	ND (12)	ND (11)	ND (55)	ND (11)	ND (12)	ND (10)
1,1-DICHLOROETHENE	ND (12)	3	ND (55)	ND (11)	ND (12)	ND (10)
1,2-DICHLOROETHANE	ND (12)	ND (11)	ND (55)	ND (11)	ND (12)	ND (10)
4-METHYL-2-PENTANONE	ND (12)	ND (11)	ND (55)	ND (11)	ND (12)	ND (10)
ACETONE	ND (63)	ND (10)	ND (100)	ND (11)	ND (12)	ND (10)
BENZENE	ND (12)	ND (11)	ND (55)	ND (11)	ND (12)	ND (10)
CARBON DISULFIDE	ND (12)	ND (11)	ND (55)	ND (11)	ND (12)	ND (10)
CHLOROFORM	ND (12)	ND (11)	ND (55)	ND (11)	ND (12)	ND (10)
ETHYLBENZENE	ND (12)	ND (11)	ND (55)	ND (11)	ND (12)	ND (10)

TABLE 4.8-12 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	PA33SS43	PA33SS46	PA33SS47	PA33SS48	PA33SS59	PA50TA05
Sampling Depth (feet bgs)	1.45	1.25	0.75	0.75	1.25	7.75
Sample Number	9310J379	9310J387	9310J370	9310J371	9310J388	9324A057
Sample Date	03/10/93	03/10/93	03/08/93	03/08/93	03/11/93	06/18/93
Volatile Organic Compound (ug/kg)						
METHYLENE CHLORIDE	ND (12)	ND (5)	ND (55)	ND (11)	ND (12)	ND (3)
TETRACHLOROETHENE	ND (12)	16	110	ND (11)	ND (12)	ND (10)
TOLUENE	ND (12)	ND (11)	ND (55)	4	ND (12)	ND (10)
TRICHLOROETHENE	ND (12)	6	ND (55)	ND (11)	ND (12)	ND (10)
XYLENE (TOTAL)	ND (12)	ND (11)	ND (36)	ND (19)	ND (12)	ND (10)
Semivolatile Organic Compound (ug/kg)						
2-METHYLNAPHTHALENE	ND (400)	ND (380)	ND (110,000)	ND (110,000)	ND (390)	ND (10,000)
2-METHYLPHENOL	ND (400)	ND (380)	ND (110,000)	ND (110,000)	ND (390)	ND (10,000)
4-METHYLPHENOL	ND (400)	ND (380)	ND (110,000)	ND (110,000)	ND (390)	ND (10,000)
ACENAPHTHENE	ND (400)	ND (380)	ND (110,000)	ND (110,000)	ND (390)	ND (10,000)
ANTHRACENE	ND (400)	ND (380)	ND (110,000)	ND (110,000)	ND (390)	ND (10,000)
BENZO(A)ANTHRACENE	ND (400)	ND (380)	ND (110,000)	ND (110,000)	ND (390)	ND (10,000)
BENZO(A)PYRENE	ND (400)	ND (380)	ND (110,000)	ND (110,000)	ND (390)	ND (10,000)
BENZO(B)FLUORANTHENE	ND (400)	ND (380)	ND (110,000)	ND (110,000)	ND (390)	ND (10,000)
BENZO(G,H,I)PERYLENE	ND (400)	ND (380)	ND (110,000)	ND (110,000)	ND (390)	ND (10,000)
BENZO(K)FLUORANTHENE	ND (400)	ND (380)	ND (110,000)	ND (110,000)	ND (390)	ND (10,000)
BIS(2-ETHYLHEXYL)PHTHALATE	ND (400)	ND (380)	ND (110,000)	ND (110,000)	ND (390)	ND (10,000)
CARBAZOLE	ND (400)	ND (380)	ND (110,000)	ND (110,000)	ND (390)	ND (10,000)
CHRYSENE	ND (400)	ND (380)	ND (110,000)	ND (110,000)	ND (390)	ND (10,000)
DIBENZOFURAN	ND (400)	ND (380)	ND (110,000)	ND (110,000)	ND (390)	ND (10,000)
FLUORANTHENE	ND (400)	ND (380)	ND (110,000)	ND (110,000)	ND (390)	ND (10,000)
FLUORENE	ND (400)	ND (380)	ND (110,000)	ND (110,000)	ND (390)	ND (10,000)
INDENO(1,2,3-CD)PYRENE	ND (400)	ND (380)	ND (110,000)	ND (110,000)	ND (390)	ND (10,000)
NAPHTHALENE	ND (400)	ND (380)	ND (110,000)	ND (110,000)	ND (390)	ND (10,000)
PHENANTHRENE	ND (400)	ND (380)	ND (110,000)	ND (110,000)	ND (390)	ND (10,000)
PYRENE	ND (400)	ND (380)	ND (110,000)	ND (110,000)	ND (390)	ND (10,000)
Pesticide/Polychlorinated Biphenyl (ug/kg)						
4,4'-DDD	ND (4)	ND (4)	ND (37)	ND (36)	ND (4)	ND (4)
4,4'-DDE	ND (4)	ND (4)	ND (37)	ND (36)	ND (4)	ND (4)
4,4'-DDT	ND (4)	ND (4)	ND (37)	ND (36)	ND (4)	ND (4)
ALDRIN	ND (2)	ND (2)	ND (18)	ND (18)	ND (2)	ND (2)
ALPHA-CHLORDANE	ND (2)	ND (2)	ND (18)	ND (18)	ND (2)	ND (2)
DIELDRIN	ND (4)	ND (4)	ND (37)	ND (36)	ND (4)	ND (4)
ENDOSULFAN I	ND (2)	ND (2)	ND (18)	ND (18)	ND (2)	ND (2)

TABLE 4.8-12 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	PA33SS43	PA33SS46	PA33SS47	PA33SS48	PA33SS59	PA50TA05
Sampling Depth (feet bgs)	1.45	1.25	0.75	0.75	1.25	7.75
Sample Number	9310J379	9310J387	9310J370	9310J371	9310J388	9324A057
Sample Date	03/10/93	03/10/93	03/08/93	03/08/93	03/11/93	06/18/93
Pesticide/Polychlorinated Biphenyl (ug/kg)						
ENDRIN	ND (4)	ND (4)	ND (37)	ND (36)	ND (4)	ND (4)
ENDRIN ALDEHYDE	ND (4)	ND (4)	ND (37)	ND (36)	ND (4)	ND (4)
ENDRIN KETONE	ND (4)	ND (4)	ND (37)	ND (36)	ND (4)	ND (4)
GAMMA-CHLORDANE	ND (2)	ND (2)	ND (18)	ND (18)	ND (2)	ND (2)
HEPTACHLOR	ND (2)	ND (2)	ND (18)	ND (18)	ND (2)	ND (2)
HEPTACHLOR EPOXIDE	ND (2)	ND (2)	ND (18)	ND (18)	ND (2)	ND (2)
AROCLOR-1260	ND (40)	ND (38)	ND (370)	ND (360)	ND (39)	ND (35)
TPH-Purgeable (mg/kg)						
TPH-GASOLINE	ND (6)	ND (6)	13	ND (6)	ND (6)	ND (5)
TPH-Extractable (mg/kg)						
TPH-DIESEL	ND (12)	29	390	220	88	18
TPH-EXTRACTABLE UNKNOWN HYDROCARBON	NA	NA	NA	NA	NA	NA
TPH-MOTOR OIL	NA	NA	NA	NA	NA	NA
Total Recoverable Petroleum Hydrocarbons (mg/kg)						
TRPH	NA	NA	NA	NA	NA	150
Oil and Grease (mg/kg)						
TOTAL OIL & GREASE	85	430	15,000	24,000	4,200	NA
Percent Moisture (%)						
% SOLIDS	82.5	88.6	90.6	92.5	85.5	95.6
pH (pH units)						
PH	8.3	7.7	8.7	8.2	7.5	8.5

TABLE 4.8-12 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

%	Percent
bgs	Below ground surface
mg/kg	Milligram per kilogram
NA	Not analyzed
ND()	Not detected (detection limit in parentheses)
µg/kg	Microgram per kilogram
*	Detected concentration greater than U.S. Environmental Protection Agency Region IX preliminary remediation goals (PRG) for residential use
#	Detected concentration greater than U.S. Environmental Protection Agency Region IX PRG for industrial use
α	Detected concentration greater than the Hunters Point ambient level.
	Detected concentration greater than at least one screening criterion.

TABLE 4.8-13

SUMMARY OF MONITORING WELL GROUNDWATER ANALYTICAL TESTS - IR-33 NORTH HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
IR33MW61A	9432E100						√				√	√				√			√	√	√	√
IR33MW61A	9432E101						√				√	√				√			√	√	√	√
IR33MW61A	9603J800						√				√	√				√			√	√	√	√
IR33MW61A	9607W104						√					√				√			√	√	√	√
IR33MW61A	9607W105						√					√				√			√	√	√	√
IR33MW61A	9615Z040	√									√	√		√						√		
IR33MW62A	9435K055						√				√	√				√			√	√	√	√
IR33MW62A	9435K056						√				√	√				√			√	√	√	√
IR33MW62A	9603W006						√				√	√				√			√	√	√	√
IR33MW62A	9608W107						√				√	√				√			√	√	√	√
IR33MW64A	9443X544						√				√	√				√			√	√	√	√
IR33MW64A	9443X545						√				√	√				√			√	√	√	√
IR33MW64A	9603W005						√				√	√				√			√	√	√	√
IR33MW64A	9608J880						√				√	√				√			√	√	√	√
IR33MW65A	9443X541						√				√	√				√			√	√	√	√
IR33MW65A	9443X542						√				√	√				√			√	√	√	√
IR33MW65A	9527X770						√															
IR33MW65A	9527X771						√															
IR33MW65A	9603W002						√				√	√				√			√	√	√	√
IR33MW65A	9603W003						√				√	√				√			√	√	√	√
IR33MW65A	9608W109						√				√	√				√			√	√	√	√
IR33MW66A	9444X547						√				√	√				√			√	√	√	√
IR33MW66A	9444X548						√				√	√				√			√	√	√	√
IR33MW66A	9603W004						√				√	√				√			√	√	√	√
IR33MW66A	9608W108						√				√	√				√			√	√	√	√
PA50MW11A	9317B102			√	√		√				√					√	√		√	√	√	√
PA50MW11A	9606J861						√				√	√				√			√	√	√	√
PA50MW11A	9611W161	√			√		√				√	√		√	√	√			√	√	√	√
PA50MW11A	9611W162																√					

TABLE 4.8-13 (Continued)

SUMMARY OF MONITORING WELL GROUNDWATER ANALYTICAL TESTS - IR-33 NORTH HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

CHROM	CHROMIUM VI
CYAN	Cyanide
DIOXIN	Dioxins and Furans
O&G	Total oil and grease
PAH	Polynuclear aromatic hydrocarbons
PCTMST	Percent moisture
PEST	Pesticides/polychlorinated biphenyls
PHYS	Physical characteristic
SALIN	Salinity
SVOC	Semivolatile organic compounds
SOLIDS	Total dissolved solids
TOC	Total organic carbon
TMICROB	Coliform
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
VOC	Volatile organic compounds

TABLE 4.8-14

STATISTICAL SUMMARY OF MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-33 NORTH HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Tap Water PRG Value	Above[e] PRG	MCL Value[f]	Above[g] MCL	NAWQC Value	Above[h] NAWQC
METAL	ALUMINUM	117	1,940	1,080	UG/L	17.4	19	3	37,000	0				
	ANTIMONY	2.1	2.1	2.1	UG/L	1.6	19	2	15.0	0	6.0	0	500	0
	ARSENIC	1.4	73.2	16.6	UG/L	1.6	19	9	0.04	9	50.0	1	36.0	1
	BARIUM	19.8	119	60.8	UG/L	1.5	19	18	2,600	0	1,000	0		
	CALCIUM	9,480	286,000	51,600	UG/L	29.2	19	18						
	CHROMIUM	4.4	273	95.1	UG/L	0.40	19	4			50.0	2		
	COBALT	0.54	10.7	3.3	UG/L	0.53	19	8						
	COPPER	2.1	81.0	28.6	UG/L	0.92	19	6	1,400	0			2.4	5
	IRON	12.0	222	80.0	UG/L	12.0	19	4						
	MAGNESIUM	13,500	193,000	55,900	UG/L	26.1	19	17						
	MANGANESE	5.7	980	216	UG/L	0.22	19	17	180	6				
	MERCURY	0.13	0.13	0.13	UG/L	0.10	19	1	11.0	0	2.0	0	0.03	1
	MOLYBDENUM	0.93	76.0	23.5	UG/L	0.56	19	10	180	0				
	NICKEL	6.5	28.6	16.0	UG/L	1.8	19	7	730	0	100	0	8.2	6
	POTASSIUM	2,840	126,000	28,200	UG/L	378	19	19						
	SELENIUM	2.9	6.1	4.3	UG/L	2.3	19	5	180	0	50.0	0	71.0	0
	SODIUM	132,000	2,510,000	537,000	UG/L	61.2	19	19						
	THALLIUM	2.2	2.2	2.2	UG/L	1.9	18	3			2.0	3		
	VANADIUM	3.9	59.9	15.3	UG/L	0.66	19	18	260	0				
	ZINC	15.2	15.2	15.2	UG/L	0.30	19	1	11,000	0			81.0	0
VOC	1,1,2-TRICHLOROETHANE	0.6	0.6	0.6	UG/L	0.5	18	1	0.2	1	5	0		
	1,2-DICHLOROETHANE	0.2	0.2	0.2	UG/L	0.5	18	1	0.1	1	0.5	0		

TABLE 4.8-14 (Continued)

STATISTICAL SUMMARY OF MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Tap Water PRG Value	Above[e] PRG	MCL Value[f]	Above[g] MCL	NAWQC Value	Above[h] NAWQC
	2-HEXANONE	0.6	0.6	0.6	UG/L	4	13	1						
	BENZENE	4	610	210	UG/L	34	18	3	0.4	3	1	3		
	CARBON DISULFIDE	3	3	3	UG/L	10	18	1	21	0				
	CARBON TETRACHLORIDE	0.3	0.3	0.3	UG/L	0.5	18	2	0.2	2	0.5	0		
	CHLOROFORM	0.1	6	2	UG/L	0.5	18	7	0.2	6	100	0		
	CHLOROMETHANE	0.4	0.4	0.4	UG/L	0.5	18	1	2	0				
	ETHYLBENZENE	1	330	120	UG/L	34	18	3	1,300	0	700	0		
	TETRACHLOROETHENE	0.2	0.2	0.2	UG/L	0.5	18	1	1	0	5	0		
	TOLUENE	0.2	2	1	UG/L	0.5	18	2	720	0	150	0		
	XYLENE (TOTAL)	4	1,100	390	UG/L	34	18	3	1,400	0	1,800	0		
SVOC	2,4-DIMETHYLPHENOL	4	4	4	UG/L	10	17	1	730	0				
	2-METHYLNAPHTHALENE	4	23	14	UG/L	10	18	2	240	0				
	4-METHYLPHENOL	2	2	2	UG/L	10	17	1	180	0				
	ANTHRACENE	2	2	2	UG/L	10	18	1	1,800	0				
	HEXACHLOROETHANE	44	44	44	UG/L	10	18	1	5	1				
	NAPHTHALENE	8	56	32	UG/L	10	18	2	240	0				
	PHENOL	59	59	59	UG/L	10	17	1	22,000	0				
TPHPRG	TPH-GASOLINE	26	8,000	1,800	UG/L	280	19	5	100	4i				
TPHEXT	TPH-DIESEL	66	1,700	600	UG/L	120	18	5	100	3i				
	TPH-MOTOR OIL	58	1,100	320	UG/L	110	17	15	100	10i				
TRPH	TRPH	500	2,300	1,400	UG/L	1,000	18	2	100	2i				
ANION	CHLORIDE	115,000	1,070,000	593,000	UG/L	22,000	2	2						

TABLE 4.8-14 (Continued)

STATISTICAL SUMMARY OF MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Tap Water PRG Value	Above[e] PRG	MCL Value[f]	Above[g] MCL	NAWQC Value	Above[h] NAWQC
	FLUORIDE	120	670	395	UG/L	100	2	2			1,400	0		
	NITRATE	190	1,200	695	UG/L	70.0	2	2	58,000	0				
	NITRITE	9,100	9,100	9,100	UG/L	150	2	1	3,700	1				
	SULFATE	161,000	204,000	183,000	UG/L	3,000	2	2						
SOLIDS	TOTAL DISSOLVED SOLIDS	2,600,000	2,600,000	2,600,000	UG/L	10,000	1	1						
SALIN	SALINITY	1.0	2.5	1.8	PPT	0.005	2	2						

TABLE 4.8-15

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33MW61A	IR33MW61A	IR33MW61A	IR33MW61A	IR33MW61A	IR33MW61A	IR33MW62A
Sample Number	9432E100	9432E101	9603J800	9607W104	9607W105	9615Z040	9435K055
Sample Date	08/08/94	08/08/94	01/16/96	02/16/96	02/16/96	04/08/96	08/29/94
Metal (ug/L)							
ALUMINUM	ND (35.3)	ND (35.3)	1,180	1,970	1,910	NA	ND (35.3)
ANTIMONY	ND (4.1)	ND (12.1)	2.1	2.1	2.1	NA	ND (3.5)
ARSENIC	70.2 *Bδ	76.3 *Bδ	27.6 *	7.9 *	7.6 *	NA	6.9 *
BARIUM	61.8	67.5	28.2	32.3	31.3	NA	97.4
CALCIUM	31,000	31,900	43,200	47,400	46,200	NA	44,000
CHROMIUM	ND (13.1)	ND (7.1)	90.4 δ	276 δ	269 δ	NA	ND (8.8)
COBALT	2.1	1.9	8.6	11.1	10.3	NA	0.72
COPPER	9.3 B	37.6 B	55.9 B	81.7 B	80.2 B	NA	3.0 B
IRON	ND (23.0)	ND (24.9)	ND (48.2)	23.3	15.0	NA	ND (18.8)
MAGNESIUM	24,600	26,500	ND (68.8)	ND (49.8)	ND (26.1)	NA	72,200
MANGANESE	186 *	209 *	ND (1.6)	ND (1.4)	ND (0.34)	NA	34.5
MERCURY	ND (0.10)	ND (0.10)	ND (0.23)	ND (0.10)	0.20 B	NA	ND (0.10)
MOLYBDENUM	18.5	16.4	74.6	76.6	75.4	NA	8.5
NICKEL	ND (7.4)	ND (9.2)	26.6 B	29.1 B	28.0 B	NA	ND (11.7)
POTASSIUM	47,100	48,400	38,600	42,400	43,700	NA	38,000
SELENIUM	ND (2.3)	ND (2.3)	6.1	5.6	5.5	NA	ND (2.4)
SODIUM	523,000	569,000	299,000	271,000	281,000	NA	613,000
THALLIUM	ND (2.0)	ND (2.0)	2.2 δ	ND (1.9)	ND (1.9)	NA	ND (2.0)
VANADIUM	17.9	13.6	59.9	50.9	49.0	NA	12.5
ZINC	ND (5.7)	ND (4.6)	ND (8.3)	ND (8.8)	ND (12.0)	NA	ND (3.1)
Volatile Organic Compound (ug/L)							
1,1,2-TRICHLOROETHANE	ND (100)	ND (100)	ND (0.5)	ND (0.5)	1 *	NA	ND (10)
1,2-DICHLOROETHANE	ND (100)	ND (100)	ND (0.5)	ND (0.5)	0.2 *	NA	ND (10)
2-HEXANONE	ND (100)	ND (100)	ND (4)	ND (4)	0.6	NA	ND (10)
BENZENE	650 *δ	560 *δ	19 *δ	3 *δ	4 *δ	NA	ND (10)
CARBON DISULFIDE	ND (100)	ND (100)	ND (0.5)	ND (0.5)	ND (0.5)	NA	ND (10)
CARBON TETRACHLORIDE	ND (100)	ND (100)	ND (0.5)	ND (0.5)	ND (0.5)	NA	ND (10)
CHLOROFORM	ND (100)	ND (100)	ND (0.5)	ND (0.5)	0.1	NA	ND (10)
CHLOROMETHANE	ND (100)	ND (100)	ND (0.5)	ND (0.5)	0.6	NA	ND (10)
ETHYLBENZENE	350	300	20	1	1	NA	ND (10)
TETRACHLOROETHENE	ND (100)	ND (100)	ND (0.5)	ND (0.5)	ND (0.5)	NA	ND (10)
TOLUENE	ND (100)	ND (100)	2	0.2	0.2	NA	ND (10)
XYLENE (TOTAL)	1,200	1,000	59	4	4	NA	ND (10)

TABLE 4.8-14 (Continued)

STATISTICAL SUMMARY OF MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-33 NORTH HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

CYAN	Cyanide
EPA	U.S. Environmental Protection Agency
MCL	Maximum contaminant level
NAWQC	National Ambient Water Quality Criteria
O&G	Total oil and grease
PCTMST	Percent moisture
PEST	Pesticide/polychlorinated biphenyl
PPT	Parts per thousand
PRG	Preliminary remediation goal
SALIN	Salinity
SVOC	Semivolatile organic compound
TMICROB	Coliform
TOC	Total organic carbon
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
UG/L	Microgram per liter
VOC	Volatile organic compound

a Organic results of less than 10 are reported to one significant figure, and results of greater than or equal to 10 are reported to two significant figures. Inorganic results of less than 10 are reported to two significant figures, and results of greater than or equal to 10 are reported to three significant figures. Values that are not nondetects are compared to screening criteria before the significant figure rule is applied. Both the value and the screening criteria are then rounded for reporting purposes.

b Blank boxes indicate that screening critera have not been established for these analytes.

c Total number of samples analyzed

d Total number of samples showing concentrations greater than detection limit

e Total number of samples showing concentrations greater than tap water PRG
California-modified PRGs were used for the following analytes: 1,2-Dibromo-3-chloropropane, benzo[a]pyrene, benzo[k]fluoranthene, cadmium, chromium VI, chrysene, lead, nickel, and tetrachloroethylene (PCE).
For the analytes listed below, Region IX PRGs are not available; therefore, PRGs for similar chemicals were used as follows:

Analyte:	Similar Analyte:
2-Methylnapthalene	Naphthalene
Acenaphthylene	Acenaphthene
Alpha-chlordane	Chlordane
Aroclor-1260	Polychlorinated biphenyls
Benzo(g,h,i)perylene	Naphthalene
Delta BHC	HCH-technical
Endosulfan I	Endosulfan
Endosulfan sulfate	Endosulfan
Endrin aldehyde	Endrin
Endrin ketone	Endrin
Gamma-chlordane	Chlordane
Phenanthrene	Naphthalene

f EPA Title 40 Code of Federal Regulations or California Code of Regulations Title 22 MCL used, whichever is more stringent

g Total number of samples showing concentrations greater than MCL

h Total number of samples showing concentrations greater than NAWQC;
NAWQC based on 4-day average study of saltwater aquatic life

i Total number of samples showing concentrations greater than TPH, TRPH, or O&G screening level, not PRG value

j Most probable number of organisms per 100 milliliters (mpn/100 mL)

TABLE 4.8-15 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33MW61A	IR33MW61A	IR33MW61A	IR33MW61A	IR33MW61A	IR33MW61A	IR33MW62A
Sample Number	9432E100	9432E101	9603J800	9607W104	9607W105	96152040	9435K055
Sample Date	08/08/94	08/08/94	01/16/96	02/16/96	02/16/96	04/08/96	08/29/94
Semivolatile Organic Compound (ug/L)							
2,4-DIMETHYLPHENOL	4	3	NA	ND (100)	ND (100)	NA	ND (10)
2-METHYLNAPHTHALENE	24	22	4	ND (10)	ND (10)	NA	ND (10)
4-METHYLPHENOL	2	2	NA	ND (100)	ND (100)	NA	ND (10)
ANTHRACENE	ND (10)	ND (10)	ND (10)	ND (10)	2	NA	ND (10)
HEXACHLOROETHANE	43 *	45 *	ND (10)	ND (10)	ND (10)	NA	ND (10)
NAPHTHALENE	58	54	8	ND (10)	ND (10)	NA	ND (10)
PHENOL	56	62	NA	ND (100)	ND (100)	NA	ND (10)
TPH-Purgeable (ug/L)							
TPH-GASOLINE	8,800	7,100	650	140	140	400	26
TPH-Extractable (ug/L)							
TPH-DIESEL	1,700	1,600	680	530	490	NA	ND (100)
TPH-MOTOR OIL	530	610	430	480	490	NA	1,000
Total Recoverable Petroleum Hydrocarbons (ug/L)							
TRPH	2,500	2,100	ND (1,000)	ND (1,000)	ND (1,000)	NA	ND (1,000)
Anion (ug/L)							
CHLORIDE	NA	NA	NA	NA	NA	115,000	NA
FLUORIDE	NA	NA	NA	NA	NA	120	NA
NITRATE	NA	NA	NA	NA	NA	1,200	NA
NITRITE	NA	NA	NA	NA	NA	9,100 *	NA
SULFATE	NA	NA	NA	NA	NA	161,000	NA
Solids (ug/L)							
TOTAL DISSOLVED SOLIDS	NA	NA	NA	NA	NA	NA	NA
pH (pH units)							
PH	8.4	8.5	11.5	7.5	11.8	11.6	7.6
Salinity (ppt)							
SALINITY	NA	NA	NA	NA	NA	1.0	NA

TABLE 4.8-15 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33MW62A	IR33MW62A	IR33MW62A	IR33MW64A	IR33MW64A	IR33MW64A	IR33MW64A
Sample Number	9435K056	9603W006	9608W107	9443X544	9443X545	9603W005	9608J880
Sample Date	08/29/94	01/17/96	02/20/96	10/27/94	10/27/94	01/17/96	02/20/96
Metal (ug/L)							
ALUMINUM	ND (35.3)	ND (37.4)	ND (30.0)	ND (115)	ND (105)	ND (47.6)	ND (31.6)
ANTIMONY	ND (1.8)	ND (1.6)	ND (1.6)	ND (2.9)	ND (2.2)	ND (1.6)	ND (1.6)
ARSENIC	5.7 *	13.4 *	7.4 *	ND (1.7)	ND (1.7)	ND (1.4)	ND (1.4)
BARIUM	95.9	25.1	82.7	69.7	70.8	116	111
CALCIUM	44,400	10,800	34,100	40,900	41,500	55,100	58,000
CHROMIUM	ND (8.0)	13.0	ND (7.9)	ND (2.3)	ND (2.8)	ND (2.2)	ND (3.8)
COBALT	ND (0.70)	ND (0.64)	ND (0.40)	0.72	ND (0.70)	ND (0.58)	ND (0.40)
COPPER	2.8 B	ND (4.5)	ND (1.7)	10.8 B	ND (4.0)	ND (2.2)	ND (1.1)
IRON	ND (18.8)	ND (15.3)	ND (11.0)	ND (129)	ND (125)	ND (15.3)	ND (11.0)
MAGNESIUM	73,800	16,500	45,500	39,900	40,300	52,100	58,900
MANGANESE	34.4	9.6	5.7	488 *	454 *	161	146
MERCURY	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)
MOLYBDENUM	8.0	9.3	ND (3.2)	ND (1.0)	ND (0.92)	1.5	ND (0.60)
NICKEL	ND (11.4)	ND (2.7)	ND (1.1)	ND (3.8)	ND (4.0)	ND (1.3)	ND (0.70)
POTASSIUM	39,400	13,300	19,500	9,380	9,130	8,980	7,070
SELENIUM	ND (3.7)	3.5	3.6	ND (2.3)	ND (2.3)	ND (2.3)	ND (2.3)
SODIUM	611,000	257,000	361,000	163,000	159,000	221,000	198,000
THALLIUM	ND (2.0)	ND (1.9)	ND (1.9)	ND (2.0)	ND (2.0)	ND (1.9)	ND (1.9)
VANADIUM	12.4	23.0	13.8	4.7	5.2	5.2	5.4
ZINC	ND (3.1)	ND (7.9)	ND (4.8)	ND (53.3)	ND (38.0)	ND (14.6)	ND (11.4)
Volatile Organic Compound (ug/L)							
1,1,2-TRICHLOROETHANE	ND (10)	ND (0.5)	ND (0.5)	ND (10)	ND (10)	ND (0.5)	ND (0.5)
1,2-DICHLOROETHANE	ND (10)	ND (0.5)	ND (0.5)	ND (10)	ND (10)	ND (0.5)	ND (0.5)
2-HEXANONE	ND (10)	ND (4)	NA	ND (10)	ND (10)	ND (4)	NA
BENZENE	ND (10)	ND (0.5)	ND (0.5)	ND (10)	ND (10)	ND (0.5)	ND (0.5)
CARBON DISULFIDE	ND (10)	ND (0.5)	ND (0.5)	ND (10)	ND (10)	ND (0.5)	ND (0.5)
CARBON TETRACHLORIDE	ND (10)	ND (0.5)	ND (0.5)	ND (10)	ND (10)	0.3 *	0.3 *
CHLOROFORM	ND (10)	0.7 *	1 *	ND (7)	ND (7)	3 *	3 *
CHLOROMETHANE	ND (10)	ND (0.5)	ND (0.5)	ND (10)	ND (10)	ND (0.5)	ND (0.5)
ETHYLBENZENE	ND (10)	ND (0.5)	ND (0.5)	ND (10)	ND (10)	ND (0.5)	ND (0.5)
TETRACHLOROETHENE	ND (10)	ND (0.5)	ND (0.5)	ND (10)	ND (10)	ND (0.5)	ND (0.5)
TOLUENE	ND (10)	ND (0.5)	ND (0.5)	ND (10)	ND (10)	ND (0.5)	ND (0.5)
XYLENE (TOTAL)	ND (10)	ND (0.5)	ND (0.5)	ND (10)	ND (10)	ND (0.5)	ND (0.5)

TABLE 4.8-15 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33MW62A	IR33MW62A	IR33MW62A	IR33MW64A	IR33MW64A	IR33MW64A	IR33MW64A
Sample Number	9435K056	9603W006	9608W107	9443X544	9443X545	9603W005	9608J880
Sample Date	08/29/94	01/17/96	02/20/96	10/27/94	10/27/94	01/17/96	02/20/96
Semivolatile Organic Compound (ug/L)							
2,4-DIMETHYLPHENOL	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
2-METHYLNAPHTHALENE	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
4-METHYLPHENOL	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
ANTHRACENE	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
HEXACHLOROETHANE	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
NAPHTHALENE	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
PHENOL	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
TPH-Purgeable (ug/L)							
TPH-GASOLINE	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)
TPH-Extractable (ug/L)							
TPH-DIESEL	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)
TPH-MOTOR OIL	1,200	110	89	540	540	59	60
Total Recoverable Petroleum Hydrocarbons (ug/L)							
TRPH	ND (1,000)	ND (1,000)	ND (1,000)	ND (1,000)	ND (1,000)	ND (1,000)	ND (1,000)
Anion (ug/L)							
CHLORIDE	NA	NA	NA	NA	NA	NA	NA
FLUORIDE	NA	NA	NA	NA	NA	NA	NA
NITRATE	NA	NA	NA	NA	NA	NA	NA
NITRITE	NA	NA	NA	NA	NA	NA	NA
SULFATE	NA	NA	NA	NA	NA	NA	NA
Solids (ug/L)							
TOTAL DISSOLVED SOLIDS	NA	NA	NA	NA	NA	NA	NA
pH (pH units)							
PH	7.6	7.9	7.8	7.3	7.3	7.3	7.2
Salinity (ppt)							
SALINITY	NA	NA	NA	NA	NA	NA	NA

TABLE 4.8-15 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33MW65A	IR33MW65A	IR33MW65A	IR33MW65A	IR33MW65A	IR33MW65A	IR33MW65A
Sample Number	9443X541	9443X542	9527X770	9527X771	9603W002	9603W003	9608W109
Sample Date	10/26/94	10/26/94	07/07/95	07/07/95	01/17/96	01/17/96	02/20/96
Metal (ug/L)							
ALUMINUM	170	ND (128)	ND (61.4)	ND (44.7)	ND (92.1)	ND (38.3)	ND (41.6)
ANTIMONY	ND (2.9)	ND (2.2)	ND (2.1)	ND (2.1)	ND (1.6)	ND (1.6)	ND (1.6)
ARSENIC	ND (1.7)	ND (1.7)	ND (2.8)	ND (2.8)	ND (1.4)	ND (1.4)	1.4 *
BARIUM	20.1	19.4	25.8	35.0	46.3	45.0	20.9
CALCIUM	8,930	10,000	13,600	18,000	22,100	21,300	10,500
CHROMIUM	ND (16.2)	ND (14.9)	ND (6.5)	ND (5.2)	4.4	4.4	ND (1.7)
COBALT	ND (0.70)	ND (0.70)	0.84	1.1	ND (1.0)	ND (0.50)	ND (0.40)
COPPER	ND (2.6)	ND (5.0)	2.8 B	1.5	ND (5.3)	ND (5.6)	ND (1.4)
IRON	288	156	100	ND (65.4)	ND (42.3)	ND (16.6)	ND (11.0)
MAGNESIUM	12,500	14,400	22,700	30,400	35,000	33,800	16,300
MANGANESE	25.2	37.2	17.9	48.9	156	138	7.4
MERCURY	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.12)
MOLYBDENUM	ND (3.7)	ND (3.5)	ND (1.1)	ND (6.2)	1.9	1.4	ND (0.60)
NICKEL	ND (4.3)	ND (3.2)	ND (3.9)	ND (3.5)	ND (1.8)	ND (1.8)	ND (0.70)
POTASSIUM	3,730	4,060	4,080	5,240	5,150	5,210	2,840
SELENIUM	ND (2.3)	ND (2.3)	ND (3.4)	ND (3.4)	ND (2.3)	ND (2.3)	ND (2.3)
SODIUM	123,000	146,000	168,000	221,000	221,000	215,000	132,000
THALLIUM	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.9)	ND (1.9)	ND (1.9)
VANADIUM	16.2	15.5	13.6	12.5	11.5	10.6	11.5
ZINC	ND (29.8)	ND (38.0)	20.7	9.7	ND (30.6)	ND (11.5)	ND (15.7)
Volatile Organic Compound (ug/L)							
1,1,2-TRICHLOROETHANE	ND (10)	ND (10)	NA	NA	ND (0.5)	ND (0.5)	ND (0.5)
1,2-DICHLOROETHANE	ND (10)	ND (10)	NA	NA	ND (0.5)	ND (0.5)	ND (0.5)
2-HEXANONE	ND (10)	ND (10)	NA	NA	ND (4)	ND (4)	NA
BENZENE	ND (10)	ND (10)	NA	NA	ND (0.5)	ND (0.5)	ND (0.5)
CARBON DISULFIDE	ND (10)	ND (10)	NA	NA	ND (0.5)	ND (0.5)	ND (0.5)
CARBON TETRACHLORIDE	ND (10)	ND (10)	NA	NA	ND (0.5)	ND (0.5)	ND (0.5)
CHLOROFORM	ND (28)	ND (29)	NA	NA	1 *	2 *	6 *
CHLOROMETHANE	ND (10)	ND (10)	NA	NA	ND (0.5)	ND (0.5)	ND (0.5)
ETHYLBENZENE	ND (10)	ND (10)	NA	NA	ND (0.5)	ND (0.5)	ND (0.5)
TETRACHLOROETHENE	ND (10)	ND (10)	NA	NA	ND (0.5)	ND (0.5)	0.2
TOLUENE	ND (10)	ND (10)	NA	NA	ND (0.5)	ND (0.5)	ND (0.5)
XYLENE (TOTAL)	ND (10)	ND (10)	NA	NA	ND (0.5)	ND (0.5)	ND (0.5)

TABLE 4.8-15 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33MW65A	IR33MW65A	IR33MW65A	IR33MW65A	IR33MW65A	IR33MW65A	IR33MW65A
Sample Number	9443X541	9443X542	9527X770	9527X771	9603W002	9603W003	9608W109
Sample Date	10/26/94	10/26/94	07/07/95	07/07/95	01/17/96	01/17/96	02/20/96
Semivolatile Organic Compound (ug/L)							
2,4-DIMETHYLPHENOL	ND (10)	ND (10)	NA	NA	ND (10)	ND (10)	ND (10)
2-METHYLNAPHTHALENE	ND (10)	ND (10)	NA	NA	ND (10)	ND (10)	ND (10)
4-METHYLPHENOL	ND (10)	ND (10)	NA	NA	ND (10)	ND (10)	ND (10)
ANTHRACENE	ND (10)	ND (10)	NA	NA	ND (10)	ND (10)	ND (10)
HEXACHLOROETHANE	ND (10)	ND (10)	NA	NA	ND (10)	ND (10)	ND (10)
NAPHTHALENE	ND (10)	ND (10)	NA	NA	ND (10)	ND (10)	ND (10)
PHENOL	ND (10)	ND (10)	NA	NA	ND (10)	ND (10)	ND (10)
TPH-Purgeable (ug/L)							
TPH-GASOLINE	ND (50)	ND (50)	NA	NA	ND (50)	ND (50)	ND (50)
TPH-Extractable (ug/L)							
TPH-DIESEL	ND (100)	ND (100)	NA	NA	ND (100)	ND (100)	ND (100)
TPH-MOTOR OIL	310	400	NA	NA	66	ND (100)	ND (100)
Total Recoverable Petroleum Hydrocarbons (ug/L)							
TRPH	ND (1,000)	ND (1,000)	NA	NA	ND (1,000)	ND (1,000)	ND (1,000)
Anion (ug/L)							
CHLORIDE	NA	NA	NA	NA	NA	NA	NA
FLUORIDE	NA	NA	NA	NA	NA	NA	NA
NITRATE	NA	NA	NA	NA	NA	NA	NA
NITRITE	NA	NA	NA	NA	NA	NA	NA
SULFATE	NA	NA	NA	NA	NA	NA	NA
Solids (ug/L)							
TOTAL DISSOLVED SOLIDS	NA	NA	NA	NA	NA	NA	NA
pH (pH units)							
PH	7.4	7.4	NA	NA	7.2	7.2	7.3
Salinity (ppt)							
SALINITY	NA	NA	NA	NA	NA	NA	NA

TABLE 4.8-15 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33MW66A	IR33MW66A	IR33MW66A	IR33MW66A	PA50MW11A	PA50MW11A	PA50MW11A
Sample Number	9444X547	9444X548	9603W004	9608W108	9317B102	9606J861	9611W161
Sample Date	10/31/94	10/31/94	01/17/96	02/20/96	04/27/93	02/09/96	03/14/96
Metal (ug/L)							
ALUMINUM	ND (53.1)	ND (69.9)	ND (26.6)	ND (28.1)	ND (40.8)	ND (18.0)	ND (56.7)
ANTIMONY	ND (3.7)	ND (7.7)	ND (1.6)	ND (1.6)	ND (13.8)	ND (1.6)	ND (1.6)
ARSENIC	ND (1.7)	ND (1.7)	ND (1.4)	ND (1.4)	9.2 *	ND (1.4)	3.2 *
BARIUM	ND (30.2)	ND (30.8)	93.3	86.6	119	33.0	19.9
CALCIUM	ND (22,800)	ND (22,700)	56,400	56,000	286,000	64,300	44,300
CHROMIUM	ND (1.1)	ND (1.5)	ND (0.40)	ND (0.40)	ND (1.5)	ND (0.40)	ND (0.40)
COBALT	ND (0.70)	ND (0.70)	ND (1.9)	1.1	ND (2.9)	2.3	ND (2.1)
COPPER	ND (3.3)	ND (7.0)	ND (4.2)	ND (0.75)	ND (4.1)	ND (0.71)	ND (1.3)
IRON	ND (104)	ND (109)	ND (30.5)	ND (11.0)	ND (18.8)	ND (12.9)	12.0
MAGNESIUM	28,300	28,000	74,200	76,300	193,000	108,000	67,900
MANGANESE	347 *	337 *	980 *	741 *	335 *	21.5	14.3
MERCURY	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.07)	ND (0.10)	ND (0.10)
MOLYBDENUM	ND (2.2)	ND (2.2)	0.93	ND (0.60)	ND (8.4)	21.7	23.5
NICKEL	5.9	7.1	12.1 B	ND (9.3)	9.5 B	16.7 B	11.7 B
POTASSIUM	3,470	3,440	4,110	3,330	118,000	126,000	38,000
SELENIUM	ND (2.3)	ND (2.3)	ND (2.3)	ND (2.3)	ND (22.0)	ND (2.3)	2.9
SODIUM	452,000	479,000	597,000	508,000	2,510,000	1,640,000	871,000
THALLIUM	2.3 δ	2.1 δ	2.2 δ	ND (1.9)	NA	ND (1.9)	ND (1.9)
VANADIUM	9.4	9.1	6.4	6.7	8.0	ND (2.0)	3.9
ZINC	ND (27.0)	ND (30.7)	ND (12.2)	ND (4.5)	ND (33.2)	ND (10.3)	ND (16.7)
Volatile Organic Compound (ug/L)							
1,1,2-TRICHLOROETHANE	ND (10)	ND (10)	ND (0.5)	ND (0.5)	ND (10)	ND (0.5)	ND (0.5)
1,2-DICHLOROETHANE	ND (10)	ND (10)	ND (0.5)	ND (0.5)	ND (10)	ND (0.5)	ND (0.5)
2-HEXANONE	ND (10)	ND (10)	ND (4)	NA	ND (10)	ND (4)	NA
BENZENE	ND (10)	ND (10)	ND (0.5)	ND (0.5)	ND (10)	ND (0.5)	ND (0.5)
CARBON DISULFIDE	ND (10)	3	ND (0.5)	ND (0.5)	ND (10)	ND (0.5)	ND (0.5)
CARBON TETRACHLORIDE	ND (10)	ND (10)	ND (0.5)	ND (0.5)	ND (10)	ND (0.5)	ND (0.5)
CHLOROFORM	ND (10)	ND (10)	ND (0.5)	ND (0.5)	ND (10)	ND (0.5)	ND (0.5)
CHLOROMETHANE	ND (10)	ND (10)	ND (0.5)	ND (0.5)	ND (10)	ND (0.5)	ND (0.5)
ETHYLBENZENE	ND (10)	ND (10)	ND (0.5)	ND (0.5)	ND (10)	ND (0.5)	ND (0.5)
TETRACHLOROETHENE	ND (10)	ND (10)	ND (0.5)	ND (0.5)	ND (10)	ND (0.5)	ND (0.5)
TOLUENE	ND (10)	ND (10)	ND (0.5)	ND (0.5)	ND (10)	ND (0.5)	ND (0.5)
XYLENE (TOTAL)	ND (10)	ND (10)	ND (0.5)	ND (0.5)	ND (10)	ND (0.5)	ND (0.5)

TABLE 4.8-15 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33MW66A	IR33MW66A	IR33MW66A	IR33MW66A	PA50MW11A	PA50MW11A	PA50MW11A
Sample Number	9444X547	9444X548	9603W004	9608W108	9317B102	9606J861	9611W161
Sample Date	10/31/94	10/31/94	01/17/96	02/20/96	04/27/93	02/09/96	03/14/96
Semivolatile Organic Compound (ug/L)							
2,4-DIMETHYLPHENOL	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
2-METHYLNAPHTHALENE	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
4-METHYLPHENOL	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
ANTHRACENE	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
HEXACHLOROETHANE	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
NAPHTHALENE	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
PHENOL	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
TPH-Purgeable (ug/L)							
TPH-GASOLINE	ND (50)	ND (50)	ND (50)	ND (50)	ND (500)	ND (50)	ND (50)
TPH-Extractable (ug/L)							
TPH-DIESEL	ND (100)	ND (100)	ND (100)	66	ND (500)	76	ND (100)
TPH-MOTOR OIL	610	560	ND (100)	73	NA	140	140
Total Recoverable Petroleum Hydrocarbons (ug/L)							
TRPH	ND (1,000)	500	ND (1,000)	ND (1,000)	ND (1,000)	ND (1,000)	ND (1,000)
Anion (ug/L)							
CHLORIDE	NA	NA	NA	NA	NA	NA	1,070,000
FLUORIDE	NA	NA	NA	NA	NA	NA	670
NITRATE	NA	NA	NA	NA	NA	NA	190
NITRITE	NA	NA	NA	NA	NA	NA	ND (150)
SULFATE	NA	NA	NA	NA	NA	NA	204,000
Solids (ug/L)							
TOTAL DISSOLVED SOLIDS	NA	NA	NA	NA	NA	NA	2,600,000
pH (pH units)							
PH	7.1	7.1	6.8	6.9	NA	7.3	7.4
Salinity (ppt)							
SALINITY	NA	NA	NA	NA	NA	NA	2.5

TABLE 4.8-15 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

NA	Not analyzed
ND()	Not detected (detection limit in parentheses)
ppt	Parts per thousand
µg/L	Microgram per liter
*	Detected concentration greater than U.S. Environmental Protection Agency Region IX preliminary remediation goals (PRG) for tap water
ß	Detected concentration greater than National Ambient Water Quality Criteria (NAWQC) based on 4-day average study of saltwater aquatic life
δ	Detected concentration greater than maximum contaminant level (MCL) U.S. Environmental Protection Agency Title 40 Code of Federal Regulations or California Code of Regulations Title 22 MCL used, whichever is more stringent
▒	Detected concentration greater than at least one screening criterion.

TABLE 4.8-16

SUMMARY OF HYDROPUNCH GROUNDWATER ANALYTICAL TESTS - IR-33 NORTH HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
IR33B068	9419L433										√					√			√	√		√
IR33B069	9419L440										√					√			√	√		√
IR33B070	9415C129						√				√	√				√			√	√	√	√
IR33B074	9418L431										√					√			√	√		√
IR33B075	9415C124															√			√	√		√
IR33B075	9415C126						√				√	√									√	
IR33B076	9415C133						√				√	√				√			√	√	√	√
IR33B077	9415C131															√			√	√		√
IR33B077	9415C132						√				√	√									√	
IR33B086	9413A720																		√	√		√
IR33B087	9413L196																		√	√		√
IR33B089	9413L166																		√	√		√
IR33B090	9431R497																		√	√		√
IR33B112	9431R478			√																		√

Notes:

CHROM	CHROMIUM VI
CYAN	Cyanide
DIOXIN	Dioxins and Furans
O&G	Total oil and grease
PAH	Polynuclear aromatic hydrocarbons
PCTMST	Percent moisture
PEST	Pesticides/polychlorinated biphenyls
PHYS	Physical characteristic
SALIN	Salinity
SVOC	Semivolatile organic compounds
SOLIDS	Total dissolved solids
TOC	Total organic carbon
TMICROB	Coliform
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
VOC	Volatile organic compounds

TABLE 4.8-17

STATISTICAL SUMMARY OF HYDROPUNCH GROUNDWATER ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Tap Water PRG Value	Above[e] PRG	MCL Value[f]	Above[g] MCL	NAWQC Value	Above[h] NAWQC
METAL	ALUMINUM	84.2	107	95.7	UG/L	34.1	4	2	37,000	0				
	ANTIMONY	5.2	9.2	7.7	UG/L	1.3	4	4	15.0	0	6.0	3	500	0
	BARIUM	51.6	632	356	UG/L	4.7	4	4	2,600	0	1,000	0		
	CALCIUM	30,500	188,000	140,000	UG/L	64.9	4	4						
	COBALT	2.4	35.9	12.8	UG/L	0.80	4	4						
	COPPER	2.0	6.0	3.7	UG/L	0.43	4	3	1,400	0			2.4	2
	IRON	53.5	14,600	5,380	UG/L	20.0	4	3						
	MAGNESIUM	41,100	364,000	223,000	UG/L	54.0	4	4						
	MANGANESE	954	8,410	3,790	UG/L	0.50	4	4	180	4				
	MOLYBDENUM	13.3	17.4	15.4	UG/L	0.70	4	2	180	0				
	NICKEL	7.7	46.4	26.1	UG/L	1.0	4	3	730	0	100	0	8.2	2
	POTASSIUM	16,100	141,000	58,600	UG/L	46.1	4	4						
	SODIUM	645,000	3,030,000	1,730,000	UG/L	1,080	4	4						
	THALLIUM	2.2	2.2	2.2	UG/L	2.0	4	1			2.0	1		
	VANADIUM	1.7	7.6	4.2	UG/L	0.97	4	3	260	0				
	ZINC	12.0	21.6	15.4	UG/L	3.3	4	4	11,000	0			81.0	0
VOC	1,2-DICHLOROETHANE	0.3	0.3	0.3	UG/L	1	12	1	0.1	1	0.5	0		
	2-BUTANONE	40	58	49	UG/L	5	12	2	1,900	0				
	BENZENE	0.3	410	210	UG/L	10	12	2	0.4	1	1	1		
	CIS-1,2-DICHLOROETHENE	0.4	0.4	0.4	UG/L	1	12	1	61	0	6	0		
SVOC	2-METHYLNAPHTHALENE	73	73	73	UG/L	10	6	1	240	0				
	ANTHRACENE	0.3	0.3	0.3	UG/L	10	6	1	1,800	0				

TABLE 4.8-17 (Continued)

STATISTICAL SUMMARY OF HYDROPUNCH GROUNDWATER ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Tap Water PRG Value	Above[e] PRG	MCL Value[f]	Above[g] MCL	NAWQC Value	Above[h] NAWQC
	FLUORANTHENE	0.2	0.2	0.2	UG/L	10	6	1	1,500	0				
	NAPHTHALENE	420	420	420	UG/L	10	6	1	240	1				
	PHENANTHRENE	0.6	0.6	0.6	UG/L	10	6	1	240	0			5	0
	PHENOL	16	16	16	UG/L	10	7	1	22,000	0				
	PYRENE	0.6	0.6	0.6	UG/L	10	6	1	1,100	0				
PEST	ALPHA-CHLORDANE	0.03	0.03	0.03	UG/L	0.05	7	1	0.05	0				
	HEPTACHLOR EPOXIDE	0.04	0.04	0.04	UG/L	0.05	7	1	0.007	1	0.01	1		
TPHPRG	TPH-GASOLINE	30	5,000	2,500	UG/L	630	11	2	100	1i				
TPHEXT	TPH-DIESEL	74	3,400	690	UG/L	150	11	8	100	6i				
	TPH-MOTOR OIL	67	980	460	UG/L	160	11	7	100	6i				
TRPH	TRPH	1,900	1,900	1,900	UG/L	290	4	1	100	1i				

TABLE 4.8-17 (Continued)

STATISTICAL SUMMARY OF HYDROPUNCH GROUNDWATER ANALYTICAL RESULTS - IR-33 NORTH HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

CYAN	Cyanide
EPA	U.S. Environmental Protection Agency
MCL	Maximum contaminant level
NAWQC	National Ambient Water Quality Criteria
O&G	Total oil and grease
PCTMST	Percent moisture
PEST	Pesticide/polychlorinated biphenyl
PPT	Parts per thousand
PRG	Preliminary remediation goal
SALIN	Salinity
SVOC	Semivolatile organic compound
TMICROB	Coliform
TOC	Total organic carbon
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
UG/L	Microgram per liter
VOC	Volatile organic compound

a Organic results of less than 10 are reported to one significant figure, and results of greater than or equal to 10 are reported to two significant figures. Inorganic results of less than 10 are reported to two significant figures, and results of greater than or equal to 10 are reported to three significant figures. Values that are not nondetects are compared to screening criteria before the significant figure rule is applied. Both the value and the screening criteria are then rounded for reporting purposes.

b Blank boxes indicate that screening critera have not been established for these analytes.

c Total number of samples analyzed

d Total number of samples showing concentrations greater than detection limit

e Total number of samples showing concentrations greater than tap water PRG
California-modified PRGs were used for the following analytes: 1,2-Dibromo-3-chloropropane, benzo[a]pyrene, benzo[k]fluoranthene, cadmium, chromium VI, chrysene, lead, nickel, and tetrachloroethylene (PCE).
For the analytes listed below, Region IX PRGs are not available; therefore, PRGs for similar chemicals were used as follows:

Analyte:	Similar Analyte:
2-Methylnapthalene	Naphthalene
Acenaphthylene	Acenaphthene
Alpha-chlordane	Chlordane
Aroclor-1260	Polychlorinated biphenyls
Benzo(g,h,i)perylene	Naphthalene
Delta BHC	HCH-technical
Endosulfan I	Endosulfan
Endosulfan sulfate	Endosulfan
Endrin aldehyde	Endrin
Endrin ketone	Endrin
Gamma-chlordane	Chlordane
Phenanthrene	Naphthalene

f EPA Title 40 Code of Federal Regulations or California Code of Regulations Title 22 MCL used, whichever is more stringent

g Total number of samples showing concentrations greater than MCL

h Total number of samples showing concentrations greater than NAWQC;
NAWQC based on 4-day average study of saltwater aquatic life

i Total number of samples showing concentrations greater than TPH, TRPH, or O&G screening level, not PRG value

TABLE 4.8-18

HYDROPUNCH GROUNDWATER ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B068	IR33B069	IR33B070	IR33B074	IR33B075	IR33B075	IR33B076
Sample Number	9419L433	9419L440	9415C129	9418L431	9415C124	9415C126	9415C133
Sample Date	05/11/94	05/11/94	04/12/94	05/06/94	04/11/94	04/12/94	04/13/94
Metal (ug/L)							
ALUMINUM	NA	NA	ND (51.2)	NA	NA	ND (70.5)	84.2
ANTIMONY	NA	NA	9.1 δ	NA	NA	9.2 δ	5.2
BARIUM	NA	NA	51.6	NA	NA	310	632
CALCIUM	NA	NA	30,500	NA	NA	188,000	185,000
COBALT	NA	NA	2.4	NA	NA	35.9	3.0
COPPER	NA	NA	3.2 B	NA	NA	6.0 B	ND (0.50)
IRON	NA	NA	53.5	NA	NA	1,500	14,600
MAGNESIUM	NA	NA	41,100	NA	NA	271,000	364,000
MANGANESE	NA	NA	954 *	NA	NA	8,410 *	2,000 *
MOLYBDENUM	NA	NA	13.3	NA	NA	17.4	ND (3.9)
NICKEL	NA	NA	7.7	NA	NA	24.2 B	ND (4.8)
POTASSIUM	NA	NA	29,000	NA	NA	48,600	141,000
SODIUM	NA	NA	645,000	NA	NA	1,720,000	3,030,000
THALLIUM	NA	NA	ND (0.99)	NA	NA	ND (1.0)	2.2 δ
VANADIUM	NA	NA	7.6	NA	NA	3.2	ND (1.5)
ZINC	NA	NA	12.0	NA	NA	15.5	12.5
Volatile Organic Compound (ug/L)							
1,2-DICHLOROETHANE	ND (0.5)	ND (10)	ND (0.5)	ND (0.5)	ND (0.5)	NA	ND (0.5)
2-BUTANONE	ND (5)	ND (100)	ND (5)	58	ND (5)	NA	ND (5)
BENZENE	ND (0.5)	410 *δ	ND (0.5)	ND (0.5)	ND (0.5)	NA	ND (0.5)
CIS-1,2-DICHLOROETHENE	ND (0.5)	ND (10)	ND (0.5)	ND (0.5)	ND (0.5)	NA	ND (0.5)
Semivolatile Organic Compound (ug/L)							
2-METHYLNAPHTHALENE	ND (10)	73	ND (10)	ND (10)	ND (13)	NA	ND (10)
ANTHRACENE	ND (10)	0.3	ND (10)	ND (10)	ND (13)	NA	ND (10)
FLUORANTHENE	ND (10)	0.2	ND (10)	ND (10)	ND (13)	NA	ND (10)
NAPHTHALENE	ND (10)	420 *	ND (10)	ND (10)	ND (13)	NA	ND (10)
PHENANTHRENE	ND (10)	0.6	ND (10)	ND (10)	ND (13)	NA	ND (10)
PHENOL	ND (10)	16	ND (10)	ND (10)	ND (13)	NA	ND (10)
PYRENE	ND (10)	0.6	ND (10)	ND (10)	ND (13)	NA	ND (10)
Pesticide/Polychlorinated Biphenyl (ug/L)							
ALPHA-CHLORDANE	ND (0.05)	0.03	ND (0.05)	ND (0.05)	NA	ND (0.05)	ND (0.05)
HEPTACHLOR EPOXIDE	ND (0.01)	0.04 *δ	ND (0.01)	ND (0.01)	NA	ND (0.01)	ND (0.01)

TABLE 4.8-18 (Continued)

HYDROPUNCH GROUNDWATER ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B068	IR33B069	IR33B070	IR33B074	IR33B075	IR33B075	IR33B076
Sample Number	9419L433	9419L440	9415C129	9418L431	9415C124	9415C126	9415C133
Sample Date	05/11/94	05/11/94	04/12/94	05/06/94	04/11/94	04/12/94	04/13/94
TPH-Purgeable (ug/L)							
TPH-GASOLINE	ND (50)	5,000	ND (50)	ND (30)	ND (50)	NA	ND (50)
TPH-Extractable (ug/L)							
TPH-DIESEL	ND (100)	3,400	1,200	92	130	NA	74
TPH-MOTOR OIL	260	820	700	67	ND (100)	NA	ND (100)
Total Recoverable Petroleum Hydrocarbons (ug/L)							
TRPH	NA	NA	1,900	NA	NA	ND (370)	ND (1,000)
pH (pH units)							
PH	NA	NA	7.5	NA	NA	7.1	6.9

TABLE 4.8-18 (Continued)

HYDROPUNCH GROUNDWATER ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B077	IR33B077	IR33B086	IR33B087	IR33B089	IR33B090
Sample Number	9415C131	9415C132	9413A720	9413L196	9413L166	9431R497
Sample Date	04/12/94	04/13/94	03/31/94	03/30/94	03/28/94	08/04/94
Metal (ug/L)						
ALUMINUM	NA	107	NA	NA	NA	NA
ANTIMONY	NA	7.4 B	NA	NA	NA	NA
BARIUM	NA	431	NA	NA	NA	NA
CALCIUM	NA	156,000	NA	NA	NA	NA
COBALT	NA	9.9	NA	NA	NA	NA
COPPER	NA	2.0	NA	NA	NA	NA
IRON	NA	ND (40.7)	NA	NA	NA	NA
MAGNESIUM	NA	217,000	NA	NA	NA	NA
MANGANESE	NA	3,780 *	NA	NA	NA	NA
MOLYBDENUM	NA	ND (11.3)	NA	NA	NA	NA
NICKEL	NA	46.4 B	NA	NA	NA	NA
POTASSIUM	NA	16,100	NA	NA	NA	NA
SODIUM	NA	1,550,000	NA	NA	NA	NA
THALLIUM	NA	ND (10.0)	NA	NA	NA	NA
VANADIUM	NA	1.7	NA	NA	NA	NA
ZINC	NA	21.6	NA	NA	NA	NA
Volatile Organic Compound (ug/L)						
1,2-DICHLOROETHANE	ND (0.5)	NA	ND (1)	ND (1)	ND (1)	0.3 *
2-BUTANONE	ND (5)	NA	40	ND (5)	ND (5)	ND (8)
BENZENE	ND (0.5)	NA	0.3	ND (1)	ND (1)	ND (0.5)
CIS-1,2-DICHLOROETHENE	ND (0.5)	NA	ND (1)	ND (1)	ND (1)	0.4
Semivolatile Organic Compound (ug/L)						
2-METHYLNAPHTHALENE	NA	NA	NA	NA	NA	NA
ANTHRACENE	NA	NA	NA	NA	NA	NA
FLUORANTHENE	NA	NA	NA	NA	NA	NA
NAPHTHALENE	NA	NA	NA	NA	NA	NA
PHENANTHRENE	NA	NA	NA	NA	NA	NA
PHENOL	ND (12)	NA	NA	NA	NA	NA
PYRENE	NA	NA	NA	NA	NA	NA
Pesticide/Polychlorinated Biphenyl (ug/L)						
ALPHA-CHLORDANE	NA	ND (0.05)	NA	NA	NA	NA
HEPTACHLOR EPOXIDE	NA	ND (0.01)	NA	NA	NA	NA

TABLE 4.8-18 (Continued)

HYDROPUNCH GROUNDWATER ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B077	IR33B077	IR33B086	IR33B087	IR33B089	IR33B090
Sample Number	9415C131	9415C132	9413A720	9413L196	9413L166	9431R497
Sample Date	04/12/94	04/13/94	03/31/94	03/30/94	03/28/94	08/04/94
TPH-Purgeable (ug/L)						
TPH-GASOLINE	ND (50)	NA	ND (26)	ND (50)	30	ND (50)
TPH-Extractable (ug/L)						
TPH-DIESEL	150	NA	240	200	ND (100)	ND (100)
TPH-MOTOR OIL	130	NA	ND (100)	ND (72)	980	290
Total Recoverable Petroleum Hydrocarbons (ug/L)						
TRPH	NA	ND (1,000)	NA	NA	NA	NA
pH (pH units)						
PH	NA	6.9	NA	NA	NA	NA

Notes:

NA Not analyzed
ND() Not detected (detection limit in parentheses)
µg/L Microgram per liter

* Detected concentration greater than U.S. Environmental Protection Agency Region IX preliminary remediation goals (PRG) for tap water
ß Detected concentration greater than National Ambient Water Quality Criteria (NAWQC) based on 4-day average study of saltwater aquatic life
δ Detected concentration greater than maximum contaminant level (MCL)
U.S. Environmental Protection Agency Title 40 Code of Federal Regulations or California Code of Regulations Title 22 MCL used, whichever is more stringent

Detected concentration greater than at least one screening criterion.

TABLE 4.8-19

SUMMARY OF GRAB GROUNDWATER ANALYTICAL TESTS - IR-33 NORTH HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
IR33B065	9420N541																		√	√	√	
IR33B073	9418A835															√			√	√		√
IR33B073	9418S836										√	√										
IR33B079	9435C499																		√	√		√
IR33B081	9427R399																		√	√		√
IR33B083	9413L181																		√	√		√
IR33B085	9413L190																		√	√		√
IR33B091	9413L173																		√	√		√
IR33B119	9551J731										√					√			√		√	√

Notes:

CHROM	CHROMIUM VI
CYAN	Cyanide
DIOXIN	Dioxins and Furans
O&G	Total oil and grease
PAH	Polynuclear aromatic hydrocarbons
PCTMST	Percent moisture
PEST	Pesticides/polychlorinated biphenyls
PHYS	Physical characteristic
SALIN	Salinity
SVOC	Semivolatile organic compounds
SOLIDS	Total dissolved solids
TOC	Total organic carbon
TMICROB	Coliform
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
VOC	Volatile organic compounds

TABLE 4.8-20

STATISTICAL SUMMARY OF GRAB GROUNDWATER ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Tap Water PRG Value	Above[e] PRG	MCL Value[f]	Above[g] MCL	NAWQC Value	Above[h] NAWQC
VOC	1,1-DICHLOROETHANE	1	1	1	UG/L	1	7	1	810	0				
	1,2-DICHLOROBENZENE	2	2	2	UG/L	1	7	1	370	0	600	0		
	2-BUTANONE	11	11	11	UG/L	10	7	1	1,900	0				
	CHLOROBENZENE	3	3	3	UG/L	1	7	1	39	0	70	0		
	CIS-1,2-DICHLOROETHENE	0.5	0.5	0.5	UG/L	1	7	1	61	0	6	0		
	TETRACHLOROETHENE	2	3	3	UG/L	0.8	7	2	1	2	5	0		
TPHPRG	TPH-GASOLINE	42	230,000	120,000	UG/L	25,000	7	2	100	1i				
TPHEXT	TPH-DIESEL	66	6,100	2,100	UG/L	230	8	3	100	2i				
	TPH-MOTOR OIL	53	35,000	12,000	UG/L	3,400	8	3	100	2i				
TRPH	TRPH	2,000	7,600	4,800	UG/L	700	2	2	100	2i				

TABLE 4.8-20 (Continued)

STATISTICAL SUMMARY OF GRAB GROUNDWATER ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

CYAN	Cyanide
EPA	U.S. Environmental Protection Agency
MCL	Maximum contaminant level
NAWQC	National Ambient Water Quality Criteria
O&G	Total oil and grease
PCTMST	Percent moisture
PEST	Pesticide/polychlorinated biphenyl
PPT	Parts per thousand
PRG	Preliminary remediation goal
SALIN	Salinity
SVOC	Semivolatile organic compound
TMICROB	Coliform
TOC	Total organic carbon
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
UG/L	Microgram per liter
VOC	Volatile organic compound

a Organic results of less than 10 are reported to one significant figure, and results of greater than or equal to 10 are reported to two significant figures. Inorganic results of less than 10 are reported to two significant figures, and results of greater than or equal to 10 are reported to three significant figures. Values that are not nondetects are compared to screening criteria before the significant figure rule is applied. Both the value and the screening criteria are then rounded for reporting purposes.

b Blank boxes indicate that screening critera have not been established for these analytes.

c Total number of samples analyzed

d Total number of samples showing concentrations greater than detection limit

e Total number of samples showing concentrations greater than tap water PRG
California-modified PRGs were used for the following analytes: 1,2-Dibromo-3-chloropropane, benzo[a]pyrene, benzo[k]fluoranthene, cadmium, chromium VI, chrysene, lead, nickel, and tetrachloroethylene (PCE).
For the analytes listed below, Region IX PRGs are not available; therefore, PRGs for similar chemicals were used as follows:

Analyte:	Similar Analyte:
2-Methylnapthalene	Naphthalene
Acenaphthylene	Acenaphthene
Alpha-chlordane	Chlordane
Aroclor-1260	Polychlorinated biphenyls
Benzo(g,h,i)perylene	Naphthalene
Delta BHC	HCH-technical
Endosulfan I	Endosulfan
Endosulfan sulfate	Endosulfan
Endrin aldehyde	Endrin
Endrin ketone	Endrin
Gamma-chlordane	Chlordane
Phenanthrene	Naphthalene

f EPA Title 40 Code of Federal Regulations or California Code of Regulations Title 22 MCL used, whichever is more stringent

g Total number of samples showing concentrations greater than MCL

h Total number of samples showing concentrations greater than NAWQC;
NAWQC based on 4-day average study of saltwater aquatic life

i Total number of samples showing concentrations greater than TPH, TRPH, or O&G screening level, not PRG value

TABLE 4.8-21

GRAB GROUNDWATER ANALYTICAL RESULTS - IR-33 NORTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B065	IR33B073	IR33B073	IR33B081	IR33B083	IR33B091	IR33B119
Sample Number	9420N541	9418A835	9418S836	9427R399	9413L181	9413L173	9551J731
Sample Date	05/20/94	05/02/94	05/02/94	07/08/94	03/29/94	03/29/94	12/21/95
Volatile Organic Compound (ug/L)							
1,1-DICHLOROETHANE	NA	ND (0.5)	NA	ND (0.5)	1	ND (5)	ND (0.5)
1,2-DICHLOROBENZENE	NA	ND (0.5)	NA	ND (0.5)	2	ND (5)	ND (0.5)
2-BUTANONE	NA	ND (5)	NA	ND (10)	ND (5)	ND (25)	11
CHLOROBENZENE	NA	ND (0.5)	NA	ND (0.5)	3	ND (5)	ND (0.5)
CIS-1,2-DICHLOROETHENE	NA	0.5	NA	ND (0.5)	ND (1)	ND (5)	ND (0.5)
TETRACHLOROETHENE	NA	ND (0.5)	NA	2 *	ND (1)	ND (5)	3 *
TPH-Purgeable (ug/L)							
TPH-GASOLINE	ND (50)	ND (50)	NA	ND (50)	42	230,000	NA
TPH-Extractable (ug/L)							
TPH-DIESEL	ND (310)	66	NA	140	ND (100)	6,100	ND (10,000)
TPH-MOTOR OIL	ND (530)	53	NA	150	ND (260)	ND (500)	35,000
Total Recoverable Petroleum Hydrocarbons (ug/L)							
TRPH	7,600	NA	NA	NA	NA	NA	2,000
pH (pH units)							
PH	NA	NA	7.3	NA	NA	NA	NA

Notes:

NA Not analyzed
ND() Not detected (detection limit in parentheses)
µg/L Microgram per liter

* Detected concentration greater than U.S. Environmental Protection Agency Region IX preliminary remediation goals (PRG) for tap water

Detected concentration greater than at least one screening criterion.

TABLE 4.9-1

SUMMARY OF OTHER SEDIMENT ANALYTICAL TESTS - IR-33 SOUTH HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
PA33FV26	9312X947				√		√	√		√	√	√				√			√	√		√

Notes:

CHROM	CHROMIUM VI
CYAN	Cyanide
DIOXIN	Dioxins and Furans
O&G	Total oil and grease
PAH	Polynuclear aromatic hydrocarbons
PCTMST	Percent moisture
PEST	Pesticides/polychlorinated biphenyls
PHYS	Physical characteristic
SALIN	Salinity
SVOC	Semivolatile organic compounds
SOLIDS	Total dissolved solids
TOC	Total organic carbon
TMICROB	Coliform
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
VOC	Volatile organic compounds

TABLE 4.9-2

STATISTICAL SUMMARY OF OTHER SEDIMENT ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection Frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Residential PRG Value	Above[e] Res PRG	Industrial PRG Value	Above[f] Ind PRG	HPAL Value	Above[g] HPAL
METAL	ALUMINUM	16,100	16,100	16,100	MG/KG	4.3	1	1	76,700	0	100,000	0		
	ANTIMONY	20.0	20.0	20.0	MG/KG	4.0	1	1	30.7	0	681	0	9.05	1
	ARSENIC	19.1	19.1	19.1	MG/KG	0.70	1	1	0.32	1	2.0	1	11.10	1
	BARIUM	179	179	179	MG/KG	0.78	1	1	5,340	0	100,000	0	314.36	0
	CADMIUM	13.4	13.4	13.4	MG/KG	0.56	1	1	9.0	1	852	0	3.14	1
	CALCIUM	16,000	16,000	16,000	MG/KG	15.6	1	1						
	CHROMIUM	505	505	505	MG/KG	0.48	1	1	211	1	1,580	0	h	1
	COBALT	28.4	28.4	28.4	MG/KG	0.81	1	1					h	1
	COPPER	453	453	453	MG/KG	0.05	1	1	2,850	0	63,300	0	124.31	1
	IRON	109,000	109,000	109,000	MG/KG	4.6	1	1						
	LEAD	538	538	538	MG/KG	3.2	1	1	130	1	1,000	0	8.99	1
	MAGNESIUM	1,930	1,930	1,930	MG/KG	24.7	1	1						
	MANGANESE	3,350	3,350	3,350	MG/KG	0.22	1	1	382	1	8,300	0	1431.18	1
	MOLYBDENUM	54.3	54.3	54.3	MG/KG	0.67	1	1	383	0	8,520	0	2.68	1
	NICKEL	506	506	506	MG/KG	1.2	1	1	150	1	34,100	0	h	1
	POTASSIUM	1,250	1,250	1,250	MG/KG	142	1	1						
	VANADIUM	68.0	68.0	68.0	MG/KG	0.83	1	1	537	0	11,900	0	117.17	0
	ZINC	1,860	1,860	1,860	MG/KG	0.35	1	1	23,000	0	100,000	0	109.86	1
CYAN	CYANIDE	2,930	2,930	2,930	UG/KG	120	1	1	1,300,000	0	13,600,000	0		
SVOC	ANTHRACENE	540	540	540	UG/KG	4,500	1	1	19,000	0	19,000	0		
	BENZO(A)ANTHRACENE	1,400	1,400	1,400	UG/KG	4,500	1	1	610	1	2,600	0		
	BIS(2-ETHYLHEXYL)PHTHALATE	25,000	25,000	25,000	UG/KG	4,500	1	1	32,000	0	140,000	0		

TABLE 4.9-2 (Continued)

STATISTICAL SUMMARY OF OTHER SEDIMENT ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Residential PRG Value	Above[e] Res PRG	Industrial PRG Value	Above[f] Ind PRG	HPAL Value	Above[g] HPAL
	FLUORANTHENE	2,200	2,200	2,200	UG/KG	4,500	1	1	2,600,000	0	27,000,000	0		
	PHENANTHRENE	1,400	1,400	1,400	UG/KG	4,500	1	1	800,000	0	800,000	0		
	PYRENE	2,500	2,500	2,500	UG/KG	4,500	1	1	2,000,000	0	20,000,000	0		
PEST	AROCLOR-1260	2,400	2,400	2,400	UG/KG	45	1	1	66	1	340	1		
TPHEXT	TPH-DIESEL	72	72	72	MG/KG	13	1	1	1,000	0i				
O&G	TOTAL OIL & GREASE	1,600	1,600	1,600	MG/KG	34	1	1	1,000	1i				

TABLE 4.9-2 (Continued)

STATISTICAL SUMMARY OF OTHER SEDIMENT ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

CYAN	Cyanide
EPA	U.S. Environmental Protection Agency
HPAL	Hunters Point ambient level
MG/KG	Milligram per kilogram
O&G	Total oil and grease
PCTMST	Percent moisture
PEST	Pesticide/polychlorinated biphenyl
PHYS	Physical characteristic
PRG	Preliminary remediation goal
SALIN	Salinity
SVOC	Semivolatile organic compound
TMICROB	Coliform
TOC	Total organic carbon
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
UG/KG	Microgram per kilogram
VOC	Volatile organic compound

a Organic results of less than 10 are reported to one significant figure, and results of greater than or equal to 10 are reported to two significant figures. Inorganic results of less than 10 are reported to two significant figures, and results of greater than or equal to 10 are reported to three significant figures. Values that are not nondetects are compared to screening criteria before the significant figure rule is applied. Both the value and the screening criteria are then rounded for reporting purposes.

b Blank boxes indicate that screening critera have not been established for these analytes.

c Total number of samples analyzed

d Total number of samples showing concentrations greater than detection limit

e Total number of samples showing concentrations greater than residential PRG

f Total number of samples showing concentrations greater than industrial PRG
California-modified PRGs were used for the following analytes: 1,2-Dibromo-3-chloropropane, benzo[a]pyrene, benzo[k]fluoranthene, cadmium, chromium VI, chrysene, lead, nickel, and tetrachloroethylene (PCE).
For the analytes listed below, Region IX PRGs are not available; therefore, PRGs for similar chemicals were used as follows:

Analyte:	Similar Analyte:
2-Methylnapthalene	Naphthalene
Acenaphthylene	Acenaphthene
Alpha-chlordane	Chlordane
Aroclor-1260	Polychlorinated biphenyls
Benzo(g,h,i)perylene	Naphthalene
Delta BHC	HCH-technical
Endosulfan I	Endosulfan
Endosulfan sulfate	Endosulfan
Endrin aldehyde	Endrin
Endrin ketone	Endrin
Gamma-chlordane	Chlordane
Phenanthrene	Naphthalene

g Total number of samples showing concentrations greater than HPAL

h HPALs for chromium, cobalt, and nickel are based on the concentration of magnesium in each sample; thus, no single value applies to all samples. The range of HPAL values for chromium, cobalt, and nickel are 62.217 to 62.217, 13.387 to 13.387, and 49.269 to 49.269 mg/kg respectively.

i Total number of samples showing concentrations greater than TPH, TRPH, or O&G screening level, not PRG value

TABLE 4.9-3

OTHER SEDIMENT ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	PA33FV26
Sampling Depth (feet bgs)	0.00
Sample Number	9312X947
Sample Date	03/23/93
Metal (mg/kg)	
ALUMINUM	16,100
ANTIMONY	20.0 α
ARSENIC	19.1 *#α
BARIUM	179
CADMIUM	13.6 *α
CALCIUM	16,000
CHROMIUM	505 *α
COBALT	28.4 α
COPPER	453 α
IRON	109,000
LEAD	538 *α
MAGNESIUM	1,930
MANGANESE	3,350 *α
MOLYBDENUM	54.3 α
NICKEL	506 *α
POTASSIUM	1,250
VANADIUM	68.0
ZINC	1,860 α
Cyanide (ug/kg)	
CYANIDE	2,930
Semivolatile Organic Compound (ug/kg)	
ANTHRACENE	540
BENZO(A)ANTHRACENE	1,400 *
BIS(2-ETHYLHEXYL)PHTHALATE	25,000
FLUORANTHENE	2,200
PHENANTHRENE	1,400
PYRENE	2,500
Pesticide/Polychlorinated Biphenyl (ug/kg)	
AROCLOR-1260	2,400 *#

TABLE 4.9-3 (Continued)

OTHER SEDIMENT ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	PA33FV26
Sampling Depth (feet bgs)	0.00
Sample Number	9312X947
Sample Date	03/23/93
TPH-Extractable (mg/kg)	
TPH-DIESEL	72
Oil and Grease (mg/kg)	
TOTAL OIL & GREASE	1,600
Percent Moisture (%)	
% SOLIDS	74.4
pH (pH units)	
PH	8.8

Notes:

%	Percent
bgs	Below ground surface
mg/kg	Milligram per kilogram
NA	Not analyzed
ND()	Not detected (detection limit in parentheses)
µg/kg	Microgram per kilogram
*	Detected concentration greater than U.S. Environmental Protection Agency Region IX preliminary remediation goals (PRG) for residential use
#	Detected concentration greater than U.S. Environmental Protection Agency Region IX PRG for industrial use
α	Detected concentration greater than the Hunters Point ambient level.
▒	Detected concentration greater than at least one screening criterion.

TABLE 4.9-4

SUMMARY OF SOIL ANALYTICAL TESTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
IR33B067	9420R130						√			√	√	√				√			√	√	√	√
IR33B067	9420R131						√			√	√	√				√			√	√	√	√
IR33B067	9420R133						√			√	√	√				√			√	√	√	√
IR33B092	9606J855						√			√	√	√				√			√	√	√	√
IR33B092	9606J856						√			√	√	√				√			√	√	√	√
IR33B094	9545J590						√			√	√	√				√			√	√	√	√
IR33B094	9545J591						√			√	√	√				√			√	√	√	√
IR33B094	9545J592						√			√	√	√				√			√	√	√	√
IR33B094	9545J595						√			√	√	√				√			√	√	√	√
IR33B094	9545J596						√			√	√	√				√			√	√	√	√
IR33B095	9607J869						√			√	√	√				√			√	√	√	√
IR33B095	9607J870						√			√		√				√			√	√	√	√
IR33B095	9607J871						√			√	√	√				√			√	√	√	√
IR33B096	9607J866						√			√		√				√			√	√		√
IR33B096	9607J867						√			√		√				√			√	√	√	√
IR33B096	9607J868						√			√		√				√			√	√		√
IR33B100	9438A066						√			√	√	√				√			√	√	√	√
IR33B100	9438A067						√			√	√	√				√			√	√	√	√
IR33B100	9438A068						√			√	√	√				√			√	√	√	√
IR33B100	9438A069						√			√	√	√				√			√	√	√	√
IR33B117	9532G038						√			√	√	√				√			√	√	√	
IR33B117	9532G040						√			√	√	√				√			√	√		
IR33B117	9532G041						√			√	√	√				√			√	√		
IR33B118	9543W088						√			√	√	√				√			√	√	√	
IR33B118	9543W089						√			√	√	√				√			√	√	√	√
IR33B118	9543W090						√			√	√	√				√			√	√	√	√
IR33B118	9543W091						√			√	√	√				√			√	√	√	√
IR33B118	9543W092						√			√	√	√				√			√	√	√	√
IR34B033	9438A072						√			√	√	√				√			√	√	√	√
IR34B033	9438A073						√			√	√	√				√			√	√	√	√
IR34B033	9438A075						√			√	√	√				√			√	√	√	√
IR34B033	9438A076						√			√	√	√				√			√	√	√	√
IR34B033	9438A077						√			√	√	√				√			√	√	√	√
PA33B035	9308D074						√	√		√	√	√				√			√	√		√
PA33B035	9308D075						√	√		√	√	√				√			√	√		√
PA33B038	9308D071						√	√		√	√	√				√			√	√		√
PA33B038	9308D072						√	√		√	√	√				√			√	√		√

TABLE 4.9-4 (Continued)

SUMMARY OF SOIL ANALYTICAL TESTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
PA33B038	9308D073						√	√		√	√	√				√			√	√		√
PA33B039	9308D068						√	√		√	√	√				√			√	√		√
PA33B039	9308D069						√	√		√	√	√				√			√	√		√
PA33B039	9308D070						√	√		√	√	√				√			√	√		√
PA33B040	9308D076						√	√		√	√	√				√			√	√		√
PA33B040	9308D077						√	√		√	√	√				√			√	√		√
PA33B040	9308D078						√	√		√	√					√			√	√		√
PA33B051	9342G750						√			√	√	√				√			√	√	√	√
PA33B051	9342G751						√			√	√	√				√			√	√	√	√
PA33B053	9311N177						√	√		√	√	√				√			√	√		√
PA33B055	9311N176						√	√		√	√	√				√			√	√		√
PA33B056	9313N181						√	√		√	√	√				√			√	√		√
PA33B058	9311N180						√	√		√	√	√				√			√	√		√
PA33MW36A	9309A647			√			√	√			√	√				√			√	√		√
PA33MW36A	9309A648			√			√	√			√	√				√			√	√		√
PA33MW36A	9309A649			√			√	√			√	√				√			√	√		√
PA33MW36A	9309A650			√			√	√				√				√			√	√		√
PA33MW37A	9309A641			√			√	√			√	√				√			√	√		√
PA33MW37A	9309A642			√			√	√			√	√				√			√	√		√
PA33MW37A	9309A643			√			√	√			√	√				√			√	√		√
PA33MW37A	9309A644			√			√	√			√	√				√			√	√		√
PA33SS52	9310J393						√	√		√	√	√				√			√	√		√
PA33SS57	9310J394						√	√		√	√	√				√			√	√		√
PA45TA08	9322P222		√				√			√	√	√				√			√	√	√	√
PA50B015	9330H504			√	√		√			√	√	√				√	√		√	√	√	√
PA50TA11	9327P231			√	√		√			√	√	√				√	√		√	√	√	√

TABLE 4.9-4 (Continued)

SUMMARY OF SOIL ANALYTICAL TESTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

CHROM	CHROMIUM VI
CYAN	Cyanide
DIOXIN	Dioxins and Furans
O&G	Total oil and grease
PAH	Polynuclear aromatic hydrocarbons
PCTMST	Percent moisture
PEST	Pesticides/polychlorinated biphenyls
PHYS	Physical characteristic
SALIN	Salinity
SVOC	Semivolatile organic compounds
SOLIDS	Total dissolved solids
TOC	Total organic carbon
TMICROB	Coliform
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
VOC	Volatile organic compounds

TABLE 4.9-5

STATISTICAL SUMMARY OF SOIL ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Residential PRG Value	Above[e] Res PRG	Industrial PRG Value	Above[f] Ind PRG	HPAL Value	Above[g] HPAL
METAL	ALUMINUM	793	43,500	20,800	MG/KG	4.0	63	63	76,700	0	100,000	0		
	ANTIMONY	0.68	62.4	7.1	MG/KG	1.8	60	26	30.7	1	681	0	9.05	5
	ARSENIC	0.87	11.3	3.7	MG/KG	0.49	63	38	0.32	38	2.0	29	11.10	1
	BARIUM	5.6	724	129	MG/KG	0.51	63	62	5,340	0	100,000	0	314.36	1
	BERYLLIUM	0.11	0.73	0.36	MG/KG	0.12	63	30	0.14	29	1.1	0	0.71	1
	CADMIUM	0.12	5.3	1.3	MG/KG	0.12	63	18	9.0	0	852	0	3.14	3
	CALCIUM	324	136,000	17,900	MG/KG	11.2	63	61						
	CHROMIUM	5.9	1,350	218	MG/KG	0.33	63	63	211	22	1,580	0	h	6
	COBALT	1.8	134	35.0	MG/KG	0.37	63	56					h	2
	COPPER	4.0	3,630	135	MG/KG	0.26	63	63	2,850	1	63,300	0	124.31	7
	IRON	4,680	58,700	34,100	MG/KG	3.2	63	63						
	LEAD	0.34	559	45.1	MG/KG	0.36	63	62	130	7	1,000	0	8.99	21
	MAGNESIUM	536	205,000	43,200	MG/KG	12.1	63	63						
	MANGANESE	29.3	4,450	873	MG/KG	0.14	63	63	382	50	8,300	0	1431.18	5
	MERCURY	0.05	5.5	0.36	MG/KG	0.05	63	29	23.0	0	511	0	2.28	1
	MOLYBDENUM	0.32	2.3	1.3	MG/KG	0.52	63	8	383	0	8,520	0	2.68	0
	NICKEL	6.0	2,550	357	MG/KG	1.7	63	63	150	31	34,100	0	h	0
	POTASSIUM	57.3	2,400	837	MG/KG	64.3	63	61						
	SELENIUM	0.77	1.3	0.99	MG/KG	0.80	63	4	383	0	8,520	0	1.95	0
	SILVER	0.44	0.78	0.58	MG/KG	0.46	63	8	383	0	8,520	0	1.43	0
	SODIUM	152	4,650	1,040	MG/KG	23.4	63	43						
	THALLIUM	3.4	4.6	4.1	MG/KG	0.43	63	3					0.81	3

TABLE 4.9-5 (Continued)

STATISTICAL SUMMARY OF SOIL ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Residential PRG Value	Above[e] Res PRG	Industrial PRG Value	Above[f] Ind PRG	HPAL Value	Above[g] HPAL
	VANADIUM	3.1	176	75.5	MG/KG	0.41	63	63	537	0	11,900	0	117.17	10
	ZINC	21.5	2,530	221	MG/KG	0.42	63	63	23,000	0	100,000	0	109.86	11
VOC	2-BUTANONE	14	110	62	UG/KG	11	57	2	8,700,000	0	34,000,000	0		
	4-METHYL-2-PENTANONE	16	21	18	UG/KG	12	57	2	5,200,000	0	55,000,000	0		
	ACETONE	14	140	64	UG/KG	12	59	5	2,000,000	0	8,400,000	0		
	BENZENE	0.7	0.7	0.7	UG/KG	0.6	57	1	1,400	0	3,200	0		
	CARBON DISULFIDE	3	29	15	UG/KG	11	57	5	16,000	0	52,000	0		
	ETHYLBENZENE	1	1	1	UG/KG	0.6	57	1	2,900,000	0	3,100,000	0		
	METHYLENE CHLORIDE	2	2	2	UG/KG	10	57	1	11,000	0	25,000	0		
	TRICHLOROETHENE	2	36	19	UG/KG	11	57	2	7,100	0	17,000	0		
	XYLENE (TOTAL)	18	18	18	UG/KG	11	57	1	980,000	0	980,000	0		
SVOC	2,4-DIMETHYLPHENOL	130	130	130	UG/KG	390	63	1	1,300,000	0	14,000,000	0		
	2-METHYLPHENOL	330	330	330	UG/KG	390	63	1	3,300,000	0	34,000,000	0		
	4-METHYLPHENOL	870	870	870	UG/KG	390	63	1	330,000	0	3,400,000	0		
	BENZO(A)ANTHRACENE	100	810	370	UG/KG	350	63	3	610	1	2,600	0		
	BENZO(A)PYRENE	95	190	140	UG/KG	370	62	3	61	3	260	0		
	BENZO(B)FLUORANTHENE	190	1,000	500	UG/KG	350	62	3	610	1	2,600	0		
	BENZO(G,H,I)PERYLENE	92	120	110	UG/KG	340	62	2	800,000	0	800,000	0		
	BENZO(K)FLUORANTHENE	100	100	100	UG/KG	330	62	1	610	0	26,000	0		
	CHRYSENE	110	950	410	UG/KG	380	63	4	6,100	0	24,000	0		
	FLUORANTHENE	140	1,700	590	UG/KG	380	63	4	2,600,000	0	27,000,000	0		
	INDENO(1,2,3-CD)PYRENE	77	110	94	UG/KG	340	62	2	610	0	2,600	0		

TABLE 4.9-5 (Continued)

STATISTICAL SUMMARY OF SOIL ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection Frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Residential PRG Value	Above[e] Res PRG	Industrial PRG Value	Above[f] Ind PRG	HPAL Value	Above[g] HPAL
	PHENANTHRENE	39	1,100	340	UG/KG	380	63	4	800,000	0	800,000	0		
	PHENOL	130	1,400	760	UG/KG	380	63	4	39,000,000	0	100,000,00	0		
	PYRENE	210	2,000	700	UG/KG	380	63	4	2,000,000	0	20,000,000	0		
PEST	4,4'-DDD	4	4	4	UG/KG	3	58	1	1,900	0	7,900	0		
	4,4'-DDT	5	8	6	UG/KG	3	58	2	1,300	0	5,600	0		
	DELTA-BHC	2	2	2	UG/KG	2	58	1	250	0	1,100	0		
	ENDRIN KETONE	4	4	4	UG/KG	3	58	1	20,000	0	200,000	0		
	AROCLOR-1254	680	680	680	UG/KG	38	58	1	1,400	0	19,000	0		
	AROCLOR-1260	22	79	55	UG/KG	34	58	3	66	1	340	0		
TPHEXT	TPH-DIESEL	7	1,500	150	MG/KG	34	63	15	1,000	1i				
	TPH-EXTRACTABLE UNKNOWN HYDRO.	20	22	21	MG/KG	7	9	2	1,000	0i				
	TPH-MOTOR OIL	11	1,300	190	MG/KG	17	36	15	1,000	1i				
TRPH	TRPH	10	400	98	MG/KG	14	34	18	1,000	0i				
O&G	TOTAL OIL & GREASE	40	12,000	1,200	MG/KG	39	25	24	1,000	4i				

TABLE 4.9-5 (Continued)

STATISTICAL SUMMARY OF SOIL ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

CYAN	Cyanide
EPA	U.S. Environmental Protection Agency
HPAL	Hunters Point ambient level
MG/KG	Milligram per kilogram
O&G	Total oil and grease
PCTMST	Percent moisture
PEST	Pesticide/polychlorinated biphenyl
PHYS	Physical characteristic
PRG	Preliminary remediation goal
SALIN	Salinity
SVOC	Semivolatile organic compound
TMICROB	Coliform
TOC	Total organic carbon
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
UG/KG	Microgram per kilogram
VOC	Volatile organic compound

a Organic results of less than 10 are reported to one significant figure, and results of greater than or equal to 10 are reported to two significant figures. Inorganic results of less than 10 are reported to two significant figures, and results of greater than or equal to 10 are reported to three significant figures. Values that are not nondetects are compared to screening criteria before the significant figure rule is applied. Both the value and the screening criteria are then rounded for reporting purposes.

b Blank boxes indicate that screening critera have not been established for these analytes.

c Total number of samples analyzed

d Total number of samples showing concentrations greater than detection limit

e Total number of samples showing concentrations greater than residential PRG

f Total number of samples showing concentrations greater than industrial PRG

California-modified PRGs were used for the following analytes: 1,2-Dibromo-3-chloropropane, benzo[a]pyrene, benzo[k]fluoranthene, cadmium, chromium VI, chrysene, lead, nickel, and tetrachloroethylene (PCE).

For the analytes listed below, Region IX PRGs are not available; therefore, PRGs for similar chemicals were used as follows:

Analyte:	Similar Analyte:
2-Methylnapthalene	Naphthalene
Acenaphthylene	Acenaphthene
Alpha-chlordane	Chlordane
Aroclor-1260	Polychlorinated biphenyls
Benzo(g,h,i)perylene	Naphthalene
Delta BHC	HCH-technical
Endosulfan I	Endosulfan
Endosulfan sulfate	Endosulfan
Endrin aldehyde	Endrin
Endrin ketone	Endrin
Gamma-chlordane	Chlordane
Phenanthrene	Naphthalene

g Total number of samples showing concentrations greater than HPAL

h HPALs for chromium, cobalt, and nickel are based on the concentration of magnesium in each sample; thus, no single value applies to all samples. The range of HPAL values for chromium, cobalt, and nickel are 25.745 to 1550.829, 6.896 to 150.154, and 14.628 to 4115.240 mg/kg respectively.

i Total number of samples showing concentrations greater than TPH, TRPH, or O&G screening level, not PRG value

j Most probable number of organisms per 100 grams (mpn/100 g)

TABLE 4.9-6

SOIL ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B067	IR33B067	IR33B067	IR33B092	IR33B092	IR33B094	IR33B094
Sampling Depth (feet bgs)	6.25	11.25	16.25	1.25	4.50	1.25	6.75
Sample Number	9420R130	9420R131	9420R133	9606J855	9606J856	9545J590	9545J591
Sample Date	05/16/94	05/16/94	05/16/94	02/07/96	02/07/96	11/07/95	11/07/95
Metal (mg/kg)							
ALUMINUM	28,600	36,700	20,400	1,090	892	17,300	23,300
ANTIMONY	ND (2.3)	ND (2.2)	ND (2.0)	3.1	2.7	1.6	1.2
ARSENIC	ND (1.0)	ND (1.5)	4.8 *#	2.5 *#	2.5 *#	2.5 *#	11.3 *#α
BARIUM	149	111	97.9	13.1	10.9	178	183
BERYLLIUM	0.11	0.19 *	0.23 *	ND (0.02)	ND (0.04)	ND (0.02)	ND (0.06)
CADMIUM	ND (0.06)	0.30	ND (0.10)	2.2	1.1	ND (0.04)	ND (0.05)
CALCIUM	21,400	23,700	17,000	1,630	864	9,430	11,700
CHROMIUM	122	126	123	95.0 α	57.4 α	350 *	89.0
COBALT	32.2	33.6	22.7	5.1	1.9	36.0	29.1
COPPER	64.4	60.8	33.7	144 α	136 α	32.8	80.3
IRON	42,800	47,700	33,400	7,120	8,800	28,400	34,500
LEAD	1.3	1.4	10.0 α	451 *α	325 *α	17.8 α	12.6 α
MAGNESIUM	21,100	18,100	26,100	932	536	51,100	28,200
MANGANESE	1,210 *	1,100 *	597 *	65.9	55.3	850 *	2,940 *α
MERCURY	ND (0.08)	ND (0.03)	0.22	0.38	0.15	ND (0.06)	ND (0.12)
MOLYBDENUM	ND (0.13)	ND (0.11)	0.32	ND (0.70)	0.85	ND (0.27)	ND (0.28)
NICKEL	74.3	52.1	160 *	9.1	6.4	510 *	164 *
POTASSIUM	446	717	1,610	252	230	1,030	2,400
SELENIUM	ND (0.32)	ND (0.26)	ND (0.41)	ND (0.49)	ND (0.46)	ND (0.86)	ND (0.91)
SILVER	ND (0.13)	ND (0.11)	ND (0.17)	ND (0.11)	ND (0.10)	ND (0.15)	ND (0.16)
SODIUM	359	1,850	2,700	ND (304)	ND (140)	1,110	ND (28.9)
THALLIUM	ND (0.21)	ND (0.12)	ND (0.18)	ND (0.40)	ND (0.38)	ND (0.42)	ND (2.8)
VANADIUM	118 α	148 α	72.1	3.9	3.1	56.5	72.0
ZINC	62.3	57.2	59.5	2,530 α	1,200 α	64.6	90.7
Volatile Organic Compound (ug/kg)							
2-BUTANONE	ND (11)	ND (12)	110	NA	NA	ND (11)	ND (12)
4-METHYL-2-PENTANONE	ND (11)	ND (12)	ND (13)	NA	NA	ND (11)	ND (12)
ACETONE	ND (11)	ND (9)	ND (12)	ND (10)	ND (24)	ND (11)	ND (12)
BENZENE	ND (11)	ND (12)	ND (13)	NA	NA	ND (11)	ND (12)
CARBON DISULFIDE	ND (11)	ND (12)	3	NA	NA	ND (11)	ND (12)
ETHYLBENZENE	ND (11)	ND (12)	ND (13)	NA	NA	ND (11)	ND (12)
METHYLENE CHLORIDE	ND (11)	ND (12)	ND (13)	NA	NA	ND (11)	ND (12)
TRICHLOROETHENE	ND (11)	ND (12)	ND (13)	NA	NA	ND (11)	ND (12)
XYLENE (TOTAL)	ND (11)	ND (12)	ND (13)	NA	NA	ND (11)	ND (12)

TABLE 4.9-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B067	IR33B067	IR33B067	IR33B092	IR33B092	IR33B094	IR33B094
Sampling Depth (feet bgs)	6.25	11.25	16.25	1.25	4.50	1.25	6.75
Sample Number	9420R130	9420R131	9420R133	9606J855	9606J856	9545J590	9545J591
Sample Date	05/16/94	05/16/94	05/16/94	02/07/96	02/07/96	11/07/95	11/07/95
Semivolatile Organic Compound (ug/kg)							
2,4-DIMETHYLPHENOL	ND (380)	ND (380)	ND (410)	ND (350)	ND (330)	ND (370)	ND (380)
2-METHYLPHENOL	ND (380)	ND (380)	ND (410)	ND (350)	ND (330)	ND (370)	ND (380)
4-METHYLPHENOL	ND (380)	ND (380)	ND (410)	ND (350)	ND (330)	ND (370)	ND (380)
BENZO(A)ANTHRACENE	ND (380)	ND (380)	ND (410)	100	200	ND (370)	ND (380)
BENZO(A)PYRENE	ND (380)	ND (380)	ND (410)	130 *	190 *	NA	ND (380)
BENZO(B)FLUORANTHENE	ND (380)	ND (380)	ND (410)	190	320	NA	ND (380)
BENZO(G,H,I)PERYLENE	ND (380)	ND (380)	ND (410)	92	120	NA	ND (380)
BENZO(K)FLUORANTHENE	ND (380)	ND (380)	ND (410)	ND (350)	100	NA	ND (380)
CHRYSENE	ND (380)	ND (380)	ND (410)	240	350	ND (370)	ND (380)
FLUORANTHENE	ND (380)	ND (380)	ND (410)	200	330	ND (370)	ND (380)
INDENO(1,2,3-CD)PYRENE	ND (380)	ND (380)	ND (410)	77	110	NA	ND (380)
PHENANTHRENE	ND (380)	ND (380)	ND (410)	ND (350)	120	ND (370)	ND (380)
PHENOL	ND (380)	ND (380)	ND (410)	ND (350)	ND (330)	ND (370)	ND (380)
PYRENE	ND (380)	ND (380)	ND (410)	220	380	ND (370)	ND (380)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
4,4'-DDD	ND (4)	ND (4)	ND (4)	ND (4)	4	ND (4)	ND (4)
4,4'-DDT	ND (4)	ND (4)	ND (4)	8	5	ND (4)	ND (4)
DELTA-BHC	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
ENDRIN KETONE	ND (4)	ND (4)	ND (4)	ND (4)	4	ND (4)	ND (4)
AROCLOR-1254	ND (38)	ND (38)	ND (41)	ND (35)	ND (34)	ND (37)	ND (39)
AROCLOR-1260	ND (38)	ND (38)	ND (41)	79 *	63	ND (37)	ND (39)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (12)	ND (12)	ND (13)	36	73	ND (11)	ND (12)
TPH-EXTRACTABLE UNKNOWN HYDROCARBON	NA	NA	NA	NA	NA	NA	NA
TPH-MOTOR OIL	ND (120)	ND (120)	ND (130)	78	91	57	ND (12)
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	85	30	93	55	100	310	ND (12)
Oil and Grease (mg/kg)							
TOTAL OIL & GREASE	NA	NA	NA	NA	NA	NA	NA

TABLE 4.9-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B067	IR33B067	IR33B067	IR33B092	IR33B092	IR33B094	IR33B094
Sampling Depth (feet bgs)	6.25	11.25	16.25	1.25	4.50	1.25	6.75
Sample Number	9420R130	9420R131	9420R133	9606J855	9606J856	9545J590	9545J591
Sample Date	05/16/94	05/16/94	05/16/94	02/07/96	02/07/96	11/07/95	11/07/95
Percent Moisture (%)							
% SOLIDS	87.4	87.2	79.7	94.5	99.1	90.5	85.6
pH (pH units)							
PH	7.4	7.4	8.3	11.1	9.3	9.6	8.3

TABLE 4.9-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B094	IR33B094	IR33B094	IR33B095	IR33B095	IR33B095	IR33B096
Sampling Depth (feet bgs)	9.75	17.75	25.75	1.60	5.50	10.75	1.75
Sample Number	9545J592	9545J595	9545J596	9607J869	9607J870	9607J871	9607J866
Sample Date	11/07/95	11/07/95	11/07/95	02/13/96	02/13/96	02/13/96	02/13/96
Metal (mg/kg)							
ALUMINUM	25,500	12,200	21,900	23,400	18,500	16,900	847
ANTIMONY	1.8	ND (0.72)	1.2	1.1	1.6	0.68	10.0 α
ARSENIC	5.7 *#	3.0 *#	7.5 *#	ND (0.68)	ND (1.4)	ND (0.33)	5.3 *#
BARIUM	86.3	101	77.3	106	146	85.8	ND (1.2)
BERYLLIUM	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.03)
CADMIUM	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.04)	ND (0.05)	ND (0.05)	5.3 α
CALCIUM	6,210	2,640	7,270	14,500	5,420	9,350	1,060
CHROMIUM	214 *	139	170	91.1	408 *	85.0	145 α
COBALT	29.3	15.9	25.6	37.8	50.7	27.3	3.0
COPPER	33.7	13.5	37.5	65.8	36.9	53.3	3,630 *α
IRON	33,800	24,000	31,500	38,000	31,800	28,900	7,430
LEAD	8.2	5.2	9.5 α	2.8	8.4	2.4	559 *α
MAGNESIUM	47,400	7,260	45,400	18,800	85,400	15,700	886
MANGANESE	714 *	274	598 *	1,080 *	837 *	736 *	104
MERCURY	ND (0.06)	ND (0.06)	ND (0.10)	ND (0.08)	ND (0.13)	0.45	ND (0.27)
MOLYBDENUM	ND (0.29)	ND (0.29)	2.2	ND (0.13)	ND (0.15)	ND (0.14)	1.2
NICKEL	393 *	145	315 *	46.4	803 *	45.9	20.2
POTASSIUM	1,190	549	1,390	807	816	420	185
SELENIUM	ND (0.94)	0.97	ND (0.94)	ND (0.52)	ND (0.57)	ND (0.54)	ND (0.49)
SILVER	ND (0.17)	ND (0.17)	ND (0.17)	ND (0.11)	ND (0.12)	ND (0.12)	ND (0.31)
SODIUM	ND (34.7)	257	ND (29.9)	ND (92.8)	208	228	220
THALLIUM	ND (0.46)	ND (0.46)	ND (0.46)	ND (0.43)	ND (0.47)	ND (0.45)	ND (0.80)
VANADIUM	69.0	77.7	50.8	112	53.7	77.0	5.1
ZINC	74.6	34.5	72.3	63.5	56.7	53.0	2,330 α
Volatile Organic Compound (ug/kg)							
2-BUTANONE	ND (12)	ND (12)	ND (12)	ND (11)	ND (12)	ND (12)	ND (11)
4-METHYL-2-PENTANONE	ND (12)	ND (12)	ND (12)	ND (11)	ND (12)	ND (12)	ND (11)
ACETONE	ND (48)	65	ND (12)	ND (43)	ND (40)	ND (17)	ND (17)
BENZENE	ND (12)	ND (12)	ND (12)	ND (11)	ND (12)	ND (12)	ND (11)
CARBON DISULFIDE	ND (12)	ND (12)	ND (12)	ND (11)	ND (12)	ND (12)	ND (11)
ETHYLBENZENE	ND (12)	ND (12)	ND (12)	ND (11)	ND (12)	ND (12)	ND (11)
METHYLENE CHLORIDE	ND (12)	ND (12)	ND (12)	ND (11)	ND (12)	ND (12)	ND (11)
TRICHLOROETHENE	ND (12)	ND (12)	ND (12)	ND (11)	ND (12)	ND (12)	ND (11)
XYLENE (TOTAL)	ND (12)	ND (12)	ND (12)	ND (11)	ND (12)	ND (12)	ND (11)

TABLE 4.9-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B094	IR33B094	IR33B094	IR33B095	IR33B095	IR33B095	IR33B096
Sampling Depth (feet bgs)	9.75	17.75	25.75	1.60	5.50	10.75	1.75
Sample Number	9545J592	9545J595	9545J596	9607J869	9607J870	9607J871	9607J866
Sample Date	11/07/95	11/07/95	11/07/95	02/13/96	02/13/96	02/13/96	02/13/96
Semivolatile Organic Compound (ug/kg)							
2,4-DIMETHYLPHENOL	ND (400)	ND (400)	ND (400)	ND (370)	ND (410)	ND (390)	ND (11,000)
2-METHYLPHENOL	ND (400)	ND (400)	ND (400)	ND (370)	ND (410)	ND (390)	ND (11,000)
4-METHYLPHENOL	ND (400)	ND (400)	ND (400)	ND (370)	ND (410)	ND (390)	ND (11,000)
BENZO(A)ANTHRACENE	ND (400)	ND (400)	ND (400)	ND (370)	ND (410)	ND (390)	ND (11,000)
BENZO(A)PYRENE	ND (400)	ND (400)	ND (400)	ND (370)	ND (410)	ND (390)	ND (11,000)
BENZO(B)FLUORANTHENE	ND (400)	ND (400)	ND (400)	ND (370)	ND (410)	ND (390)	ND (11,000)
BENZO(G,H,I)PERYLENE	ND (400)	ND (400)	ND (400)	ND (370)	ND (410)	ND (390)	ND (11,000)
BENZO(K)FLUORANTHENE	ND (400)	ND (400)	ND (400)	ND (370)	ND (410)	ND (390)	ND (11,000)
CHRYSENE	ND (400)	ND (400)	ND (400)	ND (370)	ND (410)	ND (390)	ND (11,000)
FLUORANTHENE	ND (400)	ND (400)	ND (400)	ND (370)	ND (410)	ND (390)	ND (11,000)
INDENO(1,2,3-CD)PYRENE	ND (400)	ND (400)	ND (400)	ND (370)	ND (410)	ND (390)	ND (11,000)
PHENANTHRENE	ND (400)	ND (400)	ND (400)	ND (370)	ND (410)	ND (390)	ND (11,000)
PHENOL	ND (400)	ND (400)	ND (400)	ND (370)	ND (410)	ND (390)	ND (11,000)
PYRENE	ND (400)	ND (400)	ND (400)	ND (370)	ND (410)	ND (390)	ND (11,000)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
4,4'-DDD	ND (4)	ND (4)	ND (4)	ND (4)	NA	ND (4)	NA
4,4'-DDT	ND (4)	ND (4)	ND (4)	ND (4)	NA	ND (4)	NA
DELTA-BHC	ND (2)	ND (2)	ND (2)	ND (2)	NA	ND (2)	NA
ENDRIN KETONE	ND (4)	ND (4)	ND (4)	ND (4)	NA	ND (4)	NA
AROCLOR-1254	ND (40)	ND (40)	ND (40)	ND (37)	NA	ND (39)	NA
AROCLOR-1260	ND (40)	ND (40)	ND (40)	ND (37)	NA	ND (39)	NA
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (12)	ND (12)	ND (12)	130	ND (12)	ND (12)	230
TPH-EXTRACTABLE UNKNOWN HYDROCARBON	NA	NA	NA	NA	NA	NA	NA
TPH-MOTOR OIL	ND (12)	ND (12)	ND (12)	240	11	ND (12)	1,300
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	ND (12)	ND (12)	ND (12)	400	ND (12)	ND (12)	NA
Oil and Grease (mg/kg)							
TOTAL OIL & GREASE	NA	NA	NA	NA	NA	NA	NA

TABLE 4.9-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B094	IR33B094	IR33B094	IR33B095	IR33B095	IR33B095	IR33B096
Sampling Depth (feet bgs)	9.75	17.75	25.75	1.60	5.50	10.75	1.75
Sample Number	9545J592	9545J595	9545J596	9607J869	9607J870	9607J871	9607J866
Sample Date	11/07/95	11/07/95	11/07/95	02/13/96	02/13/96	02/13/96	02/13/96
Percent Moisture (%)							
% SOLIDS	83.1	83.4	82.7	89.2	81.0	85.3	94.3
pH (pH units)							
PH	8.1	8.3	8.1	8.6	9.6	8.2	8.4

TABLE 4.9-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B096	IR33B096	IR33B100	IR33B100	IR33B100	IR33B100	IR33B117
Sampling Depth (feet bgs)	6.50	10.50	6.25	11.25	15.75	21.25	0.75
Sample Number	9607J867	9607J868	9438A066	9438A067	9438A068	9438A069	9532G038
Sample Date	02/13/96	02/13/96	09/19/94	09/19/94	09/19/94	09/19/94	08/09/95
Metal (mg/kg)							
ALUMINUM	793	3,750	22,300	2,250	11,600	10,100	21,200
ANTIMONY	62.4 *α	14.8 α	ND (1.9)	ND (3.4)	ND (0.48)	ND (0.41)	ND (0.99)
ARSENIC	2.4 *#	2.0 *	ND (1.8)	ND (0.36)	6.3 *#	5.5 *#	1.2 *
BARIUM	12.7	13.6	150	204	32.2	32.6	148
BERYLLIUM	ND (0.04)	ND (0.02)	0.39 *	ND (0.04)	ND (0.30)	ND (0.28)	ND (0.02)
CADMIUM	4.0 α	3.3 α	0.41	0.97	0.29	0.32	ND (0.04)
CALCIUM	525	4,390	24,700	ND (624)	136,000	56,400	16,800
CHROMIUM	143 α	58.8	278 *	706 *	41.3	48.6	64.2
COBALT	1.8	4.3	33.3	90.8	8.0	8.8	29.4
COPPER	162 α	739 α	645 α	6.0	16.1	12.3	48.9
IRON	4,680	8,410	36,200	33,600	15,700	19,800	31,500
LEAD	191 *α	206 *α	16.1 α	2.2	8.7	4.7	5.4
MAGNESIUM	758	3,840	52,300	194,000	6,530	6,650	14,300
MANGANESE	29.3	119	809 *	989 *	235	232	855 *
MERCURY	0.31	ND (0.16)	0.43	0.08	0.12	ND (0.06)	ND (0.05)
MOLYBDENUM	ND (0.91)	ND (0.88)	ND (0.09)	ND (0.10)	ND (0.24)	ND (0.80)	ND (0.19)
NICKEL	19.5	20.8	447 *	1,870 *	38.4	43.9	45.4
POTASSIUM	187	325	1,180	ND (92.9)	2,360	2,080	1,110
SELENIUM	ND (0.52)	ND (0.52)	ND (0.53)	ND (0.56)	ND (0.61)	ND (0.59)	ND (0.70)
SILVER	ND (0.11)	ND (0.11)	ND (0.14)	ND (0.15)	ND (0.16)	ND (0.15)	ND (0.12)
SODIUM	197	259	ND (664)	ND (244)	4,650	ND (3,590)	ND (26.5)
THALLIUM	ND (0.62)	ND (0.93)	ND (0.46)	ND (0.49)	ND (0.53)	ND (0.51)	4.6 α
VANADIUM	3.4	9.7	70.3	20.0	35.6	38.5	98.3
ZINC	1,580 α	1,060 α	125 α	32.3	39.7	33.4	67.6
Volatile Organic Compound (ug/kg)							
2-BUTANONE	ND (11)	ND (11)	ND (11)	ND (7)	ND (7)	ND (13)	NA
4-METHYL-2-PENTANONE	ND (11)	ND (11)	ND (11)	ND (12)	ND (13)	ND (13)	NA
ACETONE	ND (11)	63	ND (62)	ND (50)	ND (51)	ND (45)	NA
BENZENE	ND (11)	ND (11)	ND (11)	ND (12)	ND (13)	ND (13)	NA
CARBON DISULFIDE	ND (11)	ND (11)	ND (11)	ND (12)	11	21	NA
ETHYLBENZENE	ND (11)	ND (11)	ND (11)	ND (12)	ND (13)	ND (13)	NA
METHYLENE CHLORIDE	ND (11)	ND (11)	ND (9)	ND (6)	ND (10)	ND (15)	NA
TRICHLOROETHENE	ND (11)	ND (11)	ND (11)	ND (12)	ND (13)	ND (13)	NA
XYLENE (TOTAL)	ND (11)	ND (11)	ND (11)	ND (12)	ND (13)	ND (13)	NA

TABLE 4.9-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B096	IR33B096	IR33B100	IR33B100	IR33B100	IR33B100	IR33B117
Sampling Depth (feet bgs)	6.50	10.50	6.25	11.25	15.75	21.25	0.75
Sample Number	9607J867	9607J868	9438A066	9438A067	9438A068	9438A069	9532G038
Sample Date	02/13/96	02/13/96	09/19/94	09/19/94	09/19/94	09/19/94	08/09/95
Semivolatile Organic Compound (ug/kg)							
2,4-DIMETHYLPHENOL	ND (380)	ND (1,900)	ND (380)	ND (410)	ND (440)	ND (430)	ND (340)
2-METHYLPHENOL	ND (380)	ND (1,900)	ND (380)	ND (410)	ND (440)	ND (430)	ND (340)
4-METHYLPHENOL	ND (380)	ND (1,900)	ND (380)	ND (410)	ND (440)	ND (430)	ND (340)
BENZO(A)ANTHRACENE	810 *	ND (1,900)	ND (380)	ND (410)	ND (440)	ND (430)	ND (340)
BENZO(A)PYRENE	ND (380)	ND (1,900)	ND (380)	ND (410)	ND (440)	ND (430)	ND (340)
BENZO(B)FLUORANTHENE	1,000 *	ND (1,900)	ND (380)	ND (410)	ND (440)	ND (430)	ND (340)
BENZO(G,H,I)PERYLENE	ND (380)	ND (1,900)	ND (380)	ND (410)	ND (440)	ND (430)	ND (340)
BENZO(K)FLUORANTHENE	ND (380)	ND (1,900)	ND (380)	ND (410)	ND (440)	ND (430)	ND (340)
CHRYSENE	950	ND (1,900)	ND (380)	ND (410)	ND (440)	ND (430)	ND (340)
FLUORANTHENE	1,700	ND (1,900)	ND (380)	ND (410)	ND (440)	ND (430)	ND (340)
INDENO(1,2,3-CD)PYRENE	ND (380)	ND (1,900)	ND (380)	ND (410)	ND (440)	ND (430)	ND (340)
PHENANTHRENE	1,100	ND (1,900)	ND (380)	ND (410)	ND (440)	ND (430)	ND (340)
PHENOL	1,200	1,400	ND (380)	ND (410)	ND (440)	ND (430)	ND (340)
PYRENE	2,000	ND (1,900)	ND (380)	ND (410)	ND (440)	ND (430)	ND (340)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
4,4'-DDD	NA	NA	ND (4)	ND (4)	ND (4)	ND (4)	ND (3)
4,4'-DDT	NA	NA	ND (4)	ND (4)	ND (4)	ND (4)	ND (3)
DELTA-BHC	NA	NA	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
ENDRIN KETONE	NA	NA	ND (4)	ND (4)	ND (4)	ND (4)	ND (3)
AROCLOR-1254	NA	NA	ND (38)	ND (41)	ND (44)	ND (43)	ND (34)
AROCLOR-1260	NA	NA	ND (38)	ND (41)	ND (44)	ND (43)	22
TPH-Extractable (mg/kg)							
TPH-DIESEL	7	28	ND (29)	ND (12)	ND (13)	ND (13)	ND (10)
TPH-EXTRACTABLE UNKNOWN HYDROCARBON	NA	NA	NA	NA	NA	NA	NA
TPH-MOTOR OIL	21	88	520	15	ND (13)	ND (13)	78
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	300	NA	46	ND (7)	ND (4)	ND (4)	21
Oil and Grease (mg/kg)							
TOTAL OIL & GREASE	NA	NA	NA	NA	NA	NA	NA

TABLE 4.9-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B096	IR33B096	IR33B100	IR33B100	IR33B100	IR33B100	IR33B117
Sampling Depth (feet bgs)	6.50	10.50	6.25	11.25	15.75	21.25	0.75
Sample Number	9607J867	9607J868	9438A066	9438A067	9438A068	9438A069	9532G038
Sample Date	02/13/96	02/13/96	09/19/94	09/19/94	09/19/94	09/19/94	08/09/95
Percent Moisture (%)							
% SOLIDS	87.7	88.1	86.8	82.3	75.6	78.1	96.6
pH (pH units)							
PH	8.4	11.4	9.3	7.8	8.7	8.5	8.4

TABLE 4.9-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B117	IR33B117	IR33B118	IR33B118	IR33B118	IR33B118	IR33B118
Sampling Depth (feet bgs)	4.25	9.25	0.50	5.75	10.75	15.25	20.75
Sample Number	9532G040	9532G041	9543W088	9543W089	9543W090	9543W091	9543W092
Sample Date	08/09/95	08/09/95	10/26/95	10/26/95	10/26/95	10/26/95	10/26/95
Metal (mg/kg)							
ALUMINUM	21,700	36,300	23,600	2,800	1,960	9,430	7,210
ANTIMONY	ND (1.2)	ND (2.3)	2.2	1.8	2.2	NA	NA
ARSENIC	ND (0.58)	ND (0.63)	3.5 *#	ND (0.64)	ND (0.69)	5.7 *#	1.2 *
BARIUM	97.1	124	171	10.5	5.6	28.1	32.4
BERYLLIUM	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.03)	ND (0.03)
CADMIUM	ND (0.04)	ND (0.04)	ND (0.04)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
CALCIUM	15,400	26,800	7,810	707	324	88,100	2,300
CHROMIUM	59.0	106	395 *	451 *	566 *	70.5	49.2
COBALT	42.5	41.7	52.9	68.2	89.8	12.2	8.1
COPPER	77.4	79.7	40.7	4.0	4.0	20.1	7.3
IRON	29,400	45,200	39,900	27,600	34,700	16,400	12,500
LEAD	ND (1.6)	2.7	8.1	3.1	5.0	11.0 α	1.9
MAGNESIUM	18,600	25,400	78,500	205,000	205,000	9,640	3,350
MANGANESE	928 *	990 *	1,050 *	490 *	636 *	173	99.1
MERCURY	ND (0.05)	ND (0.06)	0.11	ND (0.04)	ND (0.03)	0.11	ND (0.01)
MOLYBDENUM	ND (0.19)	ND (0.20)	ND (0.27)	ND (0.27)	ND (0.30)	ND (0.33)	ND (0.31)
NICKEL	41.0	51.4	816 *	1,380 *	1,860 *	69.7	64.5
POTASSIUM	1,440	1,920	1,370	57.3	90.5	1,920	1,330
SELENIUM	ND (0.71)	ND (0.76)	ND (0.87)	ND (0.89)	ND (0.97)	ND (1.1)	ND (1.0)
SILVER	ND (0.12)	ND (0.13)	ND (0.16)	ND (0.16)	ND (0.17)	ND (0.19)	ND (0.18)
SODIUM	ND (26.6)	4,060	ND (27.5)	ND (88.2)	ND (108)	2,060	1,550
THALLIUM	3.4 α	4.4 α	ND (0.42)	ND (0.43)	ND (0.47)	ND (0.52)	ND (0.49)
VANADIUM	77.5	136 α	71.3	14.0	16.1	41.4	38.7
ZINC	82.6	87.7	70.4	27.5	33.6	40.7	57.1
Volatile Organic Compound (ug/kg)							
2-BUTANONE	NA	NA	NA	ND (11)	ND (12)	ND (14)	ND (13)
4-METHYL-2-PENTANONE	NA	NA	NA	ND (11)	ND (12)	ND (14)	ND (13)
ACETONE	NA	NA	NA	ND (11)	ND (12)	ND (30)	ND (16)
BENZENE	NA	NA	NA	ND (11)	ND (12)	ND (14)	ND (13)
CARBON DISULFIDE	NA	NA	NA	ND (11)	ND (12)	ND (14)	ND (13)
ETHYLBENZENE	NA	NA	NA	ND (11)	ND (12)	ND (14)	ND (13)
METHYLENE CHLORIDE	NA	NA	NA	ND (11)	ND (12)	ND (14)	ND (13)
TRICHLOROETHENE	NA	NA	NA	ND (11)	ND (12)	ND (14)	ND (13)
XYLENE (TOTAL)	NA	NA	NA	ND (11)	ND (12)	ND (14)	ND (13)

TABLE 4.9-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B117	IR33B117	IR33B118	IR33B118	IR33B118	IR33B118	IR33B118
Sampling Depth (feet bgs)	4.25	9.25	0.50	5.75	10.75	15.25	20.75
Sample Number	9532G040	9532G041	9543W088	9543W089	9543W090	9543W091	9543W092
Sample Date	08/09/95	08/09/95	10/26/95	10/26/95	10/26/95	10/26/95	10/26/95
Semivolatile Organic Compound (ug/kg)							
2,4-DIMETHYLPHENOL	ND (350)	ND (370)	ND (370)	ND (380)	ND (410)	ND (440)	ND (420)
2-METHYLPHENOL	ND (350)	ND (370)	ND (370)	ND (380)	ND (410)	ND (440)	ND (420)
4-METHYLPHENOL	ND (350)	ND (370)	ND (370)	ND (380)	ND (410)	ND (440)	ND (420)
BENZO(A)ANTHRACENE	ND (350)	ND (370)	ND (370)	ND (380)	ND (410)	ND (440)	ND (420)
BENZO(A)PYRENE	ND (350)	ND (370)	ND (370)	ND (380)	ND (410)	95 *	ND (420)
BENZO(B)FLUORANTHENE	ND (350)	ND (370)	ND (370)	ND (380)	ND (410)	ND (440)	ND (420)
BENZO(G,H,I)PERYLENE	ND (350)	ND (370)	ND (370)	ND (380)	ND (410)	ND (440)	ND (420)
BENZO(K)FLUORANTHENE	ND (350)	ND (370)	ND (370)	ND (380)	ND (410)	ND (440)	ND (420)
CHRYSENE	ND (350)	ND (370)	ND (370)	ND (380)	ND (410)	110	ND (420)
FLUORANTHENE	ND (350)	ND (370)	ND (370)	ND (380)	ND (410)	140	ND (420)
INDENO(1,2,3-CD)PYRENE	ND (350)	ND (370)	ND (370)	ND (380)	ND (410)	ND (440)	ND (420)
PHENANTHRENE	ND (350)	ND (370)	ND (370)	ND (380)	ND (410)	110	ND (420)
PHENOL	ND (350)	290	ND (370)	ND (380)	ND (410)	ND (440)	ND (420)
PYRENE	ND (350)	ND (370)	ND (370)	ND (380)	ND (410)	210	ND (420)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
4,4'-DDD	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (5)	ND (4)
4,4'-DDT	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (5)	ND (4)
DELTA-BHC	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
ENDRIN KETONE	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (5)	ND (4)
AROCLOR-1254	ND (35)	ND (37)	ND (37)	ND (38)	ND (41)	ND (45)	ND (43)
AROCLOR-1260	ND (35)	ND (37)	ND (37)	ND (38)	ND (41)	ND (45)	ND (43)
TPH-Extractable (mg/kg)							
TPH-DIESEL	10	ND (32)	ND (28)	ND (11)	ND (12)	ND (14)	ND (13)
TPH-EXTRACTABLE UNKNOWN HYDROCARBON	NA	NA	NA	NA	NA	NA	NA
TPH-MOTOR OIL	ND (13)	ND (32)	150	ND (11)	ND (12)	16	ND (13)
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	NA	NA	18	ND (11)	ND (12)	ND (14)	ND (13)
Oil and Grease (mg/kg)							
TOTAL OIL & GREASE	NA	NA	NA	NA	NA	NA	NA

TABLE 4.9-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B117	IR33B117	IR33B118	IR33B118	IR33B118	IR33B118	IR33B118
Sampling Depth (feet bgs)	4.25	9.25	0.50	5.75	10.75	15.25	20.75
Sample Number	9532G040	9532G041	9543W088	9543W089	9543W090	9543W091	9543W092
Sample Date	08/09/95	08/09/95	10/26/95	10/26/95	10/26/95	10/26/95	10/26/95
Percent Moisture (%)							
% SOLIDS	96.1	89.0	90.4	87.7	80.7	73.5	77.9
pH (pH units)							
PH	8.3	8.0	8.7	8.5	8.2	9.1	9.0

TABLE 4.9-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR34B033	IR34B033	IR34B033	IR34B033	IR34B033	PA33B035	PA33B035
Sampling Depth (feet bgs)	2.25	6.25	11.25	16.25	21.25	2.25	6.75
Sample Number	9438A072	9438A073	9438A075	9438A076	9438A077	9308D074	9308D075
Sample Date	09/20/94	09/20/94	09/20/94	09/20/94	09/20/94	02/25/93	02/25/93
Metal (mg/kg)							
ALUMINUM	20,800	32,600	23,900	14,200	6,720	36,500	43,500
ANTIMONY	NA	ND (1.1)	ND (1.1)	ND (0.75)	ND (0.41)	7.8	6.6
ARSENIC	ND (0.31)	ND (0.89)	ND (0.35)	ND (1.6)	3.7 *#	1.1 *	ND (0.98)
BARIUM	25.9	164	140	74.9	21.2	156	115
BERYLLIUM	ND (0.12)	0.43 *	0.33 *	0.33 *	ND (0.17)	0.43 *	0.38 *
CADMIUM	0.15	0.35	0.15	0.12	0.22	ND (0.47)	ND (0.48)
CALCIUM	14,900	26,800	17,600	ND (5,910)	72,800	22,900	27,800
CHROMIUM	5.9	115	86.6	88.3	42.7	163	139
COBALT	12.3	41.9	35.9	17.8	6.8	45.6	48.0
COPPER	85.0	76.8	63.0	16.1	7.1	68.6	79.5
IRON	22,900	53,600	40,300	26,800	13,000	51,900	56,500
LEAD	2.1	2.0	1.7	3.1	2.6	4.9	1.3
MAGNESIUM	9,400	21,000	16,800	5,480	5,330	37,800	25,900
MANGANESE	386 *	1,410 *	1,450 *α	515 *	168	1,250 *	1,200 *
MERCURY	0.06	ND (0.06)	ND (0.06)	ND (0.06)	ND (0.06)	ND (0.06)	ND (0.06)
MOLYBDENUM	ND (0.18)	ND (0.09)	ND (0.09)	ND (0.09)	ND (0.49)	ND (0.56)	ND (0.57)
NICKEL	6.0	89.1	60.4	55.3	36.2	185 *	58.1
POTASSIUM	811	982	703	376	1,190	638	523
SELENIUM	ND (0.48)	ND (0.52)	ND (0.54)	ND (0.54)	ND (0.58)	ND (0.40)	ND (0.41)
SILVER	ND (0.12)	ND (0.13)	ND (0.14)	ND (0.14)	ND (0.15)	ND (0.43)	ND (0.43)
SODIUM	ND (1,160)	ND (128)	ND (1,320)	ND (888)	ND (2,600)	459	597
THALLIUM	ND (0.42)	ND (0.45)	ND (0.47)	ND (0.47)	ND (0.50)	ND (0.38)	ND (0.39)
VANADIUM	61.5	145 α	116	93.2	30.6	138 α	176 α
ZINC	40.2	88.0	67.7	29.0	21.5	75.8	64.8
Volatile Organic Compound (ug/kg)							
2-BUTANONE	ND (10)	ND (11)	ND (12)	ND (12)	ND (8)	ND (11)	ND (11)
4-METHYL-2-PENTANONE	ND (10)	ND (11)	ND (12)	ND (12)	ND (12)	ND (11)	ND (11)
ACETONE	ND (26)	ND (31)	ND (38)	ND (30)	ND (51)	ND (14)	ND (30)
BENZENE	ND (10)	ND (11)	ND (12)	ND (12)	ND (12)	ND (11)	ND (11)
CARBON DISULFIDE	ND (10)	ND (11)	ND (12)	ND (12)	29	ND (11)	ND (11)
ETHYLBENZENE	ND (10)	ND (11)	ND (12)	ND (12)	ND (12)	ND (11)	ND (11)
METHYLENE CHLORIDE	ND (7)	ND (6)	ND (7)	ND (10)	ND (13)	ND (11)	ND (11)
TRICHLOROETHENE	ND (10)	ND (11)	ND (12)	ND (12)	ND (12)	36	ND (11)
XYLENE (TOTAL)	ND (10)	ND (11)	ND (12)	ND (12)	ND (12)	ND (11)	ND (11)

TABLE 4.9-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR34B033	IR34B033	IR34B033	IR34B033	IR34B033	PA33B035	PA33B035
Sampling Depth (feet bgs)	2.25	6.25	11.25	16.25	21.25	2.25	6.75
Sample Number	9438A072	9438A073	9438A075	9438A076	9438A077	9308D074	9308D075
Sample Date	09/20/94	09/20/94	09/20/94	09/20/94	09/20/94	02/25/93	02/25/93
Semivolatile Organic Compound (ug/kg)							
2,4-DIMETHYLPHENOL	ND (350)	ND (370)	ND (390)	ND (390)	ND (420)	ND (370)	ND (380)
2-METHYLPHENOL	ND (350)	ND (370)	ND (390)	ND (390)	ND (420)	ND (370)	ND (380)
4-METHYLPHENOL	ND (350)	ND (370)	ND (390)	ND (390)	ND (420)	ND (370)	ND (380)
BENZO(A)ANTHRACENE	ND (350)	ND (370)	ND (390)	ND (390)	ND (420)	ND (370)	ND (380)
BENZO(A)PYRENE	ND (350)	ND (370)	ND (390)	ND (390)	ND (420)	ND (370)	ND (380)
BENZO(B)FLUORANTHENE	ND (350)	ND (370)	ND (390)	ND (390)	ND (420)	ND (370)	ND (380)
BENZO(G,H,I)PERYLENE	ND (350)	ND (370)	ND (390)	ND (390)	ND (420)	ND (370)	ND (380)
BENZO(K)FLUORANTHENE	ND (350)	ND (370)	ND (390)	ND (390)	ND (420)	ND (370)	ND (380)
CHRYSENE	ND (350)	ND (370)	ND (390)	ND (390)	ND (420)	ND (370)	ND (380)
FLUORANTHENE	ND (350)	ND (370)	ND (390)	ND (390)	ND (420)	ND (370)	ND (380)
INDENO(1,2,3-CD)PYRENE	ND (350)	ND (370)	ND (390)	ND (390)	ND (420)	ND (370)	ND (380)
PHENANTHRENE	ND (350)	ND (370)	ND (390)	ND (390)	ND (420)	ND (370)	ND (380)
PHENOL	ND (350)	ND (370)	ND (390)	ND (390)	ND (420)	ND (370)	ND (380)
PYRENE	ND (350)	ND (370)	ND (390)	ND (390)	ND (420)	ND (370)	ND (380)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
4,4'-DDD	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
4,4'-DDT	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
DELTA-BHC	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
ENDRIN KETONE	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
AROCLOR-1254	ND (35)	ND (37)	ND (39)	ND (39)	ND (42)	ND (37)	ND (38)
AROCLOR-1260	ND (35)	ND (37)	ND (39)	ND (39)	ND (42)	ND (37)	ND (38)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (10)	ND (11)	ND (12)	ND (12)	ND (13)	67	ND (11)
TPH-EXTRACTABLE UNKNOWN HYDROCARBON	NA	NA	NA	NA	NA	NA	NA
TPH-MOTOR OIL	150	ND (11)	44	ND (12)	ND (13)	NA	NA
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	56	ND (6)	32	ND (4)	ND (6)	NA	NA
Oil and Grease (mg/kg)							
TOTAL OIL & GREASE	NA	NA	NA	NA	NA	490	ND (28)

TABLE 4.9-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR34B033	IR34B033	IR34B033	IR34B033	IR34B033	PA33B035	PA33B035
Sampling Depth (feet bgs)	2.25	6.25	11.25	16.25	21.25	2.25	6.75
Sample Number	9438A072	9438A073	9438A075	9438A076	9438A077	9308D074	9308D075
Sample Date	09/20/94	09/20/94	09/20/94	09/20/94	09/20/94	02/25/93	02/25/93
Percent Moisture (%)							
% SOLIDS	96.2	89.3	85.3	85.5	79.6	89.1	87.8
pH (pH units)							
PH	8.3	7.4	7.7	7.4	8.2	8.4	7.4

TABLE 4.9-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	PA33B038	PA33B038	PA33B038	PA33B039	PA33B039	PA33B039	PA33B040
Sampling Depth (feet bgs)	2.25	6.75	10.25	2.25	6.75	10.75	2.25
Sample Number	9308D071	9308D072	9308D073	9308D068	9308D069	9308D070	9308D076
Sample Date	02/25/93	02/25/93	02/25/93	02/25/93	02/25/93	02/25/93	02/25/93
Metal (mg/kg)							
ALUMINUM	31,600	36,100	36,400	31,000	26,100	29,300	25,200
ANTIMONY	5.8	5.8	ND (3.3)	4.4	6.0	5.3	ND (3.5)
ARSENIC	ND (1.3)	3.1 *#	6.0 *#	ND (1.2)	ND (1.3)	ND (1.0)	3.4 *#
BARIUM	124	724 α	132	137	122	117	214
BERYLLIUM	0.26 *	0.73 *α	0.53 *	0.22 *	0.25 *	0.26 *	0.44 *
CADMIUM	ND (0.46)	ND (0.46)	ND (0.47)	ND (0.47)	ND (0.47)	ND (0.47)	ND (0.49)
CALCIUM	19,200	20,600	13,000	20,400	16,100	17,200	8,440
CHROMIUM	145	155	463 *	120	147	130	370 *
COBALT	34.0	44.1	64.4	37.7	37.0	37.3	54.2
COPPER	56.8	104	37.4	49.5	48.2	52.7	43.9
IRON	41,800	56,200	44,500	36,700	36,900	39,600	43,000
LEAD	1.7	5.0	6.2	0.34	2.0	2.6	4.7
MAGNESIUM	26,000	33,000	90,800	18,500	31,200	28,600	94,000
MANGANESE	908 *	4,450 *α	803 *	988 *	777 *	818 *	1,100 *
MERCURY	ND (0.06)	0.10	0.09	ND (0.06)	ND (0.06)	ND (0.06)	0.08
MOLYBDENUM	ND (0.55)	ND (0.54)	ND (0.56)	ND (0.56)	ND (0.56)	ND (0.56)	ND (0.58)
NICKEL	71.0	191 *	1,090 *	53.0	179 *	152 *	770 *
POTASSIUM	377	969	930	283	365	526	597
SELENIUM	ND (0.40)	ND (0.39)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.41)	ND (0.42)
SILVER	ND (0.42)	0.78	0.44	ND (0.43)	ND (0.43)	ND (0.43)	ND (0.44)
SODIUM	588	438	180	441	385	414	213
THALLIUM	ND (0.38)	ND (0.37)	ND (0.38)	ND (0.38)	ND (0.38)	ND (0.38)	ND (0.40)
VANADIUM	138 α	125 α	85.0	118 α	105	113	73.4
ZINC	50.8	111 α	67.4	36.3	46.9	65.8	59.0
Volatile Organic Compound (ug/kg)							
2-BUTANONE	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	ND (12)
4-METHYL-2-PENTANONE	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	ND (12)
ACETONE	ND (12)	ND (18)	ND (11)	ND (31)	ND (12)	ND (14)	ND (11)
BENZENE	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.6)
CARBON DISULFIDE	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	ND (12)
ETHYLBENZENE	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.6)
METHYLENE CHLORIDE	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	ND (12)
TRICHLOROETHENE	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)	ND (12)
XYLENE (TOTAL)	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.6)

TABLE 4.9-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	PA33B038	PA33B038	PA33B038	PA33B039	PA33B039	PA33B039	PA33B040
Sampling Depth (feet bgs)	2.25	6.75	10.25	2.25	6.75	10.75	2.25
Sample Number	9308D071	9308D072	9308D073	9308D068	9308D069	9308D070	9308D076
Sample Date	02/25/93	02/25/93	02/25/93	02/25/93	02/25/93	02/25/93	02/25/93
Semivolatile Organic Compound (ug/kg)							
2,4-DIMETHYLPHENOL	ND (1,800)	ND (360)	ND (380)	ND (370)	ND (370)	ND (380)	ND (390)
2-METHYLPHENOL	ND (1,800)	ND (360)	ND (380)	ND (370)	ND (370)	ND (380)	ND (390)
4-METHYLPHENOL	ND (1,800)	ND (360)	ND (380)	ND (370)	ND (370)	ND (380)	ND (390)
BENZO(A)ANTHRACENE	ND (1,800)	ND (360)	ND (380)	ND (370)	ND (370)	ND (380)	ND (390)
BENZO(A)PYRENE	ND (1,800)	ND (360)	ND (380)	ND (370)	ND (370)	ND (380)	ND (390)
BENZO(B)FLUORANTHENE	ND (1,800)	ND (360)	ND (380)	ND (370)	ND (370)	ND (380)	ND (390)
BENZO(G,H,I)PERYLENE	ND (1,800)	ND (360)	ND (380)	ND (370)	ND (370)	ND (380)	ND (390)
BENZO(K)FLUORANTHENE	ND (1,800)	ND (360)	ND (380)	ND (370)	ND (370)	ND (380)	ND (390)
CHRYSENE	ND (1,800)	ND (360)	ND (380)	ND (370)	ND (370)	ND (380)	ND (390)
FLUORANTHENE	ND (1,800)	ND (360)	ND (380)	ND (370)	ND (370)	ND (380)	ND (390)
INDENO(1,2,3-CD)PYRENE	ND (1,800)	ND (360)	ND (380)	ND (370)	ND (370)	ND (380)	ND (390)
PHENANTHRENE	ND (1,800)	ND (360)	ND (380)	ND (370)	ND (370)	ND (380)	ND (390)
PHENOL	ND (1,800)	ND (360)	ND (380)	ND (370)	ND (370)	ND (380)	ND (390)
PYRENE	ND (1,800)	ND (360)	ND (380)	ND (370)	ND (370)	ND (380)	ND (390)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
4,4'-DDD	ND (4)	ND (4)	ND (4)	ND (4)	ND (8)	ND (19)	ND (4)
4,4'-DDT	ND (4)	ND (4)	ND (4)	ND (4)	ND (8)	ND (19)	ND (4)
DELTA-BHC	ND (2)	ND (2)	ND (2)	ND (2)	ND (4)	ND (9)	ND (2)
ENDRIN KETONE	ND (4)	ND (4)	ND (4)	ND (4)	ND (8)	ND (19)	ND (4)
AROCLOR-1254	ND (37)	ND (36)	ND (37)	ND (37)	ND (75)	ND (190)	ND (39)
AROCLOR-1260	ND (37)	ND (36)	ND (37)	ND (37)	ND (75)	ND (190)	ND (39)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (11)	12	ND (11)	ND (11)	43	29	ND (12)
TPH-EXTRACTABLE UNKNOWN HYDROCARBON	NA	NA	NA	NA	NA	NA	NA
TPH-MOTOR OIL	NA	NA	NA	NA	NA	NA	NA
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	NA	NA	NA	NA	NA	NA	NA
Oil and Grease (mg/kg)							
TOTAL OIL & GREASE	130	440	800	150	3,800	6,500	280

TABLE 4.9-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	PA33B038	PA33B038	PA33B038	PA33B039	PA33B039	PA33B039	PA33B040
Sampling Depth (feet bgs)	2.25	6.75	10.25	2.25	6.75	10.75	2.25
Sample Number	9308D071	9308D072	9308D073	9308D068	9308D069	9308D070	9308D076
Sample Date	02/25/93	02/25/93	02/25/93	02/25/93	02/25/93	02/25/93	02/25/93
Percent Moisture (%)							
% SOLIDS	90.5	91.9	89.0	89.2	89.2	88.8	85.6
pH (pH units)							
PH	7.9	7.9	9.1	8.0	7.6	7.7	7.9

TABLE 4.9-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	PA33B040	PA33B040	PA33B051	PA33B051	PA33B053	PA33B055	PA33B056
Sampling Depth (feet bgs)	6.75	10.25	7.25	12.25	9.75	9.25	7.25
Sample Number	9308D077	9308D078	9342G750	9342G751	9311N177	9311N176	9313N181
Sample Date	02/25/93	02/25/93	10/18/93	10/18/93	03/19/93	03/19/93	04/01/93
Metal (mg/kg)							
ALUMINUM	30,100	22,800	22,100	25,100	1,110	20,500	29,400
ANTIMONY	ND (3.6)	3.3	ND (4.6)	ND (9.8)	15.6 α	ND (3.7)	ND (3.2)
ARSENIC	ND (1.5)	3.2 *#	1.0 *	ND (0.74)	2.9 *#	3.2 *#	ND (0.61)
BARIUM	171	71.9	107	128	259	170	121
BERYLLIUM	0.43 *	0.45 *	ND (0.21)	ND (0.22)	ND (0.14)	ND (0.34)	ND (0.22)
CADMIUM	ND (0.51)	ND (0.44)	ND (0.25)	ND (0.26)	2.0	2.4	ND (0.23)
CALCIUM	13,200	8,490	17,200	19,300	780	26,700	17,900
CHROMIUM	332 *	537 *	75.1	83.5	114 α	179	95.2
COBALT	56.7	60.4	32.0	34.7	2.7	25.6	40.2
COPPER	35.9	25.8	51.9	57.8	477 α	72.9	58.1
IRON	43,200	37,600	37,000	35,800	6,900	34,400	43,300
LEAD	4.4	5.1	6.4	9.0 α	343 *α	367 *α	5.6
MAGNESIUM	103,000	114,000	15,400	17,600	981	37,200	19,400
MANGANESE	848 *	772 *	1,100 *	983 *	74.2	703 *	1,120 *
MERCURY	0.06	ND (0.05)	0.41	0.26	5.5 α	0.21	ND (0.12)
MOLYBDENUM	ND (0.61)	ND (0.53)	ND (0.97)	ND (1.2)	ND (1.6)	ND (0.63)	ND (0.65)
NICKEL	735 *	1,070 *	57.9	58.1	15.2	266 *	86.5
POTASSIUM	523	468	669	608	237	893	642
SELENIUM	ND (0.44)	ND (0.38)	ND (0.63)	ND (0.67)	ND (0.41)	ND (0.45)	ND (0.51)
SILVER	0.46	ND (1.2)	ND (0.49)	ND (0.52)	ND (0.44)	ND (0.48)	ND (1.4)
SODIUM	152	163	ND (1,150)	2,260	208	1,060	531
THALLIUM	ND (0.41)	ND (0.36)	ND (0.94)	ND (0.64)	ND (0.39)	ND (0.43)	ND (0.65)
VANADIUM	73.7	53.2	98.1	106	5.6	78.1	116
ZINC	56.3	49.0	74.4	64.8	1,060 α	540 α	54.0
Volatile Organic Compound (ug/kg)							
2-BUTANONE	ND (12)	ND (11)	ND (11)	14	ND (11)	ND (13)	ND (21)
4-METHYL-2-PENTANONE	ND (12)	ND (11)	ND (11)	ND (12)	ND (11)	ND (13)	21
ACETONE	ND (11)	ND (14)	ND (6)	ND (32)	140	ND (52)	ND (61)
BENZENE	ND (0.6)	0.7	ND (11)	ND (12)	ND (11)	ND (13)	ND (12)
CARBON DISULFIDE	ND (12)	ND (11)	ND (11)	ND (12)	ND (11)	9	ND (12)
ETHYLBENZENE	ND (0.6)	1	ND (11)	ND (12)	ND (11)	ND (13)	ND (12)
METHYLENE CHLORIDE	ND (12)	ND (11)	ND (11)	2	ND (11)	ND (13)	ND (12)
TRICHLOROETHENE	ND (12)	ND (11)	ND (11)	ND (12)	ND (11)	ND (13)	ND (12)
XYLENE (TOTAL)	ND (0.6)	ND (0.6)	ND (11)	ND (12)	18	ND (13)	ND (12)

TABLE 4.9-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	PA33B040	PA33B040	PA33B051	PA33B051	PA33B053	PA33B055	PA33B056
Sampling Depth (feet bgs)	6.75	10.25	7.25	12.25	9.75	9.25	7.25
Sample Number	9308D077	9308D078	9342G750	9342G751	9311N177	9311N176	9313N181
Sample Date	02/25/93	02/25/93	10/18/93	10/18/93	03/19/93	03/19/93	04/01/93
Semivolatile Organic Compound (ug/kg)							
2,4-DIMETHYLPHENOL	ND (400)	ND (11,000)	ND (370)	ND (400)	ND (110,000)	ND (420)	ND (390)
2-METHYLPHENOL	ND (400)	ND (11,000)	ND (370)	ND (400)	ND (110,000)	ND (420)	ND (390)
4-METHYLPHENOL	ND (400)	ND (11,000)	ND (370)	ND (400)	ND (110,000)	ND (420)	ND (390)
BENZO(A)ANTHRACENE	ND (400)	ND (11,000)	ND (370)	ND (400)	ND (110,000)	ND (420)	ND (390)
BENZO(A)PYRENE	ND (400)	ND (11,000)	ND (370)	ND (400)	ND (110,000)	ND (420)	ND (390)
BENZO(B)FLUORANTHENE	ND (400)	ND (11,000)	ND (370)	ND (400)	ND (110,000)	ND (420)	ND (390)
BENZO(G,H,I)PERYLENE	ND (400)	ND (11,000)	ND (370)	ND (400)	ND (110,000)	ND (420)	ND (390)
BENZO(K)FLUORANTHENE	ND (400)	ND (11,000)	ND (370)	ND (400)	ND (110,000)	ND (420)	ND (390)
CHRYSENE	ND (400)	ND (11,000)	ND (370)	ND (400)	ND (110,000)	ND (420)	ND (390)
FLUORANTHENE	ND (400)	ND (11,000)	ND (370)	ND (400)	ND (110,000)	ND (420)	ND (390)
INDENO(1,2,3-CD)PYRENE	ND (400)	ND (11,000)	ND (370)	ND (400)	ND (110,000)	ND (420)	ND (390)
PHENANTHRENE	ND (400)	ND (11,000)	ND (370)	ND (400)	ND (110,000)	ND (420)	ND (390)
PHENOL	ND (400)	ND (11,000)	ND (370)	ND (400)	ND (110,000)	ND (420)	ND (390)
PYRENE	ND (400)	ND (11,000)	ND (370)	ND (400)	ND (110,000)	ND (420)	ND (390)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
4,4'-DDD	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
4,4'-DDT	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
DELTA-BHC	ND (2)	ND (2)	2	ND (2)	ND (2)	ND (2)	ND (2)
ENDRIN KETONE	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
AROCLOR-1254	ND (40)	ND (35)	ND (37)	ND (40)	680	ND (42)	ND (39)
AROCLOR-1260	ND (40)	ND (35)	ND (37)	ND (40)	ND (38)	ND (42)	ND (39)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (12)	ND (11)	36	ND (12)	1,500	20	ND (12)
TPH-EXTRACTABLE UNKNOWN HYDROCARBON	NA	NA	NA	NA	NA	NA	NA
TPH-MOTOR OIL	NA	NA	ND (11)	ND (12)	NA	NA	NA
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	NA	NA	120	27	NA	NA	NA
Oil and Grease (mg/kg)							
TOTAL OIL & GREASE	40	130	NA	NA	12,000	420	180

TABLE 4.9-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	PA33B040	PA33B040	PA33B051	PA33B051	PA33B053	PA33B055	PA33B056
Sampling Depth (feet bgs)	6.75	10.25	7.25	12.25	9.75	9.25	7.25
Sample Number	9308D077	9308D078	9342G750	9342G751	9311N177	9311N176	9313N181
Sample Date	02/25/93	02/25/93	10/18/93	10/18/93	03/19/93	03/19/93	04/01/93
Percent Moisture (%)							
% SOLIDS	82.5	94.9	89.0	84.2	87.2	79.8	85.8
pH (pH units)							
PH	8.2	NA	8.9	8.0	8.8	10.1	7.7

TABLE 4.9-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	PA33B058	PA33MW36A	PA33MW36A	PA33MW36A	PA33MW36A	PA33MW37A	PA33MW37A
Sampling Depth (feet bgs)	3.75	3.25	6.25	11.75	16.75	3.75	6.75
Sample Number	9311N180	9309A647	9309A648	9309A649	9309A650	9309A641	9309A642
Sample Date	03/19/93	03/02/93	03/02/93	03/02/93	03/02/93	03/02/93	03/02/93
Metal (mg/kg)							
ALUMINUM	17,800	31,100	24,100	25,300	30,000	36,200	19,900
ANTIMONY	ND (3.4)	ND (6.9)	ND (6.9)	ND (6.8)	ND (7.0)	ND (6.0)	ND (6.6)
ARSENIC	ND (2.0)	1.6 *	4.8 *#	2.0 *	4.2 *#	2.2 *#	5.3 *#
BARIUM	150	134	246	162	198	178	195
BERYLLIUM	ND (0.36)	0.32 *	0.43 *	0.37 *	0.57 *	0.16 *	0.41 *
CADMIUM	0.59	ND (1.1)	ND (1.1)	ND (1.1)	ND (1.1)	ND (0.98)	ND (1.1)
CALCIUM	7,980	30,200	9,310	20,100	6,320	30,300	6,260
CHROMIUM	218 *	199	530 *	132	333 *	104	379 *
COBALT	35.9	ND (42.1)	ND (44.7)	ND (31.6)	ND (35.7)	ND (32.4)	51.6
COPPER	38.2	70.4	51.6	55.7	45.4	59.1	48.4
IRON	32,700	46,300	42,700	37,600	41,800	43,700	39,900
LEAD	9.1 α	12.1 α	10.7 α	14.5 α	7.5	2.5	4.8
MAGNESIUM	28,000	25,300	65,900	28,100	61,100	32,300	111,000
MANGANESE	821 *	1,190 *	955 *	1,060 *	1,030 *	890 *	1,330 *
MERCURY	0.11	ND (0.06)	0.06	ND (0.06)	0.07	0.05	0.11
MOLYBDENUM	ND (0.58)	ND (0.90)	2.3	ND (0.88)	ND (0.91)	0.99	0.96
NICKEL	387 *	154 *	695 *	197 *	577 *	93.6	917 *
POTASSIUM	584	835	966	638	768	504	695
SELENIUM	ND (0.44)	ND (0.81)	ND (0.80)	ND (0.79)	ND (0.81)	ND (0.70)	0.77
SILVER	ND (0.44)	0.71	0.59	ND (0.49)	ND (0.50)	0.46	0.51
SODIUM	877	656	365	437	468	460	186
THALLIUM	ND (0.39)	ND (0.74)	ND (0.73)	ND (0.72)	ND (0.74)	ND (0.64)	ND (0.70)
VANADIUM	85.6	120 α	73.9	95.2	63.4	92.0	62.7
ZINC	87.8	75.6	66.9	63.0	73.6	64.7	119 α
Volatile Organic Compound (ug/kg)							
2-BUTANONE	ND (18)	ND (12)	ND (12)	ND (12)	ND (12)	ND (10)	ND (11)
4-METHYL-2-PENTANONE	16	ND (12)	ND (12)	ND (12)	ND (12)	ND (10)	ND (11)
ACETONE	ND (20)	ND (12)	ND (12)	ND (4)	ND (12)	ND (10)	ND (11)
BENZENE	ND (12)	ND (12)	ND (12)	ND (12)	ND (12)	ND (10)	ND (11)
CARBON DISULFIDE	ND (12)	ND (12)	ND (12)	ND (12)	ND (12)	ND (10)	ND (11)
ETHYLBENZENE	ND (12)	ND (12)	ND (12)	ND (12)	ND (12)	ND (10)	ND (11)
METHYLENE CHLORIDE	ND (12)	ND (2)	ND (2)	ND (2)	ND (4)	ND (2)	ND (2)
TRICHLOROETHENE	ND (12)	ND (12)	ND (12)	ND (12)	ND (12)	ND (10)	ND (11)
XYLENE (TOTAL)	ND (12)	ND (12)	ND (12)	ND (12)	ND (12)	ND (10)	ND (11)

TABLE 4.9-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	PA33B058	PA33MW36A	PA33MW36A	PA33MW36A	PA33MW36A	PA33MW37A	PA33MW37A
Sampling Depth (feet bgs)	3.75	3.25	6.25	11.75	16.75	3.75	6.75
Sample Number	9311N180	9309A647	9309A648	9309A649	9309A650	9309A641	9309A642
Sample Date	03/19/93	03/02/93	03/02/93	03/02/93	03/02/93	03/02/93	03/02/93
Semivolatile Organic Compound (ug/kg)							
2,4-DIMETHYLPHENOL	ND (380)	ND (390)	ND (390)	ND (380)	ND (390)	ND (340)	ND (370)
2-METHYLPHENOL	ND (380)	ND (390)	ND (390)	ND (380)	ND (390)	ND (340)	ND (370)
4-METHYLPHENOL	ND (380)	ND (390)	ND (390)	ND (380)	ND (390)	ND (340)	ND (370)
BENZO(A)ANTHRACENE	ND (380)	ND (390)	ND (390)	ND (380)	ND (390)	ND (340)	ND (370)
BENZO(A)PYRENE	ND (380)	ND (390)	ND (390)	ND (380)	ND (390)	ND (340)	ND (370)
BENZO(B)FLUORANTHENE	ND (380)	ND (390)	ND (390)	ND (380)	ND (390)	ND (340)	ND (370)
BENZO(G,H,I)PERYLENE	ND (380)	ND (390)	ND (390)	ND (380)	ND (390)	ND (340)	ND (370)
BENZO(K)FLUORANTHENE	ND (380)	ND (390)	ND (390)	ND (380)	ND (390)	ND (340)	ND (370)
CHRYSENE	ND (380)	ND (390)	ND (390)	ND (380)	ND (390)	ND (340)	ND (370)
FLUORANTHENE	ND (380)	ND (390)	ND (390)	ND (380)	ND (390)	ND (340)	ND (370)
INDENO(1,2,3-CD)PYRENE	ND (380)	ND (390)	ND (390)	ND (380)	ND (390)	ND (340)	ND (370)
PHENANTHRENE	ND (380)	ND (390)	ND (390)	ND (380)	ND (390)	ND (340)	39
PHENOL	ND (380)	ND (390)	ND (390)	ND (380)	ND (390)	ND (340)	ND (370)
PYRENE	ND (380)	ND (390)	ND (390)	ND (380)	ND (390)	ND (340)	ND (370)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
4,4'-DDD	ND (4)	ND (4)	ND (4)	ND (4)	NA	ND (3)	ND (4)
4,4'-DDT	ND (4)	ND (4)	ND (4)	ND (4)	NA	ND (3)	ND (4)
DELTA-BHC	ND (2)	ND (2)	ND (2)	ND (2)	NA	ND (2)	ND (2)
ENDRIN KETONE	ND (4)	ND (4)	ND (4)	ND (4)	NA	ND (3)	ND (4)
AROCLOR-1254	ND (38)	ND (39)	ND (39)	ND (38)	NA	ND (34)	ND (37)
AROCLOR-1260	ND (38)	ND (39)	ND (39)	ND (38)	NA	ND (34)	ND (37)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (12)	ND (12)	ND (12)	ND (12)	ND (12)	ND (10)	ND (11)
TPH-EXTRACTABLE UNKNOWN HYDROCARBON	NA	ND (12)	ND (12)	ND (12)	ND (12)	ND (10)	ND (11)
TPH-MOTOR OIL	NA	NA	NA	NA	NA	NA	NA
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	NA	NA	NA	NA	NA	NA	NA
Oil and Grease (mg/kg)							
TOTAL OIL & GREASE	110	100	99	88	96	110	90

TABLE 4.9-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	PA33B058	PA33MW36A	PA33MW36A	PA33MW36A	PA33MW36A	PA33MW37A	PA33MW37A
Sampling Depth (feet bgs)	3.75	3.25	6.25	11.75	16.75	3.75	6.75
Sample Number	9311N180	9309A647	9309A648	9309A649	9309A650	9309A641	9309A642
Sample Date	03/19/93	03/02/93	03/02/93	03/02/93	03/02/93	03/02/93	03/02/93
Percent Moisture (%)							
% SOLIDS	86.7	NA	NA	NA	NA	NA	NA
pH (pH units)							
PH	9.0	8.4	7.8	7.8	8.0	8.3	8.0

TABLE 4.9-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	PA33MW37A	PA33MW37A	PA33SS52	PA33SS57	PA45TA08	PA50B015	PA50TA11
Sampling Depth (feet bgs)	11.75	16.75	4.50	5.25	5.75	8.25	6.25
Sample Number	9309A643	9309A644	9310J393	9310J394	9322P222	9330H504	9327P231
Sample Date	03/02/93	03/02/93	03/12/93	03/12/93	06/03/93	07/26/93	07/07/93
Metal (mg/kg)							
ALUMINUM	32,000	30,900	28,700	9,300	19,700	26,600	12,500
ANTIMONY	ND (6.8)	9.9 α	ND (3.5)	ND (4.2)	4.9	ND (7.2)	ND (9.5)
ARSENIC	4.3 *#	5.4 *#	5.3 *#	1.3 *	0.87 *	ND (4.7)	4.7 *#
BARIUM	141	161	157	97.5	138	282	60.6
BERYLLIUM	0.54 *	0.53 *	0.53 *	0.18 *	ND (0.09)	0.32 *	0.18 *
CADMIUM	ND (1.1)	ND (1.2)	ND (0.50)	ND (0.60)	ND (0.27)	ND (0.93)	ND (0.35)
CALCIUM	12,900	11,400	9,790	3,210	9,980	18,300	3,560
CHROMIUM	357 *	347 *	307 *	1,350 *α	68.8	346 *	228 *
COBALT	ND (41.9)	ND (46.0)	47.2	134 α	41.2 α	23.4	16.3
COPPER	43.1	52.1	43.6	21.5	75.5	53.7	24.0
IRON	46,200	46,700	40,900	58,700	35,800	47,000	30,000
LEAD	10.2 α	7.5	8.9	20.8 α	12.9 α	2.9	8.3
MAGNESIUM	70,400	79,100	68,200	135,000	16,300	42,800	15,700
MANGANESE	719 *	1,090 *	972 *	1,530 *α	1,450 *α	1,010 *	321
MERCURY	0.08	0.08	0.19	0.21	0.22	ND (0.12)	ND (0.14)
MOLYBDENUM	1.5	ND (0.91)	ND (0.59)	ND (0.72)	ND (0.78)	ND (2.4)	ND (1.4)
NICKEL	508 *	649 *	528 *	2,550 *	55.6	297 *	106
POTASSIUM	1,060	946	1,090	808	556	ND (1,130)	861
SELENIUM	1.3	ND (0.82)	ND (0.43)	ND (0.52)	ND (0.49)	0.92	ND (0.48)
SILVER	0.65	ND (0.50)	ND (0.45)	ND (0.54)	ND (0.49)	ND (0.47)	ND (0.28)
SODIUM	463	931	555	378	4,610	4,140	2,270
THALLIUM	ND (0.72)	ND (0.74)	ND (0.40)	ND (0.49)	ND (0.63)	ND (0.70)	ND (0.61)
VANADIUM	89.6	82.6	76.6	44.5	80.0	88.8	60.7
ZINC	78.9	85.1	68.0	73.3	120 α	72.1	56.9
Volatile Organic Compound (ug/kg)							
2-BUTANONE	ND (12)	ND (12)	ND (12)	ND (14)	ND (11)	ND (12)	ND (11)
4-METHYL-2-PENTANONE	ND (12)	ND (12)	ND (12)	ND (14)	ND (11)	ND (12)	ND (11)
ACETONE	ND (4)	ND (12)	14	36	ND (33)	ND (12)	ND (11)
BENZENE	ND (12)	ND (12)	ND (12)	ND (14)	ND (11)	ND (6)	ND (11)
CARBON DISULFIDE	ND (12)	ND (12)	ND (12)	ND (14)	ND (11)	ND (12)	ND (11)
ETHYLBENZENE	ND (12)	ND (12)	ND (12)	ND (14)	ND (11)	ND (6)	ND (11)
METHYLENE CHLORIDE	ND (4)	ND (3)	ND (12)	ND (14)	ND (4)	ND (4)	ND (6)
TRICHLOROETHENE	ND (12)	ND (12)	ND (12)	ND (14)	ND (11)	ND (12)	2
XYLENE (TOTAL)	ND (12)	ND (12)	ND (12)	ND (14)	ND (11)	ND (6)	ND (11)

TABLE 4.9-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	PA33MW37A	PA33MW37A	PA33SS52	PA33SS57	PA45TA08	PA50B015	PA50TA11
Sampling Depth (feet bgs)	11.75	16.75	4.50	5.25	5.75	8.25	6.25
Sample Number	9309A643	9309A644	9310J393	9310J394	9322P222	9330H504	9327P231
Sample Date	03/02/93	03/02/93	03/12/93	03/12/93	06/03/93	07/26/93	07/07/93
Semivolatile Organic Compound (ug/kg)							
2,4-DIMETHYLPHENOL	ND (380)	ND (400)	130	ND (480)	ND (11,000)	ND (380)	ND (360)
2-METHYLPHENOL	ND (380)	ND (400)	330	ND (480)	ND (11,000)	ND (380)	ND (360)
4-METHYLPHENOL	ND (380)	ND (400)	870	ND (480)	ND (11,000)	ND (380)	ND (360)
BENZO(A)ANTHRACENE	ND (380)	ND (400)	ND (390)	ND (480)	ND (11,000)	ND (380)	ND (360)
BENZO(A)PYRENE	ND (380)	ND (400)	ND (390)	ND (480)	ND (11,000)	ND (380)	ND (360)
BENZO(B)FLUORANTHENE	ND (380)	ND (400)	ND (390)	ND (480)	ND (11,000)	ND (380)	ND (360)
BENZO(G,H,I)PERYLENE	ND (380)	ND (400)	ND (390)	ND (480)	ND (11,000)	ND (380)	ND (360)
BENZO(K)FLUORANTHENE	ND (380)	ND (400)	ND (390)	ND (480)	ND (11,000)	ND (380)	ND (360)
CHRYSENE	ND (380)	ND (400)	ND (390)	ND (480)	ND (11,000)	ND (380)	ND (360)
FLUORANTHENE	ND (380)	ND (400)	ND (390)	ND (480)	ND (11,000)	ND (380)	ND (360)
INDENO(1,2,3-CD)PYRENE	ND (380)	ND (400)	ND (390)	ND (480)	ND (11,000)	ND (380)	ND (360)
PHENANTHRENE	ND (380)	ND (400)	ND (390)	ND (480)	ND (11,000)	ND (380)	ND (360)
PHENOL	ND (380)	ND (400)	130	ND (480)	ND (11,000)	ND (380)	ND (360)
PYRENE	ND (380)	ND (400)	ND (390)	ND (480)	ND (11,000)	ND (380)	ND (360)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
4,4'-DDD	ND (4)	ND (4)	ND (4)	ND (5)	ND (4)	ND (4)	ND (4)
4,4'-DDT	ND (4)	ND (4)	ND (4)	ND (5)	ND (4)	ND (4)	ND (4)
DELTA-BHC	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
ENDRIN KETONE	ND (4)	ND (4)	ND (4)	ND (5)	ND (4)	ND (4)	ND (4)
AROCLOR-1254	ND (38)	ND (40)	ND (39)	ND (48)	ND (37)	ND (38)	ND (36)
AROCLOR-1260	ND (38)	ND (40)	ND (39)	ND (48)	ND (37)	ND (38)	ND (36)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (12)	ND (12)	ND (12)	49	ND (11)	ND (1)	ND (11)
TPH-EXTRACTABLE UNKNOWN HYDROCARBON	22	ND (12)	NA	NA	NA	20	NA
TPH-MOTOR OIL	NA	NA	NA	NA	NA	ND (12)	NA
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	NA	NA	NA	NA	10	33	32
Oil and Grease (mg/kg)							
TOTAL OIL & GREASE	77	82	110	2,200	NA	NA	NA

TABLE 4.9-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	PA33MW37A	PA33MW37A	PA33SS52	PA33SS57	PA45TA08	PA50B015	PA50TA11
Sampling Depth (feet bgs)	11.75	16.75	4.50	5.25	5.75	8.25	6.25
Sample Number	9309A643	9309A644	9310J393	9310J394	9322P222	9330H504	9327P231
Sample Date	03/02/93	03/02/93	03/12/93	03/12/93	06/03/93	07/26/93	07/07/93
Percent Moisture (%)							
% SOLIDS	NA	NA	84.5	69.9	89.2	86.0	92.1
pH (pH units)							
PH	8.0	7.9	8.9	8.5	9.4	8.4	8.0

Notes:

%	Percent
bgs	Below ground surface
mg/kg	Milligram per kilogram
NA	Not analyzed
ND()	Not detected (detection limit in parentheses)
µg/kg	Microgram per kilogram
*	Detected concentration greater than U.S. Environmental Protection Agency Region IX preliminary remediation goals (PRG) for residential use
#	Detected concentration greater than U.S. Environmental Protection Agency Region IX PRG for industrial use
α	Detected concentration greater than the Hunters Point ambient level.
▒	Detected concentration greater than at least one screening criterion.

TABLE 4.9-7

SUMMARY OF MONITORING WELL GROUNDWATER ANALYTICAL TESTS - IR-33 SOUTH HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
IR09MW44A	9141X206	√		√	√	√	√		√			√			√				√	√		√
IR09MW44A	9151X346	√		√	√	√	√		√			√			√				√	√		√
IR09MW44A	9151X347	√		√	√	√	√		√			√			√				√	√		√
IR09MW44A	9345X077			√	√		√									√						√
IR09MW44A	9408X218			√	√		√									√						√
IR09MW44A	9408X219			√	√		√									√						√
IR09MW44A	9419X285			√	√		√									√						√
IR09MW44A	9436X456			√	√		√									√						√
IR09MW44A	9436X457			√	√		√									√						√
IR09P040A	9141X210	√		√	√	√	√		√			√			√				√	√		√
IR09P040A	9141X211	√		√	√	√	√		√			√			√				√	√		√
IR09P040A	9151X341	√		√	√	√	√		√			√			√				√	√		√
IR09P040A	9151X342	√		√	√	√	√		√			√			√				√	√		√
IR09P040A	9345X094			√	√		√									√						√
IR09P040A	9345X095			√	√		√									√						√
IR09P040A	9408X238			√	√		√									√						√
IR09P040A	9419X280			√	√		√									√						√
IR09P040A	9436X464			√	√		√									√						√
IR09P042A	9141X208	√		√	√	√	√		√			√			√				√	√		√
IR09P042A	9151X348	√		√	√	√	√		√			√			√				√	√		√
IR09P042A	9345X087			√	√		√									√						√
IR09P042A	9345X088			√	√		√									√						√
IR09P042A	9408X237			√	√		√									√						√
IR09P042A	9419X272			√	√		√									√						√
IR09P042A	9436X461			√	√		√									√						√
IR09P042A	9436X462			√	√		√									√						√
IR09P043A	9141X207	√		√	√	√	√		√			√			√				√	√		√
IR09P043A	9151X349	√		√	√	√	√		√			√			√				√	√		√
IR09P043A	9345X078			√	√		√									√						√
IR09P043A	9345X079			√	√		√									√						√
IR09P043A	9408X235			√	√		√									√						√
IR09P043A	9408X236			√	√		√									√						√
IR09P043A	9419M548			√	√		√									√						√
IR09P043A	9436X463			√	√		√									√						√
PA33MW36A	9312A700																			√		√
PA33MW36A	9312X953			√			√	√			√					√			√			
PA33MW36A	9606W069						√				√	√				√			√	√	√	√

TABLE 4.9-7 (Continued)

SUMMARY OF MONITORING WELL GROUNDWATER ANALYTICAL TESTS - IR-33 SOUTH HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
PA33MW36A	9611W147	√					√				√	√		√	√	√			√	√	√	√
PA33MW37A	9312A698																			√		√
PA33MW37A	9312A699																			√		√
PA33MW37A	9312X951			√			√	√			√					√			√			
PA33MW37A	9312X952			√			√	√			√					√			√			
PA33MW37A	9530X903						√															
PA33MW37A	9607J864						√				√	√				√			√	√	√	√

Notes:

CHROM	CHROMIUM VI
CYAN	Cyanide
DIOXIN	Dioxins and Furans
O&G	Total oil and grease
PAH	Polynuclear aromatic hydrocarbons
PCTMST	Percent moisture
PEST	Pesticides/polychlorinated biphenyls
PHYS	Physical characteristic
SALIN	Salinity
SVOC	Semivolatile organic compounds
SOLIDS	Total dissolved solids
TOC	Total organic carbon
TMICROB	Coliform
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
VOC	Volatile organic compounds

TABLE 4.9-8

STATISTICAL SUMMARY OF MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection Frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Tap Water PRG Value	Above[e] PRG	MCL Value[f]	Above[g] MCL	NAWQC Value	Above[h] NAWQC
METAL	ALUMINUM	22.2	32.5	27.3	UG/L	25.5	14	3	37,000	0				
	ANTIMONY	14.2	33.3	21.3	UG/L	18.4	14	3	15.0	2	6.0	3	500	0
	ARSENIC	1.5	9.2	4.6	UG/L	1.9	14	11	0.04	11	50.0	0	36.0	0
	BARIUM	47.8	952	387	UG/L	1.0	14	14	2,600	0	1,000	0		
	CADMIUM	0.25	0.25	0.25	UG/L	0.20	14	1	18.0	0	5.0	0	9.3	0
	CALCIUM	55,200	279,000	164,000	UG/L	19,700	14	14						
	COBALT	3.2	57.0	12.0	UG/L	4.0	14	12						
	COPPER	1.9	2.4	2.1	UG/L	1.3	14	3	1,400	0			2.4	0
	IRON	18.7	394	148	UG/L	15.2	14	3						
	LEAD	1.6	8.6	6.1	UG/L	1.4	14	3	4.0	2	50.0	0	8.1	2
	MAGNESIUM	165,000	1,330,000	543,000	UG/L	40.8	14	14						
	MANGANESE	227	5,750	2,710	UG/L	0.41	14	14	180	14				
	MERCURY	0.12	0.22	0.16	UG/L	0.10	14	3	11.0	0	2.0	0	0.03	3
	MOLYBDENUM	4.9	33.5	14.2	UG/L	2.1	14	5	180	0				
	NICKEL	5.5	317	75.8	UG/L	6.0	30	21	730	0	100	7	8.2	19
	POTASSIUM	2,560	39,200	16,300	UG/L	691	14	14						
	SILVER	1.3	1.3	1.3	UG/L	1.7	14	1	180	0			0.92	1
	SODIUM	546,000	2,220,000	889,000	UG/L	46.7	14	14						
	THALLIUM	1.9	10.2	6.0	UG/L	2.0	12	2			2.0	1		
	VANADIUM	2.5	13.9	6.1	UG/L	1.8	14	11	260	0				
	ZINC	7.0	7.0	7.0	UG/L	6.1	14	1	11,000	0			81.0	0
CYAN	CYANIDE	1.1	1.3	1.2	UG/L	1.1	24	2	730	0	200	0		

TABLE 4.9-8 (Continued)

STATISTICAL SUMMARY OF MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Tap Water PRG Value	Above[e] PRG	MCL Value[f]	Above[g] MCL	NAWQC Value	Above[h] NAWQC
VOC	CHLOROFORM	1	7	3	UG/L	2	29	3	0.2	3	100	0		
SVOC	ACENAPHTHENE	17	17	17	UG/L	2	29	1	370	0				
	BENZO(A)PYRENE	0.2	0.3	0.2	UG/L	0.05	29	2	0.002	2	0.2	1		
	BENZO(B)FLUORANTHENE	0.09	0.2	0.1	UG/L	0.02	29	2	0.09	1				
	BENZO(G,H,I)PERYLENE	0.2	0.3	0.2	UG/L	0.08	29	2	240	0				
	BENZO(K)FLUORANTHENE	0.04	0.07	0.06	UG/L	0.02	29	2	0.9	0				
	FLUORANTHENE	0.2	0.2	0.2	UG/L	0.2	29	1	1,500	0				
	FLUORENE	0.2	0.2	0.2	UG/L	0.2	29	1	240	0				
	INDENO(1,2,3-CD)PYRENE	0.3	0.3	0.3	UG/L	0.2	29	1	0.09	1				
	PYRENE	0.2	0.2	0.2	UG/L	0.3	29	1	1,100	0				
TPHEXT	TPH-DIESEL	78	100	93	UG/L	100	13	3	100	0i				
	TPH-MOTOR OIL	54	140	84	UG/L	100	3	3	100	1i				
ANION	CHLORIDE	1,330,000	3,820,000	2,190,000	UG/L	169,000	9	9						
	FLUORIDE	130	130	130	UG/L	100	5	1			1,400	0		
	NITRATE	540	770	655	UG/L	500	9	2	58,000	0				
	ORTHOPHOSPHATE	7,050	7,050	7,050	UG/L	2,000	9	1						
	SULFATE	6,400	673,000	226,000	UG/L	40,000	9	9						
SOLIDS	TOTAL DISSOLVED SOLIDS	2,700,000	8,800,000	4,700,000	UG/L	29,000	9	9						
DIOXIN	TETRACHLORODIBENZOFURANS(TOTA.	0.004	0.004	0.004	UG/L	0.001	8	1						
SALIN	SALINITY	3.2	3.2	3.2	PPT	0.005	1	1						

TABLE 4.9-8 (Continued)

STATISTICAL SUMMARY OF MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-33 SOUTH HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

CYAN	Cyanide
EPA	U.S. Environmental Protection Agency
MCL	Maximum contaminant level
NAWQC	National Ambient Water Quality Criteria
O&G	Total oil and grease
PCTMST	Percent moisture
PEST	Pesticide/polychlorinated biphenyl
PPT	Parts per thousand
PRG	Preliminary remediation goal
SALIN	Salinity
SVOC	Semivolatile organic compound
TMICROB	Coliform
TOC	Total organic carbon
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
UG/L	Microgram per liter
VOC	Volatile organic compound

a Organic results of less than 10 are reported to one significant figure, and results of greater than or equal to 10 are reported to two significant figures. Inorganic results of less than 10 are reported to two significant figures, and results of greater than or equal to 10 are reported to three significant figures. Values that are not nondetects are compared to screening criteria before the significant figure rule is applied. Both the value and the screening criteria are then rounded for reporting purposes.

b Blank boxes indicate that screening critera have not been established for these analytes.

c Total number of samples analyzed

d Total number of samples showing concentrations greater than detection limit

e Total number of samples showing concentrations greater than tap water PRG
California-modified PRGs were used for the following analytes: 1,2-Dibromo-3-chloropropane, benzo[a]pyrene, benzo[k]fluoranthene, cadmium, chromium VI, chrysene, lead, nickel, and tetrachloroethylene (PCE).
For the analytes listed below, Region IX PRGs are not available; therefore, PRGs for similar chemicals were used as follows:

Analyte:	Similar Analyte:
2-Methylnapthalene	Naphthalene
Acenaphthylene	Acenaphthene
Alpha-chlordane	Chlordane
Aroclor-1260	Polychlorinated biphenyls
Benzo(g,h,i)perylene	Naphthalene
Delta BHC	HCH-technical
Endosulfan I	Endosulfan
Endosulfan sulfate	Endosulfan
Endrin aldehyde	Endrin
Endrin ketone	Endrin
Gamma-chlordane	Chlordane
Phenanthrene	Naphthalene

f EPA Title 40 Code of Federal Regulations or California Code of Regulations Title 22 MCL used, whichever is more stringent

g Total number of samples showing concentrations greater than MCL

h Total number of samples showing concentrations greater than NAWQC;
NAWQC based on 4-day average study of saltwater aquatic life

i Total number of samples showing concentrations greater than TPH, TRPH, or O&G screening level, not PRG value

TABLE 4.9-9

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09MW44A	IR09MW44A	IR09MW44A	IR09MW44A	IR09MW44A	IR09MW44A	IR09MW44A
Sample Number	9141X206	9151X346	9151X347	9345X077	9408X218	9408X219	9419X285
Sample Date	10/08/91	12/18/91	12/18/91	11/10/93	02/22/94	02/22/94	05/11/94
Metal (ug/L)							
ALUMINUM	ND (25.7)	ND (15.3)	ND (15.3)	NA	NA	NA	NA
ANTIMONY	ND (14.3)	ND (27.6)	ND (27.6)	NA	NA	NA	NA
ARSENIC	2.7 *	4.4 *	3.8 *	NA	NA	NA	NA
BARIUM	47.8	133	139	NA	NA	NA	NA
CADMIUM	ND (3.4)	ND (2.3)	ND (2.3)	NA	NA	NA	NA
CALCIUM	55,200	88,900	90,200	NA	NA	NA	NA
COBALT	7.6	11.2	ND (10.4)	NA	NA	NA	NA
COPPER	ND (1.3)	ND (3.0)	ND (3.0)	NA	NA	NA	NA
IRON	ND (11.9)	ND (6.3)	ND (6.3)	NA	NA	NA	NA
LEAD	ND (1.2)	ND (2.0)	ND (2.0)	NA	NA	NA	NA
MAGNESIUM	203,000	402,000	410,000	NA	NA	NA	NA
MANGANESE	227 *	684 *	735 *	NA	NA	NA	NA
MERCURY	0.22 B	ND (0.40)	ND (0.40)	NA	NA	NA	NA
MOLYBDENUM	ND (6.2)	ND (3.1)	ND (3.1)	NA	NA	NA	NA
NICKEL	ND (49.8)	38.7 B	51.4 B	101 B6	62.4 B	63.5 B	47.4 B
POTASSIUM	29,700	37,600	37,800	NA	NA	NA	NA
SILVER	ND (1.7)	ND (4.9)	ND (4.9)	NA	NA	NA	NA
SODIUM	933,000	1,430,000	1,430,000	NA	NA	NA	NA
THALLIUM	ND (15.0)	ND (2.0)	ND (2.0)	NA	NA	NA	NA
VANADIUM	3.8	ND (3.9)	ND (3.9)	NA	NA	NA	NA
ZINC	ND (1.6)	ND (6.1)	ND (6.1)	NA	NA	NA	NA
Cyanide (ug/L)							
CYANIDE	ND (10.0)	ND (10.0)	ND (10.0)	ND (0.8)	ND (1)	ND (1)	ND (1.2)
Volatile Organic Compound (ug/L)							
CHLOROFORM	7 *	1 *	1 *	ND (1)	ND (1)	ND (1)	ND (0.5)
Semivolatile Organic Compound (ug/L)							
ACENAPHTHENE	ND (2)	ND (2)	ND (2)	ND (10)	ND (10)	ND (10)	ND (10)
BENZO(A)PYRENE	ND (0.05)	ND (0.05)	ND (0.05)	ND (10)	ND (10)	ND (10)	ND (10)
BENZO(B)FLUORANTHENE	ND (0.02)	ND (0.02)	ND (0.02)	ND (10)	ND (10)	ND (10)	ND (10)
BENZO(G,H,I)PERYLENE	ND (0.08)	ND (0.08)	ND (0.08)	ND (10)	ND (10)	ND (10)	ND (10)
BENZO(K)FLUORANTHENE	ND (0.02)	ND (0.02)	ND (0.02)	ND (10)	ND (10)	ND (10)	ND (10)
FLUORANTHENE	ND (0.2)	ND (0.2)	ND (0.2)	ND (10)	ND (10)	ND (10)	ND (10)
FLUORENE	ND (0.2)	ND (0.2)	ND (0.2)	ND (10)	ND (10)	ND (10)	ND (10)
INDENO(1,2,3-CD)PYRENE	ND (0.2)	ND (0.2)	ND (0.2)	ND (10)	ND (10)	ND (10)	ND (10)

TABLE 4.9-9 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09MW44A	IR09MW44A	IR09MW44A	IR09MW44A	IR09MW44A	IR09MW44A	IR09MW44A
Sample Number	9141X206	9151X346	9151X347	9345X077	9408X218	9408X219	9419X285
Sample Date	10/08/91	12/18/91	12/18/91	11/10/93	02/22/94	02/22/94	05/11/94
Semivolatile Organic Compound (ug/L)							
PYRENE	ND (0.3)	ND (0.3)	ND (0.3)	ND (10)	ND (10)	ND (10)	ND (10)
TPH-Extractable (ug/L)							
TPH-DIESEL	ND (500)	ND (500)	ND (500)	NA	NA	NA	NA
TPH-MOTOR OIL	NA	NA	NA	NA	NA	NA	NA
Anion (ug/L)							
CHLORIDE	1,770,000	2,950,000	3,030,000	NA	NA	NA	NA
FLUORIDE	ND (5,000)	NA	NA	NA	NA	NA	NA
NITRATE	770	530	550	NA	NA	NA	NA
ORTHOPHOSPHATE	ND (2,000)	ND (2,000)	ND (2,000)	NA	NA	NA	NA
SULFATE	284,000	853,000	492,000	NA	NA	NA	NA
Solids (ug/L)							
TOTAL DISSOLVED SOLIDS	3,700,000	6,400,000	6,200,000	NA	NA	NA	NA
Dioxins and Furans (ug/L)							
TETRACHLORODIBENZOFURANS(TOTAL)	0.004	ND (0.00008)	ND (0.00006)	NA	NA	NA	NA
pH (pH units)							
PH	7.4	7.6	7.6	NA	NA	NA	NA
Salinity (ppt)							
SALINITY	NA	NA	NA	NA	NA	NA	NA

TABLE 4.9-9 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09MW44A	IR09MW44A	IR09P040A	IR09P040A	IR09P040A	IR09P040A	IR09P040A
Sample Number	9436X456	9436X457	9141X210	9141X211	9151X341	9151X342	9345X094
Sample Date	09/07/94	09/07/94	10/08/91	10/08/91	12/17/91	12/17/91	11/12/93
Metal (ug/L)							
ALUMINUM	NA	NA	ND (36.4)	26.2	ND (15.3)	ND (15.3)	NA
ANTIMONY	NA	NA	ND (14.3)	ND (14.3)	ND (27.6)	ND (27.6)	NA
ARSENIC	NA	NA	ND (2.5)	ND (2.5)	2.8 *	2.1 *	NA
BARIUM	NA	NA	90.2	89.0	81.3	78.1	NA
CADMIUM	NA	NA	ND (3.4)	ND (3.4)	ND (2.3)	ND (2.3)	NA
CALCIUM	NA	NA	162,000	161,000	184,000	177,000	NA
COBALT	NA	NA	8.4	ND (4.9)	ND (10.4)	ND (10.4)	NA
COPPER	NA	NA	ND (1.3)	3.3 B	ND (3.0)	ND (3.0)	NA
IRON	NA	NA	ND (36.9)	ND (30.7)	ND (7.7)	ND (6.3)	NA
LEAD	NA	NA	ND (1.2)	ND (1.2)	ND (2.0)	ND (2.0)	NA
MAGNESIUM	NA	NA	212,000	210,000	236,000	225,000	NA
MANGANESE	NA	NA	3,150 *	3,230 *	3,640 *	3,170 *	NA
MERCURY	NA	NA	ND (0.20)	ND (0.20)	ND (0.40)	ND (0.40)	NA
MOLYBDENUM	NA	NA	ND (5.5)	ND (11.0)	ND (3.3)	ND (3.3)	NA
NICKEL	49.1 B	50.6 B	ND (36.5)	ND (23.9)	ND (17.8)	ND (17.8)	15.3 B
POTASSIUM	NA	NA	10,900	11,200	8,190	7,180	NA
SILVER	NA	NA	ND (1.7)	1.7 B	ND (4.9)	ND (4.9)	NA
SODIUM	NA	NA	778,000	771,000	766,000	743,000	NA
THALLIUM	NA	NA	ND (15.0)	ND (15.0)	ND (2.0)	ND (2.0)	NA
VANADIUM	NA	NA	3.4	9.2	5.2	5.1	NA
ZINC	NA	NA	ND (1.6)	ND (1.6)	ND (6.1)	ND (6.1)	NA
Cyanide (ug/L)							
CYANIDE	1.6	ND (1.1)	ND (10.0)	ND (10.0)	ND (10.0)	ND (10.0)	ND (0.8)
Volatile Organic Compound (ug/L)							
CHLOROFORM	ND (0.5)	ND (0.5)	2 *	2 *	ND (5)	ND (5)	ND (1)
Semivolatile Organic Compound (ug/L)							
ACENAPHTHENE	ND (10)	ND (10)	ND (2)	ND (2)	ND (2)	ND (2)	ND (10)
BENZO(A)PYRENE	ND (10)	ND (10)	0.3 *δ	0.2 *δ	0.2 *δ	0.1 *	ND (10)
BENZO(B)FLUORANTHENE	ND (10)	ND (10)	0.2 *	0.1 *	0.1 *	0.07	ND (10)
BENZO(G,H,I)PERYLENE	ND (10)	ND (10)	0.3	0.3	0.2	0.1	ND (10)
BENZO(K)FLUORANTHENE	ND (10)	ND (10)	0.08	0.06	0.06	0.03	ND (10)
FLUORANTHENE	ND (10)	ND (10)	0.2	ND (0.2)	ND (0.2)	ND (0.2)	ND (10)
FLUORENE	ND (10)	ND (10)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (10)
INDENO(1,2,3-CD)PYRENE	ND (10)	ND (10)	0.3 *	0.2 *	ND (0.2)	ND (0.2)	ND (10)

TABLE 4.9-9 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09MW44A	IR09MW44A	IR09P040A	IR09P040A	IR09P040A	IR09P040A	IR09P040A
Sample Number	9436X456	9436X457	9141X210	9141X211	9151X341	9151X342	9345X094
Sample Date	09/07/94	09/07/94	10/08/91	10/08/91	12/17/91	12/17/91	11/12/93
Semivolatile Organic Compound (ug/L)							
PYRENE	ND (10)	ND (10)	0.3	ND (0.3)	ND (0.3)	ND (0.3)	ND (10)
TPH-Extractable (ug/L)							
TPH-DIESEL	NA	NA	ND (500)	ND (500)	ND (500)	ND (500)	NA
TPH-MOTOR OIL	NA	NA	NA	NA	NA	NA	NA
Anion (ug/L)							
CHLORIDE	NA	NA	1,710,000	1,770,000	1,480,000	1,490,000	NA
FLUORIDE	NA	NA	ND (5,000)	ND (5,000)	NA	NA	NA
NITRATE	NA	NA	ND (500)	ND (500)	ND (500)	ND (500)	NA
ORTHOPHOSPHATE	NA	NA	ND (2,000)	13,100	ND (2,000)	ND (2,000)	NA
SULFATE	NA	NA	234,000	235,000	260,000	263,000	NA
Solids (ug/L)							
TOTAL DISSOLVED SOLIDS	NA	NA	3,400,000	3,500,000	3,500,000	3,500,000	NA
Dioxins and Furans (ug/L)							
TETRACHLORODIBENZOFURANS(TOTAL)	NA	NA	ND (0.0003)	ND (0.0003)	ND (0.00006)	ND (0.00009)	NA
pH (pH units)							
PH	NA	NA	7.0	7.1	6.9	7.0	NA
Salinity (ppt)							
SALINITY	NA	NA	NA	NA	NA	NA	NA

TABLE 4.9-9 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09P040A	IR09P040A	IR09P042A	IR09P042A	IR09P042A	IR09P042A	IR09P042A
Sample Number	9345X095	9436X464	9141X208	9151X348	9345X088	9436X461	9436X462
Sample Date	11/12/93	09/08/94	10/08/91	12/18/91	11/11/93	09/08/94	09/08/94
Metal (ug/L)							
ALUMINUM	NA	NA	ND (25.7)	ND (15.3)	NA	NA	NA
ANTIMONY	NA	NA	ND (14.3)	ND (27.6)	NA	NA	NA
ARSENIC	NA	NA	ND (2.5)	ND (1.4)	NA	NA	NA
BARIUM	NA	NA	174	207	NA	NA	NA
CADMIUM	NA	NA	ND (3.4)	ND (2.3)	NA	NA	NA
CALCIUM	NA	NA	95,900	93,900	NA	NA	NA
COBALT	NA	NA	5.0	ND (10.4)	NA	NA	NA
COPPER	NA	NA	1.9	ND (3.0)	NA	NA	NA
IRON	NA	NA	ND (16.8)	ND (6.8)	NA	NA	NA
LEAD	NA	NA	ND (1.2)	ND (2.0)	NA	NA	NA
MAGNESIUM	NA	NA	167,000	165,000	NA	NA	NA
MANGANESE	NA	NA	745 *	722 *	NA	NA	NA
MERCURY	NA	NA	ND (0.20)	ND (0.40)	NA	NA	NA
MOLYBDENUM	NA	NA	33.5	17.4	NA	NA	NA
NICKEL	12.5 B	12.6 B	ND (22.2)	ND (17.8)	7.7	5.6	5.7
POTASSIUM	NA	NA	25,000	25,100	NA	NA	NA
SILVER	NA	NA	ND (1.7)	ND (4.9)	NA	NA	NA
SODIUM	NA	NA	611,000	601,000	NA	NA	NA
THALLIUM	NA	NA	ND (15.0)	ND (2.0)	NA	NA	NA
VANADIUM	NA	NA	3.3	ND (3.9)	NA	NA	NA
ZINC	NA	NA	ND (1.6)	ND (6.1)	NA	NA	NA
Cyanide (ug/L)							
CYANIDE	ND (0.8)	1.3	ND (10.0)	ND (10.0)	ND (0.8)	ND (1.1)	ND (1.1)
Volatile Organic Compound (ug/L)							
CHLOROFORM	ND (1)	ND (0.5)	ND (0.5)	ND (5)	ND (1)	ND (0.5)	ND (0.5)
Semivolatile Organic Compound (ug/L)							
ACENAPHTHENE	ND (10)	ND (10)	ND (2)	17	ND (10)	ND (10)	ND (10)
BENZO(A)PYRENE	ND (10)	ND (10)	ND (0.05)	ND (0.05)	ND (10)	ND (10)	ND (10)
BENZO(B)FLUORANTHENE	ND (10)	ND (10)	ND (0.02)	ND (0.02)	ND (10)	ND (10)	ND (10)
BENZO(G,H,I)PERYLENE	ND (10)	ND (10)	ND (0.08)	ND (0.08)	ND (10)	ND (10)	ND (10)
BENZO(K)FLUORANTHENE	ND (10)	ND (10)	ND (0.02)	ND (0.02)	ND (10)	ND (10)	ND (10)
FLUORANTHENE	ND (10)	ND (10)	ND (0.2)	ND (0.2)	ND (10)	ND (10)	ND (10)
FLUORENE	ND (10)	ND (10)	0.2	ND (0.2)	ND (10)	ND (10)	ND (10)
INDENO(1,2,3-CD)PYRENE	ND (10)	ND (10)	ND (0.2)	ND (0.2)	ND (10)	ND (10)	ND (10)

TABLE 4.9-9 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09P040A	IR09P040A	IR09P042A	IR09P042A	IR09P042A	IR09P042A	IR09P042A
Sample Number	9345X095	9436X464	9141X208	9151X348	9345X088	9436X461	9436X462
Sample Date	11/12/93	09/08/94	10/08/91	12/18/91	11/11/93	09/08/94	09/08/94
Semivolatile Organic Compound (ug/L)							
PYRENE	ND (10)	ND (10)	ND (0.3)	ND (0.3)	ND (10)	ND (10)	ND (10)
TPH-Extractable (ug/L)							
TPH-DIESEL	NA	NA	ND (500)	ND (500)	NA	NA	NA
TPH-MOTOR OIL	NA	NA	NA	NA	NA	NA	NA
Anion (ug/L)							
CHLORIDE	NA	NA	1,400,000	1,330,000	NA	NA	NA
FLUORIDE	NA	NA	ND (2,000)	NA	NA	NA	NA
NITRATE	NA	NA	ND (500)	ND (500)	NA	NA	NA
ORTHOPHOSPHATE	NA	NA	ND (2,000)	ND (2,000)	NA	NA	NA
SULFATE	NA	NA	57,900	42,200	NA	NA	NA
Solids (ug/L)							
TOTAL DISSOLVED SOLIDS	NA	NA	2,800,000	2,700,000	NA	NA	NA
Dioxins and Furans (ug/L)							
TETRACHLORODIBENZOFURANS(TOTAL)	NA	NA	ND (0.0003)	ND (0.00004)	NA	NA	NA
pH (pH units)							
PH	NA	NA	7.5	7.4	NA	NA	NA
Salinity (ppt)							
SALINITY	NA	NA	NA	NA	NA	NA	NA

TABLE 4.9-9 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09P043A	IR09P043A	IR09P043A	IR09P043A	IR09P043A	IR09P043A	IR09P043A
Sample Number	9141X207	9151X349	9345X078	9345X079	9408X235	9408X236	9419M548
Sample Date	10/08/91	12/18/91	11/10/93	11/10/93	02/24/94	02/24/94	05/12/94
Metal (ug/L)							
ALUMINUM	ND (25.7)	ND (15.3)	NA	NA	NA	NA	NA
ANTIMONY	ND (14.3)	33.3 *δ	NA	NA	NA	NA	NA
ARSENIC	4.3 *	6.8 *	NA	NA	NA	NA	NA
BARIUM	563	559	NA	NA	NA	NA	NA
CADMIUM	ND (3.4)	ND (2.3)	NA	NA	NA	NA	NA
CALCIUM	141,000	144,000	NA	NA	NA	NA	NA
COBALT	16.6	22.5	NA	NA	NA	NA	NA
COPPER	2.4	ND (7.2)	NA	NA	NA	NA	NA
IRON	ND (26.4)	ND (8.2)	NA	NA	NA	NA	NA
LEAD	ND (1.2)	ND (2.0)	NA	NA	NA	NA	NA
MAGNESIUM	1,220,000	1,330,000	NA	NA	NA	NA	NA
MANGANESE	3,970 *	5,750 *	NA	NA	NA	NA	NA
MERCURY	ND (0.20)	ND (0.40)	NA	NA	NA	NA	NA
MOLYBDENUM	ND (5.4)	ND (6.7)	NA	NA	NA	NA	NA
NICKEL	185 βδ	134 βδ	141 βδ	122 βδ	119 βδ	117 βδ	99.6 β
POTASSIUM	14,000	11,000	NA	NA	NA	NA	NA
SILVER	ND (1.7)	ND (4.9)	NA	NA	NA	NA	NA
SODIUM	698,000	748,000	NA	NA	NA	NA	NA
THALLIUM	ND (15.0)	ND (2.0)	NA	NA	NA	NA	NA
VANADIUM	2.5	8.1	NA	NA	NA	NA	NA
ZINC	ND (1.6)	7.0	NA	NA	NA	NA	NA
Cyanide (ug/L)							
CYANIDE	ND (10.0)	ND (10.0)	ND (0.8)	ND (0.8)	ND (0.6)	ND (0.6)	ND (1.2)
Volatile Organic Compound (ug/L)							
CHLOROFORM	ND (0.5)	ND (5)	ND (1)	ND (1)	ND (1)	ND (1)	ND (0.5)
Semivolatile Organic Compound (ug/L)							
ACENAPHTHENE	ND (2)	ND (3)	ND (10)	ND (10)	ND (10)	ND (11)	ND (10)
BENZO(A)PYRENE	ND (0.05)	ND (0.05)	ND (10)	ND (10)	ND (10)	ND (11)	ND (10)
BENZO(B)FLUORANTHENE	ND (0.02)	ND (0.02)	ND (10)	ND (10)	ND (10)	ND (11)	ND (10)
BENZO(G,H,I)PERYLENE	ND (0.08)	ND (0.08)	ND (10)	ND (10)	ND (10)	ND (11)	ND (10)
BENZO(K)FLUORANTHENE	ND (0.02)	ND (0.02)	ND (10)	ND (10)	ND (10)	ND (11)	ND (10)
FLUORANTHENE	ND (0.2)	ND (0.2)	ND (10)	ND (10)	ND (10)	ND (11)	ND (10)
FLUORENE	ND (0.2)	ND (0.2)	ND (10)	ND (10)	ND (10)	ND (11)	ND (10)
INDENO(1,2,3-CD)PYRENE	ND (0.2)	ND (0.2)	ND (10)	ND (10)	ND (10)	ND (11)	ND (10)

TABLE 4.9-9 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09P043A	IR09P043A	IR09P043A.	IR09P043A	IR09P043A	IR09P043A	IR09P043A
Sample Number	9141X207	9151X349	9345X078	9345X079	9408X235	9408X236	9419M548
Sample Date	10/08/91	12/18/91	11/10/93	11/10/93	02/24/94	02/24/94	05/12/94
Semivolatile Organic Compound (ug/L)							
PYRENE	ND (0.3)	ND (0.3)	ND (10)	ND (10)	ND (10)	ND (11)	ND (10)
TPH-Extractable (ug/L)							
TPH-DIESEL	ND (500)	ND (500)	NA	NA	NA	NA	NA
TPH-MOTOR OIL	NA	NA	NA	NA	NA	NA	NA
Anion (ug/L)							
CHLORIDE	3,560,000	3,820,000	NA	NA	NA	NA	NA
FLUORIDE	ND (5,000)	NA	NA	NA	NA	NA	NA
NITRATE	ND (500)	ND (500)	NA	NA	NA	NA	NA
ORTHOPHOSPHATE	ND (2,000)	ND (2,000)	NA	NA	NA	NA	NA
SULFATE	237,000	236,000	NA	NA	NA	NA	NA
Solids (ug/L)							
TOTAL DISSOLVED SOLIDS	7,400,000	8,800,000	NA	NA	NA	NA	NA
Dioxins and Furans (ug/L)							
TETRACHLORODIBENZOFURANS(TOTAL)	ND (0.0002)	ND (0.0001)	NA	NA	NA	NA	NA
pH (pH units)							
PH	7.0	7.0	NA	NA	NA	NA	NA
Salinity (ppt)							
SALINITY	NA	NA	NA	NA	NA	NA	NA

TABLE 4.9-9 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09P043A	PA33MW36A	PA33MW36A	PA33MW36A	PA33MW37A	PA33MW37A	PA33MW37A
Sample Number	9436X463	9312X953	9606W069	9611W147	9312X951	9312X952	9530X903
Sample Date	09/08/94	03/25/93	02/07/96	03/11/96	03/25/93	03/25/93	07/28/95
Metal (ug/L)							
ALUMINUM	NA	27.1	ND (19.1)	ND (49.9)	36.7	28.3	ND (16.3)
ANTIMONY	NA	14.2 δ	ND (1.6)	ND (1.6)	15.7 *δ	17.3 *δ	ND (2.1)
ARSENIC	NA	4.0 *	1.5 *	1.5 *	6.5 *	6.4 *	9.2 *
BARIUM	NA	441	583	710	334	349	530
CADMIUM	NA	ND (1.0)	0.25	ND (0.20)	ND (1.0)	ND (1.0)	ND (0.54)
CALCIUM	NA	157,000	216,000	215,000	ND (275,000)	310,000	279,000
COBALT	NA	3.3	5.5	4.3	3.0	3.5	57.0
COPPER	NA	ND (4.1)	ND (3.7)	ND (1.5)	ND (4.1)	ND (4.1)	ND (4.4)
IRON	NA	ND (18.8)	ND (21.2)	394	28.0	ND (18.8)	31.2
LEAD	NA	8.6 *B	ND (0.80)	ND (0.80)	15.1 *B	ND (2.6)	1.6
MAGNESIUM	NA	281,000	372,000	353,000	1,080,000	588,000	902,000
MANGANESE	NA	3,090 *	4,300 *	4,450 *	430 *	538 *	2,790 *
MERCURY	NA	0.12 B	ND (0.10)	ND (0.10)	0.15 B	0.13 B	ND (0.11)
MOLYBDENUM	NA	ND (2.8)	ND (2.9)	ND (1.4)	3.9	5.9	5.5
NICKEL	112 Bδ	17.4 B	18.6 B	16.4 B	59.4 B	61.2 B	317 Bδ
POTASSIUM	NA	4,030	2,560	2,810	8,270	9,120	9,730
SILVER	NA	ND (1.3)	ND (0.50)	ND (0.50)	ND (1.3)	ND (1.3)	ND (0.60)
SODIUM	NA	572,000	546,000	562,000	1,120,000	682,000	1,090,000
THALLIUM	NA	NA	1.9	ND (1.9)	NA	NA	10.2 δ
VANADIUM	NA	4.8	9.1	7.4	2.9	2.5	13.9
ZINC	NA	ND (1.6)	ND (19.5)	ND (9.3)	ND (1.6)	ND (1.6)	ND (50.5)
Cyanide (ug/L)							
CYANIDE	ND (1.1)	NA	NA	NA	NA	NA	NA
Volatile Organic Compound (ug/L)							
CHLOROFORM	ND (0.5)	NA	ND (0.5)	ND (0.5)	NA	NA	NA
Semivolatile Organic Compound (ug/L)							
ACENAPHTHENE	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	NA
BENZO(A)PYRENE	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	NA
BENZO(B)FLUORANTHENE	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	NA
BENZO(G,H,I)PERYLENE	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	NA
BENZO(K)FLUORANTHENE	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	NA
FLUORANTHENE	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	NA
FLUORENE	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	NA
INDENO(1,2,3-CD)PYRENE	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	NA

TABLE 4.9-9 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09P043A	PA33MW36A	PA33MW36A	PA33MW36A	PA33MW37A	PA33MW37A	PA33MW37A
Sample Number	9436X463	9312X953	9606W069	9611W147	9312X951	9312X952	9530X903
Sample Date	09/08/94	03/25/93	02/07/96	03/11/96	03/25/93	03/25/93	07/28/95
Semivolatile Organic Compound (ug/L)							
PYRENE	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	NA
TPH-Extractable (ug/L)							
TPH-DIESEL	NA	ND (500)	100	100	ND (500)	ND (500)	NA
TPH-MOTOR OIL	NA	NA	59	54	NA	NA	NA
Anion (ug/L)							
CHLORIDE	NA	NA	NA	1,630,000	NA	NA	NA
FLUORIDE	NA	NA	NA	130	NA	NA	NA
NITRATE	NA	NA	NA	ND (20.0)	NA	NA	NA
ORTHOPHOSPHATE	NA	NA	NA	ND (50.0)	NA	NA	NA
SULFATE	NA	NA	NA	6,400	NA	NA	NA
Solids (ug/L)							
TOTAL DISSOLVED SOLIDS	NA	NA	NA	3,300,000	NA	NA	NA
Dioxins and Furans (ug/L)							
TETRACHLORODIBENZOFURANS(TOTAL)	NA	NA	NA	NA	NA	NA	NA
pH (pH units)							
PH	NA	NA	7.1	7.1	NA	NA	NA
Salinity (ppt)							
SALINITY	NA	NA	NA	3.2	NA	NA	NA

TABLE 4.9-9 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	PA33MW37A
Sample Number	9607J864
Sample Date	02/12/96
Metal (ug/L)	
ALUMINUM	ND (18.0)
ANTIMONY	ND (1.6)
ARSENIC	8.1 *
BARIUM	952
CADMIUM	ND (0.20)
CALCIUM	249,000
COBALT	5.9
COPPER	ND (0.50)
IRON	ND (399)
LEAD	ND (0.80)
MAGNESIUM	927,000
MANGANESE	4,150 *
MERCURY	ND (0.10)
MOLYBDENUM	9.8
NICKEL	38.9 B
POTASSIUM	39,200
SILVER	ND (0.50)
SODIUM	2,220,000
THALLIUM	ND (1.9)
VANADIUM	ND (2.4)
ZINC	ND (7.4)
Cyanide (ug/L)	
CYANIDE	NA
Volatile Organic Compound (ug/L)	
CHLOROFORM	ND (0.5)
Semivolatile Organic Compound (ug/L)	
ACENAPHTHENE	ND (10)
BENZO(A)PYRENE	ND (10)
BENZO(B)FLUORANTHENE	ND (10)
BENZO(G,H,I)PERYLENE	ND (10)
BENZO(K)FLUORANTHENE	ND (10)
FLUORANTHENE	ND (10)
FLUORENE	ND (10)
INDENO(1,2,3-CD)PYRENE	ND (10)

TABLE 4.9-9 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	PA33MW37A
Sample Number	9607J864
Sample Date	02/12/96
Semivolatile Organic Compound (ug/L)	
PYRENE	ND (10)
TPH-Extractable (ug/L)	
TPH-DIESEL	78
TPH-MOTOR OIL	140
Anion (ug/L)	
CHLORIDE	NA
FLUORIDE	NA
NITRATE	NA
ORTHOPHOSPHATE	NA
SULFATE	NA
Solids (ug/L)	
TOTAL DISSOLVED SOLIDS	NA
Dioxins and Furans (ug/L)	
TETRACHLORODIBENZOFURANS(TOTAL)	NA
pH (pH units)	
PH	7.2
Salinity (ppt)	
SALINITY	NA

TABLE 4.9-9 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

NA	Not analyzed
ND()	Not detected (detection limit in parentheses)
ppt	Parts per thousand
µg/L	Microgram per liter
*	Detected concentration greater than U.S. Environmental Protection Agency Region IX preliminary remediation goals (PRG) for tap water
ß	Detected concentration greater than National Ambient Water Quality Criteria (NAWQC) based on 4-day average study of saltwater aquatic life
δ	Detected concentration greater than maximum contaminant level (MCL) U.S. Environmental Protection Agency Title 40 Code of Federal Regulations or California Code of Regulations Title 22 MCL used, whichever is more stringent
▒	Detected concentration greater than at least one screening criterion.

TABLE 4.9-10

SUMMARY OF HYDROPUNCH GROUNDWATER ANALYTICAL TESTS - IR-33 SOUTH HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
IR33B067	9420R132																		✓	✓		✓
IR33B094	9545J593																		✓	✓		✓
IR34B033	9438A074																		✓	✓		✓

Notes:

CHROM	CHROMIUM VI
CYAN	Cyanide
DIOXIN	Dioxins and Furans
O&G	Total oil and grease
PAH	Polynuclear aromatic hydrocarbons
PCTMST	Percent moisture
PEST	Pesticides/polychlorinated biphenyls
PHYS	Physical characteristic
SALIN	Salinity
SVOC	Semivolatile organic compounds
SOLIDS	Total dissolved solids
TOC	Total organic carbon
TMICROB	Coliform
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
VOC	Volatile organic compounds

TABLE 4.9-11

STATISTICAL SUMMARY OF HYDROPUNCH GROUNDWATER ANALYTICAL RESULTS - IR-33 SOUTH HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Tap Water PRG Value	Above[e] PRG	MCL Value[f]	Above[g] MCL	NAWQC Value	Above[h] NAWQC
VOC	2-BUTANONE	39	39	39	UG/L	5	3	1	1,900	0				
	TRICHLOROETHENE	0.4	0.4	0.4	UG/L	1	3	1	2	0	5	0		
TPHEXT	TPH-DIESEL	200	200	200	UG/L	100	3	1	100	1i				
	TPH-MOTOR OIL	970	2,400	1,700	UG/L	100	3	2	100	2i				

TABLE 4.9-11 (Continued)

STATISTICAL SUMMARY OF HYDROPUNCH GROUNDWATER ANALYTICAL RESULTS - IR-33 SOUTH HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

CYAN	Cyanide
EPA	U.S. Environmental Protection Agency
MCL	Maximum contaminant level
NAWQC	National Ambient Water Quality Criteria
O&G	Total oil and grease
PCTMST	Percent moisture
PEST	Pesticide/polychlorinated biphenyl
PPT	Parts per thousand
PRG	Preliminary remediation goal
SALIN	Salinity
SVOC	Semivolatile organic compound
TMICROB	Coliform
TOC	Total organic carbon
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
UG/L	Microgram per liter
VOC	Volatile organic compound

a Organic results of less than 10 are reported to one significant figure, and results of greater than or equal to 10 are reported to two significant figures. Inorganic results of less than 10 are reported to two significant figures, and results of greater than or equal to 10 are reported to three significant figures. Values that are not nondetects are compared to screening criteria before the significant figure rule is applied. Both the value and the screening criteria are then rounded for reporting purposes.

b Blank boxes indicate that screening critera have not been established for these analytes.

c Total number of samples analyzed

d Total number of samples showing concentrations greater than detection limit

e Total number of samples showing concentrations greater than tap water PRG
California-modified PRGs were used for the following analytes: 1,2-Dibromo-3-chloropropane, benzo[a]pyrene, benzo[k]fluoranthene, cadmium, chromium VI, chrysene, lead, nickel, and tetrachloroethylene (PCE).
For the analytes listed below, Region IX PRGs are not available; therefore, PRGs for similar chemicals were used as follows:

Analyte:	Similar Analyte:
2-Methylnapthalene	Naphthalene
Acenaphthylene	Acenaphthene
Alpha-chlordane	Chlordane
Aroclor-1260	Polychlorinated biphenyls
Benzo(g,h,i)perylene	Naphthalene
Delta BHC	HCH-technical
Endosulfan I	Endosulfan
Endosulfan sulfate	Endosulfan
Endrin aldehyde	Endrin
Endrin ketone	Endrin
Gamma-chlordane	Chlordane
Phenanthrene	Naphthalene

f EPA Title 40 Code of Federal Regulations or California Code of Regulations Title 22 MCL used, whichever is more stringent

g Total number of samples showing concentrations greater than MCL

h Total number of samples showing concentrations greater than NAWQC;
NAWQC based on 4-day average study of saltwater aquatic life

i Total number of samples showing concentrations greater than TPH, TRPH, or O&G screening level, not PRG value

TABLE 4.9-12

HYDROPUNCH GROUNDWATER ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B067	IR33B094	IR34B033
Sample Number	9420R132	9545J593	9438A074
Sample Date	05/16/94	11/07/95	09/20/94
Volatile Organic Compound (ug/L)			
2-BUTANONE	39	ND (10)	ND (10)
TRICHLOROETHENE	ND (0.5)	ND (0.5)	0.4
TPH-Extractable (ug/L)			
TPH-DIESEL	ND (500)	200	ND (100)
TPH-MOTOR OIL	ND (6,500)	970	2,400

Notes:

NA Not analyzed
ND() Not detected (detection limit in parentheses)
µg/L Microgram per liter

TABLE 4.9-13

SUMMARY OF GRAB GROUNDWATER ANALYTICAL TESTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
IR33B095	9607W092						✓				✓	✓				✓			✓	✓	✓	✓
IR33B100	9438A070																		✓	✓		✓

Notes:

CHROM	CHROMIUM VI
CYAN	Cyanide
DIOXIN	Dioxins and Furans
O&G	Total oil and grease
PAH	Polynuclear aromatic hydrocarbons
PCTMST	Percent moisture
PEST	Pesticides/polychlorinated biphenyls
PHYS	Physical characteristic
SALIN	Salinity
SVOC	Semivolatile organic compounds
SOLIDS	Total dissolved solids
TOC	Total organic carbon
TMICROB	Coliform
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
VOC	Volatile organic compounds

TABLE 4.9-14

STATISTICAL SUMMARY OF GRAB GROUNDWATER ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Tap Water PRG Value	Above[e] PRG	MCL Value[f]	Above[g] MCL	NAWQC Value	Above[h] NAWQC
METAL	BARIUM	17.7	17.7	17.7	UG/L	0.30	1	1	2,600	0	1,000	0		
	CALCIUM	13,800	13,800	13,800	UG/L	14.2	1	1						
	COBALT	0.48	0.48	0.48	UG/L	0.40	1	1						
	MAGNESIUM	14,800	14,800	14,800	UG/L	16.3	1	1						
	MANGANESE	24.1	24.1	24.1	UG/L	0.10	1	1	180	0				
	MOLYBDENUM	2.9	2.9	2.9	UG/L	0.60	1	1	180	0				
	NICKEL	0.74	0.74	0.74	UG/L	0.70	1	1	730	0	100	0	8.2	0
	SODIUM	83,200	83,200	83,200	UG/L	168	1	1						
	VANADIUM	10.5	10.5	10.5	UG/L	0.40	1	1	260	0				
TPHEXT	TPH-DIESEL	170	170	170	UG/L	100	2	1	100	1i				
	TPH-MOTOR OIL	230	2,400	1,300	UG/L	300	2	2	100	2i				

TABLE 4.9-14 (Continued)

STATISTICAL SUMMARY OF GRAB GROUNDWATER ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

CYAN	Cyanide
EPA	U.S. Environmental Protection Agency
MCL	Maximum contaminant level
NAWQC	National Ambient Water Quality Criteria
O&G	Total oil and grease
PCTMST	Percent moisture
PEST	Pesticide/polychlorinated biphenyl
PPT	Parts per thousand
PRG	Preliminary remediation goal
SALIN	Salinity
SVOC	Semivolatile organic compound
TMICROB	Coliform
TOC	Total organic carbon
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
UG/L	Microgram per liter
VOC	Volatile organic compound

a Organic results of less than 10 are reported to one significant figure, and results of greater than or equal to 10 are reported to two significant figures. Inorganic results of less than 10 are reported to two significant figures, and results of greater than or equal to 10 are reported to three significant figures. Values that are not nondetects are compared to screening criteria before the significant figure rule is applied. Both the value and the screening criteria are then rounded for reporting purposes.

b Blank boxes indicate that screening critera have not been established for these analytes.

c Total number of samples analyzed

d Total number of samples showing concentrations greater than detection limit

e Total number of samples showing concentrations greater than tap water PRG
California-modified PRGs were used for the following analytes: 1,2-Dibromo-3-chloropropane, benzo[a]pyrene, benzo[k]fluoranthene, cadmium, chromium VI, chrysene, lead, nickel, and tetrachloroethylene (PCE).
For the analytes listed below, Region IX PRGs are not available; therefore, PRGs for similar chemicals were used as follows:

Analyte:	Similar Analyte:
2-Methylnapthalene	Naphthalene
Acenaphthylene	Acenaphthene
Alpha-chlordane	Chlordane
Aroclor-1260	Polychlorinated biphenyls
Benzo(g,h,i)perylene	Naphthalene
Delta BHC	HCH-technical
Endosulfan I	Endosulfan
Endosulfan sulfate	Endosulfan
Endrin aldehyde	Endrin
Endrin ketone	Endrin
Gamma-chlordane	Chlordane
Phenanthrene	Naphthalene

f EPA Title 40 Code of Federal Regulations or California Code of Regulations Title 22 MCL used, whichever is more stringent

g Total number of samples showing concentrations greater than MCL

h Total number of samples showing concentrations greater than NAWQC;
NAWQC based on 4-day average study of saltwater aquatic life

i Total number of samples showing concentrations greater than TPH, TRPH, or O&G screening level, not PRG value

TABLE 4.9-15

GRAB GROUNDWATER ANALYTICAL RESULTS - IR-33 SOUTH
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33B095	IR33B100
Sample Number	9607W092	9438A070
Sample Date	02/13/96	09/19/94
Metal (ug/L)		
BARIUM	17.7	NA
CALCIUM	13,800	NA
COBALT	0.48	NA
MAGNESIUM	14,800	NA
MANGANESE	24.1	NA
MOLYBDENUM	2.9	NA
NICKEL	0.74	NA
SODIUM	83,200	NA
VANADIUM	10.5	NA
TPH-Extractable (ug/L)		
TPH-DIESEL	170	ND (500)
TPH-MOTOR OIL	230	2,400
pH (pH units)		
PH	7.2	NA

Notes:

NA	Not analyzed
ND()	Not detected (detection limit in parentheses)
µg/L	Microgram per liter

TABLE 4.10-1

SUMMARY OF STORM DRAIN SEDIMENT ANALYTICAL TESTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
PA34SW07	9308A625			√			√	√			√					√			√	√		√
PA34SW10	9308A627			√			√	√			√					√			√	√		√
PA34SW12	9308A626			√			√	√			√					√			√	√		√

Notes:

CHROM	CHROMIUM VI
CYAN	Cyanide
DIOXIN	Dioxins and Furans
O&G	Total oil and grease
PAH	Polynuclear aromatic hydrocarbons
PCTMST	Percent moisture
PEST	Pesticides/polychlorinated biphenyls
PHYS	Physical characteristic
SALIN	Salinity
SVOC	Semivolatile organic compounds
SOLIDS	Total dissolved solids
TOC	Total organic carbon
TMICROB	Coliform
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
VOC	Volatile organic compounds

TABLE 4.10-2

STATISTICAL SUMMARY OF STORM DRAIN SEDIMENT ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Residential PRG Value	Above[e] Res PRG	Industrial PRG Value	Above[f] Ind PRG	HPAL Value	Above[g] HPAL
METAL	ALUMINUM	7,030	10,000	8,720	MG/KG	4.2	3	3	76,700	0	100,000	0		
	ANTIMONY	18.4	33.2	25.8	MG/KG	10.3	3	2	30.7	1	681	0	9.05	2
	ARSENIC	4.5	23.8	12.9	MG/KG	1.6	3	3	0.32	3	2.0	3	11.10	1
	BARIUM	111	361	207	MG/KG	0.61	3	3	5,340	0	100,000	0	314.36	1
	CADMIUM	9.6	9.6	9.6	MG/KG	1.7	3	1	9.0	1	852	0	3.14	1
	CALCIUM	11,600	68,200	31,100	MG/KG	2.5	3	3						
	CHROMIUM	77.6	479	215	MG/KG	0.92	3	3	211	1	1,580	0	h	1
	COBALT	12.9	49.1	32.3	MG/KG	0.61	3	3					h	2
	COPPER	193	2,190	935	MG/KG	0.61	3	3	2,850	0	63,300	0	124.31	3
	IRON	17,100	48,000	30,400	MG/KG	1.5	3	3						
	LEAD	65.3	1,840	882	MG/KG	72.7	3	3	130	2	1,000	1	8.99	3
	MAGNESIUM	6,370	7,010	6,610	MG/KG	6.3	3	3						
	MANGANESE	336	601	495	MG/KG	0.30	3	3	382	2	8,300	0	1431.18	0
	MERCURY	0.18	0.28	0.23	MG/KG	0.12	3	2	23.0	0	511	0	2.28	0
	MOLYBDENUM	106	233	170	MG/KG	1.0	3	2	383	0	8,520	0	2.68	2
	NICKEL	72.3	335	163	MG/KG	2.1	3	3	150	1	34,100	0	h	1
	POTASSIUM	599	864	722	MG/KG	190	3	3						
	SILVER	0.98	2.0	1.5	MG/KG	0.67	3	2	383	0	8,520	0	1.43	1
	SODIUM	583	1,730	1,160	MG/KG	6.0	3	2						
	VANADIUM	19.5	44.1	32.4	MG/KG	0.61	3	3	537	0	11,900	0	117.17	0
	ZINC	484	1,650	1,050	MG/KG	0.30	3	3	23,000	0	100,000	0	109.86	3
VOC	1,1,1-TRICHLOROETHANE	7,400	7,400	7,400	UG/KG	21	3	1	3,200,000	0	3,000,000	0		

TABLE 4.10-2 (Continued)

STATISTICAL SUMMARY OF STORM DRAIN SEDIMENT ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection Frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Residential PRG Value	Above[e] Res PRG	Industrial PRG Value	Above[f] Ind PRG	HPAL Value	Above[g] HPAL
	1,1,2-TRICHLOROETHANE	110	110	110	UG/KG	21	3	1	1,400	0	3,300	0		
	1,1-DICHLOROETHANE	3,000	3,000	3,000	UG/KG	21	3	1	840,000	0	3,900,000	0		
	1,1-DICHLOROETHENE	2,300	2,300	2,300	UG/KG	21	3	1	38	1	82	1		
	1,2-DICHLOROETHANE	140	140	140	UG/KG	21	3	1	440	0	980	0		
	1,2-DICHLOROETHENE (TOTAL)	13,000	13,000	13,000	UG/KG	21	3	1	75,000	0	270,000	0		
	BENZENE	4	44	24	UG/KG	23	3	2	1,400	0	3,200	0		
	CARBON DISULFIDE	1	86	31	UG/KG	19	3	3	16,000	0	52,000	0		
	CHLOROBENZENE	87	87	87	UG/KG	21	3	1	160,000	0	570,000	0		
	CHLOROETHANE	5	34	20	UG/KG	17	3	2	1,100,000	0	2,200,000	0		
	CHLOROFORM	180	180	180	UG/KG	21	3	1	530	0	1,100	0		
	ETHYLBENZENE	190	2,400	1,000	UG/KG	17	3	3	2,900,000	0	3,100,000	0		
	TETRACHLOROETHENE	110	110	110	UG/KG	21	3	1	7,000	0	25,000	0		
	TOLUENE	8	21,000	7,000	UG/KG	80	3	3	1,900,000	0	2,700,000	0		
	TRICHLOROETHENE	17,000	17,000	17,000	UG/KG	21	3	1	7,100	1	17,000	1		
	VINYL CHLORIDE	42	42	42	UG/KG	21	3	1	5	1	11	1		
	XYLENE (TOTAL)	59	5,000	1,900	UG/KG	17	3	3	980,000	0	980,000	0		
SVOC	2-METHYLNAPHTHALENE	46	350	200	UG/KG	2,400	3	2	800,000	0	800,000	0		
	2-METHYLPHENOL	440	440	440	UG/KG	800	3	1	3,300,000	0	34,000,000	0		
	4-METHYLPHENOL	2,400	2,400	2,400	UG/KG	1,400	3	1	330,000	0	3,400,000	0		
	BENZO(A)ANTHRACENE	4,300	4,300	4,300	UG/KG	1,400	3	1	610	1	2,600	1		
	BENZO(B)FLUORANTHENE	3,200	3,200	3,200	UG/KG	1,400	3	1	610	1	2,600	1		
	BENZO(K)FLUORANTHENE	2,800	2,800	2,800	UG/KG	1,400	3	1	610	1	26,000	0		

TABLE 4.10-2 (Continued)

STATISTICAL SUMMARY OF STORM DRAIN SEDIMENT ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Residential PRG Value	Above[e] Res PRG	Industrial PRG Value	Above[f] Ind PRG	HPAL Value	Above[g] HPAL
	CARBAZOLE	1,600	1,600	1,600	UG/KG	1,400	3	1	22,000	0	95,000	0		
	CHRYSENE	6,200	6,200	6,200	UG/KG	1,400	3	1	6,100	1	24,000	0		
	DIBENZOFURAN	760	760	760	UG/KG	1,400	3	1	260,000	0	2,700,000	0		
	FLUORANTHENE	690	18,000	6,600	UG/KG	2,100	3	3	2,600,000	0	27,000,000	0		
	FLUORENE	2,100	2,100	2,100	UG/KG	1,400	3	1	300,000	0	300,000	0		
	INDENO(1,2,3-CD)PYRENE	2,100	2,100	2,100	UG/KG	1,400	3	1	610	1	2,600	0		
	NAPHTHALENE	1,300	1,300	1,300	UG/KG	1,400	3	1	800,000	0	800,000	0		
	PENTACHLOROPHENOL	620	5,000	2,800	UG/KG	2,700	3	2	2,500	1	7,900	0		
	PHENANTHRENE	440	12,000	4,700	UG/KG	2,100	3	3	800,000	0	800,000	0		
	PHENOL	640	640	640	UG/KG	800	3	1	39,000,000	0	100,000,00	0		
	PYRENE	570	10,000	3,800	UG/KG	2,100	3	3	2,000,000	0	20,000,000	0		
PEST	4,4'-DDD	9	350	120	UG/KG	15	3	3	1,900	0	7,900	0		
	4,4'-DDE	5	610	210	UG/KG	15	3	3	1,300	0	5,600	0		
	4,4'-DDT	6	6	6	UG/KG	8	3	1	1,300	0	5,600	0		
	ALPHA-CHLORDANE	9	12	10	UG/KG	3	3	2	340	0	1,500	0		
	DELTA-BHC	4	4	4	UG/KG	2	3	1	250	0	1,100	0		
	DIELDRIN	10	140	56	UG/KG	15	3	3	28	1	120	1		
	ENDOSULFAN II	20	72	46	UG/KG	19	3	2	3,300	0	34,000	0		
	ENDRIN	27	27	27	UG/KG	8	3	1	20,000	0	200,000	0		
	GAMMA-CHLORDANE	3	31	13	UG/KG	8	3	3	340	0	1,500	0		
	AROCLOR-1254	480	4,900	2,000	UG/KG	150	3	3	1,400	1	19,000	0		
TPHPRG	TPH-GASOLINE	0.7	94	47	MG/KG	22	3	2	100	0i				

TABLE 4.10-2 (Continued)

STATISTICAL SUMMARY OF STORM DRAIN SEDIMENT ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Residential PRG Value	Above[e] Res PRG	Industrial PRG Value	Above[f] Ind PRG	HPAL Value	Above[g] HPAL
	TPH-PURGEABLE UNKNOWN HYDROCA.	28	28	28	MG/KG	0.01	3	1	100	0i				
TPHEXT	TPH-DIESEL	440	440	440	MG/KG	3	3	1	1,000	0i				
	TPH-EXTRACTABLE UNKNOWN HYDRO.	260	15,000	5,500	MG/KG	19	3	3	1,000	2i				
O&G	TOTAL OIL & GREASE	1,100	27,000	12,000	MG/KG	37	3	3	1,000	3i				

TABLE 4.10-2 (Continued)

STATISTICAL SUMMARY OF STORM DRAIN SEDIMENT ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

CYAN	Cyanide
EPA	U.S. Environmental Protection Agency
HPAL	Hunters Point ambient level
MG/KG	Milligram per kilogram
O&G	Total oil and grease
PCTMST	Percent moisture
PEST	Pesticide/polychlorinated biphenyl
PHYS	Physical characteristic
PRG	Preliminary remediation goal
SALIN	Salinity
SVOC	Semivolatile organic compound
TMICROB	Coliform
TOC	Total organic carbon
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
UG/KG	Microgram per kilogram
VOC	Volatile organic compound

a Organic results of less than 10 are reported to one significant figure, and results of greater than or equal to 10 are reported to two significant figures. Inorganic results of less than 10 are reported to two significant figures, and results of greater than or equal to 10 are reported to three significant figures. Values that are not nondetects are compared to screening criteria before the significant figure rule is applied. Both the value and the screening criteria are then rounded for reporting purposes.

b Blank boxes indicate that screening critera have not been established for these analytes.

c Total number of samples analyzed

d Total number of samples showing concentrations greater than detection limit

e Total number of samples showing concentrations greater than residential PRG

f Total number of samples showing concentrations greater than industrial PRG
California-modified PRGs were used for the following analytes: 1,2-Dibromo-3-chloropropane, benzo[a]pyrene, benzo[k]fluoranthene, cadmium, chromium VI, chrysene, lead, nickel, and tetrachloroethylene (PCE).
For the analytes listed below, Region IX PRGs are not available; therefore, PRGs for similar chemicals were used as follows:

Analyte:	Similar Analyte:
2-Methylnapthalene	Naphthalene
Acenaphthylene	Acenaphthene
Alpha-chlordane	Chlordane
Aroclor-1260	Polychlorinated biphenyls
Benzo(g,h,i)perylene	Naphthalene
Delta BHC	HCH-technical
Endosulfan I	Endosulfan
Endosulfan sulfate	Endosulfan
Endrin aldehyde	Endrin
Endrin ketone	Endrin
Gamma-chlordane	Chlordane
Phenanthrene	Naphthalene

g Total number of samples showing concentrations greater than HPAL

h HPALs for chromium, cobalt, and nickel are based on the concentration of magnesium in each sample; thus, no single value applies to all samples. The range of HPAL values for chromium, cobalt, and nickel are 141.648 to 151.308, 24.848 to 26.111, and 152.851 to 167.377 mg/kg respectively.

i Total number of samples showing concentrations greater than TPH, TRPH, or O&G screening level, not PRG value

TABLE 4.10-3

STORM DRAIN SEDIMENT ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	PA34SW07	PA34SW10	PA34SW12
Sampling Depth (feet bgs)	2.10	2.10	2.10
Sample Number	9308A625	9308A627	9308A626
Sample Date	02/25/93	02/25/93	02/25/93
Metal (mg/kg)			
ALUMINUM	10,000	9,120	7,030
ANTIMONY	33.2 *α	18.4 α	ND (7.6)
ARSENIC	23.8 *#α	10.4 *#	4.5 *#
BARIUM	361 α	148	111
CADMIUM	9.6 *α	ND (2.7)	ND (1.4)
CALCIUM	13,500	11,600	68,200
CHROMIUM	479 *α	87.7	77.6
COBALT	34.8 α	12.9	49.1 α
COPPER	2,190 α	421 α	193 α
IRON	48,000	26,200	17,100
LEAD	741 *α	1,840 *#α	65.3 α
MAGNESIUM	7,010	6,370	6,450
MANGANESE	601 *	547 *	336
MERCURY	ND (0.21)	0.18	0.28
MOLYBDENUM	233 α	106 α	ND (14.7)
NICKEL	335 *α	72.3	82.1
POTASSIUM	864	702	599
SILVER	2.0 α	ND (0.49)	0.98
SODIUM	1,730	583	ND (233)
VANADIUM	44.1	33.6	19.5
ZINC	1,650 α	484 α	1,010 α
Volatile Organic Compound (ug/kg)			
1,1,1-TRICHLOROETHANE	7,400	ND (24)	ND (12)
1,1,2-TRICHLOROETHANE	110	ND (24)	ND (12)
1,1-DICHLOROETHANE	3,000	ND (24)	ND (12)
1,1-DICHLOROETHENE	2,300 *#	ND (24)	ND (12)
1,2-DICHLOROETHANE	140	ND (24)	ND (12)
1,2-DICHLOROETHENE (TOTAL)	13,000	ND (24)	ND (12)
BENZENE	44	4	ND (6)
CARBON DISULFIDE	86	6	1
CHLOROBENZENE	87	ND (24)	ND (12)
CHLOROETHANE	34	ND (24)	5
CHLOROFORM	180	ND (24)	ND (12)
ETHYLBENZENE	2,400	470	190

TABLE 4.10-3 (Continued)

STORM DRAIN SEDIMENT ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	PA34SW07	PA34SW10	PA34SW12
Sampling Depth (feet bgs)	2.10	2.10	2.10
Sample Number	9308A625	9308A627	9308A626
Sample Date	02/25/93	02/25/93	02/25/93
Volatile Organic Compound (ug/kg)			
TETRACHLOROETHENE	110	ND (24)	ND (12)
TOLUENE	21,000	8	12
TRICHLOROETHENE	17,000 *#	ND (24)	ND (12)
VINYL CHLORIDE	42 *#	ND (24)	ND (12)
XYLENE (TOTAL)	5,000	540	59
Semivolatile Organic Compound (ug/kg)			
2-METHYLNAPHTHALENE	ND (1,400)	350	46
2-METHYLPHENOL	ND (1,400)	ND (4,000)	440
4-METHYLPHENOL	2,400	ND (4,000)	ND (800)
BENZO(A)ANTHRACENE	4,300 *#	ND (4,000)	ND (800)
BENZO(B)FLUORANTHENE	3,200 *#	ND (4,000)	ND (800)
BENZO(K)FLUORANTHENE	2,800 *	ND (4,000)	ND (800)
CARBAZOLE	1,600	ND (4,000)	ND (800)
CHRYSENE	6,200 *	ND (4,000)	ND (800)
DIBENZOFURAN	760	ND (4,000)	ND (800)
FLUORANTHENE	18,000	970	690
FLUORENE	2,100	ND (4,000)	ND (800)
INDENO(1,2,3-CD)PYRENE	2,100 *	ND (4,000)	ND (800)
NAPHTHALENE	1,300	ND (4,000)	ND (800)
PENTACHLOROPHENOL	5,000 *	ND (9,800)	620
PHENANTHRENE	12,000	1,800	440
PHENOL	ND (1,400)	ND (4,000)	640
PYRENE	10,000	810	570
Pesticide/Polychlorinated Biphenyl (ug/kg)			
4,4'-DDD	350	9	12
4,4'-DDE	610	5	14
4,4'-DDT	ND (34)	6	ND (4)
ALPHA-CHLORDANE	ND (18)	9	12
DELTA-BHC	ND (18)	ND (4)	4
DIELDRIN	140 *#	17	10
ENDOSULFAN II	72	ND (8)	20
ENDRIN	ND (34)	27	ND (4)
GAMMA-CHLORDANE	31	3	6

TABLE 4.10-3 (Continued)

STORM DRAIN SEDIMENT ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	PA34SW07	PA34SW10	PA34SW12
Sampling Depth (feet bgs)	2.10	2.10	2.10
Sample Number	9308A625	9308A627	9308A626
Sample Date	02/25/93	02/25/93	02/25/93
Pesticide/Polychlorinated Biphenyl (ug/kg)			
AROCLOR-1254	4,900 *	480	480
TPH-Purgeable (mg/kg)			
TPH-GASOLINE	94	ND (2)	0.7
TPH-PURGEABLE UNKNOWN HYDROCARBON	ND (0.2)	28	ND (0.006)
TPH-Extractable (mg/kg)			
TPH-DIESEL	ND (52)	440	ND (1)
TPH-EXTRACTABLE UNKNOWN HYDROCARBON	15,000	1,200	260
Oil and Grease (mg/kg)			
TOTAL OIL & GREASE	27,000	6,600	1,100

Notes:

bgs Below ground surface
mg/kg Milligram per kilogram
NA Not analyzed
ND() Not detected (detection limit in parentheses)
µg/kg Microgram per kilogram

* Detected concentration greater than U.S. Environmental Protection Agency Region IX preliminary remediation goals (PRG) for residential use
\# Detected concentration greater than U.S. Environmental Protection Agency Region IX PRG for industrial use
α Detected concentration greater than the Hunters Point ambient level.

Detected concentration greater than at least one screening criterion.

TABLE 4.10-4

SUMMARY OF SOIL ANALYTICAL TESTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
IR34B015	9414L243						√			√	√	√				√			√	√	√	√
IR34B015	9414L244						√			√	√	√				√			√	√		√
IR34B015	9414L245						√			√	√	√				√			√	√	√	√
IR34B015	9414L247						√			√	√	√				√			√	√	√	√
IR34B015	9414L248						√			√	√	√				√			√	√	√	√
IR34B015	9414L249						√			√	√	√				√			√	√	√	√
IR34B016	9414L250						√			√	√	√				√			√	√	√	√
IR34B016	9414L251						√			√	√	√				√			√	√	√	√
IR34B016	9414L252						√			√	√	√				√			√	√	√	√
IR34B016	9414L255						√			√	√	√				√			√	√	√	√
IR34B016	9414L256						√			√	√	√				√			√	√	√	√
IR34B017	9413L200						√			√	√	√				√			√	√	√	√
IR34B017	9413L201						√			√	√	√				√			√	√	√	√
IR34B017	9413L202						√			√	√	√				√			√	√	√	√
IR34B017	9413L205						√			√	√	√				√			√	√	√	√
IR34B017	9413L206						√			√	√	√				√			√	√	√	√
IR34B017	9413L207						√			√	√	√				√			√	√	√	√
IR34B018	9432A029						√			√	√	√				√			√	√	√	√
IR34B018	9432A030						√			√	√	√				√			√	√	√	√
IR34B018	9432A032						√			√	√	√				√			√	√	√	√
IR34B018	9432A033						√			√	√	√				√			√	√	√	√
IR34B019	9414L218						√			√	√	√				√			√	√	√	√
IR34B019	9414L219						√			√	√	√				√			√	√	√	√
IR34B019	9414L220						√			√	√	√				√			√	√	√	√
IR34B019	9414L223						√			√	√	√				√			√	√	√	√
IR34B019	9414L224						√			√	√	√				√			√	√	√	√
IR34B019	9414L225						√			√	√	√				√			√	√	√	√
IR34B020	9427R384						√			√	√	√				√			√	√	√	√
IR34B020	9427R385						√			√	√	√				√			√	√	√	√
IR34B020	9427R386						√			√	√	√				√			√	√	√	√
IR34B020	9427R388						√			√	√	√				√			√	√	√	√
IR34B021	9414L228						√			√	√	√				√			√	√	√	√
IR34B021	9414L229						√			√	√	√				√			√	√	√	√
IR34B021	9414L230						√			√	√	√				√			√	√	√	√
IR34B021	9414L232						√			√	√	√				√			√	√	√	√
IR34B021	9414L233						√			√	√	√				√			√	√	√	√
IR34B022	9427R378						√			√	√	√				√			√	√	√	√

TABLE 4.10-4 (Continued)

SUMMARY OF SOIL ANALYTICAL TESTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
IR34B022	9427R379						√			√	√	√				√			√	√	√	√
IR34B022	9427R381						√			√	√	√				√			√	√	√	√
IR34B022	9427R382						√			√	√	√				√			√	√	√	√
IR34B022	9427R383						√			√	√	√				√			√	√	√	√
IR34B023	9414L234						√			√	√	√				√			√	√		√
IR34B023	9414L235						√			√	√	√				√			√	√	√	√
IR34B023	9414L236						√			√	√	√				√			√	√	√	√
IR34B023	9414L239						√			√	√	√				√			√	√	√	√
IR34B023	9414L240						√			√	√	√				√			√	√	√	√
IR34B023	9414L241						√			√	√	√				√			√	√	√	√
IR34B024	9434R584						√			√	√	√				√			√	√	√	√
IR34B024	9434R585						√			√	√	√				√			√	√	√	√
IR34B024	9434R587						√			√	√	√				√			√	√	√	√
IR34B024	9434R588						√			√	√	√				√			√	√	√	√
IR34B025	9414L257						√			√	√	√				√			√	√	√	√
IR34B025	9414L258						√			√	√	√				√			√	√	√	√
IR34B025	9414L259						√			√	√	√				√			√	√	√	√
IR34B025	9414L261						√			√	√	√				√			√	√	√	√
IR34B025	9414L262						√			√	√	√				√			√	√	√	√
IR34B026	9434R616						√			√	√	√				√			√	√	√	√
IR34B026	9434R617						√			√	√	√				√			√	√	√	√
IR34B026	9434R618						√			√	√	√				√			√	√	√	√
IR34B026	9434R620						√			√	√	√				√			√	√	√	√
IR34B026	9434R621						√			√	√	√				√			√	√	√	√
IR34B027	9413L210						√			√	√	√				√			√	√	√	√
IR34B027	9413L211						√			√	√	√				√			√	√	√	√
IR34B027	9413L212						√			√	√	√				√			√	√	√	√
IR34B027	9413L214						√			√	√	√				√			√	√	√	√
IR34B027	9413L215						√			√	√	√				√			√	√	√	√
IR34B027	9413L217						√			√	√	√				√			√	√	√	√
IR34B028	9427R372						√			√	√	√				√			√	√	√	√
IR34B028	9427R373						√			√	√	√				√			√	√	√	√
IR34B028	9427R375						√			√	√	√				√			√	√	√	√
IR34B028	9427R376						√			√	√	√				√			√	√	√	√
IR34B028	9427R377						√			√	√	√				√			√	√	√	√
IR34B029	9434R622						√			√	√	√				√			√	√	√	√

TABLE 4.10-4 (Continued)

SUMMARY OF SOIL ANALYTICAL TESTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
IR34B029	9434R623						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR34B029	9434R624						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR34B029	9434R626						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR34B030	9434R598						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR34B030	9434R599						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR34B030	9434R600						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR34B030	9434R602						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR34B030	9434R603						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR34B030	9434R604						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR34B030	9434R606						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR34B031	9434R608						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR34B031	9434R609						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR34B031	9434R610						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR34B031	9434R612						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR34B031	9434R613						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR34B032	9441A135						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR34B032	9441A136						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR34B032	9441A138						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR34B032	9441A139						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR34B032	9441A140						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR34B034	9551J727						✓			✓	✓	✓				✓			✓	✓	✓	
IR34B034	9551J728						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR34B034	9551J729						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR34MW35A	9601G007						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR34MW35A	9601G008						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR50B018	9422R213						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR50B018	9422R214						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR50B018	9422R215						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR50B019	9422R218						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR50B019	9422R219						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR50B019	9422R220						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR50B019	9422R221						✓			✓	✓	✓				✓			✓	✓	✓	✓
PA34B005	9308D085	✓		✓			✓					✓										
PA34B005	9308D086	✓		✓			✓					✓										
PA34B006	9308D088						✓	✓			✓					✓			✓	✓		✓
PA34B006	9308D089						✓	✓			✓					✓			✓	✓		✓

TABLE 4.10-4 (Continued)

SUMMARY OF SOIL ANALYTICAL TESTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
PA34B006	9308D090						√	√			√					√			√	√		√
PA34B008	9308D082						√	√			√					√			√	√		√
PA34B008	9308D083						√	√			√					√			√	√		√
PA34B008	9308D084						√	√			√					√			√	√		√
PA34B009	9308D079						√	√			√					√			√	√		√
PA34B009	9308D080						√	√			√					√			√	√		√
PA34B009	9308D081						√	√			√					√			√	√		√
PA34B011	9309A680						√	√			√					√			√	√		√
PA34B011	9309A681						√	√			√					√			√	√		√
PA34B011	9309A682						√	√			√					√			√	√		√
PA34B013	9309A638						√	√			√	√				√			√	√		√
PA34B013	9309A639						√	√			√	√				√			√	√		√
PA34B013	9309A640						√	√			√	√				√			√	√		√
PA34SS03	9310J398						√	√		√	√	√				√			√	√		√
PA34SS04	9310J397						√	√		√	√	√				√			√	√		√
PA34SS14	9312A696						√	√		√	√	√				√			√	√		√

Notes:

CHROM	CHROMIUM VI
CYAN	Cyanide
DIOXIN	Dioxins and Furans
O&G	Total oil and grease
PAH	Polynuclear aromatic hydrocarbons
PCTMST	Percent moisture
PEST	Pesticides/polychlorinated biphenyls
PHYS	Physical characteristic
SALIN	Salinity
SVOC	Semivolatile organic compounds
SOLIDS	Total dissolved solids
TOC	Total organic carbon
TMICROB	Coliform
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
VOC	Volatile organic compounds

TABLE 4.10-5

STATISTICAL SUMMARY OF SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Residential PRG Value	Above[e] Res PRG	Industrial PRG Value	Above[f] Ind PRG	HPAL Value	Above[g] HPAL
METAL	ALUMINUM	2,280	38,800	22,900	MG/KG	5.6	125	125	76,700	0	100,000	0		
	ANTIMONY	0.52	8.2	1.7	MG/KG	0.59	113	39	30.7	0	681	0	9.05	0
	ARSENIC	0.33	11.0	2.5	MG/KG	0.35	125	93	0.32	93	2.0	43	11.10	0
	BARIUM	11.2	561	133	MG/KG	0.85	125	125	5,340	0	100,000	0	314.36	6
	BERYLLIUM	0.09	0.69	0.35	MG/KG	0.05	125	58	0.14	53	1.1	0	0.71	0
	CADMIUM	0.05	2.2	0.73	MG/KG	0.10	125	91	9.0	0	852	0	3.14	0
	CALCIUM	1,670	206,000	23,400	MG/KG	17.3	125	123						
	CHROMIUM	5.7	218	101	MG/KG	0.23	125	125	211	1	1,580	0	h	3
	COBALT	1.5	47.3	26.2	MG/KG	0.20	125	122					h	4
	COPPER	8.4	304	56.7	MG/KG	0.26	125	122	2,850	0	63,300	0	124.31	3
	IRON	4,750	70,800	36,300	MG/KG	4.3	125	125						
	LEAD	0.72	1,180	20.4	MG/KG	0.26	125	118	130	3	1,000	1	8.99	9
	MAGNESIUM	1,380	43,500	15,700	MG/KG	9.3	125	125						
	MANGANESE	90.2	5,190	1,010	MG/KG	0.13	125	125	382	103	8,300	0	1431.18	22
	MERCURY	0.01	0.66	0.13	MG/KG	0.04	125	36	23.0	0	511	0	2.28	0
	MOLYBDENUM	0.79	2.6	1.4	MG/KG	0.41	125	14	383	0	8,520	0	2.68	0
	NICKEL	6.2	353	81.2	MG/KG	0.73	125	125	150	10	34,100	0	h	2
	POTASSIUM	202	4,160	1,050	MG/KG	28.8	125	121						
	SELENIUM	0.44	1.3	0.84	MG/KG	0.45	125	11	383	0	8,520	0	1.95	0
	SILVER	0.60	0.80	0.73	MG/KG	0.48	125	3	383	0	8,520	0	1.43	0
	SODIUM	113	6,620	2,140	MG/KG	27.6	121	86						
	THALLIUM	1.0	1.0	1.0	MG/KG	0.46	125	1					0.81	1

TABLE 4.10-5 (Continued)

STATISTICAL SUMMARY OF SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection Frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Residential PRG Value	Above[e] Res PRG	Industrial PRG Value	Above[f] Ind PRG	HPAL Value	Above[g] HPAL
	VANADIUM	13.7	178	98.3	MG/KG	0.27	125	125	537	0	11,900	0	117.17	38
	ZINC	17.2	728	74.3	MG/KG	0.59	125	125	23,000	0	100,000	0	109.86	9
VOC	1,1,1-TRICHLOROETHANE	12	12	12	UG/KG	11	122	1	3,200,000	0	3,000,000	0		
	1,1-DICHLOROETHANE	2	2	2	UG/KG	11	122	1	840,000	0	3,900,000	0		
	1,2-DICHLOROETHENE (TOTAL)	13	13	13	UG/KG	11	122	1	75,000	0	270,000	0		
	2-BUTANONE	9	250	53	UG/KG	10	122	8	8,700,000	0	34,000,000	0		
	4-METHYL-2-PENTANONE	4	4	4	UG/KG	10	122	1	5,200,000	0	55,000,000	0		
	ACETONE	25	220	110	UG/KG	10	122	9	2,000,000	0	8,400,000	0		
	CARBON DISULFIDE	0.5	35	11	UG/KG	11	122	14	16,000	0	52,000	0		
	CHLOROFORM	2	2	2	UG/KG	12	122	2	530	0	1,100	0		
	ETHYLBENZENE	4	12	8	UG/KG	10	122	2	2,900,000	0	3,100,000	0		
	TOLUENE	6	8	7	UG/KG	11	122	2	1,900,000	0	2,700,000	0		
	TRICHLOROETHENE	13	21	17	UG/KG	11	122	2	7,100	0	17,000	0		
	XYLENE (TOTAL)	0.5	94	31	UG/KG	10	122	4	980,000	0	980,000	0		
SVOC	2-METHYLNAPHTHALENE	61	61	61	UG/KG	410	123	1	800,000	0	800,000	0		
	ANTHRACENE	9	120	66	UG/KG	390	123	3	19,000	0	19,000	0		
	BENZO(A)ANTHRACENE	36	690	240	UG/KG	390	123	4	610	1	2,600	0		
	BENZO(A)PYRENE	68	270	160	UG/KG	390	123	4	61	4	260	1		
	BENZO(B)FLUORANTHENE	62	440	180	UG/KG	390	123	4	610	0	2,600	0		
	BENZO(G,H,I)PERYLENE	53	150	110	UG/KG	390	123	4	800,000	0	800,000	0		
	BENZO(K)FLUORANTHENE	21	330	150	UG/KG	390	123	4	610	0	26,000	0		
	BIS(2-ETHYLHEXYL)PHTHALATE	82	1,200	470	UG/KG	370	123	5	32,000	0	140,000	0		

TABLE 4.10-5 (Continued)

STATISTICAL SUMMARY OF SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Residential PRG Value	Above[e] Res PRG	Industrial PRG Value	Above[f] Ind PRG	HPAL Value	Above[g] HPAL
	CARBAZOLE	60	60	60	UG/KG	340	123	1	22,000	0	95,000	0		
	CHRYSENE	33	600	160	UG/KG	390	123	6	6,100	0	24,000	0		
	DIBENZ(A,H)ANTHRACENE	31	84	58	UG/KG	380	123	2	61	1	260	0		
	DIBENZOFURAN	24	24	24	UG/KG	340	123	1	260,000	0	2,700,000	0		
	FLUORANTHENE	76	1,800	590	UG/KG	390	123	4	2,600,000	0	27,000,000	0		
	INDENO(1,2,3-CD)PYRENE	39	170	110	UG/KG	390	123	4	610	0	2,600	0		
	NAPHTHALENE	18	24	21	UG/KG	370	123	2	800,000	0	800,000	0		
	PHENANTHRENE	18	1,300	210	UG/KG	380	123	8	800,000	0	800,000	0		
	PYRENE	38	2,600	490	UG/KG	370	123	7	2,000,000	0	20,000,000	0		
PEST	4,4'-DDD	0.2	0.2	0.2	UG/KG	4	123	1	1,900	0	7,900	0		
	4,4'-DDE	0.02	0.8	0.4	UG/KG	4	123	2	1,300	0	5,600	0		
	4,4'-DDT	0.1	5	1	UG/KG	4	123	4	1,300	0	5,600	0		
	ALDRIN	0.6	0.6	0.6	UG/KG	2	123	1	26	0	110	0		
	ALPHA-CHLORDANE	0.03	0.03	0.03	UG/KG	2	123	1	340	0	1,500	0		
	BETA-BHC	0.2	0.2	0.2	UG/KG	2	123	1	250	0	1,100	0		
	DIELDRIN	0.04	0.04	0.04	UG/KG	4	123	1	28	0	120	0		
	ENDRIN	0.1	0.1	0.1	UG/KG	4	123	1	20,000	0	200,000	0		
	ENDRIN ALDEHYDE	0.3	0.3	0.3	UG/KG	4	123	1	20,000	0	200,000	0		
	GAMMA-CHLORDANE	0.05	0.05	0.05	UG/KG	2	123	1	340	0	1,500	0		
	HEPTACHLOR	0.2	0.2	0.2	UG/KG	2	123	1	99	0	420	0		
	AROCLOR-1260	14	100	57	UG/KG	37	123	2	66	1	340	0		
TPHPRG	TPH-GASOLINE	0.1	1	0.8	MG/KG	0.5	123	3	100	0i				

TABLE 4.10-5 (Continued)

STATISTICAL SUMMARY OF SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Residential PRG Value	Above[e] Res PRG	Industrial PRG Value	Above[f] Ind PRG	HPAL Value	Above[g] HPAL
TPHEXT	TPH-DIESEL	11	1,100	230	MG/KG	34	123	5	1,000	1i				
	TPH-MOTOR OIL	6	6,500	340	MG/KG	170	117	39	1,000	2i				
TRPH	TRPH	3	2,900	170	MG/KG	23	103	60	1,000	3i				
O&G	TOTAL OIL & GREASE	55	2,600	480	MG/KG	36	18	7	1,000	1i				
ANION	CHLORIDE	13,000	16,000	14,500	UG/KG	21,000	2	2						
	NITRATE	1,800	34,000	17,900	UG/KG	5,250	2	2	100,000,00	0	100,000,00	0		
	SULFATE	6,400	16,000	11,200	UG/KG	31,500	2	2						

TABLE 4.10-5 (Continued)

STATISTICAL SUMMARY OF SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

CYAN	Cyanide
EPA	U.S. Environmental Protection Agency
HPAL	Hunters Point ambient level
MG/KG	Milligram per kilogram
O&G	Total oil and grease
PCTMST	Percent moisture
PEST	Pesticide/polychlorinated biphenyl
PHYS	Physical characteristic
PRG	Preliminary remediation goal
SALIN	Salinity
SVOC	Semivolatile organic compound
TMICROB	Coliform
TOC	Total organic carbon
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
UG/KG	Microgram per kilogram
VOC	Volatile organic compound

a Organic results of less than 10 are reported to one significant figure, and results of greater than or equal to 10 are reported to two significant figures. Inorganic results of less than 10 are reported to two significant figures, and results of greater than or equal to 10 are reported to three significant figures. Values that are not nondetects are compared to screening criteria before the significant figure rule is applied. Both the value and the screening criteria are then rounded for reporting purposes.

b Blank boxes indicate that screening critera have not been established for these analytes.

c Total number of samples analyzed

d Total number of samples showing concentrations greater than detection limit

e Total number of samples showing concentrations greater than residential PRG

f Total number of samples showing concentrations greater than industrial PRG
California-modified PRGs were used for the following analytes: 1,2-Dibromo-3-chloropropane, benzo[a]pyrene, benzo[k]fluoranthene, cadmium, chromium VI, chrysene, lead, nickel, and tetrachloroethylene (PCE).
For the analytes listed below, Region IX PRGs are not available; therefore, PRGs for similar chemicals were used as follows:

Analyte:	Similar Analyte:
2-Methylnapthalene	Naphthalene
Acenaphthylene	Acenaphthene
Alpha-chlordane	Chlordane
Aroclor-1260	Polychlorinated biphenyls
Benzo(g,h,i)perylene	Naphthalene
Delta BHC	HCH-technical
Endosulfan I	Endosulfan
Endosulfan sulfate	Endosulfan
Endrin aldehyde	Endrin
Endrin ketone	Endrin
Gamma-chlordane	Chlordane
Phenanthrene	Naphthalene

g Total number of samples showing concentrations greater than HPAL

h HPALs for chromium, cobalt, and nickel are based on the concentration of magnesium in each sample; thus, no single value applies to all samples. The range of HPAL values for chromium, cobalt, and nickel are 49.382 to 532.471, 11.253 to 67.231, and 35.850 to 945.373 mg/kg respectively.

i Total number of samples showing concentrations greater than TPH, TRPH, or O&G screening level, not PRG value

TABLE 4.10-6

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR34B015	IR34B015	IR34B015	IR34B015	IR34B015	IR34B015	IR34B016
Sampling Depth (feet bgs)	1.25	6.25	11.25	16.25	21.25	26.25	1.25
Sample Number	9414L243	9414L244	9414L245	9414L247	9414L248	9414L249	9414L250
Sample Date	04/05/94	04/05/94	04/05/94	04/05/94	04/05/94	04/05/94	04/06/94
Metal (mg/kg)							
ALUMINUM	25,200	10,400	21,600	22,100	38,000	28,100	35,500
ANTIMONY	2.3	0.95	1.7	1.3	ND (1.9)	ND (3.3)	1.1
ARSENIC	0.92 *	0.63 *	1.2 *	8.0 *#	2.3 *#	2.2 *#	0.34 *
BARIUM	82.5	82.5	133	41.3	79.6	85.6	120
BERYLLIUM	ND (0.01)	ND (0.05)	ND (0.09)	0.34 *	0.36 *	ND (0.01)	ND (0.34)
CADMIUM	ND (0.06)	ND (0.04)	ND (0.18)	0.44	1.6	1.2	1.4
CALCIUM	17,100	6,630	14,700	53,700	17,000	16,500	29,700
CHROMIUM	72.4	53.1	90.9	81.0	167	198	127
COBALT	32.7	20.0	27.7	13.1	36.3 α	23.1	33.3
COPPER	68.8	34.0	44.4	25.5	57.2	107	70.3
IRON	41,800	17,400	34,800	34,100	54,400	41,200	44,700
LEAD	1.1	1.5	1.3	7.0	2.9	2.0	1.2
MAGNESIUM	17,100	7,920	12,800	12,300	12,800	22,600	20,200
MANGANESE	731 *	749 *	1,100 *	381	1,120 *	1,100 *	1,090 *
MERCURY	0.17	ND (0.02)	ND (0.03)	ND (0.07)	0.07	0.01	ND (0.05)
MOLYBDENUM	ND (0.54)	ND (0.70)	ND (0.59)	1.4	ND (0.38)	ND (0.35)	ND (0.15)
NICKEL	32.2	54.2	70.4	70.3	94.2	49.7	76.5
POTASSIUM	594	236	1,210	3,610	1,620	596	520
SELENIUM	ND (0.34)	ND (0.35)	ND (0.22)	ND (0.45)	ND (0.36)	ND (0.28)	ND (0.64)
SILVER	ND (0.14)	ND (0.14)	ND (0.09)	ND (0.18)	ND (0.15)	ND (0.12)	ND (0.17)
SODIUM	ND (31.9)	ND (32.8)	1,970	3,550	2,200	ND (26.2)	660
THALLIUM	ND (0.14)	ND (0.19)	ND (0.13)	ND (0.29)	ND (0.23)	ND (0.20)	ND (0.43)
VANADIUM	125 α	45.8	77.7	62.4	161 α	156 α	135 α
ZINC	60.5	27.2	53.5	64.2	58.1	398 α	59.6
Volatile Organic Compound (ug/kg)							
1,1,1-TRICHLOROETHANE	ND (11)	ND (11)	ND (11)	ND (16)	ND (13)	ND (12)	ND (11)
1,1-DICHLOROETHANE	ND (11)	ND (11)	ND (11)	ND (16)	ND (13)	ND (12)	ND (11)
1,2-DICHLOROETHENE (TOTAL)	ND (11)	ND (11)	ND (11)	ND (16)	ND (13)	ND (12)	ND (11)
2-BUTANONE	ND (11)	ND (11)	ND (11)	ND (16)	ND (13)	ND (12)	ND (11)
4-METHYL-2-PENTANONE	ND (11)	ND (11)	ND (11)	ND (16)	ND (13)	ND (12)	ND (11)
ACETONE	ND (11)	ND (11)	ND (11)	ND (30)	ND (8)	ND (12)	ND (45)
CARBON DISULFIDE	ND (11)	ND (11)	ND (11)	ND (12)	ND (13)	ND (12)	ND (11)
CHLOROFORM	ND (11)	ND (11)	ND (11)	ND (16)	ND (13)	ND (12)	ND (11)
ETHYLBENZENE	ND (11)	ND (11)	ND (11)	ND (16)	ND (13)	ND (12)	ND (11)
TOLUENE	ND (11)	ND (11)	ND (11)	ND (16)	ND (13)	ND (12)	ND (11)

TABLE 4.10-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR34B015	IR34B015	IR34B015	IR34B015	IR34B015	IR34B015	IR34B016
Sampling Depth (feet bgs)	1.25	6.25	11.25	16.25	21.25	26.25	1.25
Sample Number	9414L243	9414L244	9414L245	9414L247	9414L248	9414L249	9414L250
Sample Date	04/05/94	04/05/94	04/05/94	04/05/94	04/05/94	04/05/94	04/06/94
Volatile Organic Compound (ug/kg)							
TRICHLOROETHENE	ND (11)	ND (11)	ND (11)	ND (16)	ND (13)	ND (12)	ND (11)
XYLENE (TOTAL)	ND (11)	ND (11)	ND (11)	ND (16)	ND (13)	ND (12)	ND (11)
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (370)	ND (350)	ND (380)	ND (520)	ND (430)	ND (400)	ND (350)
ANTHRACENE	ND (370)	ND (350)	ND (380)	ND (520)	ND (430)	ND (400)	ND (350)
BENZO(A)ANTHRACENE	ND (370)	ND (350)	ND (380)	ND (520)	ND (430)	ND (400)	ND (350)
BENZO(A)PYRENE	ND (370)	ND (350)	ND (380)	ND (520)	ND (430)	ND (400)	ND (350)
BENZO(B)FLUORANTHENE	ND (370)	ND (350)	ND (380)	ND (520)	ND (430)	ND (400)	ND (350)
BENZO(G,H,I)PERYLENE	ND (370)	ND (350)	ND (380)	ND (520)	ND (430)	ND (400)	ND (350)
BENZO(K)FLUORANTHENE	ND (370)	ND (350)	ND (380)	ND (520)	ND (430)	ND (400)	ND (350)
BIS(2-ETHYLHEXYL)PHTHALATE	ND (370)	ND (350)	ND (380)	ND (520)	ND (430)	ND (400)	ND (350)
CARBAZOLE	ND (370)	ND (350)	ND (380)	ND (520)	ND (430)	ND (400)	ND (350)
CHRYSENE	ND (370)	ND (350)	ND (380)	ND (520)	ND (430)	ND (400)	ND (350)
DIBENZ(A,H)ANTHRACENE	ND (370)	ND (350)	ND (380)	ND (520)	ND (430)	ND (400)	ND (350)
DIBENZOFURAN	ND (370)	ND (350)	ND (380)	ND (520)	ND (430)	ND (400)	ND (350)
FLUORANTHENE	ND (370)	ND (350)	ND (380)	ND (520)	ND (430)	ND (400)	ND (350)
INDENO(1,2,3-CD)PYRENE	ND (370)	ND (350)	ND (380)	ND (520)	ND (430)	ND (400)	ND (350)
NAPHTHALENE	ND (370)	ND (350)	ND (380)	ND (520)	ND (430)	ND (400)	ND (350)
PHENANTHRENE	ND (370)	ND (350)	ND (380)	ND (520)	ND (430)	ND (400)	ND (350)
PYRENE	ND (370)	ND (350)	ND (380)	ND (520)	ND (430)	ND (400)	ND (350)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
4,4'-DDD	ND (4)	ND (4)	ND (4)	ND (5)	ND (4)	ND (4)	ND (4)
4,4'-DDE	ND (4)	ND (4)	ND (4)	ND (5)	ND (4)	ND (4)	ND (4)
4,4'-DDT	ND (4)	ND (4)	ND (4)	ND (5)	ND (4)	ND (4)	ND (4)
ALDRIN	ND (2)	ND (2)	ND (2)	ND (3)	ND (2)	ND (2)	ND (2)
ALPHA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (3)	ND (2)	ND (2)	ND (2)
BETA-BHC	ND (2)	ND (2)	ND (2)	ND (3)	ND (2)	ND (2)	ND (2)
DIELDRIN	ND (4)	ND (4)	ND (4)	ND (5)	ND (4)	ND (4)	ND (4)
ENDRIN	ND (4)	ND (4)	ND (4)	ND (5)	ND (4)	ND (4)	ND (4)
ENDRIN ALDEHYDE	ND (4)	ND (4)	ND (4)	ND (5)	ND (4)	ND (4)	ND (4)
GAMMA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (3)	ND (2)	ND (2)	ND (2)
HEPTACHLOR	ND (2)	ND (2)	ND (2)	ND (3)	ND (2)	ND (2)	ND (2)
AROCLOR-1260	ND (37)	ND (35)	ND (37)	ND (52)	ND (43)	ND (40)	ND (35)

TABLE 4.10-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR34B015	IR34B015	IR34B015	IR34B015	IR34B015	IR34B015	IR34B016
Sampling Depth (feet bgs)	1.25	6.25	11.25	16.25	21.25	26.25	1.25
Sample Number	9414L243	9414L244	9414L245	9414L247	9414L248	9414L249	9414L250
Sample Date	04/05/94	04/05/94	04/05/94	04/05/94	04/05/94	04/05/94	04/06/94
TPH-Purgeable (mg/kg)							
TPH-GASOLINE	ND (0.6)	ND (0.5)	ND (0.6)	ND (0.8)	ND (0.7)	ND (0.6)	ND (0.5)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (12)	ND (18)	ND (12)	ND (16)	ND (13)	ND (13)	ND (11)
TPH-MOTOR OIL	ND (120)	ND (180)	ND (120)	ND (160)	ND (130)	ND (130)	7
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	2,600	NA	ND (33)	65	ND (34)	ND (32)	10
Oil and Grease (mg/kg)							
TOTAL OIL & GREASE	NA	NA	NA	NA	NA	NA	NA
Anion (ug/kg)							
CHLORIDE	NA	NA	NA	NA	NA	NA	NA
NITRATE	NA	NA	NA	NA	NA	NA	NA
SULFATE	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	90.4	93.0	87.9	64.2	76.6	81.9	94.1
pH (pH units)							
PH	7.5	8.3	8.5	8.3	7.6	7.4	8.2

TABLE 4.10-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR34B016	IR34B016	IR34B016	IR34B016	IR34B017	IR34B017	IR34B017
Sampling Depth (feet bgs)	6.25	11.25	16.25	21.25	1.25	6.25	11.25
Sample Number	9414L251	9414L252	9414L255	9414L256	9413L200	9413L201	9413L202
Sample Date	04/06/94	04/06/94	04/06/94	04/06/94	03/31/94	03/31/94	03/31/94
Metal (mg/kg)							
ALUMINUM	25,800	31,100	28,300	26,100	22,800	18,900	18,100
ANTIMONY	0.63	1.5	1.2	0.52	ND (0.90)	ND (1.2)	ND (1.1)
ARSENIC	0.44 *	0.57 *	0.34 *	0.82 *	3.3 *#	ND (0.85)	ND (1.8)
BARIUM	121	161	117	91.6	320 α	76.0	536 α
BERYLLIUM	0.57 *	ND (0.39)	ND (0.36)	0.47 *	0.50 *	ND (0.10)	ND (0.24)
CADMIUM	1.3	1.0	0.81	1.3	1.2	0.98	1.5
CALCIUM	16,900	22,800	23,000	13,900	17,100	12,700	17,800
CHROMIUM	72.6	143	92.5	150	78.8	66.5	114
COBALT	28.8	37.0	28.0	39.5 α	20.0	25.3	25.0
COPPER	44.9	77.1	52.9	52.8	44.3	49.9	48.0
IRON	54,800	46,400	36,100	43,400	35,500	30,000	35,300
LEAD	ND (0.79)	1.3	1.2	3.6	8.6	0.83	420 *α
MAGNESIUM	14,200	19,500	13,800	9,310	14,800	15,900	9,730
MANGANESE	1,210 *	1,320 *	771 *	515 *	1,590 *α	840 *	1,400 *
MERCURY	ND (0.05)	ND (0.06)	ND (0.06)	ND (0.06)	0.12	ND (0.05)	0.06
MOLYBDENUM	ND (0.15)	ND (0.16)	ND (0.16)	ND (0.18)	ND (0.15)	ND (0.15)	ND (0.17)
NICKEL	41.2	91.1	61.5	69.6	112	55.7	77.6
POTASSIUM	318	921	1,130	2,180	1,230	539	622
SELENIUM	ND (0.66)	ND (0.69)	ND (0.67)	ND (0.76)	ND (0.65)	ND (0.63)	ND (0.71)
SILVER	ND (0.18)	ND (0.18)	ND (0.18)	ND (0.20)	ND (0.17)	ND (0.17)	ND (0.19)
SODIUM	284	4,440	4,670	4,800	ND (237)	ND (112)	ND (497)
THALLIUM	ND (0.44)	ND (0.46)	ND (0.45)	ND (0.51)	ND (0.43)	ND (0.42)	ND (0.48)
VANADIUM	95.0	150 α	114	151 α	79.6	81.7	111
ZINC	106	74.8	48.9	64.2	76.8	50.9	339 α
Volatile Organic Compound (ug/kg)							
1,1,1-TRICHLOROETHANE	ND (11)	ND (11)	ND (11)	ND (13)	ND (11)	ND (11)	ND (12)
1,1-DICHLOROETHANE	ND (11)	ND (11)	ND (11)	ND (13)	ND (11)	ND (11)	ND (12)
1,2-DICHLOROETHENE (TOTAL)	ND (11)	ND (11)	ND (11)	ND (13)	ND (11)	ND (11)	ND (12)
2-BUTANONE	ND (11)	ND (11)	ND (11)	ND (13)	ND (11)	ND (11)	ND (13)
4-METHYL-2-PENTANONE	ND (11)	ND (11)	ND (11)	ND (13)	ND (11)	ND (11)	ND (12)
ACETONE	ND (20)	ND (18)	ND (16)	ND (22)	ND (8)	ND (10)	ND (63)
CARBON DISULFIDE	ND (11)	ND (11)	ND (11)	ND (13)	ND (11)	ND (11)	ND (12)
CHLOROFORM	ND (11)	ND (11)	ND (11)	ND (13)	ND (11)	ND (11)	ND (12)
ETHYLBENZENE	ND (11)	ND (11)	ND (11)	ND (13)	ND (11)	ND (11)	ND (12)
TOLUENE	ND (11)	ND (11)	ND (11)	ND (13)	ND (11)	ND (11)	ND (12)

TABLE 4.10-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR34B016	IR34B016	IR34B016	IR34B016	IR34B017	IR34B017	IR34B017
Sampling Depth (feet bgs)	6.25	11.25	16.25	21.25	1.25	6.25	11.25
Sample Number	9414L251	9414L252	9414L255	9414L256	9413L200	9413L201	9413L202
Sample Date	04/06/94	04/06/94	04/06/94	04/06/94	03/31/94	03/31/94	03/31/94
Volatile Organic Compound (ug/kg)							
TRICHLOROETHENE	ND (11)	ND (11)	ND (11)	ND (13)	ND (11)	ND (11)	ND (12)
XYLENE (TOTAL)	ND (11)	ND (11)	ND (11)	ND (13)	ND (11)	ND (11)	ND (12)
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (370)	ND (380)	ND (370)	ND (420)	ND (360)	ND (350)	ND (400)
ANTHRACENE	ND (370)	ND (380)	ND (370)	ND (420)	ND (360)	ND (350)	ND (400)
BENZO(A)ANTHRACENE	ND (370)	ND (380)	ND (370)	ND (420)	ND (360)	ND (350)	ND (400)
BENZO(A)PYRENE	ND (370)	ND (380)	ND (370)	ND (420)	ND (360)	ND (350)	ND (400)
BENZO(B)FLUORANTHENE	ND (370)	ND (380)	ND (370)	ND (420)	ND (360)	ND (350)	ND (400)
BENZO(G,H,I)PERYLENE	ND (370)	ND (380)	ND (370)	ND (420)	ND (360)	ND (350)	ND (400)
BENZO(K)FLUORANTHENE	ND (370)	ND (380)	ND (370)	ND (420)	ND (360)	ND (350)	ND (400)
BIS(2-ETHYLHEXYL)PHTHALATE	ND (120)	ND (380)	ND (310)	ND (420)	ND (360)	ND (350)	ND (400)
CARBAZOLE	ND (370)	ND (380)	ND (370)	ND (420)	ND (360)	ND (350)	ND (400)
CHRYSENE	ND (370)	ND (380)	ND (370)	ND (420)	ND (360)	ND (350)	ND (400)
DIBENZ(A,H)ANTHRACENE	ND (370)	ND (380)	ND (370)	ND (420)	ND (360)	ND (350)	ND (400)
DIBENZOFURAN	ND (370)	ND (380)	ND (370)	ND (420)	ND (360)	ND (350)	ND (400)
FLUORANTHENE	ND (370)	ND (380)	ND (370)	ND (420)	ND (360)	ND (350)	ND (400)
INDENO(1,2,3-CD)PYRENE	ND (370)	ND (380)	ND (370)	ND (420)	ND (360)	ND (350)	ND (400)
NAPHTHALENE	ND (370)	ND (380)	ND (370)	ND (420)	ND (360)	ND (350)	ND (400)
PHENANTHRENE	ND (370)	ND (380)	ND (370)	ND (420)	ND (360)	ND (350)	ND (400)
PYRENE	ND (370)	ND (380)	ND (370)	ND (420)	ND (360)	ND (350)	ND (400)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
4,4'-DDD	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
4,4'-DDE	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
4,4'-DDT	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ALDRIN	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
ALPHA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
BETA-BHC	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
DIELDRIN	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ENDRIN	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ENDRIN ALDEHYDE	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
GAMMA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
HEPTACHLOR	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
AROCLOR-1260	ND (37)	ND (38)	ND (37)	ND (42)	ND (36)	ND (35)	ND (40)

TABLE 4.10-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR34B016	IR34B016	IR34B016	IR34B016	IR34B017	IR34B017	IR34B017
Sampling Depth (feet bgs)	6.25	11.25	16.25	21.25	1.25	6.25	11.25
Sample Number	9414L251	9414L252	9414L255	9414L256	9413L200	9413L201	9413L202
Sample Date	04/06/94	04/06/94	04/06/94	04/06/94	03/31/94	03/31/94	03/31/94
TPH-Purgeable (mg/kg)							
TPH-GASOLINE	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.6)	0.1	ND (0.5)	ND (0.6)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (11)	11	16	ND (13)	ND (11)	ND (10)	ND (12)
TPH-MOTOR OIL	ND (11)	ND (11)	ND (11)	ND (13)	ND (11)	ND (10)	ND (12)
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	19	4	3	ND (6)	6	6	15
Oil and Grease (mg/kg)							
TOTAL OIL & GREASE	NA	NA	NA	NA	NA	NA	NA
Anion (ug/kg)							
CHLORIDE	NA	NA	NA	NA	NA	NA	NA
NITRATE	NA	NA	NA	NA	NA	NA	NA
SULFATE	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	91.2	87.5	88.9	79.2	92.3	95.3	84.0
pH (pH units)							
PH	7.6	7.7	7.6	7.9	8.7	8.5	7.2

TABLE 4.10-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR34B017	IR34B017	IR34B017	IR34B018	IR34B018	IR34B018	IR34B018
Sampling Depth (feet bgs)	16.25	21.25	26.25	1.25	7.25	11.75	17.25
Sample Number	9413L205	9413L206	9413L207	9432A029	9432A030	9432A032	9432A033
Sample Date	03/31/94	03/31/94	04/01/94	08/12/94	08/12/94	08/12/94	08/12/94
Metal (mg/kg)							
ALUMINUM	23,800	13,300	5,550	13,700	21,800	16,000	9,680
ANTIMONY	ND (0.97)	ND (1.3)	ND (1.0)	1.1	1.7	1.5	1.0
ARSENIC	ND (0.95)	4.8 *#	3.2 *#	ND (1.2)	ND (0.34)	ND (1.6)	5.0 *#
BARIUM	113	49.3	58.8	141	122	239	28.6
BERYLLIUM	ND (0.16)	ND (0.17)	ND (0.08)	0.21 *	0.29 *	0.25 *	0.23 *
CADMIUM	1.1	1.0	0.65	0.12	ND (0.04)	ND (0.04)	0.17
CALCIUM	16,900	3,310	ND (1,990)	28,400	16,300	11,900	52,900
CHROMIUM	108	186 α	159 α	26.5	97.6	74.2	58.4
COBALT	28.0	19.8	11.4	12.2	31.4	22.0	9.4
COPPER	52.5	17.2	ND (8.9)	39.9	56.4	53.2	10.3
IRON	33,900	30,200	15,600	21,100	36,400	27,800	19,200
LEAD	4.3	2.5	3.3	9.6 α	3.3	2.7	4.1
MAGNESIUM	12,700	7,240	4,290	8,830	14,100	10,000	7,910
MANGANESE	923 *	225	242	505 *	901 *	1,320 *	234
MERCURY	ND (0.06)	ND (0.06)	ND (0.06)	0.11	ND (0.06)	ND (0.06)	ND (0.07)
MOLYBDENUM	ND (0.17)	ND (0.18)	ND (0.17)	ND (0.12)	ND (0.09)	ND (0.09)	ND (0.43)
NICKEL	53.7	353 *α	179 *α	36.0	54.7	50.0	54.7
POTASSIUM	435	1,880	614	871	647	490	1,860
SELENIUM	ND (0.73)	ND (0.75)	ND (0.74)	ND (0.47)	ND (0.52)	ND (0.51)	ND (0.61)
SILVER	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.12)	ND (0.13)	ND (0.13)	ND (0.16)
SODIUM	1,150	3,760	ND (2,470)	196	113	218	3,300
THALLIUM	ND (0.49)	ND (0.50)	ND (0.50)	ND (0.41)	ND (0.45)	ND (0.44)	ND (0.53)
VANADIUM	105	52.0	36.8	58.4	117	82.5	43.4
ZINC	52.5	41.2	26.4	44.9	58.1	45.6	33.0
Volatile Organic Compound (ug/kg)							
1,1,1-TRICHLOROETHANE	ND (12)	ND (13)	ND (12)	ND (10)	ND (11)	ND (11)	ND (13)
1,1-DICHLOROETHANE	ND (12)	ND (13)	ND (12)	ND (10)	ND (11)	ND (11)	ND (13)
1,2-DICHLOROETHENE (TOTAL)	ND (12)	ND (13)	ND (12)	ND (10)	ND (11)	ND (11)	ND (13)
2-BUTANONE	ND (12)	ND (13)	ND (12)	ND (10)	ND (11)	250	ND (13)
4-METHYL-2-PENTANONE	ND (12)	ND (13)	ND (12)	ND (10)	ND (11)	ND (11)	ND (13)
ACETONE	ND (65)	ND (18)	ND (8)	ND (11)	ND (12)	ND (51)	ND (17)
CARBON DISULFIDE	5	ND (13)	ND (12)	ND (10)	ND (11)	ND (11)	35
CHLOROFORM	ND (12)	ND (13)	ND (12)	ND (10)	ND (11)	ND (11)	ND (13)
ETHYLBENZENE	ND (12)	ND (13)	ND (12)	ND (10)	ND (11)	ND (11)	ND (13)
TOLUENE	ND (12)	ND (13)	ND (12)	ND (10)	ND (11)	ND (11)	ND (13)

TABLE 4.10-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR34B017	IR34B017	IR34B017	IR34B018	IR34B018	IR34B018	IR34B018
Sampling Depth (feet bgs)	16.25	21.25	26.25	1.25	7.25	11.75	17.25
Sample Number	9413L205	9413L206	9413L207	9432A029	9432A030	9432A032	9432A033
Sample Date	03/31/94	03/31/94	04/01/94	08/12/94	08/12/94	08/12/94	08/12/94
Volatile Organic Compound (ug/kg)							
TRICHLOROETHENE	ND (12)	ND (13)	ND (12)	ND (10)	ND (11)	ND (11)	ND (13)
XYLENE (TOTAL)	ND (12)	ND (13)	ND (12)	ND (10)	ND (11)	ND (11)	ND (13)
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (410)	ND (420)	ND (410)	ND (1,700)	ND (370)	ND (370)	ND (440)
ANTHRACENE	ND (410)	ND (420)	ND (410)	ND (1,700)	ND (370)	ND (370)	ND (440)
BENZO(A)ANTHRACENE	ND (410)	ND (420)	ND (410)	ND (1,700)	ND (370)	ND (370)	ND (440)
BENZO(A)PYRENE	ND (410)	ND (420)	ND (410)	ND (1,700)	ND (370)	ND (370)	ND (440)
BENZO(B)FLUORANTHENE	ND (410)	ND (420)	ND (410)	ND (1,700)	ND (370)	ND (370)	ND (440)
BENZO(G,H,I)PERYLENE	ND (410)	ND (420)	ND (410)	ND (1,700)	ND (370)	ND (370)	ND (440)
BENZO(K)FLUORANTHENE	ND (410)	ND (420)	ND (410)	ND (1,700)	ND (370)	ND (370)	ND (440)
BIS(2-ETHYLHEXYL)PHTHALATE	ND (410)	ND (420)	ND (170)	ND (1,700)	ND (370)	ND (370)	ND (440)
CARBAZOLE	ND (410)	ND (420)	ND (410)	ND (1,700)	ND (370)	ND (370)	ND (440)
CHRYSENE	ND (410)	ND (420)	ND (410)	ND (1,700)	ND (370)	ND (370)	ND (440)
DIBENZ(A,H)ANTHRACENE	ND (410)	ND (420)	ND (410)	ND (1,700)	ND (370)	ND (370)	ND (440)
DIBENZOFURAN	ND (410)	ND (420)	ND (410)	ND (1,700)	ND (370)	ND (370)	ND (440)
FLUORANTHENE	ND (410)	ND (420)	ND (410)	ND (1,700)	ND (370)	ND (370)	ND (440)
INDENO(1,2,3-CD)PYRENE	ND (410)	ND (420)	ND (410)	ND (1,700)	ND (370)	ND (370)	ND (440)
NAPHTHALENE	ND (410)	ND (420)	ND (410)	ND (1,700)	ND (370)	ND (370)	ND (440)
PHENANTHRENE	ND (410)	ND (420)	ND (410)	ND (1,700)	ND (370)	ND (370)	ND (440)
PYRENE	ND (410)	ND (420)	ND (410)	ND (1,700)	ND (370)	ND (370)	ND (440)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
4,4'-DDD	ND (4)	ND (4)	ND (4)	ND (17)	ND (4)	ND (4)	ND (4)
4,4'-DDE	ND (4)	ND (4)	ND (4)	ND (17)	ND (4)	ND (4)	ND (4)
4,4'-DDT	ND (4)	ND (4)	ND (4)	ND (17)	ND (4)	ND (4)	ND (4)
ALDRIN	ND (2)	ND (2)	ND (2)	ND (9)	ND (2)	ND (2)	ND (2)
ALPHA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (9)	ND (2)	ND (2)	ND (2)
BETA-BHC	ND (2)	ND (2)	ND (2)	ND (9)	ND (2)	ND (2)	ND (2)
DIELDRIN	ND (4)	ND (4)	ND (4)	ND (17)	ND (4)	ND (4)	ND (4)
ENDRIN	ND (4)	ND (4)	ND (4)	ND (17)	ND (4)	ND (4)	ND (4)
ENDRIN ALDEHYDE	ND (4)	ND (4)	ND (4)	ND (17)	ND (4)	ND (4)	ND (4)
GAMMA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (9)	ND (2)	ND (2)	ND (2)
HEPTACHLOR	ND (2)	ND (2)	ND (2)	ND (9)	ND (2)	ND (2)	ND (2)
AROCLOR-1260	ND (41)	ND (42)	ND (41)	ND (85)	ND (19)	ND (19)	ND (22)

TABLE 4.10-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR34B017	IR34B017	IR34B017	IR34B018	IR34B018	IR34B018	IR34B018
Sampling Depth (feet bgs)	16.25	21.25	26.25	1.25	7.25	11.75	17.25
Sample Number	9413L205	9413L206	9413L207	9432A029	9432A030	9432A032	9432A033
Sample Date	03/31/94	03/31/94	04/01/94	08/12/94	08/12/94	08/12/94	08/12/94
TPH-Purgeable (mg/kg)							
TPH-GASOLINE	ND (0.6)	ND (0.6)	ND (0.6)	0.8	ND (0.6)	ND (0.6)	ND (0.7)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (12)	ND (13)	ND (12)	ND (510)	ND (11)	ND (11)	ND (13)
TPH-MOTOR OIL	ND (12)	ND (13)	ND (12)	4,100	ND (11)	7	7
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	6	5	ND (6)	2,200	5	3	4
Oil and Grease (mg/kg)							
TOTAL OIL & GREASE	NA	NA	NA	NA	NA	NA	NA
Anion (ug/kg)							
CHLORIDE	NA	NA	NA	NA	NA	NA	NA
NITRATE	NA	NA	NA	NA	NA	NA	NA
SULFATE	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	81.9	79.5	80.6	98.0	88.9	89.9	75.3
pH (pH units)							
PH	7.0	8.7	7.8	9.0	8.6	8.1	8.6

TABLE 4.10-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR34B019	IR34B019	IR34B019	IR34B019	IR34B019	IR34B019	IR34B020
Sampling Depth (feet bgs)	1.25	6.25	11.25	16.25	21.25	26.25	1.75
Sample Number	9414L218	9414L219	9414L220	9414L223	9414L224	9414L225	9427R384
Sample Date	04/04/94	04/04/94	04/04/94	04/04/94	04/04/94	04/04/94	07/06/94
Metal (mg/kg)							
ALUMINUM	36,800	36,200	37,000	23,300	15,900	9,370	23,100
ANTIMONY	ND (3.5)	ND (3.5)	ND (3.1)	ND (1.4)	ND (1.7)	ND (0.79)	ND (1.4)
ARSENIC	2.9 *#	1.9 *	2.2 *#	11.0 *#	3.1 *#	2.4 *#	3.0 *#
BARIUM	193	393 α	132	50.4	34.6	50.2	197
BERYLLIUM	0.09	0.17 *	0.12	0.31 *	0.13	0.09	0.50 *
CADMIUM	0.35	0.58	0.23	0.66	ND (0.07)	ND (0.15)	0.21
CALCIUM	27,600	24,900	25,600	52,600	5,300	2,720	17,400
CHROMIUM	195	181	165	89.2	115	59.2	83.1
COBALT	38.8	41.8	33.5	15.1	18.9	9.5	20.9
COPPER	61.9	69.9	64.2	26.7	21.0	8.7	24.3
IRON	48,800	58,000	52,900	38,200	29,900	17,700	33,800
LEAD	2.2	1.5	1.4	6.8	2.0	1.8	7.7
MAGNESIUM	43,500	25,000	20,000	14,100	6,640	3,790	17,400
MANGANESE	961 *	2,530 *α	1,050 *	466 *	348	216	691 *
MERCURY	ND (0.03)	0.20	ND (0.04)	ND (0.05)	ND (0.08)	ND (0.14)	0.12
MOLYBDENUM	ND (0.60)	ND (0.83)	ND (0.48)	2.4	ND (0.26)	ND (0.30)	ND (0.08)
NICKEL	249 *	145	118	84.4	151 *	78.2	91.5
POTASSIUM	1,480	705	1,310	3,980	1,590	936	1,160
SELENIUM	ND (0.33)	ND (0.28)	ND (0.41)	ND (0.32)	ND (0.31)	0.44	ND (0.48)
SILVER	ND (0.14)	ND (0.12)	ND (0.17)	ND (0.13)	ND (0.13)	ND (0.14)	ND (0.13)
SODIUM	NA	NA	NA	3,300	2,520	1,640	ND (28.4)
THALLIUM	ND (0.17)	ND (0.17)	ND (0.24)	ND (0.29)	ND (0.23)	ND (0.21)	ND (0.42)
VANADIUM	114	120 α	145 α	66.2	72.9	40.5	80.6
ZINC	74.9	83.0	71.9	65.4	40.8	26.5	59.6
Volatile Organic Compound (ug/kg)							
1,1,1-TRICHLOROETHANE	ND (11)	ND (11)	ND (11)	ND (14)	ND (12)	ND (12)	ND (10)
1,1-DICHLOROETHANE	ND (11)	ND (11)	ND (11)	ND (14)	ND (12)	ND (12)	ND (10)
1,2-DICHLOROETHENE (TOTAL)	ND (11)	ND (11)	ND (11)	ND (14)	ND (12)	ND (12)	ND (10)
2-BUTANONE	ND (11)	ND (11)	ND (11)	ND (14)	ND (12)	ND (12)	ND (10)
4-METHYL-2-PENTANONE	ND (11)	ND (11)	ND (11)	ND (14)	ND (12)	ND (12)	ND (10)
ACETONE	ND (11)	ND (11)	ND (11)	ND (9)	ND (12)	ND (12)	ND (13)
CARBON DISULFIDE	ND (11)	ND (11)	ND (11)	5	ND (12)	ND (12)	ND (10)
CHLOROFORM	ND (11)	ND (11)	ND (11)	ND (14)	ND (12)	ND (12)	ND (10)
ETHYLBENZENE	ND (11)	ND (11)	ND (11)	ND (14)	ND (12)	ND (12)	ND (10)
TOLUENE	ND (11)	ND (11)	ND (11)	ND (14)	ND (12)	ND (12)	ND (10)

TABLE 4.10-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR34B019	IR34B019	IR34B019	IR34B019	IR34B019	IR34B019	IR34B020
Sampling Depth (feet bgs)	1.25	6.25	11.25	16.25	21.25	26.25	1.75
Sample Number	9414L218	9414L219	9414L220	9414L223	9414L224	9414L225	9427R384
Sample Date	04/04/94	04/04/94	04/04/94	04/04/94	04/04/94	04/04/94	07/06/94
Volatile Organic Compound (ug/kg)							
TRICHLOROETHENE	ND (11)	ND (11)	ND (11)	ND (14)	ND (12)	ND (12)	ND (10)
XYLENE (TOTAL)	ND (11)	ND (11)	ND (11)	ND (14)	ND (12)	ND (12)	ND (10)
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (370)	ND (380)	ND (410)	ND (510)	ND (400)	ND (400)	ND (350)
ANTHRACENE	ND (370)	ND (380)	ND (410)	ND (510)	ND (400)	ND (400)	ND (350)
BENZO(A)ANTHRACENE	ND (370)	ND (380)	ND (410)	ND (510)	ND (400)	ND (400)	ND (350)
BENZO(A)PYRENE	ND (370)	ND (380)	ND (410)	ND (510)	ND (400)	ND (400)	ND (350)
BENZO(B)FLUORANTHENE	ND (370)	ND (380)	ND (410)	ND (510)	ND (400)	ND (400)	ND (350)
BENZO(G,H,I)PERYLENE	ND (370)	ND (380)	ND (410)	ND (510)	ND (400)	ND (400)	ND (350)
BENZO(K)FLUORANTHENE	ND (370)	ND (380)	ND (410)	ND (510)	ND (400)	ND (400)	ND (350)
BIS(2-ETHYLHEXYL)PHTHALATE	ND (370)	ND (380)	ND (410)	ND (510)	ND (400)	ND (400)	ND (120)
CARBAZOLE	ND (370)	ND (380)	ND (410)	ND (510)	ND (400)	ND (400)	ND (350)
CHRYSENE	ND (370)	ND (380)	ND (410)	ND (510)	ND (400)	ND (400)	ND (350)
DIBENZ(A,H)ANTHRACENE	ND (370)	ND (380)	ND (410)	ND (510)	ND (400)	ND (400)	ND (350)
DIBENZOFURAN	ND (370)	ND (380)	ND (410)	ND (510)	ND (400)	ND (400)	ND (350)
FLUORANTHENE	ND (370)	ND (380)	ND (410)	ND (510)	ND (400)	ND (400)	ND (350)
INDENO(1,2,3-CD)PYRENE	ND (370)	ND (380)	ND (410)	ND (510)	ND (400)	ND (400)	ND (350)
NAPHTHALENE	ND (370)	ND (380)	ND (410)	ND (510)	ND (400)	ND (400)	ND (350)
PHENANTHRENE	ND (370)	ND (380)	ND (410)	ND (510)	ND (400)	ND (400)	ND (350)
PYRENE	ND (370)	ND (380)	ND (410)	ND (510)	ND (400)	ND (400)	ND (350)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
4,4'-DDD	ND (4)	ND (4)	ND (4)	ND (5)	ND (4)	ND (4)	ND (4)
4,4'-DDE	ND (4)	ND (4)	ND (4)	ND (5)	ND (4)	ND (4)	ND (4)
4,4'-DDT	ND (4)	ND (4)	ND (4)	ND (5)	ND (4)	ND (4)	ND (4)
ALDRIN	ND (2)	ND (2)	ND (2)	ND (3)	ND (2)	ND (2)	ND (2)
ALPHA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (3)	ND (2)	ND (2)	ND (2)
BETA-BHC	ND (2)	ND (2)	ND (2)	ND (3)	ND (2)	ND (2)	ND (2)
DIELDRIN	ND (4)	ND (4)	ND (4)	ND (5)	ND (4)	ND (4)	ND (4)
ENDRIN	ND (4)	ND (4)	ND (4)	ND (5)	ND (4)	ND (4)	ND (4)
ENDRIN ALDEHYDE	ND (4)	ND (4)	ND (4)	ND (5)	ND (4)	ND (4)	ND (4)
GAMMA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (3)	ND (2)	ND (2)	ND (2)
HEPTACHLOR	ND (2)	ND (2)	ND (2)	ND (3)	ND (2)	ND (2)	ND (2)
AROCLOR-1260	ND (37)	ND (37)	ND (41)	ND (51)	ND (40)	ND (40)	ND (35)

TABLE 4.10-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR34B019	IR34B019	IR34B019	IR34B019	IR34B019	IR34B019	IR34B020
Sampling Depth (feet bgs)	1.25	6.25	11.25	16.25	21.25	26.25	1.75
Sample Number	9414L218	9414L219	9414L220	9414L223	9414L224	9414L225	9427R384
Sample Date	04/04/94	04/04/94	04/04/94	04/04/94	04/04/94	04/04/94	07/06/94
TPH-Purgeable (mg/kg)							
TPH-GASOLINE	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.8)	ND (0.6)	ND (0.6)	ND (0.5)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (12)	ND (12)	ND (13)	ND (16)	ND (13)	ND (13)	ND (10)
TPH-MOTOR OIL	430	ND (120)	ND (130)	ND (160)	ND (130)	ND (130)	79
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	330	ND (33)	ND (37)	ND (45)	ND (37)	ND (35)	31
Oil and Grease (mg/kg)							
TOTAL OIL & GREASE	NA	NA	NA	NA	NA	NA	NA
Anion (ug/kg)							
CHLORIDE	NA	NA	NA	NA	NA	NA	NA
NITRATE	NA	NA	NA	NA	NA	NA	NA
SULFATE	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	90.3	88.0	80.5	65.1	82.3	83.2	4.1
pH (pH units)							
PH	8.3	8.5	8.0	7.8	8.3	7.7	8.5

TABLE 4.10-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR34B020	IR34B020	IR34B020	IR34B021	IR34B021	IR34B021	IR34B021
Sampling Depth (feet bgs)	6.25	9.75	16.25	1.25	6.25	11.25	21.25
Sample Number	9427R385	9427R386	9427R388	9414L228	9414L229	9414L230	9414L232
Sample Date	07/06/94	07/06/94	07/06/94	04/04/94	04/04/94	04/04/94	04/04/94
Metal (mg/kg)							
ALUMINUM	20,600	29,100	16,700	31,300	25,500	23,400	7,630
ANTIMONY	ND (1.2)	ND (2.0)	ND (1.2)	ND (2.8)	2.5	1.8	ND (0.56)
ARSENIC	ND (0.92)	3.9 *#	3.6 *#	2.6 *#	3.2 *#	3.1 *#	1.7 *
BARIUM	144	216	88.2	120	177	419 α	13.0
BERYLLIUM	0.41 *	0.43 *	ND (0.27)	0.11	ND (0.13)	0.37 *	ND (0.08)
CADMIUM	0.41	0.49	0.41	0.38	ND (0.23)	0.33	ND (0.02)
CALCIUM	13,200	19,600	31,100	17,600	15,900	13,200	1,950
CHROMIUM	81.6	106	63.2	123	121	101	38.0
COBALT	27.3	33.4	19.1	29.7	32.3	27.8	6.2
COPPER	38.6	72.5	37.4	53.9	91.2	91.7	8.6
IRON	46,200	54,800	31,000	48,000	49,000	43,800	14,700
LEAD	3.0	3.4	6.5	2.8	1.7	5.7	1.6
MAGNESIUM	11,300	24,100	10,900	12,700	21,600	12,600	3,010
MANGANESE	1,100 *	1,660 *α	840 *	621 *	2,490 *α	2,320 *α	118
MERCURY	ND (0.06)	0.05	0.08	ND (0.03)	ND (0.04)	ND (0.04)	ND (0.03)
MOLYBDENUM	ND (0.09)	ND (0.09)	ND (0.65)	ND (0.50)	0.81	0.79	ND (0.37)
NICKEL	52.7	140	51.4	61.9	115	106	41.8
POTASSIUM	453	564	1,810	1,270	375	719	823
SELENIUM	ND (0.52)	ND (0.50)	ND (0.57)	ND (0.27)	ND (0.28)	ND (0.22)	0.53
SILVER	ND (0.13)	ND (0.13)	ND (0.15)	ND (0.11)	ND (0.11)	ND (0.09)	ND (0.15)
SODIUM	ND (30.6)	ND (29.4)	3,160	NA	ND (25.8)	1,870	1,580
THALLIUM	ND (0.45)	ND (0.43)	ND (0.50)	ND (0.14)	ND (0.18)	ND (0.16)	ND (0.21)
VANADIUM	104	143 α	75.1	140 α	140 α	110	35.6
ZINC	74.5	87.1	54.6	62.4	94.5	72.8	24.4
Volatile Organic Compound (ug/kg)							
1,1,1-TRICHLOROETHANE	ND (11)	ND (11)	ND (12)	ND (11)	ND (11)	ND (12)	ND (12)
1,1-DICHLOROETHANE	ND (11)	ND (11)	ND (12)	ND (11)	ND (11)	ND (12)	ND (12)
1,2-DICHLOROETHENE (TOTAL)	ND (11)	ND (11)	ND (12)	ND (11)	ND (11)	ND (12)	ND (12)
2-BUTANONE	ND (11)	ND (11)	ND (9)	ND (11)	ND (11)	ND (12)	ND (12)
4-METHYL-2-PENTANONE	ND (11)	ND (11)	ND (12)	ND (11)	ND (11)	ND (12)	ND (12)
ACETONE	ND (11)	ND (46)	ND (51)	ND (17)	ND (11)	ND (11)	ND (4)
CARBON DISULFIDE	ND (11)	ND (11)	ND (40)	ND (11)	ND (11)	ND (12)	ND (12)
CHLOROFORM	ND (11)	ND (11)	ND (12)	ND (11)	ND (11)	2	2
ETHYLBENZENE	ND (11)	ND (11)	ND (12)	ND (11)	ND (11)	ND (12)	ND (12)
TOLUENE	ND (11)	ND (11)	ND (12)	ND (11)	ND (11)	ND (12)	ND (12)

TABLE 4.10-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR34B020	IR34B020	IR34B020	IR34B021	IR34B021	IR34B021	IR34B021
Sampling Depth (feet bgs)	6.25	9.75	16.25	1.25	6.25	11.25	21.25
Sample Number	9427R385	9427R386	9427R388	9414L228	9414L229	9414L230	9414L232
Sample Date	07/06/94	07/06/94	07/06/94	04/04/94	04/04/94	04/04/94	04/04/94
Volatile Organic Compound (ug/kg)							
TRICHLOROETHENE	ND (11)	ND (11)	ND (12)	ND (11)	ND (11)	ND (12)	ND (12)
XYLENE (TOTAL)	ND (11)	ND (11)	ND (12)	ND (11)	ND (11)	ND (12)	ND (12)
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (370)	ND (360)	ND (410)	ND (390)	ND (360)	ND (410)	ND (400)
ANTHRACENE	ND (370)	ND (360)	ND (410)	ND (390)	ND (360)	ND (410)	ND (400)
BENZO(A)ANTHRACENE	ND (370)	ND (360)	ND (410)	ND (390)	ND (360)	ND (410)	ND (400)
BENZO(A)PYRENE	ND (370)	ND (360)	ND (410)	ND (390)	ND (360)	ND (410)	ND (400)
BENZO(B)FLUORANTHENE	ND (370)	ND (360)	ND (410)	ND (390)	ND (360)	ND (410)	ND (400)
BENZO(G,H,I)PERYLENE	ND (370)	ND (360)	ND (410)	ND (390)	ND (360)	ND (410)	ND (400)
BENZO(K)FLUORANTHENE	ND (370)	ND (360)	ND (410)	ND (390)	ND (360)	ND (410)	ND (400)
BIS(2-ETHYLHEXYL)PHTHALATE	ND (190)	ND (1,000)	ND (410)	ND (390)	ND (360)	ND (410)	ND (400)
CARBAZOLE	ND (370)	ND (360)	ND (410)	ND (390)	ND (360)	ND (410)	ND (400)
CHRYSENE	ND (370)	ND (360)	ND (410)	ND (390)	ND (360)	ND (410)	ND (400)
DIBENZ(A,H)ANTHRACENE	ND (370)	ND (360)	ND (410)	ND (390)	ND (360)	ND (410)	ND (400)
DIBENZOFURAN	ND (370)	ND (360)	ND (410)	ND (390)	ND (360)	ND (410)	ND (400)
FLUORANTHENE	ND (370)	ND (360)	ND (410)	ND (390)	ND (360)	ND (410)	ND (400)
INDENO(1,2,3-CD)PYRENE	ND (370)	ND (360)	ND (410)	ND (390)	ND (360)	ND (410)	ND (400)
NAPHTHALENE	ND (370)	ND (360)	ND (410)	ND (390)	ND (360)	ND (410)	ND (400)
PHENANTHRENE	ND (370)	ND (360)	ND (410)	ND (390)	ND (360)	ND (410)	ND (400)
PYRENE	ND (370)	ND (360)	ND (410)	ND (390)	ND (360)	ND (410)	ND (400)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
4,4'-DDD	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
4,4'-DDE	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
4,4'-DDT	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ALDRIN	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
ALPHA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
BETA-BHC	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
DIELDRIN	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ENDRIN	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ENDRIN ALDEHYDE	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
GAMMA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
HEPTACHLOR	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
AROCLOR-1260	ND (37)	ND (36)	ND (41)	ND (39)	ND (36)	ND (41)	ND (40)

TABLE 4.10-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR34B020	IR34B020	IR34B020	IR34B021	IR34B021	IR34B021	IR34B021
Sampling Depth (feet bgs)	6.25	9.75	16.25	1.25	6.25	11.25	21.25
Sample Number	9427R385	9427R386	9427R388	9414L228	9414L229	9414L230	9414L232
Sample Date	07/06/94	07/06/94	07/06/94	04/04/94	04/04/94	04/04/94	04/04/94
TPH-Purgeable (mg/kg)							
TPH-GASOLINE	ND (0.6)	ND (0.5)	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.6)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (11)	ND (11)	ND (12)	ND (12)	ND (11)	ND (13)	ND (13)
TPH-MOTOR OIL	10	14	8	ND (120)	ND (110)	ND (130)	ND (130)
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	ND (8)	ND (7)	ND (17)	40	ND (30)	ND (32)	ND (33)
Oil and Grease (mg/kg)							
TOTAL OIL & GREASE	NA	NA	NA	NA	NA	NA	NA
Anion (ug/kg)							
CHLORIDE	NA	NA	NA	NA	NA	NA	NA
NITRATE	NA	NA	NA	NA	NA	NA	NA
SULFATE	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	10.9	7.2	19.4	84.2	92.5	81.2	82.6
pH (pH units)							
PH	8.1	8.3	7.8	8.0	8.3	8.4	8.0

TABLE 4.10-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR34B021	IR34B022	IR34B022	IR34B022	IR34B022	IR34B022	IR34B023
Sampling Depth (feet bgs)	26.25	1.75	7.75	11.25	16.25	19.25	1.25
Sample Number	9414L233	9427R378	9427R379	9427R381	9427R382	9427R383	9414L234
Sample Date	04/04/94	07/06/94	07/06/94	07/06/94	07/06/94	07/06/94	04/05/94
Metal (mg/kg)							
ALUMINUM	16,600	19,100	32,200	26,600	27,500	13,400	2,280
ANTIMONY	1.8	ND (1.5)	ND (2.1)	ND (2.2)	ND (1.7)	ND (0.89)	ND (0.17)
ARSENIC	2.7 *#	3.7 *#	2.2 *#	ND (0.34)	ND (0.55)	4.4 *#	1.8 *
BARIUM	56.1	145	201	127	123	47.1	46.3
BERYLLIUM	ND (0.16)	0.53 *	0.47 *	0.39 *	ND (0.25)	ND (0.27)	ND (0.10)
CADMIUM	ND (0.06)	ND (0.04)	0.35	0.29	0.16	0.33	ND (0.27)
CALCIUM	5,120	13,300	19,600	17,700	16,900	41,000	199,000
CHROMIUM	128 α	54.5	162	154	85.3	64.8	5.7
COBALT	19.6	19.1	37.9	28.1	30.7	12.2	1.5
COPPER	15.8	18.6	73.6	41.6	62.3	23.0	10.8
IRON	31,900	27,200	54,100	47,400	43,100	25,000	4,750
LEAD	3.0	5.9	4.2	1.4	2.2	4.9	0.85
MAGNESIUM	5,210	13,200	20,400	16,400	20,100	10,000	1,380
MANGANESE	453 *	625 *	1,530 *α	1,020 *	661 *	384 *	105
MERCURY	ND (0.03)	0.16	0.06	ND (0.06)	ND (0.06)	0.07	ND (0.12)
MOLYBDENUM	ND (0.47)	ND (0.18)	ND (0.09)	ND (0.09)	ND (0.09)	ND (0.67)	ND (0.50)
NICKEL	96.5	70.0	132	95.3	50.0	57.6	6.2
POTASSIUM	1,740	1,480	787	202	982	2,080	217
SELENIUM	ND (0.35)	ND (0.48)	ND (0.53)	ND (0.51)	ND (0.54)	ND (0.63)	ND (0.27)
SILVER	ND (0.15)	ND (0.13)	ND (0.14)	ND (0.13)	ND (0.14)	ND (0.16)	ND (0.11)
SODIUM	2,450	ND (28.5)	630	1,360	4,040	4,090	ND (57.3)
THALLIUM	ND (0.20)	ND (0.42)	ND (0.46)	ND (0.45)	ND (0.47)	ND (0.55)	ND (0.18)
VANADIUM	74.8	61.8	146 α	98.5	125 α	52.7	13.7
ZINC	53.0	56.1	75.6	68.2	60.0	42.8	17.2
Volatile Organic Compound (ug/kg)							
1,1,1-TRICHLOROETHANE	ND (12)	ND (10)	ND (11)	ND (11)	ND (12)	ND (14)	ND (10)
1,1-DICHLOROETHANE	ND (12)	ND (10)	ND (11)	ND (11)	ND (12)	ND (14)	ND (10)
1,2-DICHLOROETHENE (TOTAL)	ND (12)	ND (10)	ND (11)	ND (11)	ND (12)	ND (14)	ND (10)
2-BUTANONE	ND (12)	ND (10)	ND (11)	ND (21)	ND (12)	ND (14)	ND (10)
4-METHYL-2-PENTANONE	ND (12)	ND (10)	ND (11)	ND (11)	ND (12)	ND (14)	ND (10)
ACETONE	ND (12)	ND (8)	ND (6)	ND (7)	ND (14)	ND (20)	ND (10)
CARBON DISULFIDE	ND (12)	ND (10)	ND (11)	ND (11)	ND (12)	ND (21)	ND (10)
CHLOROFORM	ND (12)	ND (10)	ND (11)	ND (11)	ND (12)	ND (14)	ND (10)
ETHYLBENZENE	ND (12)	4	ND (11)	ND (11)	ND (12)	ND (14)	ND (10)
TOLUENE	ND (12)	ND (10)	ND (11)	ND (11)	ND (12)	ND (14)	ND (10)

TABLE 4.10-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR34B021	IR34B022	IR34B022	IR34B022	IR34B022	IR34B022	IR34B023
Sampling Depth (feet bgs)	26.25	1.75	7.75	11.25	16.25	19.25	1.25
Sample Number	9414L233	9427R378	9427R379	9427R381	9427R382	9427R383	9414L234
Sample Date	04/04/94	07/06/94	07/06/94	07/06/94	07/06/94	07/06/94	04/05/94
Volatile Organic Compound (ug/kg)							
TRICHLOROETHENE	ND (12)	ND (10)	ND (11)	ND (11)	ND (12)	ND (14)	ND (10)
XYLENE (TOTAL)	ND (12)	26	3	ND (11)	ND (12)	ND (14)	ND (10)
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (400)	ND (350)	ND (380)	ND (370)	ND (390)	ND (450)	ND (340)
ANTHRACENE	ND (400)	ND (350)	ND (380)	ND (370)	ND (390)	ND (450)	120
BENZO(A)ANTHRACENE	ND (400)	ND (350)	ND (380)	ND (370)	ND (390)	ND (450)	690 *
BENZO(A)PYRENE	ND (400)	ND (350)	ND (380)	ND (370)	ND (390)	ND (450)	270 *#
BENZO(B)FLUORANTHENE	ND (400)	ND (350)	ND (380)	ND (370)	ND (390)	ND (450)	440
BENZO(G,H,I)PERYLENE	ND (400)	ND (350)	ND (380)	ND (370)	ND (390)	ND (450)	140
BENZO(K)FLUORANTHENE	ND (400)	ND (350)	ND (380)	ND (370)	ND (390)	ND (450)	330
BIS(2-ETHYLHEXYL)PHTHALATE	ND (400)	ND (500)	ND (1,100)	ND (680)	ND (42)	ND (80)	ND (340)
CARBAZOLE	ND (400)	ND (350)	ND (380)	ND (370)	ND (390)	ND (450)	60
CHRYSENE	ND (400)	72	ND (380)	ND (370)	ND (390)	ND (450)	600
DIBENZ(A,H)ANTHRACENE	ND (400)	ND (350)	ND (380)	ND (370)	ND (390)	ND (450)	84 *
DIBENZOFURAN	ND (400)	ND (350)	ND (380)	ND (370)	ND (390)	ND (450)	24
FLUORANTHENE	ND (400)	ND (350)	ND (380)	ND (370)	ND (390)	ND (450)	1,800
INDENO(1,2,3-CD)PYRENE	ND (400)	ND (350)	ND (380)	ND (370)	ND (390)	ND (450)	170
NAPHTHALENE	ND (400)	ND (350)	ND (380)	ND (370)	ND (390)	ND (450)	ND (340)
PHENANTHRENE	ND (400)	50	ND (380)	ND (370)	ND (390)	ND (450)	1,300
PYRENE	ND (400)	80	ND (380)	ND (370)	ND (390)	ND (450)	2,600
Pesticide/Polychlorinated Biphenyl (ug/kg)							
4,4'-DDD	ND (4)	ND (7)	ND (4)	ND (4)	ND (4)	ND (5)	ND (7)
4,4'-DDE	ND (4)	ND (7)	ND (4)	ND (4)	ND (4)	ND (5)	ND (7)
4,4'-DDT	ND (4)	ND (7)	ND (4)	ND (4)	ND (4)	ND (5)	ND (7)
ALDRIN	ND (2)	ND (4)	ND (2)	ND (2)	ND (2)	ND (2)	ND (4)
ALPHA-CHLORDANE	ND (2)	ND (4)	ND (2)	ND (2)	ND (2)	ND (2)	ND (4)
BETA-BHC	ND (2)	ND (4)	ND (2)	ND (2)	ND (2)	ND (2)	ND (4)
DIELDRIN	ND (4)	ND (7)	ND (4)	ND (4)	ND (4)	ND (5)	ND (7)
ENDRIN	ND (4)	ND (7)	ND (4)	ND (4)	ND (4)	ND (5)	ND (7)
ENDRIN ALDEHYDE	ND (4)	ND (7)	ND (4)	ND (4)	ND (4)	ND (5)	ND (7)
GAMMA-CHLORDANE	ND (2)	ND (4)	ND (2)	ND (2)	ND (2)	ND (2)	ND (4)
HEPTACHLOR	ND (2)	ND (4)	ND (2)	ND (2)	ND (2)	ND (2)	ND (4)
AROCLOR-1260	ND (40)	ND (70)	ND (38)	ND (37)	ND (39)	ND (45)	ND (69)

TABLE 4.10-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR34B021	IR34B022	IR34B022	IR34B022	IR34B022	IR34B022	IR34B023
Sampling Depth (feet bgs)	26.25	1.75	7.75	11.25	16.25	19.25	1.25
Sample Number	9414L233	9427R378	9427R379	9427R381	9427R382	9427R383	9414L234
Sample Date	04/04/94	07/06/94	07/06/94	07/06/94	07/06/94	07/06/94	04/05/94
TPH-Purgeable (mg/kg)							
TPH-GASOLINE	ND (0.6)	ND (0.5)	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.7)	ND (0.5)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (13)	ND (52)	ND (11)	ND (11)	ND (12)	ND (14)	ND (540)
TPH-MOTOR OIL	ND (130)	400	28	ND (11)	69	19	6,500
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	38	2,900	ND (6)	45	ND (11)	ND (10)	NA
Oil and Grease (mg/kg)							
TOTAL OIL & GREASE	NA	NA	NA	NA	NA	NA	NA
Anion (ug/kg)							
CHLORIDE	NA	NA	NA	NA	NA	NA	NA
NITRATE	NA	NA	NA	NA	NA	NA	NA
SULFATE	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	82.4	4.3	12.6	10.5	14.3	26.7	96.5
pH (pH units)							
PH	7.8	8.4	7.5	8.1	7.8	7.8	8.7

TABLE 4.10-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR34B023	IR34B023	IR34B023	IR34B023	IR34B023	IR34B024	IR34B024
Sampling Depth (feet bgs)	6.25	11.25	16.25	21.25	26.25	6.25	11.25
Sample Number	9414L235	9414L236	9414L239	9414L240	9414L241	9434R584	9434R585
Sample Date	04/05/94	04/05/94	04/05/94	04/05/94	04/05/94	08/23/94	08/23/94
Metal (mg/kg)							
ALUMINUM	28,700	25,800	14,700	35,300	35,600	8,240	25,200
ANTIMONY	2.1	2.1	1.2	2.2	1.7	ND (0.43)	ND (1.0)
ARSENIC	1.7 *	1.4 *	9.1 *#	2.7 *#	1.7 *	3.5 *#	ND (0.59)
BARIUM	94.5	98.3	80.8	128	85.0	27.9	280
BERYLLIUM	ND (0.06)	ND (0.05)	0.26 *	0.31 *	ND (0.13)	ND (0.30)	0.42 *
CADMIUM	0.33	ND (0.24)	0.42	0.32	0.45	0.27	ND (0.04)
CALCIUM	18,000	15,500	21,900	16,600	17,100	206,000	20,200
CHROMIUM	118	125	75.5	174	166	30.6	79.5
COBALT	30.0	30.7	13.7	33.9 α	30.6	5.8	29.2
COPPER	59.4	57.6	304 α	56.1	82.1	13.1	53.5
IRON	40,300	36,300	28,100	54,300	55,100	13,900	41,300
LEAD	14.7 α	0.93	337 *α	3.1	1.3	4.5	5.3
MAGNESIUM	18,800	17,300	11,200	10,500	23,500	6,630	20,100
MANGANESE	833 *	734 *	480 *	755 *	692 *	330	1,060 *
MERCURY	0.24	ND (0.03)	0.32	ND (0.05)	ND (0.10)	ND (0.07)	0.06
MOLYBDENUM	ND (0.56)	ND (0.47)	1.1	ND (0.63)	ND (0.54)	ND (0.63)	ND (0.09)
NICKEL	83.6	92.8	92.7	88.3	58.8	31.0	75.9
POTASSIUM	1,320	1,220	1,940	2,440	799	2,920	889
SELENIUM	ND (0.23)	ND (0.23)	0.68	0.72	ND (0.40)	ND (0.66)	ND (0.49)
SILVER	ND (0.09)	ND (0.09)	ND (0.12)	ND (0.16)	ND (0.16)	ND (0.17)	ND (0.13)
SODIUM	229	3,670	2,710	3,270	1,110	5,960	ND (29.0)
THALLIUM	ND (0.20)	ND (0.15)	ND (0.24)	ND (0.20)	ND (0.17)	ND (0.58)	ND (0.43)
VANADIUM	112	97.7	52.1	167 α	176 α	27.2	121 α
ZINC	64.0	51.8	294 α	60.0	178 α	31.8	67.2
Volatile Organic Compound (ug/kg)							
1,1,1-TRICHLOROETHANE	ND (12)	ND (11)	ND (17)	ND (13)	ND (12)	ND (14)	ND (11)
1,1-DICHLOROETHANE	ND (12)	ND (11)	ND (17)	ND (13)	ND (12)	ND (14)	ND (11)
1,2-DICHLOROETHENE (TOTAL)	ND (12)	ND (11)	ND (17)	ND (13)	ND (12)	ND (14)	ND (11)
2-BUTANONE	ND (12)	ND (11)	ND (17)	ND (13)	ND (12)	ND (8)	ND (11)
4-METHYL-2-PENTANONE	ND (12)	ND (11)	ND (17)	ND (13)	ND (12)	ND (14)	ND (11)
ACETONE	ND (12)	ND (11)	ND (23)	ND (13)	ND (13)	ND (22)	ND (5)
CARBON DISULFIDE	ND (12)	ND (11)	ND (17)	ND (13)	ND (12)	30	ND (11)
CHLOROFORM	ND (12)	ND (11)	ND (17)	ND (13)	ND (12)	ND (14)	ND (11)
ETHYLBENZENE	ND (12)	ND (11)	ND (17)	ND (13)	ND (12)	ND (14)	ND (11)
TOLUENE	ND (12)	ND (11)	ND (17)	ND (13)	ND (12)	ND (14)	ND (11)

TABLE 4.10-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR34B023	IR34B023	IR34B023	IR34B023	IR34B023	IR34B024	IR34B024
Sampling Depth (feet bgs)	6.25	11.25	16.25	21.25	26.25	6.25	11.25
Sample Number	9414L235	9414L236	9414L239	9414L240	9414L241	9434R584	9434R585
Sample Date	04/05/94	04/05/94	04/05/94	04/05/94	04/05/94	08/23/94	08/23/94
Volatile Organic Compound (ug/kg)							
TRICHLOROETHENE	ND (12)	ND (11)	ND (17)	ND (13)	ND (12)	ND (14)	ND (11)
XYLENE (TOTAL)	ND (12)	ND (11)	ND (17)	ND (13)	ND (12)	ND (14)	ND (11)
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (380)	ND (390)	ND (410)	ND (420)	ND (400)	ND (480)	ND (350)
ANTHRACENE	ND (380)	ND (390)	70	ND (420)	ND (400)	ND (480)	ND (350)
BENZO(A)ANTHRACENE	ND (380)	ND (390)	190	ND (420)	ND (400)	ND (480)	ND (350)
BENZO(A)PYRENE	ND (380)	ND (390)	190 *	ND (420)	ND (400)	ND (480)	ND (350)
BENZO(B)FLUORANTHENE	ND (380)	ND (390)	150	ND (420)	ND (400)	ND (480)	ND (350)
BENZO(G,H,I)PERYLENE	ND (380)	ND (390)	110	ND (420)	ND (400)	ND (480)	ND (350)
BENZO(K)FLUORANTHENE	ND (380)	ND (390)	170	ND (420)	ND (400)	ND (480)	ND (350)
BIS(2-ETHYLHEXYL)PHTHALATE	ND (75)	ND (26)	ND (410)	ND (420)	ND (400)	ND (97)	ND (1,600)
CARBAZOLE	ND (380)	ND (390)	ND (410)	ND (420)	ND (400)	ND (480)	ND (350)
CHRYSENE	ND (380)	ND (390)	180	ND (420)	ND (400)	ND (480)	ND (350)
DIBENZ(A,H)ANTHRACENE	ND (380)	ND (390)	31	ND (420)	ND (400)	ND (480)	ND (350)
DIBENZOFURAN	ND (380)	ND (390)	ND (410)	ND (420)	ND (400)	ND (480)	ND (350)
FLUORANTHENE	ND (380)	ND (390)	370	ND (420)	ND (400)	ND (480)	ND (350)
INDENO(1,2,3-CD)PYRENE	ND (380)	ND (390)	130	ND (420)	ND (400)	ND (480)	ND (350)
NAPHTHALENE	ND (380)	ND (390)	24	ND (420)	ND (400)	ND (480)	ND (350)
PHENANTHRENE	ND (380)	ND (390)	180	ND (420)	ND (400)	ND (480)	ND (350)
PYRENE	ND (380)	ND (390)	400	ND (420)	ND (400)	ND (480)	ND (350)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
4,4'-DDD	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (5)	ND (4)
4,4'-DDE	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (5)	ND (4)
4,4'-DDT	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (5)	ND (4)
ALDRIN	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	0.6
ALPHA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
BETA-BHC	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
DIELDRIN	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (5)	ND (4)
ENDRIN	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (5)	ND (4)
ENDRIN ALDEHYDE	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (5)	ND (4)
GAMMA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
HEPTACHLOR	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
AROCLOR-1260	ND (38)	ND (39)	ND (41)	ND (42)	ND (40)	ND (48)	ND (35)

TABLE 4.10-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR34B023	IR34B023	IR34B023	IR34B023	IR34B023	IR34B024	IR34B024
Sampling Depth (feet bgs)	6.25	11.25	16.25	21.25	26.25	6.25	11.25
Sample Number	9414L235	9414L236	9414L239	9414L240	9414L241	9434R584	9434R585
Sample Date	04/05/94	04/05/94	04/05/94	04/05/94	04/05/94	08/23/94	08/23/94
TPH-Purgeable (mg/kg)							
TPH-GASOLINE	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.7)	ND (0.6)	ND (0.7)	ND (0.5)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (12)	ND (12)	ND (13)	ND (13)	ND (13)	ND (14)	ND (11)
TPH-MOTOR OIL	ND (120)	ND (120)	140	ND (130)	ND (130)	ND (14)	10
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	93	59	39	71	ND (33)	ND (7)	ND (4)
Oil and Grease (mg/kg)							
TOTAL OIL & GREASE	NA	NA	NA	NA	NA	NA	NA
Anion (ug/kg)							
CHLORIDE	NA	NA	NA	NA	NA	NA	NA
NITRATE	NA	NA	NA	NA	NA	NA	NA
SULFATE	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	86.5	85.2	80.6	78.4	82.4	69.2	94.1
pH (pH units)							
PH	8.6	7.9	7.6	7.9	7.8	8.6	8.6

TABLE 4.10-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR34B024	IR34B024	IR34B025	IR34B025	IR34B025	IR34B025	IR34B025
Sampling Depth (feet bgs)	16.25	21.25	1.25	6.25	11.25	16.25	21.25
Sample Number	9434R587	9434R588	9414L257	9414L258	9414L259	9414L261	9414L262
Sample Date	08/23/94	08/23/94	04/06/94	04/06/94	04/06/94	04/06/94	04/06/94
Metal (mg/kg)							
ALUMINUM	25,600	5,600	23,800	24,700	23,700	20,800	20,400
ANTIMONY	1.5	ND (0.40)	0.90	0.88	1.1	0.98	0.78
ARSENIC	0.75 *	3.8 *#	0.52 *	ND (0.29)	0.77 *	0.71 *	1.2 *
BARIUM	223	19.0	116	111	137	135	49.3
BERYLLIUM	0.39 *	ND (0.13)	ND (0.40)	ND (0.28)	ND (0.32)	ND (0.28)	ND (0.29)
CADMIUM	1.2	0.36	0.92	0.86	0.95	0.85	0.83
CALCIUM	18,700	11,200	18,000	18,700	15,100	13,700	28,000
CHROMIUM	163	38.0	83.9	82.3	105	91.9	102
COBALT	37.8	6.3	28.3	28.7	34.0	25.1	19.4
COPPER	57.9	8.4	57.1	60.6	70.0	57.3	53.8
IRON	44,400	12,100	37,000	36,200	38,600	33,600	28,200
LEAD	3.3	2.8	1.2	2.3	1.2	1.6	1.9
MAGNESIUM	20,600	4,520	15,900	16,800	16,300	14,800	11,200
MANGANESE	2,000 *α	119	1,110 *	1,000 *	1,290 *	851 *	263
MERCURY	ND (0.06)	ND (0.06)	ND (0.05)	ND (0.06)	ND (0.06)	ND (0.06)	ND (0.06)
MOLYBDENUM	ND (0.09)	ND (0.28)	ND (0.14)	ND (0.16)	ND (0.16)	ND (0.17)	ND (0.18)
NICKEL	122	35.2	73.1	54.2	80.9	62.3	53.9
POTASSIUM	299	1,030	446	545	962	618	2,410
SELENIUM	ND (0.53)	ND (0.57)	ND (0.62)	ND (0.67)	ND (0.70)	ND (0.71)	ND (0.76)
SILVER	ND (0.14)	ND (0.15)	ND (0.17)	ND (0.18)	ND (0.19)	ND (0.19)	ND (0.20)
SODIUM	1,460	2,130	349	394	5,020	3,250	5,760
THALLIUM	ND (0.46)	ND (0.49)	ND (0.41)	ND (0.45)	ND (0.46)	ND (0.47)	ND (0.50)
VANADIUM	114	30.3	101	101	120 α	108	102
ZINC	74.7	25.7	65.9	56.7	64.0	56.3	46.2
Volatile Organic Compound (ug/kg)							
1,1,1-TRICHLOROETHANE	ND (11)	ND (12)	ND (10)	ND (11)	ND (12)	ND (12)	ND (13)
1,1-DICHLOROETHANE	ND (11)	ND (12)	ND (10)	ND (11)	ND (12)	ND (12)	ND (13)
1,2-DICHLOROETHENE (TOTAL)	ND (11)	ND (12)	ND (10)	ND (11)	ND (12)	ND (12)	ND (13)
2-BUTANONE	ND (13)	ND (13)	ND (12)	ND (11)	ND (12)	ND (8)	ND (13)
4-METHYL-2-PENTANONE	ND (11)	ND (12)	4	ND (11)	ND (12)	ND (12)	ND (13)
ACETONE	ND (40)	ND (55)	ND (25)	ND (14)	ND (17)	ND (37)	ND (32)
CARBON DISULFIDE	ND (11)	5	ND (10)	ND (11)	ND (12)	ND (12)	ND (13)
CHLOROFORM	ND (11)	ND (12)	ND (10)	ND (11)	ND (12)	ND (12)	ND (13)
ETHYLBENZENE	ND (11)	ND (12)	ND (10)	ND (11)	ND (12)	ND (12)	ND (13)
TOLUENE	ND (11)	ND (12)	ND (10)	ND (11)	ND (12)	ND (12)	ND (13)

TABLE 4.10-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR34B024	IR34B024	IR34B025	IR34B025	IR34B025	IR34B025	IR34B025
Sampling Depth (feet bgs)	16.25	21.25	1.25	6.25	11.25	16.25	21.25
Sample Number	9434R587	9434R588	9414L257	9414L258	9414L259	9414L261	9414L262
Sample Date	08/23/94	08/23/94	04/06/94	04/06/94	04/06/94	04/06/94	04/06/94
Volatile Organic Compound (ug/kg)							
TRICHLOROETHENE	ND (11)	ND (12)	ND (10)	ND (11)	ND (12)	ND (12)	ND (13)
XYLENE (TOTAL)	ND (11)	ND (12)	ND (10)	ND (11)	ND (12)	ND (12)	ND (13)
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (380)	ND (410)	ND (350)	ND (370)	ND (390)	ND (390)	ND (420)
ANTHRACENE	ND (380)	ND (410)	ND (350)	ND (370)	ND (390)	ND (390)	ND (420)
BENZO(A)ANTHRACENE	ND (380)	ND (410)	ND (350)	ND (370)	ND (390)	ND (390)	ND (420)
BENZO(A)PYRENE	ND (380)	ND (410)	ND (350)	ND (370)	ND (390)	ND (390)	ND (420)
BENZO(B)FLUORANTHENE	ND (380)	ND (410)	ND (350)	ND (370)	ND (390)	ND (390)	ND (420)
BENZO(G,H,I)PERYLENE	ND (380)	ND (410)	ND (350)	ND (370)	ND (390)	ND (390)	ND (420)
BENZO(K)FLUORANTHENE	ND (380)	ND (410)	ND (350)	ND (370)	ND (390)	ND (390)	ND (420)
BIS(2-ETHYLHEXYL)PHTHALATE	ND (68)	ND (69)	ND (350)	ND (370)	ND (390)	ND (390)	ND (420)
CARBAZOLE	ND (380)	ND (410)	ND (350)	ND (370)	ND (390)	ND (390)	ND (420)
CHRYSENE	ND (380)	ND (410)	ND (350)	ND (370)	ND (390)	ND (390)	ND (420)
DIBENZ(A,H)ANTHRACENE	ND (380)	ND (410)	ND (350)	ND (370)	ND (390)	ND (390)	ND (420)
DIBENZOFURAN	ND (380)	ND (410)	ND (350)	ND (370)	ND (390)	ND (390)	ND (420)
FLUORANTHENE	ND (380)	ND (410)	ND (350)	ND (370)	ND (390)	ND (390)	ND (420)
INDENO(1,2,3-CD)PYRENE	ND (380)	ND (410)	ND (350)	ND (370)	ND (390)	ND (390)	ND (420)
NAPHTHALENE	ND (380)	ND (410)	ND (350)	ND (370)	ND (390)	ND (390)	ND (420)
PHENANTHRENE	ND (380)	ND (410)	ND (350)	ND (370)	ND (390)	ND (390)	ND (420)
PYRENE	ND (380)	ND (410)	ND (350)	ND (370)	ND (390)	ND (390)	ND (420)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
4,4'-DDD	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
4,4'-DDE	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
4,4'-DDT	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ALDRIN	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
ALPHA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
BETA-BHC	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
DIELDRIN	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ENDRIN	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ENDRIN ALDEHYDE	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
GAMMA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
HEPTACHLOR	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
AROCLOR-1260	ND (38)	ND (41)	ND (35)	ND (37)	ND (39)	ND (39)	ND (42)

TABLE 4.10-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR34B024	IR34B024	IR34B025	IR34B025	IR34B025	IR34B025	IR34B025
Sampling Depth (feet bgs)	16.25	21.25	1.25	6.25	11.25	16.25	21.25
Sample Number	9434R587	9434R588	9414L257	9414L258	9414L259	9414L261	9414L262
Sample Date	08/23/94	08/23/94	04/06/94	04/06/94	04/06/94	04/06/94	04/06/94
TPH-Purgeable (mg/kg)							
TPH-GASOLINE	ND (0.6)	ND (0.6)	ND (0.5)	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.6)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (11)	ND (12)	ND (10)	ND (11)	ND (12)	ND (12)	ND (13)
TPH-MOTOR OIL	ND (11)	ND (12)	ND (10)	ND (11)	ND (12)	ND (12)	ND (13)
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	4	3	15	ND (6)	ND (6)	4	ND (6)
Oil and Grease (mg/kg)							
TOTAL OIL & GREASE	NA	NA	NA	NA	NA	NA	NA
Anion (ug/kg)							
CHLORIDE	NA	NA	NA	NA	NA	NA	NA
NITRATE	NA	NA	NA	NA	NA	NA	NA
SULFATE	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	87.0	80.9	96.6	89.1	86.1	84.7	79.4
pH (pH units)							
PH	7.7	8.6	8.9	8.1	7.5	7.4	8.9

TABLE 4.10-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR34B026	IR34B026	IR34B026	IR34B026	IR34B026	IR34B027	IR34B027
Sampling Depth (feet bgs)	1.75	6.25	11.25	16.25	20.25	1.25	6.25
Sample Number	9434R616	9434R617	9434R618	9434R620	9434R621	9413L210	9413L211
Sample Date	08/25/94	08/25/94	08/25/94	08/26/94	08/26/94	04/01/94	04/01/94
Metal (mg/kg)							
ALUMINUM	24,400	28,400	26,400	26,900	15,700	23,000	28,400
ANTIMONY	ND (1.3)	1.5	1.7	1.6	ND (0.93)	ND (1.3)	ND (0.98)
ARSENIC	3.0 *#	0.38 *	0.69 *	0.61 *	0.55 *	4.1 *#	ND (0.73)
BARIUM	165	141	154	279	35.9	92.4	111
BERYLLIUM	0.65 *	0.35 *	0.45 *	0.54 *	0.36 *	ND (0.12)	ND (0.20)
CADMIUM	0.14	0.10	0.05	0.22	0.12	1.3	1.6
CALCIUM	17,300	22,000	21,000	18,800	13,500	17,700	19,800
CHROMIUM	67.8	107	120	114	85.3	95.4	108
COBALT	21.4	38.0	32.0	31.0	16.4	25.6	32.4
COPPER	19.5	80.0	56.9	57.8	26.3	142 α	59.8
IRON	34,200	43,300	38,100	49,100	23,700	32,600	38,900
LEAD	6.5	2.2	8.0	4.2	3.3	6.9	0.72
MAGNESIUM	14,700	19,600	10,700	17,800	7,210	17,300	21,400
MANGANESE	714 *	1,290 *	1,260 *	2,000 *α	215	796 *	1,020 *
MERCURY	0.08	ND (0.05)	0.07	ND (0.06)	ND (0.06)	ND (0.06)	ND (0.05)
MOLYBDENUM	ND (0.09)	ND (0.09)	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.15)	ND (0.15)
NICKEL	87.6	74.1	66.6	97.1	58.9	67.2	125
POTASSIUM	1,360	1,240	1,090	587	2,570	423	ND (364)
SELENIUM	ND (0.49)	ND (0.49)	ND (0.59)	ND (0.56)	ND (0.57)	ND (0.66)	ND (0.66)
SILVER	ND (0.13)	ND (0.13)	ND (0.15)	ND (0.15)	ND (0.15)	ND (0.18)	ND (0.18)
SODIUM	133	ND (29.3)	133	3,230	3,740	ND (260)	ND (339)
THALLIUM	ND (0.43)	ND (0.43)	ND (0.51)	ND (0.49)	ND (0.50)	ND (0.44)	ND (0.44)
VANADIUM	95.8	134 α	143 α	140 α	97.3	88.0	106
ZINC	65.8	74.9	64.8	78.1	38.6	92.4	54.0
Volatile Organic Compound (ug/kg)							
1,1,1-TRICHLOROETHANE	ND (11)	ND (11)	ND (13)	ND (12)	ND (12)	ND (11)	ND (11)
1,1-DICHLOROETHANE	ND (11)	ND (11)	ND (13)	ND (12)	ND (12)	ND (11)	ND (11)
1,2-DICHLOROETHENE (TOTAL)	ND (11)	ND (11)	ND (13)	ND (12)	ND (12)	ND (11)	ND (11)
2-BUTANONE	9	ND (11)	41	10	9	ND (11)	ND (30)
4-METHYL-2-PENTANONE	ND (11)	ND (11)	ND (13)	ND (12)	ND (12)	ND (11)	ND (11)
ACETONE	85	ND (49)	220	ND (56)	130	ND (13)	130
CARBON DISULFIDE	ND (11)	ND (11)	ND (13)	ND (12)	6	ND (11)	ND (11)
CHLOROFORM	ND (11)	ND (11)	ND (13)	ND (12)	ND (12)	ND (11)	ND (11)
ETHYLBENZENE	ND (11)	ND (11)	ND (13)	ND (12)	ND (12)	ND (11)	ND (11)
TOLUENE	ND (11)	ND (11)	ND (13)	ND (12)	ND (12)	ND (3)	ND (11)

TABLE 4.10-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR34B026	IR34B026	IR34B026	IR34B026	IR34B026	IR34B027	IR34B027
Sampling Depth (feet bgs)	1.75	6.25	11.25	16.25	20.25	1.25	6.25
Sample Number	9434R616	9434R617	9434R618	9434R620	9434R621	9413L210	9413L211
Sample Date	08/25/94	08/25/94	08/25/94	08/26/94	08/26/94	04/01/94	04/01/94
Volatile Organic Compound (ug/kg)							
TRICHLOROETHENE	ND (11)	ND (11)	ND (13)	ND (12)	ND (12)	ND (11)	ND (11)
XYLENE (TOTAL)	ND (11)	ND (11)	ND (13)	ND (12)	ND (12)	ND (11)	ND (11)
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (350)	ND (360)	ND (420)	ND (410)	ND (420)	ND (370)	ND (370)
ANTHRACENE	ND (350)	ND (360)	ND (420)	ND (410)	ND (420)	ND (370)	ND (370)
BENZO(A)ANTHRACENE	ND (350)	ND (360)	ND (420)	ND (410)	ND (420)	ND (370)	ND (370)
BENZO(A)PYRENE	ND (350)	ND (360)	ND (420)	ND (410)	ND (420)	ND (370)	ND (370)
BENZO(B)FLUORANTHENE	ND (350)	ND (360)	ND (420)	ND (410)	ND (420)	ND (370)	ND (370)
BENZO(G,H,I)PERYLENE	ND (350)	ND (360)	ND (420)	ND (410)	ND (420)	ND (370)	ND (370)
BENZO(K)FLUORANTHENE	ND (350)	ND (360)	ND (420)	ND (410)	ND (420)	ND (370)	ND (370)
BIS(2-ETHYLHEXYL)PHTHALATE	ND (350)	520	ND (170)	ND (410)	ND (420)	ND (370)	ND (370)
CARBAZOLE	ND (350)	ND (360)	ND (420)	ND (410)	ND (420)	ND (370)	ND (370)
CHRYSENE	ND (350)	ND (360)	ND (420)	ND (410)	ND (420)	ND (370)	ND (370)
DIBENZ(A,H)ANTHRACENE	ND (350)	ND (360)	ND (420)	ND (410)	ND (420)	ND (370)	ND (370)
DIBENZOFURAN	ND (350)	ND (360)	ND (420)	ND (410)	ND (420)	ND (370)	ND (370)
FLUORANTHENE	ND (350)	ND (360)	ND (420)	ND (410)	ND (420)	ND (370)	ND (370)
INDENO(1,2,3-CD)PYRENE	ND (350)	ND (360)	ND (420)	ND (410)	ND (420)	ND (370)	ND (370)
NAPHTHALENE	ND (350)	ND (360)	ND (420)	ND (410)	ND (420)	ND (370)	ND (370)
PHENANTHRENE	ND (350)	ND (360)	ND (420)	ND (410)	ND (420)	ND (370)	ND (370)
PYRENE	ND (350)	ND (360)	ND (420)	ND (410)	ND (420)	ND (370)	ND (370)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
4,4'-DDD	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
4,4'-DDE	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
4,4'-DDT	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ALDRIN	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
ALPHA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
BETA-BHC	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
DIELDRIN	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ENDRIN	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ENDRIN ALDEHYDE	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
GAMMA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
HEPTACHLOR	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
AROCLOR-1260	ND (35)	ND (36)	ND (42)	ND (41)	ND (42)	ND (37)	ND (37)

TABLE 4.10-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR34B026	IR34B026	IR34B026	IR34B026	IR34B026	IR34B027	IR34B027
Sampling Depth (feet bgs)	1.75	6.25	11.25	16.25	20.25	1.25	6.25
Sample Number	9434R616	9434R617	9434R618	9434R620	9434R621	9413L210	9413L211
Sample Date	08/25/94	08/25/94	08/25/94	08/26/94	08/26/94	04/01/94	04/01/94
TPH-Purgeable (mg/kg)							
TPH-GASOLINE	ND (0.5)	ND (0.5)	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.6)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (11)	ND (11)	ND (13)	ND (12)	ND (12)	ND (11)	ND (11)
TPH-MOTOR OIL	6	13	ND (13)	ND (12)	ND (12)	15	ND (11)
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	6	14	4	ND (6)	ND (6)	19	5
Oil and Grease (mg/kg)							
TOTAL OIL & GREASE	NA	NA	NA	NA	NA	NA	NA
Anion (ug/kg)							
CHLORIDE	NA	NA	NA	NA	NA	NA	NA
NITRATE	NA	NA	NA	NA	NA	NA	NA
SULFATE	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	94.0	93.0	78.6	81.6	80.2	90.7	91.2
pH (pH units)							
PH	8.2	8.2	7.2	7.4	8.8	8.4	8.1

TABLE 4.10-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR34B027	IR34B027	IR34B027	IR34B027	IR34B028	IR34B028	IR34B028
Sampling Depth (feet bgs)	11.25	16.25	21.25	31.25	1.75	6.25	11.25
Sample Number	9413L212	9413L214	9413L215	9413L217	9427R372	9427R373	9427R375
Sample Date	04/01/94	04/01/94	04/01/94	04/01/94	07/06/94	07/06/94	07/06/94
Metal (mg/kg)							
ALUMINUM	21,600	19,500	5,260	6,300	19,900	29,500	22,800
ANTIMONY	ND (1.1)	ND (0.81)	NA	ND (0.54)	ND (1.5)	ND (1.9)	ND (1.5)
ARSENIC	ND (1.6)	ND (0.48)	3.1 *#	ND (1.8)	4.0 *#	ND (0.60)	ND (0.78)
BARIUM	131	102	13.3	16.1	561 α	223	182
BERYLLIUM	ND (0.23)	ND (0.12)	ND (0.05)	ND (0.07)	0.43 *	0.44 *	0.36 *
CADMIUM	1.5	1.3	0.48	0.49	0.56	0.37	0.27
CALCIUM	13,800	13,700	6,670	ND (3,240)	34,900	20,200	16,000
CHROMIUM	123	90.6	37.6	48.5	77.1	135	117
COBALT	22.3	29.3	6.1	7.8	20.1	34.6	32.1
COPPER	59.5	58.9	ND (8.9)	ND (6.2)	24.1	58.8	55.7
IRON	35,500	32,400	10,300	11,500	29,700	47,200	37,400
LEAD	1.9	0.73	1.9	1.5	7.6	3.3	3.8
MAGNESIUM	11,800	14,600	3,650	2,500	16,000	19,900	18,200
MANGANESE	747 *	958 *	90.2	188	613 *	2,020 *α	1,910 *α
MERCURY	ND (0.06)	ND (0.06)	ND (0.06)	ND (0.06)	0.13	ND (0.06)	ND (0.06)
MOLYBDENUM	ND (0.16)	ND (0.17)	ND (0.17)	ND (0.17)	ND (0.24)	ND (0.09)	ND (0.09)
NICKEL	86.2	64.2	28.1	27.6	103	122	116
POTASSIUM	520	517	796	648	1,050	475	388
SELENIUM	ND (0.68)	ND (0.71)	ND (0.75)	ND (0.72)	ND (0.49)	ND (0.52)	ND (0.53)
SILVER	ND (0.18)	ND (0.19)	ND (0.20)	ND (0.19)	ND (0.13)	ND (0.13)	ND (0.14)
SODIUM	ND (1,780)	ND (1,630)	ND (1,810)	ND (2,020)	ND (28.7)	ND (30.6)	487
THALLIUM	ND (0.46)	ND (0.47)	ND (0.50)	ND (0.48)	ND (0.42)	ND (0.45)	ND (0.46)
VANADIUM	104	81.7	25.0	32.4	68.8	123 α	90.8
ZINC	47.9	57.4	20.3	20.2	56.4	58.5	54.1
Volatile Organic Compound (ug/kg)							
1,1,1-TRICHLOROETHANE	ND (11)	ND (12)	ND (12)	ND (12)	ND (11)	ND (11)	ND (11)
1,1-DICHLOROETHANE	ND (11)	ND (12)	ND (12)	ND (12)	ND (11)	ND (11)	ND (11)
1,2-DICHLOROETHENE (TOTAL)	ND (11)	ND (12)	ND (12)	ND (12)	ND (11)	ND (11)	ND (11)
2-BUTANONE	ND (11)	ND (12)	ND (12)	ND (12)	ND (11)	ND (11)	81
4-METHYL-2-PENTANONE	ND (11)	ND (12)	ND (12)	ND (12)	ND (11)	ND (11)	ND (11)
ACETONE	ND (28)	ND (15)	ND (22)	ND (9)	ND (7)	ND (8)	ND (7)
CARBON DISULFIDE	ND (11)	10	4	ND (12)	ND (11)	ND (11)	ND (11)
CHLOROFORM	ND (11)	ND (12)	ND (12)	ND (12)	ND (11)	ND (11)	ND (11)
ETHYLBENZENE	ND (11)	ND (12)	ND (12)	ND (12)	ND (11)	ND (11)	ND (11)
TOLUENE	ND (11)	ND (12)	ND (12)	ND (12)	ND (11)	ND (11)	ND (11)

TABLE 4.10-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR34B027	IR34B027	IR34B027	IR34B027	IR34B028	IR34B028	IR34B028
Sampling Depth (feet bgs)	11.25	16.25	21.25	31.25	1.75	6.25	11.25
Sample Number	9413L212	9413L214	9413L215	9413L217	9427R372	9427R373	9427R375
Sample Date	04/01/94	04/01/94	04/01/94	04/01/94	07/06/94	07/06/94	07/06/94
Volatile Organic Compound (ug/kg)							
TRICHLOROETHENE	ND (11)	ND (12)	ND (12)	ND (12)	ND (11)	ND (11)	ND (11)
XYLENE (TOTAL)	ND (11)	ND (12)	ND (12)	ND (12)	ND (11)	ND (11)	ND (11)
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (380)	ND (390)	ND (420)	ND (400)	ND (350)	ND (370)	ND (380)
ANTHRACENE	ND (380)	ND (390)	ND (420)	ND (400)	ND (350)	ND (370)	ND (380)
BENZO(A)ANTHRACENE	ND (380)	ND (390)	ND (420)	ND (400)	ND (350)	ND (370)	ND (380)
BENZO(A)PYRENE	ND (380)	ND (390)	ND (420)	ND (400)	ND (350)	ND (370)	ND (380)
BENZO(B)FLUORANTHENE	ND (380)	ND (390)	ND (420)	ND (400)	ND (350)	ND (370)	ND (380)
BENZO(G,H,I)PERYLENE	ND (380)	ND (390)	ND (420)	ND (400)	ND (350)	ND (370)	ND (380)
BENZO(K)FLUORANTHENE	ND (380)	ND (390)	ND (420)	ND (400)	ND (350)	ND (370)	ND (380)
BIS(2-ETHYLHEXYL)PHTHALATE	ND (380)	ND (390)	ND (420)	ND (400)	ND (190)	ND (330)	ND (450)
CARBAZOLE	ND (380)	ND (390)	ND (420)	ND (400)	ND (350)	ND (370)	ND (380)
CHRYSENE	ND (380)	ND (390)	ND (420)	ND (400)	ND (350)	ND (370)	ND (380)
DIBENZ(A,H)ANTHRACENE	ND (380)	ND (390)	ND (420)	ND (400)	ND (350)	ND (370)	ND (380)
DIBENZOFURAN	ND (380)	ND (390)	ND (420)	ND (400)	ND (350)	ND (370)	ND (380)
FLUORANTHENE	ND (380)	ND (390)	ND (420)	ND (400)	ND (350)	ND (370)	ND (380)
INDENO(1,2,3-CD)PYRENE	ND (380)	ND (390)	ND (420)	ND (400)	ND (350)	ND (370)	ND (380)
NAPHTHALENE	ND (380)	ND (390)	ND (420)	ND (400)	ND (350)	ND (370)	ND (380)
PHENANTHRENE	ND (380)	ND (390)	ND (420)	ND (400)	50	ND (370)	ND (380)
PYRENE	ND (380)	ND (390)	ND (420)	ND (400)	49	ND (370)	ND (380)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
4,4'-DDD	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
4,4'-DDE	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
4,4'-DDT	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ALDRIN	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
ALPHA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
BETA-BHC	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
DIELDRIN	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ENDRIN	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ENDRIN ALDEHYDE	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
GAMMA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
HEPTACHLOR	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
AROCLOR-1260	ND (38)	ND (39)	ND (42)	ND (40)	ND (35)	ND (37)	ND (38)

TABLE 4.10-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR34B027	IR34B027	IR34B027	IR34B027	IR34B028	IR34B028	IR34B028
Sampling Depth (feet bgs)	11.25	16.25	21.25	31.25	1.75	6.25	11.25
Sample Number	9413L212	9413L214	9413L215	9413L217	9427R372	9427R373	9427R375
Sample Date	04/01/94	04/01/94	04/01/94	04/01/94	07/06/94	07/06/94	07/06/94
TPH-Purgeable (mg/kg)							
TPH-GASOLINE	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.5)	ND (0.6)	ND (0.6)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (11)	ND (12)	ND (12)	ND (12)	ND (11)	ND (11)	ND (11)
TPH-MOTOR OIL	ND (11)	33	ND (12)	ND (12)	140	ND (11)	ND (11)
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	7	8	5	4	23	ND (10)	ND (9)
Oil and Grease (mg/kg)							
TOTAL OIL & GREASE	NA	NA	NA	NA	NA	NA	NA
Anion (ug/kg)							
CHLORIDE	NA	NA	NA	NA	NA	NA	NA
NITRATE	NA	NA	NA	NA	NA	NA	NA
SULFATE	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	87.6	84.7	80.1	83.4	5.2	10.9	12.9
pH (pH units)							
PH	7.3	7.2	8.6	7.6	8.4	8.1	8.8

TABLE 4.10-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR34B028	IR34B028	IR34B029	IR34B029	IR34B029	IR34B029	IR34B030
Sampling Depth (feet bgs)	16.25	21.25	1.25	6.25	11.25	15.75	1.25
Sample Number	9427R376	9427R377	9434R622	9434R623	9434R624	9434R626	9434R598
Sample Date	07/06/94	07/06/94	08/26/94	08/26/94	08/26/94	08/26/94	08/24/94
Metal (mg/kg)							
ALUMINUM	15,400	7,480	20,900	29,100	30,000	21,400	33,600
ANTIMONY	ND (1.0)	ND (0.46)	ND (1.1)	1.8	1.8	ND (1.1)	1.6
ARSENIC	8.5 *#	ND (1.2)	2.7 *#	1.4 *	2.6 *#	0.78 *	ND (0.32)
BARIUM	48.4	17.1	252	217	200	118	100
BERYLLIUM	0.37 *	ND (0.14)	0.45 *	0.37 *	0.69 *	0.32 *	0.22 *
CADMIUM	0.57	ND (0.05)	0.62	0.57	0.66	0.47	1.0
CALCIUM	26,100	1,670	12,800	19,000	20,800	12,700	28,300
CHROMIUM	65.5	38.7	81.9	143	147	85.0	147
COBALT	11.7	7.3	21.8	32.3	42.9	24.8	27.4
COPPER	18.9	8.4	19.3	43.5	65.1	48.2	60.1
IRON	32,000	11,900	32,000	41,200	46,300	34,000	39,900
LEAD	7.3	2.2	7.3	5.0	6.1	7.0	1.9
MAGNESIUM	11,100	3,370	16,400	26,800	20,800	12,300	20,300
MANGANESE	367	101	782 *	1,310 *	3,440 *α	773 *	670 *
MERCURY	0.10	ND (0.06)	0.18	0.07	ND (0.06)	ND (0.06)	ND (0.05)
MOLYBDENUM	2.6	ND (0.10)	ND (0.11)	ND (0.09)	ND (0.09)	ND (0.10)	ND (0.09)
NICKEL	70.6	43.0	85.2	160 *	140	69.8	53.0
POTASSIUM	3,070	1,130	1,360	1,020	504	1,170	413
SELENIUM	ND (0.68)	ND (0.57)	ND (0.48)	ND (0.51)	ND (0.53)	ND (0.56)	ND (0.50)
SILVER	ND (0.18)	ND (0.15)	ND (0.12)	ND (0.13)	ND (0.14)	ND (0.15)	ND (0.13)
SODIUM	4,590	2,230	120	189	365	3,610	357
THALLIUM	ND (0.59)	ND (0.50)	ND (0.42)	ND (0.45)	1.0 α	ND (0.48)	ND (0.43)
VANADIUM	52.2	36.7	66.9	111	118 α	110	130 α
ZINC	53.5	23.4	61.1	58.0	71.5	46.7	52.0
Volatile Organic Compound (ug/kg)							
1,1,1-TRICHLOROETHANE	ND (15)	ND (12)	ND (10)	ND (11)	ND (12)	ND (12)	ND (11)
1,1-DICHLOROETHANE	ND (15)	ND (12)	ND (10)	ND (11)	ND (12)	ND (12)	ND (11)
1,2-DICHLOROETHENE (TOTAL)	ND (15)	ND (12)	ND (10)	ND (11)	ND (12)	ND (12)	ND (11)
2-BUTANONE	ND (8)	ND (18)	ND (10)	ND (11)	ND (12)	10	ND (11)
4-METHYL-2-PENTANONE	ND (15)	ND (12)	ND (10)	ND (11)	ND (12)	ND (12)	ND (11)
ACETONE	ND (21)	ND (12)	77	ND (6)	ND (6)	ND (21)	ND (14)
CARBON DISULFIDE	ND (27)	ND (4)	ND (10)	ND (11)	ND (12)	ND (12)	ND (11)
CHLOROFORM	ND (15)	ND (12)	ND (10)	ND (11)	ND (12)	ND (12)	ND (11)
ETHYLBENZENE	ND (15)	ND (12)	ND (10)	ND (11)	ND (12)	ND (12)	ND (11)
TOLUENE	ND (15)	ND (12)	ND (10)	ND (11)	ND (12)	ND (12)	ND (11)

TABLE 4.10-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR34B028	IR34B028	IR34B029	IR34B029	IR34B029	IR34B029	IR34B030
Sampling Depth (feet bgs)	16.25	21.25	1.25	6.25	11.25	15.75	1.25
Sample Number	9427R376	9427R377	9434R622	9434R623	9434R624	9434R626	9434R598
Sample Date	07/06/94	07/06/94	08/26/94	08/26/94	08/26/94	08/26/94	08/24/94
Volatile Organic Compound (ug/kg)							
TRICHLOROETHENE	ND (15)	ND (12)	ND (10)	ND (11)	ND (12)	ND (12)	ND (11)
XYLENE (TOTAL)	ND (15)	ND (12)	ND (10)	ND (11)	ND (12)	ND (12)	ND (11)
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (490)	ND (410)	ND (350)	ND (370)	ND (390)	ND (400)	ND (360)
ANTHRACENE	ND (490)	ND (410)	ND (350)	ND (370)	ND (390)	ND (400)	ND (360)
BENZO(A)ANTHRACENE	ND (490)	ND (410)	ND (350)	ND (370)	ND (390)	ND (400)	ND (360)
BENZO(A)PYRENE	ND (490)	ND (410)	ND (350)	ND (370)	ND (390)	ND (400)	ND (360)
BENZO(B)FLUORANTHENE	ND (490)	ND (410)	ND (350)	ND (370)	ND (390)	ND (400)	ND (360)
BENZO(G,H,I)PERYLENE	ND (490)	ND (410)	ND (350)	ND (370)	ND (390)	ND (400)	ND (360)
BENZO(K)FLUORANTHENE	ND (490)	ND (410)	ND (350)	ND (370)	ND (390)	ND (400)	ND (360)
BIS(2-ETHYLHEXYL)PHTHALATE	ND (490)	ND (54)	82	400	1,200	ND (400)	ND (100)
CARBAZOLE	ND (490)	ND (410)	ND (350)	ND (370)	ND (390)	ND (400)	ND (360)
CHRYSENE	ND (490)	ND (410)	ND (350)	ND (370)	ND (390)	ND (400)	ND (360)
DIBENZ(A,H)ANTHRACENE	ND (490)	ND (410)	ND (350)	ND (370)	ND (390)	ND (400)	ND (360)
DIBENZOFURAN	ND (490)	ND (410)	ND (350)	ND (370)	ND (390)	ND (400)	ND (360)
FLUORANTHENE	ND (490)	ND (410)	ND (350)	ND (370)	ND (390)	ND (400)	ND (360)
INDENO(1,2,3-CD)PYRENE	ND (490)	ND (410)	ND (350)	ND (370)	ND (390)	ND (400)	ND (360)
NAPHTHALENE	ND (490)	ND (410)	18	ND (370)	ND (390)	ND (400)	ND (360)
PHENANTHRENE	ND (490)	ND (410)	18	ND (370)	ND (390)	ND (400)	ND (360)
PYRENE	ND (490)	ND (410)	ND (350)	ND (370)	ND (390)	ND (400)	ND (360)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
4,4'-DDD	ND (5)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
4,4'-DDE	ND (5)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
4,4'-DDT	ND (5)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ALDRIN	ND (3)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
ALPHA-CHLORDANE	ND (3)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
BETA-BHC	ND (3)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
DIELDRIN	ND (5)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ENDRIN	ND (5)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ENDRIN ALDEHYDE	ND (5)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
GAMMA-CHLORDANE	ND (3)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
HEPTACHLOR	ND (3)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
AROCLOR-1260	ND (49)	ND (42)	ND (35)	ND (37)	ND (39)	ND (40)	ND (36)

TABLE 4.10-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR34B028	IR34B028	IR34B029	IR34B029	IR34B029	IR34B029	IR34B030
Sampling Depth (feet bgs)	16.25	21.25	1.25	6.25	11.25	15.75	1.25
Sample Number	9427R376	9427R377	9434R622	9434R623	9434R624	9434R626	9434R598
Sample Date	07/06/94	07/06/94	08/26/94	08/26/94	08/26/94	08/26/94	08/24/94
TPH-Purgeable (mg/kg)							
TPH-GASOLINE	ND (0.7)	ND (0.6)	ND (0.5)	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.5)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (15)	ND (12)	ND (10)	ND (11)	ND (12)	ND (12)	ND (11)
TPH-MOTOR OIL	48	16	20	35	6	ND (12)	180
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	ND (7)	ND (7)	39	5	4	3	470
Oil and Grease (mg/kg)							
TOTAL OIL & GREASE	NA	NA	NA	NA	NA	NA	NA
Anion (ug/kg)							
CHLORIDE	NA	NA	NA	NA	NA	NA	NA
NITRATE	NA	NA	NA	NA	NA	NA	NA
SULFATE	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	32.5	19.6	96.1	89.8	86.5	82.6	92.7
pH (pH units)							
PH	8.3	8.7	8.4	8.3	8.2	7.8	8.3

TABLE 4.10-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR34B030	IR34B030	IR34B030	IR34B030	IR34B030	IR34B030	IR34B031
Sampling Depth (feet bgs)	6.25	11.25	16.25	21.25	26.25	31.75	1.75
Sample Number	9434R599	9434R600	9434R602	9434R603	9434R604	9434R606	9434R608
Sample Date	08/24/94	08/24/94	08/24/94	08/24/94	08/24/94	08/24/94	08/25/94
Metal (mg/kg)							
ALUMINUM	30,300	27,300	29,300	22,100	19,900	10,300	18,800
ANTIMONY	ND (1.4)	ND (1.0)	ND (1.4)	ND (1.2)	ND (1.1)	ND (0.68)	ND (0.97)
ARSENIC	ND (0.33)	0.34 *	0.51 *	0.54 *	7.4 *#	1.4 *	ND (0.33)
BARIUM	104	91.4	162	123	52.3	28.3	98.9
BERYLLIUM	ND (0.19)	ND (0.19)	0.32 *	0.26 *	0.50 *	ND (0.18)	ND (0.13)
CADMIUM	1.0	0.85	1.4	0.96	1.1	0.42	0.64
CALCIUM	22,800	20,400	17,600	13,800	6,390	5,170	13,200
CHROMIUM	136	108	102	126	81.1	75.2	94.5
COBALT	31.9	27.3	35.4	30.3	16.3	10.6	22.8
COPPER	59.7	51.1	66.3	51.2	38.1	27.7	45.0
IRON	40,400	35,200	46,700	36,100	34,100	19,500	27,600
LEAD	1.9	2.1	2.8	2.9	8.7	3.2	1.7
MAGNESIUM	18,000	15,500	19,100	16,200	13,100	7,840	15,100
MANGANESE	827 *	749 *	1,210 *	1,190 *	261	229	619 *
MERCURY	ND (0.05)	ND (0.06)	ND (0.06)	ND (0.06)	ND (0.07)	ND (0.06)	ND (0.06)
MOLYBDENUM	ND (0.09)	ND (0.09)	ND (0.09)	ND (0.10)	1.9	ND (0.09)	ND (0.09)
NICKEL	56.6	53.2	79.3	81.6	93.0	46.9	50.6
POTASSIUM	404	356	1,420	423	4,160	2,040	297
SELENIUM	ND (0.50)	ND (0.52)	ND (0.54)	ND (0.55)	ND (0.68)	ND (0.53)	ND (0.51)
SILVER	ND (0.13)	ND (0.13)	ND (0.14)	ND (0.14)	ND (0.18)	ND (0.14)	ND (0.13)
SODIUM	258	337	5,320	1,480	6,360	3,300	218
THALLIUM	ND (0.44)	ND (0.45)	ND (0.47)	ND (0.48)	ND (0.59)	ND (0.46)	ND (0.44)
VANADIUM	127 α	105	126 α	111	72.2	57.2	80.0
ZINC	48.4	45.4	66.7	50.4	69.4	61.0	44.0
Volatile Organic Compound (ug/kg)							
1,1,1-TRICHLOROETHANE	ND (11)	ND (11)	ND (12)	ND (12)	ND (15)	ND (11)	ND (11)
1,1-DICHLOROETHANE	ND (11)	ND (11)	ND (12)	ND (12)	ND (15)	ND (11)	ND (11)
1,2-DICHLOROETHENE (TOTAL)	ND (11)	ND (11)	ND (12)	ND (12)	ND (15)	ND (11)	ND (11)
2-BUTANONE	ND (5)	ND (8)	ND (7)	ND (12)	ND (15)	ND (11)	ND (11)
4-METHYL-2-PENTANONE	ND (11)	ND (11)	ND (12)	ND (12)	ND (15)	ND (11)	ND (11)
ACETONE	ND (41)	ND (15)	ND (17)	ND (15)	ND (33)	ND (46)	ND (32)
CARBON DISULFIDE	ND (11)	ND (11)	ND (12)	3	27	ND (11)	ND (11)
CHLOROFORM	ND (11)	ND (11)	ND (12)	ND (12)	ND (15)	ND (11)	ND (11)
ETHYLBENZENE	ND (11)	ND (11)	ND (12)	ND (12)	ND (15)	ND (11)	ND (11)
TOLUENE	ND (11)	ND (11)	ND (12)	ND (12)	ND (15)	ND (11)	ND (11)

TABLE 4.10-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR34B030	IR34B030	IR34B030	IR34B030	IR34B030	IR34B030	IR34B031
Sampling Depth (feet bgs)	6.25	11.25	16.25	21.25	26.25	31.75	1.75
Sample Number	9434R599	9434R600	9434R602	9434R603	9434R604	9434R606	9434R608
Sample Date	08/24/94	08/24/94	08/24/94	08/24/94	08/24/94	08/24/94	08/25/94
Volatile Organic Compound (ug/kg)							
TRICHLOROETHENE	ND (11)	ND (11)	ND (12)	ND (12)	ND (15)	ND (11)	ND (11)
XYLENE (TOTAL)	ND (11)	ND (11)	ND (12)	ND (12)	ND (15)	ND (11)	ND (11)
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (380)	ND (370)	ND (390)	ND (400)	ND (490)	ND (380)	ND (390)
ANTHRACENE	ND (380)	ND (370)	ND (390)	ND (400)	ND (490)	ND (380)	ND (390)
BENZO(A)ANTHRACENE	ND (380)	ND (370)	ND (390)	ND (400)	ND (490)	ND (380)	ND (390)
BENZO(A)PYRENE	ND (380)	ND (370)	ND (390)	ND (400)	ND (490)	ND (380)	ND (390)
BENZO(B)FLUORANTHENE	ND (380)	ND (370)	ND (390)	ND (400)	ND (490)	ND (380)	ND (390)
BENZO(G,H,I)PERYLENE	ND (380)	ND (370)	ND (390)	ND (400)	ND (490)	ND (380)	ND (390)
BENZO(K)FLUORANTHENE	ND (380)	ND (370)	ND (390)	ND (400)	ND (490)	ND (380)	ND (390)
BIS(2-ETHYLHEXYL)PHTHALATE	ND (48)	ND (400)	ND (170)	ND (150)	ND (36)	ND (26)	ND (75)
CARBAZOLE	ND (380)	ND (370)	ND (390)	ND (400)	ND (490)	ND (380)	ND (390)
CHRYSENE	ND (380)	ND (370)	ND (390)	ND (400)	ND (490)	ND (380)	ND (390)
DIBENZ(A,H)ANTHRACENE	ND (380)	ND (370)	ND (390)	ND (400)	ND (490)	ND (380)	ND (390)
DIBENZOFURAN	ND (380)	ND (370)	ND (390)	ND (400)	ND (490)	ND (380)	ND (390)
FLUORANTHENE	ND (380)	ND (370)	ND (390)	ND (400)	ND (490)	ND (380)	ND (390)
INDENO(1,2,3-CD)PYRENE	ND (380)	ND (370)	ND (390)	ND (400)	ND (490)	ND (380)	ND (390)
NAPHTHALENE	ND (380)	ND (370)	ND (390)	ND (400)	ND (490)	ND (380)	ND (390)
PHENANTHRENE	ND (380)	ND (370)	ND (390)	ND (400)	ND (490)	ND (380)	ND (390)
PYRENE	ND (380)	ND (370)	ND (390)	ND (400)	ND (490)	ND (380)	ND (390)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
4,4'-DDD	ND (4)	ND (4)	ND (4)	ND (4)	ND (5)	ND (4)	ND (4)
4,4'-DDE	ND (4)	ND (4)	ND (4)	ND (4)	ND (5)	ND (4)	ND (4)
4,4'-DDT	ND (4)	ND (4)	ND (4)	ND (4)	ND (5)	ND (4)	ND (4)
ALDRIN	ND (2)	ND (2)	ND (2)	ND (2)	ND (3)	ND (2)	ND (2)
ALPHA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	ND (3)	ND (2)	ND (2)
BETA-BHC	ND (2)	ND (2)	ND (2)	ND (2)	ND (3)	ND (2)	ND (2)
DIELDRIN	ND (4)	ND (4)	ND (4)	ND (4)	ND (5)	ND (4)	ND (4)
ENDRIN	ND (4)	ND (4)	ND (4)	ND (4)	ND (5)	ND (4)	ND (4)
ENDRIN ALDEHYDE	ND (4)	ND (4)	ND (4)	ND (4)	ND (5)	ND (4)	ND (4)
GAMMA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	ND (3)	ND (2)	ND (2)
HEPTACHLOR	ND (2)	ND (2)	ND (2)	ND (2)	ND (3)	ND (2)	ND (2)
AROCLOR-1260	ND (37)	ND (37)	ND (39)	ND (40)	ND (49)	ND (38)	ND (37)

TABLE 4.10-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR34B030	IR34B030	IR34B030	IR34B030	IR34B030	IR34B030	IR34B031
Sampling Depth (feet bgs)	6.25	11.25	16.25	21.25	26.25	31.75	1.75
Sample Number	9434R599	9434R600	9434R602	9434R603	9434R604	9434R606	9434R608
Sample Date	08/24/94	08/24/94	08/24/94	08/24/94	08/24/94	08/24/94	08/25/94
TPH-Purgeable (mg/kg)							
TPH-GASOLINE	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.7)	ND (0.6)	ND (0.6)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (11)	ND (11)	ND (12)	ND (12)	ND (15)	ND (12)	ND (11)
TPH-MOTOR OIL	ND (11)	9	ND (12)	ND (12)	ND (15)	ND (12)	6
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	4	7	4	7	4	4	11
Oil and Grease (mg/kg)							
TOTAL OIL & GREASE	NA	NA	NA	NA	NA	NA	NA
Anion (ug/kg)							
CHLORIDE	NA	NA	NA	NA	NA	NA	NA
NITRATE	NA	NA	NA	NA	NA	NA	NA
SULFATE	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	91.3	89.3	85.9	84.2	67.9	86.9	90.3
pH (pH units)							
PH	7.7	7.7	7.7	7.1	8.8	8.0	8.7

TABLE 4.10-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR34B031	IR34B031	IR34B031	IR34B031	IR34B032	IR34B032	IR34B032
Sampling Depth (feet bgs)	6.25	11.25	16.25	21.25	1.75	6.25	11.25
Sample Number	9434R609	9434R610	9434R612	9434R613	9441A135	9441A136	9441A138
Sample Date	08/25/94	08/25/94	08/25/94	08/25/94	10/12/94	10/12/94	10/12/94
Metal (mg/kg)							
ALUMINUM	20,900	18,100	21,600	10,200	26,600	29,600	24,400
ANTIMONY	ND (0.69)	ND (0.90)	ND (0.87)	ND (0.62)	ND (1.2)	ND (1.6)	ND (1.2)
ARSENIC	ND (0.32)	ND (0.32)	0.58 *	6.9 *#	ND (0.37)	ND (0.37)	ND (0.42)
BARIUM	136	113	106	30.7	146	120	99.8
BERYLLIUM	0.22 *	ND (0.18)	0.22 *	ND (0.30)	0.28 *	ND (0.20)	ND (0.16)
CADMIUM	0.87	0.47	1.0	0.17	1.1	0.80	0.65
CALCIUM	14,600	13,200	12,600	36,500	15,700	19,900	15,500
CHROMIUM	70.1	66.4	87.1	54.3	76.4	121	107
COBALT	29.3	29.1	27.7	9.5	32.6	33.3	27.4
COPPER	52.5	63.6	52.7	14.2	59.2	57.6	60.4
IRON	37,600	27,600	38,200	16,300	48,500	39,100	32,100
LEAD	1.6	1.3	2.5	8.3	2.7	1.7	1.7
MAGNESIUM	16,800	15,100	15,000	6,750	25,100	20,100	18,500
MANGANESE	1,010 *	856 *	829 *	151	1,280 *	874 *	705 *
MERCURY	ND (0.05)	ND (0.05)	ND (0.06)	0.15	ND (0.05)	ND (0.06)	ND (0.06)
MOLYBDENUM	ND (0.08)	ND (0.09)	ND (0.09)	ND (0.78)	ND (0.15)	ND (0.15)	ND (0.17)
NICKEL	47.0	45.0	40.3	51.2	52.5	52.5	54.6
POTASSIUM	480	869	479	1,730	596	648	543
SELENIUM	ND (0.49)	ND (0.49)	ND (0.54)	ND (0.59)	ND (0.51)	ND (0.51)	ND (0.56)
SILVER	ND (0.13)	ND (0.13)	ND (0.14)	ND (0.15)	ND (0.09)	ND (0.09)	ND (0.10)
SODIUM	143	255	2,620	2,480	ND (20.0)	ND (20.0)	ND (162)
THALLIUM	ND (0.42)	ND (0.43)	ND (0.47)	ND (0.52)	ND (0.44)	ND (0.44)	ND (0.49)
VANADIUM	103	81.0	117	43.6	111	118 α	89.8
ZINC	60.5	57.2	51.6	32.0	97.9	53.9	55.4
Volatile Organic Compound (ug/kg)							
1,1,1-TRICHLOROETHANE	ND (11)	ND (11)	ND (12)	ND (13)	ND (11)	ND (11)	ND (12)
1,1-DICHLOROETHANE	ND (11)	ND (11)	ND (12)	ND (13)	ND (11)	ND (11)	ND (12)
1,2-DICHLOROETHENE (TOTAL)	ND (11)	ND (11)	ND (12)	ND (13)	ND (11)	ND (11)	ND (12)
2-BUTANONE	ND (11)	ND (11)	ND (7)	13	ND (11)	ND (11)	ND (12)
4-METHYL-2-PENTANONE	ND (11)	ND (11)	ND (12)	ND (13)	ND (11)	ND (11)	ND (12)
ACETONE	ND (28)	ND (39)	120	160	ND (39)	ND (31)	ND (24)
CARBON DISULFIDE	ND (11)	ND (11)	ND (12)	11	ND (11)	ND (11)	ND (12)
CHLOROFORM	ND (11)	ND (11)	ND (12)	ND (13)	ND (11)	ND (11)	ND (12)
ETHYLBENZENE	ND (11)	ND (11)	ND (12)	ND (13)	ND (11)	ND (11)	ND (12)
TOLUENE	ND (11)	ND (11)	ND (12)	ND (13)	ND (11)	ND (11)	ND (12)

TABLE 4.10-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR34B031	IR34B031	IR34B031	IR34B031	IR34B032	IR34B032	IR34B032
Sampling Depth (feet bgs)	6.25	11.25	16.25	21.25	1.75	6.25	11.25
Sample Number	9434R609	9434R610	9434R612	9434R613	9441A135	9441A136	9441A138
Sample Date	08/25/94	08/25/94	08/25/94	08/25/94	10/12/94	10/12/94	10/12/94
Volatile Organic Compound (ug/kg)							
TRICHLOROETHENE	ND (11)	ND (11)	ND (12)	ND (13)	ND (11)	ND (11)	ND (12)
XYLENE (TOTAL)	ND (11)	ND (11)	ND (12)	ND (13)	ND (11)	ND (11)	ND (12)
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (350)	ND (360)	ND (390)	ND (430)	ND (370)	ND (370)	ND (410)
ANTHRACENE	ND (350)	ND (360)	ND (390)	9	ND (370)	ND (370)	ND (410)
BENZO(A)ANTHRACENE	ND (350)	ND (360)	ND (390)	36	ND (370)	ND (370)	ND (410)
BENZO(A)PYRENE	ND (350)	ND (360)	ND (390)	68 *	ND (370)	ND (370)	ND (410)
BENZO(B)FLUORANTHENE	ND (350)	ND (360)	ND (390)	62	ND (370)	ND (370)	ND (410)
BENZO(G,H,I)PERYLENE	ND (350)	ND (360)	ND (390)	53	ND (370)	ND (370)	ND (410)
BENZO(K)FLUORANTHENE	ND (350)	ND (360)	ND (390)	21	ND (370)	ND (370)	ND (410)
BIS(2-ETHYLHEXYL)PHTHALATE	ND (140)	ND (200)	ND (53)	ND (430)	ND (89)	ND (370)	ND (520)
CARBAZOLE	ND (350)	ND (360)	ND (390)	ND (430)	ND (370)	ND (370)	ND (410)
CHRYSENE	ND (350)	ND (360)	ND (390)	39	ND (370)	ND (370)	ND (410)
DIBENZ(A,H)ANTHRACENE	ND (350)	ND (360)	ND (390)	ND (430)	ND (370)	ND (370)	ND (410)
DIBENZOFURAN	ND (350)	ND (360)	ND (390)	ND (430)	ND (370)	ND (370)	ND (410)
FLUORANTHENE	ND (350)	ND (360)	ND (390)	76	ND (370)	ND (370)	ND (410)
INDENO(1,2,3-CD)PYRENE	ND (350)	ND (360)	ND (390)	39	ND (370)	ND (370)	ND (410)
NAPHTHALENE	ND (350)	ND (360)	ND (390)	ND (430)	ND (370)	ND (370)	ND (410)
PHENANTHRENE	ND (350)	ND (360)	ND (390)	21	ND (370)	ND (370)	ND (410)
PYRENE	ND (350)	ND (360)	ND (390)	90	ND (370)	ND (370)	ND (410)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
4,4'-DDD	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
4,4'-DDE	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
4,4'-DDT	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ALDRIN	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
ALPHA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
BETA-BHC	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
DIELDRIN	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ENDRIN	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ENDRIN ALDEHYDE	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
GAMMA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
HEPTACHLOR	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
AROCLOR-1260	ND (35)	ND (36)	ND (39)	ND (43)	ND (18)	ND (18)	ND (20)

TABLE 4.10-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR34B031	IR34B031	IR34B031	IR34B031	IR34B032	IR34B032	IR34B032
Sampling Depth (feet bgs)	6.25	11.25	16.25	21.25	1.75	6.25	11.25
Sample Number	9434R609	9434R610	9434R612	9434R613	9441A135	9441A136	9441A138
Sample Date	08/25/94	08/25/94	08/25/94	08/25/94	10/12/94	10/12/94	10/12/94
TPH-Purgeable (mg/kg)							
TPH-GASOLINE	ND (0.5)	ND (0.5)	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.6)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (11)	ND (11)	ND (12)	ND (13)	ND (11)	ND (11)	ND (12)
TPH-MOTOR OIL	ND (11)	14	ND (12)	9	ND (11)	ND (12)	ND (12)
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	23	8	ND (6)	3	ND (5)	ND (5)	ND (4)
Oil and Grease (mg/kg)							
TOTAL OIL & GREASE	NA	NA	NA	NA	NA	NA	NA
Anion (ug/kg)							
CHLORIDE	NA	NA	NA	NA	NA	NA	NA
NITRATE	NA	NA	NA	NA	NA	NA	NA
SULFATE	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	94.4	93.5	85.2	77.6	91.0	90.7	81.8
pH (pH units)							
PH	8.7	8.7	8.3	8.8	8.2	8.4	7.8

TABLE 4.10-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR34B032	IR34B032	IR34B034	IR34B034	IR34B034	IR34MW35A	IR34MW35A
Sampling Depth (feet bgs)	16.25	21.25	0.75	6.00	9.75	15.25	20.25
Sample Number	9441A139	9441A140	9551J727	9551J728	9551J729	9601G007	9601G008
Sample Date	10/12/94	10/12/94	12/20/95	12/20/95	12/20/95	01/02/96	01/02/96
Metal (mg/kg)							
ALUMINUM	24,500	5,710	19,300	26,700	26,000	7,010	6,700
ANTIMONY	ND (1.0)	ND (0.49)	0.55	0.99	1.0	ND (0.66)	ND (0.38)
ARSENIC	ND (0.40)	4.1 *#	0.33 *	ND (0.31)	0.45 *	7.2 *#	4.6 *#
BARIUM	102	22.9	80.2	82.4	92.8	456 α	11.2
BERYLLIUM	0.23 *	ND (0.11)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)
CADMIUM	0.75	0.34	ND (0.05)	ND (0.04)	ND (0.05)	ND (0.05)	ND (0.05)
CALCIUM	17,700	142,000	10,300	16,700	14,900	77,000	54,800
CHROMIUM	102	34.1	104	92.9	129	54.1	39.8
COBALT	33.1	6.0	32.2	34.9	34.4	10.7	7.5
COPPER	56.5	9.6	52.3	71.4	65.8	207 α	11.9
IRON	39,400	9,130	31,500	37,900	40,700	17,200	12,200
LEAD	1.5	7.6	2.9	1.3	2.6	1,180 *#α	2.0
MAGNESIUM	18,400	4,150	16,800	25,600	24,000	10,200	5,620
MANGANESE	1,010 *	129	753 *	852 *	893 *	504 *	139
MERCURY	ND (0.06)	0.09	ND (0.06)	ND (0.05)	ND (0.06)	0.53	ND (0.06)
MOLYBDENUM	ND (0.16)	ND (0.17)	ND (0.14)	ND (0.13)	ND (0.14)	ND (0.50)	ND (0.14)
NICKEL	42.1	26.7	55.4	43.3	56.7	75.6	36.9
POTASSIUM	324	1,170	432	1,020	597	1,490	1,640
SELENIUM	ND (0.54)	ND (0.56)	ND (0.52)	ND (0.51)	ND (0.52)	ND (0.52)	ND (0.55)
SILVER	ND (0.09)	ND (0.10)	ND (0.11)	ND (0.11)	ND (0.11)	ND (0.11)	ND (0.12)
SODIUM	ND (2,690)	ND (3,770)	192	ND (18.5)	ND (28.2)	2,720	2,410
THALLIUM	ND (0.47)	ND (0.49)	ND (0.43)	ND (0.42)	ND (0.43)	ND (0.43)	ND (0.45)
VANADIUM	123 α	23.4	93.4	105	115	31.0	31.1
ZINC	59.2	24.2	57.7	64.0	72.1	728 α	28.5
Volatile Organic Compound (ug/kg)							
1,1,1-TRICHLOROETHANE	ND (12)	ND (12)	NA	ND (11)	ND (11)	ND (11)	ND (12)
1,1-DICHLOROETHANE	ND (12)	ND (12)	NA	ND (11)	ND (11)	ND (11)	ND (12)
1,2-DICHLOROETHENE (TOTAL)	ND (12)	ND (12)	NA	ND (11)	ND (11)	ND (11)	ND (12)
2-BUTANONE	ND (12)	ND (10)	NA	ND (11)	ND (11)	ND (11)	ND (12)
4-METHYL-2-PENTANONE	ND (12)	ND (12)	NA	ND (11)	ND (11)	ND (11)	ND (12)
ACETONE	ND (32)	ND (43)	NA	ND (11)	ND (11)	ND (11)	ND (12)
CARBON DISULFIDE	ND (12)	8	NA	ND (11)	ND (11)	ND (11)	ND (12)
CHLOROFORM	ND (12)	ND (12)	NA	ND (11)	ND (11)	ND (11)	ND (12)
ETHYLBENZENE	ND (12)	ND (12)	NA	ND (11)	ND (11)	ND (11)	ND (12)
TOLUENE	ND (12)	ND (12)	NA	ND (11)	ND (11)	ND (11)	ND (12)

TABLE 4.10-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR34B032	IR34B032	IR34B034	IR34B034	IR34B034	IR34MW35A	IR34MW35A
Sampling Depth (feet bgs)	16.25	21.25	0.75	6.00	9.75	15.25	20.25
Sample Number	9441A139	9441A140	9551J727	9551J728	9551J729	9601G007	9601G008
Sample Date	10/12/94	10/12/94	12/20/95	12/20/95	12/20/95	01/02/96	01/02/96
Volatile Organic Compound (ug/kg)							
TRICHLOROETHENE	ND (12)	ND (12)	NA	ND (11)	ND (11)	ND (11)	ND (12)
XYLENE (TOTAL)	ND (12)	ND (12)	NA	ND (11)	ND (11)	ND (11)	ND (12)
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (390)	ND (410)	ND (380)	ND (360)	ND (380)	ND (380)	ND (390)
ANTHRACENE	ND (390)	ND (410)	ND (380)	ND (360)	ND (380)	ND (380)	ND (390)
BENZO(A)ANTHRACENE	ND (390)	46	ND (380)	ND (360)	ND (380)	ND (380)	ND (390)
BENZO(A)PYRENE	ND (390)	130 *	ND (380)	ND (360)	ND (380)	ND (380)	ND (390)
BENZO(B)FLUORANTHENE	ND (390)	86	ND (380)	ND (360)	ND (380)	ND (380)	ND (390)
BENZO(G,H,I)PERYLENE	ND (390)	150	ND (380)	ND (360)	ND (380)	ND (380)	ND (390)
BENZO(K)FLUORANTHENE	ND (390)	78	ND (380)	ND (360)	ND (380)	ND (380)	ND (390)
BIS(2-ETHYLHEXYL)PHTHALATE	ND (260)	ND (69)	ND (380)	ND (360)	ND (730)	ND (380)	ND (390)
CARBAZOLE	ND (390)	ND (410)	ND (380)	ND (360)	ND (380)	ND (380)	ND (390)
CHRYSENE	ND (390)	59	ND (380)	ND (360)	ND (380)	ND (380)	ND (390)
DIBENZ(A,H)ANTHRACENE	ND (390)	ND (410)	ND (380)	ND (360)	ND (380)	ND (380)	ND (390)
DIBENZOFURAN	ND (390)	ND (410)	ND (380)	ND (360)	ND (380)	ND (380)	ND (390)
FLUORANTHENE	ND (390)	100	ND (380)	ND (360)	ND (380)	ND (380)	ND (390)
INDENO(1,2,3-CD)PYRENE	ND (390)	92	ND (380)	ND (360)	ND (380)	ND (380)	ND (390)
NAPHTHALENE	ND (390)	ND (410)	ND (380)	ND (360)	ND (380)	ND (380)	ND (390)
PHENANTHRENE	ND (390)	26	ND (380)	ND (360)	ND (380)	ND (380)	ND (390)
PYRENE	ND (390)	160	ND (380)	ND (360)	ND (380)	ND (380)	ND (390)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
4,4'-DDD	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
4,4'-DDE	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
4,4'-DDT	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ALDRIN	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
ALPHA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
BETA-BHC	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
DIELDRIN	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ENDRIN	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ENDRIN ALDEHYDE	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
GAMMA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
HEPTACHLOR	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
AROCLOR-1260	ND (19)	ND (20)	ND (38)	ND (37)	ND (38)	ND (38)	ND (40)

TABLE 4.10-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR34B032	IR34B032	IR34B034	IR34B034	IR34B034	IR34MW35A	IR34MW35A
Sampling Depth (feet bgs)	16.25	21.25	0.75	6.00	9.75	15.25	20.25
Sample Number	9441A139	9441A140	9551J727	9551J728	9551J729	9601G007	9601G008
Sample Date	10/12/94	10/12/94	12/20/95	12/20/95	12/20/95	01/02/96	01/02/96
TPH-Purgeable (mg/kg)							
TPH-GASOLINE	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.6)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (12)	ND (12)	ND (11)	ND (11)	19	18	ND (12)
TPH-MOTOR OIL	ND (12)	ND (8)	8	ND (11)	250	64	ND (12)
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	ND (4)	ND (8)	ND (11)	11	100	ND (11)	ND (12)
Oil and Grease (mg/kg)							
TOTAL OIL & GREASE	NA	NA	NA	NA	NA	NA	NA
Anion (ug/kg)							
CHLORIDE	NA	NA	NA	NA	NA	NA	NA
NITRATE	NA	NA	NA	NA	NA	NA	NA
SULFATE	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	85.8	81.6	88.1	91.0	88.4	87.8	84.2
pH (pH units)							
PH	8.0	8.5	7.7	8.1	7.7	8.6	8.8

TABLE 4.10-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR50B018	IR50B018	IR50B018	IR50B019	IR50B019	IR50B019	IR50B019
Sampling Depth (feet bgs)	3.75	6.25	11.25	1.75	6.25	11.25	16.25
Sample Number	9422R213	9422R214	9422R215	9422R218	9422R219	9422R220	9422R221
Sample Date	06/02/94	06/02/94	06/02/94	06/02/94	06/02/94	06/02/94	06/02/94
Metal (mg/kg)							
ALUMINUM	35,900	35,600	33,500	25,300	33,200	26,500	31,800
ANTIMONY	ND (1.8)	ND (2.3)	ND (2.2)	ND (2.0)	ND (2.2)	ND (2.1)	ND (2.3)
ARSENIC	1.1 *	6.3 *#	1.7 *	0.93 *	2.9 *#	1.4 *	1.4 *
BARIUM	224	242	243	83.1	177	121	150
BERYLLIUM	ND (0.03)	0.30 *	ND (0.13)	ND (0.02)	ND (0.17)	ND (0.05)	ND (0.04)
CADMIUM	0.19	0.72	0.43	0.29	0.71	0.39	0.22
CALCIUM	25,300	21,500	18,000	20,300	20,700	15,800	21,600
CHROMIUM	83.9	160	149	83.3	119	115	129
COBALT	42.3	37.6	43.0	30.0	39.4	28.7	45.1
COPPER	73.9	121	72.9	82.6	111	62.2	78.1
IRON	52,300	70,800	52,800	37,000	54,700	39,400	51,900
LEAD	1.3	4.1	2.2	22.0 α	3.3	1.7	2.1
MAGNESIUM	26,200	35,400	27,400	16,200	24,800	13,500	27,000
MANGANESE	2,060 *α	3,200 *α	2,380 *α	722 *	2,190 *α	585 *	1,580 *α
MERCURY	0.02	0.03	0.03	0.16	0.02	0.03	0.02
MOLYBDENUM	ND (0.36)	ND (0.62)	ND (0.17)	ND (0.27)	ND (0.38)	ND (0.13)	ND (0.31)
NICKEL	141	245 *	163 *	39.3	152 *	71.3	158 *
POTASSIUM	481	491	1,610	674	1,200	2,670	1,190
SELENIUM	1.3	0.81	0.97	1.0	1.0	0.66	1.1
SILVER	ND (0.11)	ND (0.09)	ND (0.10)	ND (0.09)	ND (0.08)	ND (0.12)	ND (0.11)
SODIUM	ND (20.9)	ND (17.6)	6,620	ND (18.9)	1,150	3,680	2,390
THALLIUM	ND (0.21)	ND (0.20)	ND (0.21)	ND (0.15)	ND (0.18)	ND (0.13)	ND (0.19)
VANADIUM	122 α	178 α	131 α	111	169 α	114	133 α
ZINC	69.8	154 α	72.5	86.3	150 α	60.4	71.7
Volatile Organic Compound (ug/kg)							
1,1,1-TRICHLOROETHANE	ND (11)	ND (11)	ND (12)	ND (11)	ND (12)	ND (13)	ND (12)
1,1-DICHLOROETHANE	ND (11)	ND (11)	ND (12)	ND (11)	ND (12)	ND (13)	ND (12)
1,2-DICHLOROETHENE (TOTAL)	ND (11)	ND (11)	ND (12)	ND (11)	ND (12)	ND (13)	ND (12)
2-BUTANONE	ND (11)	ND (11)	ND (12)	ND (11)	ND (12)	ND (13)	ND (12)
4-METHYL-2-PENTANONE	ND (11)	ND (11)	ND (12)	ND (11)	ND (12)	ND (13)	ND (12)
ACETONE	ND (8)	ND (7)	ND (12)	ND (18)	ND (7)	ND (4)	ND (12)
CARBON DISULFIDE	ND (11)	ND (11)	ND (12)	ND (11)	ND (12)	ND (13)	ND (12)
CHLOROFORM	ND (11)	ND (11)	ND (12)	ND (11)	ND (12)	ND (13)	ND (12)
ETHYLBENZENE	ND (11)	ND (11)	ND (12)	12	ND (12)	ND (13)	ND (12)
TOLUENE	ND (11)	ND (11)	ND (12)	8	ND (12)	ND (13)	ND (12)

TABLE 4.10-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR50B018	IR50B018	IR50B018	IR50B019	IR50B019	IR50B019	IR50B019
Sampling Depth (feet bgs)	3.75	6.25	11.25	1.75	6.25	11.25	16.25
Sample Number	9422R213	9422R214	9422R215	9422R218	9422R219	9422R220	9422R221
Sample Date	06/02/94	06/02/94	06/02/94	06/02/94	06/02/94	06/02/94	06/02/94
Volatile Organic Compound (ug/kg)							
TRICHLOROETHENE	ND (11)	ND (11)	ND (12)	13	ND (12)	ND (13)	ND (12)
XYLENE (TOTAL)	ND (11)	ND (11)	ND (12)	94	ND (12)	ND (13)	ND (12)
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (370)	ND (370)	ND (400)	ND (360)	ND (380)	ND (410)	61
ANTHRACENE	ND (370)	ND (370)	ND (400)	ND (360)	ND (380)	ND (410)	ND (410)
BENZO(A)ANTHRACENE	ND (370)	ND (370)	ND (400)	ND (360)	ND (380)	ND (410)	ND (410)
BENZO(A)PYRENE	ND (370)	ND (370)	ND (400)	ND (360)	ND (380)	ND (410)	ND (410)
BENZO(B)FLUORANTHENE	ND (370)	ND (370)	ND (400)	ND (360)	ND (380)	ND (410)	ND (410)
BENZO(G,H,I)PERYLENE	ND (370)	ND (370)	ND (400)	ND (360)	ND (380)	ND (410)	ND (410)
BENZO(K)FLUORANTHENE	ND (370)	ND (370)	ND (400)	ND (360)	ND (380)	ND (410)	ND (410)
BIS(2-ETHYLHEXYL)PHTHALATE	ND (40)	ND (120)	ND (53)	ND (73)	ND (60)	ND (230)	ND (270)
CARBAZOLE	ND (370)	ND (370)	ND (400)	ND (360)	ND (380)	ND (410)	ND (410)
CHRYSENE	ND (370)	ND (370)	ND (400)	ND (360)	ND (380)	ND (410)	33
DIBENZ(A,H)ANTHRACENE	ND (370)	ND (370)	ND (400)	ND (360)	ND (380)	ND (410)	ND (410)
DIBENZOFURAN	ND (370)	ND (370)	ND (400)	ND (360)	ND (380)	ND (410)	ND (410)
FLUORANTHENE	ND (370)	ND (370)	ND (400)	ND (360)	ND (380)	ND (410)	ND (410)
INDENO(1,2,3-CD)PYRENE	ND (370)	ND (370)	ND (400)	ND (360)	ND (380)	ND (410)	ND (410)
NAPHTHALENE	ND (370)	ND (370)	ND (400)	ND (360)	ND (380)	ND (410)	ND (410)
PHENANTHRENE	ND (370)	ND (370)	ND (400)	ND (360)	ND (380)	ND (410)	32
PYRENE	ND (370)	ND (370)	ND (400)	ND (360)	ND (380)	ND (410)	ND (410)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
4,4'-DDD	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
4,4'-DDE	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
4,4'-DDT	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ALDRIN	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
ALPHA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
BETA-BHC	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
DIELDRIN	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ENDRIN	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ENDRIN ALDEHYDE	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
GAMMA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
HEPTACHLOR	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
AROCLOR-1260	ND (37)	ND (37)	ND (40)	ND (36)	ND (38)	ND (41)	ND (41)

TABLE 4.10-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR50B018	IR50B018	IR50B018	IR50B019	IR50B019	IR50B019	IR50B019
Sampling Depth (feet bgs)	3.75	6.25	11.25	1.75	6.25	11.25	16.25
Sample Number	9422R213	9422R214	9422R215	9422R218	9422R219	9422R220	9422R221
Sample Date	06/02/94	06/02/94	06/02/94	06/02/94	06/02/94	06/02/94	06/02/94
TPH-Purgeable (mg/kg)							
TPH-GASOLINE	ND (0.6)	ND (0.6)	ND (0.6)	1	ND (0.6)	ND (0.6)	ND (0.6)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (12)	ND (12)	ND (13)	ND (11)	ND (12)	ND (13)	ND (13)
TPH-MOTOR OIL	ND (120)	ND (120)	ND (130)	ND (110)	ND (120)	ND (130)	280
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	43	ND (29)	ND (33)	ND (29)	48	56	450
Oil and Grease (mg/kg)							
TOTAL OIL & GREASE	NA	NA	NA	NA	NA	NA	NA
Anion (ug/kg)							
CHLORIDE	NA	NA	NA	NA	NA	NA	NA
NITRATE	NA	NA	NA	NA	NA	NA	NA
SULFATE	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	90.4	89.6	82.1	91.6	86.3	81.4	80.0
pH (pH units)							
PH	7.8	9.0	8.4	8.5	8.1	7.2	7.0

TABLE 4.10-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	PA34B005	PA34B005	PA34B006	PA34B006	PA34B006	PA34B008	PA34B008
Sampling Depth (feet bgs)	2.25	6.75	2.25	6.75	10.25	2.25	6.75
Sample Number	9308D085	9308D086	9308D088	9308D089	9308D090	9308D082	9308D083
Sample Date	02/26/93	02/26/93	02/26/93	02/26/93	02/26/93	02/26/93	02/26/93
Metal (mg/kg)							
ALUMINUM	5,110	23,700	14,700	28,200	26,100	20,100	25,400
ANTIMONY	NA	NA	ND (7.0)	ND (7.1)	ND (7.3)	NA	NA
ARSENIC	2.1 *#	1.4 *	1.5 *	1.6 *	1.4 *	0.97 *	1.1 *
BARIUM	46.4	82.1	98.1	150	136	75.2	141
BERYLLIUM	ND (0.21)	ND (0.21)	ND (0.23)	ND (0.23)	0.35 *	ND (0.23)	ND (0.24)
CADMIUM	ND (0.83)	ND (0.85)	ND (0.90)	ND (0.92)	ND (0.94)	ND (0.90)	ND (0.98)
CALCIUM	20,300	16,400	27,800	19,900	19,700	15,000	14,100
CHROMIUM	17.1	38.0	71.2	114	164	82.1	122
COBALT	5.4	25.1	19.5	33.0	36.4	21.2	36.6
COPPER	23.1	78.3	50.6	69.1	52.5	46.0	70.5
IRON	8,210	33,200	22,200	40,700	50,800	30,200	40,900
LEAD	6.1	4.1	12.3 α	ND (2.2)	ND (1.6)	4.0	13.7 α
MAGNESIUM	4,260	18,500	14,100	22,400	19,700	14,100	18,800
MANGANESE	232	793 *	711 *	1,400 *	1,650 *α	743 *	1,530 *α
MERCURY	ND (0.10)	ND (0.11)	ND (0.11)	ND (0.12)	ND (0.12)	ND (0.11)	ND (0.12)
MOLYBDENUM	ND (0.62)	0.98	ND (0.89)	ND (0.70)	ND (1.6)	0.91	1.8
NICKEL	26.3	41.0	59.6	104	110	48.9	65.2
POTASSIUM	441	607	427	687	487	338	1,360
SELENIUM	ND (0.62)	ND (0.63)	ND (0.68)	ND (0.69)	ND (0.71)	ND (0.68)	ND (0.73)
SILVER	ND (0.41)	ND (0.42)	ND (0.45)	ND (0.46)	ND (0.47)	ND (0.45)	ND (0.49)
SODIUM	385	972	ND (332)	911	1,610	1,040	4,370
THALLIUM	ND (0.62)	ND (0.63)	ND (0.68)	ND (0.69)	ND (0.71)	ND (0.68)	ND (0.73)
VANADIUM	17.6	79.8	60.1	109	103	82.2	126 α
ZINC	29.4	48.9	48.7	68.9	83.8	52.1	104
Volatile Organic Compound (ug/kg)							
1,1,1-TRICHLOROETHANE	NA	NA	ND (11)	ND (11)	ND (12)	ND (11)	ND (12)
1,1-DICHLOROETHANE	NA	NA	ND (11)	ND (11)	ND (12)	ND (11)	ND (12)
1,2-DICHLOROETHENE (TOTAL)	NA	NA	ND (11)	ND (11)	ND (12)	ND (11)	ND (12)
2-BUTANONE	NA	NA	ND (0.9)	ND (2)	ND (12)	ND (2)	ND (2)
4-METHYL-2-PENTANONE	NA	NA	ND (11)	ND (11)	ND (12)	ND (11)	ND (12)
ACETONE	NA	NA	ND (11)	ND (2)	ND (3)	ND (0.5)	ND (3)
CARBON DISULFIDE	NA	NA	0.5	ND (11)	1	ND (0.7)	ND (3)
CHLOROFORM	NA	NA	ND (11)	ND (11)	ND (12)	ND (11)	ND (12)
ETHYLBENZENE	NA	NA	ND (6)	ND (6)	ND (6)	ND (6)	ND (6)
TOLUENE	NA	NA	ND (6)	ND (6)	ND (6)	ND (6)	ND (6)

TABLE 4.10-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	PA34B005	PA34B005	PA34B006	PA34B006	PA34B006	PA34B008	PA34B008
Sampling Depth (feet bgs)	2.25	6.75	2.25	6.75	10.25	2.25	6.75
Sample Number	9308D085	9308D086	9308D088	9308D089	9308D090	9308D082	9308D083
Sample Date	02/26/93	02/26/93	02/26/93	02/26/93	02/26/93	02/26/93	02/26/93
Volatile Organic Compound (ug/kg)							
TRICHLOROETHENE	NA	NA	ND (11)	ND (11)	ND (12)	ND (11)	ND (12)
XYLENE (TOTAL)	NA	NA	ND (6)	ND (6)	ND (6)	ND (6)	ND (6)
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	NA	NA	ND (370)	ND (380)	ND (390)	ND (370)	ND (400)
ANTHRACENE	NA	NA	ND (370)	ND (380)	ND (390)	ND (370)	ND (400)
BENZO(A)ANTHRACENE	NA	NA	ND (370)	ND (380)	ND (390)	ND (370)	ND (400)
BENZO(A)PYRENE	NA	NA	ND (370)	ND (380)	ND (390)	ND (370)	ND (400)
BENZO(B)FLUORANTHENE	NA	NA	ND (370)	ND (380)	ND (390)	ND (370)	ND (400)
BENZO(G,H,I)PERYLENE	NA	NA	ND (370)	ND (380)	ND (390)	ND (370)	ND (400)
BENZO(K)FLUORANTHENE	NA	NA	ND (370)	ND (380)	ND (390)	ND (370)	ND (400)
BIS(2-ETHYLHEXYL)PHTHALATE	NA	NA	ND (370)	ND (380)	ND (390)	ND (370)	ND (400)
CARBAZOLE	NA	NA	ND (370)	ND (380)	ND (390)	ND (370)	ND (400)
CHRYSENE	NA	NA	ND (370)	ND (380)	ND (390)	ND (370)	ND (400)
DIBENZ(A,H)ANTHRACENE	NA	NA	ND (370)	ND (380)	ND (390)	ND (370)	ND (400)
DIBENZOFURAN	NA	NA	ND (370)	ND (380)	ND (390)	ND (370)	ND (400)
FLUORANTHENE	NA	NA	ND (370)	ND (380)	ND (390)	ND (370)	ND (400)
INDENO(1,2,3-CD)PYRENE	NA	NA	ND (370)	ND (380)	ND (390)	ND (370)	ND (400)
NAPHTHALENE	NA	NA	ND (370)	ND (380)	ND (390)	ND (370)	ND (400)
PHENANTHRENE	NA	NA	ND (370)	ND (380)	ND (390)	ND (370)	ND (400)
PYRENE	NA	NA	ND (370)	ND (380)	ND (390)	ND (370)	ND (400)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
4,4'-DDD	NA	NA	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
4,4'-DDE	NA	NA	ND (4)	ND (4)	ND (4)	ND (4)	0.8
4,4'-DDT	NA	NA	0.4	0.1	ND (4)	ND (4)	5
ALDRIN	NA	NA	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
ALPHA-CHLORDANE	NA	NA	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
BETA-BHC	NA	NA	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
DIELDRIN	NA	NA	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ENDRIN	NA	NA	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ENDRIN ALDEHYDE	NA	NA	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
GAMMA-CHLORDANE	NA	NA	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
HEPTACHLOR	NA	NA	0.2	ND (2)	ND (2)	ND (2)	ND (2)
AROCLOR-1260	NA	NA	ND (37)	ND (38)	ND (39)	ND (37)	ND (40)

TABLE 4.10-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	PA34B005	PA34B005	PA34B006	PA34B006	PA34B006	PA34B008	PA34B008
Sampling Depth (feet bgs)	2.25	6.75	2.25	6.75	10.25	2.25	6.75
Sample Number	9308D085	9308D086	9308D088	9308D089	9308D090	9308D082	9308D083
Sample Date	02/26/93	02/26/93	02/26/93	02/26/93	02/26/93	02/26/93	02/26/93
TPH-Purgeable (mg/kg)							
TPH-GASOLINE	NA	NA	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
TPH-Extractable (mg/kg)							
TPH-DIESEL	NA	NA	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
TPH-MOTOR OIL	NA	NA	35	ND (11)	ND (12)	10	ND (12)
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	NA	NA	NA	NA	NA	NA	NA
Oil and Grease (mg/kg)							
TOTAL OIL & GREASE	NA	NA	250	ND (29)	ND (30)	ND (28)	ND (30)
Anion (ug/kg)							
CHLORIDE	16,000	13,000	NA	NA	NA	NA	NA
NITRATE	1,800	34,000	NA	NA	NA	NA	NA
SULFATE	16,000	6,400	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	NA	NA	NA	NA	NA	NA	NA
pH (pH units)							
PH	8.5	7,900	NA	NA	NA	NA	NA

TABLE 4.10-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	PA34B008	PA34B009	PA34B009	PA34B009	PA34B011	PA34B011	PA34B011
Sampling Depth (feet bgs)	10.25	2.25	6.75	10.25	1.75	6.75	10.25
Sample Number	9308D084	9308D079	9308D080	9308D081	9309A680	9309A681	9309A682
Sample Date	02/26/93	02/26/93	02/26/93	02/26/93	03/05/93	03/05/93	03/05/93
Metal (mg/kg)							
ALUMINUM	29,800	22,200	32,700	36,700	30,400	24,100	32,400
ANTIMONY	NA	NA	ND (9.2)	NA	NA	NA	NA
ARSENIC	1.5 *	0.85 *	ND (2.2)	1.9 *	ND (1.2)	ND (1.4)	ND (1.1)
BARIUM	131	87.2	213	286	120	117	109
BERYLLIUM	0.50 *	ND (0.23)	0.37 *	0.29 *	ND (0.23)	ND (0.22)	ND (0.23)
CADMIUM	ND (0.94)	1.7	1.9	2.2	1.8	ND (0.88)	1.4
CALCIUM	24,800	13,100	26,100	23,500	20,800	20,400	25,100
CHROMIUM	73.1	87.4	102	154	113	76.6	218 *
COBALT	47.3 α	30.7	27.5	36.9	32.6	27.2	35.7
COPPER	90.0	70.4	44.6	67.0	78.2	71.4	71.2
IRON	33,500	38,600	55,800	57,500	46,100	34,800	41,200
LEAD	2.5	ND (1.4)	ND (1.3)	3.9	1.7	ND (0.62)	1.6
MAGNESIUM	15,400	19,600	18,600	24,700	21,100	16,700	24,000
MANGANESE	5,190 *α	1,050 *	1,840 *α	1,830 *α	1,710 *α	1,080 *	1,340 *
MERCURY	ND (0.12)	ND (0.12)	ND (0.11)	ND (0.12)	0.12	0.66	ND (0.11)
MOLYBDENUM	1.2	0.90	1.5	ND (0.71)	ND (0.68)	ND (0.66)	ND (0.69)
NICKEL	81.1	48.5	45.7	115	88.4	45.7	180 *
POTASSIUM	1,800	406	316	747	ND (526)	ND (687)	ND (967)
SELENIUM	ND (0.71)	ND (0.69)	ND (0.68)	ND (0.71)	ND (0.68)	ND (0.66)	ND (0.69)
SILVER	ND (0.47)	ND (0.46)	ND (0.46)	ND (0.47)	ND (0.45)	ND (0.44)	ND (0.46)
SODIUM	4,360	658	642	1,150	403	309	5,110
THALLIUM	ND (0.71)	ND (0.69)	ND (0.68)	ND (0.71)	ND (0.68)	ND (0.66)	ND (0.69)
VANADIUM	84.8	116	137 α	137 α	134 α	104	108
ZINC	91.7	88.2	124 α	70.8	71.7	55.4	75.0
Volatile Organic Compound (ug/kg)							
1,1,1-TRICHLOROETHANE	ND (12)	ND (11)	ND (11)	ND (12)	ND (11)	12	ND (11)
1,1-DICHLOROETHANE	ND (12)	ND (11)	ND (11)	ND (12)	ND (11)	2	ND (11)
1,2-DICHLOROETHENE (TOTAL)	ND (12)	ND (11)	ND (11)	ND (12)	ND (11)	13	ND (11)
2-BUTANONE	ND (5)	ND (2)	ND (11)	ND (2)	ND (3)	ND (11)	ND (11)
4-METHYL-2-PENTANONE	ND (12)	ND (11)	ND (11)	ND (12)	ND (11)	ND (11)	ND (11)
ACETONE	ND (12)	ND (4)	ND (1)	ND (5)	ND (3)	ND (6)	ND (5)
CARBON DISULFIDE	ND (1)	ND (1)	ND (1)	ND (1)	ND (11)	ND (11)	ND (11)
CHLOROFORM	ND (12)	ND (11)	ND (11)	ND (12)	ND (11)	ND (11)	ND (11)
ETHYLBENZENE	ND (6)	ND (6)	ND (6)	ND (6)	ND (6)	ND (5)	ND (6)
TOLUENE	ND (6)	ND (6)	ND (6)	ND (6)	ND (6)	6	ND (1)

TABLE 4.10-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	PA34B008	PA34B009	PA34B009	PA34B009	PA34B011	PA34B011	PA34B011
Sampling Depth (feet bgs)	10.25	2.25	6.75	10.25	1.75	6.75	10.25
Sample Number	9308D084	9308D079	9308D080	9308D081	9309A680	9309A681	9309A682
Sample Date	02/26/93	02/26/93	02/26/93	02/26/93	03/05/93	03/05/93	03/05/93
Volatile Organic Compound (ug/kg)							
TRICHLOROETHENE	ND (12)	ND (11)	ND (11)	ND (12)	ND (11)	21	ND (11)
XYLENE (TOTAL)	ND (6)	ND (6)	ND (6)	ND (6)	ND (6)	0.5	ND (6)
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (390)	ND (380)	ND (370)	ND (390)	ND (370)	ND (360)	ND (380)
ANTHRACENE	ND (390)	ND (380)	ND (370)	ND (390)	ND (370)	ND (360)	ND (380)
BENZO(A)ANTHRACENE	ND (390)	ND (380)	ND (370)	ND (390)	ND (370)	ND (360)	ND (380)
BENZO(A)PYRENE	ND (390)	ND (380)	ND (370)	ND (390)	ND (370)	ND (360)	ND (380)
BENZO(B)FLUORANTHENE	ND (390)	ND (380)	ND (370)	ND (390)	ND (370)	ND (360)	ND (380)
BENZO(G,H,I)PERYLENE	ND (390)	ND (380)	ND (370)	ND (390)	ND (370)	ND (360)	ND (380)
BENZO(K)FLUORANTHENE	ND (390)	ND (380)	ND (370)	ND (390)	ND (370)	ND (360)	ND (380)
BIS(2-ETHYLHEXYL)PHTHALATE	ND (390)	ND (380)	ND (370)	ND (390)	ND (370)	ND (360)	ND (380)
CARBAZOLE	ND (390)	ND (380)	ND (370)	ND (390)	ND (370)	ND (360)	ND (380)
CHRYSENE	ND (390)	ND (380)	ND (370)	ND (390)	ND (370)	ND (360)	ND (380)
DIBENZ(A,H)ANTHRACENE	ND (390)	ND (380)	ND (370)	ND (390)	ND (370)	ND (360)	ND (380)
DIBENZOFURAN	ND (390)	ND (380)	ND (370)	ND (390)	ND (370)	ND (360)	ND (380)
FLUORANTHENE	ND (390)	ND (380)	ND (370)	ND (390)	ND (370)	ND (360)	ND (380)
INDENO(1,2,3-CD)PYRENE	ND (390)	ND (380)	ND (370)	ND (390)	ND (370)	ND (360)	ND (380)
NAPHTHALENE	ND (390)	ND (380)	ND (370)	ND (390)	ND (370)	ND (360)	ND (380)
PHENANTHRENE	ND (390)	ND (380)	ND (370)	ND (390)	ND (370)	ND (360)	ND (380)
PYRENE	ND (390)	ND (380)	ND (370)	ND (390)	ND (370)	38	ND (380)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
4,4'-DDD	ND (4)	ND (4)	ND (4)	ND (4)	0.2	ND (4)	ND (4)
4,4'-DDE	ND (4)	ND (4)	ND (4)	ND (4)	0.02	ND (4)	ND (4)
4,4'-DDT	ND (4)	ND (4)	ND (4)	ND (4)	0.2	ND (4)	ND (4)
ALDRIN	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
ALPHA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	0.03	ND (2)
BETA-BHC	ND (2)	ND (2)	ND (2)	ND (2)	0.2	ND (2)	ND (2)
DIELDRIN	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	0.04	ND (4)
ENDRIN	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	0.1	ND (4)
ENDRIN ALDEHYDE	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	0.3	ND (4)
GAMMA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	0.05	ND (2)
HEPTACHLOR	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
AROCLOR-1260	ND (39)	ND (38)	ND (37)	ND (39)	ND (37)	14	ND (38)

TABLE 4.10-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	PA34B008	PA34B009	PA34B009	PA34B009	PA34B011	PA34B011	PA34B011
Sampling Depth (feet bgs)	10.25	2.25	6.75	10.25	1.75	6.75	10.25
Sample Number	9308D084	9308D079	9308D080	9308D081	9309A680	9309A681	9309A682
Sample Date	02/26/93	02/26/93	02/26/93	02/26/93	03/05/93	03/05/93	03/05/93
TPH-Purgeable (mg/kg)							
TPH-GASOLINE	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
TPH-MOTOR OIL	ND (12)	98	ND (11)	24	ND (11)	ND (11)	ND (11)
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	NA	NA	NA	NA	NA	NA	NA
Oil and Grease (mg/kg)							
TOTAL OIL & GREASE	ND (29)	ND (29)	ND (28)	ND (29)	ND (28)	55	ND (29)
Anion (ug/kg)							
CHLORIDE	NA	NA	NA	NA	NA	NA	NA
NITRATE	NA	NA	NA	NA	NA	NA	NA
SULFATE	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	NA	NA	NA	NA	NA	NA	NA
pH (pH units)							
PH	NA	NA	NA	NA	NA	NA	NA

TABLE 4.10-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	PA34B013	PA34B013	PA34B013	PA34SS03	PA34SS04	PA34SS14
Sampling Depth (feet bgs)	1.75	6.75	10.25	2.75	1.75	1.25
Sample Number	9309A638	9309A639	9309A640	9310J398	9310J397	9312A696
Sample Date	03/02/93	03/02/93	03/02/93	03/12/93	03/12/93	03/22/93
Metal (mg/kg)						
ALUMINUM	38,800	29,900	28,800	23,300	24,200	20,600
ANTIMONY	8.2	ND (6.3)	ND (7.3)	4.8	4.0	NA
ARSENIC	0.64 *	0.84 *	2.6 *#	1.6 *	1.5 *	4.4 *#
BARIUM	86.1	100	197	153	138	123
BERYLLIUM	0.29 *	0.30 *	0.47 *	0.32 *	0.25 *	ND (0.31)
CADMIUM	ND (1.0)	ND (1.0)	ND (1.2)	ND (0.51)	ND (0.49)	0.55
CALCIUM	25,500	21,500	15,200	14,800	16,400	13,200
CHROMIUM	107	120	138	117	98.7	80.1
COBALT	ND (39.3)	ND (33.7)	ND (39.8)	41.8	33.1	23.7
COPPER	69.8	69.7	93.7	56.3	53.8	44.7
IRON	51,700	42,100	46,200	40,400	33,800	28,800
LEAD	1.1	ND (0.41)	5.1	2.6	4.0	41.8 α
MAGNESIUM	28,300	20,700	19,600	18,100	18,800	12,800
MANGANESE	1,020 *	888 *	935 *	1,380 *	1,060 *	709 *
MERCURY	ND (0.05)	ND (0.05)	ND (0.06)	0.12	0.11	ND (0.08)
MOLYBDENUM	ND (0.81)	1.0	ND (0.95)	ND (0.61)	ND (0.58)	ND (0.56)
NICKEL	53.9	68.3	133	95.6	86.5	62.9
POTASSIUM	674	558	2,110	608	587	616
SELENIUM	ND (0.72)	ND (0.74)	ND (0.85)	ND (0.44)	ND (0.42)	ND (0.50)
SILVER	0.78	0.60	0.80	ND (0.46)	ND (0.44)	ND (0.43)
SODIUM	439	437	5,910	556	463	ND (488)
THALLIUM	ND (0.66)	ND (0.67)	ND (0.78)	ND (0.41)	ND (0.40)	ND (0.63)
VANADIUM	140 α	116	116	127 α	103	87.0
ZINC	66.2	59.1	111 α	76.4	55.8	81.7
Volatile Organic Compound (ug/kg)						
1,1,1-TRICHLOROETHANE	ND (11)	ND (11)	ND (12)	ND (12)	ND (12)	ND (11)
1,1-DICHLOROETHANE	ND (11)	ND (11)	ND (12)	ND (12)	ND (12)	ND (11)
1,2-DICHLOROETHENE (TOTAL)	ND (11)	ND (11)	ND (12)	ND (12)	ND (12)	ND (11)
2-BUTANONE	ND (11)	ND (11)	ND (12)	ND (12)	ND (12)	ND (11)
4-METHYL-2-PENTANONE	ND (11)	ND (11)	ND (12)	ND (12)	ND (12)	ND (11)
ACETONE	ND (11)	ND (11)	ND (12)	25	39	ND (11)
CARBON DISULFIDE	ND (11)	ND (11)	ND (12)	ND (12)	ND (12)	ND (11)
CHLOROFORM	ND (11)	ND (11)	ND (12)	ND (12)	ND (12)	ND (11)
ETHYLBENZENE	ND (11)	ND (11)	ND (12)	ND (12)	ND (12)	ND (11)
TOLUENE	ND (11)	ND (11)	ND (12)	ND (12)	ND (12)	ND (11)

TABLE 4.10-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	PA34B013	PA34B013	PA34B013	PA34SS03	PA34SS04	PA34SS14
Sampling Depth (feet bgs)	1.75	6.75	10.25	2.75	1.75	1.25
Sample Number	9309A638	9309A639	9309A640	9310J398	9310J397	9312A696
Sample Date	03/02/93	03/02/93	03/02/93	03/12/93	03/12/93	03/22/93
Volatile Organic Compound (ug/kg)						
TRICHLOROETHENE	ND (11)	ND (11)	ND (12)	ND (12)	ND (12)	ND (11)
XYLENE (TOTAL)	ND (11)	ND (11)	ND (12)	ND (12)	ND (12)	ND (11)
Semivolatile Organic Compound (ug/kg)						
2-METHYLNAPHTHALENE	ND (350)	ND (360)	ND (410)	ND (400)	ND (120,000)	ND (1,900)
ANTHRACENE	ND (350)	ND (360)	ND (410)	ND (400)	ND (120,000)	ND (1,900)
BENZO(A)ANTHRACENE	ND (350)	ND (360)	ND (410)	ND (400)	ND (120,000)	ND (1,900)
BENZO(A)PYRENE	ND (350)	ND (360)	ND (410)	ND (400)	ND (120,000)	ND (1,900)
BENZO(B)FLUORANTHENE	ND (350)	ND (360)	ND (410)	ND (400)	ND (120,000)	ND (1,900)
BENZO(G,H,I)PERYLENE	ND (350)	ND (360)	ND (410)	ND (400)	ND (120,000)	ND (1,900)
BENZO(K)FLUORANTHENE	ND (350)	ND (360)	ND (410)	ND (400)	ND (120,000)	ND (1,900)
BIS(2-ETHYLHEXYL)PHTHALATE	ND (350)	ND (75)	ND (410)	160	ND (120,000)	ND (1,900)
CARBAZOLE	ND (350)	ND (360)	ND (410)	ND (400)	ND (120,000)	ND (1,900)
CHRYSENE	ND (350)	ND (360)	ND (410)	ND (400)	ND (120,000)	ND (1,900)
DIBENZ(A,H)ANTHRACENE	ND (350)	ND (360)	ND (410)	ND (400)	ND (120,000)	ND (1,900)
DIBENZOFURAN	ND (350)	ND (360)	ND (410)	ND (400)	ND (120,000)	ND (1,900)
FLUORANTHENE	ND (350)	ND (360)	ND (410)	ND (400)	ND (120,000)	ND (1,900)
INDENO(1,2,3-CD)PYRENE	ND (350)	ND (360)	ND (410)	ND (400)	ND (120,000)	ND (1,900)
NAPHTHALENE	ND (350)	ND (360)	ND (410)	ND (400)	ND (120,000)	ND (1,900)
PHENANTHRENE	ND (350)	ND (360)	ND (410)	ND (400)	ND (120,000)	ND (1,900)
PYRENE	ND (350)	ND (360)	ND (410)	ND (400)	ND (120,000)	ND (1,900)
Pesticide/Polychlorinated Biphenyl (ug/kg)						
4,4'-DDD	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
4,4'-DDE	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
4,4'-DDT	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ALDRIN	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
ALPHA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
BETA-BHC	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
DIELDRIN	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ENDRIN	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ENDRIN ALDEHYDE	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
GAMMA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
HEPTACHLOR	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
AROCLOR-1260	ND (35)	ND (36)	ND (41)	ND (40)	ND (39)	100 *

TABLE 4.10-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	PA34B013	PA34B013	PA34B013	PA34SS03	PA34SS04	PA34SS14
Sampling Depth (feet bgs)	1.75	6.75	10.25	2.75	1.75	1.25
Sample Number	9309A638	9309A639	9309A640	9310J398	9310J397	9312A696
Sample Date	03/02/93	03/02/93	03/02/93	03/12/93	03/12/93	03/22/93
TPH-Purgeable (mg/kg)						
TPH-GASOLINE	ND (1)	ND (1)	ND (1)	ND (6)	ND (6)	ND (6)
TPH-Extractable (mg/kg)						
TPH-DIESEL	ND (11)	ND (11)	ND (13)	ND (12)	ND (12)	1,100
TPH-MOTOR OIL	NA	NA	NA	NA	NA	NA
Total Recoverable Petroleum Hydrocarbons (mg/kg)						
TRPH	NA	NA	NA	NA	NA	NA
Oil and Grease (mg/kg)						
TOTAL OIL & GREASE	87	71	ND (320)	180	130	2,600
Anion (ug/kg)						
CHLORIDE	NA	NA	NA	NA	NA	NA
NITRATE	NA	NA	NA	NA	NA	NA
SULFATE	NA	NA	NA	NA	NA	NA
Percent Moisture (%)						
% SOLIDS	NA	NA	NA	82.5	85.5	88.8
pH (pH units)						
PH	7.7	7.7	7.1	9.0	8.0	8.7

TABLE 4.10-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

%	Percent
bgs	Below ground surface
mg/kg	Milligram per kilogram
NA	Not analyzed
ND()	Not detected (detection limit in parentheses)
µg/kg	Microgram per kilogram
*	Detected concentration greater than U.S. Environmental Protection Agency Region IX preliminary remediation goals (PRG) for residential use
#	Detected concentration greater than U.S. Environmental Protection Agency Region IX PRG for industrial use
α	Detected concentration greater than the Hunters Point ambient level.
	Detected concentration greater than at least one screening criterion.

TABLE 4.10-7

SUMMARY OF MONITORING WELL GROUNDWATER ANALYTICAL TESTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
IR34MW01A	9438X495						✓				✓	✓				✓			✓	✓	✓	✓
IR34MW01A	9438X496						✓				✓	✓				✓			✓	✓	✓	✓
IR34MW01A	9603W007						✓				✓	✓				✓			✓	✓	✓	✓
IR34MW01A	9608J881						✓				✓	✓				✓			✓	✓	✓	✓
IR34MW35A	9602J782						✓				✓	✓				✓			✓	✓	✓	✓
IR34MW35A	9606W068						✓				✓	✓				✓			✓	✓	✓	✓
IR34MW35A	9610W142						✓				✓	✓				✓			✓	✓	✓	✓

Notes:

CHROM	CHROMIUM VI
CYAN	Cyanide
DIOXIN	Dioxins and Furans
O&G	Total oil and grease
PAH	Polynuclear aromatic hydrocarbons
PCTMST	Percent moisture
PEST	Pesticides/polychlorinated biphenyls
PHYS	Physical characteristic
SALIN	Salinity
SVOC	Semivolatile organic compounds
SOLIDS	Total dissolved solids
TOC	Total organic carbon
TMICROB	Coliform
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
VOC	Volatile organic compounds

TABLE 4.10-8

STATISTICAL SUMMARY OF MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Tap Water PRG Value	Above[e] PRG	MCL Value[f]	Above[g] MCL	NAWQC Value	Above[h] NAWQC
METAL	ALUMINUM	313	16,800	4,560	UG/L	18.8	6	4	37,000	0				
	ARSENIC	1.8	4.5	3.2	UG/L	1.4	6	2	0.04	2	50.0	0	36.0	0
	BARIUM	23.6	114	53.5	UG/L	0.93	6	6	2,600	0	1,000	0		
	CADMIUM	0.45	2.7	1.6	UG/L	0.20	6	2	18.0	0	5.0	0	9.3	0
	CALCIUM	8,070	42,800	18,300	UG/L	14.2	6	5						
	CHROMIUM	6.9	81.2	44.1	UG/L	0.40	6	2			50.0	1		
	COBALT	1.3	12.8	7.1	UG/L	0.40	6	2						
	COPPER	6.2	51.0	28.6	UG/L	1.5	6	2	1,400	0			2.4	2
	IRON	402	26,700	7,160	UG/L	11.0	6	4						
	LEAD	1.1	8.0	4.6	UG/L	0.90	6	2	4.0	1	50.0	0	8.1	0
	MAGNESIUM	10,900	88,500	36,700	UG/L	28.5	6	6						
	MANGANESE	11.8	1,120	488	UG/L	0.13	6	6	180	5				
	MOLYBDENUM	4.6	4.7	4.7	UG/L	0.60	6	2	180	0				
	NICKEL	7.2	65.0	36.1	UG/L	0.70	6	2	730	0	100	0	8.2	1
	POTASSIUM	1,890	23,900	11,300	UG/L	471	6	6						
	SILVER	0.56	0.56	0.56	UG/L	0.50	6	1	180	0			0.92	0
	SODIUM	267,000	1,150,000	673,000	UG/L	45.1	6	6						
	THALLIUM	1.9	2.0	2.0	UG/L	1.9	6	3			2.0	0		
	VANADIUM	5.3	74.5	21.4	UG/L	0.52	6	6	260	0				
	ZINC	90.0	90.0	90.0	UG/L	1.0	6	1	11,000	0			81.0	1
VOC	1,1,1-TRICHLOROETHANE	1	1	1	UG/L	0.5	6	2	1,300	0	200	0		
	1,1-DICHLOROETHANE	0.4	0.4	0.4	UG/L	0.5	6	2	810	0				

TABLE 4.10-8 (Continued)

STATISTICAL SUMMARY OF MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Tap Water PRG Value	Above[e] PRG	MCL Value[f]	Above[g] MCL	NAWQC Value	Above[h] NAWQC
	1,2-DICHLOROETHENE (TOTAL)	0.3	3	2	UG/L	0.5	6	4	55	0				
	CHLOROFORM	0.7	2	1	UG/L	0.5	6	4	0.2	4	100	0		
	TRICHLOROETHENE	2	4	3	UG/L	0.5	6	3	2	3	5	0		
TPHEXT	TPH-DIESEL	53	86	70	UG/L	100	6	2	100	0i				
	TPH-MOTOR OIL	72	210	150	UG/L	100	6	6	100	4i				

TABLE 4.10-8 (Continued)

STATISTICAL SUMMARY OF MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

CYAN	Cyanide
EPA	U.S. Environmental Protection Agency
MCL	Maximum contaminant level
NAWQC	National Ambient Water Quality Criteria
O&G	Total oil and grease
PCTMST	Percent moisture
PEST	Pesticide/polychlorinated biphenyl
PPT	Parts per thousand
PRG	Preliminary remediation goal
SALIN	Salinity
SVOC	Semivolatile organic compound
TMICROB	Coliform
TOC	Total organic carbon
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
UG/L	Microgram per liter
VOC	Volatile organic compound

a Organic results of less than 10 are reported to one significant figure, and results of greater than or equal to 10 are reported to two significant figures. Inorganic results of less than 10 are reported to two significant figures, and results of greater than or equal to 10 are reported to three significant figures. Values that are not nondetects are compared to screening criteria before the significant figure rule is applied. Both the value and the screening criteria are then rounded for reporting purposes.

b Blank boxes indicate that screening critera have not been established for these analytes.

c Total number of samples analyzed

d Total number of samples showing concentrations greater than detection limit

e Total number of samples showing concentrations greater than tap water PRG
California-modified PRGs were used for the following analytes: 1,2-Dibromo-3-chloropropane, benzo[a]pyrene, benzo[k]fluoranthene, cadmium, chromium VI, chrysene, lead, nickel, and tetrachloroethylene (PCE).
For the analytes listed below, Region IX PRGs are not available; therefore, PRGs for similar chemicals were used as follows:

Analyte:	Similar Analyte:
2-Methylnapthalene	Naphthalene
Acenaphthylene	Acenaphthene
Alpha-chlordane	Chlordane
Aroclor-1260	Polychlorinated biphenyls
Benzo(g,h,i)perylene	Naphthalene
Delta BHC	HCH-technical
Endosulfan I	Endosulfan
Endosulfan sulfate	Endosulfan
Endrin aldehyde	Endrin
Endrin ketone	Endrin
Gamma-chlordane	Chlordane
Phenanthrene	Naphthalene

f EPA Title 40 Code of Federal Regulations or California Code of Regulations Title 22 MCL used, whichever is more stringent

g Total number of samples showing concentrations greater than MCL

h Total number of samples showing concentrations greater than NAWQC;
NAWQC based on 4-day average study of saltwater aquatic life

i Total number of samples showing concentrations greater than TPH, TRPH, or O&G screening level, not PRG value

TABLE 4.10-9

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR34MW01A	IR34MW01A	IR34MW01A	IR34MW01A	IR34MW35A	IR34MW35A	IR34MW35A
Sample Number	9438X495	9438X496	9603W007	9608J881	9602J782	9606W068	9610W142
Sample Date	09/23/94	09/23/94	01/17/96	02/21/96	01/09/96	02/06/96	03/08/96
Metal (ug/L)							
ALUMINUM	ND (54.0)	ND (53.0)	313	16,800	ND (42.3)	473	655
ARSENIC	ND (1.5)	ND (1.5)	1.8 *	4.5 *	ND (1.4)	ND (1.4)	ND (1.4)
BARIUM	33.6	34.9	23.6	60.6	60.6	55.9	32.4
CADMIUM	ND (0.20)	ND (0.20)	ND (0.20)	114	0.45	2.7	ND (0.20)
CALCIUM	ND (32,900)	ND (32,000)	8,070	8,740	42,800	19,400	12,300
CHROMIUM	ND (3.5)	ND (3.5)	6.9	81.2 B	ND (0.40)	ND (2.1)	ND (2.4)
COBALT	ND (0.70)	ND (0.70)	ND (0.63)	12.8	ND (2.9)	1.3	ND (2.7)
COPPER	ND (2.4)	11.1 B	ND (5.1)	51.0 B	ND (1.5)	ND (5.0)	ND (4.6)
IRON	ND (18.8)	ND (18.8)	402	26,700	ND (11.0)	613	908
LEAD	ND (1.0)	1.7	ND (0.80)	8.0 *	ND (0.80)	ND (0.80)	ND (0.80)
MAGNESIUM	43,700	42,200	10,900	17,000	88,500	38,300	22,400
MANGANESE	312 *	285 *	11.8	811 *	1,120 *	346 *	342 *
MOLYBDENUM	ND (2.5)	ND (2.7)	4.6	4.7	ND (2.1)	ND (3.4)	ND (5.0)
NICKEL	ND (4.2)	ND (5.2)	ND (2.6)	65.0 B	ND (7.4)	ND (5.3)	7.2
POTASSIUM	12,700	11,800	1,890	3,050	23,900	13,900	12,800
SILVER	ND (0.60)	ND (0.60)	ND (0.50)	ND (0.50)	0.56	ND (0.80)	ND (0.50)
SODIUM	739,000	1,560,000	334,000	267,000	1,070,000	665,000	551,000
THALLIUM	ND (2.0)	ND (2.0)	1.9	2.0	ND (2.7)	2.0	ND (1.9)
VANADIUM	8.9	9.0	13.3	74.5	5.3	11.3	15.3
ZINC	ND (11.7)	ND (16.2)	ND (12.2)	90.0 B	ND (15.5)	ND (20.1)	ND (15.1)
Volatile Organic Compound (ug/L)							
1,1,1-TRICHLOROETHANE	ND (10)	ND (10)	ND (0.5)	1	ND (0.5)	ND (0.5)	1
1,1-DICHLOROETHANE	ND (10)	ND (10)	ND (0.5)	0.4	ND (0.5)	ND (0.5)	0.4
1,2-DICHLOROETHENE (TOTAL)	ND (10)	ND (10)	3	2	ND (0.5)	0.8	0.3
CHLOROFORM	ND (10)	ND (10)	0.7 *	1 *	2 *	ND (0.9)	2 *
TRICHLOROETHENE	ND (10)	ND (10)	2 *	4 *	ND (0.5)	ND (0.5)	4 *
TPH-Extractable (ug/L)							
TPH-DIESEL	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	53	86
TPH-MOTOR OIL	250	140	100	130	72	200	210
pH (pH units)							
PH	7.2	7.2	7.4	7.4	7.1	7.6	7.2

TABLE 4.10-9 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

NA	Not analyzed
ND()	Not detected (detection limit in parentheses)
µg/L	Microgram per liter
*	Detected concentration greater than U.S. Environmental Protection Agency Region IX preliminary remediation goals (PRG) for tap water
β	Detected concentration greater than National Ambient Water Quality Criteria (NAWQC) based on 4-day average study of saltwater aquatic life
δ	Detected concentration greater than maximum contaminant level (MCL) U.S. Environmental Protection Agency Title 40 Code of Federal Regulations or California Code of Regulations Title 22 MCL used, whichever is more stringent
	Detected concentration greater than at least one screening criterion.

TABLE 4.10-10

SUMMARY OF HYDROPUNCH GROUNDWATER ANALYTICAL TESTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
IR34B015	9414L246																		✓	✓		✓
IR34B016	9414L253																		✓	✓		✓
IR34B017	9413L203																		✓	✓		✓
IR34B018	9432A031															✓			✓	✓		✓
IR34B019	9414L221																		✓	✓		✓
IR34B020	9427R387																		✓	✓		✓
IR34B021	9414L231																		✓	✓		✓
IR34B022	9427R380																		✓	✓		✓
IR34B023	9414L237																		✓	✓		✓
IR34B024	9434R586																		✓	✓		✓
IR34B025	9414L260																		✓	✓		✓
IR34B026	9434R619																		✓	✓		✓
IR34B027	9413L213																		✓	✓		✓
IR34B028	9427R374																		✓	✓		✓
IR34B029	9434R625																		✓	✓		✓
IR34B030	9434R601																		✓	✓		✓
IR34B031	9434R611																		✓	✓		✓
IR34B032	9441A137																		✓	✓		✓
IR34B034	9551J730						✓				✓	✓				✓			✓	✓	✓	✓

Notes:

CHROM	CHROMIUM VI
CYAN	Cyanide
DIOXIN	Dioxins and Furans
O&G	Total oil and grease
PAH	Polynuclear aromatic hydrocarbons
PCTMST	Percent moisture
PEST	Pesticides/polychlorinated biphenyls
PHYS	Physical characteristic
SALIN	Salinity
SVOC	Semivolatile organic compounds
SOLIDS	Total dissolved solids
TOC	Total organic carbon
TMICROB	Coliform
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
VOC	Volatile organic compounds

TABLE 4.10-11

STATISTICAL SUMMARY OF HYDROPUNCH GROUNDWATER ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Tap Water PRG Value	Above[e] PRG	MCL Value[f]	Above[g] MCL	NAWQC Value	Above[h] NAWQC
METAL	ALUMINUM	3,700	3,700	3,700	UG/L	18.8	1	1	37,000	0				
	BARIUM	264	264	264	UG/L	0.30	1	1	2,600	0	1,000	0		
	CADMIUM	1.6	1.6	1.6	UG/L	0.20	1	1	18.0	0	5.0	0	9.3	0
	CALCIUM	43,200	43,200	43,200	UG/L	14.2	1	1						
	CHROMIUM	0.66	0.66	0.66	UG/L	0.40	1	1			50.0	0		
	COBALT	52.2	52.2	52.2	UG/L	0.40	1	1						
	COPPER	57.2	57.2	57.2	UG/L	0.50	1	1	1,400	0			2.4	1
	IRON	1,180	1,180	1,180	UG/L	11.0	1	1						
	MAGNESIUM	90,500	90,500	90,500	UG/L	25.9	1	1						
	MANGANESE	4,090	4,090	4,090	UG/L	0.10	1	1	180	1				
	NICKEL	57.4	57.4	57.4	UG/L	0.70	1	1	730	0	100	0	8.2	1
	POTASSIUM	33,300	33,300	33,300	UG/L	484	1	1						
	SODIUM	1,450,000	1,450,000	1,450,000	UG/L	28.5	1	1						
	THALLIUM	10.0	10.0	10.0	UG/L	1.9	1	1			2.0	1		
	VANADIUM	124	124	124	UG/L	0.40	1	1	260	0				
	ZINC	40.6	40.6	40.6	UG/L	1.0	1	1	11,000	0			81.0	0
VOC	1,1,1-TRICHLOROETHANE	0.9	0.9	0.9	UG/L	1	19	1	1,300	0	200	0		
	1,1-DICHLOROETHANE	0.3	0.7	0.5	UG/L	1	19	2	810	0				
	2-BUTANONE	12	420	150	UG/L	7	19	3	1,900	0				
	CHLOROFORM	0.4	0.4	0.4	UG/L	1	19	1	0.2	1	100	0		
	CIS-1,2-DICHLOROETHENE	3	3	3	UG/L	1	19	1	61	0	6	0		
	TRICHLOROETHENE	0.3	5	2	UG/L	1	19	3	2	1	5	0		

TABLE 4.10-11 (Continued)

STATISTICAL SUMMARY OF HYDROPUNCH GROUNDWATER ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Tap Water PRG Value	Above[e] PRG	MCL Value[f]	Above[g] MCL	NAWQC Value	Above[h] NAWQC
TPHEXT	TPH-DIESEL	72	300	170	UG/L	100	19	3	100	2i				
	TPH-MOTOR OIL	68	1,400	410	UG/L	100	19	13	100	9i				

TABLE 4.10-11 (Continued)

STATISTICAL SUMMARY OF HYDROPUNCH GROUNDWATER ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

CYAN	Cyanide
EPA	U.S. Environmental Protection Agency
MCL	Maximum contaminant level
NAWQC	National Ambient Water Quality Criteria
O&G	Total oil and grease
PCTMST	Percent moisture
PEST	Pesticide/polychlorinated biphenyl
PPT	Parts per thousand
PRG	Preliminary remediation goal
SALIN	Salinity
SVOC	Semivolatile organic compound
TMICROB	Coliform
TOC	Total organic carbon
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
UG/L	Microgram per liter
VOC	Volatile organic compound

a Organic results of less than 10 are reported to one significant figure, and results of greater than or equal to 10 are reported to two significant figures. Inorganic results of less than 10 are reported to two significant figures, and results of greater than or equal to 10 are reported to three significant figures. Values that are not nondetects are compared to screening criteria before the significant figure rule is applied. Both the value and the screening criteria are then rounded for reporting purposes.

b Blank boxes indicate that screening critera have not been established for these analytes.

c Total number of samples analyzed

d Total number of samples showing concentrations greater than detection limit

e Total number of samples showing concentrations greater than tap water PRG
California-modified PRGs were used for the following analytes: 1,2-Dibromo-3-chloropropane, benzo[a]pyrene, benzo[k]fluoranthene, cadmium, chromium VI, chrysene, lead, nickel, and tetrachloroethylene (PCE).
For the analytes listed below, Region IX PRGs are not available; therefore, PRGs for similar chemicals were used as follows:

Analyte:	Similar Analyte:
2-Methylnapthalene	Naphthalene
Acenaphthylene	Acenaphthene
Alpha-chlordane	Chlordane
Aroclor-1260	Polychlorinated biphenyls
Benzo(g,h,i)perylene	Naphthalene
Delta BHC	HCH-technical
Endosulfan I	Endosulfan
Endosulfan sulfate	Endosulfan
Endrin aldehyde	Endrin
Endrin ketone	Endrin
Gamma-chlordane	Chlordane
Phenanthrene	Naphthalene

f EPA Title 40 Code of Federal Regulations or California Code of Regulations Title 22 MCL used, whichever is more stringent

g Total number of samples showing concentrations greater than MCL

h Total number of samples showing concentrations greater than NAWQC;
NAWQC based on 4-day average study of saltwater aquatic life

i Total number of samples showing concentrations greater than TPH, TRPH, or O&G screening level, not PRG value

TABLE 4.10-12

HYDROPUNCH GROUNDWATER ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR34B015	IR34B016	IR34B018	IR34B019	IR34B020	IR34B021	IR34B022
Sample Number	9414L246	9414L253	9432A031	9414L221	9427R387	9414L231	9427R380
Sample Date	04/05/94	04/06/94	08/12/94	04/04/94	07/06/94	04/04/94	07/06/94
Metal (ug/L)							
ALUMINUM	NA	NA	NA	NA	NA	NA	NA
BARIUM	NA	NA	NA	NA	NA	NA	NA
CADMIUM	NA	NA	NA	NA	NA	NA	NA
CALCIUM	NA	NA	NA	NA	NA	NA	NA
CHROMIUM	NA	NA	NA	NA	NA	NA	NA
COBALT	NA	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA	NA
MAGNESIUM	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA
NICKEL	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	NA	NA	NA	NA	NA	NA	NA
SODIUM	NA	NA	NA	NA	NA	NA	NA
THALLIUM	NA	NA	NA	NA	NA	NA	NA
VANADIUM	NA	NA	NA	NA	NA	NA	NA
ZINC	NA	NA	NA	NA	NA	NA	NA
Volatile Organic Compound (ug/L)							
1,1,1-TRICHLOROETHANE	ND (1)	ND (1)	ND (0.5)	ND (1)	ND (0.5)	0.9	ND (0.5)
1,1-DICHLOROETHANE	ND (1)	ND (1)	ND (0.5)	ND (1)	0.3	0.7	ND (0.5)
2-BUTANONE	ND (5)	ND (5)	ND (15)	ND (5)	ND (6)	32	12
CHLOROFORM	ND (1)	ND (1)	0.4 *	ND (1)	ND (0.5)	ND (1)	ND (0.5)
CIS-1,2-DICHLOROETHENE	ND (1)	ND (1)	ND (0.5)	ND (1)	ND (0.5)	3	ND (0.5)
TRICHLOROETHENE	ND (1)	ND (1)	ND (0.5)	1	ND (0.5)	5 *	ND (0.5)
TPH-Extractable (ug/L)							
TPH-DIESEL	ND (100)	ND (100)	72	ND (100)	130	ND (100)	ND (100)
TPH-MOTOR OIL	610	90	ND (100)	ND (170)	ND (100)	ND (120)	68
pH (pH units)							
PH	NA	NA	NA	NA	NA	NA	NA

TABLE 4.10-12 (Continued)

HYDROPUNCH GROUNDWATER ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR34B023	IR34B024	IR34B025	IR34B026	IR34B027	IR34B028	IR34B029
Sample Number	9414L237	9434R586	9414L260	9434R619	9413L213	9427R374	9434R625
Sample Date	04/05/94	08/23/94	04/06/94	08/25/94	04/01/94	07/06/94	08/26/94
Metal (ug/L)							
ALUMINUM	NA	NA	NA	NA	NA	NA	NA
BARIUM	NA	NA	NA	NA	NA	NA	NA
CADMIUM	NA	NA	NA	NA	NA	NA	NA
CALCIUM	NA	NA	NA	NA	NA	NA	NA
CHROMIUM	NA	NA	NA	NA	NA	NA	NA
COBALT	NA	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA	NA
MAGNESIUM	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA
NICKEL	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	NA	NA	NA	NA	NA	NA	NA
SODIUM	NA	NA	NA	NA	NA	NA	NA
THALLIUM	NA	NA	NA	NA	NA	NA	NA
VANADIUM	NA	NA	NA	NA	NA	NA	NA
ZINC	NA	NA	NA	NA	NA	NA	NA
Volatile Organic Compound (ug/L)							
1,1,1-TRICHLOROETHANE	ND (1)	ND (0.5)	ND (1)	ND (0.5)	ND (1)	ND (1)	ND (0.5)
1,1-DICHLOROETHANE	ND (1)	ND (0.5)	ND (1)	ND (0.5)	ND (1)	ND (1)	ND (0.5)
2-BUTANONE	ND (5)	ND (7)	ND (5)	ND (11)	ND (5)	420	ND (11)
CHLOROFORM	ND (1)	ND (5)	ND (1)	ND (2)	ND (1)	ND (1)	ND (0.5)
CIS-1,2-DICHLOROETHENE	ND (1)	ND (0.5)	ND (1)	ND (0.5)	ND (1)	ND (1)	ND (0.5)
TRICHLOROETHENE	ND (1)	ND (0.5)	ND (1)	ND (0.5)	ND (1)	ND (1)	ND (0.5)
TPH-Extractable (ug/L)							
TPH-DIESEL	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)
TPH-MOTOR OIL	990	130	82	710	330	91	370
pH (pH units)							
PH	NA	NA	NA	NA	NA	NA	NA

TABLE 4.10-12 (Continued)

HYDROPUNCH GROUNDWATER ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR34B030	IR34B031	IR34B032	IR34B034
Sample Number	9434R601	9434R611	9441A137	9551J730
Sample Date	08/24/94	08/25/94	10/12/94	12/20/95
Metal (ug/L)				
ALUMINUM	NA	NA	NA	3,700
BARIUM	NA	NA	NA	264
CADMIUM	NA	NA	NA	1.6
CALCIUM	NA	NA	NA	43,200
CHROMIUM	NA	NA	NA	0.66
COBALT	NA	NA	NA	52.2
COPPER	NA	NA	NA	57.2 B
IRON	NA	NA	NA	1,180
MAGNESIUM	NA	NA	NA	90,500
MANGANESE	NA	NA	NA	4,090 *
NICKEL	NA	NA	NA	57.4 B
POTASSIUM	NA	NA	NA	33,300
SODIUM	NA	NA	NA	1,450,000
THALLIUM	NA	NA	NA	10.0 B
VANADIUM	NA	NA	NA	124
ZINC	NA	NA	NA	40.6
Volatile Organic Compound (ug/L)				
1,1,1-TRICHLOROETHANE	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,1-DICHLOROETHANE	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
2-BUTANONE	ND (6)	ND (7)	ND (10)	ND (10)
CHLOROFORM	ND (0.5)	ND (5)	ND (0.4)	ND (0.5)
CIS-1,2-DICHLOROETHENE	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
TRICHLOROETHENE	ND (0.5)	ND (0.5)	0.3	ND (0.5)
TPH-Extractable (ug/L)				
TPH-DIESEL	ND (100)	ND (100)	ND (100)	300
TPH-MOTOR OIL	150	350	ND (100)	1,400
pH (pH units)				
PH	NA	NA	NA	3.1

TABLE 4.10-12 (Continued)

HYDROPUNCH GROUNDWATER ANALYTICAL RESULTS - IR-34
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

NA	Not analyzed
ND()	Not detected (detection limit in parentheses)
µg/L	Microgram per liter
*	Detected concentration greater than U.S. Environmental Protection Agency Region IX preliminary remediation goals (PRG) for tap water
ß	Detected concentration greater than National Ambient Water Quality Criteria (NAWQC) based on 4-day average study of saltwater aquatic life
δ	Detected concentration greater than maximum contaminant level (MCL) U.S. Environmental Protection Agency Title 40 Code of Federal Regulations or California Code of Regulations Title 22 MCL used, whichever is more stringent
▒	Detected concentration greater than at least one screening criterion.

TABLE 4.15-1

SUMMARY OF STORM DRAIN SEDIMENT ANALYTICAL TESTS - IR-37
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
PA37SW01	9308A628			√			√	√			√					√			√	√		√
PA37SW05	9308A629			√			√	√			√					√			√	√		√
PA50CB405	9309X924			√	√		√			√	√	√				√			√	√	√	√

Notes:

CHROM	CHROMIUM VI
CYAN	Cyanide
DIOXIN	Dioxins and Furans
O&G	Total oil and grease
PAH	Polynuclear aromatic hydrocarbons
PCTMST	Percent moisture
PEST	Pesticides/polychlorinated biphenyls
PHYS	Physical characteristic
SALIN	Salinity
SVOC	Semivolatile organic compounds
SOLIDS	Total dissolved solids
TOC	Total organic carbon
TMICROB	Coliform
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
VOC	Volatile organic compounds

TABLE 4.15-2

STATISTICAL SUMMARY OF STORM DRAIN SEDIMENT ANALYTICAL RESULTS - IR-37
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Residential PRG Value	Above[e] Res PRG	Industrial PRG Value	Above[f] Ind PRG	HPAL Value	Above[g] HPAL
METAL	ALUMINUM	5,630	9,120	7,800	MG/KG	4.1	3	3	76,700	0	100,000	0		
	ANTIMONY	5.1	5.1	5.1	MG/KG	3.8	3	1	30.7	0	681	0	9.05	0
	ARSENIC	3.6	9.3	6.2	MG/KG	0.51	3	3	0.32	3	2.0	3	11.10	0
	BARIUM	275	609	408	MG/KG	0.64	3	3	5,340	0	100,000	0	314.36	2
	BERYLLIUM	0.16	0.16	0.16	MG/KG	0.15	3	1	0.14	1	1.1	0	0.71	0
	CADMIUM	0.70	27.3	10.4	MG/KG	0.96	3	3	9.0	1	852	0	3.14	2
	CALCIUM	6,160	10,200	8,550	MG/KG	6.5	3	3						
	CHROMIUM	150	426	255	MG/KG	0.76	3	3	211	1	1,580	0	h	1
	COBALT	14.2	17.5	16.0	MG/KG	0.65	3	3					h	0
	COPPER	179	1,430	650	MG/KG	0.41	3	3	2,850	0	63,300	0	124.31	3
	IRON	23,800	42,300	30,600	MG/KG	2.4	3	3						
	LEAD	304	4,120	2,210	MG/KG	90.0	3	2	130	2	1,000	1	8.99	2
	MAGNESIUM	5,850	24,100	17,200	MG/KG	11.9	3	3						
	MANGANESE	367	589	467	MG/KG	0.26	3	3	382	2	8,300	0	1431.18	0
	MERCURY	0.23	4.6	1.7	MG/KG	0.12	3	3	23.0	0	511	0	2.28	1
	MOLYBDENUM	1.6	16.7	7.0	MG/KG	0.81	3	3	383	0	8,520	0	2.68	2
	NICKEL	226	274	246	MG/KG	1.8	3	3	150	3	34,100	0	h	1
	POTASSIUM	343	734	494	MG/KG	168	3	3						
	SELENIUM	30.3	30.3	30.3	MG/KG	10.6	3	1	383	0	8,520	0	1.95	1
	SILVER	4.9	4.9	4.9	MG/KG	0.71	3	1	383	0	8,520	0	1.43	1
	SODIUM	414	550	477	MG/KG	13.3	3	3						
	VANADIUM	30.8	40.7	35.7	MG/KG	0.66	3	3	537	0	11,900	0	117.17	0

TABLE 4.15-2 (Continued)

STATISTICAL SUMMARY OF STORM DRAIN SEDIMENT ANALYTICAL RESULTS - IR-37
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection Frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Residential PRG Value	Above[e] Res PRG	Industrial PRG Value	Above[f] Ind PRG	HPAL Value	Above[g] HPAL
	ZINC	355	5,960	2,350	MG/KG	0.31	3	3	23,000	0	100,000	0	109.86	3
CYAN	CYANIDE	330	330	330	UG/KG	110	1	1	1,300,000	0	13,600,000	0		
VOC	ACETONE	360,000	360,000	360,000	UG/KG	420,000	3	1	2,000,000	0	8,400,000	0		
	BENZENE	2,200	2,200	2,200	UG/KG	180	3	1	1,400	1	3,200	0		
	CARBON DISULFIDE	8	8	8	UG/KG	13	3	1	16,000	0	52,000	0		
	CHLOROBENZENE	5,300,000	5,300,000	5,300,000	UG/KG	420,000	3	1	160,000	1	570,000	1		
	ETHYLBENZENE	3	130,000	43,000	UG/KG	140,000	3	3	2,900,000	0	3,100,000	0		
	METHYLENE CHLORIDE	34,000	34,000	34,000	UG/KG	420,000	3	1	11,000	1	25,000	1		
	TOLUENE	68,000	68,000	68,000	UG/KG	420,000	3	1	1,900,000	0	2,700,000	0		
	XYLENE (TOTAL)	21	110,000	55,000	UG/KG	210,000	3	2	980,000	0	980,000	0		
SVOC	1,2,4-TRICHLOROBENZENE	12,000	12,000	12,000	UG/KG	18,000	3	1	620,000	0	5,900,000	0		
	1,2-DICHLOROBENZENE	95,000	95,000	95,000	UG/KG	18,000	3	1	2,300,000	0	2,300,000	0		
	1,3-DICHLOROBENZENE	320,000	320,000	320,000	UG/KG	18,000	3	1	2,800,000	0	2,800,000	0		
	1,4-DICHLOROBENZENE	1,400,000	1,400,000	1,400,000	UG/KG	18,000	3	1	7,400	1	20,000	1		
	2-METHYLNAPHTHALENE	27,000	27,000	27,000	UG/KG	18,000	3	1	800,000	0	800,000	0		
	BENZO(A)ANTHRACENE	510	510	510	UG/KG	780	3	1	610	0	2,600	0		
	BIS(2-ETHYLHEXYL)PHTHALATE	4,100	240,000	120,000	UG/KG	9,400	3	2	32,000	1	140,000	1		
	BUTYLBENZYLPHTHALATE	360	330,000	170,000	UG/KG	9,400	3	2	13,000,000	0	100,000,00	0		
	CHRYSENE	670	670	670	UG/KG	780	3	1	6,100	0	24,000	0		
	DI-N-BUTYLPHTHALATE	410	48,000	24,000	UG/KG	9,400	3	2	6,500,000	0	68,000,000	0		
	DI-N-OCTYLPHTHALATE	45,000	45,000	45,000	UG/KG	18,000	3	1	1,300,000	0	14,000,000	0		
	FLUORANTHENE	1,000	4,600	2,800	UG/KG	9,400	3	2	2,600,000	0	27,000,000	0		

TABLE 4.15-2 (Continued)

STATISTICAL SUMMARY OF STORM DRAIN SEDIMENT ANALYTICAL RESULTS - IR-37
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Residential PRG Value	Above[e] Res PRG	Industrial PRG Value	Above[f] Ind PRG	HPAL Value	Above[g] HPAL
	NAPHTHALENE	28,000	28,000	28,000	UG/KG	18,000	3	1	800,000	0	800,000	0		
	PHENANTHRENE	700	6,600	3,700	UG/KG	9,400	3	2	800,000	0	800,000	0		
	PYRENE	1,100	24,000	13,000	UG/KG	9,400	3	2	2,000,000	0	20,000,000	0		
PEST	4,4'-DDD	25	25	25	UG/KG	4	3	1	1,900	0	7,900	0		
	4,4'-DDE	28	28	28	UG/KG	4	3	1	1,300	0	5,600	0		
	DIELDRIN	34	20,000	10,000	UG/KG	2,900	3	2	28	2	120	1		
	ENDOSULFAN II	110	140,000	70,000	UG/KG	2,900	3	2	3,300	1	34,000	1		
	ENDRIN ALDEHYDE	83	81,000	41,000	UG/KG	2,900	3	2	20,000	1	200,000	0		
	ENDRIN KETONE	4,800	4,800	4,800	UG/KG	5,800	3	1	20,000	0	200,000	0		
	GAMMA-CHLORDANE	7	2,500	1,300	UG/KG	1,500	3	2	340	1	1,500	1		
	AROCLOR-1260	3,100	3,900,000	1,300,000	UG/KG	19,000	3	3	66	3	340	3		
TPHPRG	TPH-GASOLINE	110	110	110	MG/KG	35	3	1	100	1i				
	TPH-PURGEABLE UNKNOWN HYDROCA.	1	320	160	MG/KG	0.09	2	2	100	1i				
TPHEXT	TPH-DIESEL	340	340	340	MG/KG	130	3	1	1,000	0i				
	TPH-KEROSENE	2,200	2,200	2,200	MG/KG	180	2	1	1,000	1i				
	TPH-MOTOR OIL	330	38,000	19,000	MG/KG	920	2	2	1,000	1i				
TRPH	TRPH	1,300	1,300	1,300	MG/KG	6	1	1	1,000	1i				
O&G	TOTAL OIL & GREASE	1,600	39,000	20,000	MG/KG	37	2	2	1,000	2i				

TABLE 4.15-2 (Continued)

STATISTICAL SUMMARY OF STORM DRAIN SEDIMENT ANALYTICAL RESULTS - IR-37
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

CYAN	Cyanide
EPA	U.S. Environmental Protection Agency
HPAL	Hunters Point ambient level
MG/KG	Milligram per kilogram
O&G	Total oil and grease
PCTMST	Percent moisture
PEST	Pesticide/polychlorinated biphenyl
PHYS	Physical characteristic
PRG	Preliminary remediation goal
SALIN	Salinity
SVOC	Semivolatile organic compound
TMICROB	Coliform
TOC	Total organic carbon
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
UG/KG	Microgram per kilogram
VOC	Volatile organic compound

a Organic results of less than 10 are reported to one significant figure, and results of greater than or equal to 10 are reported to two significant figures. Inorganic results of less than 10 are reported to two significant figures, and results of greater than or equal to 10 are reported to three significant figures. Values that are not nondetects are compared to screening criteria before the significant figure rule is applied. Both the value and the screening criteria are then rounded for reporting purposes.

b Blank boxes indicate that screening critera have not been established for these analytes.

c Total number of samples analyzed

d Total number of samples showing concentrations greater than detection limit

e Total number of samples showing concentrations greater than residential PRG

f Total number of samples showing concentrations greater than industrial PRG
California-modified PRGs were used for the following analytes: 1,2-Dibromo-3-chloropropane, benzo[a]pyrene, benzo[k]fluoranthene, cadmium, chromium VI, chrysene, lead, nickel, and tetrachloroethylene (PCE).
For the analytes listed below, Region IX PRGs are not available; therefore, PRGs for similar chemicals were used as follows:

Analyte:	Similar Analyte:
2-Methylnapthalene	Naphthalene
Acenaphthylene	Acenaphthene
Alpha-chlordane	Chlordane
Aroclor-1260	Polychlorinated biphenyls
Benzo(g,h,i)perylene	Naphthalene
Delta BHC	HCH-technical
Endosulfan I	Endosulfan
Endosulfan sulfate	Endosulfan
Endrin aldehyde	Endrin
Endrin ketone	Endrin
Gamma-chlordane	Chlordane
Phenanthrene	Naphthalene

g Total number of samples showing concentrations greater than HPAL

h HPALs for chromium, cobalt, and nickel are based on the concentration of magnesium in each sample; thus, no single value applies to all samples. The range of HPAL values for chromium, cobalt, and nickel are 133.575 to 354.850, 23.775 to 49.555, and 140.993 to 540.860 mg/kg respectively.

i Total number of samples showing concentrations greater than TPH, TRPH, or O&G screening level, not PRG value

TABLE 4.15-3

STORM DRAIN SEDIMENT ANALYTICAL RESULTS - IR-37
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	PA37SW01	PA37SW05	PA50CB405
Sampling Depth (feet bgs)	2.10	2.10	2.10
Sample Number	9308A628	9308A629	9309X924
Sample Date	02/25/93	02/25/93	03/05/93
Metal (mg/kg)			
ALUMINUM	9,120	5,630	8,650
ANTIMONY	ND (17.6)	ND (50.2)	5.1
ARSENIC	5.8 *#	9.3 *#	3.6 *#
BARIUM	275	609 α	340 α
BERYLLIUM	ND (0.24)	ND (0.35)	0.16 *
CADMIUM	3.2 α	27.3 *α	0.70
CALCIUM	9,340	6,160	10,200
CHROMIUM	188	426 *α	150
COBALT	17.5	14.2	16.2
COPPER	342 α	1,430 α	179 α
IRON	25,700	42,300	23,800
LEAD	ND (236)	4,120 *#α	304 *α
MAGNESIUM	21,700	5,850	24,100
MANGANESE	589 *	446 *	367
MERCURY	0.23	4.6 α	0.31
MOLYBDENUM	2.7 α	16.7 α	1.6
NICKEL	226 *	239 *α	274 *
POTASSIUM	734	405	343
SELENIUM	ND (0.71)	30.3 α	ND (0.46)
SILVER	ND (0.47)	4.9 α	ND (0.48)
SODIUM	414	468	550
VANADIUM	40.7	30.8	35.6
ZINC	727 α	5,960 α	355 α
Cyanide (ug/kg)			
CYANIDE	NA	NA	330
Volatile Organic Compound (ug/kg)			
ACETONE	ND (7)	360,000	ND (100)
BENZENE	ND (6)	2,200 *	ND (13)
CARBON DISULFIDE	ND (2)	ND (420,000)	8
CHLOROBENZENE	ND (12)	5,300,000 *#	ND (13)
ETHYLBENZENE	3	130,000	4
METHYLENE CHLORIDE	ND (1)	34,000 *#	ND (13)
TOLUENE	ND (6)	68,000	ND (13)
XYLENE (TOTAL)	21	110,000	ND (9)

TABLE 4.15-3 (Continued)

STORM DRAIN SEDIMENT ANALYTICAL RESULTS - IR-37
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	PA37SW01	PA37SW05	PA50CB405
Sampling Depth (feet bgs)	2.10	2.10	2.10
Sample Number	9308A628	9308A629	9309X924
Sample Date	02/25/93	02/25/93	03/05/93
Semivolatile Organic Compound (ug/kg)			
1,2,4-TRICHLOROBENZENE	ND (780)	12,000	ND (130,000)
1,2-DICHLOROBENZENE	ND (780)	95,000	ND (130,000)
1,3-DICHLOROBENZENE	ND (780)	320,000	ND (130,000)
1,4-DICHLOROBENZENE	ND (780)	1,400,000 *#	ND (130,000)
2-METHYLNAPHTHALENE	ND (780)	27,000	ND (130,000)
BENZO(A)ANTHRACENE	510	ND (18,000)	ND (130,000)
BIS(2-ETHYLHEXYL)PHTHALATE	4,100	240,000 *#	ND (130,000)
BUTYLBENZYLPHTHALATE	360	330,000	ND (130,000)
CHRYSENE	670	ND (18,000)	ND (130,000)
DI-N-BUTYLPHTHALATE	410	48,000	ND (130,000)
DI-N-OCTYLPHTHALATE	ND (780)	45,000	ND (130,000)
FLUORANTHENE	1,000	4,600	ND (130,000)
NAPHTHALENE	ND (780)	28,000	ND (130,000)
PHENANTHRENE	700	6,600	ND (130,000)
PYRENE	1,100	24,000	ND (130,000)
Pesticide/Polychlorinated Biphenyl (ug/kg)			
4,4'-DDD	25	ND (5,800)	ND (9)
4,4'-DDE	28	ND (5,800)	ND (9)
DIELDRIN	34 *	20,000 *#	ND (9)
ENDOSULFAN II	110	140,000 *#	ND (9)
ENDRIN ALDEHYDE	83	81,000 *	ND (9)
ENDRIN KETONE	ND (4)	4,800	ND (9)
GAMMA-CHLORDANE	7	2,500 *#	ND (4)
AROCLOR-1260	3,100 *#	3,900,000 *#	3,700 *#
TPH-Purgeable (mg/kg)			
TPH-GASOLINE	ND (1)	110	ND (7)
TPH-PURGEABLE UNKNOWN HYDROCARBON	1	320	NA
TPH-Extractable (mg/kg)			
TPH-DIESEL	ND (5)	ND (180)	340
TPH-KEROSENE	ND (5)	2,200	NA
TPH-MOTOR OIL	330	38,000	NA

TABLE 4.15-3 (Continued)

STORM DRAIN SEDIMENT ANALYTICAL RESULTS - IR-37
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	PA37SW01	PA37SW05	PA50CB405
Sampling Depth (feet bgs)	2.10	2.10	2.10
Sample Number	9308A628	9308A629	9309X924
Sample Date	02/25/93	02/25/93	03/05/93
Total Recoverable Petroleum Hydrocarbons (mg/kg)			
TRPH	NA	NA	1,300
Oil and Grease (mg/kg)			
TOTAL OIL & GREASE	1,600	39,000	NA
Percent Moisture (%)			
% SOLIDS	NA	NA	78.8
pH (pH units)			
PH	NA	NA	7.5

Notes:

%	Percent
bgs	Below ground surface
mg/kg	Milligram per kilogram
NA	Not analyzed
ND()	Not detected (detection limit in parentheses)
µg/kg	Microgram per kilogram
*	Detected concentration greater than U.S. Environmental Protection Agency Region IX preliminary remediation goals (PRG) for residential use
#	Detected concentration greater than U.S. Environmental Protection Agency Region IX PRG for industrial use
α	Detected concentration greater than the Hunters Point ambient level.
▒	Detected concentration greater than at least one screening criterion.

TABLE 4.15-4

SUMMARY OF OTHER WATER ANALYTICAL TESTS - IR-37
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
PA37SN01	9206X500													√	√							
PA37SN01	9208H095													√	√							
PA37SN01	9212X596													√	√							
PA37SN01	9310H421													√	√							
PA37SN02	9206X501													√	√							
PA37SN02	9208H096													√	√							
PA37SN02	9212X595													√	√							
PA37SN02	9310H420													√	√							

Notes:

CHROM	CHROMIUM VI
CYAN	Cyanide
DIOXIN	Dioxins and Furans
O&G	Total oil and grease
PAH	Polynuclear aromatic hydrocarbons
PCTMST	Percent moisture
PEST	Pesticides/polychlorinated biphenyls
PHYS	Physical characteristic
SALIN	Salinity
SVOC	Semivolatile organic compounds
SOLIDS	Total dissolved solids
TOC	Total organic carbon
TMICROB	Coliform
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
VOC	Volatile organic compounds

TABLE 4.15-5

STATISTICAL SUMMARY OF OTHER WATER ANALYTICAL RESULTS - IR-37
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Tap Water PRG Value	Above[e] PRG	MCL Value[f]	Above[g] MCL	NAWQC Value	Above[h] NAWQC
SOLIDS	TOTAL DISSOLVED SOLIDS	4,000,000	16,000,000	10,000,000	UG/L	8,500	8	8						

TABLE 4.15-5 (Continued)

STATISTICAL SUMMARY OF OTHER WATER ANALYTICAL RESULTS - IR-37
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

CYAN	Cyanide
EPA	U.S. Environmental Protection Agency
MCL	Maximum contaminant level
NAWQC	National Ambient Water Quality Criteria
O&G	Total oil and grease
PCTMST	Percent moisture
PEST	Pesticide/polychlorinated biphenyl
PPT	Parts per thousand
PRG	Preliminary remediation goal
SALIN	Salinity
SVOC	Semivolatile organic compound
TMICROB	Coliform
TOC	Total organic carbon
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
UG/L	Microgram per liter
VOC	Volatile organic compound

a Organic results of less than 10 are reported to one significant figure, and results of greater than or equal to 10 are reported to two significant figures. Inorganic results of less than 10 are reported to two significant figures, and results of greater than or equal to 10 are reported to three significant figures. Values that are not nondetects are compared to screening criteria before the significant figure rule is applied. Both the value and the screening criteria are then rounded for reporting purposes.

b Blank boxes indicate that screening critera have not been established for these analytes.

c Total number of samples analyzed

d Total number of samples showing concentrations greater than detection limit

e Total number of samples showing concentrations greater than tap water PRG
California-modified PRGs were used for the following analytes: 1,2-Dibromo-3-chloropropane, benzo[a]pyrene, benzo[k]fluoranthene, cadmium, chromium VI, chrysene, lead, nickel, and tetrachloroethylene (PCE).
For the analytes listed below, Region IX PRGs are not available; therefore, PRGs for similar chemicals were used as follows:

Analyte:	Similar Analyte:
2-Methylnapthalene	Naphthalene
Acenaphthylene	Acenaphthene
Alpha-chlordane	Chlordane
Aroclor-1260	Polychlorinated biphenyls
Benzo(g,h,i)perylene	Naphthalene
Delta BHC	HCH-technical
Endosulfan I	Endosulfan
Endosulfan sulfate	Endosulfan
Endrin aldehyde	Endrin
Endrin ketone	Endrin
Gamma-chlordane	Chlordane
Phenanthrene	Naphthalene

f EPA Title 40 Code of Federal Regulations or California Code of Regulations Title 22 MCL used, whichever is more stringent

g Total number of samples showing concentrations greater than MCL

h Total number of samples showing concentrations greater than NAWQC;
NAWQC based on 4-day average study of saltwater aquatic life

i Total number of samples showing concentrations greater than TPH, TRPH, or O&G screening level, not PRG value

TABLE 4.15-6

OTHER WATER ANALYTICAL RESULTS - IR-37
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	PA37SN01	PA37SN01	PA37SN01	PA37SN01	PA37SN02	PA37SN02	PA37SN02
Sample Number	9206X500	9208H095	9212X596	9310H421	9206X501	9208H096	9212X595
Sample Date	02/05/92	02/21/92	03/18/92	03/08/93	02/05/92	02/21/92	03/18/92
Solids (ug/L)							
TOTAL DISSOLVED SOLIDS	14,000,000	16,000,000	9,400,000	4,200,000	15,000,000	11,000,000	4,000,000

TABLE 4.15-6 (Continued)

OTHER WATER ANALYTICAL RESULTS - IR-37
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	PA37SN02
Sample Number	9310H420
Sample Date	03/08/93
Solids (ug/L)	
TOTAL DISSOLVED SOLIDS	6,800,000

Notes:

NA Not analyzed
ND() Not detected (detection limit in parentheses)
µg/L Microgram per liter

TABLE 4.15-7

SUMMARY OF SOIL ANALYTICAL TESTS - IR-37
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
IR09B010	8941F011			√	√		√			√	√	√				√			√	√		√
IR09B010	8941F012			√			√			√	√	√				√			√	√		√
IR09B010	8941F013			√			√			√	√	√				√			√	√		√
IR09B010	8941F014			√			√			√												
IR09B045	9415C141			√						√												
IR09B045	9415C142			√						√												
IR09B045	9415C144			√						√												
IR37B010	9421C246						√				√	√				√			√	√	√	√
IR37B010	9421C247						√				√	√				√			√	√	√	√
IR37B010	9421C248						√				√	√				√			√	√	√	√
IR37B011	9415C147						√			√	√	√				√			√	√	√	√
IR37B011	9415C148						√			√	√	√				√			√	√	√	√
IR37B011	9415C149						√			√	√	√				√			√	√	√	√
IR37B012	9422C250						√			√	√	√				√			√	√	√	√
IR37B013	9421R180						√			√	√	√				√			√	√	√	√
IR37B013	9421R181						√			√	√	√				√			√	√	√	√
IR37B013	9421R182						√			√	√	√				√			√	√	√	√
IR37B013	9421R183						√			√	√	√				√			√	√	√	√
IR37B014	9423C266						√			√	√	√				√			√	√	√	√
IR37B014	9423C267						√			√	√	√				√			√	√	√	√
IR37B015	9423C263						√			√	√	√				√			√	√	√	√
IR37B015	9423C264						√			√	√	√				√			√	√	√	√
IR37B016	9423C260						√			√	√	√				√			√	√	√	√
IR37B016	9423C261						√			√	√	√				√			√	√	√	√
IR37B017	9424C268						√			√	√	√				√			√	√	√	√
IR37B017	9424C269						√			√	√	√				√			√	√	√	√
IR37B017	9424C270						√			√	√	√				√			√	√	√	√
IR37B018	9537J241						√			√	√	√				√			√	√	√	
IR37B018	9537J242						√			√	√	√				√			√	√	√	√
IR37B018	9537J243						√			√	√	√				√			√	√	√	√
IR37B018	9537J244						√			√	√	√				√			√	√	√	√
IR37B019	9537J245						√			√	√	√				√			√	√	√	
IR37B019	9537J246						√			√	√	√				√			√	√	√	√
IR37B019	9537J247						√			√	√	√				√			√	√	√	√
IR37B019	9537J248						√			√	√	√				√			√	√	√	√
IR37B020	9538J289						√			√	√	√				√			√	√	√	√
IR37B020	9538J290						√			√	√	√				√			√	√	√	√

TABLE 4.15-7 (Continued)

SUMMARY OF SOIL ANALYTICAL TESTS - IR-37
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
IR37B020	9538J291						√			√	√	√				√			√	√	√	√
IR37B020	9538J292						√			√	√	√				√			√	√	√	√
IR37B021	9545J582						√			√	√	√				√			√	√	√	
IR37B021	9545J583						√			√	√	√				√			√	√	√	√
IR37B021	9545J584						√			√	√	√				√			√	√	√	√
IR37B021	9545J585						√			√	√	√				√			√	√	√	√
IR37SS22	9605J797						√			√	√	√				√			√	√	√	
IR37SS23	9605J798						√			√	√	√				√			√	√	√	
IR37SS24	9605J796						√			√	√	√				√			√	√	√	
IR50B016	9422R210						√			√	√	√				√			√	√	√	√
IR50B016	9422R211						√			√	√	√				√			√	√	√	√
IR50B016	9422R212						√			√	√	√				√			√	√	√	√
PA37SS04	9312A697			√			√	√		√	√	√				√			√	√		√
PA37SS08	9310J389			√			√	√		√	√	√				√			√	√		√
PA37SS09	9310J369			√			√	√		√	√	√				√			√	√		√

Notes:

CHROM	CHROMIUM VI
CYAN	Cyanide
DIOXIN	Dioxins and Furans
O&G	Total oil and grease
PAH	Polynuclear aromatic hydrocarbons
PCTMST	Percent moisture
PEST	Pesticides/polychlorinated biphenyls
PHYS	Physical characteristic
SALIN	Salinity
SVOC	Semivolatile organic compounds
SOLIDS	Total dissolved solids
TOC	Total organic carbon
TMICROB	Coliform
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
VOC	Volatile organic compounds

TABLE 4.15-8

STATISTICAL SUMMARY OF SOIL ANALYTICAL RESULTS - IR-37
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Residential PRG Value	Above[e] Res PRG	Industrial PRG Value	Above[f] Ind PRG	HPAL Value	Above[g] HPAL
METAL	ALUMINUM	295	26,400	8,960	MG/KG	3.4	49	49	76,700	0	100,000	0		
	ANTIMONY	0.82	83.0	10.9	MG/KG	1.5	47	31	30.7	3	681	0	9.05	3
	ARSENIC	0.53	9.5	2.9	MG/KG	0.42	49	25	0.32	25	2.0	15	11.10	0
	BARIUM	2.1	500	121	MG/KG	0.53	49	49	5,340	0	100,000	0	314.36	4
	BERYLLIUM	0.15	0.40	0.26	MG/KG	0.11	49	5	0.14	5	1.1	0	0.71	0
	CADMIUM	0.42	1.9	1.1	MG/KG	0.10	49	16	9.0	0	852	0	3.14	0
	CALCIUM	114	48,800	7,170	MG/KG	10.6	49	48						
	CHROMIUM	8.6	835	357	MG/KG	0.23	49	49	211	32	1,580	0	h	1
	CHROMIUM VI	0.10	0.14	0.12	MG/KG	0.06	10	2	0.20	0	225	0		
	COBALT	5.5	116	65.0	MG/KG	0.44	49	49					h	1
	COPPER	2.2	98.7	30.1	MG/KG	0.19	49	47	2,850	0	63,300	0	124.31	0
	IRON	11,200	70,800	35,000	MG/KG	4.0	49	49						
	LEAD	0.81	128	15.5	MG/KG	0.29	49	41	130	0	1,000	0	8.99	12
	MAGNESIUM	1,650	260,000	125,000	MG/KG	48.3	49	49						
	MANGANESE	90.1	3,110	984	MG/KG	0.10	49	49	382	46	8,300	0	1431.18	7
	MERCURY	0.02	0.34	0.11	MG/KG	0.04	47	21	23.0	0	511	0	2.28	0
	MOLYBDENUM	0.62	2.3	1.7	MG/KG	1.1	49	5	383	0	8,520	0	2.68	0
	NICKEL	45.2	2,820	1,160	MG/KG	1.1	49	48	150	34	34,100	0	h	1
	POTASSIUM	32.8	1,810	640	MG/KG	24.8	49	38						
	SELENIUM	0.50	0.54	0.52	MG/KG	0.45	49	2	383	0	8,520	0	1.95	0
	SODIUM	30.6	1,330	310	MG/KG	26.8	49	26						
	THALLIUM	0.82	2.0	1.5	MG/KG	0.44	49	3					0.81	3

TABLE 4.15-8 (Continued)

STATISTICAL SUMMARY OF SOIL ANALYTICAL RESULTS - IR-37
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Residential PRG Value	Above[e] Res PRG	Industrial PRG Value	Above[f] Ind PRG	HPAL Value	Above[g] HPAL
	VANADIUM	8.7	94.4	46.3	MG/KG	0.26	49	49	537	0	11,900	0	117.17	0
	ZINC	13.2	238	58.6	MG/KG	0.57	49	49	23,000	0	100,000	0	109.86	4
VOC	2-BUTANONE	15	21	18	UG/KG	12	42	2	8,700,000	0	34,000,000	0		
	ACETONE	33	120	88	UG/KG	10	42	3	2,000,000	0	8,400,000	0		
	ETHYLBENZENE	1	8	4	UG/KG	8	42	2	2,900,000	0	3,100,000	0		
	TETRACHLOROETHENE	2	2	2	UG/KG	12	42	2	7,000	0	25,000	0		
	TOLUENE	2	150	33	UG/KG	8	42	5	1,900,000	0	2,700,000	0		
	XYLENE (TOTAL)	13	22	17	UG/KG	14	42	2	980,000	0	980,000	0		
SVOC	2-METHYLNAPHTHALENE	56	860	400	UG/KG	1,200	48	4	800,000	0	800,000	0		
	ANTHRACENE	40	51	47	UG/KG	370	48	3	19,000	0	19,000	0		
	BENZO(A)ANTHRACENE	69	150	120	UG/KG	360	48	4	610	0	2,600	0		
	BENZO(A)PYRENE	64	120	95	UG/KG	370	47	3	61	3	260	0		
	BENZO(B)FLUORANTHENE	61	250	120	UG/KG	360	47	4	610	0	2,600	0		
	BENZO(G,H,I)PERYLENE	48	57	53	UG/KG	380	47	2	800,000	0	800,000	0		
	BENZO(K)FLUORANTHENE	30	100	66	UG/KG	360	47	4	610	0	26,000	0		
	BIS(2-ETHYLHEXYL)PHTHALATE	150	150	150	UG/KG	370	48	1	32,000	0	140,000	0		
	CARBAZOLE	22	340	180	UG/KG	370	45	2	22,000	0	95,000	0		
	CHRYSENE	31	340	150	UG/KG	750	48	8	6,100	0	24,000	0		
	FLUORANTHENE	75	680	310	UG/KG	360	48	5	2,600,000	0	27,000,000	0		
	INDENO(1,2,3-CD)PYRENE	42	46	44	UG/KG	380	47	2	610	0	2,600	0		
	NAPHTHALENE	120	200	160	UG/KG	1,900	48	2	800,000	0	800,000	0		
	PHENANTHRENE	34	520	260	UG/KG	990	48	5	800,000	0	800,000	0		

TABLE 4.15-8 (Continued)

STATISTICAL SUMMARY OF SOIL ANALYTICAL RESULTS - IR-37
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Residential PRG Value	Above[e] Res PRG	Industrial PRG Value	Above[f] Ind PRG	HPAL Value	Above[g] HPAL
	PYRENE	66	800	340	UG/KG	360	48	5	2,000,000	0	20,000,000	0		
PEST	4,4'-DDD	21	180	100	UG/KG	39	48	2	1,900	0	7,900	0		
	4,4'-DDE	3	8	5	UG/KG	5	48	3	1,300	0	5,600	0		
	ALDRIN	4	4	4	UG/KG	4	48	1	26	0	110	0		
	ALPHA-CHLORDANE	1	3	2	UG/KG	2	48	3	340	0	1,500	0		
	ENDOSULFAN II	2	2	2	UG/KG	4	48	1	3,300	0	34,000	0		
	ENDRIN	5	5	5	UG/KG	7	48	1	20,000	0	200,000	0		
	ENDRIN KETONE	3	8	6	UG/KG	5	48	2	20,000	0	200,000	0		
	GAMMA-CHLORDANE	1	2	2	UG/KG	3	48	2	340	0	1,500	0		
	HEPTACHLOR EPOXIDE	1	3	2	UG/KG	3	48	2	49	0	210	0		
	AROCLOR-1242	22	22	22	UG/KG	37	48	1						
	AROCLOR-1260	18	460	140	UG/KG	100	48	6	66	2	340	1		
TPHPRG	TPH-GASOLINE	0.5	130	27	MG/KG	3	48	5	100	1i				
TPHEXT	TPH-DIESEL	15	1,400	530	MG/KG	170	48	9	1,000	2i				
	TPH-EXTRACTABLE UNKNOWN HYDRO.	12	12	12	MG/KG	1	3	1	1,000	0i				
	TPH-MOTOR OIL	7	6,000	820	MG/KG	220	42	21	1,000	4i				
TRPH	TRPH	8	6,900	1,200	MG/KG	59	42	25	1,000	7i				
O&G	TOTAL OIL & GREASE	580	29,000	12,000	MG/KG	27	3	3	1,000	2i				

TABLE 4.15-8 (Continued)

STATISTICAL SUMMARY OF SOIL ANALYTICAL RESULTS - IR-37
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

CYAN	Cyanide
EPA	U.S. Environmental Protection Agency
HPAL	Hunters Point ambient level
MG/KG	Milligram per kilogram
O&G	Total oil and grease
PCTMST	Percent moisture
PEST	Pesticide/polychlorinated biphenyl
PHYS	Physical characteristic
PRG	Preliminary remediation goal
SALIN	Salinity
SVOC	Semivolatile organic compound
TMICROB	Coliform
TOC	Total organic carbon
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
UG/KG	Microgram per kilogram
VOC	Volatile organic compound

a Organic results of less than 10 are reported to one significant figure, and results of greater than or equal to 10 are reported to two significant figures. Inorganic results of less than 10 are reported to two significant figures, and results of greater than or equal to 10 are reported to three significant figures. Values that are not nondetects are compared to screening criteria before the significant figure rule is applied. Both the value and the screening criteria are then rounded for reporting purposes.

b Blank boxes indicate that screening critera have not been established for these analytes.

c Total number of samples analyzed

d Total number of samples showing concentrations greater than detection limit

e Total number of samples showing concentrations greater than residential PRG

f Total number of samples showing concentrations greater than industrial PRG
California-modified PRGs were used for the following analytes: 1,2-Dibromo-3-chloropropane, benzo[a]pyrene, benzo[k]fluoranthene, cadmium, chromium VI, chrysene, lead, nickel, and tetrachloroethylene (PCE).
For the analytes listed below, Region IX PRGs are not available; therefore, PRGs for similar chemicals were used as follows:

Analyte:	Similar Analyte:
2-Methylnapthalene	Naphthalene
Acenaphthylene	Acenaphthene
Alpha-chlordane	Chlordane
Aroclor-1260	Polychlorinated biphenyls
Benzo(g,h,i)perylene	Naphthalene
Delta BHC	HCH-technical
Endosulfan I	Endosulfan
Endosulfan sulfate	Endosulfan
Endrin aldehyde	Endrin
Endrin ketone	Endrin
Gamma-chlordane	Chlordane
Phenanthrene	Naphthalene

g Total number of samples showing concentrations greater than HPAL

h HPALs for chromium, cobalt, and nickel are based on the concentration of magnesium in each sample; thus, no single value applies to all samples. The range of HPAL values for chromium, cobalt, and nickel are 55.850 to 1827.084, 12.344 to 169.843, and 42.467 to 5156.421 mg/kg respectively.

i Total number of samples showing concentrations greater than TPH, TRPH, or O&G screening level, not PRG value

TABLE 4.15-9

SOIL ANALYTICAL RESULTS - IR-37
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09B010	IR09B010	IR09B010	IR09B010	IR09B045	IR09B045	IR09B045
Sampling Depth (feet bgs)	1.25	3.25	5.75	10.75	6.25	11.25	16.25
Sample Number	8941F011	8941F012	8941F013	8941F014	9415C141	9415C142	9415C144
Sample Date	10/11/89	10/11/89	10/11/89	10/11/89	04/14/94	04/14/94	04/14/94
Metal (mg/kg)							
ALUMINUM	22,500	3,730	19,200	4,170	NA	NA	NA
ANTIMONY	ND (6.7)	8.1	ND (7.6)	ND (7.4)	NA	NA	NA
ARSENIC	ND (0.44)	ND (0.59)	ND (0.64)	3.8 *#	NA	NA	NA
BARIUM	30.4	8.7	65.5	20.5	NA	NA	NA
BERYLLIUM	0.15 *	0.18 *	0.34 *	ND (0.13)	NA	NA	NA
CADMIUM	ND (0.78)	ND (0.91)	1.5	ND (0.85)	NA	NA	NA
CALCIUM	19,900	755	15,900	3,520	NA	NA	NA
CHROMIUM	8.6	814 *	282 *	56.5 α	NA	NA	NA
CHROMIUM VI	0.14	0.10	ND (0.06)	ND (0.05)	ND (0.05)	ND (0.08)	ND (0.05)
COBALT	12.1	116	34.6	5.5	NA	NA	NA
COPPER	88.9	15.9	43.4	5.3	NA	NA	NA
IRON	19,500	34,900	36,500	12,300	NA	NA	NA
LEAD	1.4	0.95	0.81	4.3	NA	NA	NA
MAGNESIUM	8,090	198,000	31,700	1,650	NA	NA	NA
MANGANESE	342	862 *	679 *	90.1	NA	NA	NA
MERCURY	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	NA	NA	NA
MOLYBDENUM	ND (1.3)	ND (1.5)	ND (1.4)	ND (1.4)	NA	NA	NA
NICKEL	ND (7.3)	2,160 *	434 *	45.2 α	NA	NA	NA
POTASSIUM	839	ND (95.3)	638	327	NA	NA	NA
SELENIUM	ND (0.46)	ND (0.54)	ND (0.52)	ND (0.51)	NA	NA	NA
SODIUM	965	122	325	285	NA	NA	NA
THALLIUM	ND (0.48)	ND (0.57)	ND (0.54)	ND (0.53)	NA	NA	NA
VANADIUM	52.4	24.2	74.5	30.6	NA	NA	NA
ZINC	33.2	38.6	44.4	13.2	NA	NA	NA
Volatile Organic Compound (ug/kg)							
2-BUTANONE	21	ND (12)	15	NA	NA	NA	NA
ACETONE	ND (18)	ND (12)	ND (47)	NA	NA	NA	NA
ETHYLBENZENE	1	ND (6)	ND (6)	NA	NA	NA	NA
TETRACHLOROETHENE	ND (5)	ND (6)	ND (6)	NA	NA	NA	NA
TOLUENE	150	2	5	NA	NA	NA	NA
XYLENE (TOTAL)	13	ND (6)	ND (6)	NA	NA	NA	NA

TABLE 4.15-9 (Continued)

SOIL ANALYTICAL RESULTS - IR-37
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09B010	IR09B010	IR09B010	IR09B010	IR09B045	IR09B045	IR09B045
Sampling Depth (feet bgs)	1.25	3.25	5.75	10.75	6.25	11.25	16.25
Sample Number	8941F011	8941F012	8941F013	8941F014	9415C141	9415C142	9415C144
Sample Date	10/11/89	10/11/89	10/11/89	10/11/89	04/14/94	04/14/94	04/14/94
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	56	ND (400)	ND (390)	NA	NA	NA	NA
ANTHRACENE	ND (350)	ND (400)	ND (390)	NA	NA	NA	NA
BENZO(A)ANTHRACENE	ND (350)	ND (400)	ND (390)	NA	NA	NA	NA
BENZO(A)PYRENE	ND (350)	ND (400)	ND (390)	NA	NA	NA	NA
BENZO(B)FLUORANTHENE	ND (350)	ND (400)	ND (390)	NA	NA	NA	NA
BENZO(G,H,I)PERYLENE	ND (350)	ND (400)	ND (390)	NA	NA	NA	NA
BENZO(K)FLUORANTHENE	ND (350)	ND (400)	ND (390)	NA	NA	NA	NA
BIS(2-ETHYLHEXYL)PHTHALATE	ND (350)	ND (400)	ND (390)	NA	NA	NA	NA
CARBAZOLE	NA	NA	NA	NA	NA	NA	NA
CHRYSENE	49	ND (400)	ND (390)	NA	NA	NA	NA
FLUORANTHENE	ND (350)	ND (400)	ND (390)	NA	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	ND (350)	ND (400)	ND (390)	NA	NA	NA	NA
NAPHTHALENE	ND (350)	ND (400)	ND (390)	NA	NA	NA	NA
PHENANTHRENE	ND (350)	ND (400)	ND (390)	NA	NA	NA	NA
PYRENE	ND (350)	ND (400)	ND (390)	NA	NA	NA	NA
Pesticide/Polychlorinated Biphenyl (ug/kg)							
4,4'-DDD	ND (170)	ND (20)	ND (19)	NA	NA	NA	NA
4,4'-DDE	ND (170)	ND (20)	ND (19)	NA	NA	NA	NA
ALDRIN	ND (84)	ND (10)	ND (9)	NA	NA	NA	NA
ALPHA-CHLORDANE	ND (840)	ND (98)	ND (94)	NA	NA	NA	NA
ENDOSULFAN II	ND (170)	ND (20)	ND (19)	NA	NA	NA	NA
ENDRIN	ND (170)	ND (20)	ND (19)	NA	NA	NA	NA
ENDRIN KETONE	ND (170)	ND (20)	ND (19)	NA	NA	NA	NA
GAMMA-CHLORDANE	ND (840)	ND (98)	ND (94)	NA	NA	NA	NA
HEPTACHLOR EPOXIDE	ND (84)	ND (10)	ND (9)	NA	NA	NA	NA
AROCLOR-1242	ND (840)	ND (98)	ND (94)	NA	NA	NA	NA
AROCLOR-1260	ND (1,700)	ND (200)	ND (190)	NA	NA	NA	NA
TPH-Purgeable (mg/kg)							
TPH-GASOLINE	ND (5)	ND (6)	ND (6)	NA	NA	NA	NA
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (530)	ND (61)	ND (590)	NA	NA	NA	NA
TPH-EXTRACTABLE UNKNOWN HYDROCARBON	NA	NA	NA	NA	NA	NA	NA
TPH-MOTOR OIL	NA	NA	NA	NA	NA	NA	NA

TABLE 4.15-9 (Continued)

SOIL ANALYTICAL RESULTS - IR-37
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR09B010	IR09B010	IR09B010	IR09B010	IR09B045	IR09B045	IR09B045
Sampling Depth (feet bgs)	1.25	3.25	5.75	10.75	6.25	11.25	16.25
Sample Number	8941F011	8941F012	8941F013	8941F014	9415C141	9415C142	9415C144
Sample Date	10/11/89	10/11/89	10/11/89	10/11/89	04/14/94	04/14/94	04/14/94
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	NA	NA	NA	NA	NA	NA	NA
Oil and Grease (mg/kg)							
TOTAL OIL & GREASE	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	94.9	81.2	84.5	86.6	26.6	16.1	12.1
pH (pH units)							
PH	8.2	7.4	7.3	NA	NA	NA	NA

TABLE 4.15-9 (Continued)

SOIL ANALYTICAL RESULTS - IR-37
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR37B010	IR37B010	IR37B010	IR37B011	IR37B011	IR37B011	IR37B012
Sampling Depth (feet bgs)	5.25	10.25	15.75	5.75	10.75	16.25	5.25
Sample Number	9421C246	9421C247	9421C248	9415C147	9415C148	9415C149	9422C250
Sample Date	05/27/94	05/27/94	05/27/94	04/14/94	04/14/94	04/14/94	05/31/94
Metal (mg/kg)							
ALUMINUM	2,110	1,970	2,800	5,180	2,400	783	295
ANTIMONY	82.2 *α	78.0 *α	83.0 *α	3.7	4.0	1.4	NA
ARSENIC	ND (0.47)	0.84 *	ND (0.46)	ND (0.35)	ND (0.29)	ND (0.31)	ND (0.29)
BARIUM	5.1	2.1	4.3	192	141	229	167
BERYLLIUM	ND (0.23)	ND (0.23)	ND (0.23)	ND (0.08)	ND (0.07)	ND (0.05)	ND (0.02)
CADMIUM	ND (0.94)	ND (0.90)	ND (0.92)	0.62	0.51	0.42	0.91
CALCIUM	343	199	1,560	1,250	395	262	155
CHROMIUM	600 *	591 *	760 *	511 *	522 *	267 *	74.6
CHROMIUM VI	NA	NA	NA	NA	NA	NA	NA
COBALT	88.6	68.1	95.2	114	87.7	92.2	78.0
COPPER	10.9	7.0	10.8	8.8	2.2	ND (0.12)	ND (0.11)
IRON	30,000	33,400	32,500	41,700	31,800	26,400	43,200
LEAD	ND (0.54)	ND (0.59)	ND (0.48)	2.0	1.5	1.6	1.6
MAGNESIUM	204,000	205,000	260,000	182,000	191,000	188,000	208,000
MANGANESE	628 *	372	535 *	1,070 *	593 *	3,110 *α	1,210 *
MERCURY	NA	0.06	NA	ND (0.07)	0.08	ND (0.06)	ND (0.05)
MOLYBDENUM	2.1	1.9	2.3	ND (0.19)	ND (0.16)	ND (0.17)	ND (0.15)
NICKEL	1,600 *	1,770 *	2,140 *	2,000 *	1,470 *	1,780 *	1,700 *
POTASSIUM	ND (147)	ND (142)	ND (144)	ND (13.0)	ND (11.0)	ND (11.7)	ND (10.7)
SELENIUM	ND (1.8)	ND (0.70)	ND (4.6)	ND (0.80)	ND (0.67)	ND (0.72)	ND (0.66)
SODIUM	ND (118)	ND (50.2)	ND (50.3)	533	434	383	78.0
THALLIUM	ND (0.47)	ND (0.45)	ND (0.46)	ND (0.53)	ND (0.45)	2.0 α	ND (0.44)
VANADIUM	32.9	33.6	25.8	40.8	37.2	8.7	10.8
ZINC	20.5	20.3	23.5	28.9	21.9	23.8	25.5
Volatile Organic Compound (ug/kg)							
2-BUTANONE	ND (12)	ND (11)	ND (11)	ND (13)	ND (11)	ND (12)	ND (11)
ACETONE	ND (5)	ND (11)	ND (11)	ND (21)	ND (13)	ND (20)	ND (11)
ETHYLBENZENE	ND (6)	ND (6)	ND (6)	ND (13)	ND (11)	ND (12)	ND (11)
TETRACHLOROETHENE	ND (12)	ND (11)	ND (11)	ND (13)	ND (11)	ND (12)	ND (11)
TOLUENE	ND (6)	ND (6)	ND (6)	ND (13)	ND (11)	ND (12)	ND (11)
XYLENE (TOTAL)	ND (6)	ND (6)	ND (6)	ND (13)	ND (11)	ND (12)	ND (11)

TABLE 4.15-9 (Continued)

SOIL ANALYTICAL RESULTS - IR-37
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR37B010	IR37B010	IR37B010	IR37B011	IR37B011	IR37B011	IR37B012
Sampling Depth (feet bgs)	5.25	10.25	15.75	5.75	10.75	16.25	5.25
Sample Number	9421C246	9421C247	9421C248	9415C147	9415C148	9415C149	9422C250
Sample Date	05/27/94	05/27/94	05/27/94	04/14/94	04/14/94	04/14/94	05/31/94
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (390)	ND (370)	ND (380)	ND (450)	ND (370)	ND (400)	ND (370)
ANTHRACENE	ND (390)	ND (370)	ND (380)	ND (450)	ND (370)	ND (400)	ND (370)
BENZO(A)ANTHRACENE	ND (390)	ND (370)	ND (380)	ND (450)	ND (370)	ND (400)	ND (370)
BENZO(A)PYRENE	ND (390)	ND (370)	ND (380)	ND (450)	ND (370)	ND (400)	ND (370)
BENZO(B)FLUORANTHENE	ND (390)	ND (370)	ND (380)	ND (450)	ND (370)	ND (400)	ND (370)
BENZO(G,H,I)PERYLENE	ND (390)	ND (370)	ND (380)	ND (450)	ND (370)	ND (400)	ND (370)
BENZO(K)FLUORANTHENE	ND (390)	ND (370)	ND (380)	ND (450)	ND (370)	ND (400)	ND (370)
BIS(2-ETHYLHEXYL)PHTHALATE	ND (390)	ND (370)	ND (380)	ND (31)	ND (370)	ND (400)	ND (370)
CARBAZOLE	ND (390)	ND (370)	ND (380)	ND (450)	ND (370)	ND (400)	ND (370)
CHRYSENE	ND (390)	ND (370)	ND (380)	ND (450)	ND (370)	ND (400)	ND (370)
FLUORANTHENE	ND (390)	ND (370)	ND (380)	ND (450)	ND (370)	ND (400)	ND (370)
INDENO(1,2,3-CD)PYRENE	ND (390)	ND (370)	ND (380)	ND (450)	ND (370)	ND (400)	ND (370)
NAPHTHALENE	ND (390)	ND (370)	ND (380)	ND (450)	ND (370)	ND (400)	ND (370)
PHENANTHRENE	ND (390)	ND (370)	ND (380)	ND (450)	ND (370)	ND (400)	ND (370)
PYRENE	ND (390)	ND (370)	ND (380)	ND (450)	ND (370)	ND (400)	ND (370)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
4,4'-DDD	ND (4)	ND (4)	ND (4)	ND (5)	ND (4)	ND (4)	ND (4)
4,4'-DDE	ND (4)	ND (4)	ND (4)	ND (5)	ND (4)	ND (4)	ND (4)
ALDRIN	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
ALPHA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
ENDOSULFAN II	ND (4)	ND (4)	ND (4)	ND (5)	ND (4)	ND (4)	ND (4)
ENDRIN	ND (4)	ND (4)	ND (4)	ND (5)	ND (4)	ND (4)	ND (4)
ENDRIN KETONE	ND (4)	ND (4)	ND (4)	ND (5)	ND (4)	ND (4)	ND (4)
GAMMA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
HEPTACHLOR EPOXIDE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (0.4)
AROCLOR-1242	ND (39)	ND (37)	ND (38)	ND (45)	ND (37)	ND (40)	ND (18)
AROCLOR-1260	40	ND (37)	ND (38)	ND (45)	ND (37)	ND (40)	ND (18)
TPH-Purgeable (mg/kg)							
TPH-GASOLINE	ND (1)	ND (1)	ND (1)	ND (0.7)	ND (0.6)	ND (0.6)	ND (0.6)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (1)	ND (1)	ND (1)	ND (13)	ND (11)	ND (12)	ND (11)
TPH-EXTRACTABLE UNKNOWN HYDROCARBON	ND (1)	ND (1)	12	NA	NA	NA	NA
TPH-MOTOR OIL	ND (12)	ND (11)	ND (11)	ND (13)	ND (11)	ND (12)	ND (11)

TABLE 4.15-9 (Continued)

SOIL ANALYTICAL RESULTS - IR-37
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR37B010	IR37B010	IR37B010	IR37B011	IR37B011	IR37B011	IR37B012
Sampling Depth (feet bgs)	5.25	10.25	15.75	5.75	10.75	16.25	5.25
Sample Number	9421C246	9421C247	9421C248	9415C147	9415C148	9415C149	9422C250
Sample Date	05/27/94	05/27/94	05/27/94	04/14/94	04/14/94	04/14/94	05/31/94
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	ND (29)	ND (28)	ND (29)	ND (9)	ND (7)	ND (6)	8
Oil and Grease (mg/kg)							
TOTAL OIL & GREASE	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	NA	NA	NA	74.9	89.1	83.2	8.8
pH (pH units)							
PH	8.3	8.3	8.3	7.9	8.4	8.3	8.5

TABLE 4.15-9 (Continued)

SOIL ANALYTICAL RESULTS - IR-37
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR37B013	IR37B013	IR37B013	IR37B013	IR37B014	IR37B014	IR37B015
Sampling Depth (feet bgs)	1.25	5.25	10.25	15.25	2.75	5.75	1.25
Sample Number	9421R180	9421R181	9421R182	9421R183	9423C266	9423C267	9423C263
Sample Date	05/25/94	05/25/94	05/25/94	05/25/94	06/10/94	06/10/94	06/10/94
Metal (mg/kg)							
ALUMINUM	13,900	3,500	3,560	2,430	3,680	3,840	16,200
ANTIMONY	ND (1.4)	3.9	6.4	6.6	ND (0.62)	ND (2.8)	ND (1.9)
ARSENIC	6.6 *#	1.7 *	0.98 *	0.53 *	3.6 *#	ND (0.31)	5.4 *#
BARIUM	178	48.0	65.7	2.9	439 α	173	486 α
BERYLLIUM	ND (0.26)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.30)	ND (0.16)	ND (0.47)
CADMIUM	0.57	1.5	1.6	1.1	ND (0.06)	ND (0.07)	ND (0.07)
CALCIUM	48,800	6,510	4,580	114	1,320	768	16,300
CHROMIUM	60.7	363 *	668 *	696 *	18.7	473 *	219 *
CHROMIUM VI	NA	NA	NA	NA	NA	NA	NA
COBALT	10.9	73.3	98.4	82.4	9.1	83.5	36.4
COPPER	53.7	51.4	19.2	11.2	76.2	4.1	86.3
IRON	22,100	39,100	48,700	37,100	11,200	35,100	33,800
LEAD	56.8 α	16.1 α	5.4	ND (0.14)	6.5	2.2	7.6
MAGNESIUM	8,900	193,000	245,000	229,000	3,540	159,000	57,500
MANGANESE	403 *	998 *	866 *	558 *	1,840 *α	698 *	2,530 *α
MERCURY	0.26	0.34	0.20	0.02	0.05	ND (0.06)	0.09
MOLYBDENUM	1.5	ND (0.36)	ND (0.44)	ND (0.13)	ND (0.18)	ND (0.17)	ND (0.15)
NICKEL	71.5	1,420 *	1,830 *	1,450 *	45.8	1,570 *	413 *
POTASSIUM	1,810	544	251	ND (7.6)	728	124	931
SELENIUM	ND (0.56)	ND (0.52)	ND (0.55)	ND (0.43)	ND (0.62)	ND (0.72)	ND (0.66)
SODIUM	276	100	40.8	30.6	ND (39.3)	87.7	ND (41.8)
THALLIUM	ND (0.22)	ND (0.15)	ND (0.19)	ND (0.15)	1.8 α	ND (0.48)	0.82 α
VANADIUM	49.0	24.3	28.0	21.1	27.9	38.6	71.6
ZINC	104	88.0	68.7	31.8	37.9	26.1	78.0
Volatile Organic Compound (ug/kg)							
2-BUTANONE	ND (11)	ND (11)	ND (11)	ND (11)	ND (10)	ND (12)	ND (11)
ACETONE	ND (36)	ND (22)	ND (15)	ND (11)	ND (14)	ND (10)	110
ETHYLBENZENE	ND (11)	ND (11)	ND (11)	ND (11)	ND (10)	ND (12)	ND (11)
TETRACHLOROETHENE	ND (11)	ND (11)	ND (11)	ND (11)	ND (10)	ND (12)	ND (11)
TOLUENE	ND (11)	ND (11)	ND (11)	ND (11)	ND (10)	ND (12)	ND (13)
XYLENE (TOTAL)	ND (11)	ND (11)	ND (11)	ND (11)	ND (10)	ND (12)	ND (11)

TABLE 4.15-9 (Continued)

SOIL ANALYTICAL RESULTS - IR-37
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR37B013	IR37B013	IR37B013	IR37B013	IR37B014	IR37B014	IR37B015
Sampling Depth (feet bgs)	1.25	5.25	10.25	15.25	2.75	5.75	1.25
Sample Number	9421R180	9421R181	9421R182	9421R183	9423C266	9423C267	9423C263
Sample Date	05/25/94	05/25/94	05/25/94	05/25/94	06/10/94	06/10/94	06/10/94
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (370)	ND (380)	ND (360)	ND (380)	ND (340)	ND (400)	67
ANTHRACENE	50	40	ND (360)	ND (380)	ND (340)	ND (400)	51
BENZO(A)ANTHRACENE	150	91	ND (360)	ND (380)	69	ND (400)	150
BENZO(A)PYRENE	100 *	64 *	ND (360)	ND (380)	ND (340)	ND (400)	120 *
BENZO(B)FLUORANTHENE	96	61	ND (360)	ND (380)	78	ND (400)	250
BENZO(G,H,I)PERYLENE	57	48	ND (360)	ND (380)	ND (340)	ND (400)	ND (360)
BENZO(K)FLUORANTHENE	100	64	ND (360)	ND (380)	30	ND (400)	70
BIS(2-ETHYLHEXYL)PHTHALATE	ND (30)	ND (52)	ND (37)	ND (380)	ND (340)	ND (400)	ND (360)
CARBAZOLE	22	ND (380)	ND (360)	ND (380)	ND (340)	ND (400)	340
CHRYSENE	190	120	31	ND (380)	72	ND (400)	340
FLUORANTHENE	450	260	75	ND (380)	92	ND (400)	680
INDENO(1,2,3-CD)PYRENE	46	42	ND (360)	ND (380)	ND (340)	ND (400)	ND (360)
NAPHTHALENE	ND (370)	ND (380)	ND (360)	ND (380)	ND (340)	ND (400)	120
PHENANTHRENE	190	160	34	ND (380)	ND (340)	ND (400)	520
PYRENE	480	280	66	ND (380)	91	ND (400)	800
Pesticide/Polychlorinated Biphenyl (ug/kg)							
4,4'-DDD	ND (4)	ND (4)	ND (4)	ND (4)	ND (3)	ND (4)	ND (4)
4,4'-DDE	5	3	ND (4)	ND (4)	ND (3)	ND (4)	ND (4)
ALDRIN	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
ALPHA-CHLORDANE	2	1	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
ENDOSULFAN II	2	ND (4)	ND (4)	ND (4)	ND (3)	ND (4)	ND (4)
ENDRIN	ND (4)	ND (4)	ND (4)	ND (4)	ND (3)	ND (4)	ND (4)
ENDRIN KETONE	3	ND (4)	ND (4)	ND (4)	ND (3)	ND (4)	ND (4)
GAMMA-CHLORDANE	ND (2)	1	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
HEPTACHLOR EPOXIDE	1	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
AROCLOR-1242	22	ND (38)	ND (36)	ND (41)	ND (34)	ND (40)	ND (37)
AROCLOR-1260	22	18	ND (36)	ND (41)	ND (34)	ND (40)	ND (37)
TPH-Purgeable (mg/kg)							
TPH-GASOLINE	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.5)	ND (0.6)	ND (0.6)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (120)	ND (12)	ND (11)	ND (12)	ND (10)	ND (12)	ND (27)
TPH-EXTRACTABLE UNKNOWN HYDROCARBON	NA	NA	NA	NA	NA	NA	NA
TPH-MOTOR OIL	900	640	150	ND (120)	79	ND (12)	230

TABLE 4.15-9 (Continued)

SOIL ANALYTICAL RESULTS - IR-37
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR37B013	IR37B013	IR37B013	IR37B013	IR37B014	IR37B014	IR37B015
Sampling Depth (feet bgs)	1.25	5.25	10.25	15.25	2.75	5.75	1.25
Sample Number	9421R180	9421R181	9421R182	9421R183	9423C266	9423C267	9423C263
Sample Date	05/25/94	05/25/94	05/25/94	05/25/94	06/10/94	06/10/94	06/10/94
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	1,900	310	93	ND (27)	42	10	420
Oil and Grease (mg/kg)							
TOTAL OIL & GREASE	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	89.0	87.2	91.1	87.3	97.2	83.8	91.4
pH (pH units)							
PH	11.6	11.2	9.5	8.7	8.2	8.1	8.5

TABLE 4.15-9 (Continued)

SOIL ANALYTICAL RESULTS - IR-37
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR37B015	IR37B016	IR37B016	IR37B017	IR37B017	IR37B017	IR37B018
Sampling Depth (feet bgs)	6.25	2.75	5.75	0.75	3.25	5.75	0.75
Sample Number	9423C264	9423C260	9423C261	9424C268	9424C269	9424C270	9537J241
Sample Date	06/10/94	06/09/94	06/09/94	06/13/94	06/13/94	06/13/94	09/15/95
Metal (mg/kg)							
ALUMINUM	6,850	5,970	2,020	23,200	3,160	16,800	23,000
ANTIMONY	ND (3.9)	ND (2.7)	ND (4.7)	ND (2.1)	ND (3.2)	ND (3.9)	1.1
ARSENIC	ND (0.30)	ND (0.28)	ND (0.30)	3.6 *#	0.64 *	1.1 *	3.3 *#
BARIUM	183	146	182	165	30.6	25.3	286
BERYLLIUM	ND (0.17)	ND (0.08)	ND (0.15)	0.24 *	ND (0.02)	ND (0.02)	ND (0.02)
CADMIUM	ND (0.07)	0.89	ND (0.07)	1.2	1.2	1.9	ND (0.04)
CALCIUM	1,950	ND (1,560)	571	33,500	598	8,020	16,200
CHROMIUM	602 *	329 *	712 *	83.2	370 *	431 *	93.9
CHROMIUM VI	NA	NA	NA	NA	NA	NA	NA
COBALT	81.8	64.7	87.8	24.0	76.5	92.3	29.8
COPPER	5.8	20.2	3.5	45.1	9.4	23.2	39.2
IRON	41,700	28,700	31,700	35,700	36,100	57,500	33,100
LEAD	2.5	ND (2.2)	2.4	46.0 α	ND (0.15)	ND (0.34)	8.0
MAGNESIUM	172,000	156,000	184,000	18,900	202,000	140,000	22,600
MANGANESE	772 *	756 *	586 *	1,060 *	637 *	921 *	1,070 *
MERCURY	0.06	ND (0.05)	ND (0.06)	0.15	0.04	ND (0.03)	0.08
MOLYBDENUM	ND (0.16)	ND (0.15)	ND (0.16)	ND (0.91)	ND (0.19)	ND (0.13)	ND (0.25)
NICKEL	1,620 *	1,230 *	1,700 *	95.5	1,600 *	1,640 *	112
POTASSIUM	91.3	ND (183)	50.3	1,330	ND (101)	277	1,440
SELENIUM	ND (0.70)	ND (0.64)	ND (0.70)	0.50	ND (0.45)	0.54	ND (0.82)
SODIUM	125	ND (41.0)	57.3	ND (30.4)	ND (32.5)	ND (36.8)	ND (25.9)
THALLIUM	ND (0.47)	ND (0.43)	ND (0.47)	ND (0.14)	ND (0.20)	ND (0.18)	ND (1.0)
VANADIUM	46.3	34.3	36.0	73.5	30.1	71.0	73.1
ZINC	31.1	24.9	26.2	106	33.3	54.5	74.8
Volatile Organic Compound (ug/kg)							
2-BUTANONE	ND (12)	ND (11)	ND (12)	ND (11)	ND (11)	ND (12)	NA
ACETONE	ND (11)	ND (25)	120	ND (7)	ND (11)	ND (8)	NA
ETHYLBENZENE	ND (12)	ND (11)	ND (12)	ND (11)	ND (11)	ND (12)	NA
TETRACHLOROETHENE	ND (12)	ND (11)	ND (12)	ND (11)	ND (11)	ND (12)	NA
TOLUENE	ND (12)	ND (11)	ND (12)	ND (11)	ND (11)	ND (12)	NA
XYLENE (TOTAL)	ND (12)	ND (11)	ND (12)	ND (11)	ND (11)	ND (12)	NA

TABLE 4.15-9 (Continued)

SOIL ANALYTICAL RESULTS - IR-37
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR37B015	IR37B016	IR37B016	IR37B017	IR37B017	IR37B017	IR37B018
Sampling Depth (feet bgs)	6.25	2.75	5.75	0.75	3.25	5.75	0.75
Sample Number	9423C264	9423C260	9423C261	9424C268	9424C269	9424C270	9537J241
Sample Date	06/10/94	06/09/94	06/09/94	06/13/94	06/13/94	06/13/94	09/15/95
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (390)	ND (360)	ND (390)	860	ND (350)	ND (390)	ND (340)
ANTHRACENE	ND (390)	ND (360)	ND (390)	ND (3,500)	ND (350)	ND (390)	ND (340)
BENZO(A)ANTHRACENE	ND (390)	ND (360)	ND (390)	ND (3,500)	ND (350)	ND (390)	ND (340)
BENZO(A)PYRENE	ND (390)	ND (360)	ND (390)	ND (3,500)	ND (350)	ND (390)	ND (340)
BENZO(B)FLUORANTHENE	ND (390)	ND (360)	ND (390)	ND (3,500)	ND (350)	ND (390)	ND (340)
BENZO(G,H,I)PERYLENE	ND (390)	ND (360)	ND (390)	ND (3,500)	ND (350)	ND (390)	ND (340)
BENZO(K)FLUORANTHENE	ND (390)	ND (360)	ND (390)	ND (3,500)	ND (350)	ND (390)	ND (340)
BIS(2-ETHYLHEXYL)PHTHALATE	ND (390)	ND (360)	ND (120)	ND (240)	ND (92)	ND (26)	ND (340)
CARBAZOLE	ND (390)	ND (360)	ND (390)	ND (3,500)	ND (350)	ND (390)	ND (340)
CHRYSENE	ND (390)	ND (360)	ND (390)	340	ND (350)	ND (390)	ND (340)
FLUORANTHENE	ND (390)	ND (360)	ND (390)	ND (3,500)	ND (350)	ND (390)	ND (340)
INDENO(1,2,3-CD)PYRENE	ND (390)	ND (360)	ND (390)	ND (3,500)	ND (350)	ND (390)	ND (340)
NAPHTHALENE	ND (390)	ND (360)	ND (390)	200	ND (350)	ND (390)	ND (340)
PHENANTHRENE	ND (390)	ND (360)	ND (390)	420	ND (350)	ND (390)	ND (340)
PYRENE	ND (390)	ND (360)	ND (390)	ND (3,500)	ND (350)	ND (390)	ND (340)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
4,4'-DDD	ND (4)	ND (4)	ND (4)	21	ND (4)	ND (4)	ND (4)
4,4'-DDE	ND (4)	ND (4)	ND (4)	8	ND (4)	ND (4)	ND (4)
ALDRIN	ND (2)	ND (2)	ND (2)	4	ND (2)	ND (2)	ND (2)
ALPHA-CHLORDANE	ND (2)	ND (2)	ND (2)	3	ND (2)	ND (2)	ND (2)
ENDOSULFAN II	ND (4)	ND (4)	ND (4)	ND (7)	ND (4)	ND (4)	ND (4)
ENDRIN	ND (4)	ND (4)	ND (4)	5	ND (4)	ND (4)	ND (4)
ENDRIN KETONE	ND (4)	ND (4)	ND (4)	8	ND (4)	ND (4)	ND (4)
GAMMA-CHLORDANE	ND (2)	ND (2)	ND (2)	2	ND (2)	ND (2)	ND (2)
HEPTACHLOR EPOXIDE	ND (2)	ND (0.4)	ND (2)	3	ND (2)	ND (2)	ND (2)
AROCLOR-1242	ND (39)	ND (18)	ND (39)	ND (69)	ND (35)	ND (39)	ND (35)
AROCLOR-1260	ND (39)	ND (18)	ND (39)	460 *#	ND (35)	ND (39)	ND (35)
TPH-Purgeable (mg/kg)							
TPH-GASOLINE	ND (0.6)	ND (0.5)	ND (0.6)	0.5	ND (0.5)	ND (0.6)	ND (0.5)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (12)	ND (11)	ND (12)	ND (230)	ND (11)	ND (12)	ND (10)
TPH-EXTRACTABLE UNKNOWN HYDROCARBON	NA	NA	NA	NA	NA	NA	NA
TPH-MOTOR OIL	ND (12)	ND (11)	20	2,700	36	ND (79)	ND (10)

TABLE 4.15-9 (Continued)

SOIL ANALYTICAL RESULTS - IR-37
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR37B015	IR37B016	IR37B016	IR37B017	IR37B017	IR37B017	IR37B018
Sampling Depth (feet bgs)	6.25	2.75	5.75	0.75	3.25	5.75	0.75
Sample Number	9423C264	9423C260	9423C261	9424C268	9424C269	9424C270	9537J241
Sample Date	06/10/94	06/09/94	06/09/94	06/13/94	06/13/94	06/13/94	09/15/95
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	9	ND (9)	26	6,400	ND (28)	ND (30)	110
Oil and Grease (mg/kg)							
TOTAL OIL & GREASE	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	85.5	6.8	85.4	95.1	92.9	84.2	95.7
pH (pH units)							
PH	8.6	8.3	8.5	9.1	8.4	8.4	8.8

TABLE 4.15-9 (Continued)

SOIL ANALYTICAL RESULTS - IR-37
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR37B018	IR37B018	IR37B018	IR37B019	IR37B019	IR37B019	IR37B019
Sampling Depth (feet bgs)	2.25	6.25	11.25	0.75	2.75	5.75	11.25
Sample Number	9537J242	9537J243	9537J244	9537J245	9537J246	9537J247	9537J248
Sample Date	09/15/95	09/15/95	09/15/95	09/15/95	09/15/95	09/15/95	09/15/95
Metal (mg/kg)							
ALUMINUM	3,340	5,300	5,580	18,100	26,400	2,230	2,640
ANTIMONY	2.8	1.2	2.1	ND (0.66)	2.0	1.2	1.9
ARSENIC	ND (0.60)	ND (0.65)	ND (0.79)	3.7 *#	1.1 *	ND (0.63)	ND (0.71)
BARIUM	12.3	18.3	30.2	237	131	12.4	6.8
BERYLLIUM	ND (0.02)	ND (0.02)	ND (0.03)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.03)
CADMIUM	ND (0.04)	ND (0.05)	ND (0.06)	ND (0.04)	ND (0.04)	ND (0.05)	ND (0.05)
CALCIUM	1,150	2,210	3,790	11,000	22,200	336	531
CHROMIUM	835 *	492 *	564 *	107	101	348 *	523 *
CHROMIUM VI	NA	NA	NA	NA	NA	NA	NA
COBALT	81.1	108	105	30.1	34.8	77.8	89.1
COPPER	8.2	18.6	13.3	67.8	31.2	8.9	8.3
IRON	32,500	37,000	40,700	41,200	70,800	30,500	38,200
LEAD	3.8	4.8	6.9	12.7 α	12.0 α	3.5	4.5
MAGNESIUM	220,000	178,000	120,000	26,300	17,600	209,000	169,000
MANGANESE	656 *	1,130 *	860 *	1,360 *	1,350 *	800 *	681 *
MERCURY	ND (0.05)	0.06	ND (0.07)	ND (0.06)	0.06	ND (0.06)	ND (0.06)
MOLYBDENUM	ND (0.26)	ND (0.28)	ND (0.34)	ND (0.26)	ND (0.43)	ND (0.27)	ND (0.30)
NICKEL	1,450 *	1,740 *	1,750 *	150	52.8	1,450 *	1,950 *
POTASSIUM	32.8	120	533	865	471	50.4	177
SELENIUM	ND (0.84)	ND (0.90)	ND (1.1)	ND (0.86)	ND (0.84)	ND (0.88)	ND (0.98)
SODIUM	ND (26.7)	70.0	522	ND (27.2)	ND (26.5)	54.2	287
THALLIUM	ND (0.41)	ND (0.44)	ND (0.53)	ND (0.63)	ND (3.4)	ND (0.43)	ND (0.48)
VANADIUM	30.7	47.0	39.7	90.9	89.8	31.7	33.5
ZINC	32.5	41.8	42.6	85.9	162 α	33.6	37.2
Volatile Organic Compound (ug/kg)							
2-BUTANONE	ND (11)	ND (11)	ND (14)	NA	ND (11)	ND (11)	ND (13)
ACETONE	ND (14)	ND (11)	ND (14)	NA	ND (11)	ND (11)	ND (13)
ETHYLBENZENE	ND (11)	ND (11)	ND (14)	NA	ND (11)	ND (11)	ND (13)
TETRACHLOROETHENE	ND (11)	ND (11)	ND (14)	NA	ND (11)	ND (11)	ND (13)
TOLUENE	ND (11)	ND (11)	ND (14)	NA	ND (11)	ND (11)	ND (13)
XYLENE (TOTAL)	ND (11)	ND (11)	ND (14)	NA	ND (11)	ND (11)	ND (13)

TABLE 4.15-9 (Continued)

SOIL ANALYTICAL RESULTS - IR-37
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR37B018	IR37B018	IR37B018	IR37B019	IR37B019	IR37B019	IR37B019
Sampling Depth (feet bgs)	2.25	6.25	11.25	0.75	2.75	5.75	11.25
Sample Number	9537J242	9537J243	9537J244	9537J245	9537J246	9537J247	9537J248
Sample Date	09/15/95	09/15/95	09/15/95	09/15/95	09/15/95	09/15/95	09/15/95
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (350)	ND (380)	ND (460)	ND (360)	ND (350)	ND (380)	ND (420)
ANTHRACENE	ND (350)	ND (380)	ND (460)	ND (360)	ND (350)	ND (380)	ND (420)
BENZO(A)ANTHRACENE	ND (350)	ND (380)	ND (460)	ND (360)	ND (350)	ND (380)	ND (420)
BENZO(A)PYRENE	ND (350)	ND (380)	ND (460)	ND (360)	ND (350)	ND (380)	ND (420)
BENZO(B)FLUORANTHENE	ND (350)	ND (380)	ND (460)	ND (360)	ND (350)	ND (380)	ND (420)
BENZO(G,H,I)PERYLENE	ND (350)	ND (380)	ND (460)	ND (360)	ND (350)	ND (380)	ND (420)
BENZO(K)FLUORANTHENE	ND (350)	ND (380)	ND (460)	ND (360)	ND (350)	ND (380)	ND (420)
BIS(2-ETHYLHEXYL)PHTHALATE	ND (350)	ND (380)	ND (460)	ND (360)	ND (350)	ND (380)	ND (420)
CARBAZOLE	ND (350)	ND (380)	ND (460)	ND (360)	ND (350)	ND (380)	ND (420)
CHRYSENE	ND (350)	ND (380)	ND (460)	ND (360)	ND (350)	ND (380)	ND (420)
FLUORANTHENE	ND (350)	ND (380)	ND (460)	ND (360)	ND (350)	ND (380)	ND (420)
INDENO(1,2,3-CD)PYRENE	ND (350)	ND (380)	ND (460)	ND (360)	ND (350)	ND (380)	ND (420)
NAPHTHALENE	ND (350)	ND (380)	ND (460)	ND (360)	ND (350)	ND (380)	ND (420)
PHENANTHRENE	ND (350)	ND (380)	ND (460)	ND (360)	ND (350)	ND (380)	ND (420)
PYRENE	ND (350)	ND (380)	ND (460)	ND (360)	ND (350)	ND (380)	ND (420)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
4,4'-DDD	ND (4)	ND (4)	ND (5)	ND (7)	ND (4)	ND (4)	ND (4)
4,4'-DDE	ND (4)	ND (4)	ND (5)	ND (7)	ND (4)	ND (4)	ND (4)
ALDRIN	ND (2)	ND (2)	ND (2)	ND (4)	ND (2)	ND (2)	ND (2)
ALPHA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (4)	ND (2)	ND (2)	ND (2)
ENDOSULFAN II	ND (4)	ND (4)	ND (5)	ND (7)	ND (4)	ND (4)	ND (4)
ENDRIN	ND (4)	ND (4)	ND (5)	ND (7)	ND (4)	ND (4)	ND (4)
ENDRIN KETONE	ND (4)	ND (4)	ND (5)	ND (7)	ND (4)	ND (4)	ND (4)
GAMMA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (4)	ND (2)	ND (2)	ND (2)
HEPTACHLOR EPOXIDE	ND (2)	ND (2)	ND (2)	ND (4)	ND (2)	ND (2)	ND (2)
AROCLOR-1242	ND (36)	ND (38)	ND (47)	ND (73)	ND (36)	ND (38)	ND (42)
AROCLOR-1260	ND (36)	ND (38)	ND (47)	ND (73)	ND (36)	ND (38)	ND (42)
TPH-Purgeable (mg/kg)							
TPH-GASOLINE	ND (0.5)	ND (0.6)	ND (0.7)	ND (0.6)	ND (0.5)	ND (0.6)	ND (0.6)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (11)	ND (12)	ND (14)	15	ND (11)	ND (11)	ND (13)
TPH-EXTRACTABLE UNKNOWN HYDROCARBON	NA	NA	NA	NA	NA	NA	NA
TPH-MOTOR OIL	ND (11)	10	ND (14)	210	ND (11)	ND (11)	ND (13)

TABLE 4.15-9 (Continued)

SOIL ANALYTICAL RESULTS - IR-37
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR37B018	IR37B018	IR37B018	IR37B019	IR37B019	IR37B019	IR37B019
Sampling Depth (feet bgs)	2.25	6.25	11.25	0.75	2.75	5.75	11.25
Sample Number	9537J242	9537J243	9537J244	9537J245	9537J246	9537J247	9537J248
Sample Date	09/15/95	09/15/95	09/15/95	09/15/95	09/15/95	09/15/95	09/15/95
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	32	ND (12)	16	180	19	22	20
Oil and Grease (mg/kg)							
TOTAL OIL & GREASE	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	92.6	86.7	71.3	90.9	93.4	88.3	79.4
pH (pH units)							
PH	8.4	8.4	8.3	8.4	8.2	8.3	8.2

TABLE 4.15-9 (Continued)

SOIL ANALYTICAL RESULTS - IR-37
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR37B020	IR37B020	IR37B020	IR37B020	IR37B021	IR37B021	IR37B021
Sampling Depth (feet bgs)	0.75	2.75	6.25	11.25	0.75	3.00	5.50
Sample Number	9538J289	9538J290	9538J291	9538J292	9545J582	9545J583	9545J584
Sample Date	09/21/95	09/21/95	09/21/95	09/21/95	11/06/95	11/06/95	11/06/95
Metal (mg/kg)							
ALUMINUM	23,200	2,300	4,160	6,520	19,900	8,270	6,020
ANTIMONY	1.1	2.0	2.2	2.2	0.82	4.0	2.9
ARSENIC	3.9 *#	ND (0.62)	ND (0.67)	ND (0.71)	3.1 *#	0.97 *	ND (0.70)
BARIUM	236	18.1	17.4	16.6	371 α	56.6	19.5
BERYLLIUM	ND (0.08)	ND (0.02)	ND (0.02)	ND (0.03)	ND (0.02)	ND (0.02)	ND (0.03)
CADMIUM	ND (0.04)	ND (0.04)	ND (0.05)	ND (0.05)	ND (0.04)	ND (0.04)	ND (0.05)
CALCIUM	15,000	529	996	1,270	21,800	11,400	1,570
CHROMIUM	54.0	390 *	481 *	593 *	113	421 *	562 *
CHROMIUM VI	NA	NA	NA	NA	NA	NA	NA
COBALT	20.6	74.0	108	88.6	34.2	60.2	114
COPPER	26.1	15.8	12.3	13.7	98.7	18.4	9.6
IRON	32,200	27,100	39,400	41,200	39,700	27,700	46,900
LEAD	8.7	3.6	5.5	6.6	7.1	6.4	5.5
MAGNESIUM	14,100	209,000	187,000	144,000	19,300	139,000	184,000
MANGANESE	780 *	604 *	859 *	688 *	2,640 *α	760 *	1,200 *
MERCURY	0.12	ND (0.06)	0.06	ND (0.06)	ND (0.05)	ND (0.06)	ND (0.06)
MOLYBDENUM	ND (0.26)	ND (0.26)	ND (0.29)	ND (0.30)	ND (0.26)	ND (0.26)	ND (0.30)
NICKEL	72.7	1,530 *	1,840 *	1,750 *	140	1,190 *	2,250 *
POTASSIUM	1,710	93.9	156	464	820	660	116
SELENIUM	ND (0.86)	ND (0.86)	ND (0.94)	ND (0.98)	ND (0.84)	ND (0.86)	ND (0.98)
SODIUM	ND (54.4)	ND (27.3)	ND (101)	486	ND (96.1)	ND (33.4)	ND (106)
THALLIUM	ND (0.42)	ND (0.42)	ND (0.46)	ND (0.48)	ND (0.91)	ND (0.42)	ND (0.48)
VANADIUM	80.0	19.0	41.5	38.9	86.2	34.4	62.0
ZINC	76.4	28.8	38.0	40.6	102	42.0	48.4
Volatile Organic Compound (ug/kg)							
2-BUTANONE	ND (11)	ND (11)	ND (12)	ND (13)	NA	ND (11)	ND (12)
ACETONE	ND (12)	ND (11)	ND (12)	ND (13)	NA	ND (11)	ND (12)
ETHYLBENZENE	ND (11)	ND (11)	ND (12)	ND (13)	NA	ND (11)	ND (12)
TETRACHLOROETHENE	ND (11)	ND (11)	ND (12)	ND (13)	NA	ND (11)	ND (12)
TOLUENE	ND (11)	ND (11)	ND (12)	ND (13)	NA	ND (11)	ND (12)
XYLENE (TOTAL)	ND (11)	ND (11)	ND (12)	ND (13)	NA	ND (11)	ND (12)

TABLE 4.15-9 (Continued)

SOIL ANALYTICAL RESULTS - IR-37
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR37B020	IR37B020	IR37B020	IR37B020	IR37B021	IR37B021	IR37B021
Sampling Depth (feet bgs)	0.75	2.75	6.25	11.25	0.75	3.00	5.50
Sample Number	9538J289	9538J290	9538J291	9538J292	9545J582	9545J583	9545J584
Sample Date	09/21/95	09/21/95	09/21/95	09/21/95	11/06/95	11/06/95	11/06/95
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (360)	ND (360)	ND (400)	ND (420)	ND (350)	ND (360)	ND (410)
ANTHRACENE	ND (360)	ND (360)	ND (400)	ND (420)	ND (350)	ND (360)	ND (410)
BENZO(A)ANTHRACENE	ND (360)	ND (360)	ND (400)	ND (420)	ND (350)	ND (360)	ND (410)
BENZO(A)PYRENE	ND (360)	ND (360)	ND (400)	ND (420)	ND (350)	ND (360)	ND (410)
BENZO(B)FLUORANTHENE	ND (360)	ND (360)	ND (400)	ND (420)	ND (350)	ND (360)	ND (410)
BENZO(G,H,I)PERYLENE	ND (360)	ND (360)	ND (400)	ND (420)	ND (350)	ND (360)	ND (410)
BENZO(K)FLUORANTHENE	ND (360)	ND (360)	ND (400)	ND (420)	ND (350)	ND (360)	ND (410)
BIS(2-ETHYLHEXYL)PHTHALATE	ND (360)	ND (360)	ND (510)	ND (420)	ND (350)	ND (360)	ND (410)
CARBAZOLE	ND (360)	ND (360)	ND (400)	ND (420)	ND (350)	ND (360)	ND (410)
CHRYSENE	ND (360)	ND (360)	ND (400)	ND (420)	ND (350)	ND (360)	ND (410)
FLUORANTHENE	ND (360)	ND (360)	ND (400)	ND (420)	ND (350)	ND (360)	ND (410)
INDENO(1,2,3-CD)PYRENE	ND (360)	ND (360)	ND (400)	ND (420)	ND (350)	ND (360)	ND (410)
NAPHTHALENE	ND (360)	ND (360)	ND (400)	ND (420)	ND (350)	ND (360)	ND (410)
PHENANTHRENE	ND (360)	ND (360)	ND (400)	ND (420)	ND (350)	ND (360)	ND (410)
PYRENE	ND (360)	ND (360)	ND (400)	ND (420)	ND (350)	ND (360)	ND (410)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
4,4'-DDD	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
4,4'-DDE	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ALDRIN	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
ALPHA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
ENDOSULFAN II	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ENDRIN	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
ENDRIN KETONE	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
GAMMA-CHLORDANE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
HEPTACHLOR EPOXIDE	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
AROCLOR-1242	ND (37)	ND (37)	ND (40)	ND (42)	ND (36)	ND (37)	ND (42)
AROCLOR-1260	ND (37)	ND (37)	ND (40)	ND (42)	ND (36)	ND (37)	ND (42)
TPH-Purgeable (mg/kg)							
TPH-GASOLINE	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.5)	ND (0.6)	ND (0.6)
TPH-Extractable (mg/kg)							
TPH-DIESEL	1,300	ND (11)	ND (12)	ND (13)	ND (11)	25	ND (13)
TPH-EXTRACTABLE UNKNOWN HYDROCARBON	NA	NA	NA	NA	NA	NA	NA
TPH-MOTOR OIL	330	25	ND (12)	8	8	82	7

TABLE 4.15-9 (Continued)

SOIL ANALYTICAL RESULTS - IR-37
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR37B020	IR37B020	IR37B020	IR37B020	IR37B021	IR37B021	IR37B021
Sampling Depth (feet bgs)	0.75	2.75	6.25	11.25	0.75	3.00	5.50
Sample Number	9538J289	9538J290	9538J291	9538J292	9545J582	9545J583	9545J584
Sample Date	09/21/95	09/21/95	09/21/95	09/21/95	11/06/95	11/06/95	11/06/95
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	4,000	ND (11)	ND (12)	ND (13)	63	17	ND (13)
Oil and Grease (mg/kg)							
TOTAL OIL & GREASE	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	90.9	90.8	83.4	79.3	92.9	90.9	79.6
pH (pH units)							
PH	8.6	8.3	8.1	7.9	8.1	8.4	8.4

TABLE 4.15-9 (Continued)

SOIL ANALYTICAL RESULTS - IR-37
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR37B021	IR37SS22	IR37SS23	IR37SS24	IR50B016	IR50B016	IR50B016
Sampling Depth (feet bgs)	10.50	0.00	0.00	0.00	1.75	6.25	15.75
Sample Number	9545J585	9605J797	9605J798	9605J796	9422R210	9422R211	9422R212
Sample Date	11/06/95	01/29/96	01/29/96	01/29/96	06/01/94	06/01/94	06/01/94
Metal (mg/kg)							
ALUMINUM	1,530	21,700	14,700	8,330	13,800	5,490	3,240
ANTIMONY	1.2	5.6	2.2	ND (0.71)	4.6	6.2	5.1
ARSENIC	ND (0.67)	3.2 *#	3.0 *#	3.5 *#	3.2 *#	1.6 *	0.84 *
BARIUM	11.9	149	94.9	88.6	154	37.5	6.6
BERYLLIUM	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.04)	ND (0.14)	ND (0.06)	ND (0.03)
CADMIUM	ND (0.05)	ND (0.04)	ND (0.04)	ND (0.18)	1.2	1.7	1.4
CALCIUM	226	16,200	9,340	5,860	7,270	3,000	234
CHROMIUM	298 *	105	63.8	31.1	413 *	612 *	539 *
CHROMIUM VI	NA	NA	NA	NA	NA	NA	NA
COBALT	105	27.2	14.4	9.0	76.4	98.7	111
COPPER	4.9	75.7	57.6	21.4	38.4	18.3	19.7
IRON	31,700	32,700	24,100	16,000	47,600	55,700	41,600
LEAD	4.4	82.4 α	128 α	13.3 α	13.6 α	3.6	ND (0.16)
MAGNESIUM	209,000	19,400	12,200	8,010	96,100	172,000	240,000
MANGANESE	823 *	994 *	508 *	446 *	1,440 *α	908 *	639 *
MERCURY	ND (0.06)	ND (0.20)	ND (0.38)	ND (0.05)	0.04	0.04	0.05
MOLYBDENUM	ND (0.29)	ND (0.13)	ND (0.23)	ND (0.13)	ND (0.47)	ND (0.20)	ND (0.24)
NICKEL	2,170 *	108	69.6	51.3	1,270 *	2,820 *	1,670 *
POTASSIUM	61.4	1,250	1,260	1,490	1,520	514	329
SELENIUM	ND (0.93)	ND (0.50)	ND (0.49)	ND (0.48)	ND (0.58)	ND (0.52)	ND (0.49)
SODIUM	295	ND (52.9)	623	ND (53.3)	ND (21.3)	104	1,330
THALLIUM	ND (0.45)	ND (0.41)	ND (0.41)	ND (0.40)	ND (0.18)	ND (0.20)	ND (0.20)
VANADIUM	38.3	83.9	45.4	19.6	61.1	40.4	41.6
ZINC	28.3	238 α	195 α	58.7	75.6	57.0	38.8
Volatile Organic Compound (ug/kg)							
2-BUTANONE	ND (12)	NA	NA	NA	ND (12)	ND (11)	ND (11)
ACETONE	ND (12)	NA	NA	NA	ND (12)	ND (11)	ND (11)
ETHYLBENZENE	ND (12)	NA	NA	NA	ND (12)	ND (11)	ND (11)
TETRACHLOROETHENE	ND (12)	NA	NA	NA	2	2	ND (11)
TOLUENE	ND (12)	NA	NA	NA	ND (12)	2	ND (11)
XYLENE (TOTAL)	ND (12)	NA	NA	NA	ND (12)	ND (11)	ND (11)

TABLE 4.15-9 (Continued)

SOIL ANALYTICAL RESULTS - IR-37
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR37B021	IR37SS22	IR37SS23	IR37SS24	IR50B016	IR50B016	IR50B016
Sampling Depth (feet bgs)	10.50	0.00	0.00	0.00	1.75	6.25	15.75
Sample Number	9545J585	9605J797	9605J798	9605J796	9422R210	9422R211	9422R212
Sample Date	11/06/95	01/29/96	01/29/96	01/29/96	06/01/94	06/01/94	06/01/94
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (390)	ND (710)	630	ND (6,900)	ND (390)	ND (380)	ND (370)
ANTHRACENE	ND (390)	ND (710)	ND (710)	ND (6,900)	ND (390)	ND (380)	ND (370)
BENZO(A)ANTHRACENE	ND (390)	ND (7,100)	ND (7,100)	ND (6,900)	ND (390)	ND (380)	ND (370)
BENZO(A)PYRENE	ND (390)	ND (7,100)	NA	ND (6,900)	ND (390)	ND (380)	ND (370)
BENZO(B)FLUORANTHENE	ND (390)	ND (7,100)	NA	ND (6,900)	ND (390)	ND (380)	ND (370)
BENZO(G,H,I)PERYLENE	ND (390)	ND (7,100)	NA	ND (6,900)	ND (390)	ND (380)	ND (370)
BENZO(K)FLUORANTHENE	ND (390)	ND (7,100)	NA	ND (6,900)	ND (390)	ND (380)	ND (370)
BIS(2-ETHYLHEXYL)PHTHALATE	ND (390)	ND (7,100)	ND (7,100)	ND (6,900)	ND (390)	ND (150)	ND (36)
CARBAZOLE	ND (390)	ND (710)	ND (710)	ND (6,900)	ND (390)	ND (380)	ND (370)
CHRYSENE	ND (390)	ND (7,100)	ND (7,100)	ND (6,900)	ND (390)	55	ND (370)
FLUORANTHENE	ND (390)	ND (710)	ND (710)	ND (6,900)	ND (390)	ND (380)	ND (370)
INDENO(1,2,3-CD)PYRENE	ND (390)	ND (7,100)	NA	ND (6,900)	ND (390)	ND (380)	ND (370)
NAPHTHALENE	ND (390)	ND (710)	ND (710)	ND (6,900)	ND (390)	ND (380)	ND (370)
PHENANTHRENE	ND (390)	ND (710)	ND (710)	ND (6,900)	ND (390)	ND (380)	ND (370)
PYRENE	ND (390)	ND (7,100)	ND (7,100)	ND (6,900)	ND (390)	ND (380)	ND (370)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
4,4'-DDD	ND (4)	ND (72)	180	ND (17)	ND (4)	ND (4)	ND (4)
4,4'-DDE	ND (4)	ND (72)	ND (72)	ND (17)	ND (4)	ND (4)	ND (4)
ALDRIN	ND (2)	ND (36)	ND (36)	ND (9)	ND (2)	ND (2)	ND (2)
ALPHA-CHLORDANE	ND (2)	ND (36)	ND (36)	ND (9)	ND (2)	ND (2)	ND (2)
ENDOSULFAN II	ND (4)	ND (72)	ND (72)	ND (17)	ND (4)	ND (4)	ND (4)
ENDRIN	ND (4)	ND (72)	ND (72)	ND (17)	ND (4)	ND (4)	ND (4)
ENDRIN KETONE	ND (4)	ND (72)	ND (72)	ND (17)	ND (4)	ND (4)	ND (4)
GAMMA-CHLORDANE	ND (2)	ND (36)	ND (36)	ND (9)	ND (2)	ND (2)	ND (2)
HEPTACHLOR EPOXIDE	ND (2)	ND (36)	ND (36)	ND (9)	ND (2)	ND (2)	ND (2)
AROCLOR-1242	ND (40)	ND (720)	ND (720)	ND (170)	ND (39)	ND (37)	ND (37)
AROCLOR-1260	ND (40)	ND (720)	ND (720)	ND (170)	ND (39)	42	ND (37)
TPH-Purgeable (mg/kg)							
TPH-GASOLINE	ND (0.6)	1	1	2	ND (0.6)	ND (0.6)	ND (0.6)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (12)	630	1,400	230	ND (12)	ND (12)	ND (12)
TPH-EXTRACTABLE UNKNOWN HYDROCARBON	NA	NA	NA	NA	NA	NA	NA
TPH-MOTOR OIL	ND (12)	4,100	6,000	1,100	120	550	ND (120)

TABLE 4.15-9 (Continued)

SOIL ANALYTICAL RESULTS - IR-37
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR37B021	IR37SS22	IR37SS23	IR37SS24	IR50B016	IR50B016	IR50B016
Sampling Depth (feet bgs)	10.50	0.00	0.00	0.00	1.75	6.25	15.75
Sample Number	9545J585	9605J797	9605J798	9605J796	9422R210	9422R211	9422R212
Sample Date	11/06/95	01/29/96	01/29/96	01/29/96	06/01/94	06/01/94	06/01/94
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	ND (12)	6,900	6,600	2,400	ND (31)	1,300	33
Oil and Grease (mg/kg)							
TOTAL OIL & GREASE	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	84.0	92.8	93.2	95.7	84.0	87.6	89.7
pH (pH units)							
PH	8.8	8.6	9.3	9.1	9.0	9.3	9.5

TABLE 4.15-9 (Continued)

SOIL ANALYTICAL RESULTS - IR-37
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	PA37SS04	PA37SS08	PA37SS09
Sampling Depth (feet bgs)	1.25	1.25	0.75
Sample Number	9312A697	9310J389	9310J369
Sample Date	03/24/93	03/11/93	03/08/93
Metal (mg/kg)			
ALUMINUM	20,300	7,210	15,600
ANTIMONY	NA	ND (3.3)	8.6
ARSENIC	3.5 *#	9.5 *#	ND (2.8)
BARIUM	270	580 α	162
BERYLLIUM	ND (0.59)	ND (0.13)	0.40 *
CADMIUM	ND (0.46)	ND (0.46)	ND (0.48)
CALCIUM	12,000	2,090	10,700
CHROMIUM	149	42.5	74.2
CHROMIUM VI	ND (0.05)	ND (0.05)	ND (0.05)
COBALT	27.0	27.5 α	18.9
COPPER	52.0	76.9	55.0
IRON	38,600	19,900	27,700
LEAD	28.6 α	11.2 α	92.1 α
MAGNESIUM	23,000	4,550	12,000
MANGANESE	1,520 *α	2,440 *α	933 *
MERCURY	ND (0.19)	0.18	0.25
MOLYBDENUM	ND (0.54)	0.62	ND (0.57)
NICKEL	234 *	63.2	75.4
POTASSIUM	790	579	871
SELENIUM	ND (0.48)	ND (0.40)	ND (4.1)
SODIUM	ND (275)	170	280
THALLIUM	ND (0.61)	ND (0.37)	ND (0.39)
VANADIUM	94.4	53.5	69.0
ZINC	72.1	46.9	172 α
Volatile Organic Compound (ug/kg)			
2-BUTANONE	ND (22)	ND (11)	ND (11)
ACETONE	ND (35)	33	ND (11)
ETHYLBENZENE	ND (22)	ND (11)	8
TETRACHLOROETHENE	ND (22)	ND (11)	ND (11)
TOLUENE	ND (22)	ND (11)	4
XYLENE (TOTAL)	22	ND (11)	ND (33)

TABLE 4.15-9 (Continued)

SOIL ANALYTICAL RESULTS - IR-37
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	PA37SS04	PA37SS08	PA37SS09
Sampling Depth (feet bgs)	1.25	1.25	0.75
Sample Number	9312A697	9310J389	9310J369
Sample Date	03/24/93	03/11/93	03/08/93
Semivolatile Organic Compound (ug/kg)			
2-METHYLNAPHTHALENE	ND (11,000)	ND (370)	ND (110,000)
ANTHRACENE	ND (11,000)	ND (370)	ND (110,000)
BENZO(A)ANTHRACENE	ND (11,000)	ND (370)	ND (110,000)
BENZO(A)PYRENE	ND (11,000)	ND (370)	ND (110,000)
BENZO(B)FLUORANTHENE	ND (11,000)	ND (370)	ND (110,000)
BENZO(G,H,I)PERYLENE	ND (11,000)	ND (370)	ND (110,000)
BENZO(K)FLUORANTHENE	ND (11,000)	ND (370)	ND (110,000)
BIS(2-ETHYLHEXYL)PHTHALATE	ND (11,000)	150	ND (110,000)
CARBAZOLE	ND (11,000)	ND (370)	ND (110,000)
CHRYSENE	ND (11,000)	ND (370)	ND (110,000)
FLUORANTHENE	ND (11,000)	ND (370)	ND (110,000)
INDENO(1,2,3-CD)PYRENE	ND (11,000)	ND (370)	ND (110,000)
NAPHTHALENE	ND (11,000)	ND (370)	ND (110,000)
PHENANTHRENE	ND (11,000)	ND (370)	ND (110,000)
PYRENE	ND (11,000)	ND (370)	ND (110,000)
Pesticide/Polychlorinated Biphenyl (ug/kg)			
4,4'-DDD	ND (4)	ND (4)	ND (38)
4,4'-DDE	ND (4)	ND (4)	ND (38)
ALDRIN	ND (2)	ND (2)	ND (19)
ALPHA-CHLORDANE	ND (2)	ND (2)	ND (19)
ENDOSULFAN II	ND (4)	ND (4)	ND (38)
ENDRIN	ND (4)	ND (4)	ND (38)
ENDRIN KETONE	ND (4)	ND (4)	ND (38)
GAMMA-CHLORDANE	ND (2)	ND (2)	ND (19)
HEPTACHLOR EPOXIDE	ND (2)	ND (2)	ND (19)
AROCLOR-1242	ND (36)	ND (37)	ND (380)
AROCLOR-1260	ND (36)	ND (37)	260 *
TPH-Purgeable (mg/kg)			
TPH-GASOLINE	130	ND (6)	ND (6)
TPH-Extractable (mg/kg)			
TPH-DIESEL	240	20	950
TPH-EXTRACTABLE UNKNOWN HYDROCARBON	NA	NA	NA
TPH-MOTOR OIL	NA	NA	NA

TABLE 4.15-9 (Continued)

SOIL ANALYTICAL RESULTS - IR-37
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	PA37SS04	PA37SS08	PA37SS09
Sampling Depth (feet bgs)	1.25	1.25	0.75
Sample Number	9312A697	9310J389	9310J369
Sample Date	03/24/93	03/11/93	03/08/93
Total Recoverable Petroleum Hydrocarbons (mg/kg)			
TRPH	NA	NA	NA
Oil and Grease (mg/kg)			
TOTAL OIL & GREASE	6,700	580	29,000
Percent Moisture (%)			
% SOLIDS	91.8	91.0	88.0
pH (pH units)			
PH	7.6	8.1	9.0

Notes:

%	Percent
bgs	Below ground surface
mg/kg	Milligram per kilogram
NA	Not analyzed
ND()	Not detected (detection limit in parentheses)
µg/kg	Microgram per kilogram
*	Detected concentration greater than U.S. Environmental Protection Agency Region IX preliminary remediation goals (PRG) for residential use
#	Detected concentration greater than U.S. Environmental Protection Agency Region IX PRG for industrial use
α	Detected concentration greater than the Hunters Point ambient level.
▒	Detected concentration greater than at least one screening criterion.

TABLE 4.15-10

SUMMARY OF MONITORING WELL GROUNDWATER ANALYTICAL TESTS - IR-37
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
IR37MW01A	9444X551						✓				✓	✓				✓			✓	✓	✓	✓
IR37MW01A	9444X552						✓				✓	✓				✓			✓	✓	✓	✓
IR37MW01A	9603W018						✓				✓	✓				✓			✓	✓	✓	✓
IR37MW01A	9608J882						✓				✓	✓				✓			✓	✓	✓	✓

Notes:

CHROM	CHROMIUM VI
CYAN	Cyanide
DIOXIN	Dioxins and Furans
O&G	Total oil and grease
PAH	Polynuclear aromatic hydrocarbons
PCTMST	Percent moisture
PEST	Pesticides/polychlorinated biphenyls
PHYS	Physical characteristic
SALIN	Salinity
SVOC	Semivolatile organic compounds
SOLIDS	Total dissolved solids
TOC	Total organic carbon
TMICROB	Coliform
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
VOC	Volatile organic compounds

TABLE 4.15-11

STATISTICAL SUMMARY OF MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-37
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection Frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Tap Water PRG Value	Above[e] PRG	MCL Value[f]	Above[g] MCL	NAWQC Value	Above[h] NAWQC
METAL	ALUMINUM	30.3	582	306	UG/L	16.6	3	2	37,000	0				
	ARSENIC	1.7	2.5	2.1	UG/L	1.4	3	2	0.04	2	50.0	0	36.0	0
	BARIUM	178	325	245	UG/L	2.0	3	3	2,600	0	1,000	0		
	CALCIUM	36,200	59,200	44,800	UG/L	16.7	3	3						
	COBALT	5.9	14.3	8.9	UG/L	0.50	3	3						
	IRON	91.9	1,370	728	UG/L	10.6	3	2						
	MAGNESIUM	202,000	343,000	254,000	UG/L	21.8	3	3						
	MANGANESE	1,070	2,160	1,500	UG/L	0.17	3	3	180	3				
	NICKEL	31.7	96.7	54.0	UG/L	0.93	3	3	730	0	100	0	8.2	3
	POTASSIUM	26,200	43,500	32,300	UG/L	370	3	3						
	SELENIUM	2.7	4.5	3.6	UG/L	2.3	3	2	180	0	50.0	0	71.0	0
	SODIUM	1,300,000	1,440,000	1,380,000	UG/L	121	3	3						
	THALLIUM	3.7	3.7	3.7	UG/L	2.0	3	1			2.0	1		
	VANADIUM	2.0	3.7	2.9	UG/L	0.57	3	3	260	0				
TPHEXT	TPH-DIESEL	52	52	52	UG/L	100	3	1	100	0i				
	TPH-MOTOR OIL	96	780	340	UG/L	100	3	3	100	2i				
TRPH	TRPH	1,300	1,300	1,300	UG/L	1,000	3	1	100	1i				

TABLE 4.15-11 (Continued)

STATISTICAL SUMMARY OF MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-37
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

CYAN	Cyanide
EPA	U.S. Environmental Protection Agency
MCL	Maximum contaminant level
NAWQC	National Ambient Water Quality Criteria
O&G	Total oil and grease
PCTMST	Percent moisture
PEST	Pesticide/polychlorinated biphenyl
PPT	Parts per thousand
PRG	Preliminary remediation goal
SALIN	Salinity
SVOC	Semivolatile organic compound
TMICROB	Coliform
TOC	Total organic carbon
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
UG/L	Microgram per liter
VOC	Volatile organic compound

a Organic results of less than 10 are reported to one significant figure, and results of greater than or equal to 10 are reported to two significant figures. Inorganic results of less than 10 are reported to two significant figures, and results of greater than or equal to 10 are reported to three significant figures. Values that are not nondetects are compared to screening criteria before the significant figure rule is applied. Both the value and the screening criteria are then rounded for reporting purposes.

b Blank boxes indicate that screening critera have not been established for these analytes.

c Total number of samples analyzed

d Total number of samples showing concentrations greater than detection limit

e Total number of samples showing concentrations greater than tap water PRG
California-modified PRGs were used for the following analytes: 1,2-Dibromo-3-chloropropane, benzo[a]pyrene, benzo[k]fluoranthene, cadmium, chromium VI, chrysene, lead, nickel, and tetrachloroethylene (PCE).
For the analytes listed below, Region IX PRGs are not available; therefore, PRGs for similar chemicals were used as follows:

Analyte:	Similar Analyte:
2-Methylnapthalene	Naphthalene
Acenaphthylene	Acenaphthene
Alpha-chlordane	Chlordane
Aroclor-1260	Polychlorinated biphenyls
Benzo(g,h,i)perylene	Naphthalene
Delta BHC	HCH-technical
Endosulfan I	Endosulfan
Endosulfan sulfate	Endosulfan
Endrin aldehyde	Endrin
Endrin ketone	Endrin
Gamma-chlordane	Chlordane
Phenanthrene	Naphthalene

f EPA Title 40 Code of Federal Regulations or California Code of Regulations Title 22 MCL used, whichever is more stringent

g Total number of samples showing concentrations greater than MCL

h Total number of samples showing concentrations greater than NAWQC;
NAWQC based on 4-day average study of saltwater aquatic life

i Total number of samples showing concentrations greater than TPH, TRPH, or O&G screening level, not PRG value

TABLE 4.15-12

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-37
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR37MW01A	IR37MW01A	IR37MW01A	IR37MW01A
Sample Number	9444X551	9444X552	9603W018	9608J882
Sample Date	11/01/94	11/01/94	01/19/96	02/21/96
Metal (ug/L)				
ALUMINUM	538	626	30.3	ND (23.4)
ARSENIC	ND (1.7)	ND (1.7)	1.7 *	2.5 *
BARIUM	338	313	231	178
CALCIUM	59,500	58,900	38,900	36,200
COBALT	14.2	14.5	5.9	6.4
IRON	1,300	1,430	91.9	ND (11.0)
MAGNESIUM	351,000	336,000	218,000	202,000
MANGANESE	2,170 *	2,140 *	1,270 *	1,070 *
NICKEL	94.3 B	99.0 B	31.7 B	33.5 B
POTASSIUM	42,200	44,800	26,200	27,300
SELENIUM	2.6	2.9	4.5	ND (2.3)
SODIUM	1,300,000	1,300,000	1,400,000	1,440,000
THALLIUM	3.5 B	3.9 B	ND (1.9)	ND (1.9)
VANADIUM	2.6	3.6	2.0	3.7
TPH-Extractable (ug/L)				
TPH-DIESEL	ND (100)	ND (100)	ND (100)	52
TPH-MOTOR OIL	460	1,100	96	150
Total Recoverable Petroleum Hydrocarbons (ug/L)				
TRPH	1,100	1,400	ND (1,000)	ND (1,000)
pH (pH units)				
PH	7.3	7.4	7.4	7.4

TABLE 4.15-12 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-37
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

NA	Not analyzed
ND()	Not detected (detection limit in parentheses)
µg/L	Microgram per liter
*	Detected concentration greater than U.S. Environmental Protection Agency Region IX preliminary remediation goals (PRG) for tap water
B	Detected concentration greater than National Ambient Water Quality Criteria (NAWQC) based on 4-day average study of saltwater aquatic life
δ	Detected concentration greater than maximum contaminant level (MCL) U.S. Environmental Protection Agency Title 40 Code of Federal Regulations or California Code of Regulations Title 22 MCL used, whichever is more stringent
▒	Detected concentration greater than at least one screening criterion.

TABLE 4.15-13

SUMMARY OF HYDROPUNCH GROUNDWATER ANALYTICAL TESTS - IR-37
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
IR09B045	9415C143			✓																		

Notes:

CHROM	CHROMIUM VI
CYAN	Cyanide
DIOXIN	Dioxins and Furans
O&G	Total oil and grease
PAH	Polynuclear aromatic hydrocarbons
PCTMST	Percent moisture
PEST	Pesticides/polychlorinated biphenyls
PHYS	Physical characteristic
SALIN	Salinity
SVOC	Semivolatile organic compounds
SOLIDS	Total dissolved solids
TOC	Total organic carbon
TMICROB	Coliform
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
VOC	Volatile organic compounds

TABLE 4.18-1

SUMMARY OF STORM DRAIN SEDIMENT ANALYTICAL TESTS - IR-44
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
PA44SW02	9309A635				√		√	√			√	√				√			√	√		√
PA44SW03	9309A636			√	√		√				√	√				√			√	√		√
PA50CB403	9309X926			√	√		√			√	√	√				√			√	√	√	√

Notes:

CHROM	CHROMIUM VI
CYAN	Cyanide
DIOXIN	Dioxins and Furans
O&G	Total oil and grease
PAH	Polynuclear aromatic hydrocarbons
PCTMST	Percent moisture
PEST	Pesticides/polychlorinated biphenyls
PHYS	Physical characteristic
SALIN	Salinity
SVOC	Semivolatile organic compounds
SOLIDS	Total dissolved solids
TOC	Total organic carbon
TMICROB	Coliform
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
VOC	Volatile organic compounds

TABLE 4.18-2

STATISTICAL SUMMARY OF STORM DRAIN SEDIMENT ANALYTICAL RESULTS - IR-44
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Residential PRG Value	Above[e] Res PRG	Industrial PRG Value	Above[f] Ind PRG	HPAL Value	Above[g] HPAL
METAL	ALUMINUM	3,180	11,500	6,580	MG/KG	3.9	3	3	76,700	0	100,000	0		
	ANTIMONY	6.5	6.5	6.5	MG/KG	3.6	3	1	30.7	0	681	0	9.05	0
	ARSENIC	3.9	26.5	12.4	MG/KG	1.4	3	3	0.32	3	2.0	3	11.10	1
	BARIUM	99.8	194	147	MG/KG	0.40	3	3	5,340	0	100,000	0	314.36	0
	BERYLLIUM	0.27	0.27	0.27	MG/KG	0.15	3	1	0.14	1	1.1	0	0.71	0
	CADMIUM	1.5	2.3	1.8	MG/KG	1.0	3	3	9.0	0	852	0	3.14	0
	CALCIUM	4,460	56,700	22,800	MG/KG	12.7	3	3						
	CHROMIUM	127	278	183	MG/KG	0.73	3	3	211	1	1,580	0	h	1
	COBALT	12.7	14.9	13.8	MG/KG	1.9	3	3					h	0
	COPPER	402	668	552	MG/KG	0.44	3	3	2,850	0	63,300	0	124.31	3
	IRON	23,300	54,800	40,000	MG/KG	2.4	3	3						
	LEAD	642	726	685	MG/KG	5.4	3	3	130	3	1,000	0	8.99	3
	MAGNESIUM	7,650	11,400	9,480	MG/KG	12.9	3	3						
	MANGANESE	304	427	375	MG/KG	0.27	3	3	382	2	8,300	0	1431.18	0
	MERCURY	0.08	0.75	0.32	MG/KG	0.06	3	3	23.0	0	511	0	2.28	0
	MOLYBDENUM	7.7	125	62.7	MG/KG	0.85	3	3	383	0	8,520	0	2.68	3
	NICKEL	61.7	174	121	MG/KG	7.0	3	3	150	1	34,100	0	h	0
	POTASSIUM	944	944	944	MG/KG	128	3	1						
	SODIUM	251	1,570	768	MG/KG	21.9	3	3						
	VANADIUM	13.9	49.5	27.4	MG/KG	0.66	3	3	537	0	11,900	0	117.17	0
	ZINC	712	1,560	1,200	MG/KG	0.62	3	3	23,000	0	100,000	0	109.86	3
CYAN	CYANIDE	260	260	260	UG/KG	110	3	1	1,300,000	0	13,600,000	0		

TABLE 4.18-2 (Continued)

STATISTICAL SUMMARY OF STORM DRAIN SEDIMENT ANALYTICAL RESULTS - IR-44
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Residential PRG Value	Above[e] Res PRG	Industrial PRG Value	Above[f] Ind PRG	HPAL Value	Above[g] HPAL
VOC	CARBON DISULFIDE	5	5	5	UG/KG	12	3	1	16,000	0	52,000	0		
	VINYL CHLORIDE	67	67	67	UG/KG	12	3	1	5	1	11	1		
SVOC	ACENAPHTHENE	120	120	120	UG/KG	820	3	1	360,000	0	360,000	0		
	ANTHRACENE	180	180	180	UG/KG	820	3	1	19,000	0	19,000	0		
	BENZO(A)ANTHRACENE	680	680	680	UG/KG	820	3	1	610	1	2,600	0		
	BENZO(A)PYRENE	520	520	520	UG/KG	820	3	1	61	1	260	1		
	BENZO(B)FLUORANTHENE	1,100	1,100	1,100	UG/KG	820	3	1	610	1	2,600	0		
	BENZO(G,H,I)PERYLENE	490	490	490	UG/KG	820	3	1	800,000	0	800,000	0		
	BENZO(K)FLUORANTHENE	310	310	310	UG/KG	820	3	1	610	0	26,000	0		
	CARBAZOLE	210	210	210	UG/KG	820	3	1	22,000	0	95,000	0		
	CHRYSENE	660	660	660	UG/KG	820	3	1	6,100	0	24,000	0		
	FLUORANTHENE	1,500	1,500	1,500	UG/KG	820	3	1	2,600,000	0	27,000,000	0		
	FLUORENE	100	100	100	UG/KG	820	3	1	300,000	0	300,000	0		
	PHENANTHRENE	840	840	840	UG/KG	820	3	1	800,000	0	800,000	0		
	PYRENE	1,100	1,100	1,100	UG/KG	820	3	1	2,000,000	0	20,000,000	0		
PEST	4,4'-DDD	1,200	1,200	1,200	UG/KG	200	2	1	1,900	0	7,900	0		
	AROCLOR-1242	160	160	160	UG/KG	43	2	1						
	AROCLOR-1254	45	84	65	UG/KG	42	2	2	1,400	0	19,000	0		
	AROCLOR-1260	93	2,300	870	UG/KG	690	3	3	66	3	340	1		
TPHPRG	TPH-PURGEABLE UNKNOWN HYDROCA.	4	4	4	MG/KG	1	2	1	100	0i				
TPHEXT	TPH-DIESEL	320	320	320	MG/KG	120	3	1	1,000	0i				
	TPH-EXTRACTABLE UNKNOWN HYDRO.	56	1,600	830	MG/KG	26	2	2	1,000	1i				

TABLE 4.18-2 (Continued)

STATISTICAL SUMMARY OF STORM DRAIN SEDIMENT ANALYTICAL RESULTS - IR-44
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Residential PRG Value	Above[e] Res PRG	Industrial PRG Value	Above[f] Ind PRG	HPAL Value	Above[g] HPAL
TRPH	TRPH	940	940	940	MG/KG	6	1	1	1,000	0i				
O&G	TOTAL OIL & GREASE	9,000	9,000	9,000	MG/KG	66	1	1	1,000	1i				

TABLE 4.18-2 (Continued)

STATISTICAL SUMMARY OF STORM DRAIN SEDIMENT ANALYTICAL RESULTS - IR-44
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

CYAN	Cyanide
EPA	U.S. Environmental Protection Agency
HPAL	Hunters Point ambient level
MG/KG	Milligram per kilogram
O&G	Total oil and grease
PCTMST	Percent moisture
PEST	Pesticide/polychlorinated biphenyl
PHYS	Physical characteristic
PRG	Preliminary remediation goal
SALIN	Salinity
SVOC	Semivolatile organic compound
TMICROB	Coliform
TOC	Total organic carbon
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
UG/KG	Microgram per kilogram
VOC	Volatile organic compound

a Organic results of less than 10 are reported to one significant figure, and results of greater than or equal to 10 are reported to two significant figures. Inorganic results of less than 10 are reported to two significant figures, and results of greater than or equal to 10 are reported to three significant figures. Values that are not nondetects are compared to screening criteria before the significant figure rule is applied. Both the value and the screening criteria are then rounded for reporting purposes.

b Blank boxes indicate that screening critera have not been established for these analytes.

c Total number of samples analyzed

d Total number of samples showing concentrations greater than detection limit

e Total number of samples showing concentrations greater than residential PRG

f Total number of samples showing concentrations greater than industrial PRG
California-modified PRGs were used for the following analytes: 1,2-Dibromo-3-chloropropane, benzo[a]pyrene, benzo[k]fluoranthene, cadmium, chromium VI, chrysene, lead, nickel, and tetrachloroethylene (PCE).
For the analytes listed below, Region IX PRGs are not available; therefore, PRGs for similar chemicals were used as follows:

Analyte:	Similar Analyte:
2-Methylnapthalene	Naphthalene
Acenaphthylene	Acenaphthene
Alpha-chlordane	Chlordane
Aroclor-1260	Polychlorinated biphenyls
Benzo(g,h,i)perylene	Naphthalene
Delta BHC	HCH-technical
Endosulfan I	Endosulfan
Endosulfan sulfate	Endosulfan
Endrin aldehyde	Endrin
Endrin ketone	Endrin
Gamma-chlordane	Chlordane
Phenanthrene	Naphthalene

g Total number of samples showing concentrations greater than HPAL

h HPALs for chromium, cobalt, and nickel are based on the concentration of magnesium in each sample; thus, no single value applies to all samples. The range of HPAL values for chromium, cobalt, and nickel are 160.697 to 211.311, 27.320 to 33.563, and 181.834 to 265.039 mg/kg respectively.

i Total number of samples showing concentrations greater than TPH, TRPH, or O&G screening level, not PRG value

TABLE 4.18-3

STORM DRAIN SEDIMENT ANALYTICAL RESULTS - IR-44
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	PA44SW02	PA44SW03	PA50CB403
Sampling Depth (feet bgs)	2.10	2.10	2.10
Sample Number	9309A635	9309A636	9309X926
Sample Date	03/01/93	03/01/93	03/05/93
Metal (mg/kg)			
ALUMINUM	5,060	3,180	11,500
ANTIMONY	ND (7.7)	ND (7.3)	6.5
ARSENIC	6.8 *#	26.5 *#α	3.9 *#
BARIUM	146	194	99.8
BERYLLIUM	ND (0.18)	ND (0.17)	0.27 *
CADMIUM	2.3	1.5	1.5
CALCIUM	4,460	56,700	7,290
CHROMIUM	278 *α	144	127
COBALT	12.7	13.8	14.9
COPPER	668 α	585 α	402 α
IRON	54,800	41,800	23,300
LEAD	642 *α	726 *α	688 *α
MAGNESIUM	9,420	7,650	11,400
MANGANESE	427 *	394 *	304
MERCURY	0.13	0.08	0.75
MOLYBDENUM	55.3 α	125 α	7.7 α
NICKEL	174 *	61.7	128
POTASSIUM	ND (750)	ND (570)	944
SODIUM	487	251	1,570
VANADIUM	18.9	13.9	49.5
ZINC	1,560 α	1,330 α	712 α
Cyanide (ug/kg)			
CYANIDE	ND (660)	ND (620)	260
Volatile Organic Compound (ug/kg)			
CARBON DISULFIDE	ND (66)	ND (12)	5
VINYL CHLORIDE	ND (66)	ND (12)	67 *#
Semivolatile Organic Compound (ug/kg)			
ACENAPHTHENE	ND (8,700)	120	ND (120,000)
ANTHRACENE	ND (8,700)	180	ND (120,000)
BENZO(A)ANTHRACENE	ND (8,700)	680 *	ND (120,000)
BENZO(A)PYRENE	ND (8,700)	520 *#	ND (120,000)
BENZO(B)FLUORANTHENE	ND (8,700)	1,100 *	ND (120,000)

TABLE 4.18-3 (Continued)

STORM DRAIN SEDIMENT ANALYTICAL RESULTS - IR-44
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	PA44SW02	PA44SW03	PA50CB403
Sampling Depth (feet bgs)	2.10	2.10	2.10
Sample Number	9309A635	9309A636	9309X926
Sample Date	03/01/93	03/01/93	03/05/93
Semivolatile Organic Compound (ug/kg)			
BENZO(G,H,I)PERYLENE	ND (8,700)	490	ND (120,000)
BENZO(K)FLUORANTHENE	ND (8,700)	310	ND (120,000)
CARBAZOLE	ND (8,700)	210	ND (120,000)
CHRYSENE	ND (8,700)	660	ND (120,000)
FLUORANTHENE	ND (8,700)	1,500	ND (120,000)
FLUORENE	ND (8,700)	100	ND (120,000)
PHENANTHRENE	ND (8,700)	840	ND (120,000)
PYRENE	ND (8,700)	1,100	ND (120,000)
Pesticide/Polychlorinated Biphenyl (ug/kg)			
4,4'-DDD	NA	ND (4)	1,200
AROCLOR-1242	160	ND (41)	NA
AROCLOR-1254	45	84	NA
AROCLOR-1260	93 *	210 *	2,300 *#
TPH-Purgeable (mg/kg)			
TPH-PURGEABLE UNKNOWN HYDROCARBON	4	ND (1)	NA
TPH-Extractable (mg/kg)			
TPH-DIESEL	ND (40)	ND (12)	320
TPH-EXTRACTABLE UNKNOWN HYDROCARBON	1,600	56	NA
Total Recoverable Petroleum Hydrocarbons (mg/kg)			
TRPH	NA	NA	940
Oil and Grease (mg/kg)			
TOTAL OIL & GREASE	9,000	NA	NA
Percent Moisture (%)			
% SOLIDS	NA	NA	82.7
pH (pH units)			
PH	7.2	8.3	8.2

TABLE 4.18-3 (Continued)

STORM DRAIN SEDIMENT ANALYTICAL RESULTS - IR-44
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

%	Percent
bgs	Below ground surface
mg/kg	Milligram per kilogram
NA	Not analyzed
ND()	Not detected (detection limit in parentheses)
µg/kg	Microgram per kilogram
*	Detected concentration greater than U.S. Environmental Protection Agency Region IX preliminary remediation goals (PRG) for residential use
#	Detected concentration greater than U.S. Environmental Protection Agency Region IX PRG for industrial use
α	Detected concentration greater than the Hunters Point ambient level.
▒	Detected concentration greater than at least one screening criterion.

TABLE 4.18-4

SUMMARY OF OTHER SEDIMENT ANALYTICAL TESTS - IR-44
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
PA44SB01	9309A634				√		√					√				√						
PA44SB01	9309A634C			√																		
PA44SB04	9309A637			√	√		√					√				√						

Notes:

CHROM	CHROMIUM VI
CYAN	Cyanide
DIOXIN	Dioxins and Furans
O&G	Total oil and grease
PAH	Polynuclear aromatic hydrocarbons
PCTMST	Percent moisture
PEST	Pesticides/polychlorinated biphenyls
PHYS	Physical characteristic
SALIN	Salinity
SVOC	Semivolatile organic compounds
SOLIDS	Total dissolved solids
TOC	Total organic carbon
TMICROB	Coliform
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
VOC	Volatile organic compounds

TABLE 4.18-5

STATISTICAL SUMMARY OF OTHER SEDIMENT ANALYTICAL RESULTS - IR-44
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Residential PRG Value	Above[e] Res PRG	Industrial PRG Value	Above[f] Ind PRG	HPAL Value	Above[g] HPAL
METAL	ALUMINUM	1,670	3,180	2,430	MG/KG	3.2	2	2	76,700	0	100,000	0		
	ARSENIC	11.1	13.1	12.1	MG/KG	1.1	2	2	0.32	2	2.0	2	11.10	1
	BARIUM	87.7	217	152	MG/KG	0.21	2	2	5,340	0	100,000	0	314.36	0
	CALCIUM	1,440	5,220	3,330	MG/KG	9.9	2	2						
	CHROMIUM	79.3	199	139	MG/KG	0.71	2	2	211	0	1,580	0	h	2
	COBALT	8.8	11.2	10.0	MG/KG	2.0	2	2					h	0
	COPPER	351	1,050	701	MG/KG	0.53	2	2	2,850	0	63,300	0	124.31	2
	IRON	32,000	76,600	54,300	MG/KG	1.3	2	2						
	LEAD	187	340	264	MG/KG	5.4	2	2	130	2	1,000	0	8.99	2
	MAGNESIUM	1,640	8,210	4,930	MG/KG	6.8	2	2						
	MANGANESE	264	369	317	MG/KG	0.26	2	2	382	0	8,300	0	1431.18	0
	MERCURY	0.81	0.81	0.81	MG/KG	0.05	2	1	23.0	0	511	0	2.28	0
	MOLYBDENUM	9.1	106	57.6	MG/KG	0.80	2	2	383	0	8,520	0	2.68	2
	NICKEL	104	161	133	MG/KG	8.1	2	2	150	1	34,100	0	h	1
	SILVER	0.47	0.56	0.52	MG/KG	0.44	2	2	383	0	8,520	0	1.43	0
	SODIUM	140	536	338	MG/KG	15.5	2	2						
	VANADIUM	6.0	10.8	8.4	MG/KG	0.50	2	2	537	0	11,900	0	117.17	0
	ZINC	857	3,210	2,030	MG/KG	0.63	2	2	23,000	0	100,000	0	109.86	2
SVOC	BENZO(A)ANTHRACENE	43	110	77	UG/KG	350	2	2	610	0	2,600	0		
	BENZO(A)PYRENE	47	97	72	UG/KG	350	2	2	61	1	260	0		
	BENZO(B)FLUORANTHENE	98	220	160	UG/KG	350	2	2	610	0	2,600	0		
	BENZO(G,H,I)PERYLENE	44	96	70	UG/KG	350	2	2	800,000	0	800,000	0		

TABLE 4.18-5 (Continued)

STATISTICAL SUMMARY OF OTHER SEDIMENT ANALYTICAL RESULTS - IR-44
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Residential PRG Value	Above[e] Res PRG	Industrial PRG Value	Above[f] Ind PRG	HPAL Value	Above[g] HPAL
	BENZO(K)FLUORANTHENE	60	60	60	UG/KG	340	2	1	610	0	26,000	0		
	CARBAZOLE	50	50	50	UG/KG	340	2	1	22,000	0	95,000	0		
	CHRYSENE	73	130	100	UG/KG	350	2	2	6,100	0	24,000	0		
	FLUORANTHENE	140	260	200	UG/KG	350	2	2	2,600,000	0	27,000,000	0		
	INDENO(1,2,3-CD)PYRENE	52	120	86	UG/KG	350	2	2	610	0	2,600	0		
	ISOPHORONE	58	58	58	UG/KG	340	2	1	470,000	0	2,000,000	0		
	PHENANTHRENE	83	220	150	UG/KG	350	2	2	800,000	0	800,000	0		
	PHENOL	500	500	500	UG/KG	340	2	1	39,000,000	0	100,000,00	0		
	PYRENE	100	170	140	UG/KG	350	2	2	2,000,000	0	20,000,000	0		

TABLE 4.18-5 (Continued)

STATISTICAL SUMMARY OF OTHER SEDIMENT ANALYTICAL RESULTS - IR-44
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

CYAN	Cyanide
EPA	U.S. Environmental Protection Agency
HPAL	Hunters Point ambient level
MG/KG	Milligram per kilogram
O&G	Total oil and grease
PCTMST	Percent moisture
PEST	Pesticide/polychlorinated biphenyl
PHYS	Physical characteristic
PRG	Preliminary remediation goal
SALIN	Salinity
SVOC	Semivolatile organic compound
TMICROB	Coliform
TOC	Total organic carbon
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
UG/KG	Microgram per kilogram
VOC	Volatile organic compound

a Organic results of less than 10 are reported to one significant figure, and results of greater than or equal to 10 are reported to two significant figures. Inorganic results of less than 10 are reported to two significant figures, and results of greater than or equal to 10 are reported to three significant figures. Values that are not nondetects are compared to screening criteria before the significant figure rule is applied. Both the value and the screening criteria are then rounded for reporting purposes.

b Blank boxes indicate that screening critera have not been established for these analytes.

c Total number of samples analyzed

d Total number of samples showing concentrations greater than detection limit

e Total number of samples showing concentrations greater than residential PRG

f Total number of samples showing concentrations greater than industrial PRG
California-modified PRGs were used for the following analytes: 1,2-Dibromo-3-chloropropane, benzo[a]pyrene, benzo[k]fluoranthene, cadmium, chromium VI, chrysene, lead, nickel, and tetrachloroethylene (PCE).
For the analytes listed below, Region IX PRGs are not available; therefore, PRGs for similar chemicals were used as follows:

Analyte:	Similar Analyte:
2-Methylnapthalene	Naphthalene
Acenaphthylene	Acenaphthene
Alpha-chlordane	Chlordane
Aroclor-1260	Polychlorinated biphenyls
Benzo(g,h,i)perylene	Naphthalene
Delta BHC	HCH-technical
Endosulfan I	Endosulfan
Endosulfan sulfate	Endosulfan
Endrin aldehyde	Endrin
Endrin ketone	Endrin
Gamma-chlordane	Chlordane
Phenanthrene	Naphthalene

g Total number of samples showing concentrations greater than HPAL

h HPALs for chromium, cobalt, and nickel are based on the concentration of magnesium in each sample; thus, no single value applies to all samples. The range of HPAL values for chromium, cobalt, and nickel are 55.617 to 168.715, 12.305 to 28.338, and 42.223 to 194.433 mg/kg respectively.

i Total number of samples showing concentrations greater than TPH, TRPH, or O&G screening level, not PRG value

TABLE 4.18-6

OTHER SEDIMENT ANALYTICAL RESULTS - IR-44
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	PA44SB01	PA44SB04
Sampling Depth (feet bgs)	0.00	0.00
Sample Number	9309A634	9309A637
Sample Date	03/01/93	03/01/93
Metal (mg/kg)		
ALUMINUM	3,180	1,670
ARSENIC	11.1 *#	13.1 *#α
BARIUM	217	87.7
CALCIUM	5,220	1,440
CHROMIUM	199 α	79.3 α
COBALT	11.2	8.8
COPPER	1,050 α	351 α
IRON	32,000	76,600
LEAD	340 *α	187 *α
MAGNESIUM	8,210	1,640
MANGANESE	264	369
MERCURY	0.81	ND (0.05)
MOLYBDENUM	106 α	9.1 α
NICKEL	161 *	104 α
SILVER	0.47	0.56
SODIUM	536	140
VANADIUM	10.8	6.0
ZINC	857 α	3,210 α
Semivolatile Organic Compound (ug/kg)		
BENZO(A)ANTHRACENE	110	43
BENZO(A)PYRENE	97 *	47
BENZO(B)FLUORANTHENE	220	98
BENZO(G,H,I)PERYLENE	96	44
BENZO(K)FLUORANTHENE	60	ND (350)
CARBAZOLE	50	ND (350)
CHRYSENE	130	73
FLUORANTHENE	260	140
INDENO(1,2,3-CD)PYRENE	120	52
ISOPHORONE	58	ND (350)
PHENANTHRENE	220	83
PHENOL	500	ND (350)
PYRENE	170	100

TABLE 4.18-6 (Continued)

OTHER SEDIMENT ANALYTICAL RESULTS - IR-44
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	PA44SB01	PA44SB04
Sampling Depth (feet bgs)	0.00	0.00
Sample Number	9309A634	9309A637
Sample Date	03/01/93	03/01/93
pH (pH units)		
PH	7.9	7.9

Notes:

bgs Below ground surface
mg/kg Milligram per kilogram
NA Not analyzed
ND() Not detected (detection limit in parentheses)
µg/kg Microgram per kilogram

* Detected concentration greater than U.S. Environmental Protection Agency Region IX preliminary remediation goals (PRG) for residential use
\# Detected concentration greater than U.S. Environmental Protection Agency Region IX PRG for industrial use
α Detected concentration greater than the Hunters Point ambient level.

▒ Detected concentration greater than at least one screening criterion.

TABLE 4.18-7

SUMMARY OF SOIL ANALYTICAL TESTS - IR-44
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
IR44B006	9533C090						√			√	√	√				√			√	√	√	√
IR44B006	9533C091						√			√	√	√				√			√	√	√	√
IR44B006	9533C094						√			√	√	√				√			√	√	√	√
IR44B006	9533C095						√			√	√	√				√			√	√	√	√
IR44B006	9533C096						√			√	√	√				√			√	√	√	√
IR44B006	9533C098												√					√				
IR44B006	9533C100						√			√	√	√				√			√	√	√	
IR44B006	9533S095												√					√				
IR44B007	9545J577						√			√	√	√				√			√	√	√	
IR44B007	9545J578						√			√	√	√				√			√	√	√	√
IR44B007	9545J579						√			√	√	√				√			√	√	√	√
IR44B009	9605G041						√			√	√	√				√			√	√	√	
IR44B009	9605G042						√			√	√	√				√			√	√	√	√
IR44B009	9605G043						√			√	√	√				√			√	√	√	√
IR44MW08A	9538J256						√			√	√	√				√			√	√	√	
IR44MW08A	9538J257						√			√	√	√				√			√	√	√	√
IR44MW08A	9538J259						√			√	√	√				√			√	√	√	√
IR44MW08A	9538J260						√			√	√	√				√			√	√	√	√
IR50B020	9421R185						√				√	√				√			√	√	√	√
IR50B020	9421R186						√				√	√				√			√	√	√	√
IR50B020	9421R187						√				√	√				√			√	√	√	√
IR50B020	9421R188						√				√	√				√			√	√	√	√
IR50B021	9423R253						√			√	√	√				√			√	√		√
IR50B021	9423R254						√			√	√	√				√			√	√	√	√
IR50B021	9423R255						√			√	√	√				√			√	√	√	√
IR50B021	9423R256						√			√	√	√				√			√	√	√	√
PA44B005	9310A691						√	√		√	√	√				√			√	√		√

TABLE 4.18-7 (Continued)

SUMMARY OF SOIL ANALYTICAL TESTS - IR-44
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

CHROM	CHROMIUM VI
CYAN	Cyanide
DIOXIN	Dioxins and Furans
O&G	Total oil and grease
PAH	Polynuclear aromatic hydrocarbons
PCTMST	Percent moisture
PEST	Pesticides/polychlorinated biphenyls
PHYS	Physical characteristic
SALIN	Salinity
SVOC	Semivolatile organic compounds
SOLIDS	Total dissolved solids
TOC	Total organic carbon
TMICROB	Coliform
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
VOC	Volatile organic compounds

TABLE 4.18-8

STATISTICAL SUMMARY OF SOIL ANALYTICAL RESULTS - IR-44
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Residential PRG Value	Above[e] Res PRG	Industrial PRG Value	Above[f] Ind PRG	HPAL Value	Above[g] HPAL
METAL	ALUMINUM	3,950	34,300	18,500	MG/KG	3.9	25	25	76,700	0	100,000	0		
	ANTIMONY	0.86	2.8	1.5	MG/KG	0.69	25	7	30.7	0	681	0	9.05	0
	ARSENIC	1.5	36.7	6.8	MG/KG	0.47	25	15	0.32	15	2.0	10	11.10	2
	BARIUM	11.8	499	102	MG/KG	0.44	25	25	5,340	0	100,000	0	314.36	1
	BERYLLIUM	0.25	0.69	0.37	MG/KG	0.10	25	8	0.14	8	1.1	0	0.71	0
	CADMIUM	0.04	0.53	0.29	MG/KG	0.07	25	2	9.0	0	852	0	3.14	0
	CALCIUM	3,640	243,000	54,000	MG/KG	7.0	25	24						
	CHROMIUM	12.8	304	85.4	MG/KG	0.32	25	25	211	1	1,580	0	h	0
	COBALT	4.0	65.3	21.2	MG/KG	0.22	25	25					h	1
	COPPER	9.2	117	44.7	MG/KG	0.21	25	25	2,850	0	63,300	0	124.31	0
	IRON	8,970	56,800	27,500	MG/KG	4.1	25	25						
	LEAD	2.1	27.5	9.2	MG/KG	0.45	25	24	130	0	1,000	0	8.99	9
	MAGNESIUM	3,000	127,000	20,900	MG/KG	6.3	25	25						
	MANGANESE	124	2,790	664	MG/KG	0.12	25	25	382	15	8,300	0	1431.18	2
	MERCURY	0.06	0.40	0.17	MG/KG	0.06	25	12	23.0	0	511	0	2.28	0
	MOLYBDENUM	0.53	2.1	1.5	MG/KG	1.3	25	3	383	0	8,520	0	2.68	0
	NICKEL	16.5	853	95.0	MG/KG	0.68	25	25	150	3	34,100	0	h	0
	POTASSIUM	833	3,580	1,580	MG/KG	33.6	25	24						
	SELENIUM	0.98	3.7	2.3	MG/KG	0.51	25	4	383	0	8,520	0	1.95	2
	SODIUM	26.7	8,570	3,280	MG/KG	30.4	25	20						
	THALLIUM	0.49	1.4	0.85	MG/KG	0.45	25	3					0.81	1
	VANADIUM	17.0	162	64.9	MG/KG	0.27	25	25	537	0	11,900	0	117.17	1

TABLE 4.18-8 (Continued)

STATISTICAL SUMMARY OF SOIL ANALYTICAL RESULTS - IR-44
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Residential PRG Value	Above[e] Res PRG	Industrial PRG Value	Above[f] Ind PRG	HPAL Value	Above[g] HPAL
	ZINC	24.4	121	66.2	MG/KG	0.40	25	25	23,000	0	100,000	0	109.86	2
VOC	ACETONE	83	120	100	UG/KG	13	21	2	2,000,000	0	8,400,000	0		
	CARBON DISULFIDE	2	7	5	UG/KG	12	21	4	16,000	0	52,000	0		
	TETRACHLOROETHENE	3	3	3	UG/KG	11	21	1	7,000	0	25,000	0		
SVOC	ANTHRACENE	34	54	41	UG/KG	490	25	3	19,000	0	19,000	0		
	BENZO(A)ANTHRACENE	130	340	220	UG/KG	490	24	3	610	0	2,600	0		
	BENZO(A)PYRENE	240	1,200	570	UG/KG	490	24	4	61	4	260	3		
	BENZO(B)FLUORANTHENE	290	760	490	UG/KG	490	24	3	610	1	2,600	0		
	BENZO(G,H,I)PERYLENE	240	1,200	670	UG/KG	490	24	3	800,000	0	800,000	0		
	BENZO(K)FLUORANTHENE	99	570	290	UG/KG	490	24	4	610	0	26,000	0		
	CHRYSENE	160	430	280	UG/KG	490	24	3	6,100	0	24,000	0		
	FLUORANTHENE	210	930	430	UG/KG	480	25	5	2,600,000	0	27,000,000	0		
	INDENO(1,2,3-CD)PYRENE	200	900	500	UG/KG	490	24	3	610	1	2,600	0		
	PHENANTHRENE	110	250	170	UG/KG	490	25	3	800,000	0	800,000	0		
	PYRENE	330	1,400	660	UG/KG	480	24	5	2,000,000	0	20,000,000	0		
PEST	4,4'-DDT	4	4	4	UG/KG	4	25	1	1,300	0	5,600	0		
	AROCLOR-1260	15	15	15	UG/KG	35	25	1	66	0	340	0		
TPHEXT	TPH-DIESEL	7	740	100	MG/KG	75	25	12	1,000	0i				
	TPH-EXTRACTABLE UNKNOWN HYDRO.	13	370	150	MG/KG	1	4	4	1,000	0i				
	TPH-MOTOR OIL	6	6,500	590	MG/KG	57	24	17	1,000	2i				
TRPH	TRPH	6	10,000	1,200	MG/KG	54	23	13	1,000	3i				
O&G	TOTAL OIL & GREASE	3,000	3,000	3,000	MG/KG	28	1	1	1,000	1i				

TABLE 4.18-8 (Continued)

STATISTICAL SUMMARY OF SOIL ANALYTICAL RESULTS - IR-44
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Residential PRG Value	Above[e] Res PRG	Industrial PRG Value	Above[f] Ind PRG	HPAL Value	Above[g] HPAL
PHYS	DRY BULK DENSITY	85	120	100	%	0	2	2						
	GRAIN SIZE ANALYSIS - %CLAY	29	29	29	%	0	2	2						
	GRAIN SIZE ANALYSIS - %COBBLE.	0	0	0	%	0	2	2						
	GRAIN SIZE ANALYSIS - %GRAVEL	3	3	3	%	0	2	2						
	GRAIN SIZE ANALYSIS - %SAND	50	50	50	%	0	2	2						
	GRAIN SIZE ANALYSIS - %SILT	18	18	18	%	0	2	2						
	MOISTURE CONTENT	17	36	26	%	0	2	2						
	POROSITY	32	50	41	%	0	2	2						
	WET BULK DENSITY	120	140	130	%	0	2	2						
TOC	TOTAL ORGANIC CARBON	29,000,000	29,000,000	29,000,000	UG/KG	100,000	2	1						

TABLE 4.18-8 (Continued)

STATISTICAL SUMMARY OF SOIL ANALYTICAL RESULTS - IR-44
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

CYAN	Cyanide
EPA	U.S. Environmental Protection Agency
HPAL	Hunters Point ambient level
MG/KG	Milligram per kilogram
O&G	Total oil and grease
PCTMST	Percent moisture
PEST	Pesticide/polychlorinated biphenyl
PHYS	Physical characteristic
PRG	Preliminary remediation goal
SALIN	Salinity
SVOC	Semivolatile organic compound
TMICROB	Coliform
TOC	Total organic carbon
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
UG/KG	Microgram per kilogram
VOC	Volatile organic compound

a Organic results of less than 10 are reported to one significant figure, and results of greater than or equal to 10 are reported to two significant figures. Inorganic results of less than 10 are reported to two significant figures, and results of greater than or equal to 10 are reported to three significant figures. Values that are not nondetects are compared to screening criteria before the significant figure rule is applied. Both the value and the screening criteria are then rounded for reporting purposes.

b Blank boxes indicate that screening critera have not been established for these analytes.

c Total number of samples analyzed

d Total number of samples showing concentrations greater than detection limit

e Total number of samples showing concentrations greater than residential PRG

f Total number of samples showing concentrations greater than industrial PRG
California-modified PRGs were used for the following analytes: 1,2-Dibromo-3-chloropropane, benzo[a]pyrene, benzo[k]fluoranthene, cadmium, chromium VI, chrysene, lead, nickel, and tetrachloroethylene (PCE).
For the analytes listed below, Region IX PRGs are not available; therefore, PRGs for similar chemicals were used as follows:

Analyte:	Similar Analyte:
2-Methylnapthalene	Naphthalene
Acenaphthylene	Acenaphthene
Alpha-chlordane	Chlordane
Aroclor-1260	Polychlorinated biphenyls
Benzo(g,h,i)perylene	Naphthalene
Delta BHC	HCH-technical
Endosulfan I	Endosulfan
Endosulfan sulfate	Endosulfan
Endrin aldehyde	Endrin
Endrin ketone	Endrin
Gamma-chlordane	Chlordane
Phenanthrene	Naphthalene

g Total number of samples showing concentrations greater than HPAL

h HPALs for chromium, cobalt, and nickel are based on the concentration of magnesium in each sample; thus, no single value applies to all samples. The range of HPAL values for chromium, cobalt, and nickel are 84.312 to 1114.669, 16.823 to 117.149, and 74.851 to 2612.582 mg/kg respectively.

i Total number of samples showing concentrations greater than TPH, TRPH, or O&G screening level, not PRG value

TABLE 4.18-9

SOIL ANALYTICAL RESULTS - IR-44
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR44B006	IR44B006	IR44B006	IR44B006	IR44B006	IR44B006	IR44B006
Sampling Depth (feet bgs)	6.25	10.25	16.25	21.25	26.25	36.25	0.75
Sample Number	9533C090	9533C091	9533C094	9533C095	9533C096	9533C098	9533C100
Sample Date	08/14/95	08/14/95	08/14/95	08/14/95	08/14/95	08/14/95	08/14/95
Metal (mg/kg)							
ALUMINUM	21,500	27,400	22,900	4,360	5,810	NA	14,900
ANTIMONY	ND (1.9)	ND (1.8)	ND (2.3)	ND (0.81)	ND (0.50)	NA	ND (0.87)
ARSENIC	ND (3.8)	ND (0.88)	ND (2.2)	ND (3.4)	ND (2.8)	NA	7.0 *#
BARIUM	240	64.6	68.2	11.8	15.9	NA	44.2
BERYLLIUM	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	NA	0.34 *
CADMIUM	0.04	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	NA	ND (0.04)
CALCIUM	15,100	15,600	16,100	11,400	12,600	NA	3,640
CHROMIUM	97.2	98.3	115	35.5	37.1	NA	34.6
COBALT	21.6	22.7	21.2	7.2	7.6	NA	11.5
COPPER	32.7	57.2	42.8	10.8	9.2	NA	16.1
IRON	30,700	37,700	29,800	9,270	10,100	NA	27,400
LEAD	10.0 α	2.1	3.7	2.6	2.1	NA	10.2 α
MAGNESIUM	19,600	18,700	17,200	3,900	4,380	NA	9,500
MANGANESE	698 *	362	422 *	127	150	NA	715 *
MERCURY	ND (0.05)	ND (0.06)	ND (0.06)	ND (0.06)	ND (0.06)	NA	ND (0.05)
MOLYBDENUM	ND (1.2)	ND (0.22)	ND (0.37)	ND (0.21)	ND (0.22)	NA	ND (0.33)
NICKEL	100	46.6	60.6	34.5	31.9	NA	34.5
POTASSIUM	1,780	2,330	2,030	1,090	1,010	NA	1,450
SELENIUM	ND (0.71)	ND (0.81)	ND (0.78)	ND (0.79)	ND (0.82)	NA	ND (0.71)
SODIUM	26.7	6,600	4,990	1,980	2,300	NA	ND (47.3)
THALLIUM	0.49	1.4 α	0.65	ND (0.46)	ND (0.48)	NA	ND (0.42)
VANADIUM	69.8	113	87.3	23.6	28.0	NA	42.3
ZINC	73.0	85.4	64.6	24.4	27.1	NA	68.6
Volatile Organic Compound (ug/kg)							
ACETONE	ND (13)	ND (12)	ND (11)	ND (18)	ND (23)	NA	NA
CARBON DISULFIDE	ND (10)	ND (12)	ND (11)	ND (12)	ND (12)	NA	NA
TETRACHLOROETHENE	ND (10)	ND (12)	ND (11)	ND (12)	ND (12)	NA	NA
Semivolatile Organic Compound (ug/kg)							
ANTHRACENE	ND (350)	ND (400)	ND (380)	ND (390)	ND (400)	NA	ND (350)
BENZO(A)ANTHRACENE	ND (350)	ND (400)	ND (380)	ND (390)	ND (400)	NA	ND (350)
BENZO(A)PYRENE	ND (350)	ND (400)	ND (380)	ND (390)	ND (400)	NA	ND (350)
BENZO(B)FLUORANTHENE	ND (350)	ND (400)	ND (380)	ND (390)	ND (400)	NA	ND (350)
BENZO(G,H,I)PERYLENE	ND (350)	ND (400)	ND (380)	ND (390)	ND (400)	NA	ND (350)
BENZO(K)FLUORANTHENE	ND (350)	ND (400)	ND (380)	ND (390)	ND (400)	NA	ND (350)

TABLE 4.18-9 (Continued)

SOIL ANALYTICAL RESULTS - IR-44
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR44B006	IR44B006	IR44B006	IR44B006	IR44B006	IR44B006	IR44B006
Sampling Depth (feet bgs)	6.25	10.25	16.25	21.25	26.25	36.25	0.75
Sample Number	9533C090	9533C091	9533C094	9533C095	9533C096	9533C098	9533C100
Sample Date	08/14/95	08/14/95	08/14/95	08/14/95	08/14/95	08/14/95	08/14/95
Semivolatile Organic Compound (ug/kg)							
CHRYSENE	ND (350)	ND (400)	ND (380)	ND (390)	ND (400)	NA	ND (350)
FLUORANTHENE	ND (350)	ND (400)	ND (380)	ND (390)	ND (400)	NA	ND (350)
INDENO(1,2,3-CD)PYRENE	ND (350)	ND (400)	ND (380)	ND (390)	ND (400)	NA	ND (350)
PHENANTHRENE	ND (350)	ND (400)	ND (380)	ND (390)	ND (400)	NA	ND (350)
PYRENE	ND (350)	ND (400)	ND (380)	ND (390)	ND (400)	NA	ND (350)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
4,4'-DDT	ND (17)	ND (4)	ND (4)	ND (4)	ND (20)	NA	ND (17)
AROCLOR-1260	ND (170)	ND (40)	ND (38)	ND (39)	ND (200)	NA	ND (170)
TPH-Extractable (mg/kg)							
TPH-DIESEL	63	ND (12)	11	8	7	NA	140
TPH-EXTRACTABLE UNKNOWN HYDROCARBON	NA	NA	NA	NA	NA	NA	NA
TPH-MOTOR OIL	450	6	65	22	19	NA	920
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	690	ND (12)	150	ND (12)	ND (12)	NA	2,100
Oil and Grease (mg/kg)							
TOTAL OIL & GREASE	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	95.7	83.6	86.7	86.1	83.4	NA	96.2
pH (pH units)							
PH	8.9	7.6	8.5	8.7	8.5	NA	8.5
Physical Characteristic (%)							
DRY BULK DENSITY	NA	NA	NA	NA	NA	120	NA
GRAIN SIZE ANALYSIS - %CLAY	NA	NA	NA	NA	NA	29	NA
GRAIN SIZE ANALYSIS - %COBBLES	NA	NA	NA	NA	NA		NA
GRAIN SIZE ANALYSIS - %GRAVEL	NA	NA	NA	NA	NA	3	NA
GRAIN SIZE ANALYSIS - %SAND	NA	NA	NA	NA	NA	50	NA
GRAIN SIZE ANALYSIS - %SILT	NA	NA	NA	NA	NA	18	NA
MOISTURE CONTENT	NA	NA	NA	NA	NA	17	NA

TABLE 4.18-9 (Continued)

SOIL ANALYTICAL RESULTS - IR-44
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR44B006	IR44B006	IR44B006	IR44B006	IR44B006	IR44B006	IR44B006
Sampling Depth (feet bgs)	6.25	10.25	16.25	21.25	26.25	36.25	0.75
Sample Number	9533C090	9533C091	9533C094	9533C095	9533C096	9533C098	9533C100
Sample Date	08/14/95	08/14/95	08/14/95	08/14/95	08/14/95	08/14/95	08/14/95
Physical Characteristic (%)							
POROSITY	NA	NA	NA	NA	NA	32	NA
WET BULK DENSITY	NA	NA	NA	NA	NA	140	NA
Total Organic Carbon (ug/kg)							
TOTAL ORGANIC CARBON	NA	NA	NA	NA	NA	29,000,000	NA

TABLE 4.18-9 (Continued)

SOIL ANALYTICAL RESULTS - IR-44
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR44B006	IR44B007	IR44B007	IR44B007	IR44B009	IR44B009	IR44B009
Sampling Depth (feet bgs)	20.75	0.75	5.50	8.75	1.50	4.50	8.75
Sample Number	9533S095	9545J577	9545J578	9545J579	9605G041	9605G042	9605G043
Sample Date	08/14/95	11/06/95	11/06/95	11/06/95	01/30/96	01/30/96	01/30/96
Metal (mg/kg)							
ALUMINUM	NA	24,500	30,800	27,300	14,200	32,400	34,300
ANTIMONY	NA	1.1	2.8	0.86	ND (0.54)	ND (1.3)	2.2
ARSENIC	NA	1.9 *	ND (0.59)	ND (0.65)	2.2 *#	ND (0.29)	1.5 *
BARIUM	NA	206	114	54.8	65.1	96.9	46.0
BERYLLIUM	NA	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)
CADMIUM	NA	ND (0.05)	ND (0.04)	ND (0.05)	ND (0.04)	ND (0.04)	ND (0.05)
CALCIUM	NA	18,200	20,000	16,400	9,440	35,900	18,300
CHROMIUM	NA	114	150	97.9	20.1	104	166
COBALT	NA	39.9	36.2	30.6	11.0	30.3	36.9
COPPER	NA	69.8	76.5	63.9	53.2	57.8	117
IRON	NA	38,400	44,700	37,200	19,200	37,500	56,800
LEAD	NA	10.4 α	6.0	2.9	6.0	ND (0.79)	6.0
MAGNESIUM	NA	23,300	32,400	24,200	8,400	35,100	36,500
MANGANESE	NA	1,520 *α	1,130 *	859 *	428 *	730 *	785 *
MERCURY	NA	ND (0.06)	ND (0.06)	ND (0.07)	ND (0.05)	ND (0.05)	ND (0.06)
MOLYBDENUM	NA	ND (0.27)	ND (0.25)	ND (0.28)	ND (0.13)	ND (0.26)	ND (0.14)
NICKEL	NA	110	94.9	50.6	34.2	54.6	45.8
POTASSIUM	NA	973	1,600	1,160	1,370	1,030	1,300
SELENIUM	NA	ND (0.89)	ND (0.83)	ND (0.90)	ND (0.48)	ND (0.48)	ND (0.53)
SODIUM	NA	870	1,560	4,070	617	1,520	3,780
THALLIUM	NA	ND (0.43)	ND (0.40)	ND (0.44)	ND (0.40)	ND (0.40)	ND (0.44)
VANADIUM	NA	113	105	93.8	48.5	83.2	162 α
ZINC	NA	83.4	93.4	87.3	45.2	64.6	121 α
Volatile Organic Compound (ug/kg)							
ACETONE	NA	NA	ND (10)	ND (12)	NA	ND (16)	ND (22)
CARBON DISULFIDE	NA	NA	ND (10)	ND (12)	NA	ND (10)	ND (12)
TETRACHLOROETHENE	NA	NA	ND (10)	ND (12)	NA	ND (10)	ND (12)
Semivolatile Organic Compound (ug/kg)							
ANTHRACENE	NA	ND (380)	ND (350)	ND (580)	ND (350)	ND (340)	ND (380)
BENZO(A)ANTHRACENE	NA	ND (380)	ND (350)	ND (580)	NA	ND (340)	ND (380)
BENZO(A)PYRENE	NA	ND (380)	ND (350)	ND (580)	NA	ND (340)	ND (380)
BENZO(B)FLUORANTHENE	NA	ND (380)	ND (350)	ND (580)	NA	ND (340)	ND (380)
BENZO(G,H,I)PERYLENE	NA	ND (380)	ND (350)	ND (580)	NA	ND (340)	ND (380)
BENZO(K)FLUORANTHENE	NA	ND (380)	ND (350)	ND (580)	NA	ND (340)	ND (380)

TABLE 4.18-9 (Continued)

SOIL ANALYTICAL RESULTS - IR-44
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR44B006	IR44B007	IR44B007	IR44B007	IR44B009	IR44B009	IR44B009
Sampling Depth (feet bgs)	20.75	0.75	5.50	8.75	1.50	4.50	8.75
Sample Number	9533S095	9545J577	9545J578	9545J579	9605G041	9605G042	9605G043
Sample Date	08/14/95	11/06/95	11/06/95	11/06/95	01/30/96	01/30/96	01/30/96
Semivolatile Organic Compound (ug/kg)							
CHRYSENE	NA	ND (380)	ND (350)	ND (580)	NA	ND (340)	ND (380)
FLUORANTHENE	NA	ND (380)	ND (350)	ND (580)	ND (350)	ND (340)	ND (380)
INDENO(1,2,3-CD)PYRENE	NA	ND (380)	ND (350)	ND (580)	NA	ND (340)	ND (380)
PHENANTHRENE	NA	ND (380)	ND (350)	ND (580)	ND (350)	ND (340)	ND (380)
PYRENE	NA	ND (380)	ND (350)	ND (580)	NA	ND (340)	ND (380)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
4,4'-DDT	NA	ND (4)	ND (4)	ND (4)	ND (180)	ND (4)	ND (4)
AROCLOR-1260	NA	ND (38)	ND (35)	ND (39)	ND (1,800)	ND (35)	ND (38)
TPH-Extractable (mg/kg)							
TPH-DIESEL	NA	16	8	ND (12)	740	ND (10)	ND (12)
TPH-EXTRACTABLE UNKNOWN HYDROCARBON	NA	NA	NA	NA	NA	NA	NA
TPH-MOTOR OIL	NA	150	57	ND (12)	6,500	9	ND (12)
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	NA	110	72	ND (12)	10,000	6	28
Oil and Grease (mg/kg)							
TOTAL OIL & GREASE	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	NA	87.5	94.4	86.2	95.3	95.5	86.7
pH (pH units)							
PH	NA	9.4	9.6	8.4	9.0	9.8	8.3
Physical Characteristic (%)							
DRY BULK DENSITY	85	NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %CLAY	29	NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %COBBLES		NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %GRAVEL	3	NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %SAND	50	NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %SILT	18	NA	NA	NA	NA	NA	NA
MOISTURE CONTENT	36	NA	NA	NA	NA	NA	NA

TABLE 4.18-9 (Continued)

SOIL ANALYTICAL RESULTS - IR-44
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR44B006	IR44B007	IR44B007	IR44B007	IR44B009	IR44B009	IR44B009
Sampling Depth (feet bgs)	20.75	0.75	5.50	8.75	1.50	4.50	8.75
Sample Number	9533S095	9545J577	9545J578	9545J579	9605G041	9605G042	9605G043
Sample Date	08/14/95	11/06/95	11/06/95	11/06/95	01/30/96	01/30/96	01/30/96
Physical Characteristic (%)							
POROSITY	50	NA	NA	NA	NA	NA	NA
WET BULK DENSITY	120	NA	NA	NA	NA	NA	NA
Total Organic Carbon (ug/kg)							
TOTAL ORGANIC CARBON	ND (120,000)	NA	NA	NA	NA	NA	NA

TABLE 4.18-9 (Continued)

SOIL ANALYTICAL RESULTS - IR-44
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR44MW08A	IR44MW08A	IR44MW08A	IR44MW08A	IR50B020	IR50B020	IR50B020
Sampling Depth (feet bgs)	0.50	10.75	15.75	20.25	2.25	6.25	16.25
Sample Number	9538J256	9538J257	9538J259	9538J260	9421R185	9421R186	9421R187
Sample Date	09/18/95	09/18/95	09/18/95	09/18/95	05/26/94	05/26/94	05/26/94
Metal (mg/kg)							
ALUMINUM	13,800	18,500	7,890	9,070	3,950	29,600	21,100
ANTIMONY	ND (0.69)	1.6	1.2	0.90	ND (6.5)	ND (6.6)	ND (8.9)
ARSENIC	ND (0.64)	ND (1.6)	5.5 *#	5.5 *#	3.0 *#	15.2 *#α	6.9 *#
BARIUM	47.8	103	36.3	21.6	51.4	163	44.8
BERYLLIUM	ND (0.02)	ND (0.02)	ND (0.04)	ND (0.06)	ND (0.21)	0.40 *	0.41 *
CADMIUM	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.06)	ND (0.84)	ND (1.5)	ND (1.1)
CALCIUM	10,100	8,330	187,000	206,000	ND (4,290)	26,500	187,000
CHROMIUM	12.8	304 *	40.8	30.0	27.6	87.5	58.6
COBALT	9.3	65.3	7.6	6.0	4.0	20.3	9.1
COPPER	49.3	33.4	21.3	14.8	32.3	42.7	31.8
IRON	17,000	35,400	10,900	12,400	8,970	38,300	22,300
LEAD	2.9	5.0	16.6 α	7.0	19.5 α	6.7	19.1 α
MAGNESIUM	7,550	127,000	7,030	5,870	3,000	21,200	9,290
MANGANESE	349	1,140 *	325	251	124	744 *	309
MERCURY	0.09	0.08	0.29	0.14	0.10	0.11	0.40
MOLYBDENUM	ND (0.28)	ND (0.29)	ND (0.32)	0.53	ND (1.5)	1.9	2.1
NICKEL	16.5	853 *	40.7	26.8	22.0	88.9	51.6
POTASSIUM	1,160	1,210	2,430	3,580	ND (366)	1,510	2,600
SELENIUM	ND (0.90)	ND (0.94)	ND (1.1)	ND (1.2)	0.98	1.1	3.7 α
SODIUM	459	4,310	5,400	6,880	ND (318)	ND (534)	ND (6,580)
THALLIUM	ND (0.44)	ND (0.46)	ND (0.58)	ND (0.57)	ND (0.42)	ND (0.43)	ND (0.57)
VANADIUM	48.4	60.5	24.5	25.9	17.0	92.2	51.5
ZINC	41.1	63.7	59.0	45.0	117 α	68.2	72.3
Volatile Organic Compound (ug/kg)							
ACETONE	NA	ND (12)	ND (34)	ND (52)	ND (31)	ND (11)	ND (26)
CARBON DISULFIDE	NA	ND (12)	ND (14)	ND (15)	ND (11)	ND (11)	2
TETRACHLOROETHENE	NA	ND (12)	ND (14)	ND (15)	3	ND (11)	ND (14)
Semivolatile Organic Compound (ug/kg)							
ANTHRACENE	ND (380)	ND (400)	ND (440)	ND (490)	ND (350)	ND (1,100)	54
BENZO(A)ANTHRACENE	ND (380)	ND (400)	ND (440)	ND (490)	ND (350)	ND (1,100)	340
BENZO(A)PYRENE	ND (3,800)	ND (400)	ND (440)	240 *	ND (350)	ND (1,100)	1,200 *#
BENZO(B)FLUORANTHENE	ND (3,800)	ND (400)	ND (440)	ND (490)	ND (350)	ND (1,100)	760 *
BENZO(G,H,I)PERYLENE	ND (3,800)	ND (400)	ND (440)	ND (490)	ND (350)	ND (1,100)	1,200
BENZO(K)FLUORANTHENE	ND (3,800)	ND (400)	ND (440)	250	ND (350)	ND (1,100)	570

TABLE 4.18-9 (Continued)

SOIL ANALYTICAL RESULTS - IR-44
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR44MW08A	IR44MW08A	IR44MW08A	IR44MW08A	IR50B020	IR50B020	IR50B020
Sampling Depth (feet bgs)	0.50	10.75	15.75	20.25	2.25	6.25	16.25
Sample Number	9538J256	9538J257	9538J259	9538J260	9421R185	9421R186	9421R187
Sample Date	09/18/95	09/18/95	09/18/95	09/18/95	05/26/94	05/26/94	05/26/94
Semivolatile Organic Compound (ug/kg)							
CHRYSENE	ND (380)	ND (400)	ND (440)	ND (490)	ND (350)	ND (1,100)	430
FLUORANTHENE	ND (380)	ND (400)	210	230	ND (350)	ND (1,100)	930
INDENO(1,2,3-CD)PYRENE	ND (3,800)	ND (400)	ND (440)	ND (490)	ND (350)	ND (1,100)	900 *
PHENANTHRENE	ND (380)	ND (400)	ND (440)	ND (490)	ND (350)	ND (1,100)	250
PYRENE	ND (380)	ND (400)	330	340	ND (350)	ND (1,100)	1,400
Pesticide/Polychlorinated Biphenyl (ug/kg)							
4,4'-DDT	ND (19)	ND (4)	ND (5)	ND (5)	4	ND (4)	ND (5)
AROCLOR-1260	ND (190)	ND (40)	ND (45)	ND (50)	15	ND (35)	ND (47)
TPH-Extractable (mg/kg)							
TPH-DIESEL	150	ND (30)	14	8	ND (1)	ND (1)	ND (1)
TPH-EXTRACTABLE UNKNOWN HYDROCARBON	NA	NA	NA	NA	170	370	43
TPH-MOTOR OIL	1,400	240	76	52	ND (11)	ND (11)	ND (14)
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	1,500	31	ND (13)	ND (15)	ND (49)	ND (34)	260
Oil and Grease (mg/kg)							
TOTAL OIL & GREASE	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)							
% SOLIDS	87.1	83.3	74.1	67.2	NA	NA	NA
pH (pH units)							
PH	8.1	8.0	8.2	8.8	10.0	9.3	8.4
Physical Characteristic (%)							
DRY BULK DENSITY	NA	NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %CLAY	NA	NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %COBBLES	NA	NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %GRAVEL	NA	NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %SAND	NA	NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %SILT	NA	NA	NA	NA	NA	NA	NA
MOISTURE CONTENT	NA	NA	NA	NA	NA	NA	NA

TABLE 4.18-9 (Continued)

SOIL ANALYTICAL RESULTS - IR-44
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR44MW08A	IR44MW08A	IR44MW08A	IR44MW08A	IR50B020	IR50B020	IR50B020
Sampling Depth (feet bgs)	0.50	10.75	15.75	20.25	2.25	6.25	16.25
Sample Number	9538J256	9538J257	9538J259	9538J260	9421R185	9421R186	9421R187
Sample Date	09/18/95	09/18/95	09/18/95	09/18/95	05/26/94	05/26/94	05/26/94
Physical Characteristic (%)							
POROSITY	NA	NA	NA	NA	NA	NA	NA
WET BULK DENSITY	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon (ug/kg)							
TOTAL ORGANIC CARBON	NA	NA	NA	NA	NA	NA	NA

TABLE 4.18-9 (Continued)

SOIL ANALYTICAL RESULTS - IR-44
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR50B020	IR50B021	IR50B021	IR50B021	IR50B021	PA44B005
Sampling Depth (feet bgs)	21.25	2.75	6.25	10.75	16.25	5.25
Sample Number	9421R188	9423R253	9423R254	9423R255	9423R256	9310A691
Sample Date	05/26/94	06/08/94	06/08/94	06/08/94	06/08/94	03/10/93
Metal (mg/kg)						
ALUMINUM	18,800	17,800	20,500	23,200	7,810	9,200
ANTIMONY	ND (9.4)	ND (1.5)	ND (1.4)	ND (1.7)	ND (0.77)	ND (7.3)
ARSENIC	36.7 *#α	3.0 *#	2.0 *	1.6 *	7.7 *#	1.7 *
BARIUM	48.5	126	177	158	34.2	499 α
BERYLLIUM	ND (0.30)	0.27 *	0.33 *	0.25 *	0.27 *	0.69 *
CADMIUM	ND (1.2)	ND (0.06)	ND (0.07)	ND (0.08)	0.53	ND (0.47)
CALCIUM	243,000	10,500	12,600	15,600	191,000	4,680
CHROMIUM	51.1	116	115	134	38.9	49.2
COBALT	8.7	24.4	27.1	29.0	6.8	35.1 α
COPPER	29.3	37.1	36.2	49.5	24.1	110
IRON	20,000	29,500	32,100	38,000	15,200	28,200
LEAD	17.5 α	7.3	8.4	5.5	27.5 α	15.2 α
MAGNESIUM	9,640	25,400	28,700	30,200	6,120	7,080
MANGANESE	347	597 *	725 *	727 *	235	2,790 *α
MERCURY	0.27	0.06	0.11	0.07	0.34	ND (0.06)
MOLYBDENUM	ND (2.1)	ND (0.19)	ND (0.15)	ND (3.6)	ND (1.3)	ND (0.56)
NICKEL	39.1	153 *	157 *	128	32.2	65.9
POTASSIUM	2,000	833	990	912	2,540	1,030
SELENIUM	3.3 α	ND (0.63)	ND (0.65)	ND (0.80)	ND (0.89)	ND (0.41)
SODIUM	8,570	608	735	2,720	7,570	ND (30.5)
THALLIUM	ND (0.61)	ND (0.42)	ND (0.43)	ND (0.53)	ND (0.59)	ND (0.38)
VANADIUM	50.4	62.4	70.3	83.6	29.1	36.5
ZINC	54.1	59.4	59.3	69.3	63.4	45.1
Volatile Organic Compound (ug/kg)						
ACETONE	83	ND (14)	ND (14)	ND (16)	120	ND (16)
CARBON DISULFIDE	6	ND (11)	ND (11)	3	7	ND (11)
TETRACHLOROETHENE	ND (15)	ND (11)	ND (11)	ND (13)	ND (15)	ND (11)
Semivolatile Organic Compound (ug/kg)						
ANTHRACENE	34	ND (350)	ND (360)	ND (440)	34	ND (380)
BENZO(A)ANTHRACENE	180	ND (350)	ND (360)	ND (440)	130	ND (380)
BENZO(A)PYRENE	540 *#	ND (350)	ND (360)	ND (440)	300 *#	ND (380)
BENZO(B)FLUORANTHENE	410	ND (350)	ND (360)	ND (440)	290	ND (380)
BENZO(G,H,I)PERYLENE	570	ND (350)	ND (360)	ND (440)	240	ND (380)
BENZO(K)FLUORANTHENE	240	ND (350)	ND (360)	ND (440)	99	ND (380)

TABLE 4.18-9 (Continued)

SOIL ANALYTICAL RESULTS - IR-44
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR50B020	IR50B021	IR50B021	IR50B021	IR50B021	PA44B005
Sampling Depth (feet bgs)	21.25	2.75	6.25	10.75	16.25	5.25
Sample Number	9421R188	9423R253	9423R254	9423R255	9423R256	9310A691
Sample Date	05/26/94	06/08/94	06/08/94	06/08/94	06/08/94	03/10/93
Semivolatile Organic Compound (ug/kg)						
CHRYSENE	240	ND (350)	ND (360)	ND (440)	160	ND (380)
FLUORANTHENE	490	ND (350)	ND (360)	ND (440)	300	ND (380)
INDENO(1,2,3-CD)PYRENE	400	ND (350)	ND (360)	ND (440)	200	ND (380)
PHENANTHRENE	150	ND (350)	ND (360)	ND (440)	110	ND (380)
PYRENE	740	ND (350)	ND (360)	ND (440)	490	ND (380)
Pesticide/Polychlorinated Biphenyl (ug/kg)						
4,4'-DDT	ND (5)	ND (4)	ND (4)	ND (4)	ND (5)	ND (19)
AROCLOR-1260	ND (50)	ND (18)	ND (18)	ND (22)	ND (25)	ND (190)
TPH-Extractable (mg/kg)						
TPH-DIESEL	ND (2)	ND (11)	ND (11)	ND (13)	ND (15)	56
TPH-EXTRACTABLE UNKNOWN HYDROCARBON	13	NA	NA	NA	NA	NA
TPH-MOTOR OIL	ND (15)	36	28	ND (13)	61	NA
Total Recoverable Petroleum Hydrocarbons (mg/kg)						
TRPH	ND (38)	NA	37	ND (8)	330	NA
Oil and Grease (mg/kg)						
TOTAL OIL & GREASE	NA	NA	NA	NA	NA	3,000
Percent Moisture (%)						
% SOLIDS	NA	5.1	8.0	25.0	32.3	88.5
pH (pH units)						
PH	8.3	8.7	8.6	8.3	8.2	7.5
Physical Characteristic (%)						
DRY BULK DENSITY	NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %CLAY	NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %COBBLES	NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %GRAVEL	NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %SAND	NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %SILT	NA	NA	NA	NA	NA	NA
MOISTURE CONTENT	NA	NA	NA	NA	NA	NA

TABLE 4.18-9 (Continued)

SOIL ANALYTICAL RESULTS - IR-44
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR50B020	IR50B021	IR50B021	IR50B021	IR50B021	PA44B005
Sampling Depth (feet bgs)	21.25	2.75	6.25	10.75	16.25	5.25
Sample Number	9421R188	9423R253	9423R254	9423R255	9423R256	9310A691
Sample Date	05/26/94	06/08/94	06/08/94	06/08/94	06/08/94	03/10/93
Physical Characteristic (%)						
POROSITY	NA	NA	NA	NA	NA	NA
WET BULK DENSITY	NA	NA	NA	NA	NA	NA
Total Organic Carbon (ug/kg)						
TOTAL ORGANIC CARBON	NA	NA	NA	NA	NA	NA

Notes:

%	Percent
bgs	Below ground surface
mg/kg	Milligram per kilogram
NA	Not analyzed
ND()	Not detected (detection limit in parentheses)
µg/kg	Microgram per kilogram
*	Detected concentration greater than U.S. Environmental Protection Agency Region IX preliminary remediation goals (PRG) for residential use
#	Detected concentration greater than U.S. Environmental Protection Agency Region IX PRG for industrial use
α	Detected concentration greater than the Hunters Point ambient level.
▒	Detected concentration greater than at least one screening criterion.

TABLE 4.18-10

SUMMARY OF MONITORING WELL GROUNDWATER ANALYTICAL TESTS - IR-44
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
IR33MW63A	9448X586						√				√	√				√			√	√	√	√
IR33MW63A	9448X587						√				√	√				√			√	√	√	√
IR33MW63A	9606W052						√				√	√				√			√	√	√	√
IR33MW63A	9610J915						√				√	√				√			√	√	√	√
IR44MW08A	9542W043						√				√	√				√			√	√	√	√
IR44MW08A	9604Z008						√				√	√				√			√	√	√	√
IR44MW08A	9608W119						√				√	√				√			√	√	√	√
IR44MW08A	9608W120						√				√	√				√			√	√	√	√
PA50MW06A	9317X969			√	√		√				√					√	√		√	√	√	√
PA50MW06A	9605W055						√				√	√				√			√	√	√	√
PA50MW06A	9611J921																√					
PA50MW06A	9611W153	√			√		√				√	√		√	√	√			√	√	√	√

Notes:

CHROM	CHROMIUM VI
CYAN	Cyanide
DIOXIN	Dioxins and Furans
O&G	Total oil and grease
PAH	Polynuclear aromatic hydrocarbons
PCTMST	Percent moisture
PEST	Pesticides/polychlorinated biphenyls
PHYS	Physical characteristic
SALIN	Salinity
SVOC	Semivolatile organic compounds
SOLIDS	Total dissolved solids
TOC	Total organic carbon
TMICROB	Coliform
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
VOC	Volatile organic compounds

TABLE 4.18-11

STATISTICAL SUMMARY OF MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-44
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Tap Water PRG Value	Above[e] PRG	MCL Value[f]	Above[g] MCL	NAWQC Value	Above[h] NAWQC
METAL	ALUMINUM	41.0	41.0	41.0	UG/L	19.1	9	1	37,000	0				
	ARSENIC	1.4	3.0	2.0	UG/L	2.8	9	4	0.04	4	50.0	0	36.0	0
	BARIUM	56.6	91.1	73.2	UG/L	1.5	9	9	2,600	0	1,000	0		
	CADMIUM	0.31	24.9	12.6	UG/L	0.20	9	2	18.0	1	5.0	1	9.3	1
	CALCIUM	86,200	295,000	170,000	UG/L	21.4	9	8						
	CHROMIUM	4.0	16.2	10.0	UG/L	0.48	9	5			50.0	0		
	COBALT	0.57	3.5	2.4	UG/L	0.97	9	3						
	COPPER	2.3	2.3	2.3	UG/L	0.50	9	1	1,400	0			2.4	0
	IRON	13.5	41.2	27.4	UG/L	11.0	9	2						
	MAGNESIUM	216,000	1,040,000	552,000	UG/L	151	9	8						
	MANGANESE	2.3	2,160	1,260	UG/L	0.25	9	4	180	3				
	MERCURY	0.11	0.11	0.11	UG/L	0.10	9	1	11.0	0	2.0	0	0.03	1
	MOLYBDENUM	3.2	9.2	5.7	UG/L	1.2	9	6	180	0				
	NICKEL	1.8	18.8	7.5	UG/L	0.90	9	3	730	0	100	0	8.2	1
	POTASSIUM	90,000	321,000	169,000	UG/L	3,670	9	9						
	SELENIUM	2.4	3.1	2.7	UG/L	6.9	8	2	180	0	50.0	0	71.0	0
	SILVER	1.1	1.1	1.1	UG/L	0.50	9	1	180	0			0.92	1
	SODIUM	2,550,000	9,800,000	4,970,000	UG/L	314	9	9						
	VANADIUM	1.6	9.2	4.7	UG/L	0.40	9	4	260	0				
	ZINC	10.5	18.5	14.5	UG/L	3.0	9	2	11,000	0			81.0	0
VOC	TRICHLOROETHENE	0.2	0.6	0.4	UG/L	0.5	9	3	2	0	5	0		
TPHPRG	TPH-GASOLINE	27	27	27	UG/L	50	9	1	100	0i				

TABLE 4.18-11 (Continued)

STATISTICAL SUMMARY OF MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-44
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Tap Water PRG Value	Above[e] PRG	MCL Value[f]	Above[g] MCL	NAWQC Value	Above[h] NAWQC
TPHEXT	TPH-DIESEL	51	51	51	UG/L	100	9	1	100	0i				
	TPH-MOTOR OIL	100	370	190	UG/L	100	8	7	100	5i				
TRPH	TRPH	600	600	600	UG/L	1,000	9	1	100	1i				
ANION	CHLORIDE	4,440,000	4,440,000	4,440,000	UG/L	80,000	1	1						
	FLUORIDE	740	740	740	UG/L	100	1	1			1,400	0		
	NITRATE	560	560	560	UG/L	20.0	1	1	58,000	0				
	SULFATE	680,000	680,000	680,000	UG/L	5,000	1	1						
SOLIDS	TOTAL DISSOLVED SOLIDS	8,500,000	8,500,000	8,500,000	UG/L	10,000	1	1						
SALIN	SALINITY	7.4	7.4	7.4	PPT	0.005	1	1						

TABLE 4.18-11 (Continued)

STATISTICAL SUMMARY OF MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-44
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

CYAN	Cyanide
EPA	U.S. Environmental Protection Agency
MCL	Maximum contaminant level
NAWQC	National Ambient Water Quality Criteria
O&G	Total oil and grease
PCTMST	Percent moisture
PEST	Pesticide/polychlorinated biphenyl
PPT	Parts per thousand
PRG	Preliminary remediation goal
SALIN	Salinity
SVOC	Semivolatile organic compound
TMICROB	Coliform
TOC	Total organic carbon
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
UG/L	Microgram per liter
VOC	Volatile organic compound

a Organic results of less than 10 are reported to one significant figure, and results of greater than or equal to 10 are reported to two significant figures. Inorganic results of less than 10 are reported to two significant figures, and results of greater than or equal to 10 are reported to three significant figures. Values that are not nondetects are compared to screening criteria before the significant figure rule is applied. Both the value and the screening criteria are then rounded for reporting purposes.

b Blank boxes indicate that screening critera have not been established for these analytes.

c Total number of samples analyzed

d Total number of samples showing concentrations greater than detection limit

e Total number of samples showing concentrations greater than tap water PRG
California-modified PRGs were used for the following analytes: 1,2-Dibromo-3-chloropropane, benzo[a]pyrene, benzo[k]fluoranthene, cadmium, chromium VI, chrysene, lead, nickel, and tetrachloroethylene (PCE).
For the analytes listed below, Region IX PRGs are not available; therefore, PRGs for similar chemicals were used as follows:

Analyte:	Similar Analyte:
2-Methylnapthalene	Naphthalene
Acenaphthylene	Acenaphthene
Alpha-chlordane	Chlordane
Aroclor-1260	Polychlorinated biphenyls
Benzo(g,h,i)perylene	Naphthalene
Delta BHC	HCH-technical
Endosulfan I	Endosulfan
Endosulfan sulfate	Endosulfan
Endrin aldehyde	Endrin
Endrin ketone	Endrin
Gamma-chlordane	Chlordane
Phenanthrene	Naphthalene

f EPA Title 40 Code of Federal Regulations or California Code of Regulations Title 22 MCL used, whichever is more stringent

g Total number of samples showing concentrations greater than MCL

h Total number of samples showing concentrations greater than NAWQC;
NAWQC based on 4-day average study of saltwater aquatic life

i Total number of samples showing concentrations greater than TPH, TRPH, or O&G screening level, not PRG value

j Most probable number of organisms per 100 milliliters (mpn/100 mL)

TABLE 4.18-12

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-44
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33MW63A	IR33MW63A	IR33MW63A	IR33MW63A	IR44MW08A	IR44MW08A	IR44MW08A
Sample Number	9448X586	9448X587	9606W052	9610J915	9542W043	9604Z008	9608W119
Sample Date	12/02/94	12/02/94	02/05/96	03/07/96	10/20/95	01/22/96	02/23/96
Metal (ug/L)							
ALUMINUM	ND (130)	ND (21.8)	ND (19.1)	41.0	ND (18.8)	ND (18.8)	ND (90.0)
ARSENIC	ND (8.5)	ND (1.7)	ND (1.4)	ND (1.4)	ND (2.8)	1.8 *	ND (7.0)
BARIUM	68.0	53.3	89.0	65.3	74.3	63.7	97.3
CADMIUM	ND (1.0)	ND (0.20)	ND (0.20)	0.31	24.9 *B6	ND (0.20)	ND (1.0)
CALCIUM	273,000	213,000	108,000	99,800	295,000	150,000	194,000
CHROMIUM	26.0	ND (7.9)	10.4	4.5	ND (0.50)	4.0	ND (2.0)
COBALT	ND (3.5)	ND (0.70)	ND (0.40)	0.57	3.5	ND (2.0)	3.6
COPPER	ND (1.5)	ND (0.30)	ND (4.2)	2.3	ND (5.0)	ND (3.5)	ND (3.0)
IRON	ND (130)	ND (20.8)	ND (11.0)	13.5	ND (13.8)	ND (11.0)	ND (55.0)
MAGNESIUM	876,000	587,000	346,000	348,000	752,000	465,000	532,000
MANGANESE	ND (6.6)	ND (5.0)	ND (1.1)	2.3	1,850 *	1,040 *	2,340 *
MERCURY	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.12)	ND (0.10)	ND (0.10)
MOLYBDENUM	8.2	ND (5.7)	ND (6.8)	6.9	4.8	4.8	ND (3.4)
NICKEL	ND (17.8)	ND (4.7)	ND (1.0)	1.9	18.8 B	ND (7.5)	ND (3.5)
POTASSIUM	236,000	261,000	146,000	127,000	187,000	132,000	125,000
SELENIUM	ND (11.5)	2.4	ND (2.3)	ND (2.3)	ND (3.9)	ND (2.3)	ND (11.5)
SILVER	ND (2.0)	ND (0.40)	ND (0.50)	1.1 B	ND (0.70)	ND (0.50)	ND (2.5)
SODIUM	7,320,000	7,150,000	3,970,000	3,120,000	5,550,000	3,840,000	3,870,000
VANADIUM	ND (4.5)	ND (0.90)	ND (0.93)	2.5	ND (2.7)	1.6	ND (2.9)
ZINC	ND (8.9)	ND (12.9)	ND (18.7)	10.5	ND (22.7)	ND (16.8)	20.8
Volatile Organic Compound (ug/L)							
TRICHLOROETHENE	ND (10)	ND (10)	ND (0.5)	ND (0.5)	0.6	0.2	0.4
TPH-Purgeable (ug/L)							
TPH-GASOLINE	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	27	ND (50)
TPH-Extractable (ug/L)							
TPH-DIESEL	ND (100)	ND (100)	ND (100)	ND (100)	51	ND (100)	ND (100)
TPH-MOTOR OIL	360	340	100	170	370	110	ND (100)
Total Recoverable Petroleum Hydrocarbons (ug/L)							
TRPH	ND (1,000)	ND (1,000)	ND (1,000)	600	ND (1,000)	ND (1,000)	ND (1,000)

TABLE 4.18-12 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-44
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR33MW63A	IR33MW63A	IR33MW63A	IR33MW63A	IR44MW08A	IR44MW08A	IR44MW08A
Sample Number	9448X586	9448X587	9606W052	9610J915	9542W043	9604Z008	9608W119
Sample Date	12/02/94	12/02/94	02/05/96	03/07/96	10/20/95	01/22/96	02/23/96
Anion (ug/L)							
CHLORIDE	NA	NA	NA	NA	NA	NA	NA
FLUORIDE	NA	NA	NA	NA	NA	NA	NA
NITRATE	NA	NA	NA	NA	NA	NA	NA
SULFATE	NA	NA	NA	NA	NA	NA	NA
Solids (ug/L)							
TOTAL DISSOLVED SOLIDS	NA	NA	NA	NA	NA	NA	NA
pH (pH units)							
PH	7.5	7.4	7.5	7.0	7.2	7.1	7.2
Salinity (ppt)							
SALINITY	NA	NA	NA	NA	NA	NA	NA

TABLE 4.18-12 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-44
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR44MW08A	PA50MW06A	PA50MW06A	PA50MW06A
Sample Number	9608W120	9317X969	9605W055	9611W153
Sample Date	02/23/96	04/26/93	01/31/96	03/12/96
Metal (ug/L)				
ALUMINUM	ND (18.0)	ND (30.3)	ND (22.6)	ND (30.4)
ARSENIC	1.4 *	ND (5.2)	1.6 *	3.0 *
BARIUM	84.9	86.3	71.6	56.6
CADMIUM	ND (0.20)	ND (1.0)	ND (0.20)	ND (0.20)
CALCIUM	183,000	ND (156,000)	186,000	86,200
CHROMIUM	ND (0.40)	ND (1.5)	ND (2.7)	16.2
COBALT	2.6	ND (2.9)	ND (0.40)	ND (0.92)
COPPER	ND (2.1)	ND (4.1)	ND (3.1)	ND (1.4)
IRON	ND (11.0)	ND (18.8)	ND (13.5)	41.2
MAGNESIUM	497,000	ND (402,000)	1,040,000	216,000
MANGANESE	1,980 *	ND (51.7)	ND (2.2)	ND (1.0)
MERCURY	ND (0.10)	ND (0.04)	0.11 B	ND (0.10)
MOLYBDENUM	4.6	ND (2.8)	ND (4.7)	9.2
NICKEL	ND (8.8)	ND (7.4)	1.8	ND (1.7)
POTASSIUM	111,000	154,000	321,000	90,000
SELENIUM	ND (2.3)	NA	3.1	ND (2.9)
SILVER	ND (0.50)	ND (1.3)	ND (0.50)	ND (0.50)
SODIUM	3,620,000	4,880,000	9,800,000	2,550,000
VANADIUM	ND (2.0)	ND (6.1)	5.4	9.2
ZINC	16.2	ND (35.2)	ND (19.9)	ND (6.5)
Volatile Organic Compound (ug/L)				
TRICHLOROETHENE	0.4	ND (10)	ND (0.5)	ND (0.5)
TPH-Purgeable (ug/L)				
TPH-GASOLINE	ND (50)	ND (500)	ND (50)	ND (50)
TPH-Extractable (ug/L)				
TPH-DIESEL	ND (100)	ND (500)	ND (100)	ND (100)
TPH-MOTOR OIL	ND (100)	NA	100	150
Total Recoverable Petroleum Hydrocarbons (ug/L)				
TRPH	ND (1,000)	ND (1,000)	ND (1,000)	ND (1,000)

TABLE 4.18-12 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-44
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR44MW08A	PA50MW06A	PA50MW06A	PA50MW06A
Sample Number	9608W120	9317X969	9605W055	9611W153
Sample Date	02/23/96	04/26/93	01/31/96	03/12/96
Anion (ug/L)				
CHLORIDE	NA	NA	NA	4,440,000
FLUORIDE	NA	NA	NA	740
NITRATE	NA	NA	NA	560
SULFATE	NA	NA	NA	680,000
Solids (ug/L)				
TOTAL DISSOLVED SOLIDS	NA	NA	NA	8,500,000
pH (pH units)				
PH	7.2	NA	7.3	7.3
Salinity (ppt)				
SALINITY	NA	NA	NA	7.4

Notes:

NA Not analyzed
ND() Not detected (detection limit in parentheses)
ppt Parts per thousand
µg/L Microgram per liter

* Detected concentration greater than U.S. Environmental Protection Agency Region IX preliminary remediation goals (PRG) for tap water
β Detected concentration greater than National Ambient Water Quality Criteria (NAWQC) based on 4-day average study of saltwater aquatic life
δ Detected concentration greater than maximum contaminant level (MCL)
U.S. Environmental Protection Agency Title 40 Code of Federal Regulations or California Code of Regulations Title 22 MCL used, whichever is more stringent

Detected concentration greater than at least one screening criterion.

TABLE 4.18-13

SUMMARY OF HYDROPUNCH GROUNDWATER ANALYTICAL TESTS - IR-44
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
IR44B006	9533C092																		√	√		√
IR44B007	9545J580																		√	√		√
IR44B009	9605G044						√				√	√				√			√	√	√	√
IR44MW08A	9538J258																		√	√		√

Notes:

CHROM	CHROMIUM VI
CYAN	Cyanide
DIOXIN	Dioxins and Furans
O&G	Total oil and grease
PAH	Polynuclear aromatic hydrocarbons
PCTMST	Percent moisture
PEST	Pesticides/polychlorinated biphenyls
PHYS	Physical characteristic
SALIN	Salinity
SVOC	Semivolatile organic compounds
SOLIDS	Total dissolved solids
TOC	Total organic carbon
TMICROB	Coliform
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
VOC	Volatile organic compounds

TABLE 4.18-14

STATISTICAL SUMMARY OF HYDROPUNCH GROUNDWATER ANALYTICAL RESULTS - IR-44
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection Frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Tap Water PRG Value	Above[e] PRG	MCL Value[f]	Above[g] MCL	NAWQC Value	Above[h] NAWQC
METAL	ANTIMONY	15.5	15.5	15.5	UG/L	1.6	1	1	15.0	1	6.0	1	500	0
	ARSENIC	1.4	1.4	1.4	UG/L	1.4	1	1	0.04	1	50.0	0	36.0	0
	BARIUM	28.9	28.9	28.9	UG/L	0.30	1	1	2,600	0	1,000	0		
	CALCIUM	164,000	164,000	164,000	UG/L	14.2	1	1						
	COBALT	13.5	13.5	13.5	UG/L	0.40	1	1						
	IRON	25.6	25.6	25.6	UG/L	11.0	1	1						
	MAGNESIUM	631,000	631,000	631,000	UG/L	261	1	1						
	MANGANESE	345	345	345	UG/L	0.10	1	1	180	1				
	MOLYBDENUM	74.3	74.3	74.3	UG/L	0.60	1	1	180	0				
	NICKEL	19.4	19.4	19.4	UG/L	0.70	1	1	730	0	100	0	8.2	1
	POTASSIUM	220,000	220,000	220,000	UG/L	5,990	1	1						
	SELENIUM	3.4	3.4	3.4	UG/L	2.3	1	1	180	0	50.0	0	71.0	0
	SODIUM	5,340,000	5,340,000	5,340,000	UG/L	257	1	1						
VOC	CIS-1,2-DICHLOROETHENE	0.4	0.4	0.4	UG/L	0.5	4	1	61	0	6	0		
	TRICHLOROETHENE	2	2	2	UG/L	0.5	4	1	2	1	5	0		
SVOC	1,2-DICHLOROBENZENE	3	3	3	UG/L	5	1	1	370	0	600	0		
	1,4-DICHLOROBENZENE	5	5	5	UG/L	5	1	1	0.5	1	5	0		
PEST	4,4'-DDD	0.2	0.2	0.2	UG/L	0.1	1	1	0.3	0				
	4,4'-DDE	0.1	0.1	0.1	UG/L	0.1	1	1	0.2	0				
	ALPHA-CHLORDANE	0.05	0.05	0.05	UG/L	0.05	1	1	0.05	0				
	GAMMA-CHLORDANE	0.07	0.07	0.07	UG/L	0.05	1	1	0.05	1				
	AROCLOR-1260	0.7	0.7	0.7	UG/L	0.5	1	1	0.009	1				

TABLE 4.18-14 (Continued)

STATISTICAL SUMMARY OF HYDROPUNCH GROUNDWATER ANALYTICAL RESULTS - IR-44
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Tap Water PRG Value	Above[e] PRG	MCL Value[f]	Above[g] MCL	NAWQC Value	Above[h] NAWQC
TPHPRG	TPH-GASOLINE	39	39	39	UG/L	50	4	1	100	0i				
TPHEXT	TPH-DIESEL	120	8,900	2,900	UG/L	530	4	4	100	4i				
	TPH-MOTOR OIL	55	21,000	7,000	UG/L	530	4	4	100	3i				
TRPH	TRPH	1,700	1,700	1,700	UG/L	1,000	1	1	100	1i				

TABLE 4.18-14 (Continued)

STATISTICAL SUMMARY OF HYDROPUNCH GROUNDWATER ANALYTICAL RESULTS - IR-44
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

CYAN	Cyanide
EPA	U.S. Environmental Protection Agency
MCL	Maximum contaminant level
NAWQC	National Ambient Water Quality Criteria
O&G	Total oil and grease
PCTMST	Percent moisture
PEST	Pesticide/polychlorinated biphenyl
PPT	Parts per thousand
PRG	Preliminary remediation goal
SALIN	Salinity
SVOC	Semivolatile organic compound
TMICROB	Coliform
TOC	Total organic carbon
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
UG/L	Microgram per liter
VOC	Volatile organic compound

a Organic results of less than 10 are reported to one significant figure, and results of greater than or equal to 10 are reported to two significant figures. Inorganic results of less than 10 are reported to two significant figures, and results of greater than or equal to 10 are reported to three significant figures. Values that are not nondetects are compared to screening criteria before the significant figure rule is applied. Both the value and the screening criteria are then rounded for reporting purposes.

b Blank boxes indicate that screening critera have not been established for these analytes.

c Total number of samples analyzed

d Total number of samples showing concentrations greater than detection limit

e Total number of samples showing concentrations greater than tap water PRG
California-modified PRGs were used for the following analytes: 1,2-Dibromo-3-chloropropane, benzo[a]pyrene, benzo[k]fluoranthene, cadmium, chromium VI, chrysene, lead, nickel, and tetrachloroethylene (PCE).
For the analytes listed below, Region IX PRGs are not available; therefore, PRGs for similar chemicals were used as follows:

Analyte:	Similar Analyte:
2-Methylnapthalene	Naphthalene
Acenaphthylene	Acenaphthene
Alpha-chlordane	Chlordane
Aroclor-1260	Polychlorinated biphenyls
Benzo(g,h,i)perylene	Naphthalene
Delta BHC	HCH-technical
Endosulfan I	Endosulfan
Endosulfan sulfate	Endosulfan
Endrin aldehyde	Endrin
Endrin ketone	Endrin
Gamma-chlordane	Chlordane
Phenanthrene	Naphthalene

f EPA Title 40 Code of Federal Regulations or California Code of Regulations Title 22 MCL used, whichever is more stringent

g Total number of samples showing concentrations greater than MCL

h Total number of samples showing concentrations greater than NAWQC;
NAWQC based on 4-day average study of saltwater aquatic life

i Total number of samples showing concentrations greater than TPH, TRPH, or O&G screening level, not PRG value

TABLE 4.18-15

HYDROPUNCH GROUNDWATER ANALYTICAL RESULTS - IR-44
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR44B006	IR44B007	IR44B009	IR44MW08A
Sample Number	9533C092	9545J580	9605G044	9538J258
Sample Date	08/14/95	11/06/95	01/30/96	09/18/95
Metal (ug/L)				
ANTIMONY	NA	NA	15.5 *6	NA
ARSENIC	NA	NA	1.4 *	NA
BARIUM	NA	NA	28.9	NA
CALCIUM	NA	NA	164,000	NA
COBALT	NA	NA	13.5	NA
IRON	NA	NA	25.6	NA
MAGNESIUM	NA	NA	631,000	NA
MANGANESE	NA	NA	345 *	NA
MOLYBDENUM	NA	NA	74.3	NA
NICKEL	NA	NA	19.4 B	NA
POTASSIUM	NA	NA	220,000	NA
SELENIUM	NA	NA	3.4	NA
SODIUM	NA	NA	5,340,000	NA
Volatile Organic Compound (ug/L)				
CIS-1,2-DICHLOROETHENE	0.4	ND (0.5)	ND (0.5)	ND (0.5)
TRICHLOROETHENE	2 *	ND (0.5)	ND (0.5)	ND (0.5)
Semivolatile Organic Compound (ug/L)				
1,2-DICHLOROBENZENE	NA	NA	3	NA
1,4-DICHLOROBENZENE	NA	NA	5 *	NA
Pesticide/Polychlorinated Biphenyl (ug/L)				
4,4'-DDD	NA	NA	0.2	NA
4,4'-DDE	NA	NA	0.1	NA
ALPHA-CHLORDANE	NA	NA	0.05	NA
GAMMA-CHLORDANE	NA	NA	0.07 *	NA
AROCLOR-1260	NA	NA	0.7 *	NA
TPH-Purgeable (ug/L)				
TPH-GASOLINE	ND (50)	ND (50)	39	ND (50)
TPH-Extractable (ug/L)				
TPH-DIESEL	2,100	500	8,900	120
TPH-MOTOR OIL	2,900	3,900	21,000	55

TABLE 4.18-15 (Continued)

HYDROPUNCH GROUNDWATER ANALYTICAL RESULTS - IR-44
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR44B006	IR44B007	IR44B009	IR44MW08A
Sample Number	9533C092	9545J580	9605G044	9538J258
Sample Date	08/14/95	11/06/95	01/30/96	09/18/95
Total Recoverable Petroleum Hydrocarbons (ug/L)				
TRPH	NA	NA	1,700	NA
pH (pH units)				
PH	NA	NA	7.5	NA

Notes:

NA Not analyzed
ND() Not detected (detection limit in parentheses)
µg/L Microgram per liter

* Detected concentration greater than U.S. Environmental Protection Agency Region IX preliminary remediation goals (PRG) for tap water
β Detected concentration greater than National Ambient Water Quality Criteria (NAWQC) based on 4-day average study of saltwater aquatic life
δ Detected concentration greater than maximum contaminant level (MCL)
U.S. Environmental Protection Agency Title 40 Code of Federal Regulations or California Code of Regulations Title 22 MCL used, whichever is more stringent

Detected concentration greater than at least one screening criterion.

TABLE 4.26-1

SUMMARY OF SOIL ANALYTICAL TESTS - IR-65
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
IR65B001	9536J151						√			√	√	√				√			√	√	√	
IR65B001	9536J152						√			√	√	√				√			√	√	√	√
IR65B001	9536J153						√			√	√	√				√			√	√	√	√
IR65B001	9536J154						√			√	√	√				√			√	√	√	√
IR65B001	9536J155						√			√	√	√				√			√	√	√	√
IR65B001	9536J156												√					√				
IR65B001	9536J157						√			√	√	√				√			√	√	√	√
IR65B002	9604J763						√			√	√	√				√			√	√	√	√
IR65B002	9604J764						√			√	√	√				√			√	√	√	√
IR65B002	9604J765						√			√	√	√				√			√	√	√	√
IR65B003	9604J754						√			√	√	√				√			√	√	√	√
IR65B003	9604J755						√			√	√	√				√			√	√	√	√
IR65B003	9604J756						√			√	√	√				√			√	√	√	√
IR65B004	9604J757						√			√	√	√				√			√	√	√	√
IR65B004	9604J758						√			√	√	√				√			√	√	√	√
IR65B004	9604J759						√			√	√	√				√			√	√	√	√
IR65B005	9604J760						√			√	√	√				√			√	√	√	√
IR65B005	9604J761						√			√	√	√				√			√	√	√	√
IR65B005	9604J762						√			√	√	√				√			√	√	√	√

Notes:

CHROM	CHROMIUM VI
CYAN	Cyanide
DIOXIN	Dioxins and Furans
O&G	Total oil and grease
PAH	Polynuclear aromatic hydrocarbons
PCTMST	Percent moisture
PEST	Pesticides/polychlorinated biphenyls
PHYS	Physical characteristic
SALIN	Salinity
SVOC	Semivolatile organic compounds
SOLIDS	Total dissolved solids
TOC	Total organic carbon
TMICROB	Coliform
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
VOC	Volatile organic compounds

TABLE 4.26-2

STATISTICAL SUMMARY OF SOIL ANALYTICAL RESULTS - IR-65
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Residential PRG Value	Above[e] Res PRG	Industrial PRG Value	Above[f] Ind PRG	HPAL Value	Above[g] HPAL
METAL	ALUMINUM	12,900	32,100	22,900	MG/KG	4.0	18	18	76,700	0	100,000	0		
	ARSENIC	0.45	47.2	5.7	MG/KG	0.37	18	11	0.32	11	2.0	2	11.10	1
	BARIUM	19.6	217	95.7	MG/KG	0.07	18	18	5,340	0	100,000	0	314.36	0
	CALCIUM	2,530	114,000	20,300	MG/KG	3.3	18	18						
	CHROMIUM	29.0	147	90.3	MG/KG	0.21	18	18	211	0	1,580	0	h	0
	COBALT	17.2	45.2	32.1	MG/KG	0.10	18	18					h	1
	COPPER	19.3	85.8	59.6	MG/KG	0.14	18	18	2,850	0	63,300	0	124.31	0
	IRON	21,500	53,900	35,600	MG/KG	2.9	18	18						
	LEAD	1.2	56.2	7.1	MG/KG	0.24	18	17	130	0	1,000	0	8.99	3
	MAGNESIUM	9,300	24,000	18,300	MG/KG	3.8	18	18						
	MANGANESE	530	1,780	1,010	MG/KG	0.06	18	18	382	18	8,300	0	1431.18	4
	MERCURY	0.05	0.21	0.12	MG/KG	0.06	18	5	23.0	0	511	0	2.28	0
	NICKEL	22.6	91.6	58.1	MG/KG	0.37	18	18	150	0	34,100	0	h	0
	POTASSIUM	408	5,530	945	MG/KG	5.5	18	18						
	SELENIUM	4.9	4.9	4.9	MG/KG	0.50	18	1	383	0	8,520	0	1.95	1
	SODIUM	192	4,920	3,130	MG/KG	30.1	18	5						
	THALLIUM	0.67	1.4	0.92	MG/KG	0.44	18	5					0.81	3
	VANADIUM	40.9	135	98.1	MG/KG	0.11	18	18	537	0	11,900	0	117.17	4
	ZINC	43.5	116	76.9	MG/KG	0.18	18	18	23,000	0	100,000	0	109.86	1
VOC	ACETONE	85	85	85	UG/KG	11	17	1	2,000,000	0	8,400,000	0		
	CARBON DISULFIDE	18	18	18	UG/KG	17	17	1	16,000	0	52,000	0		
	XYLENE (TOTAL)	1	2	2	UG/KG	11	17	2	980,000	0	980,000	0		

TABLE 4.26-2 (Continued)

STATISTICAL SUMMARY OF SOIL ANALYTICAL RESULTS - IR-65
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection Frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Residential PRG Value	Above[e] Res PRG	Industrial PRG Value	Above[f] Ind PRG	HPAL Value	Above[g] HPAL
SVOC	CHRYSENE	280	280	280	UG/KG	340	18	1	6,100	0	24,000	0		
	PYRENE	210	210	210	UG/KG	340	18	1	2,000,000	0	20,000,000	0		
PEST	4,4'-DDD	49	49	49	UG/KG	34	18	1	1,900	0	7,900	0		
	4,4'-DDE	19	19	19	UG/KG	34	18	1	1,300	0	5,600	0		
	AROCLOR-1260	68	250	160	UG/KG	190	18	2	66	2	340	0		
TPHPRG	TPH-GASOLINE	0.4	0.4	0.4	MG/KG	0.5	18	1	100	0i				
TPHEXT	TPH-DIESEL	240	560	400	MG/KG	310	18	2	1,000	0i				
	TPH-MOTOR OIL	9	6,100	1,900	MG/KG	160	18	4	1,000	2i				
TRPH	TRPH	11	6,600	1,700	MG/KG	61	18	6	1,000	2i				
PHYS	DRY BULK DENSITY	67	67	67	%	0	1	1						
	GRAIN SIZE ANALYSIS - %CLAY	50	50	50	%	0	1	1						
	GRAIN SIZE ANALYSIS - %COBBLE.	0	0	0	%	0	1	1						
	GRAIN SIZE ANALYSIS - %GRAVEL	0	0	0	%	0	1	1						
	GRAIN SIZE ANALYSIS - %SAND	32	32	32	%	0	1	1						
	GRAIN SIZE ANALYSIS - %SILT	18	18	18	%	0	1	1						
	MOISTURE CONTENT	55	55	55	%	0	1	1						
	POROSITY	61	61	61	%	0	1	1						
	WET BULK DENSITY	100	100	100	%	0	1	1						
TOC	TOTAL ORGANIC CARBON	5,800,000	5,800,000	5,800,000	UG/KG	100,000	1	1						

TABLE 4.26-2 (Continued)

STATISTICAL SUMMARY OF SOIL ANALYTICAL RESULTS - IR-65
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

CYAN	Cyanide
EPA	U.S. Environmental Protection Agency
HPAL	Hunters Point ambient level
MG/KG	Milligram per kilogram
O&G	Total oil and grease
PCTMST	Percent moisture
PEST	Pesticide/polychlorinated biphenyl
PHYS	Physical characteristic
PRG	Preliminary remediation goal
SALIN	Salinity
SVOC	Semivolatile organic compound
TMICROB	Coliform
TOC	Total organic carbon
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
UG/KG	Microgram per kilogram
VOC	Volatile organic compound

a Organic results of less than 10 are reported to one significant figure, and results of greater than or equal to 10 are reported to two significant figures. Inorganic results of less than 10 are reported to two significant figures, and results of greater than or equal to 10 are reported to three significant figures. Values that are not nondetects are compared to screening criteria before the significant figure rule is applied. Both the value and the screening criteria are then rounded for reporting purposes.

b Blank boxes indicate that screening critera have not been established for these analytes.

c Total number of samples analyzed

d Total number of samples showing concentrations greater than detection limit

e Total number of samples showing concentrations greater than residential PRG

f Total number of samples showing concentrations greater than industrial PRG
California-modified PRGs were used for the following analytes: 1,2-Dibromo-3-chloropropane, benzo[a]pyrene, benzo[k]fluoranthene, cadmium, chromium VI, chrysene, lead, nickel, and tetrachloroethylene (PCE).
For the analytes listed below, Region IX PRGs are not available; therefore, PRGs for similar chemicals were used as follows:

Analyte:	Similar Analyte:
2-Methylnapthalene	Naphthalene
Acenaphthylene	Acenaphthene
Alpha-chlordane	Chlordane
Aroclor-1260	Polychlorinated biphenyls
Benzo(g,h,i)perylene	Naphthalene
Delta BHC	HCH-technical
Endosulfan I	Endosulfan
Endosulfan sulfate	Endosulfan
Endrin aldehyde	Endrin
Endrin ketone	Endrin
Gamma-chlordane	Chlordane
Phenanthrene	Naphthalene

g Total number of samples showing concentrations greater than HPAL

h HPALs for chromium, cobalt, and nickel are based on the concentration of magnesium in each sample; thus, no single value applies to all samples. The range of HPAL values for chromium, cobalt, and nickel are 183.850 to 353.381, 30.229 to 49.401, and 218.833 to 537.781 mg/kg respectively.

i Total number of samples showing concentrations greater than TPH, TRPH, or O&G screening level, not PRG value

TABLE 4.26-3

SOIL ANALYTICAL RESULTS - IR-65
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR65B001	IR65B001	IR65B001	IR65B001	IR65B001	IR65B001	IR65B001
Sampling Depth (feet bgs)	0.75	5.25	15.00	20.00	30.25	34.25	34.75
Sample Number	9536J151	9536J152	9536J153	9536J154	9536J155	9536J156	9536J157
Sample Date	09/06/95	09/06/95	09/06/95	09/06/95	09/06/95	09/06/95	09/06/95
Metal (mg/kg)							
ALUMINUM	15,700	28,900	24,000	16,100	32,100	NA	22,000
ARSENIC	ND (2.6)	ND (0.63)	ND (0.64)	ND (0.66)	ND (0.66)	NA	7.5 *#
BARIUM	217	121	69.0	49.3	68.8	NA	36.2
CALCIUM	114,000	21,600	16,900	7,900	22,800	NA	8,200
CHROMIUM	70.7	101	97.8	64.4	117	NA	78.1
COBALT	17.2	35.1	27.8	21.0	30.6	NA	17.5
COPPER	85.8	60.4	64.5	43.4	66.8	NA	42.0
IRON	21,500	38,600	31,800	23,100	37,700	NA	36,100
LEAD	56.2 α	3.0	2.1	ND (1.5)	2.8	NA	11.6 α
MAGNESIUM	14,500	18,200	18,300	14,800	20,300	NA	16,900
MANGANESE	696 *	1,380 *	707 *	591 *	639 *	NA	530 *
MERCURY	0.21	0.14	ND (0.06)	0.08	ND (0.06)	NA	0.11
NICKEL	83.1	91.6	40.4	34.4	48.4	NA	88.2
POTASSIUM	1,290	688	723	410	931	NA	5,530
SELENIUM	ND (0.70)	ND (0.76)	ND (0.78)	ND (0.80)	ND (0.80)	NA	ND (1.1)
SODIUM	ND (112)	ND (28.6)	2,780	2,950	4,820	NA	4,920
THALLIUM	0.79	1.4 α	0.67	ND (0.47)	ND (0.47)	NA	ND (0.66)
VANADIUM	65.9	115	100	58.4	120 α	NA	63.6
ZINC	104	70.9	69.6	55.6	89.7	NA	101
Volatile Organic Compound (ug/kg)							
ACETONE	NA	ND (11)	ND (14)	ND (12)	ND (15)	NA	ND (45)
CARBON DISULFIDE	NA	ND (11)	ND (11)	ND (12)	ND (12)	NA	18
XYLENE (TOTAL)	NA	ND (11)	ND (11)	ND (12)	ND (12)	NA	ND (17)
Semivolatile Organic Compound (ug/kg)							
CHRYSENE	280	ND (370)	ND (380)	ND (390)	ND (390)	NA	ND (550)
PYRENE	210	ND (370)	ND (380)	ND (390)	ND (390)	NA	ND (550)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
4,4'-DDD	49	ND (4)	ND (4)	ND (4)	ND (4)	NA	ND (6)
4,4'-DDE	19	ND (4)	ND (4)	ND (4)	ND (4)	NA	ND (6)
AROCLOR-1260	250 *	ND (37)	ND (38)	ND (39)	ND (39)	NA	ND (56)

TABLE 4.26-3 (Continued)

SOIL ANALYTICAL RESULTS - IR-65
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR65B001	IR65B001	IR65B001	IR65B001	IR65B001	IR65B001	IR65B001
Sampling Depth (feet bgs)	0.75	5.25	15.00	20.00	30.25	34.25	34.75
Sample Number	9536J151	9536J152	9536J153	9536J154	9536J155	9536J156	9536J157
Sample Date	09/06/95	09/06/95	09/06/95	09/06/95	09/06/95	09/06/95	09/06/95
TPH-Purgeable (mg/kg)							
TPH-GASOLINE	0.4	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.6)	NA	ND (0.8)
TPH-Extractable (mg/kg)							
TPH-DIESEL	560	ND (11)	ND (11)	ND (12)	ND (12)	NA	ND (17)
TPH-MOTOR OIL	6,100	ND (11)	ND (11)	ND (12)	ND (12)	NA	ND (17)
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	6,600	ND (11)	ND (11)	ND (12)	ND (12)	NA	ND (17)
Percent Moisture (%)							
% SOLIDS	97.2	89.5	87.1	85.1	85.1	NA	60.2
pH (pH units)							
PH	9.0	8.3	8.5	8.2	8.2	NA	8.7
Physical Characteristic (%)							
DRY BULK DENSITY	NA	NA	NA	NA	NA	67	NA
GRAIN SIZE ANALYSIS - %CLAY	NA	NA	NA	NA	NA	50	NA
GRAIN SIZE ANALYSIS - %COBBLES	NA	NA	NA	NA	NA		NA
GRAIN SIZE ANALYSIS - %GRAVEL	NA	NA	NA	NA	NA		NA
GRAIN SIZE ANALYSIS - %SAND	NA	NA	NA	NA	NA	32	NA
GRAIN SIZE ANALYSIS - %SILT	NA	NA	NA	NA	NA	18	NA
MOISTURE CONTENT	NA	NA	NA	NA	NA	55	NA
POROSITY	NA	NA	NA	NA	NA	61	NA
WET BULK DENSITY	NA	NA	NA	NA	NA	100	NA
Total Organic Carbon (ug/kg)							
TOTAL ORGANIC CARBON	NA	NA	NA	NA	NA	5,800,000	NA

TABLE 4.26-3 (Continued)

SOIL ANALYTICAL RESULTS - IR-65
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR65B002	IR65B002	IR65B002	IR65B003	IR65B003	IR65B003	IR65B004
Sampling Depth (feet bgs)	1.00	3.00	5.00	1.00	3.00	5.00	1.00
Sample Number	9604J763	9604J764	9604J765	9604J754	9604J755	9604J756	9604J757
Sample Date	01/25/96	01/25/96	01/25/96	01/25/96	01/25/96	01/25/96	01/25/96
Metal (mg/kg)							
ALUMINUM	15,300	25,900	28,400	19,300	22,800	22,900	12,900
ARSENIC	ND (0.31)	2.0 *	0.75 *	0.46 *	ND (0.32)	1.8 *	47.2 *#α
BARIUM	54.5	125	157	66.7	66.8	125	19.6
CALCIUM	8,730	15,900	17,500	11,800	14,700	13,600	2,530
CHROMIUM	77.3	93.0	107	64.4	113	95.4	29.0
COBALT	25.4	37.7	39.4	33.0	32.0	36.6	39.3 α
COPPER	46.0	74.7	64.2	59.8	59.6	54.2	19.3
IRON	26,800	44,600	53,900	31,600	34,700	45,000	30,700
LEAD	1.9	2.7	3.2	1.7	1.2	2.8	23.6 α
MAGNESIUM	14,000	21,400	23,500	17,600	21,100	19,400	9,300
MANGANESE	617 *	1,600 *α	1,740 *α	826 *	789 *	1,780 *α	731 *
MERCURY	ND (0.06)	ND (0.06)	ND (0.06)	0.05	ND (0.06)	ND (0.06)	ND (0.05)
NICKEL	30.5	90.1	78.9	32.4	40.7	85.1	22.6
POTASSIUM	558	913	639	452	418	447	590
SELENIUM	ND (0.51)	ND (0.51)	ND (0.57)	ND (0.50)	ND (0.53)	ND (0.53)	4.9 α
SODIUM	ND (18.7)	ND (18.8)	ND (67.6)	192	ND (19.3)	ND (19.3)	ND (47.4)
THALLIUM	ND (0.42)	ND (0.42)	ND (0.47)	ND (0.41)	ND (0.44)	0.87 α	ND (0.42)
VANADIUM	76.5	115	125 α	91.0	109	132 α	40.9
ZINC	43.5	98.1	116 α	59.3	70.0	88.9	73.4
Volatile Organic Compound (ug/kg)							
ACETONE	ND (18)	ND (11)	ND (49)	ND (11)	ND (31)	85	ND (38)
CARBON DISULFIDE	ND (11)	ND (11)	ND (12)	ND (11)	ND (11)	ND (11)	ND (11)
XYLENE (TOTAL)	ND (11)	ND (11)	ND (12)	ND (11)	ND (11)	ND (11)	1
Semivolatile Organic Compound (ug/kg)							
CHRYSENE	ND (370)	ND (370)	ND (410)	ND (360)	ND (380)	ND (380)	ND (360)
PYRENE	ND (370)	ND (370)	ND (410)	ND (360)	ND (380)	ND (380)	ND (360)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
4,4'-DDD	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
4,4'-DDE	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
AROCLOR-1260	ND (37)	ND (37)	ND (41)	ND (36)	ND (38)	ND (38)	68 *

TABLE 4.26-3 (Continued)

SOIL ANALYTICAL RESULTS - IR-65
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR65B002	IR65B002	IR65B002	IR65B003	IR65B003	IR65B003	IR65B004
Sampling Depth (feet bgs)	1.00	3.00	5.00	1.00	3.00	5.00	1.00
Sample Number	9604J763	9604J764	9604J765	9604J754	9604J755	9604J756	9604J757
Sample Date	01/25/96	01/25/96	01/25/96	01/25/96	01/25/96	01/25/96	01/25/96
TPH-Purgeable (mg/kg)							
TPH-GASOLINE	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.5)	ND (0.6)	ND (0.6)	ND (0.6)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (11)	ND (11)	ND (12)	ND (11)	ND (11)	ND (12)	240
TPH-MOTOR OIL	13	ND (11)	ND (12)	ND (11)	9	ND (12)	1,300
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	19	ND (11)	ND (12)	42	25	ND (12)	3,600
Percent Moisture (%)							
% SOLIDS	89.9	89.6	80.8	91.9	87.1	86.9	91.5
pH (pH units)							
PH	8.4	8.1	8.2	8.6	8.1	8.2	8.6
Physical Characteristic (%)							
DRY BULK DENSITY	NA	NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %CLAY	NA	NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %COBBLES	NA	NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %GRAVEL	NA	NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %SAND	NA	NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %SILT	NA	NA	NA	NA	NA	NA	NA
MOISTURE CONTENT	NA	NA	NA	NA	NA	NA	NA
POROSITY	NA	NA	NA	NA	NA	NA	NA
WET BULK DENSITY	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon (ug/kg)							
TOTAL ORGANIC CARBON	NA	NA	NA	NA	NA	NA	NA

TABLE 4.26-3 (Continued)

SOIL ANALYTICAL RESULTS - IR-65
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR65B004	IR65B004	IR65B005	IR65B005	IR65B005
Sampling Depth (feet bgs)	3.00	5.00	1.00	3.00	5.00
Sample Number	9604J758	9604J759	9604J760	9604J761	9604J762
Sample Date	01/25/96	01/25/96	01/25/96	01/25/96	01/25/96
Metal (mg/kg)					
ALUMINUM	27,800	18,900	23,200	31,800	23,600
ARSENIC	0.48 *	0.50 *	0.45 *	0.68 *	1.2 *
BARIUM	107	101	106	127	105
CALCIUM	21,300	10,900	17,500	24,000	16,100
CHROMIUM	109	79.1	79.2	147	103
COBALT	36.6	34.4	33.5	45.2	35.6
COPPER	68.7	62.9	61.8	66.7	72.6
IRON	38,800	30,500	34,200	42,600	37,700
LEAD	1.6	1.6	1.2	1.3	2.4
MAGNESIUM	19,300	19,300	17,400	24,000	19,800
MANGANESE	979 *	1,050 *	1,030 *	1,080 *	1,450 *α
MERCURY	ND (0.06)	ND (0.06)	ND (0.05)	ND (0.06)	ND (0.06)
NICKEL	53.9	55.9	49.6	52.1	67.6
POTASSIUM	921	714	726	408	652
SELENIUM	ND (0.52)	ND (0.51)	ND (0.51)	ND (0.52)	ND (0.53)
SODIUM	ND (18.9)	ND (18.7)	ND (18.5)	ND (116)	ND (19.2)
THALLIUM	ND (0.43)	ND (0.42)	0.89 α	ND (0.43)	ND (0.44)
VANADIUM	114	87.5	108	135 α	109
ZINC	65.3	66.4	66.1	69.9	76.9
Volatile Organic Compound (ug/kg)					
ACETONE	ND (33)	ND (12)	ND (17)	ND (16)	ND (32)
CARBON DISULFIDE	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)
XYLENE (TOTAL)	ND (11)	ND (11)	2	ND (11)	ND (11)
Semivolatile Organic Compound (ug/kg)					
CHRYSENE	ND (370)	ND (370)	ND (360)	ND (380)	ND (380)
PYRENE	ND (370)	ND (370)	ND (360)	ND (380)	ND (380)
Pesticide/Polychlorinated Biphenyl (ug/kg)					
4,4'-DDD	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
4,4'-DDE	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
AROCLOR-1260	ND (37)	ND (37)	ND (37)	ND (38)	ND (38)

TABLE 4.26-3 (Continued)

SOIL ANALYTICAL RESULTS - IR-65
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR65B004	IR65B004	IR65B005	IR65B005	IR65B005
Sampling Depth (feet bgs)	3.00	5.00	1.00	3.00	5.00
Sample Number	9604J758	9604J759	9604J760	9604J761	9604J762
Sample Date	01/25/96	01/25/96	01/25/96	01/25/96	01/25/96
TPH-Purgeable (mg/kg)					
TPH-GASOLINE	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.6)
TPH-Extractable (mg/kg)					
TPH-DIESEL	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)
TPH-MOTOR OIL	ND (11)	ND (11)	ND (11)	ND (11)	ND (11)
Total Recoverable Petroleum Hydrocarbons (mg/kg)					
TRPH	ND (11)	ND (11)	11	ND (11)	ND (11)
Percent Moisture (%)					
% SOLIDS	88.7	89.9	91.0	88.5	87.3
pH (pH units)					
PH	8.7	8.7	9.1	8.4	8.2
Physical Characteristic (%)					
DRY BULK DENSITY	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %CLAY	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %COBBLES	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %GRAVEL	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %SAND	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %SILT	NA	NA	NA	NA	NA
MOISTURE CONTENT	NA	NA	NA	NA	NA
POROSITY	NA	NA	NA	NA	NA
WET BULK DENSITY	NA	NA	NA	NA	NA
Total Organic Carbon (ug/kg)					
TOTAL ORGANIC CARBON	NA	NA	NA	NA	NA

TABLE 4.26-3 (Continued)

SOIL ANALYTICAL RESULTS - IR-65
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

%	Percent
bgs	Below ground surface
mg/kg	Milligram per kilogram
NA	Not analyzed
ND()	Not detected (detection limit in parentheses)
µg/kg	Microgram per kilogram
*	Detected concentration greater than U.S. Environmental Protection Agency Region IX preliminary remediation goals (PRG) for residential use
#	Detected concentration greater than U.S. Environmental Protection Agency Region IX PRG for industrial use
α	Detected concentration greater than the Hunters Point ambient level.
▒	Detected concentration greater than at least one screening criterion.

TABLE 4.26-4

SUMMARY OF MONITORING WELL GROUNDWATER ANALYTICAL TESTS - IR-65
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
IR34MW02A	9441X518						√				√	√				√			√	√	√	√
IR34MW02A	9441X519						√				√	√				√			√	√	√	√
IR34MW02A	9606W067						√				√	√				√			√	√	√	√
IR34MW02A	9610J916						√				√	√				√			√	√	√	√
IR34MW02A	9610J917						√				√	√				√			√	√	√	√

Notes:

CHROM	CHROMIUM VI
CYAN	Cyanide
DIOXIN	Dioxins and Furans
O&G	Total oil and grease
PAH	Polynuclear aromatic hydrocarbons
PCTMST	Percent moisture
PEST	Pesticides/polychlorinated biphenyls
PHYS	Physical characteristic
SALIN	Salinity
SVOC	Semivolatile organic compounds
SOLIDS	Total dissolved solids
TOC	Total organic carbon
TMICROB	Coliform
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
VOC	Volatile organic compounds

TABLE 4.26-5

STATISTICAL SUMMARY OF MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-65
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Tap Water PRG Value	Above[e] PRG	MCL Value[f]	Above[g] MCL	NAWQC Value	Above[h] NAWQC
METAL	BARIUM	37.9	90.1	70.9	UG/L	2.0	3	3	2,600	0	1,000	0		
	CALCIUM	86,000	161,000	113,000	UG/L	16.7	3	3						
	COBALT	0.95	1.6	1.3	UG/L	0.55	3	2						
	MAGNESIUM	101,000	178,000	127,000	UG/L	21.9	3	3						
	MANGANESE	1,430	2,620	1,900	UG/L	0.17	3	3	180	3				
	NICKEL	3.6	11.7	7.7	UG/L	2.9	3	2	730	0	100	0	8.2	1
	POTASSIUM	4,080	11,200	6,710	UG/L	408	3	3						
	SELENIUM	1.9	6.5	4.2	UG/L	2.3	3	2	180	0	50.0	0	71.0	0
	SODIUM	1,120,000	1,640,000	1,310,000	UG/L	116	3	3						
	THALLIUM	1.9	4.2	2.7	UG/L	1.9	3	3			2.0	2		
	VANADIUM	6.7	11.1	9.4	UG/L	0.57	3	3	260	0				
TPHEXT	TPH-MOTOR OIL	76	76	76	UG/L	100	3	1	100	0i				

TABLE 4.26-5 (Continued)

STATISTICAL SUMMARY OF MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-65
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

CYAN	Cyanide
EPA	U.S. Environmental Protection Agency
MCL	Maximum contaminant level
NAWQC	National Ambient Water Quality Criteria
O&G	Total oil and grease
PCTMST	Percent moisture
PEST	Pesticide/polychlorinated biphenyl
PPT	Parts per thousand
PRG	Preliminary remediation goal
SALIN	Salinity
SVOC	Semivolatile organic compound
TMICROB	Coliform
TOC	Total organic carbon
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
UG/L	Microgram per liter
VOC	Volatile organic compound

a Organic results of less than 10 are reported to one significant figure, and results of greater than or equal to 10 are reported to two significant figures. Inorganic results of less than 10 are reported to two significant figures, and results of greater than or equal to 10 are reported to three significant figures. Values that are not nondetects are compared to screening criteria before the significant figure rule is applied. Both the value and the screening criteria are then rounded for reporting purposes.

b Blank boxes indicate that screening critera have not been established for these analytes.

c Total number of samples analyzed

d Total number of samples showing concentrations greater than detection limit

e Total number of samples showing concentrations greater than tap water PRG
California-modified PRGs were used for the following analytes: 1,2-Dibromo-3-chloropropane, benzo[a]pyrene, benzo[k]fluoranthene, cadmium, chromium VI, chrysene, lead, nickel, and tetrachloroethylene (PCE).
For the analytes listed below, Region IX PRGs are not available; therefore, PRGs for similar chemicals were used as follows:

Analyte:	Similar Analyte:
2-Methylnapthalene	Naphthalene
Acenaphthylene	Acenaphthene
Alpha-chlordane	Chlordane
Aroclor-1260	Polychlorinated biphenyls
Benzo(g,h,i)perylene	Naphthalene
Delta BHC	HCH-technical
Endosulfan I	Endosulfan
Endosulfan sulfate	Endosulfan
Endrin aldehyde	Endrin
Endrin ketone	Endrin
Gamma-chlordane	Chlordane
Phenanthrene	Naphthalene

f EPA Title 40 Code of Federal Regulations or California Code of Regulations Title 22 MCL used, whichever is more stringent

g Total number of samples showing concentrations greater than MCL

h Total number of samples showing concentrations greater than NAWQC;
NAWQC based on 4-day average study of saltwater aquatic life

i Total number of samples showing concentrations greater than TPH, TRPH, or O&G screening level, not PRG value

TABLE 4.26-6

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-65
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR34MW02A	IR34MW02A	IR34MW02A	IR34MW02A	IR34MW02A
Sample Number	9441X518	9441X519	9606W067	9610J916	9610J917
Sample Date	10/11/94	10/11/94	02/06/96	03/08/96	03/08/96
Metal (ug/L)					
BARIUM	40.8	34.9	84.7	89.5	90.6
CALCIUM	162,000	160,000	86,000	92,200	93,800
COBALT	2.4	0.71	0.95	ND (0.95)	ND (0.94)
MAGNESIUM	179,000	176,000	101,000	101,000	102,000
MANGANESE	2,620 *	2,630 *	1,430 *	1,620 *	1,650 *
NICKEL	13.3 β	10.1 β	ND (4.2)	ND (4.3)	5.1
POTASSIUM	11,400	11,100	4,080	4,600	5,060
SELENIUM	11.8	ND (2.3)	ND (2.3)	2.6	ND (2.3)
SODIUM	1,720,000	1,560,000	1,160,000	1,140,000	1,100,000
THALLIUM	ND (2.0)	2.8 δ	4.2 δ	ND (1.9)	3.1 δ
VANADIUM	7.2	6.3	10.3	11.1	11.1
TPH-Extractable (ug/L)					
TPH-MOTOR OIL	ND (100)	ND (100)	ND (100)	73	79
pH (pH units)					
PH	7.0	7.0	7.1	7.1	7.2

Notes:

NA Not analyzed
ND() Not detected (detection limit in parentheses)
µg/L Microgram per liter

* Detected concentration greater than U.S. Environmental Protection Agency Region IX preliminary remediation goals (PRG) for tap water
β Detected concentration greater than National Ambient Water Quality Criteria (NAWQC) based on 4-day average study of saltwater aquatic life
δ Detected concentration greater than maximum contaminant level (MCL)
U.S. Environmental Protection Agency Title 40 Code of Federal Regulations or California Code of Regulations Title 22 MCL used, whichever is more stringent

Detected concentration greater than at least one screening criterion.

TABLE 4.27-1

SUMMARY OF SOIL ANALYTICAL TESTS - IR-66
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
IR36B085	9434R575						√			√	√	√				√			√	√	√	√
IR36B085	9434R576						√			√	√	√				√			√	√	√	√
IR36B085	9434R577						√			√	√	√				√			√	√	√	√
IR36B085	9434R579						√			√	√	√				√			√	√	√	√
IR36B085	9434R580						√			√	√	√				√			√	√	√	√
IR36B085	9434R581						√			√	√	√				√			√	√	√	√
IR36B118	9426C327						√			√	√	√				√			√	√	√	√
IR36B118	9426C328						√			√	√	√				√			√	√	√	√
IR36B118	9426C330						√			√	√	√				√			√	√	√	√
IR36B118	9426C331						√			√	√	√				√			√	√	√	√
IR66B001	9533C103						√			√	√	√				√			√	√	√	√
IR66B001	9533C104						√			√	√	√				√			√	√	√	√
IR66B001	9533C108						√			√	√	√				√			√	√	√	√
IR66B001	9533S102						√			√	√	√				√			√	√	√	√
IR66B002	9533C113						√			√	√	√				√			√	√	√	√
IR66B002	9533C114						√			√	√	√				√			√	√	√	√
IR66B002	9533C115						√			√	√	√				√			√	√	√	√
IR66B002	9533C116						√			√	√	√				√			√	√	√	√
IR66B002	9533C117						√			√	√	√				√			√	√	√	√
IR66B003	9533C109						√			√	√	√				√			√	√	√	
IR66B003	9533C110						√			√	√	√				√			√	√	√	√
IR66B003	9533C111						√			√	√	√				√			√	√	√	√

Notes:

CHROM	CHROMIUM VI
CYAN	Cyanide
DIOXIN	Dioxins and Furans
O&G	Total oil and grease
PAH	Polynuclear aromatic hydrocarbons
PCTMST	Percent moisture
PEST	Pesticides/polychlorinated biphenyls
PHYS	Physical characteristic
SALIN	Salinity
SVOC	Semivolatile organic compounds
SOLIDS	Total dissolved solids
TOC	Total organic carbon
TMICROB	Coliform
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
VOC	Volatile organic compounds

TABLE 4.27-2

STATISTICAL SUMMARY OF SOIL ANALYTICAL RESULTS - IR-66
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection Frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Residential PRG Value	Above[e] Res PRG	Industrial PRG Value	Above[f] Ind PRG	HPAL Value	Above[g] HPAL
METAL	ALUMINUM	3,230	35,500	18,200	MG/KG	4.6	22	22	76,700	0	100,000	0		
	ANTIMONY	0.34	4.3	2.8	MG/KG	0.38	21	10	30.7	0	681	0	9.05	0
	ARSENIC	1.3	7.8	4.8	MG/KG	0.50	22	13	0.32	13	2.0	11	11.10	0
	BARIUM	11.4	410	153	MG/KG	0.37	22	22	5,340	0	100,000	0	314.36	2
	BERYLLIUM	0.19	0.50	0.38	MG/KG	0.02	22	6	0.14	6	1.1	0	0.71	0
	CADMIUM	0.06	0.99	0.49	MG/KG	0.05	22	8	9.0	0	852	0	3.14	0
	CALCIUM	880	208,000	37,100	MG/KG	21.2	22	20						
	CHROMIUM	19.6	626	226	MG/KG	0.29	22	22	211	11	1,580	0	h	0
	COBALT	4.3	64.4	31.0	MG/KG	0.13	22	22					h	0
	COPPER	4.3	138	36.5	MG/KG	0.22	22	21	2,850	0	63,300	0	124.31	1
	IRON	9,630	42,500	29,600	MG/KG	3.6	22	22						
	LEAD	1.8	14.3	6.5	MG/KG	0.29	22	20	130	0	1,000	0	8.99	4
	MAGNESIUM	4,120	194,000	62,600	MG/KG	13.9	22	22						
	MANGANESE	224	1,440	651	MG/KG	0.11	22	22	382	18	8,300	0	1431.18	1
	MERCURY	0.06	0.11	0.08	MG/KG	0.06	22	4	23.0	0	511	0	2.28	0
	MOLYBDENUM	2.0	2.0	2.0	MG/KG	0.20	22	1	383	0	8,520	0	2.68	0
	NICKEL	23.1	1,630	455	MG/KG	0.61	22	22	150	16	34,100	0	h	0
	POTASSIUM	254	3,660	1,420	MG/KG	8.7	22	21						
	SELENIUM	0.80	1.1	0.96	MG/KG	0.53	22	4	383	0	8,520	0	1.95	0
	SODIUM	306	6,040	1,760	MG/KG	33.4	22	9						
	THALLIUM	0.53	2.1	1.4	MG/KG	0.46	22	7					0.81	6
	VANADIUM	15.9	84.3	55.2	MG/KG	0.17	22	22	537	0	11,900	0	117.17	0

TABLE 4.27-2 (Continued)

STATISTICAL SUMMARY OF SOIL ANALYTICAL RESULTS - IR-66
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Residential PRG Value	Above[e] Res PRG	Industrial PRG Value	Above[f] Ind PRG	HPAL Value	Above[g] HPAL
	ZINC	23.1	95.2	55.1	MG/KG	0.32	22	22	23,000	0	100,000	0	109.86	0
VOC	ACETONE	61	150	94	UG/KG	11	21	4	2,000,000	0	8,400,000	0		
	CARBON DISULFIDE	7	25	18	UG/KG	13	21	4	16,000	0	52,000	0		
	TRICHLOROETHENE	10	13	12	UG/KG	11	21	2	7,100	0	17,000	0		
	XYLENE (TOTAL)	4	8	6	UG/KG	12	21	4	980,000	0	980,000	0		
SVOC	2-METHYLNAPHTHALENE	20	100	60	UG/KG	360	22	2	800,000	0	800,000	0		
	BENZO(B)FLUORANTHENE	20	20	20	UG/KG	370	21	1	610	0	2,600	0		
	BENZO(G,H,I)PERYLENE	17	17	17	UG/KG	370	21	1	800,000	0	800,000	0		
	CHRYSENE	27	27	27	UG/KG	370	22	1	6,100	0	24,000	0		
	DIBENZOFURAN	49	49	49	UG/KG	370	22	1	260,000	0	2,700,000	0		
	FLUORANTHENE	22	22	22	UG/KG	370	22	1	2,600,000	0	27,000,000	0		
	NAPHTHALENE	72	72	72	UG/KG	370	22	1	800,000	0	800,000	0		
	PHENANTHRENE	94	94	94	UG/KG	370	22	1	800,000	0	800,000	0		
	PYRENE	26	26	26	UG/KG	370	22	1	2,000,000	0	20,000,000	0		
PEST	ALDRIN	0.6	0.6	0.6	UG/KG	2	22	1	26	0	110	0		
TPHEXT	TPH-DIESEL	6	48	24	MG/KG	11	22	5	1,000	0i				
	TPH-MOTOR OIL	6	560	86	MG/KG	28	22	14	1,000	0i				
TRPH	TRPH	4	150	61	MG/KG	24	22	10	1,000	0i				

TABLE 4.27-2 (Continued)

STATISTICAL SUMMARY OF SOIL ANALYTICAL RESULTS - IR-66
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

CYAN	Cyanide
EPA	U.S. Environmental Protection Agency
HPAL	Hunters Point ambient level
MG/KG	Milligram per kilogram
O&G	Total oil and grease
PCTMST	Percent moisture
PEST	Pesticide/polychlorinated biphenyl
PHYS	Physical characteristic
PRG	Preliminary remediation goal
SALIN	Salinity
SVOC	Semivolatile organic compound
TMICROB	Coliform
TOC	Total organic carbon
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
UG/KG	Microgram per kilogram
VOC	Volatile organic compound

a Organic results of less than 10 are reported to one significant figure, and results of greater than or equal to 10 are reported to two significant figures. Inorganic results of less than 10 are reported to two significant figures, and results of greater than or equal to 10 are reported to three significant figures. Values that are not nondetects are compared to screening criteria before the significant figure rule is applied. Both the value and the screening criteria are then rounded for reporting purposes.

b Blank boxes indicate that screening critera have not been established for these analytes.

c Total number of samples analyzed

d Total number of samples showing concentrations greater than detection limit

e Total number of samples showing concentrations greater than residential PRG

f Total number of samples showing concentrations greater than industrial PRG
California-modified PRGs were used for the following analytes: 1,2-Dibromo-3-chloropropane, benzo[a]pyrene, benzo[k]fluoranthene, cadmium, chromium VI, chrysene, lead, nickel, and tetrachloroethylene (PCE).
For the analytes listed below, Region IX PRGs are not available; therefore, PRGs for similar chemicals were used as follows:

Analyte:	Similar Analyte:
2-Methylnapthalene	Naphthalene
Acenaphthylene	Acenaphthene
Alpha-chlordane	Chlordane
Aroclor-1260	Polychlorinated biphenyls
Benzo(g,h,i)perylene	Naphthalene
Delta BHC	HCH-technical
Endosulfan I	Endosulfan
Endosulfan sulfate	Endosulfan
Endrin aldehyde	Endrin
Endrin ketone	Endrin
Gamma-chlordane	Chlordane
Phenanthrene	Naphthalene

g Total number of samples showing concentrations greater than HPAL

h HPALs for chromium, cobalt, and nickel are based on the concentration of magnesium in each sample; thus, no single value applies to all samples. The range of HPAL values for chromium, cobalt, and nickel are 104.953 to 1493.683, 19.834 to 145.975, and 101.176 to 3908.058 mg/kg respectively.

i Total number of samples showing concentrations greater than TPH, TRPH, or O&G screening level, not PRG value

TABLE 4.27-3

SOIL ANALYTICAL RESULTS - IR-66
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR36B085	IR36B085	IR36B085	IR36B085	IR36B085	IR36B085	IR36B118
Sampling Depth (feet bgs)	1.75	6.25	11.25	16.25	21.25	26.25	1.75
Sample Number	9434R575	9434R576	9434R577	9434R579	9434R580	9434R581	9426C327
Sample Date	08/22/94	08/22/94	08/22/94	08/23/94	08/23/94	08/23/94	06/27/94
Metal (mg/kg)							
ALUMINUM	6,770	17,700	23,000	3,820	25,000	6,600	22,700
ANTIMONY	ND (0.43)	ND (0.92)	3.1	ND (4.0)	ND (2.7)	NA	0.34
ARSENIC	1.9 *	2.3 *#	ND (0.36)	ND (0.35)	ND (1.5)	3.2 *#	1.3 *
BARIUM	410 α	242	182	168	181	19.9	61.4
BERYLLIUM	0.49 *	0.50 *	0.41 *	ND (0.11)	0.43 *	ND (0.20)	ND (0.03)
CADMIUM	0.27	0.38	0.63	ND (0.48)	ND (0.31)	ND (0.17)	0.40
CALCIUM	5,910	16,400	12,700	ND (824)	ND (7,320)	202,000	12,900
CHROMIUM	19.6	61.8	409 *	626 *	362 *	22.1	27.3
COBALT	12.6	16.0	50.0	62.1	42.7	4.3	10.7
COPPER	70.0	20.2	19.7	ND (5.6)	21.3	14.5	70.9
IRON	22,900	29,100	33,600	25,100	35,700	9,630	20,300
LEAD	8.2	9.8 α	4.9	ND (1.8)	4.9	ND (2.4)	1.8
MAGNESIUM	4,120	11,200	147,000	194,000	112,000	4,600	9,860
MANGANESE	1,440 *α	593 *	690 *	515 *	804 *	224	293
MERCURY	ND (0.05)	0.11	0.06	ND (0.06)	ND (0.06)	ND (0.07)	ND (0.13)
MOLYBDENUM	ND (0.08)	ND (0.09)	ND (0.10)	ND (0.09)	ND (0.09)	ND (0.39)	ND (0.54)
NICKEL	32.2	65.0	868 *	1,630 *	770 *	23.1	40.7
POTASSIUM	1,130	1,040	589	ND (223)	893	2,140	1,150
SELENIUM	ND (0.49)	ND (0.49)	ND (0.55)	ND (0.54)	ND (0.53)	ND (0.65)	0.82
SODIUM	ND (238)	ND (277)	ND (221)	ND (484)	ND (1,770)	ND (4,440)	1,260
THALLIUM	ND (0.42)	ND (0.43)	ND (0.48)	ND (0.47)	ND (0.46)	ND (0.56)	ND (0.13)
VANADIUM	34.5	69.9	51.2	22.8	60.5	21.2	72.1
ZINC	38.4	54.9	50.0	28.1	51.6	23.1	37.1
Volatile Organic Compound (ug/kg)							
ACETONE	74	61	92	ND (5)	ND (6)	ND (19)	ND (5)
CARBON DISULFIDE	ND (11)	ND (11)	ND (12)	ND (12)	ND (11)	23	ND (11)
TRICHLOROETHENE	ND (11)	ND (11)	ND (12)	ND (12)	ND (11)	ND (14)	10
XYLENE (TOTAL)	ND (11)	ND (11)	ND (12)	ND (12)	ND (11)	ND (14)	6
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (350)	ND (360)	ND (400)	ND (390)	ND (380)	ND (470)	20
BENZO(B)FLUORANTHENE	ND (350)	NA	ND (400)	ND (390)	ND (380)	ND (470)	ND (350)
BENZO(G,H,I)PERYLENE	ND (350)	NA	ND (400)	ND (390)	ND (380)	ND (470)	ND (350)
CHRYSENE	ND (350)	ND (360)	ND (400)	ND (390)	ND (380)	ND (470)	ND (350)
DIBENZOFURAN	ND (350)	ND (360)	ND (400)	ND (390)	ND (380)	ND (470)	ND (350)

TABLE 4.27-3 (Continued)

SOIL ANALYTICAL RESULTS - IR-66
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR36B085	IR36B085	IR36B085	IR36B085	IR36B085	IR36B085	IR36B118
Sampling Depth (feet bgs)	1.75	6.25	11.25	16.25	21.25	26.25	1.75
Sample Number	9434R575	9434R576	9434R577	9434R579	9434R580	9434R581	9426C327
Sample Date	08/22/94	08/22/94	08/22/94	08/23/94	08/23/94	08/23/94	06/27/94
Semivolatile Organic Compound (ug/kg)							
FLUORANTHENE	ND (350)	ND (360)	ND (400)	ND (390)	ND (380)	ND (470)	ND (350)
NAPHTHALENE	ND (350)	ND (360)	ND (400)	ND (390)	ND (380)	ND (470)	ND (350)
PHENANTHRENE	ND (350)	ND (360)	ND (400)	ND (390)	ND (380)	ND (470)	ND (350)
PYRENE	ND (350)	ND (360)	ND (400)	ND (390)	ND (380)	ND (470)	ND (350)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
ALDRIN	ND (2)	ND (2)	ND (2)	ND (2)	0.6	ND (2)	ND (2)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (11)	ND (53)	ND (12)	ND (12)	ND (11)	ND (14)	11
TPH-MOTOR OIL	130	560	ND (12)	6	7	ND (14)	120
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	60	43	4	ND (3)	ND (7)	ND (4)	150
Percent Moisture (%)							
% SOLIDS	94.5	93.7	84.2	85.0	87.1	70.8	94.9
pH (pH units)							
PH	8.5	8.7	8.8	8.0	8.6	8.6	8.9

TABLE 4.27-3 (Continued)

SOIL ANALYTICAL RESULTS - IR-66
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR36B118	IR36B118	IR36B118	IR66B001	IR66B001	IR66B001	IR66B001
Sampling Depth (feet bgs)	10.25	16.25	21.25	6.25	10.25	20.75	1.25
Sample Number	9426C328	9426C330	9426C331	9533C103	9533C104	9533C108	9533S102
Sample Date	06/27/94	06/27/94	06/27/94	08/15/95	08/15/95	08/16/95	08/15/95
Metal (mg/kg)							
ALUMINUM	29,100	12,700	10,800	21,000	23,500	10,200	19,700
ANTIMONY	3.7	3.1	0.34	ND (2.0)	ND (1.8)	ND (0.61)	ND (1.2)
ARSENIC	6.1 *#	3.1 *#	2.8 *#	7.1 *#	6.8 *#	6.9 *#	5.7 *#
BARIUM	216	60.4	20.0	281	125	19.4	184
BERYLLIUM	0.23 *	ND (0.08)	0.19 *	ND (0.02)	ND (0.02)	ND (0.03)	ND (0.02)
CADMIUM	0.99	0.61	0.55	ND (0.05)	ND (0.05)	0.06	ND (0.05)
CALCIUM	10,600	5,960	208,000	8,980	5,950	171,000	10,300
CHROMIUM	348 *	315 *	33.1	324 *	109	40.0	113
COBALT	42.2	35.9	6.2	41.4	24.3	9.2	33.4
COPPER	138 α	17.5	15.6	29.3	48.7	20.7	29.6
IRON	39,200	31,900	15,000	31,700	35,400	16,800	28,100
LEAD	6.6	1.9	3.6	7.2	9.9 α	6.9	6.7
MAGNESIUM	74,700	75,300	7,080	97,200	32,600	8,220	26,800
MANGANESE	649 *	453 *	229	666 *	685 *	302	1,130 *
MERCURY	ND (0.12)	ND (0.05)	ND (0.05)	ND (0.06)	ND (0.06)	ND (0.07)	ND (0.10)
MOLYBDENUM	ND (0.21)	ND (0.32)	ND (0.35)	ND (0.21)	ND (0.21)	ND (0.85)	ND (0.21)
NICKEL	491 *	631 *	32.3	694 *	179 *	43.3	225 *
POTASSIUM	1,580	699	2,610	1,880	2,480	3,660	1,060
SELENIUM	1.1	1.1	0.80	ND (0.78)	ND (0.79)	ND (1.1)	ND (0.78)
SODIUM	1,090	1,360	3,480	ND (29.4)	ND (87.1)	6,040	ND (154)
THALLIUM	ND (0.10)	ND (0.11)	ND (0.19)	1.2 α	0.53	ND (0.58)	1.6 α
VANADIUM	66.4	52.8	29.1	49.8	62.1	32.6	65.2
ZINC	73.5	36.9	35.0	67.2	95.2	51.6	71.4
Volatile Organic Compound (ug/kg)							
ACETONE	ND (4)	ND (24)	ND (28)	ND (13)	ND (12)	ND (42)	ND (11)
CARBON DISULFIDE	ND (11)	ND (12)	16	ND (11)	ND (12)	25	ND (11)
TRICHLOROETHENE	13	ND (12)	ND (15)	ND (11)	ND (12)	ND (14)	ND (11)
XYLENE (TOTAL)	8	4	5	ND (11)	ND (12)	ND (14)	ND (11)
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	100	ND (390)	ND (460)	ND (380)	ND (390)	ND (480)	ND (380)
BENZO(B)FLUORANTHENE	20	ND (390)	ND (460)	ND (380)	ND (390)	ND (480)	ND (380)
BENZO(G,H,I)PERYLENE	17	ND (390)	ND (460)	ND (380)	ND (390)	ND (480)	ND (380)
CHRYSENE	27	ND (390)	ND (460)	ND (380)	ND (390)	ND (480)	ND (380)
DIBENZOFURAN	49	ND (390)	ND (460)	ND (380)	ND (390)	ND (480)	ND (380)

TABLE 4.27-3 (Continued)

SOIL ANALYTICAL RESULTS - IR-66
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR36B118	IR36B118	IR36B118	IR66B001	IR66B001	IR66B001	IR66B001
Sampling Depth (feet bgs)	10.25	16.25	21.25	6.25	10.25	20.75	1.25
Sample Number	9426C328	9426C330	9426C331	9533C103	9533C104	9533C108	9533S102
Sample Date	06/27/94	06/27/94	06/27/94	08/15/95	08/15/95	08/16/95	08/15/95
Semivolatile Organic Compound (ug/kg)							
FLUORANTHENE	22	ND (390)	ND (460)	ND (380)	ND (390)	ND (480)	ND (380)
NAPHTHALENE	72	ND (390)	ND (460)	ND (380)	ND (390)	ND (480)	ND (380)
PHENANTHRENE	94	ND (390)	ND (460)	ND (380)	ND (390)	ND (480)	ND (380)
PYRENE	26	ND (390)	ND (460)	ND (380)	ND (390)	ND (480)	ND (380)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
ALDRIN	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (12)	ND (12)	ND (15)	ND (12)	ND (12)	ND (14)	6
TPH-MOTOR OIL	43	58	ND (94)	10	ND (12)	ND (14)	28
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	ND (27)	32	ND (27)	ND (12)	ND (12)	ND (14)	50
Percent Moisture (%)							
% SOLIDS	90.4	85.3	71.2	86.9	85.9	69.3	87.7
pH (pH units)							
PH	9.3	8.2	8.4	8.5	8.6	8.8	8.0

TABLE 4.27-3 (Continued)

SOIL ANALYTICAL RESULTS - IR-66
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR66B002	IR66B002	IR66B002	IR66B002	IR66B002	IR66B003	IR66B003
Sampling Depth (feet bgs)	1.25	6.25	11.25	16.25	21.25	1.75	6.25
Sample Number	9533C113	9533C114	9533C115	9533C116	9533C117	9533C109	9533C110
Sample Date	08/16/95	08/16/95	08/16/95	08/16/95	08/16/95	08/16/95	08/16/95
Metal (mg/kg)							
ALUMINUM	29,700	10,200	23,800	21,600	3,230	29,900	14,900
ANTIMONY	ND (2.5)	ND (2.1)	2.9	4.3	3.3	ND (2.4)	3.1
ARSENIC	7.1 *#	ND (2.6)	ND (3.3)	ND (1.8)	ND (0.66)	7.8 *#	ND (2.6)
BARIUM	214	74.8	323 α	129	11.4	197	125
BERYLLIUM	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)
CADMIUM	ND (0.04)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.04)	ND (0.05)
CALCIUM	14,500	3,030	10,500	7,330	880	17,200	3,400
CHROMIUM	243 *	119	182	303 *	462 *	264 *	197
COBALT	34.4	16.2	30.9	42.1	64.4	35.5	22.2
COPPER	51.4	12.7	34.9	31.3	4.3	60.6	17.2
IRON	38,200	25,500	32,300	33,900	33,500	39,800	30,100
LEAD	9.2 α	4.0	4.5	6.2	4.3	14.3 α	5.8
MAGNESIUM	63,200	8,630	41,500	88,600	192,000	62,700	15,300
MANGANESE	1,140 *	417 *	687 *	675 *	478 *	1,010 *	451 *
MERCURY	ND (0.05)	ND (0.06)	0.06	0.07	ND (0.06)	ND (0.09)	ND (0.06)
MOLYBDENUM	ND (0.19)	ND (0.21)	ND (0.21)	ND (0.21)	ND (0.21)	2.0	ND (0.21)
NICKEL	395 *	164 *	260 *	581 *	1,490 *	408 *	264 *
POTASSIUM	1,800	475	991	1,360	254	1,920	874
SELENIUM	ND (0.73)	ND (0.79)	ND (0.78)	ND (0.81)	ND (0.81)	ND (0.75)	ND (0.79)
SODIUM	943	ND (77.1)	397	306	985	ND (48.3)	ND (29.6)
THALLIUM	0.88 α	ND (0.46)	1.5 α	2.1 α	ND (0.47)	1.9 α	ND (0.46)
VANADIUM	75.8	64.4	76.3	53.8	15.9	79.9	84.3
ZINC	81.9	36.2	49.5	64.7	36.1	90.2	52.7
Volatile Organic Compound (ug/kg)							
ACETONE	ND (13)	ND (12)	ND (11)	ND (12)	ND (12)	NA	150
CARBON DISULFIDE	ND (11)	ND (12)	ND (11)	ND (12)	ND (12)	NA	7
TRICHLOROETHENE	ND (11)	ND (12)	ND (11)	ND (12)	ND (12)	NA	ND (12)
XYLENE (TOTAL)	ND (11)	ND (12)	ND (11)	ND (12)	ND (12)	NA	ND (12)
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (360)	ND (390)	ND (380)	ND (400)	ND (400)	ND (370)	ND (390)
BENZO(B)FLUORANTHENE	ND (360)	ND (390)	ND (380)	ND (400)	ND (400)	ND (370)	ND (390)
BENZO(G,H,I)PERYLENE	ND (360)	ND (390)	ND (380)	ND (400)	ND (400)	ND (370)	ND (390)
CHRYSENE	ND (360)	ND (390)	ND (380)	ND (400)	ND (400)	ND (370)	ND (390)
DIBENZOFURAN	ND (360)	ND (390)	ND (380)	ND (400)	ND (400)	ND (370)	ND (390)

TABLE 4.27-3 (Continued)

SOIL ANALYTICAL RESULTS - IR-66
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR66B002	IR66B002	IR66B002	IR66B002	IR66B002	IR66B003	IR66B003
Sampling Depth (feet bgs)	1.25	6.25	11.25	16.25	21.25	1.75	6.25
Sample Number	9533C113	9533C114	9533C115	9533C116	9533C117	9533C109	9533C110
Sample Date	08/16/95	08/16/95	08/16/95	08/16/95	08/16/95	08/16/95	08/16/95
Semivolatile Organic Compound (ug/kg)							
FLUORANTHENE	ND (360)	ND (390)	ND (380)	ND (400)	ND (400)	ND (370)	ND (390)
NAPHTHALENE	ND (360)	ND (390)	ND (380)	ND (400)	ND (400)	ND (370)	ND (390)
PHENANTHRENE	ND (360)	ND (390)	ND (380)	ND (400)	ND (400)	ND (370)	ND (390)
PYRENE	ND (360)	ND (390)	ND (380)	ND (400)	ND (400)	ND (370)	ND (390)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
ALDRIN	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
TPH-Extractable (mg/kg)							
TPH-DIESEL	47	ND (12)	ND (11)	ND (12)	6	48	ND (12)
TPH-MOTOR OIL	110	6	ND (11)	ND (12)	12	100	19
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	150	24	ND (11)	13	ND (12)	79	ND (12)
Percent Moisture (%)							
% SOLIDS	93.0	86.4	87.2	83.8	84.4	90.9	86.4
pH (pH units)							
PH	9.0	8.5	8.8	8.3	8.0	8.9	8.6

TABLE 4.27-3 (Continued)

SOIL ANALYTICAL RESULTS - IR-66
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR66B003
Sampling Depth (feet bgs)	10.25
Sample Number	9533C111
Sample Date	08/16/95
Metal (mg/kg)	
ALUMINUM	35,500
ANTIMONY	3.5
ARSENIC	ND (5.0)
BARIUM	119
BERYLLIUM	ND (0.02)
CADMIUM	ND (0.05)
CALCIUM	14,700
CHROMIUM	399 *
COBALT	45.7
COPPER	38.3
IRON	42,500
LEAD	8.7
MAGNESIUM	101,000
MANGANESE	781 *
MERCURY	ND (0.06)
MOLYBDENUM	ND (0.57)
NICKEL	724 *
POTASSIUM	1,220
SELENIUM	ND (0.80)
SODIUM	ND (68.2)
THALLIUM	ND (0.47)
VANADIUM	73.9
ZINC	86.8
Volatile Organic Compound (ug/kg)	
ACETONE	ND (19)
CARBON DISULFIDE	ND (12)
TRICHLOROETHENE	ND (12)
XYLENE (TOTAL)	ND (12)
Semivolatile Organic Compound (ug/kg)	
2-METHYLNAPHTHALENE	ND (390)
BENZO(B)FLUORANTHENE	ND (390)
BENZO(G,H,I)PERYLENE	ND (390)
CHRYSENE	ND (390)
DIBENZOFURAN	ND (390)

TABLE 4.27-3 (Continued)

SOIL ANALYTICAL RESULTS - IR-66
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR66B003
Sampling Depth (feet bgs)	10.25
Sample Number	9533C111
Sample Date	08/16/95
Semivolatile Organic Compound (ug/kg)	
FLUORANTHENE	ND (390)
NAPHTHALENE	ND (390)
PHENANTHRENE	ND (390)
PYRENE	ND (390)
Pesticide/Polychlorinated Biphenyl (ug/kg)	
ALDRIN	ND (2)
TPH-Extractable (mg/kg)	
TPH-DIESEL	ND (12)
TPH-MOTOR OIL	ND (12)
Total Recoverable Petroleum Hydrocarbons (mg/kg)	
TRPH	ND (12)
Percent Moisture (%)	
% SOLIDS	85.5
pH (pH units)	
PH	8.7

Notes:

%	Percent
bgs	Below ground surface
mg/kg	Milligram per kilogram
NA	Not analyzed
ND()	Not detected (detection limit in parentheses)
µg/kg	Microgram per kilogram

*	Detected concentration greater than U.S. Environmental Protection Agency Region IX preliminary remediation goals (PRG) for residential use
#	Detected concentration greater than U.S. Environmental Protection Agency Region IX PRG for industrial use
α	Detected concentration greater than the Hunters Point ambient level.
▒	Detected concentration greater than at least one screening criterion.

TABLE 4.27-4

SUMMARY OF HYDROPUNCH GROUNDWATER ANALYTICAL TESTS - IR-66
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
IR36B085	9434R578																					✓
IR36B118	9426C329																		✓	✓		✓
IR66B001	9533C105																		✓	✓		✓
IR66B003	9533C106																		✓	✓		✓
IR66B003	9533C112																		✓	✓		✓

Notes:

CHROM	CHROMIUM VI
CYAN	Cyanide
DIOXIN	Dioxins and Furans
O&G	Total oil and grease
PAH	Polynuclear aromatic hydrocarbons
PCTMST	Percent moisture
PEST	Pesticides/polychlorinated biphenyls
PHYS	Physical characteristic
SALIN	Salinity
SVOC	Semivolatile organic compounds
SOLIDS	Total dissolved solids
TOC	Total organic carbon
TMICROB	Coliform
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
VOC	Volatile organic compounds

TABLE 4.27-5

STATISTICAL SUMMARY OF HYDROPUNCH GROUNDWATER ANALYTICAL RESULTS - IR-66
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection Frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Tap Water PRG Value	Above[e] PRG	MCL Value[f]	Above[g] MCL	NAWQC Value	Above[h] NAWQC
VOC	2-BUTANONE	20	20	20	UG/L	5	4	1	1,900	0				
	TRICHLOROETHENE	0.5	0.5	0.5	UG/L	1	4	1	2	0	5	0		
TPHPRG	TPH-GASOLINE	29	29	29	UG/L	50	3	1	100	0i				
TPHEXT	TPH-DIESEL	110	150	130	UG/L	100	3	2	100	2i				
	TPH-MOTOR OIL	56	150	88	UG/L	100	3	3	100	1i				

TABLE 4.27-5 (Continued)

STATISTICAL SUMMARY OF HYDROPUNCH GROUNDWATER ANALYTICAL RESULTS - IR-66
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

CYAN	Cyanide
EPA	U.S. Environmental Protection Agency
MCL	Maximum contaminant level
NAWQC	National Ambient Water Quality Criteria
O&G	Total oil and grease
PCTMST	Percent moisture
PEST	Pesticide/polychlorinated biphenyl
PPT	Parts per thousand
PRG	Preliminary remediation goal
SALIN	Salinity
SVOC	Semivolatile organic compound
TMICROB	Coliform
TOC	Total organic carbon
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
UG/L	Microgram per liter
VOC	Volatile organic compound

a Organic results of less than 10 are reported to one significant figure, and results of greater than or equal to 10 are reported to two significant figures. Inorganic results of less than 10 are reported to two significant figures, and results of greater than or equal to 10 are reported to three significant figures. Values that are not nondetects are compared to screening criteria before the significant figure rule is applied. Both the value and the screening criteria are then rounded for reporting purposes.

b Blank boxes indicate that screening critera have not been established for these analytes.

c Total number of samples analyzed

d Total number of samples showing concentrations greater than detection limit

e Total number of samples showing concentrations greater than tap water PRG
California-modified PRGs were used for the following analytes: 1,2-Dibromo-3-chloropropane, benzo[a]pyrene, benzo[k]fluoranthene, cadmium, chromium VI, chrysene, lead, nickel, and tetrachloroethylene (PCE).
For the analytes listed below, Region IX PRGs are not available; therefore, PRGs for similar chemicals were used as follows:

Analyte:	Similar Analyte:
2-Methylnapthalene	Naphthalene
Acenaphthylene	Acenaphthene
Alpha-chlordane	Chlordane
Aroclor-1260	Polychlorinated biphenyls
Benzo(g,h,i)perylene	Naphthalene
Delta BHC	HCH-technical
Endosulfan I	Endosulfan
Endosulfan sulfate	Endosulfan
Endrin aldehyde	Endrin
Endrin ketone	Endrin
Gamma-chlordane	Chlordane
Phenanthrene	Naphthalene

f EPA Title 40 Code of Federal Regulations or California Code of Regulations Title 22 MCL used, whichever is more stringent

g Total number of samples showing concentrations greater than MCL

h Total number of samples showing concentrations greater than NAWQC;
NAWQC based on 4-day average study of saltwater aquatic life

i Total number of samples showing concentrations greater than TPH, TRPH, or O&G screening level, not PRG value

TABLE 4.27-6

HYDROPUNCH GROUNDWATER ANALYTICAL RESULTS - IR-66
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR36B118	IR66B001	IR66B003
Sample Number	9426C329	9533C105	9533C106
Sample Date	06/27/94	08/16/95	08/16/95
Volatile Organic Compound (ug/L)			
2-BUTANONE	20	ND (10)	ND (10)
TRICHLOROETHENE	0.5	ND (0.5)	ND (0.5)
TPH-Purgeable (ug/L)			
TPH-GASOLINE	29	ND (50)	ND (50)
TPH-Extractable (ug/L)			
TPH-DIESEL	ND (100)	150	160
TPH-MOTOR OIL	150	57	62

Notes:

NA Not analyzed
ND() Not detected (detection limit in parentheses)
µg/L Microgram per liter

TABLE 4.28-1

SUMMARY OF OTHER WATER ANALYTICAL TESTS - IR-67
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
IR67TK06	9540W035						√				√	√				√			√	√	√	√
IR67TK07	9540W036						√				√	√				√			√	√	√	√

Notes:

CHROM	CHROMIUM VI
CYAN	Cyanide
DIOXIN	Dioxins and Furans
O&G	Total oil and grease
PAH	Polynuclear aromatic hydrocarbons
PCTMST	Percent moisture
PEST	Pesticides/polychlorinated biphenyls
PHYS	Physical characteristic
SALIN	Salinity
SVOC	Semivolatile organic compounds
SOLIDS	Total dissolved solids
TOC	Total organic carbon
TMICROB	Coliform
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
VOC	Volatile organic compounds

TABLE 4.28-2

STATISTICAL SUMMARY OF OTHER WATER ANALYTICAL RESULTS - IR-67
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection Frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Tap Water PRG Value	Above[e] PRG	MCL Value[f]	Above[g] MCL	NAWQC Value	Above[h] NAWQC
METAL	ANTIMONY	8.4	15.8	12.1	UG/L	3.0	2	2	15.0	1	6.0	2	500	0
	ARSENIC	28.7	28.7	28.7	UG/L	2.8	2	1	0.04	1	50.0	0	36.0	0
	BARIUM	1.0	34.0	17.5	UG/L	0.40	2	2	2,600	0	1,000	0		
	CALCIUM	6,920	25,500	16,200	UG/L	7.0	2	2						
	COPPER	22.7	59.8	41.3	UG/L	0.80	2	2	1,400	0			2.4	2
	IRON	23.2	23.2	23.2	UG/L	13.8	2	1						
	MAGNESIUM	1,240	12,600	6,920	UG/L	3.8	2	2						
	MANGANESE	1.8	2.4	2.1	UG/L	0.30	2	2	180	0				
	MOLYBDENUM	6.4	37.7	22.1	UG/L	1.2	2	2	180	0				
	NICKEL	97.4	97.4	97.4	UG/L	1.3	2	1	730	0	100	0	8.2	1
	POTASSIUM	46,700	53,100	49,900	UG/L	50.1	2	2						
	SODIUM	263,000	395,000	329,000	UG/L	124	2	2						
	VANADIUM	2.0	5.6	3.8	UG/L	0.80	2	2	260	0				
SVOC	PENTACHLOROPHENOL	9	9	9	UG/L	25	2	1	0.6	1	1	1	8	1
TPHEXT	TPH-DIESEL	220	720	470	UG/L	100	2	2	100	2i				
	TPH-MOTOR OIL	250	2,000	1,100	UG/L	100	2	2	100	2i				

TABLE 4.28-2 (Continued)

STATISTICAL SUMMARY OF OTHER WATER ANALYTICAL RESULTS - IR-67
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

CYAN	Cyanide
EPA	U.S. Environmental Protection Agency
MCL	Maximum contaminant level
NAWQC	National Ambient Water Quality Criteria
O&G	Total oil and grease
PCTMST	Percent moisture
PEST	Pesticide/polychlorinated biphenyl
PPT	Parts per thousand
PRG	Preliminary remediation goal
SALIN	Salinity
SVOC	Semivolatile organic compound
TMICROB	Coliform
TOC	Total organic carbon
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
UG/L	Microgram per liter
VOC	Volatile organic compound

a Organic results of less than 10 are reported to one significant figure, and results of greater than or equal to 10 are reported to two significant figures. Inorganic results of less than 10 are reported to two significant figures, and results of greater than or equal to 10 are reported to three significant figures. Values that are not nondetects are compared to screening criteria before the significant figure rule is applied. Both the value and the screening criteria are then rounded for reporting purposes.

b Blank boxes indicate that screening critera have not been established for these analytes.

c Total number of samples analyzed

d Total number of samples showing concentrations greater than detection limit

e Total number of samples showing concentrations greater than tap water PRG
California-modified PRGs were used for the following analytes: 1,2-Dibromo-3-chloropropane, benzo[a]pyrene, benzo[k]fluoranthene, cadmium, chromium VI, chrysene, lead, nickel, and tetrachloroethylene (PCE).
For the analytes listed below, Region IX PRGs are not available; therefore, PRGs for similar chemicals were used as follows:

Analyte:	Similar Analyte:
2-Methylnapthalene	Naphthalene
Acenaphthylene	Acenaphthene
Alpha-chlordane	Chlordane
Aroclor-1260	Polychlorinated biphenyls
Benzo(g,h,i)perylene	Naphthalene
Delta BHC	HCH-technical
Endosulfan I	Endosulfan
Endosulfan sulfate	Endosulfan
Endrin aldehyde	Endrin
Endrin ketone	Endrin
Gamma-chlordane	Chlordane
Phenanthrene	Naphthalene

f EPA Title 40 Code of Federal Regulations or California Code of Regulations Title 22 MCL used, whichever is more stringent

g Total number of samples showing concentrations greater than MCL

h Total number of samples showing concentrations greater than NAWQC;
NAWQC based on 4-day average study of saltwater aquatic life

i Total number of samples showing concentrations greater than TPH, TRPH, or O&G screening level, not PRG value

TABLE 4.28-3

OTHER WATER ANALYTICAL RESULTS - IR-67
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR67TK06	IR67TK07
Sample Number	9540W035	9540W036
Sample Date	10/06/95	10/06/95
Metal (ug/L)		
ANTIMONY	8.4 δ	15.8 *δ
ARSENIC	28.7 *	ND (2.8)
BARIUM	1.0	34.0
CALCIUM	6,920	25,500
COPPER	59.8 ß	22.7 ß
IRON	23.2	ND (13.8)
MAGNESIUM	1,240	12,600
MANGANESE	1.8	2.4
MOLYBDENUM	37.7	6.4
NICKEL	97.4 ß	ND (3.5)
POTASSIUM	46,700	53,100
SODIUM	395,000	263,000
VANADIUM	2.0	5.6
Semivolatile Organic Compound (ug/L)		
PENTACHLOROPHENOL	9 *ßδ	ND (25)
TPH-Extractable (ug/L)		
TPH-DIESEL	220	720
TPH-MOTOR OIL	250	2,000
pH (pH units)		
PH	9.0	8.7

Notes:

NA Not analyzed
ND() Not detected (detection limit in parentheses)
µg/L Microgram per liter

* Detected concentration greater than U.S. Environmental Protection Agency Region IX preliminary remediation goals (PRG) for tap water
ß Detected concentration greater than National Ambient Water Quality Criteria (NAWQC) based on 4-day average study of saltwater aquatic life
δ Detected concentration greater than maximum contaminant level (MCL)
U.S. Environmental Protection Agency Title 40 Code of Federal Regulations or California Code of Regulations Title 22 MCL used, whichever is more stringent

Detected concentration greater than at least one screening criterion.

TABLE 4.28-4

SUMMARY OF SOIL ANALYTICAL TESTS - IR-67
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
IR67B001	9534D034						√			√	√	√				√			√	√	√	
IR67B001	9534D035						√			√	√	√				√			√	√	√	√
IR67B001	9534D036						√			√	√	√				√			√	√	√	√
IR67B001	9534D037												√					√				
IR67B001	9534D038						√			√	√	√				√			√	√	√	√
IR67B001	9534D039						√			√	√	√				√			√	√	√	√
IR67B002	9534D029						√			√	√	√				√			√	√	√	
IR67B002	9534D030						√			√	√	√				√			√	√	√	√
IR67B002	9534D031						√			√	√	√				√			√	√	√	√
IR67B002	9534D032						√			√	√	√				√			√	√	√	√
IR67B002	9534D033						√			√	√	√				√			√	√	√	√
IR67B003	9534D016						√			√	√	√				√			√	√	√	√
IR67B003	9534D017						√			√	√	√				√			√	√	√	√
IR67B003	9534D018						√			√	√	√							√	√		√
IR67B003	9534D019						√			√	√	√				√			√	√	√	√
IR67B003	9534D020						√			√	√	√				√			√	√	√	√
IR67B003	9534D021						√			√	√	√				√			√	√	√	√
IR67B003	9534D022						√			√	√	√				√			√	√	√	√
IR67B003	9534D023						√			√	√	√				√			√	√	√	√
IR67B005	9534D011						√			√	√	√				√			√	√	√	√
IR67B005	9534D012						√			√	√	√				√			√	√	√	√
IR67B005	9534D013						√			√	√	√				√			√	√	√	√
IR67B005	9534D014						√			√	√	√				√			√	√	√	√
IR67B005	9534D015						√			√	√	√				√			√	√	√	√
IR67MW04A	9534D024						√			√	√	√				√			√	√	√	
IR67MW04A	9534D025						√			√	√	√				√			√	√	√	√
IR67MW04A	9534D026						√			√	√	√				√			√	√	√	√
IR67MW04A	9534D027						√			√	√	√				√			√	√	√	√
IR67MW04A	9534D028						√			√	√	√				√			√	√	√	√

TABLE 4.28-4 (Continued)

SUMMARY OF SOIL ANALYTICAL TESTS - IR-67
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

CHROM	CHROMIUM VI
CYAN	Cyanide
DIOXIN	Dioxins and Furans
O&G	Total oil and grease
PAH	Polynuclear aromatic hydrocarbons
PCTMST	Percent moisture
PEST	Pesticides/polychlorinated biphenyls
PHYS	Physical characteristic
SALIN	Salinity
SVOC	Semivolatile organic compounds
SOLIDS	Total dissolved solids
TOC	Total organic carbon
TMICROB	Coliform
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
VOC	Volatile organic compounds

TABLE 4.28-5

STATISTICAL SUMMARY OF SOIL ANALYTICAL RESULTS - IR-67
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection Frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Residential PRG Value	Above[e] Res PRG	Industrial PRG Value	Above[f] Ind PRG	HPAL Value	Above[g] HPAL
METAL	ALUMINUM	4,850	41,300	23,400	MG/KG	3.8	28	28	76,700	0	100,000	0		
	ANTIMONY	3.5	4.7	4.1	MG/KG	0.53	28	2	30.7	0	681	0	9.05	0
	ARSENIC	1.0	10.9	4.9	MG/KG	0.63	28	13	0.32	13	2.0	12	11.10	0
	BARIUM	16.7	646	171	MG/KG	0.07	28	28	5,340	0	100,000	0	314.36	2
	CALCIUM	2,910	196,000	21,100	MG/KG	3.4	28	28						
	CHROMIUM	18.5	328	151	MG/KG	0.42	28	28	211	7	1,580	0	h	0
	COBALT	4.6	51.9	30.3	MG/KG	0.12	28	28					h	1
	COPPER	12.1	75.7	44.0	MG/KG	0.19	28	28	2,850	0	63,300	0	124.31	0
	IRON	9,450	73,600	35,200	MG/KG	3.7	28	28						
	LEAD	2.0	18.3	6.3	MG/KG	0.35	28	27	130	0	1,000	0	8.99	4
	MAGNESIUM	4,560	107,000	34,600	MG/KG	3.8	28	28						
	MANGANESE	246	3,880	1,280	MG/KG	0.14	28	28	382	27	8,300	0	1431.18	8
	MERCURY	0.06	0.17	0.10	MG/KG	0.06	28	8	23.0	0	511	0	2.28	0
	NICKEL	15.7	645	211	MG/KG	0.77	28	28	150	16	34,100	0	h	0
	POTASSIUM	343	2,710	1,050	MG/KG	6.5	28	28						
	SODIUM	83.5	4,870	1,360	MG/KG	31.0	28	14						
	THALLIUM	0.62	7.4	2.8	MG/KG	0.47	28	17					0.81	15
	VANADIUM	19.6	146	80.9	MG/KG	0.14	28	28	537	0	11,900	0	117.17	3
	ZINC	28.9	139	71.7	MG/KG	0.07	28	28	23,000	0	100,000	0	109.86	2
SVOC	2-METHYLNAPHTHALENE	100	130	120	UG/KG	370	27	2	800,000	0	800,000	0		
	ANTHRACENE	75	75	75	UG/KG	370	27	1	19,000	0	19,000	0		
	NAPHTHALENE	180	180	180	UG/KG	370	27	1	800,000	0	800,000	0		

TABLE 4.28-5 (Continued)

STATISTICAL SUMMARY OF SOIL ANALYTICAL RESULTS - IR-67
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection Frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Residential PRG Value	Above[e] Res PRG	Industrial PRG Value	Above[f] Ind PRG	HPAL Value	Above[g] HPAL
	PHENANTHRENE	89	89	89	UG/KG	370	27	1	800,000	0	800,000	0		
TPHEXT	TPH-DIESEL	7	29	17	MG/KG	11	28	7	1,000	0i				
	TPH-MOTOR OIL	9	190	53	MG/KG	13	28	11	1,000	0i				
TRPH	TRPH	14	130	68	MG/KG	11	27	7	1,000	0i				
PHYS	DRY BULK DENSITY	120	120	120	%	0	1	1						
	GRAIN SIZE ANALYSIS - %CLAY	16	16	16	%	0	1	1						
	GRAIN SIZE ANALYSIS - %COBBLE.	0	0	0	%	0	1	1						
	GRAIN SIZE ANALYSIS - %GRAVEL	23	23	23	%	0	1	1						
	GRAIN SIZE ANALYSIS - %SAND	48	48	48	%	0	1	1						
	GRAIN SIZE ANALYSIS - %SILT	14	14	14	%	0	1	1						
	MOISTURE CONTENT	18	18	18	%	0	1	1						
	POROSITY	35	35	35	%	0	1	1						
	WET BULK DENSITY	140	140	140	%	0	1	1						

TABLE 4.28-5 (Continued)

STATISTICAL SUMMARY OF SOIL ANALYTICAL RESULTS - IR-67
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

CYAN	Cyanide
EPA	U.S. Environmental Protection Agency
HPAL	Hunters Point ambient level
MG/KG	Milligram per kilogram
O&G	Total oil and grease
PCTMST	Percent moisture
PEST	Pesticide/polychlorinated biphenyl
PHYS	Physical characteristic
PRG	Preliminary remediation goal
SALIN	Salinity
SVOC	Semivolatile organic compound
TMICROB	Coliform
TOC	Total organic carbon
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
UG/KG	Microgram per kilogram
VOC	Volatile organic compound

a Organic results of less than 10 are reported to one significant figure, and results of greater than or equal to 10 are reported to two significant figures. Inorganic results of less than 10 are reported to two significant figures, and results of greater than or equal to 10 are reported to three significant figures. Values that are not nondetects are compared to screening criteria before the significant figure rule is applied. Both the value and the screening criteria are then rounded for reporting purposes.

b Blank boxes indicate that screening critera have not been established for these analytes.

c Total number of samples analyzed

d Total number of samples showing concentrations greater than detection limit

e Total number of samples showing concentrations greater than residential PRG

f Total number of samples showing concentrations greater than industrial PRG
California-modified PRGs were used for the following analytes: 1,2-Dibromo-3-chloropropane, benzo[a]pyrene, benzo[k]fluoranthene, cadmium, chromium VI, chrysene, lead, nickel, and tetrachloroethylene (PCE).
For the analytes listed below, Region IX PRGs are not available; therefore, PRGs for similar chemicals were used as follows:

Analyte:	Similar Analyte:
2-Methylnapthalene	Naphthalene
Acenaphthylene	Acenaphthene
Alpha-chlordane	Chlordane
Aroclor-1260	Polychlorinated biphenyls
Benzo(g,h,i)perylene	Naphthalene
Delta BHC	HCH-technical
Endosulfan I	Endosulfan
Endosulfan sulfate	Endosulfan
Endrin aldehyde	Endrin
Endrin ketone	Endrin
Gamma-chlordane	Chlordane
Phenanthrene	Naphthalene

g Total number of samples showing concentrations greater than HPAL

h HPALs for chromium, cobalt, and nickel are based on the concentration of magnesium in each sample; thus, no single value applies to all samples. The range of HPAL values for chromium, cobalt, and nickel are 112.506 to 990.432, 20.897 to 107.192, and 111.329 to 2220.533 mg/kg respectively.

i Total number of samples showing concentrations greater than TPH, TRPH, or O&G screening level, not PRG value

TABLE 4.28-6

SOIL ANALYTICAL RESULTS - IR-67
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR67B001	IR67B001	IR67B001	IR67B001	IR67B001	IR67B001	IR67B002
Sampling Depth (feet bgs)	0.75	5.75	10.75	10.75	15.75	20.75	0.75
Sample Number	9534D034	9534D035	9534D036	9534D037	9534D038	9534D039	9534D029
Sample Date	08/22/95	08/22/95	08/22/95	08/22/95	08/22/95	08/22/95	08/22/95
Metal (mg/kg)							
ALUMINUM	31,500	41,300	22,800	NA	15,300	18,900	23,900
ANTIMONY	ND (1.1)	ND (2.7)	ND (2.1)	NA	ND (2.1)	ND (2.7)	ND (1.8)
ARSENIC	1.0 *	5.9 *#	ND (1.4)	NA	ND (2.6)	ND (2.8)	4.9 *#
BARIUM	105	81.2	273	NA	168	145	240
CALCIUM	41,700	11,600	15,500	NA	8,340	10,300	11,100
CHROMIUM	81.7	309 *	137	NA	130	171	194
COBALT	28.8	33.0	37.5	NA	26.0	30.0	28.2
COPPER	40.2	33.6	50.1	NA	31.0	32.9	55.2
IRON	31,800	40,700	40,100	NA	26,800	37,000	34,300
LEAD	3.5	8.2	3.2	NA	4.9	9.1 α	8.4
MAGNESIUM	34,700	97,200	21,300	NA	16,500	15,800	50,500
MANGANESE	959 *	794 *	2,010 *α	NA	960 *	1,050 *	1,820 *α
MERCURY	0.09	0.06	ND (0.06)	NA	ND (0.06)	ND (0.10)	0.08
NICKEL	158 *	530 *	110	NA	170 *	267 *	333 *
POTASSIUM	757	1,190	663	NA	726	878	1,590
SODIUM	ND (91.2)	ND (28.7)	2,210	NA	307	450	ND (28.2)
THALLIUM	ND (0.44)	ND (0.45)	4.1 α	NA	1.4 α	1.7 α	ND (2.4)
VANADIUM	61.0	80.6	99.6	NA	71.0	96.6	66.8
ZINC	52.6	79.0	78.0	NA	54.7	65.9	66.4
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (370)	130	ND (390)	NA	ND (400)	ND (400)	ND (370)
ANTHRACENE	ND (370)	ND (370)	ND (390)	NA	ND (400)	ND (400)	ND (370)
NAPHTHALENE	ND (370)	180	ND (390)	NA	ND (400)	ND (400)	ND (370)
PHENANTHRENE	ND (370)	89	ND (390)	NA	ND (400)	ND (400)	ND (370)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (11)	ND (11)	ND (12)	NA	ND (12)	ND (12)	27
TPH-MOTOR OIL	9	ND (11)	ND (12)	NA	ND (12)	ND (12)	85
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	ND (11)	ND (11)	ND (12)	NA	ND (12)	ND (12)	130

TABLE 4.28-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-67
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR67B001	IR67B001	IR67B001	IR67B001	IR67B001	IR67B001	IR67B002
Sampling Depth (feet bgs)	0.75	5.75	10.75	10.75	15.75	20.75	0.75
Sample Number	9534D034	9534D035	9534D036	9534D037	9534D038	9534D039	9534D029
Sample Date	08/22/95	08/22/95	08/22/95	08/22/95	08/22/95	08/22/95	08/22/95
Percent Moisture (%)							
% SOLIDS	90.7	89.0	84.7	NA	81.7	82.6	90.6
pH (pH units)							
PH	8.3	8.9	7.5	NA	8.5	8.2	8.2
Physical Characteristic (%)							
DRY BULK DENSITY	NA	NA	NA	120	NA	NA	NA
GRAIN SIZE ANALYSIS - %CLAY	NA	NA	NA	16	NA	NA	NA
GRAIN SIZE ANALYSIS - %COBBLES	NA	NA	NA		NA	NA	NA
GRAIN SIZE ANALYSIS - %GRAVEL	NA	NA	NA	23	NA	NA	NA
GRAIN SIZE ANALYSIS - %SAND	NA	NA	NA	48	NA	NA	NA
GRAIN SIZE ANALYSIS - %SILT	NA	NA	NA	14	NA	NA	NA
MOISTURE CONTENT	NA	NA	NA	18	NA	NA	NA
POROSITY	NA	NA	NA	35	NA	NA	NA
WET BULK DENSITY	NA	NA	NA	140	NA	NA	NA

TABLE 4.28-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-67
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR67B002	IR67B002	IR67B002	IR67B002	IR67B003	IR67B003	IR67B003
Sampling Depth (feet bgs)	5.75	10.75	15.75	20.75	1.25	5.50	12.25
Sample Number	9534D030	9534D031	9534D032	9534D033	9534D016	9534D017	9534D018
Sample Date	08/22/95	08/22/95	08/22/95	08/22/95	08/21/95	08/21/95	08/21/95
Metal (mg/kg)							
ALUMINUM	29,700	13,800	23,200	25,000	23,200	26,600	4,850
ANTIMONY	ND (2.6)	ND (1.4)	ND (1.4)	ND (2.0)	ND (2.6)	ND (1.9)	ND (0.46)
ARSENIC	4.7 *#	2.4 *#	2.1 *#	ND (0.62)	10.9 *#	ND (4.6)	ND (2.6)
BARIUM	322 α	165	284	66.8	210	165	216
CALCIUM	17,300	6,850	15,000	15,700	9,820	14,600	2,910
CHROMIUM	328 *	141	113	32.1	228 *	157	18.5
COBALT	45.8	24.1	34.7	29.2	27.0	34.3	13.7
COPPER	75.7	29.2	70.6	36.9	39.3	50.3	27.9
IRON	42,300	29,400	37,400	51,900	30,100	39,100	9,940
LEAD	7.2	7.4	3.2	2.9	8.6	18.3 α	2.5
MAGNESIUM	81,600	10,000	22,600	22,700	47,900	45,400	4,560
MANGANESE	2,240 *α	607 *	1,900 *α	1,570 *α	1,080 *	1,070 *	1,400 *
MERCURY	0.09	ND (0.06)	ND (0.06)	ND (0.06)	ND (0.06)	0.13	ND (0.05)
NICKEL	520 *	170 *	97.4	15.7	318 *	290 *	38.9
POTASSIUM	1,150	642	657	455	1,870	1,550	343
SODIUM	ND (27.9)	ND (235)	ND (564)	1,560	ND (28.6)	ND (28.5)	ND (26.6)
THALLIUM	4.5 α	ND (0.67)	ND (3.1)	3.6 α	0.64	1.2 α	1.9 α
VANADIUM	104	89.5	80.0	145 α	60.1	87.2	21.4
ZINC	93.3	51.5	80.7	95.0	67.7	85.4	30.2
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (360)	ND (400)	ND (380)	ND (370)	100	ND (370)	NA
ANTHRACENE	ND (360)	ND (400)	ND (380)	ND (370)	75	ND (370)	NA
NAPHTHALENE	ND (360)	ND (400)	ND (380)	ND (370)	ND (370)	ND (370)	NA
PHENANTHRENE	ND (360)	ND (400)	ND (380)	ND (370)	ND (370)	ND (370)	NA
TPH-Extractable (mg/kg)							
TPH-DIESEL	13	ND (12)	ND (11)	ND (11)	26	8	ND (10)
TPH-MOTOR OIL	12	ND (12)	ND (11)	ND (11)	54	60	ND (10)
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	ND (11)	ND (12)	ND (11)	ND (11)	62	100	NA

TABLE 4.28-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-67
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR67B002	IR67B002	IR67B002	IR67B002	IR67B003	IR67B003	IR67B003
Sampling Depth (feet bgs)	5.75	10.75	15.75	20.75	1.25	5.50	12.25
Sample Number	9534D030	9534D031	9534D032	9534D033	9534D016	9534D017	9534D018
Sample Date	08/22/95	08/22/95	08/22/95	08/22/95	08/21/95	08/21/95	08/21/95
Percent Moisture (%)							
% SOLIDS	91.6	83.2	88.0	90.8	89.4	89.7	96.2
pH (pH units)							
PH	8.2	8.2	7.4	7.2	8.6	8.6	8.2
Physical Characteristic (%)							
DRY BULK DENSITY	NA	NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %CLAY	NA	NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %COBBLES	NA	NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %GRAVEL	NA	NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %SAND	NA	NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %SILT	NA	NA	NA	NA	NA	NA	NA
MOISTURE CONTENT	NA	NA	NA	NA	NA	NA	NA
POROSITY	NA	NA	NA	NA	NA	NA	NA
WET BULK DENSITY	NA	NA	NA	NA	NA	NA	NA

TABLE 4.28-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-67
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR67B003	IR67B003	IR67B003	IR67B003	IR67B003	IR67B005	IR67B005
Sampling Depth (feet bgs)	16.00	20.75	25.75	30.75	32.75	1.25	5.75
Sample Number	9534D019	9534D020	9534D021	9534D022	9534D023	9534D011	9534D012
Sample Date	08/21/95	08/21/95	08/21/95	08/21/95	08/21/95	08/21/95	08/21/95
Metal (mg/kg)							
ALUMINUM	18,700	22,800	39,100	34,900	6,610	20,000	15,100
ANTIMONY	ND (2.2)	ND (1.6)	3.5	ND (2.6)	ND (0.61)	ND (1.7)	ND (2.4)
ARSENIC	ND (3.0)	ND (0.62)	ND (1.5)	ND (0.73)	ND (3.8)	6.9 *#	ND (0.69)
BARIUM	68.4	59.3	183	113	16.7	144	646 α
CALCIUM	9,920	17,800	33,600	31,000	196,000	9,370	9,740
CHROMIUM	134	66.2	111	91.7	22.0	211 *	110
COBALT	21.4	27.4	51.9	40.8	4.6	27.1	45.4 α
COPPER	29.7	48.1	65.1	57.4	12.1	37.3	64.1
IRON	31,000	32,300	73,600	62,500	9,450	28,300	31,400
LEAD	5.0	ND (1.3)	3.7	3.2	2.7	7.2	4.2
MAGNESIUM	17,300	14,100	31,400	27,400	5,110	47,100	15,000
MANGANESE	585 *	683 *	2,510 *α	1,930 *α	246	1,030 *	3,880 *α
MERCURY	ND (0.10)	ND (0.06)	ND (0.06)	ND (0.07)	ND (0.07)	ND (0.09)	ND (0.05)
NICKEL	161 *	29.4	96.6	71.7	21.8	291 *	105
POTASSIUM	733	374	1,700	1,170	2,710	1,360	482
SODIUM	643	897	2,600	2,420	4,870	ND (28.6)	140
THALLIUM	ND (0.47)	3.0 α	7.4 α	4.8 α	0.62	1.0 α	6.0 α
VANADIUM	92.7	112	146 α	127 α	19.6	58.5	47.8
ZINC	58.4	55.2	139 α	128 α	28.9	70.0	77.1
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (390)	ND (370)	ND (420)	ND (430)	ND (480)	ND (370)	ND (350)
ANTHRACENE	ND (390)	ND (370)	ND (420)	ND (430)	ND (480)	ND (370)	ND (350)
NAPHTHALENE	ND (390)	ND (370)	ND (420)	ND (430)	ND (480)	ND (370)	ND (350)
PHENANTHRENE	ND (390)	ND (370)	ND (420)	ND (430)	ND (480)	ND (370)	ND (350)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (12)	ND (11)	ND (13)	ND (13)	ND (14)	29	ND (11)
TPH-MOTOR OIL	ND (12)	ND (11)	ND (13)	ND (13)	ND (14)	19	9
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	ND (12)	ND (11)	ND (13)	ND (13)	ND (14)	ND (11)	14

TABLE 4.28-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-67
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR67B003	IR67B003	IR67B003	IR67B003	IR67B003	IR67B005	IR67B005
Sampling Depth (feet bgs)	16.00	20.75	25.75	30.75	32.75	1.25	5.75
Sample Number	9534D019	9534D020	9534D021	9534D022	9534D023	9534D011	9534D012
Sample Date	08/21/95	08/21/95	08/21/95	08/21/95	08/21/95	08/21/95	08/21/95
Percent Moisture (%)							
% SOLIDS	84.5	90.0	77.7	76.8	69.0	89.4	94.8
pH (pH units)							
PH	7.6	7.1	8.2	8.6	8.8	8.6	8.0
Physical Characteristic (%)							
DRY BULK DENSITY	NA	NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %CLAY	NA	NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %COBBLES	NA	NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %GRAVEL	NA	NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %SAND	NA	NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %SILT	NA	NA	NA	NA	NA	NA	NA
MOISTURE CONTENT	NA	NA	NA	NA	NA	NA	NA
POROSITY	NA	NA	NA	NA	NA	NA	NA
WET BULK DENSITY	NA	NA	NA	NA	NA	NA	NA

TABLE 4.28-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-67
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR67B005	IR67B005	IR67B005	IR67MW04A	IR67MW04A	IR67MW04A	IR67MW04A
Sampling Depth (feet bgs)	11.25	15.75	20.75	0.75	5.75	10.75	15.75
Sample Number	9534D013	9534D014	9534D015	9534D024	9534D025	9534D026	9534D027
Sample Date	08/21/95	08/21/95	08/21/95	08/22/95	08/22/95	08/22/95	08/22/95
Metal (mg/kg)							
ALUMINUM	27,800	23,600	24,300	21,800	16,300	16,500	31,200
ANTIMONY	ND (2.7)	ND (1.1)	ND (1.0)	ND (1.7)	ND (0.70)	ND (1.5)	4.7
ARSENIC	6.9 *#	ND (2.4)	ND (0.72)	2.8 *#	6.4 *#	3.6 *#	5.6 *#
BARIUM	165	162	70.9	203	76.6	128	184
CALCIUM	15,300	16,900	17,500	12,500	6,090	10,900	14,200
CHROMIUM	277 *	122	91.4	146	65.3	138	307 *
COBALT	40.2	25.0	31.0	28.2	15.0	20.8	39.1
COPPER	64.3	40.1	42.9	63.3	16.8	30.4	47.8
IRON	38,200	33,400	34,200	32,000	27,700	24,700	38,100
LEAD	9.3 α	3.3	2.0	12.0 α	6.4	8.5	7.9
MAGNESIUM	50,900	16,100	19,800	35,400	16,000	26,300	67,800
MANGANESE	1,020 *	712 *	1,250 *	1,200 *	801 *	691 *	1,020 *
MERCURY	ND (0.06)	ND (0.06)	ND (0.06)	0.17	ND (0.05)	ND (0.06)	0.08
NICKEL	398 *	99.6	70.5	198 *	72.4	182 *	452 *
POTASSIUM	1,420	513	645	1,160	1,050	1,130	1,790
SODIUM	83.5	512	1,270	ND (27.8)	ND (27.9)	ND (29.6)	ND (220)
THALLIUM	1.2 α	1.4 α	2.8 α	ND (1.4)	ND (1.2)	ND (1.1)	ND (1.1)
VANADIUM	78.5	114	91.2	73.1	53.4	55.9	71.4
ZINC	84.6	62.8	65.2	80.4	46.6	58.3	77.8
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (380)	ND (380)	ND (390)	ND (360)	ND (360)	ND (390)	ND (410)
ANTHRACENE	ND (380)	ND (380)	ND (390)	ND (360)	ND (360)	ND (390)	ND (410)
NAPHTHALENE	ND (380)	ND (380)	ND (390)	ND (360)	ND (360)	ND (390)	ND (410)
PHENANTHRENE	ND (380)	ND (380)	ND (390)	ND (360)	ND (360)	ND (390)	ND (410)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (12)	ND (12)	ND (12)	ND (27)	ND (11)	10	7
TPH-MOTOR OIL	ND (12)	ND (12)	ND (12)	190	18	98	33
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	ND (12)	ND (12)	ND (12)	110	19	42	ND (12)

TABLE 4.28-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-67
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR67B005	IR67B005	IR67B005	IR67MW04A	IR67MW04A	IR67MW04A	IR67MW04A
Sampling Depth (feet bgs)	11.25	15.75	20.75	0.75	5.75	10.75	15.75
Sample Number	9534D013	9534D014	9534D015	9534D024	9534D025	9534D026	9534D027
Sample Date	08/21/95	08/21/95	08/21/95	08/22/95	08/22/95	08/22/95	08/22/95
Percent Moisture (%)							
% SOLIDS	85.6	85.6	84.5	92.0	91.7	86.4	82.0
pH (pH units)							
PH	8.7	7.6	7.3	8.2	8.5	9.3	7.9
Physical Characteristic (%)							
DRY BULK DENSITY	NA	NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %CLAY	NA	NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %COBBLES	NA	NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %GRAVEL	NA	NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %SAND	NA	NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %SILT	NA	NA	NA	NA	NA	NA	NA
MOISTURE CONTENT	NA	NA	NA	NA	NA	NA	NA
POROSITY	NA	NA	NA	NA	NA	NA	NA
WET BULK DENSITY	NA	NA	NA	NA	NA	NA	NA

TABLE 4.28-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-67
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR67MW04A
Sampling Depth (feet bgs)	20.75
Sample Number	9534D028
Sample Date	08/22/95
Metal (mg/kg)	
ALUMINUM	36,800
ANTIMONY	ND (2.4)
ARSENIC	ND (0.74)
BARIUM	128
CALCIUM	8,210
CHROMIUM	317 *
COBALT	39.0
COPPER	39.6
IRON	39,200
LEAD	8.5
MAGNESIUM	107,000
MANGANESE	856 *
MERCURY	0.09
NICKEL	645 *
POTASSIUM	626
SODIUM	1,120
THALLIUM	ND (1.4)
VANADIUM	60.9
ZINC	73.7
Semivolatile Organic Compound (ug/kg)	
2-METHYLNAPHTHALENE	ND (440)
ANTHRACENE	ND (440)
NAPHTHALENE	ND (440)
PHENANTHRENE	ND (440)
TPH-Extractable (mg/kg)	
TPH-DIESEL	ND (13)
TPH-MOTOR OIL	ND (13)
Total Recoverable Petroleum Hydrocarbons (mg/kg)	
TRPH	ND (13)

TABLE 4.28-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-67
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR67MW04A
Sampling Depth (feet bgs)	20.75
Sample Number	9534D028
Sample Date	08/22/95
Percent Moisture (%)	
% SOLIDS	75.7
pH (pH units)	
PH	7.6
Physical Characteristic (%)	
DRY BULK DENSITY	NA
GRAIN SIZE ANALYSIS - %CLAY	NA
GRAIN SIZE ANALYSIS - %COBBLES	NA
GRAIN SIZE ANALYSIS - %GRAVEL	NA
GRAIN SIZE ANALYSIS - %SAND	NA
GRAIN SIZE ANALYSIS - %SILT	NA
MOISTURE CONTENT	NA
POROSITY	NA
WET BULK DENSITY	NA

Notes:

%	Percent
bgs	Below ground surface
mg/kg	Milligram per kilogram
NA	Not analyzed
ND()	Not detected (detection limit in parentheses)
µg/kg	Microgram per kilogram
*	Detected concentration greater than U.S. Environmental Protection Agency Region IX preliminary remediation goals (PRG) for residential use
#	Detected concentration greater than U.S. Environmental Protection Agency Region IX PRG for industrial use
α	Detected concentration greater than the Hunters Point ambient level.
▒	Detected concentration greater than at least one screening criterion.

TABLE 4.28-7

SUMMARY OF MONITORING WELL GROUNDWATER ANALYTICAL TESTS - IR-67
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
IR36MW16A	9439X498						√				√	√				√			√	√	√	√
IR36MW16A	9439X499						√				√	√				√			√	√	√	√
IR36MW16A	9605W054						√				√	√				√			√	√	√	√
IR36MW16A	9610J906						√				√	√				√			√	√	√	√
IR36MW16A	9610J907						√				√	√				√			√	√	√	√
IR67MW04A	9544W139						√				√	√				√			√	√	√	√
IR67MW04A	9602J792						√				√	√				√			√	√	√	√
IR67MW04A	9607J877						√					√				√			√	√	√	√
IR67MW04A	9615Z039	√									√	√		√						√		

Notes:

CHROM	CHROMIUM VI
CYAN	Cyanide
DIOXIN	Dioxins and Furans
O&G	Total oil and grease
PAH	Polynuclear aromatic hydrocarbons
PCTMST	Percent moisture
PEST	Pesticides/polychlorinated biphenyls
PHYS	Physical characteristic
SALIN	Salinity
SVOC	Semivolatile organic compounds
SOLIDS	Total dissolved solids
TOC	Total organic carbon
TMICROB	Coliform
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
VOC	Volatile organic compounds

TABLE 4.28-8

STATISTICAL SUMMARY OF MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-67
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Tap Water PRG Value	Above[e] PRG	MCL Value[f]	Above[g] MCL	NAWQC Value	Above[h] NAWQC
METAL	ALUMINUM	585	585	585	UG/L	95.5	6	1	37,000	0				
	ANTIMONY	4.1	4.1	4.1	UG/L	1.2	6	1	15.0	0	6.0	0	500	0
	ARSENIC	1.8	2.6	2.2	UG/L	1.5	6	2	0.04	2	50.0	0	36.0	0
	BARIUM	44.0	86.1	64.9	UG/L	1.2	6	6	2,600	0	1,000	0		
	CADMIUM	0.25	5.7	1.7	UG/L	0.40	6	4	18.0	0	5.0	1	9.3	0
	CALCIUM	493,000	1,470,000	912,000	UG/L	41.8	6	6						
	COBALT	2.6	20.0	8.8	UG/L	0.73	6	6						
	COPPER	1.3	1.3	1.3	UG/L	2.5	6	1	1,400	0			2.4	0
	IRON	17.8	713	257	UG/L	25.7	6	3						
	MAGNESIUM	1,540,000	2,070,000	1,790,000	UG/L	97.9	6	6						
	MANGANESE	12,400	29,600	18,700	UG/L	0.23	6	6	180	6				
	MERCURY	0.10	0.10	0.10	UG/L	0.10	6	2	11.0	0	2.0	0	0.03	2
	MOLYBDENUM	3.2	3.2	3.2	UG/L	3.0	6	1	180	0				
	NICKEL	24.5	73.1	50.7	UG/L	1.7	6	5	730	0	100	0	8.2	5
	POTASSIUM	16,000	70,500	27,400	UG/L	869	6	6						
	SODIUM	2,060,000	3,380,000	2,530,000	UG/L	131	6	6						
	THALLIUM	11.7	50.7	31.2	UG/L	2.0	6	2			2.0	2		
	VANADIUM	4.9	4.9	4.9	UG/L	2.0	6	1	260	0				
	ZINC	19.5	79.6	54.2	UG/L	2.3	6	3	11,000	0			81.0	0
SVOC	HEXACHLOROETHANE	100	100	100	UG/L	10	6	1	5	1				
TPHEXT	TPH-DIESEL	73	73	73	UG/L	100	6	1	100	0i				
	TPH-MOTOR OIL	62	570	260	UG/L	100	6	3	100	2i				

TABLE 4.28-8 (Continued)

STATISTICAL SUMMARY OF MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-67
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Tap Water PRG Value	Above[e] PRG	MCL Value[f]	Above[g] MCL	NAWQC Value	Above[h] NAWQC
TRPH	TRPH	500	500	500	UG/L	1,000	6	1	100	1i				
ANION	CHLORIDE	10,200,000	10,200,000	10,200,000	UG/L	400,000	1	1						
	FLUORIDE	130	130	130	UG/L	100	1	1			1,400	0		
	SULFATE	1,420,000	1,420,000	1,420,000	UG/L	6,250	1	1						
SALIN	SALINITY	14.7	14.7	14.7	PPT	0.005	1	1						

TABLE 4.28-8 (Continued)

STATISTICAL SUMMARY OF MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-67
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

CYAN	Cyanide
EPA	U.S. Environmental Protection Agency
MCL	Maximum contaminant level
NAWQC	National Ambient Water Quality Criteria
O&G	Total oil and grease
PCTMST	Percent moisture
PEST	Pesticide/polychlorinated biphenyl
PPT	Parts per thousand
PRG	Preliminary remediation goal
SALIN	Salinity
SVOC	Semivolatile organic compound
TMICROB	Coliform
TOC	Total organic carbon
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
UG/L	Microgram per liter
VOC	Volatile organic compound

a Organic results of less than 10 are reported to one significant figure, and results of greater than or equal to 10 are reported to two significant figures. Inorganic results of less than 10 are reported to two significant figures, and results of greater than or equal to 10 are reported to three significant figures. Values that are not nondetects are compared to screening criteria before the significant figure rule is applied. Both the value and the screening criteria are then rounded for reporting purposes.

b Blank boxes indicate that screening critera have not been established for these analytes.

c Total number of samples analyzed

d Total number of samples showing concentrations greater than detection limit

e Total number of samples showing concentrations greater than tap water PRG
California-modified PRGs were used for the following analytes: 1,2-Dibromo-3-chloropropane, benzo[a]pyrene, benzo[k]fluoranthene, cadmium, chromium VI, chrysene, lead, nickel, and tetrachloroethylene (PCE).
For the analytes listed below, Region IX PRGs are not available; therefore, PRGs for similar chemicals were used as follows:

Analyte:	Similar Analyte:
2-Methylnapthalene	Naphthalene
Acenaphthylene	Acenaphthene
Alpha-chlordane	Chlordane
Aroclor-1260	Polychlorinated biphenyls
Benzo(g,h,i)perylene	Naphthalene
Delta BHC	HCH-technical
Endosulfan I	Endosulfan
Endosulfan sulfate	Endosulfan
Endrin aldehyde	Endrin
Endrin ketone	Endrin
Gamma-chlordane	Chlordane
Phenanthrene	Naphthalene

f EPA Title 40 Code of Federal Regulations or California Code of Regulations Title 22 MCL used, whichever is more stringent

g Total number of samples showing concentrations greater than MCL

h Total number of samples showing concentrations greater than NAWQC;
NAWQC based on 4-day average study of saltwater aquatic life

i Total number of samples showing concentrations greater than TPH, TRPH, or O&G screening level, not PRG value

TABLE 4.28-9

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-67
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR36MW16A	IR36MW16A	IR36MW16A	IR36MW16A	IR36MW16A	IR67MW04A	IR67MW04A
Sample Number	9439X498	9439X499	9605W054	9610J906	9610J907	9544W139	9602J792
Sample Date	09/27/94	09/27/94	01/31/96	03/05/96	03/05/96	10/31/95	01/11/96
Metal (ug/L)							
ALUMINUM	ND (35.3)	ND (35.3)	ND (18.0)	1,160	ND (19.1)	ND (18.8)	ND (37.1)
ANTIMONY	7.6 δ	ND (1.2)	ND (1.6)	ND (8.0)	ND (1.6)	ND (3.0)	ND (1.6)
ARSENIC	2.0 *	3.2 *	ND (1.4)	ND (7.0)	ND (1.4)	ND (2.8)	1.8 *
BARIUM	45.5	44.1	44.0	71.0	48.8	86.1	78.7
CADMIUM	0.33	0.44	ND (0.54)	ND (1.0)	0.56	5.7 δ	0.25
CALCIUM	1,580,000	1,360,000	523,000	1,410,000	524,000	1,420,000	592,000
COBALT	4.7	4.0	2.6	5.7	3.9	20.0	11.9
COPPER	ND (1.7)	ND (1.7)	ND (2.2)	ND (2.5)	1.4	ND (1.2)	ND (1.3)
IRON	ND (18.8)	ND (18.8)	ND (11.0)	1,420	ND (11.0)	ND (68.0)	41.0
MAGNESIUM	2,100,000	1,840,000	1,620,000	1,650,000	1,710,000	1,860,000	1,540,000
MANGANESE	12,200 *	12,500 *	13,000 *	16,800 *	14,100 *	29,600 *	20,200 *
MERCURY	ND (0.10)	ND (0.10)	0.10 δ	ND (0.10)	ND (0.10)	ND (0.10)	0.10 δ
MOLYBDENUM	ND (1.5)	ND (2.2)	ND (1.8)	4.9	1.4	ND (1.2)	ND (1.2)
NICKEL	55.8 δ	55.1 δ	56.3 δ	86.4 δ	59.8 δ	44.3 δ	ND (24.3)
POTASSIUM	70,500	70,600	18,000	18,200	18,100	19,800	16,000
SODIUM	2,770,000	2,780,000	2,290,000	2,140,000	2,220,000	2,470,000	2,060,000
THALLIUM	11.4 δ	11.9 δ	ND (1.9)	ND (9.5)	ND (1.9)	50.7 δ	ND (8.2)
VANADIUM	ND (1.1)	ND (1.1)	ND (1.9)	6.6	3.1	ND (0.80)	ND (0.40)
ZINC	ND (3.1)	ND (3.1)	ND (13.8)	24.5	14.4	ND (10.5)	63.5
Semivolatile Organic Compound (ug/L)							
HEXACHLOROETHANE	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	100 *	ND (10)
TPH-Extractable (ug/L)							
TPH-DIESEL	63	82	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)
TPH-MOTOR OIL	400	740	ND (100)	ND (100)	74	ND (100)	ND (100)
Total Recoverable Petroleum Hydrocarbons (ug/L)							
TRPH	ND (1,000)	500	ND (1,000)	ND (1,000)	ND (1,000)	ND (1,000)	ND (1,000)
Anion (ug/L)							
CHLORIDE	NA	NA	NA	NA	NA	NA	NA
FLUORIDE	NA	NA	NA	NA	NA	NA	NA
SULFATE	NA	NA	NA	NA	NA	NA	NA

TABLE 4.28-9 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-67
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR36MW16A	IR36MW16A	IR36MW16A	IR36MW16A	IR36MW16A	IR67MW04A	IR67MW04A
Sample Number	9439X498	9439X499	9605W054	9610J906	9610J907	9544W139	9602J792
Sample Date	09/27/94	09/27/94	01/31/96	03/05/96	03/05/96	10/31/95	01/11/96
pH (pH units)							
PH	6.8	6.7	6.8	6.7	6.7	6.7	6.7
Salinity (ppt)							
SALINITY	NA	NA	NA	NA	NA	NA	NA

TABLE 4.28-9 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-67
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR67MW04A	IR67MW04A
Sample Number	9607J877	9615Z039
Sample Date	02/15/96	04/08/96
Metal (ug/L)		
ALUMINUM	ND (19.1)	NA
ANTIMONY	ND (1.6)	NA
ARSENIC	ND (1.4)	NA
BARIUM	76.1	NA
CADMIUM	ND (0.30)	NA
CALCIUM	493,000	NA
COBALT	9.2	NA
COPPER	ND (0.50)	NA
IRON	17.8	NA
MAGNESIUM	2,070,000	NA
MANGANESE	21,700 *	NA
MERCURY	ND (0.10)	NA
MOLYBDENUM	ND (0.60)	NA
NICKEL	24.5 B	NA
POTASSIUM	21,900	NA
SODIUM	3,380,000	NA
THALLIUM	ND (1.9)	NA
VANADIUM	ND (0.40)	NA
ZINC	79.6	NA
Semivolatile Organic Compound (ug/L)		
HEXACHLOROETHANE	ND (10)	NA
TPH-Extractable (ug/L)		
TPH-DIESEL	ND (100)	NA
TPH-MOTOR OIL	150	NA
Total Recoverable Petroleum Hydrocarbons (ug/L)		
TRPH	ND (1,000)	NA
Anion (ug/L)		
CHLORIDE	NA	10,200,000
FLUORIDE	NA	130
SULFATE	NA	1,420,000

TABLE 4.28-9 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-67
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR67MW04A	IR67MW04A
Sample Number	9607J877	96152039
Sample Date	02/15/96	04/08/96
pH (pH units)		
PH	6.5	6.8
Salinity (ppt)		
SALINITY	NA	14.7

Notes:

NA	Not analyzed
ND()	Not detected (detection limit in parentheses)
ppt	Parts per thousand
µg/L	Microgram per liter
*	Detected concentration greater than U.S. Environmental Protection Agency Region IX preliminary remediation goals (PRG) for tap water
ß	Detected concentration greater than National Ambient Water Quality Criteria (NAWQC) based on 4-day average study of saltwater aquatic life
δ	Detected concentration greater than maximum contaminant level (MCL) U.S. Environmental Protection Agency Title 40 Code of Federal Regulations or California Code of Regulations Title 22 MCL used, whichever is more stringent
▒	Detected concentration greater than at least one screening criterion.

TABLE 4.28-10

SUMMARY OF HYDROPUNCH GROUNDWATER ANALYTICAL TESTS - IR-67
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
IR67B001	9534B016																		√	√		√
IR67B002	9534B012																		√	√		√
IR67B005	9534B007																		√	√		√
IR67B005	9534B008																		√	√		√
IR67MW04A	9534B010																		√	√		√

Notes:

CHROM	CHROMIUM VI
CYAN	Cyanide
DIOXIN	Dioxins and Furans
O&G	Total oil and grease
PAH	Polynuclear aromatic hydrocarbons
PCTMST	Percent moisture
PEST	Pesticides/polychlorinated biphenyls
PHYS	Physical characteristic
SALIN	Salinity
SVOC	Semivolatile organic compounds
SOLIDS	Total dissolved solids
TOC	Total organic carbon
TMICROB	Coliform
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
VOC	Volatile organic compounds

TABLE 4.28-11

STATISTICAL SUMMARY OF HYDROPUNCH GROUNDWATER ANALYTICAL RESULTS - IR-67
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Tap Water PRG Value	Above[e] PRG	MCL Value[f]	Above[g] MCL	NAWQC Value	Above[h] NAWQC
TPHEXT	TPH-DIESEL	160	410	260	UG/L	100	4	4	100	4i				
	TPH-MOTOR OIL	87	390	190	UG/L	100	4	4	100	3i				

TABLE 4.28-11 (Continued)

STATISTICAL SUMMARY OF HYDROPUNCH GROUNDWATER ANALYTICAL RESULTS - IR-67
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

CYAN	Cyanide
EPA	U.S. Environmental Protection Agency
MCL	Maximum contaminant level
NAWQC	National Ambient Water Quality Criteria
O&G	Total oil and grease
PCTMST	Percent moisture
PEST	Pesticide/polychlorinated biphenyl
PPT	Parts per thousand
PRG	Preliminary remediation goal
SALIN	Salinity
SVOC	Semivolatile organic compound
TMICROB	Coliform
TOC	Total organic carbon
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
UG/L	Microgram per liter
VOC	Volatile organic compound

a Organic results of less than 10 are reported to one significant figure, and results of greater than or equal to 10 are reported to two significant figures. Inorganic results of less than 10 are reported to two significant figures, and results of greater than or equal to 10 are reported to three significant figures. Values that are not nondetects are compared to screening criteria before the significant figure rule is applied. Both the value and the screening criteria are then rounded for reporting purposes.

b Blank boxes indicate that screening critera have not been established for these analytes.

c Total number of samples analyzed

d Total number of samples showing concentrations greater than detection limit

e Total number of samples showing concentrations greater than tap water PRG
California-modified PRGs were used for the following analytes: 1,2-Dibromo-3-chloropropane, benzo[a]pyrene, benzo[k]fluoranthene, cadmium, chromium VI, chrysene, lead, nickel, and tetrachloroethylene (PCE).
For the analytes listed below, Region IX PRGs are not available; therefore, PRGs for similar chemicals were used as follows:

Analyte:	Similar Analyte:
2-Methylnapthalene	Naphthalene
Acenaphthylene	Acenaphthene
Alpha-chlordane	Chlordane
Aroclor-1260	Polychlorinated biphenyls
Benzo(g,h,i)perylene	Naphthalene
Delta BHC	HCH-technical
Endosulfan I	Endosulfan
Endosulfan sulfate	Endosulfan
Endrin aldehyde	Endrin
Endrin ketone	Endrin
Gamma-chlordane	Chlordane
Phenanthrene	Naphthalene

f EPA Title 40 Code of Federal Regulations or California Code of Regulations Title 22 MCL used, whichever is more stringent

g Total number of samples showing concentrations greater than MCL

h Total number of samples showing concentrations greater than NAWQC;
NAWQC based on 4-day average study of saltwater aquatic life

i Total number of samples showing concentrations greater than TPH, TRPH, or O&G screening level, not PRG value

TABLE 4.28-12

HYDROPUNCH GROUNDWATER ANALYTICAL RESULTS - IR-67
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR67B001	IR67B002	IR67B005	IR67B005	IR67MW04A
Sample Number	9534B016	9534B012	9534B007	9534B008	9534B010
Sample Date	08/22/95	08/22/95	08/21/95	08/21/95	08/22/95
TPH-Extractable (ug/L)					
TPH-DIESEL	160	170	290	280	410
TPH-MOTOR OIL	120	87	170	180	390

Notes:

NA Not analyzed
ND() Not detected (detection limit in parentheses)
µg/L Microgram per liter

TABLE 4.32-1

SUMMARY OF OTHER SEDIMENT ANALYTICAL TESTS - IR-71
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
IR71SB05	9535J139						✓			✓	✓	✓				✓			✓	✓	✓	

Notes:

CHROM	CHROMIUM VI
CYAN	Cyanide
DIOXIN	Dioxins and Furans
O&G	Total oil and grease
PAH	Polynuclear aromatic hydrocarbons
PCTMST	Percent moisture
PEST	Pesticides/polychlorinated biphenyls
PHYS	Physical characteristic
SALIN	Salinity
SVOC	Semivolatile organic compounds
SOLIDS	Total dissolved solids
TOC	Total organic carbon
TMICROB	Coliform
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
VOC	Volatile organic compounds

TABLE 4.32-2

STATISTICAL SUMMARY OF OTHER SEDIMENT ANALYTICAL RESULTS - IR-71
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Residential PRG Value	Above[e] Res PRG	Industrial PRG Value	Above[f] Ind PRG	HPAL Value	Above[g] HPAL
METAL	ALUMINUM	8,070	8,070	8,070	MG/KG	3.3	1	1	76,700	0	100,000	0		
	ANTIMONY	48.0	48.0	48.0	MG/KG	0.42	1	1	30.7	1	681	0	9.05	1
	ARSENIC	10.5	10.5	10.5	MG/KG	0.56	1	1	0.32	1	2.0	1	11.10	0
	BARIUM	262	262	262	MG/KG	0.06	1	1	5,340	0	100,000	0	314.36	0
	CADMIUM	0.63	0.63	0.63	MG/KG	0.04	1	1	9.0	0	852	0	3.14	0
	CALCIUM	25,900	25,900	25,900	MG/KG	2.9	1	1						
	CHROMIUM	97.6	97.6	97.6	MG/KG	0.36	1	1	211	0	1,580	0	h	0
	COBALT	17.8	17.8	17.8	MG/KG	0.10	1	1					h	0
	COPPER	2,000	2,000	2,000	MG/KG	0.16	1	1	2,850	0	63,300	0	124.31	1
	IRON	60,100	60,100	60,100	MG/KG	3.1	1	1						
	LEAD	413	413	413	MG/KG	0.30	1	1	130	1	1,000	0	8.99	1
	MAGNESIUM	5,170	5,170	5,170	MG/KG	3.3	1	1						
	MANGANESE	956	956	956	MG/KG	0.12	1	1	382	1	8,300	0	1431.18	0
	MERCURY	0.07	0.07	0.07	MG/KG	0.05	1	1	23.0	0	511	0	2.28	0
	MOLYBDENUM	26.5	26.5	26.5	MG/KG	0.18	1	1	383	0	8,520	0	2.68	1
	NICKEL	40.2	40.2	40.2	MG/KG	0.66	1	1	150	0	34,100	0	h	0
	POTASSIUM	1,280	1,280	1,280	MG/KG	5.6	1	1						
	SODIUM	400	400	400	MG/KG	25.6	1	1						
	VANADIUM	29.1	29.1	29.1	MG/KG	0.12	1	1	537	0	11,900	0	117.17	0
	ZINC	1,210	1,210	1,210	MG/KG	0.06	1	1	23,000	0	100,000	0	109.86	1
SVOC	BENZO(A)ANTHRACENE	340	340	340	UG/KG	330	1	1	610	0	2,600	0		
	BENZO(A)PYRENE	300	300	300	UG/KG	330	1	1	61	1	260	1		

TABLE 4.32-2 (Continued)

STATISTICAL SUMMARY OF OTHER SEDIMENT ANALYTICAL RESULTS - IR-71
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Residential PRG Value	Above[e] Res PRG	Industrial PRG Value	Above[f] Ind PRG	HPAL Value	Above[g] HPAL
	BENZO(B)FLUORANTHENE	860	860	860	UG/KG	330	1	1	610	1	2,600	0		
	BENZO(K)FLUORANTHENE	220	220	220	UG/KG	1,600	1	1	610	0	26,000	0		
	BIS(2-ETHYLHEXYL)PHTHALATE	5,500	5,500	5,500	UG/KG	330	1	1	32,000	0	140,000	0		
	CHRYSENE	480	480	480	UG/KG	330	1	1	6,100	0	24,000	0		
	FLUORANTHENE	630	630	630	UG/KG	330	1	1	2,600,000	0	27,000,000	0		
	PHENANTHRENE	610	610	610	UG/KG	330	1	1	800,000	0	800,000	0		
	PYRENE	960	960	960	UG/KG	330	1	1	2,000,000	0	20,000,000	0		
PEST	AROCLOR-1260	92	92	92	UG/KG	170	1	1	66	1	340	0		
TPHEXT	TPH-DIESEL	90	90	90	MG/KG	50	1	1	1,000	0i				
	TPH-MOTOR OIL	760	760	760	MG/KG	50	1	1	1,000	0i				
TRPH	TRPH	880	880	880	MG/KG	50	1	1	1,000	0i				

TABLE 4.32-2 (Continued)

STATISTICAL SUMMARY OF OTHER SEDIMENT ANALYTICAL RESULTS - IR-71
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

CYAN	Cyanide
EPA	U.S. Environmental Protection Agency
HPAL	Hunters Point ambient level
MG/KG	Milligram per kilogram
O&G	Total oil and grease
PCTMST	Percent moisture
PEST	Pesticide/polychlorinated biphenyl
PHYS	Physical characteristic
PRG	Preliminary remediation goal
SALIN	Salinity
SVOC	Semivolatile organic compound
TMICROB	Coliform
TOC	Total organic carbon
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
UG/KG	Microgram per kilogram
VOC	Volatile organic compound

a Organic results of less than 10 are reported to one significant figure, and results of greater than or equal to 10 are reported to two significant figures. Inorganic results of less than 10 are reported to two significant figures, and results of greater than or equal to 10 are reported to three significant figures. Values that are not nondetects are compared to screening criteria before the significant figure rule is applied. Both the value and the screening criteria are then rounded for reporting purposes.

b Blank boxes indicate that screening critera have not been established for these analytes.

c Total number of samples analyzed

d Total number of samples showing concentrations greater than detection limit

e Total number of samples showing concentrations greater than residential PRG

f Total number of samples showing concentrations greater than industrial PRG

California-modified PRGs were used for the following analytes: 1,2-Dibromo-3-chloropropane, benzo[a]pyrene, benzo[k]fluoranthene, cadmium, chromium VI, chrysene, lead, nickel, and tetrachloroethylene (PCE).

For the analytes listed below, Region IX PRGs are not available; therefore, PRGs for similar chemicals were used as follows:

Analyte:	Similar Analyte:
2-Methylnapthalene	Naphthalene
Acenaphthylene	Acenaphthene
Alpha-chlordane	Chlordane
Aroclor-1260	Polychlorinated biphenyls
Benzo(g,h,i)perylene	Naphthalene
Delta BHC	HCH-technical
Endosulfan I	Endosulfan
Endosulfan sulfate	Endosulfan
Endrin aldehyde	Endrin
Endrin ketone	Endrin
Gamma-chlordane	Chlordane
Phenanthrene	Naphthalene

g Total number of samples showing concentrations greater than HPAL

h HPALs for chromium, cobalt, and nickel are based on the concentration of magnesium in each sample; thus, no single value applies to all samples. The range of HPAL values for chromium, cobalt, and nickel are 122.672 to 122.672, 22.301 to 22.301, and 125.404 to 125.404 mg/kg respectively.

i Total number of samples showing concentrations greater than TPH, TRPH, or O&G screening level, not PRG value

TABLE 4.32-3

OTHER SEDIMENT ANALYTICAL RESULTS - IR-71
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR71SB05
Sampling Depth (feet bgs)	0.00
Sample Number	9535J139
Sample Date	09/01/95
Metal (mg/kg)	
ALUMINUM	8,070
ANTIMONY	48.0 *α
ARSENIC	10.5 *#
BARIUM	262
CADMIUM	0.63
CALCIUM	25,900
CHROMIUM	97.6
COBALT	17.8
COPPER	2,000 α
IRON	60,100
LEAD	413 *α
MAGNESIUM	5,170
MANGANESE	956 *
MERCURY	0.07
MOLYBDENUM	26.5 α
NICKEL	40.2
POTASSIUM	1,280
SODIUM	400
VANADIUM	29.1
ZINC	1,210 α
Semivolatile Organic Compound (ug/kg)	
BENZO(A)ANTHRACENE	340
BENZO(A)PYRENE	300 *#
BENZO(B)FLUORANTHENE	860 *
BENZO(K)FLUORANTHENE	220
BIS(2-ETHYLHEXYL)PHTHALATE	5,500
CHRYSENE	480
FLUORANTHENE	630
PHENANTHRENE	610
PYRENE	960
Pesticide/Polychlorinated Biphenyl (ug/kg)	
AROCLOR-1260	92 *

TABLE 4.32-3 (Continued)

OTHER SEDIMENT ANALYTICAL RESULTS - IR-71
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR71SB05
Sampling Depth (feet bgs)	0.00
Sample Number	9535J139
Sample Date	09/01/95
TPH-Extractable (mg/kg)	
TPH-DIESEL	90
TPH-MOTOR OIL	760
Total Recoverable Petroleum Hydrocarbons (mg/kg)	
TRPH	880
Percent Moisture (%)	
% SOLIDS	100
pH (pH units)	
PH	8.2

Notes:

%	Percent
bgs	Below ground surface
mg/kg	Milligram per kilogram
NA	Not analyzed
ND()	Not detected (detection limit in parentheses)
µg/kg	Microgram per kilogram
*	Detected concentration greater than U.S. Environmental Protection Agency Region IX preliminary remediation goals (PRG) for residential use
#	Detected concentration greater than U.S. Environmental Protection Agency Region IX PRG for industrial use
α	Detected concentration greater than the Hunters Point ambient level.
▒	Detected concentration greater than at least one screening criterion.

TABLE 4.32-4

SUMMARY OF SOIL ANALYTICAL TESTS - IR-71
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
IR71B002	9533C118						✓			✓	✓	✓				✓			✓	✓	✓	
IR71B002	9533C119						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR71B002	9533C120												✓					✓				
IR71B002	9533C121						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR71B002	9533C122						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR71B002	9533C123						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR71B002	9533C124												✓					✓				
IR71B004	9533D001						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR71B004	9533D002						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR71B004	9533D003						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR71B004	9533D004						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR71B004	9533D005						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR71B006A	9535J119						✓			✓	✓	✓				✓			✓	✓	✓	
IR71B006A	9535J120						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR71B007	9535J121						✓			✓	✓	✓				✓			✓	✓	✓	
IR71B007	9535J125						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR71B007	9535J126						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR71B007	9535J127						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR71B008	9535J128						✓			✓	✓	✓				✓			✓	✓	✓	
IR71B008	9535J129						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR71B008	9535J130						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR71B008	9535J131						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR71B009	9535J132						✓			✓	✓	✓				✓			✓	✓	✓	
IR71B009	9535J133						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR71B009	9535J134						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR71B009	9535J135						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR71B010	9605G046						✓			✓	✓	✓				✓			✓	✓	✓	
IR71B010	9605G047						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR71B010	9605G048						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR71B011	9604J792						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR71B011	9604J793						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR71B011	9604J794						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR71MW03A	9533G045						✓			✓	✓	✓				✓			✓	✓	✓	
IR71MW03A	9533G046						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR71MW03A	9533G047						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR71MW03A	9533G050						✓			✓	✓	✓				✓			✓	✓	✓	✓
IR71MW03A	9533G051						✓			✓	✓	✓				✓			✓	✓	✓	✓

TABLE 4.32-4 (Continued)

SUMMARY OF SOIL ANALYTICAL TESTS - IR-71
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

CHROM	CHROMIUM VI
CYAN	Cyanide
DIOXIN	Dioxins and Furans
O&G	Total oil and grease
PAH	Polynuclear aromatic hydrocarbons
PCTMST	Percent moisture
PEST	Pesticides/polychlorinated biphenyls
PHYS	Physical characteristic
SALIN	Salinity
SVOC	Semivolatile organic compounds
SOLIDS	Total dissolved solids
TOC	Total organic carbon
TMICROB	Coliform
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
VOC	Volatile organic compounds

TABLE 4.32-5

STATISTICAL SUMMARY OF SOIL ANALYTICAL RESULTS - IR-71
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Residential PRG Value	Above[e] Res PRG	Industrial PRG Value	Above[f] Ind PRG	HPAL Value	Above[g] HPAL
METAL	ALUMINUM	9,980	40,700	26,000	MG/KG	3.7	35	35	76,700	0	100,000	0		
	ANTIMONY	0.75	3.4	2.3	MG/KG	0.41	35	8	30.7	0	681	0	9.05	0
	ARSENIC	0.66	6.7	1.6	MG/KG	0.53	35	18	0.32	18	2.0	3	11.10	0
	BARIUM	16.9	202	100	MG/KG	0.07	35	35	5,340	0	100,000	0	314.36	0
	CALCIUM	2,720	161,000	24,700	MG/KG	3.2	35	35						
	CHROMIUM	37.2	150	92.3	MG/KG	0.35	35	35	211	0	1,580	0	h	0
	COBALT	8.7	46.9	31.7	MG/KG	0.11	35	35					h	1
	COPPER	19.9	176	72.6	MG/KG	0.17	35	35	2,850	0	63,300	0	124.31	2
	IRON	15,300	56,100	37,200	MG/KG	3.7	35	35						
	LEAD	1.7	83.7	11.9	MG/KG	0.30	35	26	130	0	1,000	0	8.99	8
	MAGNESIUM	8,210	35,200	19,300	MG/KG	3.6	35	35						
	MANGANESE	286	2,780	938	MG/KG	0.11	35	35	382	34	8,300	0	1431.18	2
	MERCURY	0.08	0.66	0.28	MG/KG	0.05	35	8	23.0	0	511	0	2.28	0
	MOLYBDENUM	3.2	3.2	3.2	MG/KG	0.19	35	1	383	0	8,520	0	2.68	1
	NICKEL	19.6	246	52.6	MG/KG	0.63	35	35	150	1	34,100	0	h	0
	POTASSIUM	285	3,630	1,160	MG/KG	5.9	35	35						
	SODIUM	44.1	5,070	2,380	MG/KG	29.0	35	15						
	THALLIUM	0.71	4.3	2.7	MG/KG	0.47	35	15					0.81	14
	VANADIUM	30.3	188	108	MG/KG	0.13	35	35	537	0	11,900	0	117.17	13
	ZINC	42.1	260	87.3	MG/KG	0.09	35	35	23,000	0	100,000	0	109.86	6
VOC	CARBON DISULFIDE	5	18	12	UG/KG	12	28	2	16,000	0	52,000	0		
SVOC	2-METHYLNAPHTHALENE	220	220	220	UG/KG	350	35	1	800,000	0	800,000	0		

TABLE 4.32-5 (Continued)

STATISTICAL SUMMARY OF SOIL ANALYTICAL RESULTS - IR-71
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Residential PRG Value	Above[e] Res PRG	Industrial PRG Value	Above[f] Ind PRG	HPAL Value	Above[g] HPAL
	BENZO(A)ANTHRACENE	300	300	300	UG/KG	350	35	1	610	0	2,600	0		
	CHRYSENE	290	290	290	UG/KG	350	35	1	6,100	0	24,000	0		
	FLUORANTHENE	160	200	180	UG/KG	350	35	2	2,600,000	0	27,000,000	0		
	PHENANTHRENE	320	320	320	UG/KG	350	35	1	800,000	0	800,000	0		
	PYRENE	350	350	350	UG/KG	350	35	1	2,000,000	0	20,000,000	0		
PEST	AROCLOR-1260	18	51	37	UG/KG	46	35	3	66	0	340	0		
TPHPRG	TPH-GASOLINE	0.3	1	0.8	MG/KG	0.5	35	2	100	0i				
TPHEXT	TPH-DIESEL	6	1,300	150	MG/KG	68	35	13	1,000	1i				
	TPH-MOTOR OIL	6	4,200	520	MG/KG	52	35	18	1,000	2i				
TRPH	TRPH	6	2,800	300	MG/KG	19	35	21	1,000	1i				
PHYS	DRY BULK DENSITY	74	110	91	%	0	2	2						
	GRAIN SIZE ANALYSIS - %CLAY	6	29	18	%	0	2	2						
	GRAIN SIZE ANALYSIS - %COBBLE.	0	0	0	%	0	2	2						
	GRAIN SIZE ANALYSIS - %GRAVEL	4	40	22	%	0	2	2						
	GRAIN SIZE ANALYSIS - %SAND	48	52	50	%	0	2	2						
	GRAIN SIZE ANALYSIS - %SILT	6	14	10	%	0	2	2						
	MOISTURE CONTENT	13	47	30	%	0	2	2						
	POROSITY	40	57	48	%	0	2	2						
	WET BULK DENSITY	110	120	110	%	0	2	2						
TOC	TOTAL ORGANIC CARBON	340,000	23,000,000	11,000,000	UG/KG	100,000	2	2						

TABLE 4.32-5 (Continued)

STATISTICAL SUMMARY OF SOIL ANALYTICAL RESULTS - IR-71
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

CYAN	Cyanide
EPA	U.S. Environmental Protection Agency
HPAL	Hunters Point ambient level
MG/KG	Milligram per kilogram
O&G	Total oil and grease
PCTMST	Percent moisture
PEST	Pesticide/polychlorinated biphenyl
PHYS	Physical characteristic
PRG	Preliminary remediation goal
SALIN	Salinity
SVOC	Semivolatile organic compound
TMICROB	Coliform
TOC	Total organic carbon
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
UG/KG	Microgram per kilogram
VOC	Volatile organic compound

a Organic results of less than 10 are reported to one significant figure, and results of greater than or equal to 10 are reported to two significant figures. Inorganic results of less than 10 are reported to two significant figures, and results of greater than or equal to 10 are reported to three significant figures. Values that are not nondetects are compared to screening criteria before the significant figure rule is applied. Both the value and the screening criteria are then rounded for reporting purposes.

b Blank boxes indicate that screening critera have not been established for these analytes.

c Total number of samples analyzed

d Total number of samples showing concentrations greater than detection limit

e Total number of samples showing concentrations greater than residential PRG

f Total number of samples showing concentrations greater than industrial PRG
California-modified PRGs were used for the following analytes: 1,2-Dibromo-3-chloropropane, benzo[a]pyrene, benzo[k]fluoranthene, cadmium, chromium VI, chrysene, lead, nickel, and tetrachloroethylene (PCE).
For the analytes listed below, Region IX PRGs are not available; therefore, PRGs for similar chemicals were used as follows:

Analyte:	Similar Analyte:
2-Methylnapthalene	Naphthalene
Acenaphthylene	Acenaphthene
Alpha-chlordane	Chlordane
Aroclor-1260	Polychlorinated biphenyls
Benzo(g,h,i)perylene	Naphthalene
Delta BHC	HCH-technical
Endosulfan I	Endosulfan
Endosulfan sulfate	Endosulfan
Endrin aldehyde	Endrin
Endrin ketone	Endrin
Gamma-chlordane	Chlordane
Phenanthrene	Naphthalene

g Total number of samples showing concentrations greater than HPAL

h HPALs for chromium, cobalt, and nickel are based on the concentration of magnesium in each sample; thus, no single value applies to all samples. The range of HPAL values for chromium, cobalt, and nickel are 168.715 to 460.157, 28.338 to 60.245, and 194.433 to 773.358 mg/kg respectively.

i Total number of samples showing concentrations greater than TPH, TRPH, or O&G screening level, not PRG value

TABLE 4.32-6

SOIL ANALYTICAL RESULTS - IR-71
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR71B002	IR71B002	IR71B002	IR71B002	IR71B002	IR71B002	IR71B002
Sampling Depth (feet bgs)	0.75	5.75	5.25	10.25	15.25	25.75	31.25
Sample Number	9533C118	9533C119	9533C120	9533C121	9533C122	9533C123	9533C124
Sample Date	08/17/95	08/17/95	08/17/95	08/17/95	08/17/95	08/17/95	08/17/95
Metal (mg/kg)							
ALUMINUM	20,800	24,200	NA	27,700	19,700	9,980	NA
ANTIMONY	ND (1.9)	ND (1.5)	NA	ND (1.5)	ND (2.3)	ND (0.67)	NA
ARSENIC	ND (2.6)	ND (0.58)	NA	ND (1.3)	ND (0.72)	6.7 *#	NA
BARIUM	202	127	NA	102	48.1	16.9	NA
CALCIUM	30,000	24,500	NA	15,300	14,000	161,000	NA
CHROMIUM	150	57.0	NA	71.7	66.7	46.8	NA
COBALT	31.0	28.6	NA	34.6	24.9	8.7	NA
COPPER	44.3	60.2	NA	81.0	49.5	19.9	NA
IRON	31,900	28,700	NA	41,100	29,200	15,300	NA
LEAD	35.4 α	ND (1.9)	NA	2.7	ND (1.9)	4.6	NA
MAGNESIUM	35,200	12,200	NA	22,500	14,600	8,210	NA
MANGANESE	822 *	830 *	NA	969 *	612 *	286	NA
MERCURY	0.10	ND (0.05)	NA	ND (0.06)	ND (0.06)	ND (0.07)	NA
MOLYBDENUM	ND (0.19)	ND (0.19)	NA	ND (0.21)	ND (0.21)	ND (0.34)	NA
NICKEL	246 *	29.6	NA	31.0	23.7	46.5	NA
POTASSIUM	1,270	913	NA	1,550	1,410	3,630	NA
SODIUM	ND (27.0)	ND (26.6)	NA	4,990	3,880	5,070	NA
THALLIUM	1.9 α	3.4 α	NA	4.0 α	2.6 α	ND (0.54)	NA
VANADIUM	77.3	81.6	NA	120 α	89.7	30.3	NA
ZINC	86.5	56.5	NA	143 α	63.7	42.1	NA
Volatile Organic Compound (ug/kg)							
CARBON DISULFIDE	NA	ND (10)	NA	ND (12)	ND (12)	18	NA
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (350)	ND (350)	NA	ND (390)	ND (390)	ND (440)	NA
BENZO(A)ANTHRACENE	300	ND (350)	NA	ND (390)	ND (390)	ND (440)	NA
CHRYSENE	290	ND (350)	NA	ND (390)	ND (390)	ND (440)	NA
FLUORANTHENE	200	ND (350)	NA	ND (390)	ND (390)	ND (440)	NA
PHENANTHRENE	ND (350)	ND (350)	NA	ND (390)	ND (390)	ND (440)	NA
PYRENE	350	ND (350)	NA	ND (390)	ND (390)	ND (440)	NA
Pesticide/Polychlorinated Biphenyl (ug/kg)							
AROCLOR-1260	ND (70)	ND (35)	NA	ND (39)	ND (39)	ND (44)	NA

TABLE 4.32-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-71
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR71B002	IR71B002	IR71B002	IR71B002	IR71B002	IR71B002	IR71B002
Sampling Depth (feet bgs)	0.75	5.75	5.25	10.25	15.25	25.75	31.25
Sample Number	9533C118	9533C119	9533C120	9533C121	9533C122	9533C123	9533C124
Sample Date	08/17/95	08/17/95	08/17/95	08/17/95	08/17/95	08/17/95	08/17/95
TPH-Purgeable (mg/kg)							
TPH-GASOLINE	ND (0.5)	ND (0.5)	NA	ND (0.6)	ND (0.6)	ND (0.7)	NA
TPH-Extractable (mg/kg)							
TPH-DIESEL	24	ND (10)	NA	ND (12)	ND (12)	ND (13)	NA
TPH-MOTOR OIL	200	ND (10)	NA	ND (12)	ND (12)	ND (13)	NA
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	420	ND (10)	NA	ND (12)	ND (12)	ND (13)	NA
Percent Moisture (%)							
% SOLIDS	94.8	96.3	NA	86.0	86.4	74.6	NA
pH (pH units)							
PH	8.7	8.3	NA	7.7	7.6	8.9	NA
Physical Characteristic (%)							
DRY BULK DENSITY	NA	NA	110	NA	NA	NA	74
GRAIN SIZE ANALYSIS - %CLAY	NA	NA	6	NA	NA	NA	29
GRAIN SIZE ANALYSIS - %COBBLES	NA	NA		NA	NA	NA	
GRAIN SIZE ANALYSIS - %GRAVEL	NA	NA	40	NA	NA	NA	4
GRAIN SIZE ANALYSIS - %SAND	NA	NA	48	NA	NA	NA	52
GRAIN SIZE ANALYSIS - %SILT	NA	NA	6	NA	NA	NA	14
MOISTURE CONTENT	NA	NA	13	NA	NA	NA	47
POROSITY	NA	NA	40	NA	NA	NA	57
WET BULK DENSITY	NA	NA	120	NA	NA	NA	110
Total Organic Carbon (ug/kg)							
TOTAL ORGANIC CARBON	NA	NA	340,000	NA	NA	NA	23,000,000

TABLE 4.32-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-71
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR71B004	IR71B004	IR71B004	IR71B004	IR71B004	IR71B006A	IR71B006A
Sampling Depth (feet bgs)	3.25	5.75	10.75	15.75	20.75	0.75	2.50
Sample Number	9533D001	9533D002	9533D003	9533D004	9533D005	9535J119	9535J120
Sample Date	08/18/95	08/18/95	08/18/95	08/18/95	08/18/95	08/31/95	08/31/95
Metal (mg/kg)							
ALUMINUM	20,500	21,800	16,400	15,900	31,300	40,700	38,300
ANTIMONY	2.5	ND (2.0)	ND (2.1)	ND (1.1)	ND (2.3)	ND (2.1)	3.2
ARSENIC	ND (0.85)	ND (1.8)	ND (1.9)	ND (0.66)	ND (0.65)	0.94 *	1.1 *
BARIUM	88.9	77.8	70.3	47.7	99.7	91.3	101
CALCIUM	13,400	15,100	8,830	10,400	16,900	30,800	40,000
CHROMIUM	54.5	71.3	70.4	44.5	96.8	150	142
COBALT	30.8	24.6	22.7	21.6	41.0	39.3	37.6
COPPER	57.7	53.3	39.1	42.8	72.7	84.2	105
IRON	34,700	31,800	27,200	23,900	45,400	49,500	46,200
LEAD	3.1	13.1 α	4.4	ND (1.6)	3.3	4.3	24.1 α
MAGNESIUM	14,000	14,300	9,330	11,700	22,400	21,200	25,100
MANGANESE	883 *	768 *	679 *	552 *	1,060 *	1,100 *	1,020 *
MERCURY	ND (0.05)	0.08	ND (0.06)	ND (0.06)	ND (0.06)	ND (0.06)	0.17
MOLYBDENUM	ND (0.19)	ND (0.19)	ND (0.21)	ND (0.21)	ND (0.21)	ND (0.20)	ND (0.19)
NICKEL	24.3	40.4	42.1	19.6	48.0	56.7	60.4
POTASSIUM	694	934	592	285	448	820	2,030
SODIUM	ND (27.4)	ND (26.8)	1,380	1,170	4,990	1,850	ND (810)
THALLIUM	4.3 α	4.2 α	1.4 α	2.2 α	3.1 α	ND (0.45)	ND (0.42)
VANADIUM	103	83.8	80.7	75.1	141 α	152 α	136 α
ZINC	62.5	78.0	53.4	63.1	98.7	130 α	126 α
Volatile Organic Compound (ug/kg)							
CARBON DISULFIDE	ND (11)	ND (10)	ND (12)	ND (12)	ND (12)	NA	ND (10)
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (360)	ND (350)	ND (400)	ND (390)	ND (390)	ND (370)	ND (350)
BENZO(A)ANTHRACENE	ND (360)	ND (350)	ND (400)	ND (390)	ND (390)	ND (370)	ND (350)
CHRYSENE	ND (360)	ND (350)	ND (400)	ND (390)	ND (390)	ND (370)	ND (350)
FLUORANTHENE	ND (360)	ND (350)	ND (400)	ND (390)	ND (390)	ND (370)	ND (350)
PHENANTHRENE	ND (360)	ND (350)	ND (400)	ND (390)	ND (390)	ND (370)	ND (350)
PYRENE	ND (360)	ND (350)	ND (400)	ND (390)	ND (390)	ND (370)	ND (350)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
AROCLOR-1260	ND (36)	41	ND (40)	ND (39)	ND (39)	ND (37)	ND (69)

TABLE 4.32-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-71
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR71B004	IR71B004	IR71B004	IR71B004	IR71B004	IR71B006A	IR71B006A
Sampling Depth (feet bgs)	3.25	5.75	10.75	15.75	20.75	0.75	2.50
Sample Number	9533D001	9533D002	9533D003	9533D004	9533D005	9535J119	9535J120
Sample Date	08/18/95	08/18/95	08/18/95	08/18/95	08/18/95	08/31/95	08/31/95
TPH-Purgeable (mg/kg)							
TPH-GASOLINE	ND (0.5)	ND (0.5)	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.6)	ND (0.5)
TPH-Extractable (mg/kg)							
TPH-DIESEL	18	10	ND (12)	ND (12)	ND (12)	6	42
TPH-MOTOR OIL	130	160	ND (12)	ND (12)	ND (12)	77	460
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	320	240	ND (12)	ND (12)	ND (12)	13	990
Percent Moisture (%)							
% SOLIDS	93.4	95.6	84.2	85.0	85.7	89.3	95.9
pH (pH units)							
PH	8.5	8.6	7.6	7.1	7.3	9.1	9.4
Physical Characteristic (%)							
DRY BULK DENSITY	NA	NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %CLAY	NA	NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %COBBLES	NA	NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %GRAVEL	NA	NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %SAND	NA	NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %SILT	NA	NA	NA	NA	NA	NA	NA
MOISTURE CONTENT	NA	NA	NA	NA	NA	NA	NA
POROSITY	NA	NA	NA	NA	NA	NA	NA
WET BULK DENSITY	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon (ug/kg)							
TOTAL ORGANIC CARBON	NA	NA	NA	NA	NA	NA	NA

TABLE 4.32-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-71
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR71B007	IR71B007	IR71B007	IR71B007	IR71B008	IR71B008	IR71B008
Sampling Depth (feet bgs)	0.25	2.00	5.00	10.25	0.25	2.50	4.75
Sample Number	9535J121	9535J125	9535J126	9535J127	9535J128	9535J129	9535J130
Sample Date	08/31/95	08/31/95	08/31/95	08/31/95	08/31/95	08/31/95	08/31/95
Metal (mg/kg)							
ALUMINUM	27,000	35,100	35,800	30,000	28,100	32,800	39,000
ANTIMONY	3.2	ND (2.2)	ND (2.3)	ND (1.9)	3.4	3.0	ND (2.5)
ARSENIC	2.0 *	0.92 *	1.0 *	ND (0.64)	3.8 *#	0.66 *	1.3 *
BARIUM	158	114	92.9	67.4	131	87.2	98.0
CALCIUM	24,500	32,700	35,700	21,200	22,400	24,000	31,500
CHROMIUM	106	117	122	89.7	133	107	114
COBALT	31.0	36.5	33.6	32.2	27.9	44.6	46.9
COPPER	92.4	96.6	77.2	72.4	176 α	83.4	92.9
IRON	38,100	41,700	41,300	39,900	38,700	48,200	56,100
LEAD	45.1 α	16.1 α	6.3	ND (2.4)	83.7 α	6.3	3.4
MAGNESIUM	24,000	24,900	27,000	18,300	21,000	22,400	23,300
MANGANESE	1,030 *	1,160 *	892 *	801 *	785 *	1,180 *	1,190 *
MERCURY	0.58	0.11	0.08	ND (0.06)	0.66	ND (0.05)	ND (0.05)
MOLYBDENUM	ND (0.46)	ND (0.19)	ND (0.19)	ND (0.26)	3.2 α	ND (0.19)	ND (0.20)
NICKEL	88.2	60.4	54.7	37.1	91.0	38.4	40.4
POTASSIUM	1,840	2,740	2,320	847	1,650	1,040	1,660
SODIUM	ND (242)	ND (27.0)	ND (26.9)	1,840	ND (103)	ND (27.6)	ND (28.0)
THALLIUM	ND (0.42)	ND (0.42)	ND (0.42)	ND (0.46)	ND (0.43)	ND (0.43)	ND (0.44)
VANADIUM	98.0	111	111	119 α	104	157 α	171 α
ZINC	126 α	103	92.4	106	260 α	99.7	106
Volatile Organic Compound (ug/kg)							
CARBON DISULFIDE	NA	ND (11)	ND (11)	ND (11)	NA	ND (11)	ND (11)
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (350)	ND (350)	ND (350)	ND (380)	220	ND (360)	ND (370)
BENZO(A)ANTHRACENE	ND (3,500)	ND (1,800)	ND (350)	ND (380)	ND (3,500)	ND (360)	ND (370)
CHRYSENE	ND (3,500)	ND (1,800)	ND (350)	ND (380)	ND (3,500)	ND (360)	ND (370)
FLUORANTHENE	ND (350)	ND (350)	ND (350)	ND (380)	160	ND (360)	ND (370)
PHENANTHRENE	ND (350)	ND (350)	ND (350)	ND (380)	320	ND (360)	ND (370)
PYRENE	ND (3,500)	ND (1,800)	ND (350)	ND (380)	ND (3,500)	ND (360)	ND (370)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
AROCLOR-1260	ND (69)	ND (70)	ND (35)	ND (38)	ND (350)	18	ND (37)

TABLE 4.32-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-71
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR71B007	IR71B007	IR71B007	IR71B007	IR71B008	IR71B008	IR71B008
Sampling Depth (feet bgs)	0.25	2.00	5.00	10.25	0.25	2.50	4.75
Sample Number	9535J121	9535J125	9535J126	9535J127	9535J128	9535J129	9535J130
Sample Date	08/31/95	08/31/95	08/31/95	08/31/95	08/31/95	08/31/95	08/31/95
TPH-Purgeable (mg/kg)							
TPH-GASOLINE	0.3	ND (0.5)	ND (0.5)	ND (0.6)	1	ND (0.5)	ND (0.6)
TPH-Extractable (mg/kg)							
TPH-DIESEL	210	74	41	ND (11)	1,300	47	ND (11)
TPH-MOTOR OIL	2,100	650	330	ND (11)	4,200	310	6
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	2,800	86	37	ND (11)	920	130	41
Percent Moisture (%)							
% SOLIDS	96.2	94.6	95.1	87.7	93.6	92.7	91.3
pH (pH units)							
PH	9.0	9.0	8.9	8.5	8.6	8.3	8.3
Physical Characteristic (%)							
DRY BULK DENSITY	NA	NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %CLAY	NA	NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %COBBLES	NA	NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %GRAVEL	NA	NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %SAND	NA	NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %SILT	NA	NA	NA	NA	NA	NA	NA
MOISTURE CONTENT	NA	NA	NA	NA	NA	NA	NA
POROSITY	NA	NA	NA	NA	NA	NA	NA
WET BULK DENSITY	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon (ug/kg)							
TOTAL ORGANIC CARBON	NA	NA	NA	NA	NA	NA	NA

TABLE 4.32-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-71
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR71B008	IR71B009	IR71B009	IR71B009	IR71B009	IR71B010	IR71B010
Sampling Depth (feet bgs)	10.25	0.25	2.50	5.25	10.25	1.63	5.00
Sample Number	9535J131	9535J132	9535J133	9535J134	9535J135	9605G046	9605G047
Sample Date	08/31/95	08/31/95	08/31/95	08/31/95	08/31/95	01/31/96	01/31/96
Metal (mg/kg)							
ALUMINUM	24,800	26,500	32,300	40,600	23,200	19,400	27,000
ANTIMONY	ND (1.6)	ND (1.5)	ND (2.3)	ND (2.5)	ND (1.3)	0.75	1.2
ARSENIC	1.1 *	ND (0.59)	0.99 *	1.1 *	0.71 *	1.0 *	0.77 *
BARIUM	43.2	60.7	81.3	76.6	66.7	170	159
CALCIUM	19,100	26,300	28,000	37,000	18,000	14,300	16,500
CHROMIUM	76.2	88.1	98.2	134	80.1	69.8	134
COBALT	26.6	28.3	35.7	39.4	26.3	25.3	41.5
COPPER	105	58.1	76.3	80.9	79.1	52.6	67.3
IRON	31,600	32,900	41,800	47,900	35,400	26,800	46,200
LEAD	ND (1.8)	ND (2.5)	3.7	ND (1.8)	3.0	15.6 α	5.3
MAGNESIUM	19,900	21,400	19,000	34,300	12,500	18,300	19,700
MANGANESE	591 *	646 *	949 *	953 *	827 *	632 *	1,550 *α
MERCURY	ND (0.06)	0.48	ND (0.05)	ND (0.05)	ND (0.06)	ND (0.06)	ND (0.06)
MOLYBDENUM	ND (0.20)	ND (0.19)	ND (0.19)	ND (0.19)	ND (0.22)	ND (0.13)	ND (0.14)
NICKEL	33.9	47.4	39.2	55.5	33.3	45.0	97.7
POTASSIUM	560	1,300	1,180	1,170	823	898	1,140
SODIUM	ND (508)	ND (26.8)	ND (27.0)	ND (27.0)	1,790	ND (17.5)	ND (19.3)
THALLIUM	ND (0.44)	ND (0.42)	ND (0.42)	ND (0.42)	ND (1.5)	ND (0.40)	ND (0.44)
VANADIUM	86.2	89.2	132 α	136 α	112	68.0	132 α
ZINC	59.3	63.0	75.4	85.7	65.6	64.7	92.1
Volatile Organic Compound (ug/kg)							
CARBON DISULFIDE	ND (11)	NA	ND (11)	ND (11)	ND (12)	NA	5
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (370)	ND (350)	ND (350)	ND (350)	ND (400)	ND (340)	ND (380)
BENZO(A)ANTHRACENE	ND (370)	ND (350)	ND (350)	ND (350)	ND (400)	ND (340)	ND (380)
CHRYSENE	ND (370)	ND (350)	ND (350)	ND (350)	ND (400)	ND (340)	ND (380)
FLUORANTHENE	ND (370)	ND (350)	ND (350)	ND (350)	ND (400)	ND (340)	ND (380)
PHENANTHRENE	ND (370)	ND (350)	ND (350)	ND (350)	ND (400)	ND (340)	ND (380)
PYRENE	ND (370)	ND (350)	ND (350)	ND (350)	ND (400)	ND (340)	ND (380)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
AROCLOR-1260	ND (37)	51	ND (35)	ND (35)	ND (40)	ND (35)	ND (38)

TABLE 4.32-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-71
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR71B008	IR71B009	IR71B009	IR71B009	IR71B009	IR71B010	IR71B010
Sampling Depth (feet bgs)	10.25	0.25	2.50	5.25	10.25	1.63	5.00
Sample Number	9535J131	9535J132	9535J133	9535J134	9535J135	9605G046	9605G047
Sample Date	08/31/95	08/31/95	08/31/95	08/31/95	08/31/95	01/31/96	01/31/96
TPH-Purgeable (mg/kg)							
TPH-GASOLINE	ND (0.6)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.6)	ND (0.5)	ND (0.6)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (11)	9	6	ND (11)	ND (12)	ND (10)	ND (11)
TPH-MOTOR OIL	7	83	26	9	ND (12)	15	ND (11)
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	ND (11)	150	46	14	ND (12)	12	ND (11)
Percent Moisture (%)							
% SOLIDS	90.9	95.5	94.9	94.7	83.3	95.9	87.0
pH (pH units)							
PH	9.0	9.1	8.7	8.3	8.3	8.6	7.5
Physical Characteristic (%)							
DRY BULK DENSITY	NA	NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %CLAY	NA	NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %COBBLES	NA	NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %GRAVEL	NA	NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %SAND	NA	NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %SILT	NA	NA	NA	NA	NA	NA	NA
MOISTURE CONTENT	NA	NA	NA	NA	NA	NA	NA
POROSITY	NA	NA	NA	NA	NA	NA	NA
WET BULK DENSITY	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon (ug/kg)							
TOTAL ORGANIC CARBON	NA	NA	NA	NA	NA	NA	NA

TABLE 4.32-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-71
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR71B010	IR71B011	IR71B011	IR71B011	IR71MW03A	IR71MW03A	IR71MW03A
Sampling Depth (feet bgs)	11.50	1.00	3.50	5.75	1.00	5.75	10.00
Sample Number	9605G048	9604J792	9604J793	9604J794	9533G045	9533G046	9533G047
Sample Date	01/31/96	01/26/96	01/26/96	01/26/96	08/17/95	08/17/95	08/17/95
Metal (mg/kg)							
ALUMINUM	20,000	25,900	27,100	29,700	10,600	15,300	25,200
ANTIMONY	0.77	ND (1.4)	ND (1.4)	ND (1.9)	ND (2.0)	ND (1.4)	ND (2.3)
ARSENIC	0.82 *	ND (0.31)	0.72 *	3.0 *#	ND (5.8)	ND (0.63)	ND (0.91)
BARIUM	90.5	145	85.5	165	200	66.7	69.6
CALCIUM	14,200	19,600	17,400	19,200	2,720	12,500	15,000
CHROMIUM	85.4	69.1	93.3	93.5	57.5	37.2	100
COBALT	40.3 α	41.3	34.5	42.1	18.2	21.7	29.0
COPPER	47.2	69.6	156 α	93.1	48.2	40.2	54.7
IRON	33,000	45,900	43,900	52,700	32,200	21,500	33,900
LEAD	1.7	1.9	2.2	3.6	11.1 α	ND (1.3)	2.3
MAGNESIUM	10,000	18,400	25,100	24,600	11,000	9,590	22,000
MANGANESE	908 *	1,300 *	856 *	2,780 *α	1,150 *	698 *	874 *
MERCURY	ND (0.06)	ND (0.06)	ND (0.05)	ND (0.06)	ND (0.06)	ND (0.05)	ND (0.06)
MOLYBDENUM	ND (0.14)	ND (0.13)	ND (0.13)	ND (0.14)	ND (0.20)	ND (0.19)	ND (0.21)
NICKEL	43.2	40.6	34.1	55.0	81.5	20.2	41.0
POTASSIUM	395	834	432	884	1,260	524	774
SODIUM	856	ND (18.6)	ND (18.2)	ND (19.0)	95.4	44.1	2,390
THALLIUM	ND (0.44)	0.71	ND (0.41)	1.1 α	2.4 α	2.8 α	3.9 α
VANADIUM	100	136 α	118 α	188 α	68.0	61.1	105
ZINC	46.9	91.2	65.0	96.3	58.0	49.2	123 α
Volatile Organic Compound (ug/kg)							
CARBON DISULFIDE	ND (11)	ND (11)	ND (11)	ND (11)	NA	ND (11)	ND (12)
Semivolatile Organic Compound (ug/kg)							
2-METHYLNAPHTHALENE	ND (380)	ND (370)	ND (360)	ND (380)	ND (370)	ND (350)	ND (390)
BENZO(A)ANTHRACENE	ND (380)	ND (370)	ND (360)	ND (380)	ND (370)	ND (350)	ND (390)
CHRYSENE	ND (380)	ND (370)	ND (360)	ND (380)	ND (370)	ND (350)	ND (390)
FLUORANTHENE	ND (380)	ND (370)	ND (360)	ND (380)	ND (370)	ND (350)	ND (390)
PHENANTHRENE	ND (380)	ND (370)	ND (360)	ND (380)	ND (370)	ND (350)	ND (390)
PYRENE	ND (380)	ND (370)	ND (360)	ND (380)	ND (370)	ND (350)	ND (390)
Pesticide/Polychlorinated Biphenyl (ug/kg)							
AROCLOR-1260	ND (38)	ND (37)	ND (36)	ND (38)	ND (37)	ND (35)	ND (39)

TABLE 4.32-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-71
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR71B010	IR71B011	IR71B011	IR71B011	IR71MW03A	IR71MW03A	IR71MW03A
Sampling Depth (feet bgs)	11.50	1.00	3.50	5.75	1.00	5.75	10.00
Sample Number	9605G048	9604J792	9604J793	9604J794	9533G045	9533G046	9533G047
Sample Date	01/31/96	01/26/96	01/26/96	01/26/96	08/17/95	08/17/95	08/17/95
TPH-Purgeable (mg/kg)							
TPH-GASOLINE	ND (0.6)	ND (0.6)	ND (0.5)	ND (0.6)	ND (0.6)	ND (0.5)	ND (0.6)
TPH-Extractable (mg/kg)							
TPH-DIESEL	ND (11)	130	ND (11)	ND (11)	ND (11)	ND (11)	ND (12)
TPH-MOTOR OIL	10	550	ND (11)	ND (11)	ND (11)	ND (11)	ND (12)
Total Recoverable Petroleum Hydrocarbons (mg/kg)							
TRPH	9	32	8	6	13	11	ND (12)
Percent Moisture (%)							
% SOLIDS	87.3	90.5	92.4	88.4	90.9	94.9	86.5
pH (pH units)							
PH	7.2	8.3	8.9	8.3	8.0	7.5	7.8
Physical Characteristic (%)							
DRY BULK DENSITY	NA	NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %CLAY	NA	NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %COBBLES	NA	NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %GRAVEL	NA	NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %SAND	NA	NA	NA	NA	NA	NA	NA
GRAIN SIZE ANALYSIS - %SILT	NA	NA	NA	NA	NA	NA	NA
MOISTURE CONTENT	NA	NA	NA	NA	NA	NA	NA
POROSITY	NA	NA	NA	NA	NA	NA	NA
WET BULK DENSITY	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon (ug/kg)							
TOTAL ORGANIC CARBON	NA	NA	NA	NA	NA	NA	NA

TABLE 4.32-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-71
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR71MW03A	IR71MW03A
Sampling Depth (feet bgs)	16.25	21.00
Sample Number	9533G050	9533G051
Sample Date	08/17/95	08/17/95
Metal (mg/kg)		
ALUMINUM	16,300	30,000
ANTIMONY	ND (1.5)	ND (1.6)
ARSENIC	ND (2.0)	ND (0.70)
BARIUM	93.2	109
CALCIUM	9,680	22,800
CHROMIUM	77.4	126
COBALT	28.3	31.2
COPPER	47.3	65.1
IRON	27,700	38,100
LEAD	2.4	ND (1.5)
MAGNESIUM	10,500	29,200
MANGANESE	776 *	723 *
MERCURY	ND (0.06)	ND (0.06)
MOLYBDENUM	ND (0.21)	ND (0.20)
NICKEL	45.1	48.9
POTASSIUM	791	956
SODIUM	2,340	2,950
THALLIUM	ND (1.4)	2.6 α
VANADIUM	87.7	111
ZINC	55.4	69.5
Volatile Organic Compound (ug/kg)		
CARBON DISULFIDE	ND (12)	ND (11)
Semivolatile Organic Compound (ug/kg)		
2-METHYLNAPHTHALENE	ND (390)	ND (370)
BENZO(A)ANTHRACENE	ND (390)	ND (370)
CHRYSENE	ND (390)	ND (370)
FLUORANTHENE	ND (390)	ND (370)
PHENANTHRENE	ND (390)	ND (370)
PYRENE	ND (390)	ND (370)
Pesticide/Polychlorinated Biphenyl (ug/kg)		
AROCLOR-1260	ND (39)	ND (37)

TABLE 4.32-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-71
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR71MW03A	IR71MW03A
Sampling Depth (feet bgs)	16.25	21.00
Sample Number	9533G050	9533G051
Sample Date	08/17/95	08/17/95
TPH-Purgeable (mg/kg)		
TPH-GASOLINE	ND (0.6)	ND (0.6)
TPH-Extractable (mg/kg)		
TPH-DIESEL	ND (12)	ND (11)
TPH-MOTOR OIL	ND (12)	ND (11)
Total Recoverable Petroleum Hydrocarbons (mg/kg)		
TRPH	ND (12)	ND (11)
Percent Moisture (%)		
% SOLIDS	84.9	88.8
pH (pH units)		
PH	7.5	8.1
Physical Characteristic (%)		
DRY BULK DENSITY	NA	NA
GRAIN SIZE ANALYSIS - %CLAY	NA	NA
GRAIN SIZE ANALYSIS - %COBBLES	NA	NA
GRAIN SIZE ANALYSIS - %GRAVEL	NA	NA
GRAIN SIZE ANALYSIS - %SAND	NA	NA
GRAIN SIZE ANALYSIS - %SILT	NA	NA
MOISTURE CONTENT	NA	NA
POROSITY	NA	NA
WET BULK DENSITY	NA	NA
Total Organic Carbon (ug/kg)		
TOTAL ORGANIC CARBON	NA	NA

TABLE 4.32-6 (Continued)

SOIL ANALYTICAL RESULTS - IR-71
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

%	Percent
bgs	Below ground surface
mg/kg	Milligram per kilogram
NA	Not analyzed
ND()	Not detected (detection limit in parentheses)
µg/kg	Microgram per kilogram
*	Detected concentration greater than U.S. Environmental Protection Agency Region IX preliminary remediation goals (PRG) for residential use
#	Detected concentration greater than U.S. Environmental Protection Agency Region IX PRG for industrial use
α	Detected concentration greater than the Hunters Point ambient level.
▒	Detected concentration greater than at least one screening criterion.

TABLE 4.32-7

SUMMARY OF MONITORING WELL GROUNDWATER ANALYTICAL TESTS - IR-71
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
IR71MW03A	9544W140						✓				✓	✓				✓			✓	✓	✓	✓
IR71MW03A	9602J793						✓				✓	✓				✓			✓	✓	✓	✓
IR71MW03A	9607J876						✓					✓				✓			✓	✓	✓	✓
IR71MW03A	9615Z037	✓									✓	✓		✓						✓		

Notes:

CHROM	CHROMIUM VI
CYAN	Cyanide
DIOXIN	Dioxins and Furans
O&G	Total oil and grease
PAH	Polynuclear aromatic hydrocarbons
PCTMST	Percent moisture
PEST	Pesticides/polychlorinated biphenyls
PHYS	Physical characteristic
SALIN	Salinity
SVOC	Semivolatile organic compounds
SOLIDS	Total dissolved solids
TOC	Total organic carbon
TMICROB	Coliform
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
VOC	Volatile organic compounds

TABLE 4.32-8

STATISTICAL SUMMARY OF MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-71
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Tap Water PRG Value	Above[e] PRG	MCL Value[f]	Above[g] MCL	NAWQC Value	Above[h] NAWQC
METAL	BARIUM	38.9	64.8	52.7	UG/L	0.73	3	3	2,600	0	1,000	0		
	CALCIUM	295,000	615,000	439,000	UG/L	31.1	3	3						
	CHROMIUM	1.8	1.8	1.8	UG/L	0.40	3	1			50.0	0		
	COBALT	0.94	3.8	2.4	UG/L	1.2	3	2						
	MAGNESIUM	357,000	688,000	526,000	UG/L	60.5	3	3						
	MANGANESE	465	2,310	1,170	UG/L	0.30	3	3	180	3				
	NICKEL	19.3	37.8	27.7	UG/L	1.8	3	3	730	0	100	0	8.2	3
	POTASSIUM	11,200	21,700	16,300	UG/L	1,170	3	3						
	SODIUM	2,160,000	2,960,000	2,690,000	UG/L	132	3	3						
	THALLIUM	6.0	6.0	6.0	UG/L	1.9	3	1			2.0	1		
	VANADIUM	5.3	6.9	6.2	UG/L	1.1	3	3	260	0				
	ZINC	49.1	49.1	49.1	UG/L	1.0	3	1	11,000	0			81.0	0
VOC	1,2-DICHLOROETHENE (TOTAL)	2	5	3	UG/L	0.5	3	3	55	0				
	CARBON TETRACHLORIDE	0.3	0.9	0.6	UG/L	0.5	3	2	0.2	2	0.5	1		
	CHLOROFORM	1	2	2	UG/L	0.5	3	3	0.2	3	100	0		
	TETRACHLOROETHENE	12	25	18	UG/L	0.5	3	3	1	3	5	3		
	TRICHLOROETHENE	12	17	15	UG/L	0.5	3	3	2	3	5	3		
SVOC	HEXACHLOROETHANE	120	120	120	UG/L	10	3	1	5	1				
TPHPRG	TPH-GASOLINE	31	32	32	UG/L	50	4	2	100	0i				
TPHEXT	TPH-MOTOR OIL	84	84	84	UG/L	100	3	1	100	0i				
ANION	CHLORIDE	3,060,000	3,060,000	3,060,000	UG/L	40,000	1	1						
	FLUORIDE	110	110	110	UG/L	100	1	1			1,400	0		

TABLE 4.32-8 (Continued)

STATISTICAL SUMMARY OF MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-71
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Tap Water PRG Value	Above[e] PRG	MCL Value[f]	Above[g] MCL	NAWQC Value	Above[h] NAWQC
	NITRATE	140	140	140	UG/L	100	1	1	58,000	0				
	SULFATE	527,000	527,000	527,000	UG/L	5,000	1	1						
SALIN	SALINITY	5.8	5.8	5.8	PPT	0.005	1	1						

TABLE 4.32-8 (Continued)

STATISTICAL SUMMARY OF MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-71
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

CYAN	Cyanide
EPA	U.S. Environmental Protection Agency
MCL	Maximum contaminant level
NAWQC	National Ambient Water Quality Criteria
O&G	Total oil and grease
PCTMST	Percent moisture
PEST	Pesticide/polychlorinated biphenyl
PPT	Parts per thousand
PRG	Preliminary remediation goal
SALIN	Salinity
SVOC	Semivolatile organic compound
TMICROB	Coliform
TOC	Total organic carbon
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
UG/L	Microgram per liter
VOC	Volatile organic compound

a Organic results of less than 10 are reported to one significant figure, and results of greater than or equal to 10 are reported to two significant figures. Inorganic results of less than 10 are reported to two significant figures, and results of greater than or equal to 10 are reported to three significant figures. Values that are not nondetects are compared to screening criteria before the significant figure rule is applied. Both the value and the screening criteria are then rounded for reporting purposes.

b Blank boxes indicate that screening critera have not been established for these analytes.

c Total number of samples analyzed

d Total number of samples showing concentrations greater than detection limit

e Total number of samples showing concentrations greater than tap water PRG

California-modified PRGs were used for the following analytes: 1,2-Dibromo-3-chloropropane, benzo[a]pyrene, benzo[k]fluoranthene, cadmium, chromium VI, chrysene, lead, nickel, and tetrachloroethylene (PCE).

For the analytes listed below, Region IX PRGs are not available; therefore, PRGs for similar chemicals were used as follows:

Analyte:	Similar Analyte:
2-Methylnapthalene	Naphthalene
Acenaphthylene	Acenaphthene
Alpha-chlordane	Chlordane
Aroclor-1260	Polychlorinated biphenyls
Benzo(g,h,i)perylene	Naphthalene
Delta BHC	HCH-technical
Endosulfan I	Endosulfan
Endosulfan sulfate	Endosulfan
Endrin aldehyde	Endrin
Endrin ketone	Endrin
Gamma-chlordane	Chlordane
Phenanthrene	Naphthalene

f EPA Title 40 Code of Federal Regulations or California Code of Regulations Title 22 MCL used, whichever is more stringent

g Total number of samples showing concentrations greater than MCL

h Total number of samples showing concentrations greater than NAWQC;

NAWQC based on 4-day average study of saltwater aquatic life

i Total number of samples showing concentrations greater than TPH, TRPH, or O&G screening level, not PRG value

TABLE 4.32-9

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-71
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR71MW03A	IR71MW03A	IR71MW03A	IR71MW03A
Sample Number	9544W140	9602J793	9607J876	9615Z037
Sample Date	10/31/95	01/11/96	02/15/96	04/08/96
Metal (ug/L)				
BARIUM	64.8	54.4	38.9	NA
CALCIUM	407,000	615,000	295,000	NA
CHROMIUM	ND (0.50)	ND (2.0)	1.8	NA
COBALT	ND (1.7)	3.8	0.94	NA
MAGNESIUM	533,000	688,000	357,000	NA
MANGANESE	748 *	2,310 *	465 *	NA
NICKEL	26.0 B	37.8 B	19.3 B	NA
POTASSIUM	21,700	11,200	16,000	NA
SODIUM	2,940,000	2,960,000	2,160,000	NA
THALLIUM	6.0 δ	ND (9.5)	ND (1.9)	NA
VANADIUM	5.3	6.9	6.3	NA
ZINC	ND (18.3)	ND (39.3)	49.1	NA
Volatile Organic Compound (ug/L)				
1,2-DICHLOROETHENE (TOTAL)	2	5	3	NA
CARBON TETRACHLORIDE	0.9 *δ	0.3 *	ND (0.5)	NA
CHLOROFORM	2 *	2 *	1 *	NA
TETRACHLOROETHENE	16 *δ	25 *δ	12 *δ	NA
TRICHLOROETHENE	15 *δ	17 *δ	12 *δ	NA
Semivolatile Organic Compound (ug/L)				
HEXACHLOROETHANE	120 *	ND (10)	ND (10)	NA
TPH-Purgeable (ug/L)				
TPH-GASOLINE	32	ND (50)	31	ND (50)
TPH-Extractable (ug/L)				
TPH-MOTOR OIL	ND (100)	84	ND (100)	NA
Anion (ug/L)				
CHLORIDE	NA	NA	NA	3,060,000
FLUORIDE	NA	NA	NA	110
NITRATE	NA	NA	NA	140
SULFATE	NA	NA	NA	527,000

TABLE 4.32-9 (Continued)

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS - IR-71
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR71MW03A	IR71MW03A	IR71MW03A	IR71MW03A
Sample Number	9544W140	9602J793	9607J876	96152037
Sample Date	10/31/95	01/11/96	02/15/96	04/08/96
pH (pH units)				
PH	6.7	6.7	7.1	6.8
Salinity (ppt)				
SALINITY	NA	NA	NA	5.8

Notes:

NA Not analyzed
ND() Not detected (detection limit in parentheses)
ppt Parts per thousand
µg/L Microgram per liter

* Detected concentration greater than U.S. Environmental Protection Agency Region IX preliminary remediation goals (PRG) for tap water
ß Detected concentration greater than National Ambient Water Quality Criteria (NAWQC) based on 4-day average study of saltwater aquatic life
δ Detected concentration greater than maximum contaminant level (MCL)
U.S. Environmental Protection Agency Title 40 Code of Federal Regulations or California Code of Regulations Title 22 MCL used, whichever is more stringent

Detected concentration greater than at least one screening criterion.

TABLE 4.32-10

SUMMARY OF HYDROPUNCH GROUNDWATER ANALYTICAL TESTS - IR-71
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

STATION NO.	SAMPLE NO.	ANION	ASBESTOS	CHROM	CYAN	DIOXIN	METAL	O&G	PAH	PCTMST	PEST	PH	PHYS	SALIN	SOLIDS	SVOC	TMICROB	TOC	TPHEXT	TPHPRG	TRPH	VOC
IR71B010	9605G049						✓				✓	✓				✓			✓	✓	✓	✓
IR71B011	9604J795						✓				✓	✓				✓			✓	✓	✓	✓
IR71MW03A	9533G048																		✓	✓		✓

Notes:

CHROM	CHROMIUM VI
CYAN	Cyanide
DIOXIN	Dioxins and Furans
O&G	Total oil and grease
PAH	Polynuclear aromatic hydrocarbons
PCTMST	Percent moisture
PEST	Pesticides/polychlorinated biphenyls
PHYS	Physical characteristic
SALIN	Salinity
SVOC	Semivolatile organic compounds
SOLIDS	Total dissolved solids
TOC	Total organic carbon
TMICROB	Coliform
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
VOC	Volatile organic compounds

TABLE 4.32-11

STATISTICAL SUMMARY OF HYDROPUNCH GROUNDWATER ANALYTICAL RESULTS - IR-71
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Analysis Code	Analyte	Detected Results[a]				Detection Limit Average	Detection frequency[b]							
		Minimum	Maximum	Average	Units		Samples Analyzed[c]	Total Detects[d]	Tap Water PRG Value	Above[e] PRG	MCL Value[f]	Above[g] MCL	NAWQC Value	Above[h] NAWQC
METAL	BARIUM	31.2	74.1	52.7	UG/L	0.90	2	2	2,600	0	1,000	0		
	CADMIUM	0.25	0.25	0.25	UG/L	0.20	2	1	18.0	0	5.0	0	9.3	0
	CALCIUM	99,800	643,000	371,000	UG/L	42.6	2	2						
	COBALT	5.7	5.7	5.7	UG/L	0.40	2	1						
	IRON	36.5	36.5	36.5	UG/L	11.0	2	1						
	MAGNESIUM	140,000	710,000	425,000	UG/L	73.4	2	2						
	MANGANESE	587	5,810	3,200	UG/L	0.30	2	2	180	2				
	NICKEL	8.3	29.1	18.7	UG/L	2.1	2	2	730	0	100	0	8.2	2
	POTASSIUM	6,840	22,000	14,400	UG/L	542	2	2						
	SELENIUM	2.9	2.9	2.9	UG/L	2.3	2	1	180	0	50.0	0	71.0	0
	SODIUM	1,600,000	3,330,000	2,470,000	UG/L	136	2	2						
	ZINC	479	479	479	UG/L	5.0	2	1	11,000	0			81.0	1
VOC	1,2-DICHLOROBENZENE	0.3	0.3	0.3	UG/L	0.5	3	1	370	0	600	0		
	CIS-1,2-DICHLOROETHENE	0.4	0.9	0.7	UG/L	0.5	3	3	61	0	6	0		
	TETRACHLOROETHENE	0.4	4	2	UG/L	0.5	3	3	1	2	5	0		
	TRICHLOROETHENE	0.8	3	2	UG/L	0.5	3	3	2	2	5	0		
PEST	AROCLOR-1260	0.4	0.4	0.4	UG/L	0.5	2	1	0.009	1				
TPHPRG	TPH-GASOLINE	34	34	34	UG/L	50	3	1	100	0i				
TPHEXT	TPH-DIESEL	110	560	340	UG/L	100	3	3	100	3i				
	TPH-MOTOR OIL	180	810	580	UG/L	100	3	3	100	3i				
TRPH	TRPH	1,600	1,600	1,600	UG/L	1,000	2	1	100	1i				

TABLE 4.32-11 (Continued)

STATISTICAL SUMMARY OF HYDROPUNCH GROUNDWATER ANALYTICAL RESULTS - IR-71
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

CYAN	Cyanide
EPA	U.S. Environmental Protection Agency
MCL	Maximum contaminant level
NAWQC	National Ambient Water Quality Criteria
O&G	Total oil and grease
PCTMST	Percent moisture
PEST	Pesticide/polychlorinated biphenyl
PPT	Parts per thousand
PRG	Preliminary remediation goal
SALIN	Salinity
SVOC	Semivolatile organic compound
TMICROB	Coliform
TOC	Total organic carbon
TPHEXT	Total petroleum hydrocarbons-extractable
TPHPRG	Total petroleum hydrocarbons-purgeable
TRPH	Total recoverable petroleum hydrocarbons
UG/L	Microgram per liter
VOC	Volatile organic compound

a Organic results of less than 10 are reported to one significant figure, and results of greater than or equal to 10 are reported to two significant figures. Inorganic results of less than 10 are reported to two significant figures, and results of greater than or equal to 10 are reported to three significant figures. Values that are not nondetects are compared to screening criteria before the significant figure rule is applied. Both the value and the screening criteria are then rounded for reporting purposes.

b Blank boxes indicate that screening critera have not been established for these analytes.

c Total number of samples analyzed

d Total number of samples showing concentrations greater than detection limit

e Total number of samples showing concentrations greater than tap water PRG
California-modified PRGs were used for the following analytes: 1,2-Dibromo-3-chloropropane, benzo[a]pyrene, benzo[k]fluoranthene, cadmium, chromium VI, chrysene, lead, nickel, and tetrachloroethylene (PCE).
For the analytes listed below, Region IX PRGs are not available; therefore, PRGs for similar chemicals were used as follows:

Analyte:	Similar Analyte:
2-Methylnapthalene	Naphthalene
Acenaphthylene	Acenaphthene
Alpha-chlordane	Chlordane
Aroclor-1260	Polychlorinated biphenyls
Benzo(g,h,i)perylene	Naphthalene
Delta BHC	HCH-technical
Endosulfan I	Endosulfan
Endosulfan sulfate	Endosulfan
Endrin aldehyde	Endrin
Endrin ketone	Endrin
Gamma-chlordane	Chlordane
Phenanthrene	Naphthalene

f EPA Title 40 Code of Federal Regulations or California Code of Regulations Title 22 MCL used, whichever is more stringent

g Total number of samples showing concentrations greater than MCL

h Total number of samples showing concentrations greater than NAWQC;
NAWQC based on 4-day average study of saltwater aquatic life

i Total number of samples showing concentrations greater than TPH, TRPH, or O&G screening level, not PRG value

TABLE 4.32-12

HYDROPUNCH GROUNDWATER ANALYTICAL RESULTS - IR-71
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Station Number	IR71B010	IR71B011	IR71MW03A
Sample Number	9605G049	9604J795	9533G048
Sample Date	01/31/96	01/26/96	08/17/95
Metal (ug/L)			
BARIUM	74.1	31.2	NA
CADMIUM	ND (1.0)	0.25	NA
CALCIUM	643,000	99,800	NA
COBALT	ND (5.2)	5.7	NA
IRON	ND (55.0)	36.5	NA
MAGNESIUM	710,000	140,000	NA
MANGANESE	5,810 *	587 *	NA
NICKEL	29.1 B	8.3 B	NA
POTASSIUM	6,840	22,000	NA
SELENIUM	ND (11.5)	2.9	NA
SODIUM	3,330,000	1,600,000	NA
ZINC	479 B	ND (22.2)	NA
Volatile Organic Compound (ug/L)			
1,2-DICHLOROBENZENE	0.3	ND (0.5)	ND (0.5)
CIS-1,2-DICHLOROETHENE	0.4	0.9	0.9
TETRACHLOROETHENE	0.4	3 *	4 *
TRICHLOROETHENE	0.8	3 *	3 *
Pesticide/Polychlorinated Biphenyl (ug/L)			
AROCLOR-1260	ND (0.5)	0.4 *	NA
TPH-Purgeable (ug/L)			
TPH-GASOLINE	ND (50)	34	ND (50)
TPH-Extractable (ug/L)			
TPH-DIESEL	340	110	560
TPH-MOTOR OIL	810	180	750
Total Recoverable Petroleum Hydrocarbons (ug/L)			
TRPH	1,600	ND (1,000)	NA
pH (pH units)			
PH	6.7	7.2	NA

HYDROPUNCH GROUNDWATER ANALYTICAL RESULTS - IR-71
HUNTERS POINT SHIPYARD, PARCEL D REMEDIAL INVESTIGATION

Notes:

NA	Not analyzed
ND()	Not detected (detection limit in parentheses)
µg/L	Microgram per liter
*	Detected concentration greater than U.S. Environmental Protection Agency Region IX preliminary remediation goals (PRG) for tap water
ß	Detected concentration greater than National Ambient Water Quality Criteria (NAWQC) based on 4-day average study of saltwater aquatic life
▒	Detected concentration greater than at least one screening criterion.

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
6	RMR results	Table 1	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Table 2-4. SulTech. November 30, 2007.

TABLE 2-4: HISTORY OF IDENTIFYING AND EVALUATING FURTHER ACTIONS AT SOIL SITES IN PARCEL D

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

IR Site	Remediation or De Minimis Area	Identifying Action
IR-08	RA 8-4	**FS:** Two areas at IR-08 (RA 8-1 and RA8-2) were identified for further action based on arsenic, benzo(a)pyrene, and Aroclor-1260. RA 8-4 (boring IR08B018A) was not specifically identified. IR-08 was identified as requiring action based on a the spill of PCB-containing waste oil onto soil during construction of Building 606 in 1988. IR-08 is now part of Parcel E, although RA 8-4 is in Parcel D. The Navy conducted an interim removal action at IR-08 in an area that is now part of Parcel E. About 1,255 cubic yards of soil was excavated to depths ranging from 3 to 10 feet bgs from an area measuring 50 by 150 feet (Barajas 2007). **RMR**: Based on site-specific conditions and the RMR criteria, no remedial action recommended at IR-08B018A. **TCRA SAP:** The Navy proposed additional investigation based on the detection Aroclor-1260 in one sample from location IR08B018A. **TCRA CR 1:** Excavated 13 cubic yards of soil; maximum depth 3 feet bgs.
IR-09	RA 9-1	**FS:** RA 9-1 (borings IR09B001 through IR09B009 and IR09PPY1) identified as requiring action for arsenic, beryllium, lead, nickel, PAHs, and PCBs. **RMR**: Based on site-specific conditions and the RMR criteria, no remedial action recommended for arsenic, beryllium, lead, nickel, PAHs, and PCBs; however, agencies requested further investigation for hexavalent chromium at four soil borings (IR09B003, IR09B006, IR09B007, and IR09B011) in which total chromium concentrations exceeded the sample-specific HPAL. **TCRA SAP:** The four soil borings identified in the RMR as requiring further investigation were designated as new *de minimis* areas: DM 6864 (IR09B003), DM 6965 (IR09B006), DM 6967 (IR09B007), and DM 7167 (IR09B011). Delineation sampling concluded that no remedial action was required for hexavalent chromium. **TCRA CR 1:** Analysis of TCRA samples did not detect hexavalent chromium or total chromium at concentrations above the TCRA industrial cleanup goals. No excavation performed.
	RA 9-2	**FS:** RA 9-2 (borings IR09B016 and IR09B017) identified as requiring action for arsenic and PAHs. **RMR:** Based on site-specific conditions and RMR criteria, no remedial action required for arsenic and PAHs.
	RA 9-3	**FS:** RA 9-3 (borings IR09B019, IR09B020, IR09B022, IR09B023, IR09B023A, IR09B024, IR09MW35A, IR09P35AA, and IR09P35AB) identified as requiring action for metals. **RMR:** Based on site-specific conditions and RMR criteria, no remedial action required for metals.
	DM 6864	**FS:** Identified as part of RA 9-1 (above). **RMR:** Redesignated as the areas surrounding boring IR09B003 requiring further investigation for hexavalent chromium. **TCRA SAP:** Delineation sampling concluded that no remedial action was required for hexavalent chromium. **TCRA CR 1:** Analysis of TCRA samples did not detect hexavalent chromium or total chromium at concentrations above TCRA industrial cleanup goals. No excavation performed.

TABLE 2-4: HISTORY OF IDENTIFYING AND EVALUATING FURTHER ACTIONS AT SOIL SITES IN PARCEL D (CONTINUED)
Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

IR Site	Remediation or De Minimis Area	Identifying Action
	DM 6965	**FS:** Identified as part of RA 9-1 (above). **RMR:** Redesignated as the areas surrounding boring IR09B006 requiring further investigation for hexavalent chromium. **TCRA SAP:** Delineation sampling concluded that no remedial action was required for hexavalent chromium. **TCRA CR 1:** Analysis of TCRA samples did not detect hexavalent chromium or total chromium at concentrations above TCRA industrial cleanup goals. No excavation performed.
	DM 6967	**FS:** Identified as part of RA 9-1 (above). **RMR:** Redesignated as the areas surrounding boring IR09B007 requiring further investigation for hexavalent chromium. **TCRA SAP:** Delineation sampling concluded that no remedial action was required for hexavalent chromium. **TCRA CR 1:** Analysis of TCRA samples did not detect hexavalent chromium or total chromium at concentrations above TCRA industrial cleanup goals. No excavation performed.
IR-09 (cont.)	DM 7167	**FS:** Identified as part of RA 9-1 (above). **RMR:** Redesignated as the areas surrounding boring IR09B011 requiring further investigation for hexavalent chromium. **TCRA SAP:** Delineation sampling concluded that no remedial action was required for hexavalent chromium. **TCRA CR 1:** Analysis of TCRA samples did not detect hexavalent chromium or total chromium at concentrations above TCRA industrial cleanup goals. No excavation performed.
IR-16	NA	**FS:** Identified arsenic, lead, and PCBs as requiring remediation. **EE Removal Action:** EE-15/16, an irregular-shaped area approximately 990 square feet, was excavated to a depth of 2 feet bgs. **RMR:** Based on previous removal actions (EE-15/16), site-specific conditions, and the RMR criteria, no further remedial action recommended for arsenic, lead, and PCBs.
IR-17	NA	**FS:** Identified arsenic, lead, and PCBs as requiring remediation. **TCRA CR 2:** Nine stockpiles (SPD-23 through SPD-31) within and in close proximity to IR-17 were removed as part of the TCRA conducted in 2004. The stockpiles were over-excavated by 0.5 foot bgs because they were located on unpaved soil, and confirmation samples were collected at the bottom of the excavation footprints. Analytical results for benzo(a)pyrene from the confirmation samples collected at SPD-23 and SPD-31 exceeded the TCRA screening criterion. In addition, a fuel line area identified in TCRA CR 1 south of IR-17(DM BK32) was excavated as part of TCRA CR 2 to remove PAH and petroleum contamination in soil. This excavation was 35 feet wide by 110 feet long by 10 feet deep, and approximately 1,759 cubic yards of soil was removed. All analytical results for sidewall and bottom confirmation samples collected from this excavation were below TCRA screening criteria.

TABLE 2-4: HISTORY OF IDENTIFYING AND EVALUATING FURTHER ACTIONS AT SOIL SITES IN PARCEL D (CONTINUED)
Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

IR Site	Remediation or De Minimis Area	Identifying Action
IR-22	DM 9654	**FS:** DM 9654 (test pit PA45TA09) identified as requiring remedial action for PAHs. **Parcel D RMR:** Due to parcel boundary changes, DM 9654 is now in site IR-57 of Parcel C. **Parcel C RMR:** Based on site-specific conditions and RMR criteria, no remedial action recommended for PAHs.
	DM 9562	**FS:** DM 9562 (boring IR22B014) identified as requiring action for beryllium. **RMR:** Based on site-specific conditions and RMR criteria, no remedial action recommended for beryllium.
	DM 9752	**FS:** DM 9752 (boring IR22B003) identified as requiring action for arsenic. **Parcel D RMR:** Due to parcel boundary changes, DM 9752 is now in IR-57 of Parcel C.
	DM 9759	**FS:** DM 9759 (boring IR22B012) identified as requiring action for PAHs. **RMR:** Based on site-specific conditions and RMR criteria, no remedial action recommended for PAHs.
	DM 10956	**FS:** DM 10956 (boring IR51B032) identified as requiring action for PCBs and PAHs. **RMR:** Based on site-specific conditions and RMR criteria, no remedial action recommended for PCBs or PAHs.
IR-32	DM 11367	**FS:** DM 11367 (boring PA32B003) identified as requiring action for PAHs. **RMR:** Based on site-specific conditions and RMR criteria, no remedial action recommended for PAHs.
IR-33	RA 33N-1	**FS:** RA 33N-1 (borings IR33B069, IR33B070, IR33B091, and IR33MW61A) identified as requiring action for PAHs. **RMR:** Based on site-specific conditions and RMR criteria, no remedial action recommended for PAHs.
	DM 7353	**FS:** DM 7353 (boring IR33B105) identified as requiring action for hexavalent chromium. **EE Removal Action:** EE-12, a triangular area approximately 34 by 25 by 28 feet, was excavated to a depth of 10 feet bgs. Approximately 160 cubic yards was disposed of off site. **RMR:** Based on the previous removal action (EE-12), site-specific conditions, and RMR criteria, no further remedial action recommended for hexavalent chromium.
	DM 7453	**FS:** DM 7453 (surface sample PA33SS11) identified as requiring action for lead. **EE Removal Action:** EE-12, a triangular area approximately 34 by 25 by 28 feet, was excavated to a depth of 10 feet bgs. **RMR:** Based on the previous removal action (EE-12), site-specific conditions, and RMR criteria, no further remedial action recommended for lead.
	DM 7560	**FS:** DM 7560 (boring IR33B087) identified as requiring action for hexavalent chromium. **RMR:** Based on site-specific conditions and RMR criteria, no remedial action recommended for hexavalent chromium.
	DM 7657	**FS:** DM 7657 (boring IR33B062) identified as requiring further action for arsenic and beryllium. **RMR:** Based on site-specific conditions and RMR criteria, no remedial action recommended for arsenic or beryllium.

TABLE 2-4: HISTORY OF IDENTIFYING AND EVALUATING FURTHER ACTIONS AT SOIL SITES IN PARCEL D (CONTINUED)
Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

IR Site	Remediation or De Minimis Area	Identifying Action
IR-33 (cont.)	RA 33S-1	**FS:** RA 33S-1(borings IR33B092 and IR33B094) identified as requiring action for arsenic, PAHs, and PCBs. **RMR:** Based on site-specific conditions and RMR criteria, no remedial action recommended for arsenic, PAHs, and PCBs.
	RA 33S-2	**FS:** RA 33S-2 (boring PA33B053) identified as requiring action for arsenic, PAHs, and PCBs. **RMR:** Based on site-specific conditions and RMR criteria, no remedial action recommended for arsenic, PAHs, and PCBs.
	RA 33S-3	**FS:** RA 33S-3 (boring IR33B096) identified as requiring action for PAHs. **RMR:** Based on site-specific conditions and RMR criteria, no remedial action recommended for PAHs.
	DM 8169	**FS:** DM 8169 (surface sample PA33SS57) identified as requiring action for hexavalent chromium. **RMR:** Based on site-specific conditions and RMR criteria, no remedial action recommended for hexavalent chromium.
IR-34	DM 8258	**FS:** DM 8258 (boring IR34B023) identified as requiring action for PAHs. **RMR:** Based on site-specific conditions and RMR criteria, no remedial action recommended for PAHs.
IR-35	RA 35-1	**FS:** RA 35-1 (surface samples IR35SS14, IR35SS15, and IR35SS16) identified as requiring action for PAHs and PCBs. **RMR:** Based on site-specific conditions and RMR criteria, no remedial action recommended for PAHs and PCBs.
	DM 9363	**FS:** DM 9363 (surface sample PA35SS06) identified as requiring action for PCBs. **RMR:** Based on site-specific conditions and RMR criteria, no remedial action recommended for PCBs.
IR-37	RA 37-1	**FS:** RA 37-1 (borings IR37B014, IR37B015, and IR37B017 and surface sample PA37SS09) identified as requiring action for PAHs and PCBs. **EE Removal Action:** EE-14, an area approximately 26 by 13 feet, was excavated to a depth of 3 feet bgs. **RMR:** Based on the previous removal action (EE-14), no further remedial action recommended for PAHs; however, further investigation required for manganese. **TCRA SAP:** Determined further investigation was required for manganese and PCBs. Delineation sampling concluded no further remedial action recommended for manganese; however, further action was required for PCBs. **TCRA CR 1:** Excavated 25 cubic yards of soil; maximum depth of 4 feet bgs.
	RA 37-2	**FS:** RA 37-2 (borings IR37B010 and IR37B013) identified as requiring action for arsenic, beryllium, nickel, PAHs, and PCBs. **RMR:** Based on site-specific conditions and RMR criteria, no action recommended for arsenic, beryllium, PAHs, and PCBs; however, further action required for antimony. **TCRA SAP:** Determined further investigation required for antimony. Delineation sampling concluded further remedial action recommended for antimony. **TCRA CR 1:** Excavated 44 cubic yards of soil; maximum depth of 8 feet bgs.

TABLE 2-4: HISTORY OF IDENTIFYING AND EVALUATING FURTHER ACTIONS AT SOIL SITES IN PARCEL D (CONTINUED)
Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

IR Site	Remediation or De Minimis Area	Identifying Action
IR-37 (cont.)	DM 6671	**RMR:** DM 6671 identified in RMR as the area surrounding surface sample IR37SS08 requiring further investigation for manganese. **TCRA SAP:** Determined further investigation required for manganese. Delineation sampling concluded no remedial action recommended for manganese. **TCRA CR 1:** Analysis of TCRA samples indicated that concentrations of manganese are due to the presence of chert or chert fragments. No excavation recommended.
	DM 6771	**RMR:** DM 6771 identified in the RMR as the area surrounding boring IR37B021 requiring further investigation for manganese. **TCRA SAP:** Determined further investigation required for manganese. Delineation sampling concluded no remedial action recommended for manganese. **TCRA CR 1:** Analysis of TCRA samples did not detect manganese at concentrations above TCRA cleanup goals. No excavation recommended.
IR-44	NA	**FS:** Identified no areas requiring action.
IR-45	NA	**FS:** Areas requiring action are identified for the IR site in which the steam lines are physically located with petroleum hydrocarbon compounds, including PAHs, as chemicals of concern. **TCRA:** Removed and disposed of 2,100 feet of petroleum-contaminated steam line and closed 14,500 feet of steam line in place.
IR-48	NA	**FS:** Identified no areas requiring action.
IR-50	NA	**FS:** Areas requiring action are identified for the IR site in which the storm and sanitary sewer lines are physically located. **Removal Action:** Cleaned out and disposed of 1,200 tons of sediments removed from the storm drain system.
IR-51	NA	**FS:** Areas requiring action are identified for the IR site in which the former transformer sites are physically located. **Cleanup Action:** 1988 action removed 12 transformers from Parcel D. In addition, 48 transformers stored in the yard adjacent to Buildings 524 were removed and disposed of off site.
IR-53	RA 53-1	**FS:** RA 53-1 (borings IR53B019 through IR53B026 and surface samples PA53SS09 and PA53SS10) identified as requiring action for arsenic, lead, and PCBs. **EE Removal Action:** EE-15/16, an irregular-shaped area approximately 990 square feet, was excavated to a depth of 2 feet bgs. **RMR:** Based on previous removal actions (EE-15/16), site-specific conditions, and current RMR criteria, no further remedial action recommended for arsenic, lead, and PCBs.
	RA 53-2	**FS:** RA 53-2 (borings IR53B013 through IR53B017 and surface samples PA53SS03, PA53SS04, and PA53SS12) identified as requiring action for arsenic, beryllium, PAHs, and PCBs. **RMR:** Based on site-specific conditions and RMR criteria, no remedial action recommended for arsenic, beryllium, PAHs, and PCBs.
	RA 53-3	**FS:** RA 53-3 (borings IR53B018 and IR53B018A) identified as requiring action for arsenic, beryllium, PAHs, and PCBs. **RMR:** Based on site-specific conditions and RMR criteria, no remedial action recommended for arsenic, beryllium, and PCBs. However, a new DM area (DM 11260) surrounding boring IR53B018A determined to require further investigation for PAHs.

TABLE 2-4: HISTORY OF IDENTIFYING AND EVALUATING FURTHER ACTIONS AT SOIL SITES IN PARCEL D (CONTINUED)
Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

IR Site	Remediation or De Minimis Area	Identifying Action
IR-53 (cont.)	DM 11260	**RMR:** Identified as the area surrounding boring IR53B018A requiring further investigation for PAHs. **TCRA SAP:** Determined further investigation required for PAHs. Delineation sampling confirmed that further action required for PAHs. **TCRA CR 1:** Excavated 6 cubic yards of soil; maximum depth of 3 feet bgs.
IR-55	RA 55-1	**FS:** RA 55-1 (borings IR55B019, IR55B020, IR55B021, and IR55MW02A, and test pit sample PA55TA04) identified as requiring action for arsenic, lead, PAHs, and PCBs. **RMR:** Based on site-specific conditions and RMR criteria, no remedial action recommended for arsenic, PAHs, and PCBs; however, a new DM area (DM 10676) surrounding boring IR55B016 determined to require further investigation for lead.
	DM 10383	**FS:** DM 10383 (test pit PA55TA10) identified as requiring action for arsenic and PAHs. **RMR:** Based on site-specific conditions and RMR criteria, no remedial action recommended for arsenic and PAHs.
	DM 10676	**RMR:** Identified as the area surrounding boring IR55B016 requiring further investigation for lead. **TCRA SAP:** Determined further investigation required for lead. Delineation sampling confirmed further action required for lead. **TCRA CR 1:** Excavated 7 cubic yards of soil; maximum depth of 3 feet bgs.
IR-65	DM 8866	**FS:** DM 8866 (borings IR65B001 and IR65B004) identified as requiring further action for arsenic and PCBs. **RMR:** Based on site-specific conditions and RMR criteria, no remedial action recommended for PCBs; however, further investigation required for arsenic. **TCRA SAP:** Determined further investigation required for arsenic. Delineation sampling confirmed action required for arsenic. **TCRA CR 1:** Excavated 12 cubic yards of soil; maximum depth of 3 feet bgs.
IR-66	NA	**FS:** Identified no areas requiring action.
IR-67	NA	**FS:** Identified no areas requiring action.
IR-68	RA 68-1	**FS:** RA 68-1 (borings IR68B001 through IR68B009) identified as requiring action for arsenic, PAHs, and PCBs. **RMR:** Based on site-specific conditions and RMR criteria, no remedial action recommended for arsenic, PAHs, and PCBs.
IR-69	RA 69-1	**FS:** RA 69-1 (borings IR69B001 through IR69B006) identified as requiring action for arsenic, lead, and PCBs. **RMR:** Based on site-specific conditions and RMR criteria, no further remedial action recommended for arsenic, lead, and PCBs.
IR-70	RA 70-1	**FS:** RA 70-1 (borings IR70B005 and IR70MW04A; surface samples IR70SS01, IR70SS02, and IR70SS03; and test pit sample PA45TA11) identified as requiring action for arsenic, hexavalent chromium, PAHs, and PCBs. **RMR:** Based on site-specific conditions and RMR criteria, no remedial action recommended for arsenic, hexavalent chromium, PAHs, and PCBs.

TABLE 2-4: HISTORY OF IDENTIFYING AND EVALUATING FURTHER ACTIONS AT SOIL SITES IN PARCEL D (CONTINUED)

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

IR Site	Remediation or De Minimis Area	Identifying Action
IR-70 (cont.)	RA 70-2	**FS:** RA 70-2 (borings IR55B022 through IR55B025, PA55B013, and IR70MW07A, and surface sample PA55SS16) identified as requiring action for arsenic, PAHs, and PCBs. **EE Removal Action:** EE-17, an irregular-shaped area approximately 420 square feet, was excavated to a depth of 7 feet bgs (approximately 110 cubic yards). **RMR:** Based on the previous removal action (EE-17), site-specific conditions, and RMR criteria, no further remedial action recommended for arsenic, PAHs, and PCBs.
	RA 70-3	**FS:** RA70-3 (boring IR70B009) identified as requiring action for arsenic, PAHs, and PCBs. **RMR:** Based on site-specific conditions and RMR criteria, no remedial action recommended for arsenic, PAHs, and PCBs.
IR-71	NA	**FS:** Identified no areas requiring action.

Notes: The Navy's recommendations from the RMR are described in this table.

bgs	Below ground surface
DM	*De minimis*
EE	Exploratory excavation
FS	Draft Final Parcel D Feasibility Study Report, January 24, 1997
HPAL	Hunters Point ambient level
IR	Installation Restoration
NA	Not applicable
PA	Preliminary assessment
PAH	Polynuclear aromatic hydrocarbon
PCB	Polychlorinated biphenyl
RA	Remediation area
RMR	Parcel D Risk Management Review Process Draft Final Report, June 20, 2000
TCRA	Time-critical removal action
TCRA CR 1	Parcel D Time-Critical Removal Action Closeout Report, September 28, 2001
TCRA CR 2	Parcel D Time-Critical Removal Action Closeout Report, May 13, 2005
TCRA SAP	Final Sampling and Analysis Plan Parcel D Soil Site Delineation, November 9, 2000

References:

Barajas and Associates, Inc. 2007. "Draft Revised Remedial Investigation Report for Parcel E, Hunters Point Shipyard" July 27.
Tetra Tech EM Inc. (Tetra Tech). 1997a. "Draft Final Parcel D Feasibility Study (FS), Hunters Point Shipyard, San Francisco, California." January 24.
Tetra Tech. 2000a. "Parcel D Risk Management Review Process, Draft Final Report, Hunters Point Shipyard, San Francisco, California." June 20.
Tetra Tech. 2000b. "Final Sampling and Analysis Plan Parcel D Soil Site Delineation, Hunters Point Shipyard, San Francisco, California." November 9.
Tetra Tech. 2004. "Final Work Plan, Time-Critical Removal Action for Parcel D Excavation Sites, Hunters Point Shipyard, San Francisco, California." November 1.
Tetra Tech and ITSI. 2005. "Final Closeout Report, Time Critical Removal Action for Parcel D Excavation Sites, Hunters Point Shipyard, San Francisco, California." May 13.
Tetra Tech and IT Corp. 2001. "Final Parcel D, Time-Critical Removal Action Closeout Report, Hunters Point Shipyard, San Francisco, California." December 6.

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
7	Impacted or non-impacted	Table 1	Final Historical Radiological Assessment, History of the Use of General Radioactive Materials, 1939 – 2003. Section 1.2. Naval Sea Systems Command. August 2004.

(NAVSEA) offices, with different historical controls and practices, that manage NNPP radioactive material and G-RAM.

1.2 HRA METHODOLOGY

The primary purpose of the HRA is to designate sites as impacted or non-impacted. An impacted site is one that has potential for radioactive contamination based on historical information, or is know to contain or have contained radioactive contamination. In many instances, designation as impacted does not confirm that radioactive contamination is present; only that the possibility exists and must be investigated. If contamination is found at an HPS-impacted site, measures will be taken to remove the contamination to below release levels. Because of the extensive use of radioactive materials by the Naval Radiological Defense Laboratory (NRDL), former NRDL facilities have been included as impacted sites. Once a site is designated as impacted, it remains "impacted" even after any residual contamination is removed.

A non-impacted site is one, based on historical documentation or results of previous radiological survey information, where there is no reasonable possibility for residual radioactive contamination. If new historical information becomes available or contamination is found at a non-impacted site, the site would be redesignated as "impacted."

To designate sites as impacted or non-impacted, the HRA defines the extent of past radiological operations, assesses the likelihood of potential contamination and potential contamination migration pathways, and recommends future actions. As well as being used to designate impacted sites, this information can be used to support removal actions within the context of the U.S. Environmental Protection Agency's (EPA) CERCLA process. As such, this HRA includes:

- Initial classification of areas that are impacted by radiological operations
- Historical information about radiological operations, investigations, and surveys
- Identification of potential, likely or known sources of radioactive material, radioactive contamination, and areas of use
- Assessments of the likelihood of areas of residual contamination

- Assessments of the likelihood of contamination migration
- Identification of sites that need further action as opposed to those posing no risk to human health or the environment from radiological operations
- Recommendations for future radiological investigations and remediation processes

The Navy researched multiple federal and personal archives to obtain information for preparation of the HRA. This research was supplemented by interviews of personnel with knowledge of radiological operations at HPS. Historical information was compared with evaluations made during site reconnaissance.

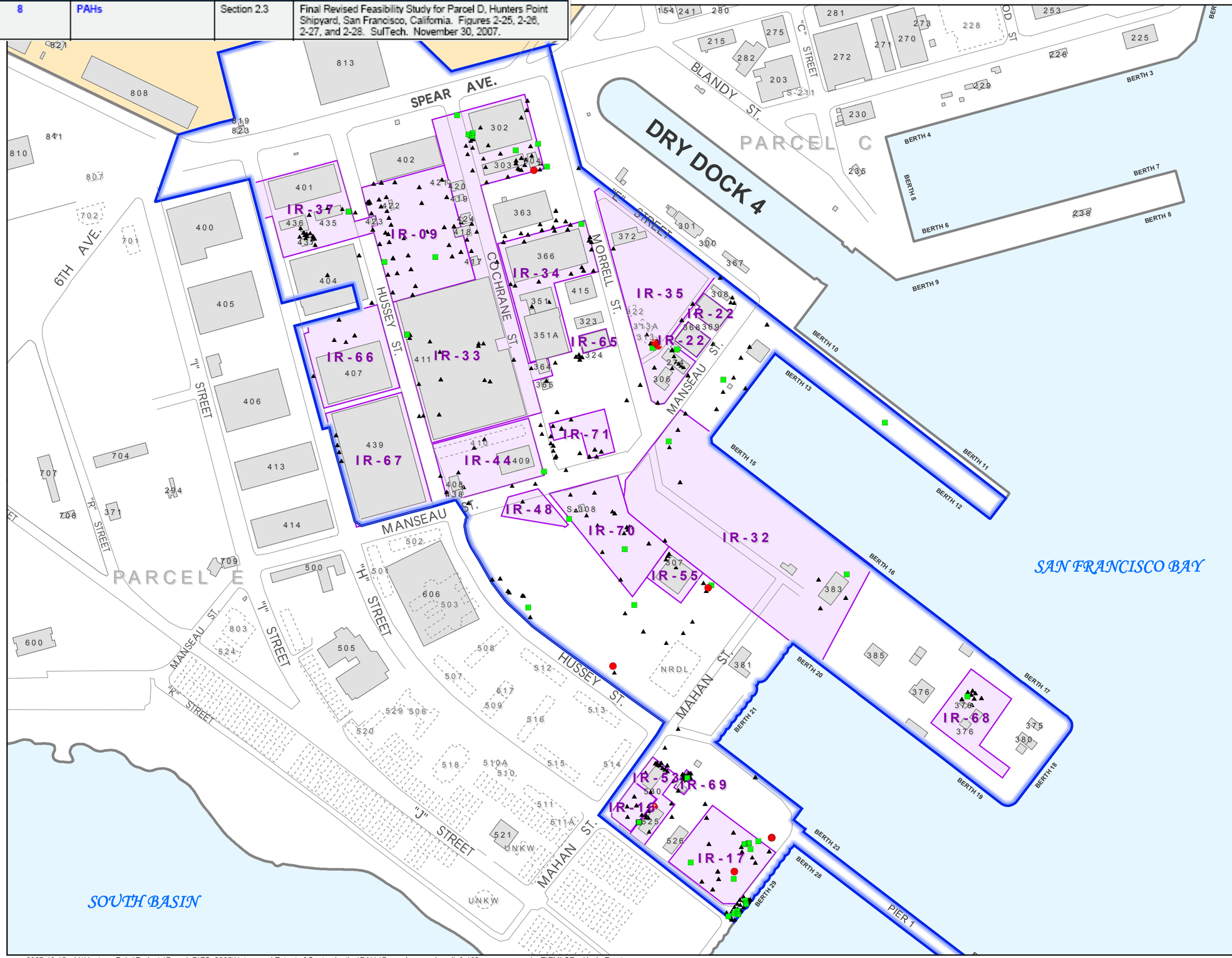
1.3 HISTORY

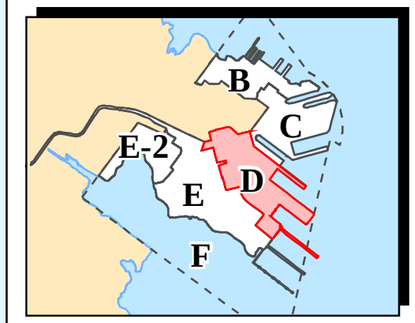
This HRA covers 64 years of radiological history at HPS from 1939 through June 2003. However, the shipyard only functioned as an active Navy-run repair facility from 1939 through 1974. After HPS ceased to function as an operational Navy shipyard in 1974, some HPS buildings and structures were leased to private tenants and Navy-related entities, the largest of which was Triple A Machine Shop, Inc. (Triple A), for ship repair operations. Buildings at HPS have also been leased for maritime and non-maritime industrial and artistic purposes. In addition, the Navy continued to use some buildings and structures for on-site oversight activities. The Navy resumed operation of the shipyard in 1986, when HPS was assigned as an annex to Naval Station Treasure Island. Throughout its history, HPS has been the subject of many radiological investigations. These investigations continue today.

Shipyard operations were permanently terminated on 29 December 1989. In 1991, HPS was placed on the Navy's BRAC list and its mission as a Navy shipyard ended on 1 April 1994. Engineering Field Activity West, Naval Facilities Engineering Command (EFA WEST), San Bruno, California, had initial oversight of base closure management of HPS. After closure of EFA WEST, this oversight authority was transferred to Southwest Division, Naval Facilities Engineering Command (SWDIV) in San Diego, California. SWDIV continues to manage the site today.

Details of the radiological history of HPS are provided in Section 6.0. Historical radiological operations included the following:

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
8	PAHs	Section 2.3	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Figures 2-25, 2-26, 2-27, and 2-28. SulTech. November 30, 2007.





Location Map

Soil Results: 0-10 feet bgs

- Result Greater than 0.33 ppm
- Result Less than or Equal to 0.33 ppm
- Nondetected Result
- Parcel D Boundary
- Other Parcel Boundaries
- IR Site Boundary
- Non-Navy Property
- Existing Building
- Demolished Building
- Road

Notes:

0.33 ppm is the lowest laboratory reporting limit for PAHs

bgs Below ground surface
IR Installation Restoration
PAH Polyaromatic hydrocarbon
ppm Part per million

N

350 0 350

Scale in Feet

SulTech

Hunters Point Shipyard, San Francisco, California

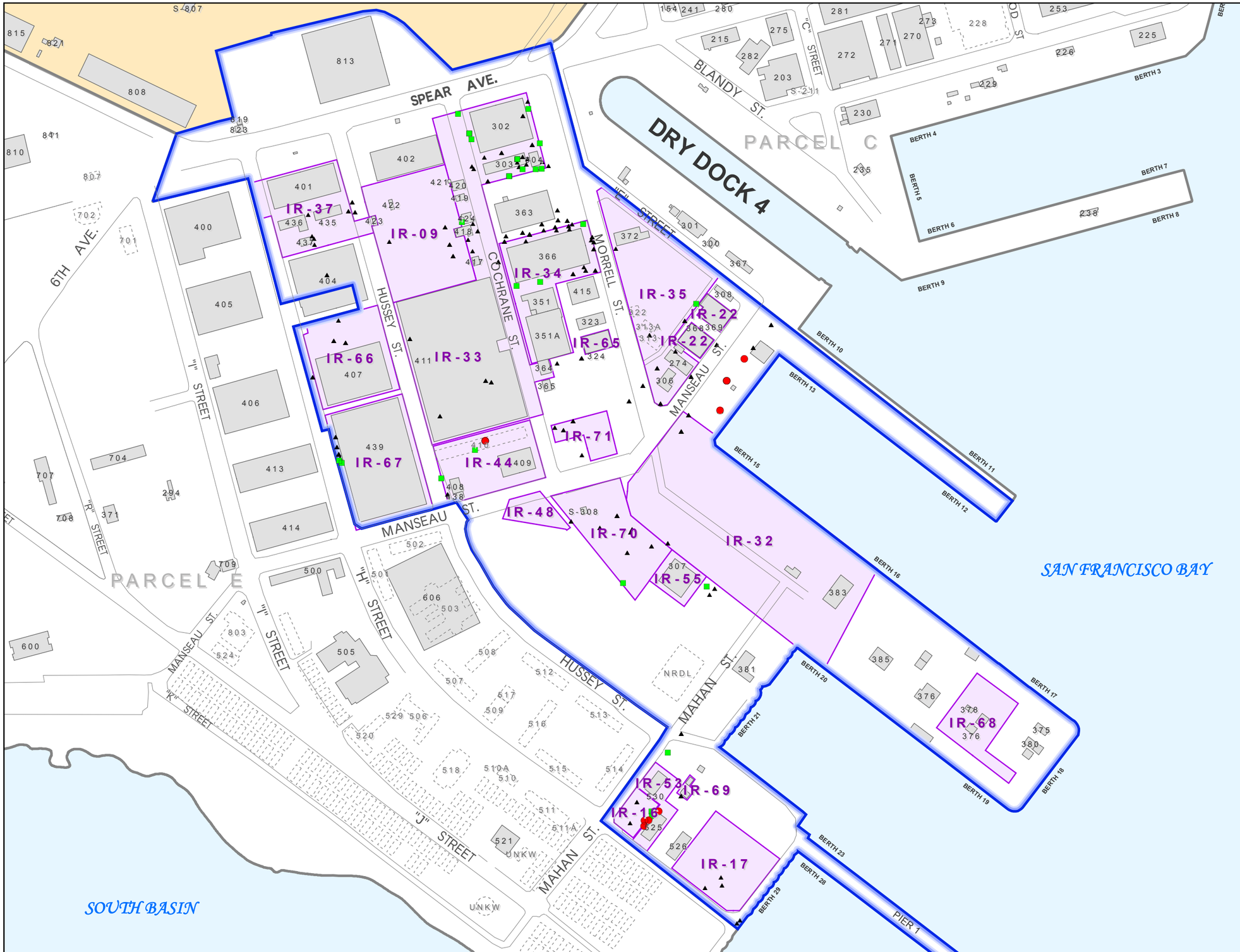
U.S. Department of the Navy, BRAC PMO West, San Diego, California

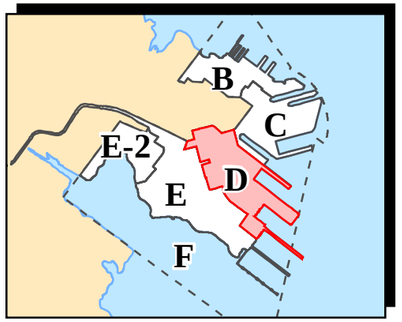
FIGURE 2-25

BENZO(A)PYRENE DISTRIBUTION IN SOIL 0 TO 10 FEET BELOW GROUND SURFACE

Revised Feasibility Study Report for Parcel D

2007-10-15 V:\Hunters_Point\Projects\Parcel_D\FS_2005\Nature and Extent of Contamination\PAHs\BenzoApyrene in soil_0-10ft_summary.mxd TtEMI-SF Kevin Ernst





Location Map

Soil Results: >10 feet bgs

- Result Greater than 0.33 ppm
- Result Less than or Equal to 0.33 ppm
- Nondetected Result
- Parcel D Boundary
- Other Parcel Boundaries
- IR Site Boundary
- Non-Navy Property
- Existing Building
- Demolished Building
- Road

Notes:

0.33 ppm is the lowest laboratory reporting limit for PAHs

> Greater than
bgs Below ground surface
IR Installation Restoration
PAH Polyaromatic hydrocarbon
ppm Part per million

350 0 350

Scale in Feet

SulTech

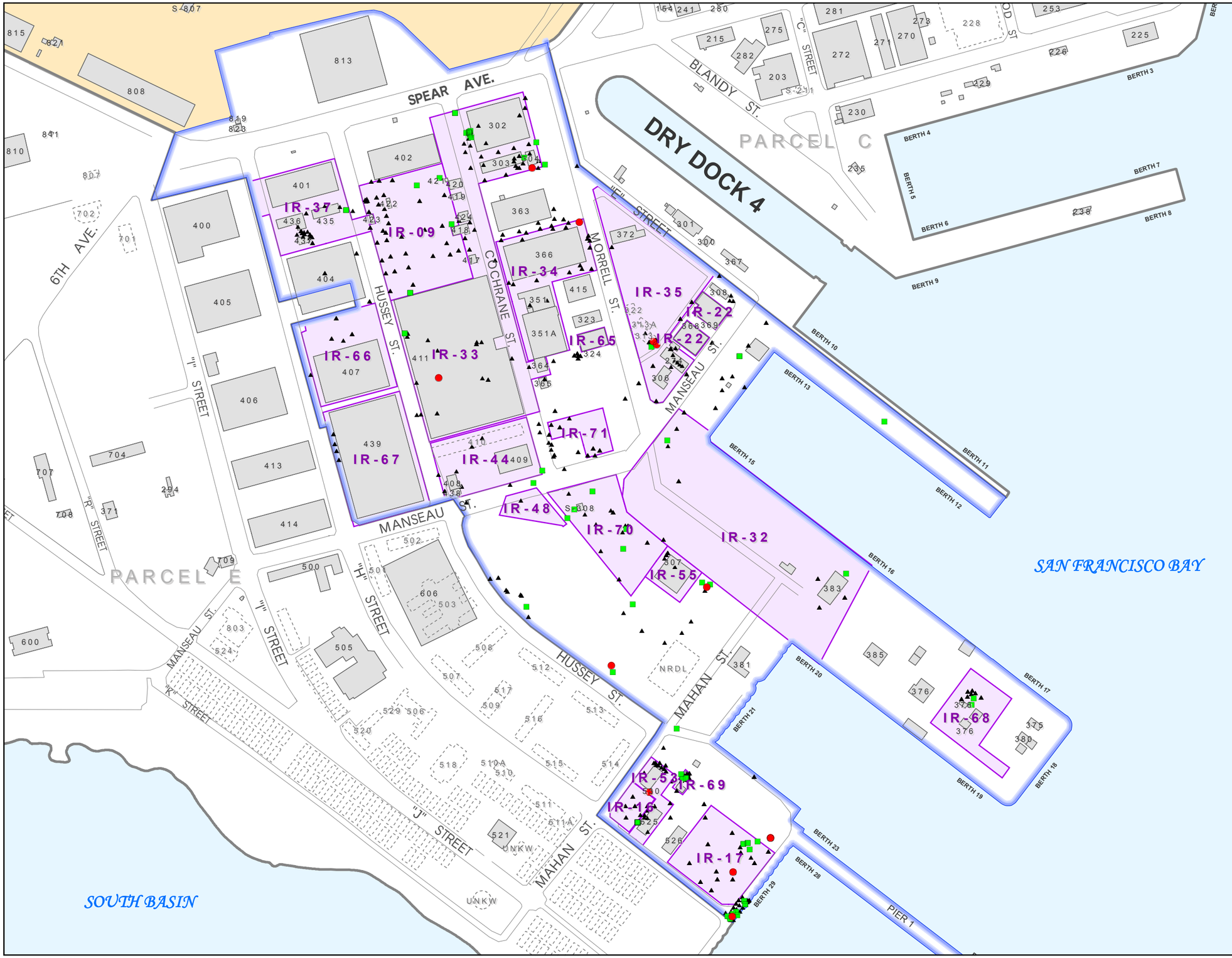
Hunters Point Shipyard, San Francisco, California

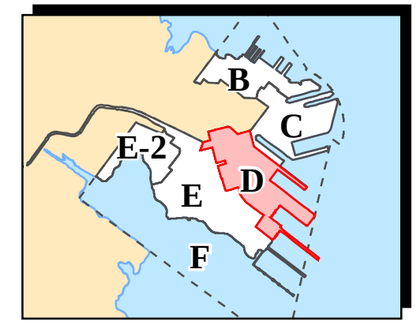
U.S. Department of the Navy, BRAC PMO West, San Diego, California

FIGURE 2-26
BENZO(A)PYRENE
DISTRIBUTION IN SOIL GREATER THAN
10 FEET BELOW GROUND SURFACE

Revised Feasibility Study Report for Parcel D

2007-10-15 V:\Hunters_Point\Projects\Parcel_D\FS_2005\Nature and Extent of Contamination\PAHs\BenzoApyrene in soil_gt10ft_summary.mxd TtEMI-SF Kevin Ernst





Location Map

Soil Results: 0-10 ft bgs

- Results Greather than 0.33 ppm
- Results Less than or Equal to 0.33 ppm
- Nondetected Result
- Parcel D Boundary
- Other Parcel Boundaries
- IR Site Boundary
- Non-Navy Property
- Existing Building
- Demolished Building
- Road

Notes:

0.33 ppm is the lowest laboratory reporting limit for PAHs

bgs Below ground surface
IR Installation Restoration
PAH Polyaromatic hydrocarbon
ppm Part per million

N

350 0 350

Scale in Feet

SulTech

Hunters Point Shipyard, San Francisco, California

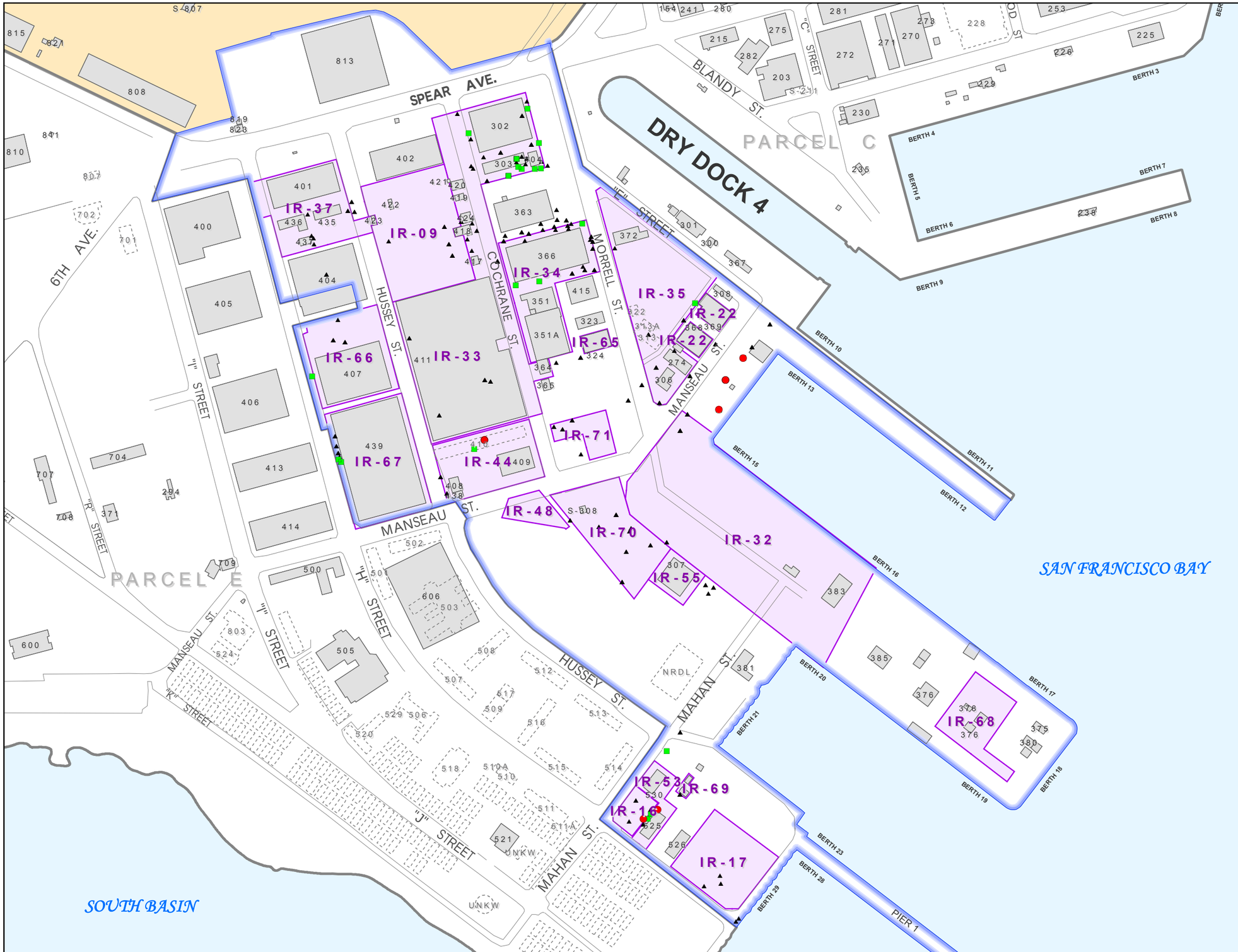
U.S. Department of the Navy, BRAC PMO West, San Diego, California

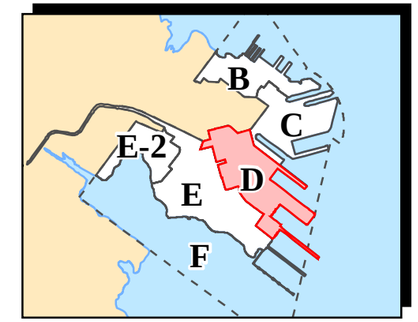
FIGURE 2-27

BENZO(B)FLUORANTHENE DISTRIBUTION IN SOIL 0 TO 10 FEET BELOW GROUND SURFACE

Revised Feasibility Study Report for Parcel D

2007-10-15 V:\Hunters_Point\Projects\Parcel_D\FS_2005\Nature and Extent of Contamination\PAHs\benzoBfluroanthene in soil_0-10ft.mxd TtEMI-SF Kevin Ernst





Location Map

Soil Results: >10 feet bgs

- Result Greater than 0.33 ppm
- Result Less than or Equal to 0.33 ppm
- Nondetected Result
- Parcel D Boundary
- Other Parcel Boundaries
- IR Site Boundary
- Non-Navy Property
- Existing Building
- Demolished Building
- Road

Notes:

0.33 ppm is the lowest laboratory reporting limit for PAHs

bgs Below ground surface
IR Installation Restoration
PAH Polyaromatic hydrocarbon
ppm Part per million

350 0 350
Scale in Feet

SulTech

Hunters Point Shipyard, San Francisco, California
U.S. Department of the Navy, BRAC PMO West, San Diego, California

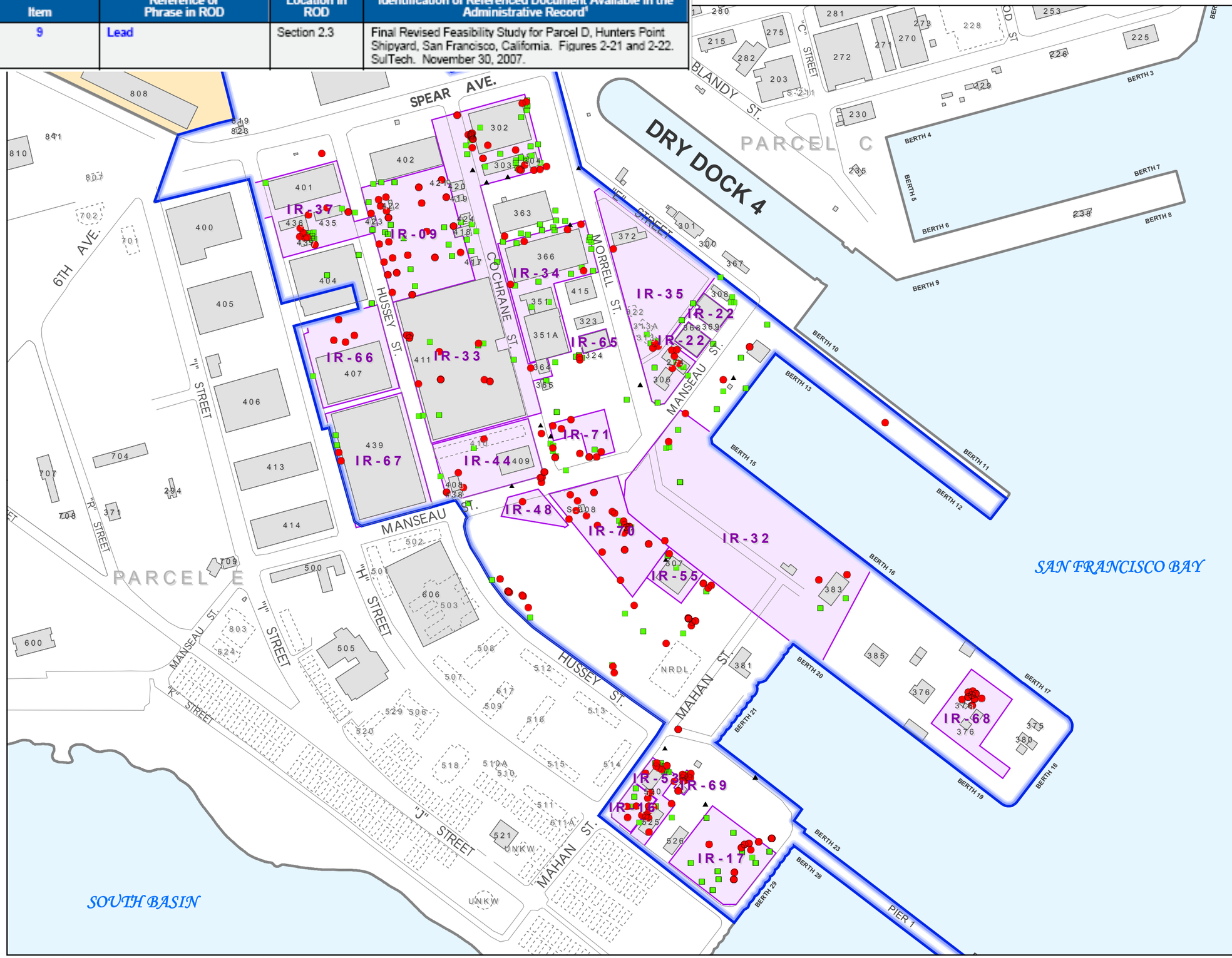
FIGURE 2-28

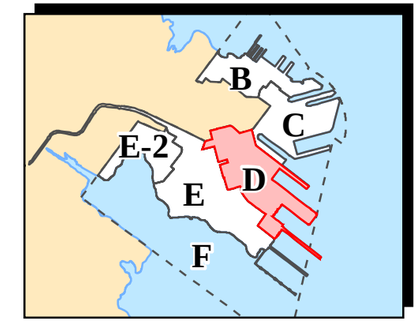
BENZO(B)FLUORANTHENE DISTRIBUTION IN SOIL GREATER THAN 10 FEET BELOW GROUND SURFACE

Revised Feasibility Study Report for Parcel D

2007-10-15 V:\Hunters_Point\Projects\Parcel_D\FS_2005\Nature and Extent of Contamination\PAHs\benzoBfluroanthene in soil_gt10ft.mxd TtEMI-SF Kevin Ernst

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
9	Lead	Section 2.3	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Figures 2-21 and 2-22. SulTech. November 30, 2007.





Location Map

Soil Results: 0-10 feet bgs

- Location Exceeds HPAL Comparison Criteria
- Location Does Not Exceed HPAL Comparison Criteria
- Nondetected Result
- Parcel D Boundary
- Other Parcel Boundaries
- IR Site Boundary
- Non-Navy Property
- Existing Building
- Demolished Building
- Road

Notes:

HPAL for lead is 8.99 mg/kg

bgs Below ground surface
HPAL Hunters Point ambient level
IR Installation Restoration
mg/kg Milligrams per kilogram

350 0 350
Scale in Feet

SulTech

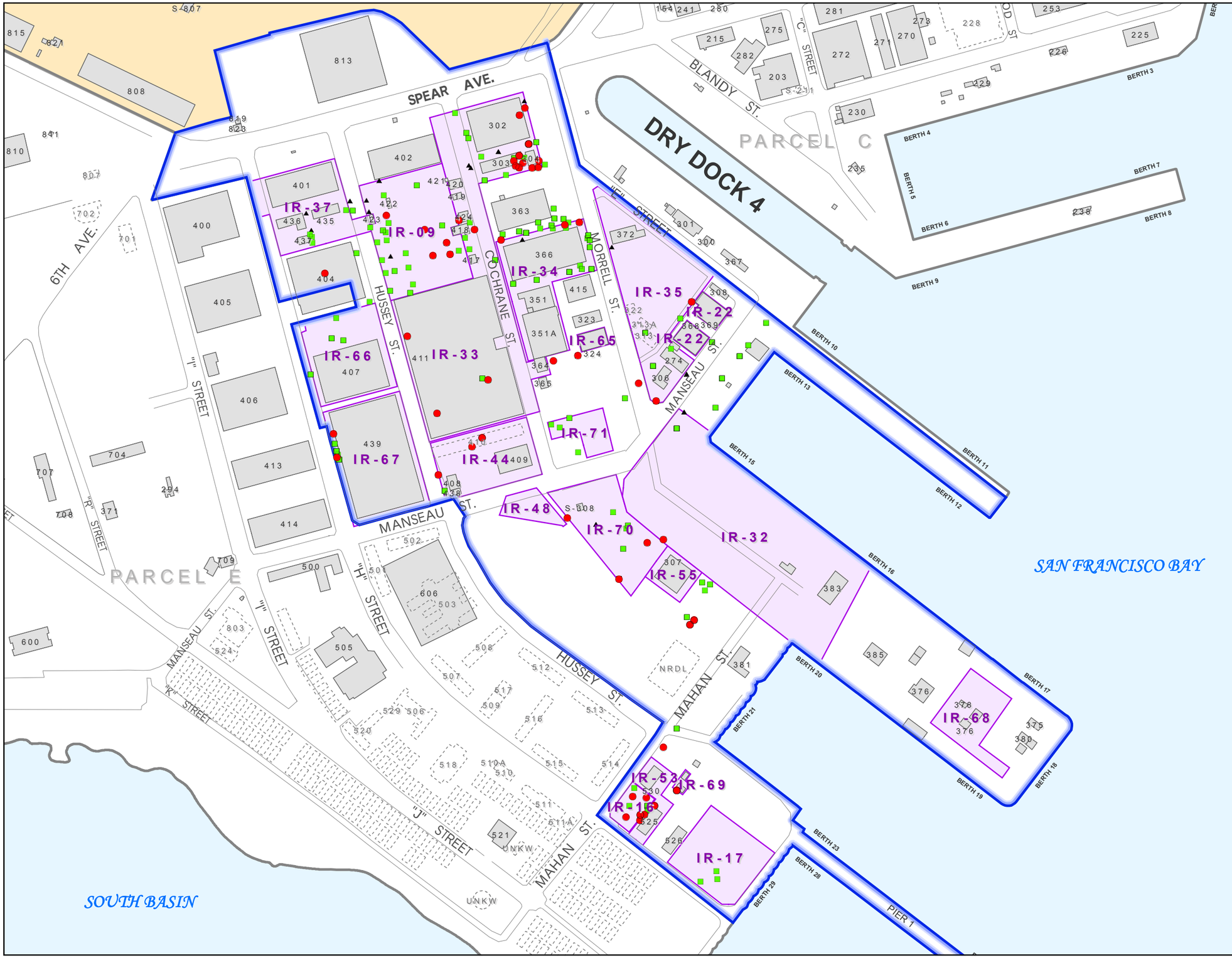
Hunters Point Shipyard, San Francisco, California
U.S. Department of the Navy, BRAC PMO West, San Diego, California

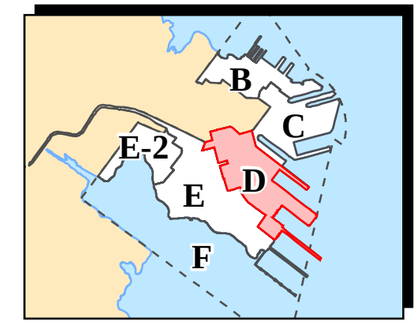
FIGURE 2-21

LEAD DISTRIBUTION IN SOIL 0 TO 10 FEET BELOW GROUND SURFACE

Revised Feasibility Study Report for Parcel D

2007-10-15 V:\Hunters_Point\Projects\Parcel_D\FS_2005\Nature and Extent of Contamination\Metals\Lead in soil_0-10ft.mxd TtEMI-SF Kevin Ernst





Location Map

Soil Results: >10 feet bgs

- Location Exceeds HPAL Comparison Criteria
- Location Does Not Exceed HPAL Comparison Criteria
- Nondetected Result
- Parcel D Boundary
- Other Parcel Boundaries
- IR Site Boundary
- Non-Navy Property
- Existing Building
- Demolished Building
- Road

Notes:

HPAL for lead is 8.99 mg/kg

>	Greater than
bgs	Below ground surface
HPAL	Hunters Point ambient level
IR	Installation Restoration
mg/kg	Milligrams per kilogram

350 0 350

Scale in Feet

SulTech

Hunters Point Shipyard, San Francisco, California

U.S. Department of the Navy, BRAC PMO West, San Diego, California

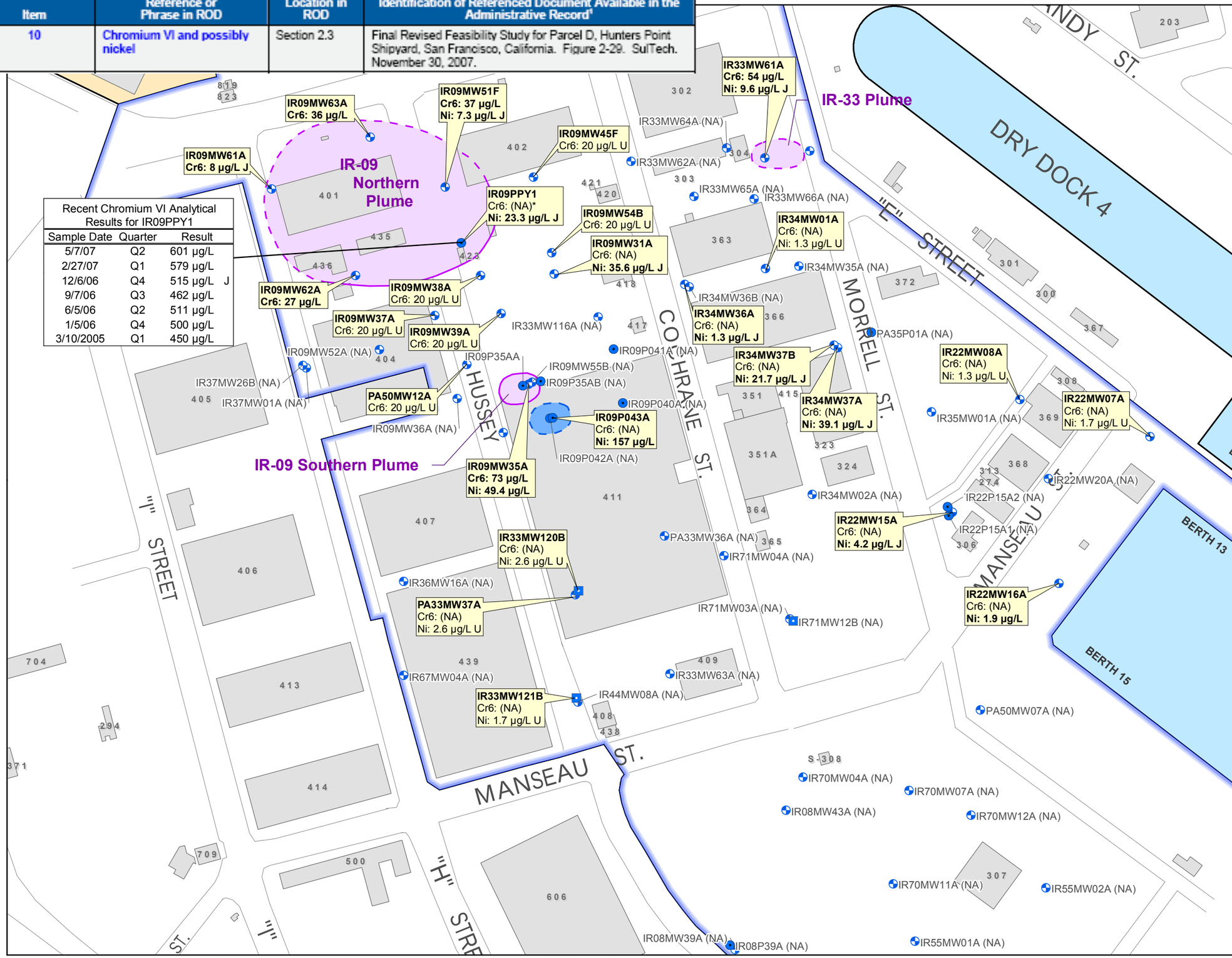
FIGURE 2-22

LEAD DISTRIBUTION IN SOIL GREATER THAN 10 FEET BELOW GROUND SURFACE

Revised Feasibility Study Report for Parcel D

2007-10-15 V:\Hunters_Point\Projects\Parcel_D\FS_2005\Nature and Extent of Contamination\Metals\Lead in soil_gt10ft.mxd TtEMI-SF Kevin Ernst

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
10	Chromium VI and possibly nickel	Section 2.3	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Figure 2-29. SulTech. November 30, 2007.



Hunters Point Shipyard, San Francisco, California

U.S. Department of the Navy, BRAC PMO West, San Diego, California

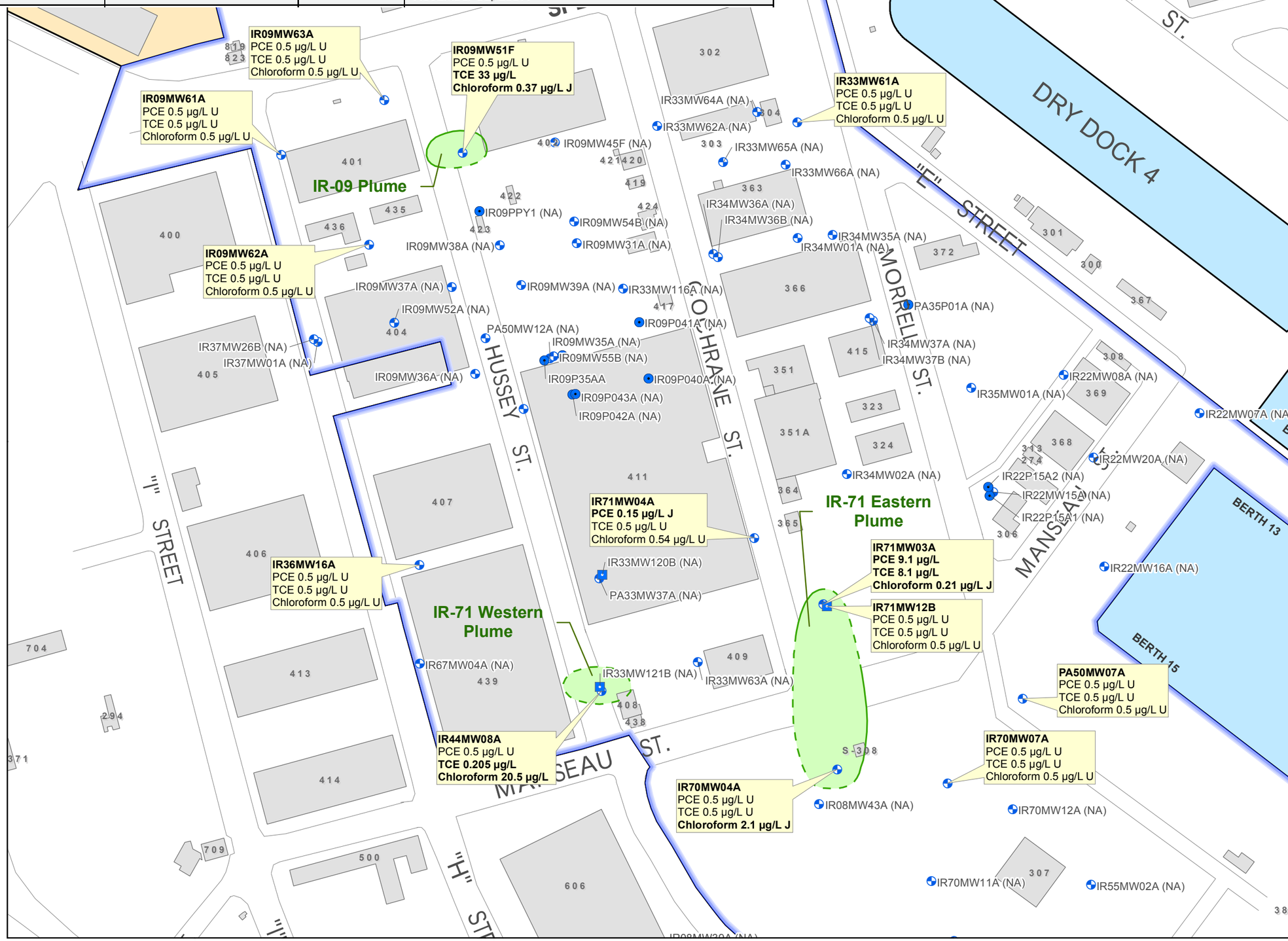
FIGURE 2-29

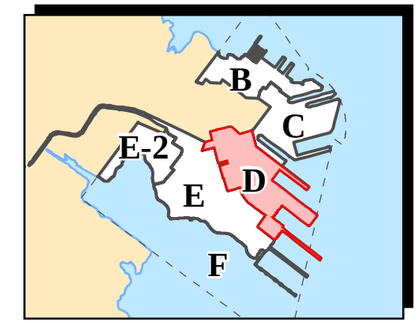
CHROMIUM VI AND NICKEL CONCENTRATIONS IN THE A-AQUIFER

Revised Feasibility Study Report for Parcel D

2007-11-29 V:\Hunters_Point\Projects\Parcel_D\FS_2005\Nature and Extent of Contamination\Groundwater\Parcel_CRVI_gw_plumes_11x17.mxd TtEMI-SF Kevin Ernst

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
11	VOCs	Section 2.3	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Figure 2-30. SulTech. November 30, 2007.





Location Map

A-Aquifer Well
B-Aquifer Well
Piezometer
2004 TCE, PCE and Chloroform Groundwater Plumes (outline dashed where uncertain)
Parcel D Boundary
Other Parcel Boundaries
Non-Navy Property
Building
Road

Notes:
Analytical results shown with a U qualifier (nondetect results) are considered not present above the level of the associated value.

Detected results are shown in bold font.

µg/L	Microgram per liter
IR	Installation Restoration
J	Estimated result
NA	Not analyzed
PCE	Tetrachloroethene
TCE	Trichloroethene
U	Nondetect result

200 0 200
Scale in Feet

SulTech

Hunters Point Shipyard, San Francisco, California
U.S. Department of the Navy, BRAC PMO West, San Diego, California

FIGURE 2-30
PCE, TCE, AND CHLOROFORM CONCENTRATIONS IN THE A-AQUIFER

Revised Feasibility Study Report for Parcel D

2007-10-15 V:\Hunters_Point\Projects\Parcel_D\FS_2005\Nature and Extent of Contamination\Groundwater\Parcel_D_PCE_TCE_CHL4M_gw_plumes_11x17.mxd TtEMI-SF Kevin Ernst

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
12	Radiologically impacted sites	Section 2.3	Final Historical Radiological Assessment, History of the Use of General Radioactive Materials, 1939 – 2003. Sections 8.3.4.6, 8.3.4.7, 8.3.4.8, 8.3.4.9, 8.3.4.10, 8.3.4.12, and 8.3.4.13. Naval Sea Systems Command. August 2004.

8.3.4.6 Building 351

Site Description: Building 351 is a WW II era reinforced concrete shop building constructed in 1945 and enlarged at a later date. The core building is three stories, with a flat roof and a five-story tower at the northwest corner **(HRA-1118, p 170)**. A building site plan is provided in Figure 8.3.4.4 above, and a floor plan is provided in Figure 8.3.4.6FP (first and second floors).

Former Uses: Electronics work area/shop **(HRA-1327 Encl 1, p 1; HRA-4667)**, optical laboratories **(HRA-1327 Encl, 1 p 1)**, NRDL Materials and Accounts Division **(HRA-1586)**, NRDL Technical Information Division **(HRA-1990, p 3; HRA-2928, p 2)**, BUMED storeroom **(HRA-2002, p 6)**, NRDL Office Services Branch **(HRA-2083, p 3)**, NRDL Thermal Branch **(HRA-2083, p 4)**, machine shop (on first floor), NRDL Engineering Division, NRDL library, sampling laboratory, general research laboratories, and biological research laboratories.

Current Uses: Unoccupied.

Radionuclides of Concern: Cs-137, Ra-226, Sr-90, and Th-232.

Previous Radiological Investigations:

2002 NWT Phase V investigations. Surveys complete.

1955 NRDL surveyed. Cleared: below release limits of the period.

Contamination Potential: Likely.

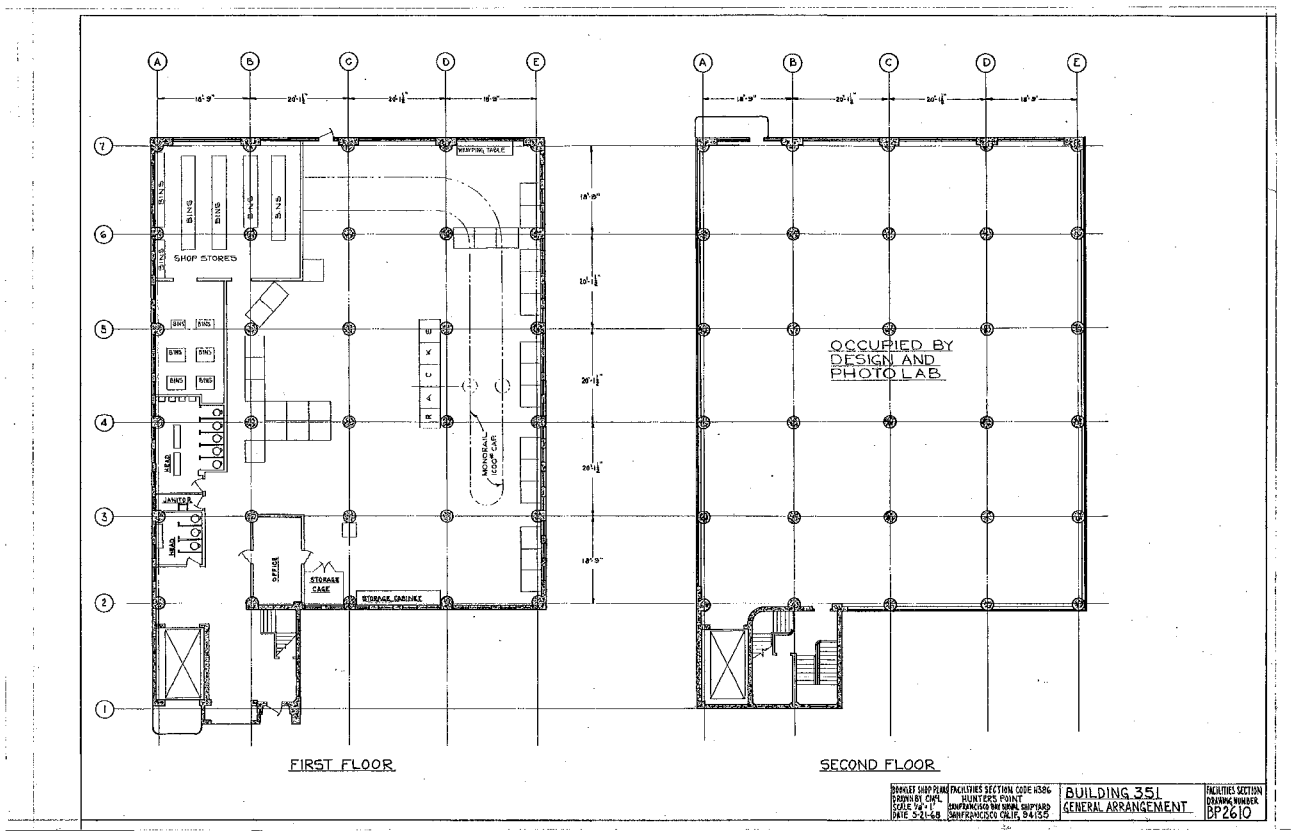
Contaminated Media:

Surface Soil: None
Subsurface Soil: None
Sediment: Low
Surface Water: None
Groundwater: None
Air: None
Structures: Moderate
Drainage Systems: Low

Potential Migration Pathways:

Surface Soil: None
Subsurface Soil: None
Sediment: Low
Surface Water: None
Groundwater: None
Air: None
Structures: Low
Drainage Systems: Low

Recommended Actions: Review Final Status Survey Report.



24 0 24

Scale in Feet

Notes:

Background image per Map ID 453.

Hunters Point Naval Shipyard
San Francisco CA

Historical Radiological Assessment

May, 2003

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Figure 8.3.4.6 FP
Building 351 - Floor Plan

8.3.4.7 Building 351A

Site Description: Building 351A is an addition connected to the south end of Building 351. It is a one-story concrete building constructed over a crawlspace. A building site plan is provided in Figure 8.3.4.4 above, and a floor plan is provided in Figure 8.3.4.7FP.

Former Uses: NRDL Chemical Technology Division **(HRA-1963, p 6; HRA-2065, p 3)**, headquarters guard post **(HRA-2069, p 4)**, NRDL Physical Security, NRDL Applied Research Branch, NRDL Chemical Technology Division, NRDL administrative offices, NRDL Nuclear and Physical Chemistry Branch, NRDL Chemical and Physics Branch **(HRA-2928, pp 2, 4, 5)**, NRDL Analytical and Standards Branch, instrument repair facility, metrology laboratory, electronics shop annex **(HRA-4667)**, material storage area, instrument calibration laboratory, and radiography shop.

Current Uses: Unoccupied.

Radionuclides of Concern: Cs-137, Pu-239, Ra-226, Sr-90, and Th-232.

Previous Radiological Investigations:

2002 NWT Phase V investigation. Upper level surveys complete. Drain piping and small amounts of soil in crawlspace removed and disposed of due to Cs-137 contamination. Drainpipe removed across Cochran Street. Resurvey complete. Contamination remains outside the back steps of the building.

1955 NRDL Survey. Cleared to release limits for the period for return to shipyard except for drain lines left in place.

Contamination Potential: Known-Continued Access.

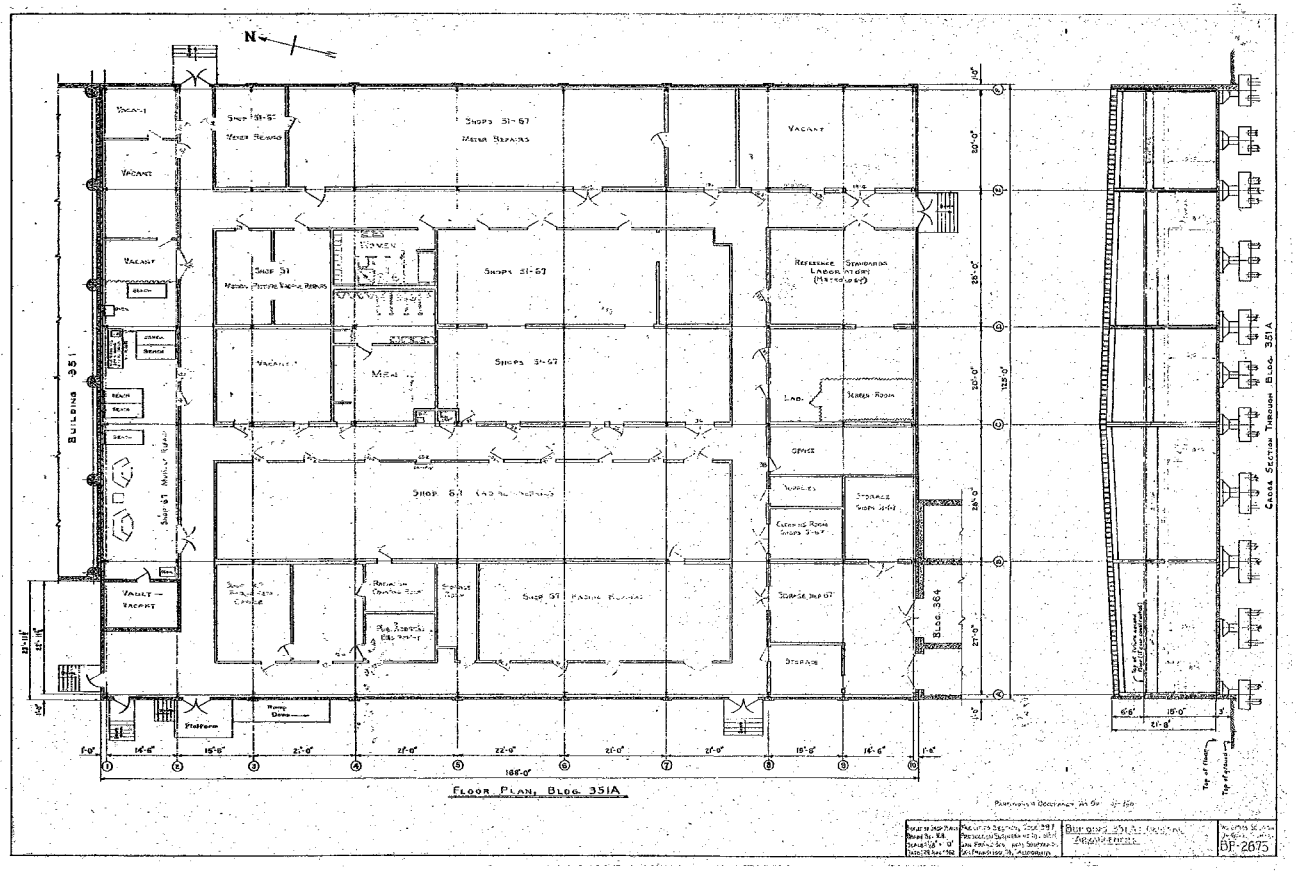
Contaminated Media:

Surface Soil: Moderate
Subsurface Soil: Moderate from drain line leakage.
Sediment: Moderate
Surface Water: None
Groundwater: None
Air: None
Structures: Moderate (crawlspace)
Drainage Systems: Moderate (crawlspace)

Potential Migration Pathways:

Surface Soil: Moderate
Subsurface Soil: Moderate from drain line leakage.
Sediment: Low
Surface Water: None
Groundwater: None
Air: None
Structures: Low (crawlspace)
Drainage Systems: Low (crawlspace)

Recommended Actions: Remediate known area of contamination. Complete Final Status Survey.



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Scale in Feet

Notes:

Background image per Map ID 534.

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Figure 8.3.4.7 FP
Building 351A - Floor Plan

8.3.4.8 Building 364

Site Description: Building 364 measures approximately 40 feet by 50 feet. A liquid radioactive waste collection area to the rear of the building contained a subsurface sump with a pumphouse on a concrete pad and two holding tanks. A building site plan is provided in Figure 8.3.4.4 above, and a floor plan is provided in Figure 8.3.4.8FP.

Former Uses: Animal irradiation facility, Liquid Radioactive Waste Collection Facility **(HRA-136; HRA-147; HRA-590)**, hot cell **(HRA-48; HRA-147; HRA-1331)**, Research Animal Facility **(HRA-48, p 8; HRA-600 Encl 3)**, storage building **(HRA-1331, p 1; HRA-4667)**, isotope processing and decontamination studies **(HRA-1095)**, and general research laboratory. Formerly leased by Young Laboratories.

Current Uses: Unoccupied.

Radionuclides of Concern: Co-60, Cs-137, Pu-239, Ra-226, Sr-90, and U-235.

Previous Radiological Investigations:

2002 NWT Phase V investigations. Cs-137 detected on building surfaces, piping in building crawlspace, and piping/trench outside rear of building. Areas remediated and resurveyed. Alpha and beta contamination remains in Room 107.

2001 NWT removal of waste tank pit. Areas met contemporary release criteria.

2001 NWT completes removal actions (peanut area) based on revised release limits. Surveys completed.

1996 ATG removal of "peanut spill" area. Subsequent survey and samples met the release criteria of the period.

1991 PRC Phase I investigations. Identified peanut area as exceeding release limits for the period.

1979 RASO survey. Decontamination and resurvey. Met release limits for the period.

1978 RASO survey. Noted areas of elevated activity. Decontaminated.

1969 AEC. Survey for clearance 24 December 1969, which included the yard and pit. Pipe outside building was concreted and allowed to remain in place. Areas met release criteria of the period.

Contamination Potential: Known-Restricted Access to Room 107

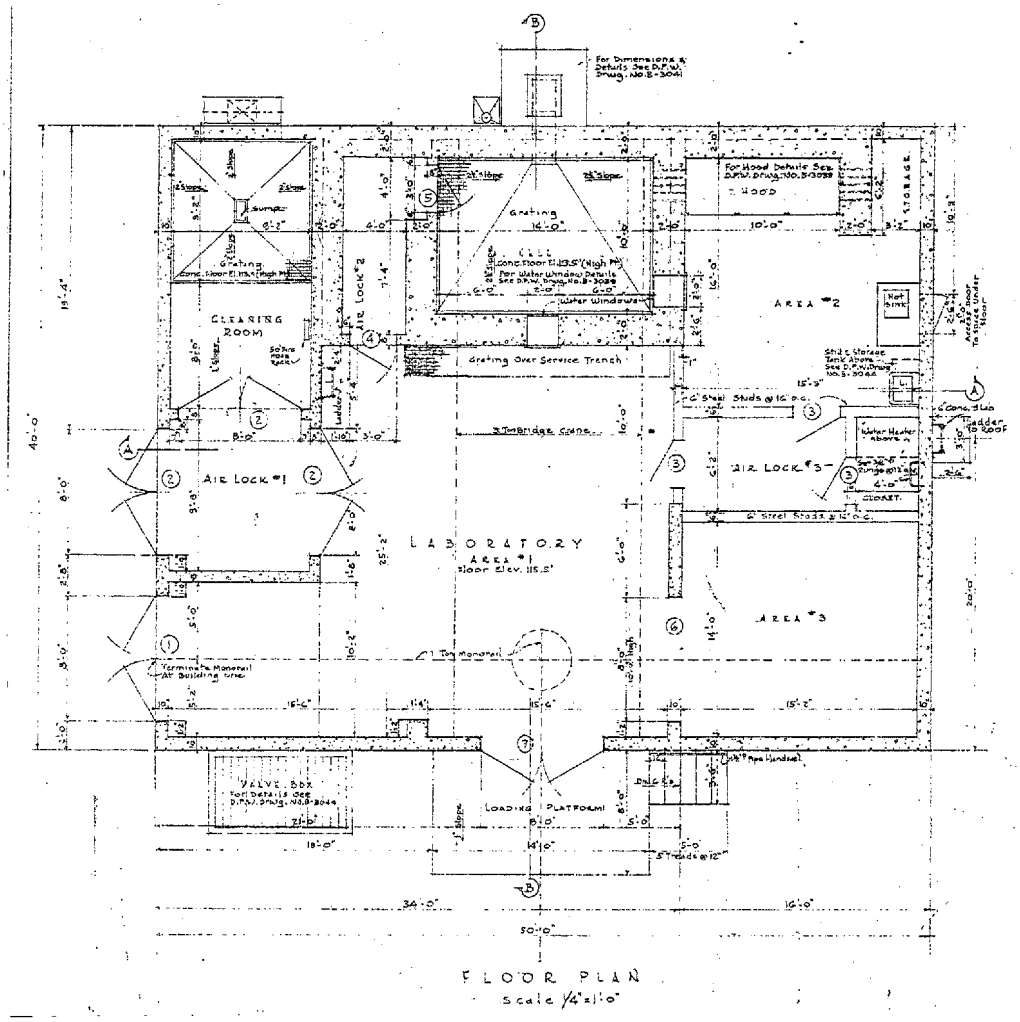
Contaminated Media:

Surface Soil: High
Subsurface Soil: Moderate
Sediment: High
Surface Water: None
Groundwater: None
Air: None
Structures: High
Drainage Systems: High

Potential Migration Pathways:

Surface Soil: Moderate
Subsurface Soil: Low
Sediment: Moderate
Surface Water: None
Groundwater: None
Air: None
Structures: Moderate
Drainage Systems: Moderate

Recommended Actions: Remediate known areas of contamination. Final Status Survey following remediation.



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12 0 12

Scale in Feet

Notes:

Background image per Map ID 116.

Hunters Point Naval Shipyard
San Francisco CA
Historical Radiological Assessment

May, 2003

Figure 8.3.4.8 FP
Bldg. 364 Floor Plan

8.3.4.9 Building 365

Site Description: Building 365 is a one-story wooden structure with a concrete foundation and measures 30 feet by 40 feet. A building site plan is provided in Figure 8.3.4.4 above.

Former Uses: Personnel decontamination facility **(HRA-136; HRA-147; HRA-431)**, change house **(HRA-412; HRA-2928, p 5)**, storage building **(HRA-4667)**, and NRDL small animal facility.

Current Uses: Unoccupied.

Radionuclides of Concern: Cs-137, Pu-239, Ra-226, Sr-90, and U-235.

Previous Radiological Investigations:

2002 NWT Phase V investigations. Surveys complete.

1978 RASO survey. Results were less than instrument MDA.

1969 AEC survey. Clearance given 24 December 1969, based on release limits of the period.

Contamination Potential: Unlikely.

Contaminated Media:

Surface Soil: None
Subsurface Soil: None
Sediment: Low
Surface Water: None
Groundwater: None
Air: None
Structures: Low
Drainage Systems: Low

Potential Migration Pathways:

Surface Soil: None
Subsurface Soil: None
Sediment: Low
Surface Water: None
Groundwater: None
Air: None
Structures: Low
Drainage Systems: Low

Recommended Actions: Review Final Status Survey Report.

8.3.4.10 Building 366 (Former Building 351B)

Site Description: Building 366 is a large corrugated metal, gable-roofed Butler-type structure, measuring approximately 280 feet by 130 feet. A building site plan is provided in Figure 8.3.4.10.

Former Uses: NRDL instrument calibration **(HRA-1036; HRA-1485)**; administrative offices **(HRA-1327, p 2)**; Applied Research and Technical Development Branches **(HRA-2022, p 6)**; administrative offices moved from D-19, 20, and 21 in 1952 **(HRA-1586)**; Radiological Safety Branch **(HRA-2018, p 5)**; Management Planning Division **(HRA-2030, p 3)**; Nucleonics Division **(HRA-2928, p 5)**; Instruments Evaluation Section; general laboratories; Chemical Research Laboratory; shipyard radiography shop; Boat/Plastic Shop **(HRA-4667)**; other military/Navy Branch Project Officers Station **(HRA-2928, p 1)**; and NRDL Management Engineering and Comptroller Department **(HRA-2928, p 1)**.

Current Uses: Leased to San Francisco Redevelopment Agency. Currently used by 29 artists from The Point artists' colony.

Radionuclides of Concern: Cs-137, Ra-226, and Sr-90.

Previous Radiological Investigations:

2002/2003	Phase V investigations. Ventilation ducting and inactive floor drain indicated Cs-137 exceeding release limits. Remediation required.
2001	NWT Survey. No activity above background, but the survey protocol did not meet Phase V survey requirements.
1955	NRDL Surveys. Cleared below release limits by NRDL.

Contamination Potential: Known-Continued Access.

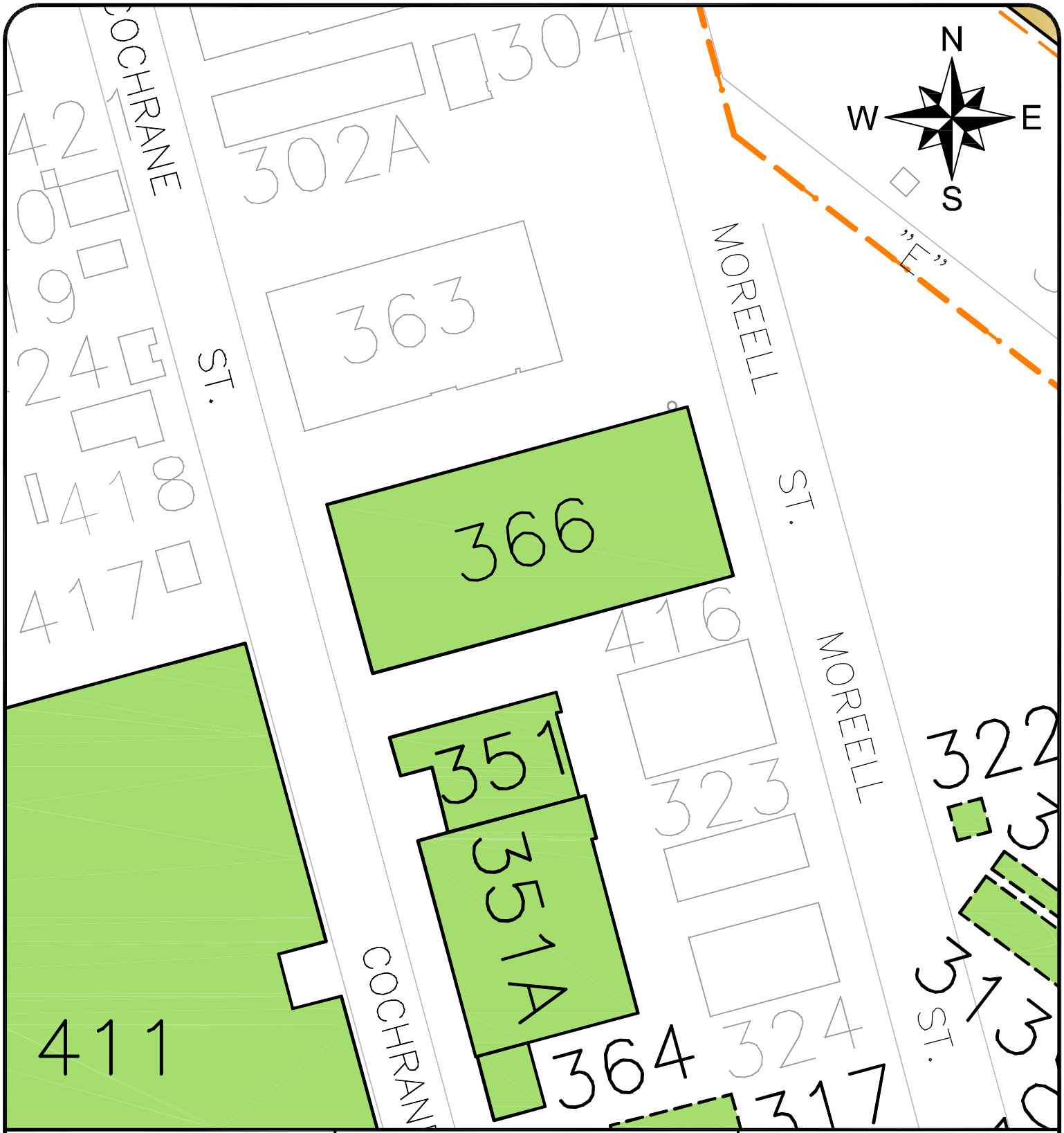
Contaminated Media:

Surface Soil: None
Subsurface Soil: None
Sediment: Moderate
Surface Water: None
Groundwater: None
Air: None
Structures: Moderate
Drainage Systems: Moderate

Potential Migration Pathways:

Surface Soil: None
Subsurface Soil: None
Sediment: Low
Surface Water: None
Groundwater: None
Air: None
Structures: Low
Drainage Systems: Low

Recommended Actions: Remediate known areas of contamination. Conduct Final Status Survey.



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100 0 100

Scale in Feet

- Impacted Site with Designation
- Impacted Site with Designation (Demolished)
- IR Site w/ Designation
- Non - Impacted Building
- Non-Impacted Building (Demolished)
- Topographic Feature
- Parcel Boundary

Hunters Point Naval Shipyard
San Francisco CA
Historical Radiological Assessment

Bldg. 366 Site Plan

January, 2004

Figure 8.3.4.10

8.3.4.12 Building 408

Site Description: Building 408 houses a furnace/smelter that was constructed in 1947. The building is the equivalent of three stories at its northern side, dropping to one story at the south. It is open-sided on the north. Most of the east and west sides are sided in transite, a corrugated asbestos-concrete material. A firebrick-lined hearth occupies most of the open area at the north. Natural gas burners exist on the east and west sides of the hearth. A pair of smokestacks extends from the lower rear segment of the building. A building site plan is provided in Figure 8.3.4.12.

Former Uses: Furnace-smelter **(HRA-1118, pp 153, 154)**.

Current Uses: Unused.

Radionuclides of Concern: Ra-226 from prior smelting operations and natural thorium in the firebrick.

Previous Radiological Investigations: None.

Contamination Potential: Likely.

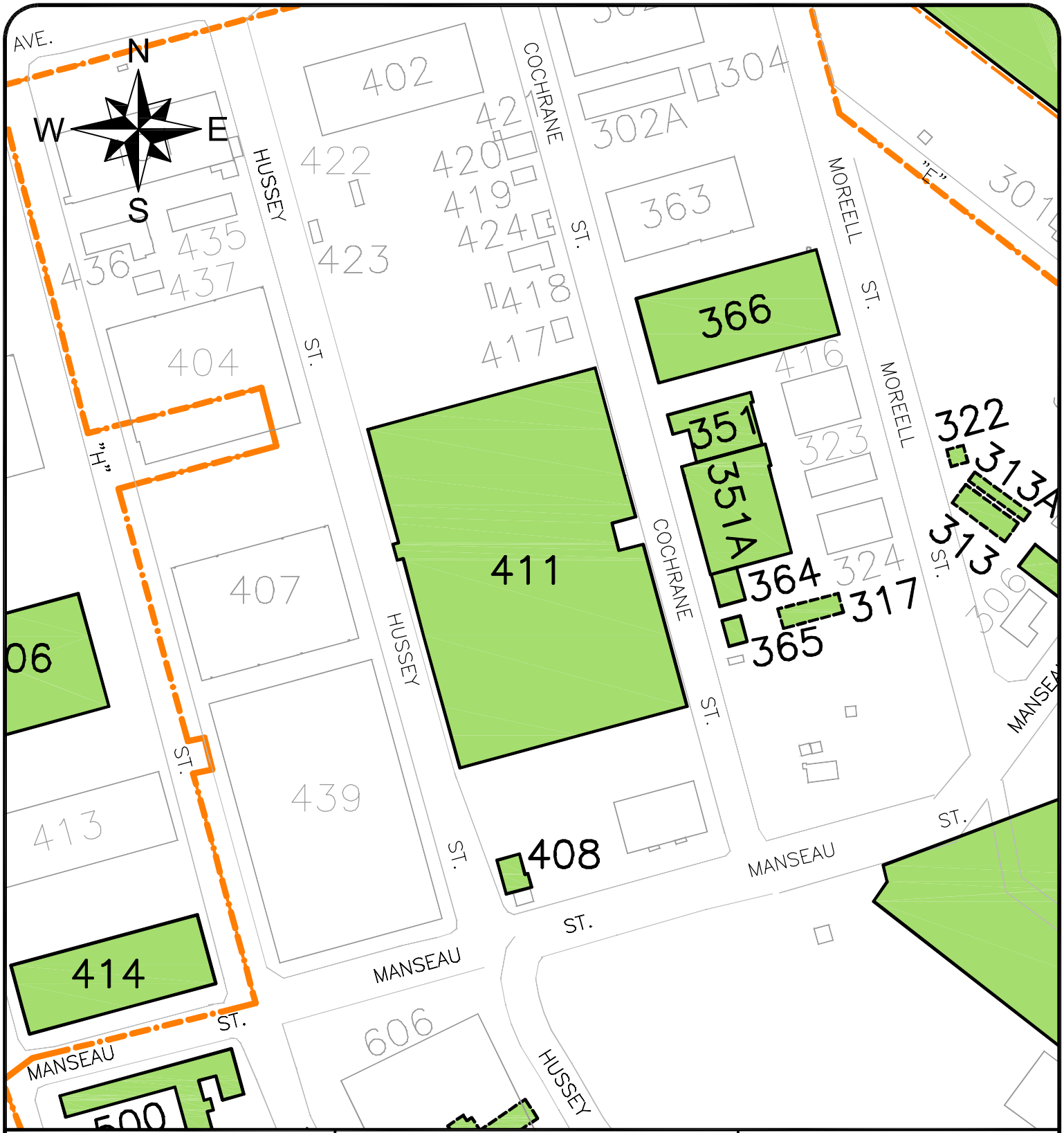
Contaminated Media:

Surface Soil: None
Subsurface Soil: None
Sediment: None
Surface Water: None
Groundwater: None
Air: None
Structures: Moderate
Drainage Systems: None

Potential Migration Pathways:

Surface Soil: None
Subsurface Soil: None
Sediment: None
Surface Water: None
Groundwater: None
Air: None
Structures: Low
Drainage Systems: None

Recommended Actions: Scoping Survey. Characterization Survey if contamination is found. Final Status Survey if no contamination is found or following remediation if that is necessary.



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200 0 200

Scale in Feet

- Impacted Site with Designation
- Impacted Site with Designation (Demolished)
- IR Site w/ Designation
- Non - Impacted Building
- Non-Impacted Building (Demolished)
- Topographic Feature
- Parcel Boundary

Hunters Point Naval Shipyard
San Francisco CA
Historical Radiological Assessment

Bldg. 408 & 411 Site Plan

January, 2004

Figure 8.3.4.12

8.3.4.13 Building 411

Site Description: Building 411 is a large curtain-walled, steel-framed building with a flat roof, located in the southern waterfront area. The building includes a saw-toothed series of rooftop monitors as well as bands of steel industrial sash and large glazed industrial doors. The building has two levels, with a taller segment to the north **(HRA-1118, pp 143-145)**. A building site plan is provided in Figure 8.3.4.12 above.

Former Uses: Source storage **(HRA-548, p 2)**, civilian cafeteria, radiography shop, Shipfitters and Boilermakers Shop, and Ship Repair Shop.

Current Uses: Eric Lansdown (The Doll House) and Sierra Western Equipment.

Radionuclides of Concern: Co-60, Cs-137, and Ra-226.

Previous Radiological Investigations:

2002 NWT Phase V investigations. Ra-226 found on second floor was within release limits. Surveys complete.

Contamination Potential: Unlikely.

Contaminated Media:

Surface Soil: None
Subsurface Soil: None
Sediment: None
Surface Water: None
Groundwater: None
Air: None
Structures: Low
Drainage Systems: None

Potential Migration Pathways:

Surface Soil: None
Subsurface Soil: None
Sediment: None
Surface Water: None
Groundwater: None
Air: None
Structures: Low
Drainage Systems: None

Recommended Actions: Review Final Status Survey Report.

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
13	Drinking water	Section 2.4	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Section 2.2.9. SulTech. November 30, 2007.

The estimated groundwater velocities at Parcel D range from 1.5 to 31 feet per year. These velocities were calculated using the typical intermediate value of hydraulic gradient for the A-aquifer throughout Parcel D of 0.001 (PRC, LFR, and U&A 1996) and an assumed effective porosity for the A-aquifer of 0.25. No slug test or pumping test evaluations were performed for the B-aquifer within Parcel D. However, slug tests were performed in two monitoring wells in the underlying fractured bedrock water-bearing zone at IR-09 in the north-central area of Parcel D (PRC, LFR, and U&A 1996), with estimated hydraulic conductivities ranging from 0.025 to 3.7 feet per day. In general, groundwater velocities in the fractured bedrock water-bearing zone is expected to be low because the flow occurs mostly through fractures that are likely filled with residual clays and silts (PRC, LFR, and U&A 1996).

2.2.9 Groundwater Beneficial Use Evaluation

This section summarizes the beneficial use evaluation conducted for groundwater underlying Parcel D. The complete beneficial use evaluation is presented in Appendix D. The potential beneficial uses of Parcel D groundwater have been evaluated several times in the past (see Appendix D; Tetra Tech 2001c). In 2003, the Navy concluded that A-aquifer groundwater at Parcel D is unsuitable for use as a potential source of drinking water based on an evaluation of site-specific factors (Navy 2003). In 2003, the Water Board concurred with the Navy's determination that the A-aquifer at HPS is not a potential drinking water source (Water Board 2003). EPA, however, did not concur and required that federal criteria also be used to assess if Parcel D groundwater could be considered a potential drinking water source.

EPA considers groundwater to be a potential source of drinking water if the following criteria are met:

- The total dissolved solids (TDS) concentration is less than 10,000 milligrams per liter (mg/L)
- A minimum well yield of 150 gallons per day or 0.104 gallon per minute can be achieved

Figure 2-10 presents the maximum TDS concentrations detected in A-aquifer groundwater monitoring wells at Parcel D. As shown on Figure 2-10, TDS concentrations exceed 10,000 mg/L along the Parcel D shoreline and are less than 10,000 mg/L in the central and northwestern part of the parcel. The federal TDS criterion was applied separately to each IR site at Parcel D in this FS report. Based on this criterion, groundwater underlying all or part of the following 17 IR sites could be considered potential sources of drinking water: IR-09, IR-16, IR-17, IR-32, IR-33 North and South, IR-34, IR-37, IR-44, IR-48, IR-53, IR-55, IR-65, IR-66, IR-67, IR-68, IR-69, and IR-70. Based on known hydrogeologic conditions at Parcel D, it is assumed that a minimum well yield of 150 gallons per day could also be achieved from

A-aquifer wells at these IR sites (PRC, LFR, and U&A 1996). A-aquifer groundwater in these areas was further evaluated against the site-specific factors below.

In a 1999 letter, EPA provided the Navy with additional guidelines for applying the federal criteria (EPA 1999a). An attachment to the letter (referred to as "Enclosure 5") listed site-specific factors that can be considered in deciding whether all or portions of an aquifer should be considered a potential source of drinking water. This letter is provided as an attachment to Appendix D. These factors include the following: (1) aquifer thickness, (2) TDS levels measured, (3) groundwater yield, (4) proximity to saltwater and the potential for saltwater intrusion, (5) the quality of underlying water-bearing units, (6) the existence of institutional controls on well construction or aquifer use, (7) information on current and historical use of the aquifer on the base or in the community surrounding the base, and (8) the cost of cleanup to federal drinking water standards. In addition, the BCT considered depth to groundwater a relevant site-specific factor because shallow aquifers are susceptible to contamination and may not be suitable sources of drinking water as a result.

The Navy evaluated seven of the eight factors listed above. Not included was factor number five, the quality of underlying water-bearing units. Quality of underlying water-bearing units was not considered because the B-aquifer at Parcel D is isolated and limited, and the deep bedrock water-bearing zone at Parcel D was not identified or investigated.

Table 2-3 summarizes the results of each of the eight site-specific factor evaluations and the overall potential for the A-aquifer to be used as a source of drinking water in each of the IR sites that meet the federal TDS criterion. The Navy believes that the A-aquifer underlying each of these sites has no potential to be used as a source of drinking water, based on the eight evaluation factors in Table 2-3, and on the key criteria presented below.

- **Aquifer thickness and depth to groundwater:** Generally, the depth to groundwater for the A-aquifer is less than 10 feet across Parcel D. The average thickness of the A-aquifer is approximately 25 feet, with a maximum thickness of approximately 40 feet (see Figure 2-7). Together, these two site-specific factors indicate the A-aquifer at Parcel D is very shallow and of limited extent, and therefore may not be suitable as a potential source of drinking water.

- **Existence of institutional controls on well construction or aquifer use:** California Department of Water Resources Bulletins 74-81 and 74-90 provide standards for well construction in California (Department of Water Resources 1981, 1991). These bulletins indicate that an individual domestic well must have a minimum seal of at least 20 feet from the ground surface, and a community water supply well must have a minimum seal of at least 50 feet from the surface for the wells to be used for water supply. Wells installed in the A-aquifer would not meet the minimum well seal requirements because of the shallow depth to groundwater at Parcel D (less than 10 feet). These well construction standards also prohibit installation of domestic wells within 50 feet of a storm drain or sanitary sewer line. Figure 2-11 shows areas of Parcel D that are beyond 50 feet of a sewer line and meet the TDS requirements.

As shown on Figure 2-11, most of Parcel D is within the 50-foot buffer zone from the sewer lines. Although these lines will be removed by the Navy, this figure shows the likely density of sewer lines that would be installed by the City and County of San Francisco during redevelopment of HPS. As a result, installation of domestic wells would be prohibited in many portions of the A-aquifer at Parcel D. Also, the City and County of San Francisco regulations prohibit installation of domestic wells within city boundaries. Based on the existence of these local and state institutional controls that prohibit or severely restrict locations where new potable wells can be installed, there is low potential for use as a source of drinking water because of these institutional controls.

- **Proximity to saltwater and actual TDS values:** Although a large portion of the A-aquifer at Parcel D meets the federal TDS criterion (10,000 mg/L) to be considered as a potential source of drinking water, the actual TDS values are still high. Additionally, much of Parcel D is near the Bay, which contains saltwater or brackish water. Together, these two site-specific factors suggest that TDS values will increase as a result of saltwater intrusion if significant quantities of water are withdrawn from the A-aquifer at Parcel D. They further suggest that this aquifer will ultimately not be suitable for use as a source of drinking water. Based on these site-specific factors, the A-aquifer at Parcel D is considered to have low potential for use as a source of drinking water.

- **Historical and Current Groundwater Use:** A-aquifer groundwater at HPS has never been and is not currently used as a drinking water source (PRC, LFR, and U&A 1996). San Francisco currently obtains its municipal water supply from the Hetch Hetchy watershed in the Sierra Nevada and plans to continue using the Hetch Hetchy watershed as a drinking water source in the reasonably foreseeable future (Tetra Tech 1999). Based on historical and current use, A-aquifer groundwater at HPS has low potential to be used as a future drinking water source.

- **Cost of Cleanup to Federal Drinking Water Standards**: Antimony, arsenic, chromium, magnesium, nickel, thallium, zinc, and other metals are components of the Franciscan Formation bedrock and bedrock-derived fill that underlies HPS. The A-aquifer contains fill material derived from the Franciscan Formation. During the RI, Hunters Point groundwater ambient levels (HGAL) were estimated for naturally occurring metals (PRC, LFR and U&A, 1996). The HGALs for antimony, arsenic and thallium exceed their respective maximum contaminant levels (MCL), even though these MCLs are federal drinking water standards. While the Navy has not calculated the cost to reduce concentrations of these naturally occurring metals to below MCLs in groundwater, the cost would likely be prohibitive, and it may be technically impracticable to do so. Based upon this site-specific factor, there is low potential for the A-aquifer groundwater at HPS to be used as a drinking water source.

As shown on Figures 2-7 and 2-12, the B-aquifer is present in only a few small, laterally discontinuous areas at Parcel D. The largest area of the B-aquifer at Parcel D is near the center of Parcel D and is interpreted to be 20 feet thick, 1,500 feet wide, and 1,000 feet long. TDS

concentrations in groundwater samples collected in this area of the B-aquifer were generally below state and federal TDS criteria. Figure 2-12 presents the maximum TDS values detected in the B-aquifer monitoring wells. Based on the TDS data alone, the B-aquifer at Parcel D would be considered suitable as a potential source of drinking water. The evaluation of other site-specific factors in this area indicated that the B-aquifer has low potential for use as a source of drinking water. These other site-specific factors include (1) the limited volume and storage capacity of the confined B-aquifer, (2) the existence of institutional controls that prohibit installing water supply wells within City and County of San Francisco limits and locating wells within 50 feet of a sanitary sewer or storm drain (see Figure 2-12), and (3) the current and historical uses of the B-aquifer (which has never been used for water supply at HPS). Therefore, the B-aquifer is considered to have a low potential for use as a source of drinking water. However, because of agreements made with the BCT on the HHRA, the groundwater ingestion pathway is included in the risk assessment for the B-aquifer. This assumption provides an additional layer of conservatism for the protection of human health at HPS.

2.3 PARCEL D INVESTIGATION HISTORY

Parcel D has been investigated following the CERCLA process. Parcel D underwent a sequence of initial investigations from 1988 to 1996. Investigations began with a preliminary assessment, which involved record searches, interviews, and limited field investigations. Sites that required further investigation were considered during the site inspection phase, which involved collection and evaluation of additional field data. Finally, sites that required even further investigation were considered during the RI phase. The RI was followed by a FS, proposed plan, ROD, risk management review (RMR), and revised FS. The following subsections summarize the significant aspects of the RI, FS, proposed plan, ROD, RMR, and revised FS.

Table 2-4 briefly describes each IR site at Parcel D and summarizes past cleanup actions and recommendations presented in past reports for Parcel D. Detailed descriptions and findings can be found in the original documents. In the various investigations and reports, areas requiring remediation were given unique alpha-numeric identifiers. Large areas were called remediation areas and their identifiers started with "RA." Small areas were called "*de minimis*" areas and their identifiers started with "DM." In order to present information consistent with previous reports, Table 2-4 includes these alpha-numeric identifiers.

2.3.1 Remedial Investigation

A draft final Parcel D RI was completed on October 25, 1996, and addressed the original 27 IR sites in Parcel D (PRC, LFR, and U&A 1996). The RI became final on January 31, 1997, following submission of responses to agencies' comments on the draft final version (Tetra Tech 1997b). The two most significant aspects of the RI report are (1) the site characterization of contaminants and (2) the HHRA. No ecological risk assessment was conducted because there is no ecological habitat of concern at Parcel D because most of the parcel is an industrial setting covered by buildings or pavement.

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
14	Human health CSM	Section 2.5.1	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Appendix B, Figure B-1. SulTech. November 30, 2007.

PRIMARY SOURCE	PRIMARY RELEASE MECHANISM	SECONDARY SOURCE	SECONDARY RELEASE MECHANISM	TERTIARY SOURCE	TERTIARY RELEASE MECHANISM	QUATERNARY SOURCE	EXPOSURE ROUTE	PRIMARY RECEPTORS: Future Industrial Worker	Future Construction Worker	Future Recreational User	Future Resident
Parcel D IR Sites	Spills and Leaks	Surface Soil (0-2 feet)					Ingestion	C	I*	C	C
							Dermal Contact	C	I*	C	C
			Root Uptake	Homegrown Produce			Ingestion	I	I	I	C
			Wind Suspension	Outdoor Air (Particulates)			Inhalation	C	I*	C	C
			Volatilization	Outdoor Air (VOCs)			Inhalation	C	I*	C	C
		Subsurface Soil (0-10 feet)					Ingestion	C	C	I	C
							Dermal Contact	C	C	I	C
			Root Uptake	Homegrown Produce			Ingestion	I	I	I	C
			Wind Suspension	Outdoor Air (Particulates)			Inhalation	C	C	I	C
			Volatilization	Outdoor Air (VOCs)			Inhalation	C	C	I	C
				Indoor Air (VOCs)			Inhalation	I	I	I	I
			Infiltration and Percolation	Groundwater (A-aquifer)			Ingestion	I	I	I	I
							Dermal Contact	I	C	I	I
					Volatilization (Construction)	Construction Trench Air (VOCs)	Inhalation	I	C	I	I
					Volatilization (Vapor Intrusion)	Indoor Air (VOCs)	Inhalation	C	I	I	C
				Groundwater (B-aquifer)			Ingestion	I	I	I	C
							Dermal Contact	I	I	I	C[a]
					Volatilization (Domestic Use)	Indoor Air (VOCs)	Inhalation	I	I	I	C

Notes:

C Potentially complete exposure pathway

I Incomplete or negligible exposure pathway

IR Installation Restoration

VOC Volatile organic compound

* See subsurface soil exposure pathways

a Addressed in Uncertainty Analysis (see Section B9.0)

Hunters Point Shipyard, San Francisco, California
U.S. Navy, BRAC PMO West, San Diego, California

FIGURE B-1

CONCEPTUAL SITE MODEL

Revised Feasibility Study Report for Parcel D

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
15	HHRA	Section 2.5.1	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Appendix B, Section B5.0. SulTech. November 30, 2007.

Two sets of COPCs for groundwater were identified for the IR-33, IR-71, and IR-09 risk plumes and for each residential and industrial grid associated with non-plume wells. The first set of COPCs for groundwater was limited to all detected volatile chemicals, for purposes of evaluating the groundwater vapor intrusion exposure pathway for residential and industrial receptors. For this HHRA, volatile chemicals are defined as those chemicals with a molecular weight less than 200 grams per mole and Henry's Law Constant greater than 10^{-5} atmosphere-cubic meters per mole (EPA 2004a). A second set of COPCs for groundwater was also identified using the two steps outlined above, and includes both volatile and non-volatile chemicals for purposes of evaluating groundwater exposures to the construction worker in the A-aquifer and to residential receptors from domestic use of the B-aquifer.

As recommended by Cal/EPA (1993), data for specific total petroleum hydrocarbon indicator chemicals (for example, benzene, toluene, benzo(a)pyrene) were used to assess potential human health risk from total petroleum hydrocarbons contamination. Nonchemical-specific data for total petroleum hydrocarbons should be excluded from evaluation in the risk assessment because they are considered to be inadequate and insufficient to evaluate risk from total petroleum hydrocarbon contamination (Cal/EPA 1993); therefore, non-specific total petroleum hydrocarbon compounds were not identified as COPCs for this HHRA.

Tables B1-1, B1-2, B1-3, and B1-4 of Attachment B1 present analytical data summary statistics for each total risk COPC. Tables B2-1, B2-3, and B2-4 of Attachment B2 present analytical data summary statistics for each incremental risk COPC. Tables B3-1 through B3-7 of Attachment B3 list the COPCs for groundwater and present analytical data summary statistics for each groundwater COPC. In these tables, statistics are developed separately for each grid with analytical data.

B5.0 EXPOSURE ASSESSMENT

An exposure assessment identifies potential human receptors that could be exposed to site-related chemicals, as well as the routes, magnitude, frequency, and duration of the potential exposures. The principal objective of this evaluation is to identify reasonable maximum exposures (RME). As defined by EPA (1989), the RME is the maximum exposure that is reasonably expected to occur at a site. The potential human receptors and potentially complete exposure pathways for the identified receptors were presented in Section B3.0, Conceptual Site Model. The remainder of this section describes the process used to estimate EPCs and to quantify pathway-specific RME chemical intakes for each receptor. Central tendency exposures were not evaluated in this revised baseline HHRA.

B5.1 EXPOSURE POINTS AND EXPOSURE POINT CONCENTRATIONS

Potential exposure points are identified on the basis of anticipated population activity patterns and the relationship of the activities to the presence of contaminated media. A location is identified as an exposure point if a human might contact (for example, ingest) a contaminated medium (for example, soil) at that location. For evaluation of exposures to soil and exposure to

groundwater not associated with risk plumes, each residential and industrial grid was considered a separate exposure point for this HHRA. For each of the groundwater risk plumes (IR-33, IR-71, and IR-09), the area encompassed by each risk plume (see Attachment B3 to this appendix) was considered a separate groundwater exposure point. Potential exposure to COPCs is assumed to occur uniformly throughout each exposure point.

The concentration in the medium (for example, subsurface soil) that a receptor may be exposed to is called the EPC. EPCs were calculated for all COPCs in all media sampled: surface soils (0 to 2 feet bgs), subsurface soils (0 to 10 feet bgs), A-aquifer groundwater, and B-aquifer groundwater. The methods used to calculate EPCs for soil and groundwater are described below in Sections B5.1.1 and B5.1.2.

As shown in the conceptual site model (see Figure B-1), chemicals in soil may be transferred to outdoor air from wind erosion or volatilization, or to vegetation from root uptake. Chemicals in groundwater may be transferred to outdoor air in a construction trench from volatilization, indoor air from vapor intrusion, and indoor air from volatilization of groundwater during domestic use. Sample data for outdoor and indoor air, and vegetation were not available for Parcel D. EPCs in outdoor air (from volatile and particulate chemicals in soil), outdoor air in a construction trench (from volatile chemicals in groundwater), indoor air (from groundwater vapor intrusion), and homegrown produce (from root uptake of chemicals in soil) were estimated using the methods described in Section B5.1.3.

B5.1.1 EPCs for Soil

The 95 percent upper confidence limit (95 UCL) of the arithmetic mean was used as the EPC for each soil COPC, unless the maximum value was less than the 95 UCL, in which case, the maximum concentration was used as the EPC. The 95 UCL for each soil COPC in each grid was calculated using the following methodology. This methodology is consistent with the approach used for the soil HHRA in the Draft Final RI Report for Parcel D (PRC, LFR, and U&A 1996), and follows the methodology recently re-established for soil HHRAs for HPS (Tetra Tech 2003; Navy 2004):

- Statistical testing was conducted to determine data distribution for sample sizes with a minimum of four samples and four detections. For samples sizes less than or equal to 50 with at least four detections, the Shapiro-Wilk W-test was used to determine the distribution of the data. For sample sizes greater than or equal to 50 with at least four detections, the D'Agostino test was used to determine the distribution of the data.

- For data found to be normally or lognormally distributed, 95 UCLs were calculated using EPA (1992) guidance.

- If distribution testing showed that data follow a non-parametric distribution, then a 95 UCL was calculated for both a normal and lognormal distribution following EPA guidance (EPA 1992) and the higher of the two 95 UCL values was selected as the representative 95 UCL. Nondetected results for COPCs were incorporated into calculation of 95 UCL concentrations by using one-half of the sample quantitation limit as a proxy concentration for nondetected results (EPA 1989).

- For samples sizes with less than four samples, distribution testing was not conducted and the maximum concentration was used as the EPC.

EPCs for each total risk assessment COPC in surface soil and subsurface soil are shown in Tables B1-1, B1-2, B1-3, and B1-4 of Attachment B1. EPCs for each incremental risk assessment COPC in surface soil and subsurface soil are shown in Tables B2-1, B2-2, B2-3, and B2-4 of Attachment B2. These tables also present the results of the distribution testing for each COPC and the calculated 95 UCLs.

Although more recent guidance regarding calculation of EPCs is available (see Section B5.1.2), the previous guidance provided by EPA (1992) was used to calculate EPCs for soil in this revised HHRA in accordance with the recent methodology established for soil HHRAs for HPS (Tetra Tech 2003; Navy 2004). In many cases, because of the relatively few sample points and detections for each grid (that is, less than four samples and four detected results), the maximum concentration is used as the EPC, resulting in a conservative estimate of potential risks.

B5.1.2 EPCs for Groundwater

Separate EPCs for groundwater were developed to evaluate exposure areas associated with risk plumes and exposure areas not associated with risk plumes (see Section B4.3.2). To evaluate exposures associated with the IR-09, IR-33, and IR-71 risk plumes, the lesser of the 95 UCL or maximum concentration was used as the EPC for each COPC present in each risk plume. The methods used to calculate 95 UCLs for each risk plume are described below. Tables B3-1, B3-2, and B3-3 and Table B3-6 of Attachment B3 present analytical data summary statistics for each risk plume-based exposure area.

For exposure areas not associated with risk plumes (that is, for areas with monitoring wells that do not fall within the risk plume boundaries delineated in Attachment B3), the maximum detected concentration was used as the EPC. Tables B3-4, B3-5, and B3-7 of Attachment B3 present analytical data summary statistics, including maximum concentrations (EPCs), for exposure areas not associated with risk plumes.

The methods used to calculate EPCs for groundwater associated with risk plumes is based on more recent EPA methodology (*ProUCL Version 3.0 User Guide* [Singh, Singh, and Maichle 2004]). This methodology incorporates the Lilliefors Test, rather than the D'Agostino Test, to determine distributions for data sets exceeding 50 samples. Because the groundwater data set for the HHRA consisted of samples collected over a number of years (that is, the last 12 rounds of

sampling), to reduce the influence of historical nondetected results on the EPCs, only detected results were used for calculation of the EPCs for groundwater. Nondetected results (that is, U- and UJ-qualified data), were not included in the EPC calculation. For data sets with fewer than six samples, statistical estimations lack statistical power and cannot be confidently estimated (EPA 2000). Therefore, the maximum detected concentration was used as the EPC for data sets with fewer than six detections, rather than six samples. A 95 UCL was used as the EPC for COPCs in groundwater associated with risk plumes for data sets consisting of six or more detections. The following methods were used to calculate the underlying distribution for each chemical, population summary statistics, and EPCs.

Distribution tests: Distribution testing was conducted for all samples with at least six measurements. Formal tests were conducted using well-established goodness-of-fit tests. The Shapiro-Wilk W-Test ($n \leq 50$) and Lilliefors Test ($n > 50$) were used to evaluate normal and lognormal distributions. The Anderson-Darling and Kolmogorov-Smirnov Test were used to evaluate gamma distributions (Singh, Singh, and Maichle 2004; EPA 2002b). A Type I error rate (α) of 0.05 (equivalent to 5 percent) was used to interpret the significance of each test. A Type I error rate of 0.05 means that there is a 5 percent chance that the null hypothesis will be rejected when it is true, leading to the false conclusion.

Chemical data confirmed as following a normal, lognormal, or gamma distribution based on the outcome of the two goodness-of-fit tests are listed as "normal (N)", "lognormal (L)," or "gamma (G)" in the summary tables (see Tables B2-1, B2-2, and B2-3 and Table B2-6 of Attachment B2). Chemical data that were not confirmed as following one of these three distributions are listed as "nonparametric (NP)" in the summary tables.

Calculation of Population Parameters and Selection of the EPC: The one-sided UCLs on the mean were calculated for chemicals with at least six samples. Recommendations in Singh, Singh, and Maichle (2004) are based on three properties measured for individual samples: (1) best-fit distribution, (2) relative degree of skewness, and (3) relative sample size. The recommendations for calculating an EPC for normal, gamma, lognormal, and nonparametric distributions are provided by the ProUCL software (EPA 2004b). EPCs for data that follow a normal distribution or that exhibit low skewness (standard deviation of the natural logarithms of the data less than 0.50) are based on calculation of a UCL using the Student's t- statistic. After a sample-by-sample evaluation of the three properties described above, a UCL is calculated based on one of the parametric or nonparametric methods listed below.

Parametric Methods	Nonparametric Methods	
Student's t UCL	Chebyshev inequality UCL	Central Limit Theorem
Approximate gamma UCL	Bootstrap t UCL	Modified-t statistic
Adjusted gamma UCL	Hall's bootstrap UCL	Adjusted-CLT
Land's H-UCL	Modified-t UCL	Percentile bootstrap
Minimum Variance	Standard Bootstrap UCL	Jackknife UCL
Unbiased Estimator (MVUE) Chebyshev UCL		

The UCL calculated using the MVUE Chebyshev or nonparametric Chebyshev method can be based on a 95, 97.5, or 99 percent one-sided UCL. The 95 UCLs calculated for groundwater are shown in Tables B3-1, B3-2, and B3-3 and Table B3-6 of Attachment B3. These tables also present the results of the distribution testing for each chemical. If the calculated 95 UCL was greater than the maximum concentration, then the maximum concentration was used as the EPC.

B5.1.3 Exposure Point Concentrations for Media Not Sampled

As discussed in Sections B3.0 and B5.1, COPCs in soil and groundwater may be transferred to outdoor air, indoor air, and vegetation (homegrown produce) from the following transfer mechanisms:

- Wind erosion of particulate chemicals from soil to outdoor air
- Volatilization from soil to outdoor air
- Vapor intrusion from groundwater to indoor air
- Volatilization from groundwater to indoor air during domestic use
- Volatilization from groundwater to outdoor air in a construction trench
- Uptake of chemicals in soil through plant roots into homegrown produce

Samples were not collected for outdoor air, indoor air, or vegetation at Parcel D. In the absence of direct measurements of chemical concentrations in air and vegetation, models were used to estimate EPCs in outdoor air, indoor air, and homegrown produce as a result of the above transfer mechanisms. These models are discussed below. EPCs for indoor air as a result of vapor intrusion of groundwater and volatilization from domestic use of groundwater were not calculated because a risk-based screening assessment was used to quantify risks from exposure to COPCs in groundwater (see Section B7.2).

B5.1.3.1 Outdoor Air – Particulate COPCs Released from Soil

EPCs of particulates released from soil to outdoor air were estimated using soil EPCs as the source term and the methodology provided by EPA Region 9 in its memorandum describing the derivation of PRGs (EPA 2004a). To derive the EPCs in outdoor air, the EPC for soil was multiplied by the reciprocal of the EPA (2004a) default particulate emission factor of 1.316E+09 cubic meters per kilogram, which is a non-chemical-specific value that relates chemical concentrations in soil to airborne concentrations that may be inhaled.

B5.1.3.2 Outdoor Air – Volatile COPCs Released from Soil

Chemical-specific volatilization factors, which relate concentrations of volatile chemicals in soil to airborne concentrations that may be inhaled, were used to estimate concentrations in outdoor air from volatile COPCs in soil. Volatilization factors were taken from the EPA Region 9 guidance (EPA 2004a) and are summarized in Table B-2. To estimate EPCs in outdoor air, the soil EPC was multiplied by the reciprocal of the volatilization factor.

B5.1.3.3 Indoor Air – Vapor Intrusion of Volatile COPCs in Groundwater

Subsurface vapor intrusion of volatile COPCs in groundwater into a hypothetical residential or standard industrial building was evaluated for the industrial and residential exposure scenarios. A risk-based screening assessment was used to calculate risks from groundwater vapor intrusion, based on groundwater EPCs developed for each A-aquifer risk plume and non-plume exposure area, and risk-based screening levels (RBSL). Section B7.2 provides further details on this approach. Because a risk-based screening assessment approach was used to evaluate groundwater vapor intrusion, EPCs were not modeled for indoor air from EPCs in groundwater.

B5.1.3.4 Indoor Air – Volatilization of COPCs in Groundwater during Domestic Use

Volatilization of volatile COPCs in groundwater into household air during domestic use of groundwater was evaluated for the residential exposure scenario, based on groundwater EPCs developed for the B-aquifer. A risk-based screening assessment was used to calculate risks from domestic use of groundwater (see Section B7.2). Because a risk-based screening assessment approach was used to evaluate risks from domestic use of groundwater, EPCs were not developed for indoor air based on volatilization of COPCs in groundwater during domestic use.

B5.1.3.5 Outdoor Air – Volatile COPCs Released from Groundwater in a Construction Trench

Chemical-specific volatilization factors which relate concentrations of volatile chemicals in groundwater accumulated in a construction trench to airborne concentrations that may be inhaled by construction workers were used to estimate EPCs from volatile COPCs in groundwater. Calculation of the volatilization factors for this scenario were based on guidance from Virginia Department of Environmental Quality (2005), which provides a combination of a vadose zone model to estimate volatilization of gaseous COPCs from groundwater into a trench, and a box model to estimate dispersion of the COPCs from the air inside the trench into aboveground air. A full description of the models used to estimate volatilization into a construction trench is provided in Attachment B5 to this appendix.

B5.1.3.6 Homegrown Produce – Uptake of COPCs in Soil through Plant Roots

Ingestion of COPCs that are transferred from soil to homegrown produce via uptake through plant roots was evaluated for the residential exposure scenario. Direct measurements of chemical concentrations in homegrown produce are not available for Parcel D because homegrown produce is not currently grown at Parcel D. EPCs for homegrown produce were calculated based on EPCs for COPCs in soil and soil-to-plant uptake factors (UF) that estimate the root uptake of inorganic and organic chemicals in soil and translocation of chemicals to edible plant parts (U.S. Department of Energy 1984). Table B-3 lists the UFs for each COPC in soil.

For inorganic COPCs, UFs were obtained from U.S. Department of Energy (1984). To estimate EPCs in homegrown produce from inorganic COPCs, the soil EPC was multiplied by the UF.

For nonvolatile organic COPCs, equations from Cal/EPA were used to derive the UFs (Cal/EPA 2003). These equations relate the octanol-water partition coefficient (K_{ow}) and the organic carbon-water partition coefficient (K_{oc}) of the contaminant and the fraction of organic carbon (F_{oc}) in the soil to calculate the UF. The equation used to calculate the UF is as follows:

$$UF = \frac{(0.03 \times K_{ow} 0.77) + 0.82}{(K_{oc})(F_{oc})} \qquad \text{(B-1)}$$

where

UF	=	Soil-to-plant uptake factor
K_{ow}	=	Octanol-water partition coefficient (cubic centimeters per gram)
K_{oc}	=	Organic carbon-water partition coefficient (cubic centimeters per gram)
F_{oc}	=	Fraction organic carbon in soil (unitless)

F_{oc} was assumed to be 0.1, a value appropriate to soil used for the production of food crops (Cal/EPA 2003). If K_{oc} values are unavailable, they were estimated based on chemical-specific K_{ow} values using the following equation (Lyman and others 1990):

$$Log\ K_{oc} = log\ K_{ow} - 0.21 \qquad \text{(B-2)}$$

Consistent with EPA guidance, a correction factor was applied to lipophilic COPCs (EPA 1998). For this HHRA, lipophilic chemicals were defined as polychlorinated biphenyls, polynuclear aromatic hydrocarbons, pesticides, and semivolatile organic compounds. EPA (1998) recommends a correction factor of 0.01 for lipophilic COPCs (log K_{ow} greater than 4); that is, for lipophilic COPCs, the UF calculated using Equation B-1 should be multiplied by the correction factor of 0.01 to calculate a corrected UF. For COPCs with a log K_{ow} less than 4, EPA does not

recommend use of a correction factor. Table B-3 lists the UFs for nonvolatile organic COPCs derived using the above equations and the values and sources of the chemical data used to derive the UFs.

Risks associated with VOCs were not evaluated in the homegrown produce pathway. VOCs are typically low-molecular-weight chemicals that do not persist or bioaccumulate in the environment (EPA 1994b). In addition, VOCs are expected to be lost during soil tilling, planting, and food preparation activities such as peeling, cooking, and cleaning.

B5.2 CHEMICAL INTAKE ESTIMATES

Estimates of exposure are based on the EPCs (as described in Section B5.1) and scenario-specific assumptions and intake parameters. Consistent with EPA guidance (EPA 1995), exposure estimates (intakes) were calculated for an RME scenario for each receptor and exposure pathway and are expressed in terms of milligrams of chemical per kilogram body weight per day (mg/kg-day). The RME represents the highest exposure reasonably expected to occur and is calculated using the 95 UCL and the RME exposure parameters.

EPA-derived exposure algorithms were used to estimate the chemical intakes for each route of exposure. Equation 5-3 is a generic equation for calculating chemical intake as follows (EPA 1989):

$$I = \frac{C \times CR \times EF \times ED}{BW \times AT} \qquad \text{(B-3)}$$

where

I	=	Intake: the amount of chemical at the exchange boundary (mg/kg-day)
C	=	Chemical concentration: the EPC (for example, mg/kg for soil)
CR	=	Contact rate: the amount of contaminated medium contacted per unit of time or event; may be the ingestion rate, inhalation rate, or dermal contact rate (for example, milligram per day for the ingestion rate of soil)
EF	=	Exposure frequency: how often the exposure occurs (days per year)
ED	=	Exposure duration: the number of years in which a receptor comes in contact with the contaminated medium (years)
BW	=	Body weight: the average body weight of the receptor over the exposure period (kilograms)
AT	=	Averaging time: the period over which exposure is averaged (days); for carcinogens, the averaging time is 25,550 days on the basis of a lifetime exposure of 70 years (average life expectancy), and for noncarcinogens, the averaging time is equal to the exposure duration multiplied by the number of days in a year (365 days)

Pathway-specific variations of Equation B-3 were used to calculate intakes of COPCs in soil for residential, industrial, recreational, and construction worker receptors, and COPCs in groundwater for construction worker receptors. Tables B-4 through B-9 present the pathway-specific equations and receptor-specific exposure assumptions used to calculate intakes. The calculation of chemical intake for the dermal contact with soil exposure pathway (all receptors) requires chemical-specific dermal absorption factors; these factors are shown in Table B-2. The calculation of chemical intake for the dermal contact with groundwater exposure pathway (construction worker) requires chemical-specific permeability constants; these factors are shown in Table B-10.

Chemical intakes for carcinogenic COPCs were calculated for a total exposure duration of 30 years for exposures scenarios for which both an adult and child receptor were evaluated (that is, residential and recreational). Chemical intakes were calculated separately for adult and child receptors; adult residential and recreational receptors were evaluated for an exposure duration of 24 years, and child residential and recreational receptors were evaluated for an exposure duration of 6 years. Calculated chemical intakes for each carcinogenic COPC were used to estimate separate cancer risks for adult receptors and child receptors; these risks were then summed to calculate the COPC-specific risk for the scenario. The cancer risk associated with exposure to a carcinogenic COPC for the residential exposure scenario was based on the COPC-specific cancer risk for the adult residential receptor summed with the COPC-specific cancer risk for the child residential receptor. In addition, the cancer risk associated with exposure to a carcinogenic COPC for the recreational exposure scenario was based on the COPC-specific cancer risk for the adult recreational receptor summed with the COPC-specific cancer risk for the child recreational receptor. Chemical intakes for noncarcinogenic COPCs were based on the chemical intake estimated for the child receptor because the intake for children of soil, groundwater, and air per unit body mass is higher than the intake for an adult receptor. (Hence, intake of noncarcinogenic COPCs for a child receptor is always higher than intake of noncarcinogenic COPCs for an adult receptor for similar exposures.)

Chemical intakes from groundwater exposure pathways for residential receptors (ingestion, inhalation during household use, and vapor intrusion) and industrial receptors (vapor intrusion) were not calculated because a risk-based screening assessment was used to quantify risks from exposure to COPCs in groundwater for these receptors (see Section B7.2).

B6.0 TOXICITY ASSESSMENT

The toxicity assessment identifies toxicity values used to quantify potential adverse health effects associated with exposure to COPCs at Parcel D. These toxicity values include references doses (RfD) for noncancer health effects and slope factors (SF) for estimating cancer risks. An RfD represents an estimated daily intake of a COPC that is expected to pose no appreciable risk of harmful effects to human health, including sensitive populations, over a lifetime. RfDs are specific to each chemical and exposure route such as inhalation or ingestion.

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[a]
16	Cancer risks and noncancer hazards	Section 2.5.1	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Appendix B, Section B7.1 through B7.4. SulTech. November 30, 2007.

B6.4 LEAD

Because no RfD or SF is currently available for evaluating health risks from exposure to lead, the HHRA evaluated the potential for human health effects from exposure to lead by comparing EPCs for lead with a HPS-specific risk-based concentration for lead for residential and recreational receptors and the EPA Region 9 industrial PRG for lead for industrial and construction worker receptors. Section B7.4 and Attachment B6 detail the methodology used to evaluate lead.

B7.0 RISK CHARACTERIZATION METHODS

The final step in this revised baseline HHRA is the characterization of the potential risks associated with exposure to COPCs. Risks from exposure to soil for all receptors and from construction worker exposure to groundwater were characterized using the methodology provided in EPA (1989); Section B7.1 details this methodology. Risks from industrial and residential exposure to groundwater were characterized using a risk-based screening assessment approach; Section B7.2 presents this methodology. Section B7.3 discusses interpretation of hazard and risk levels. Section B7.4 discusses the risk characterization approach for lead. The results of the risk characterization for Parcel D are presented in Section B8.0.

B7.1 RISK CHARACTERIZATION FOR SOIL EXPOSURES AND CONSTRUCTION WORKER EXPOSURE TO GROUNDWATER

The general methodology for estimating cancer risks and HIs for soil exposures for all receptors and construction worker exposure to groundwater follows the methodology provided in EPA (1989) and is presented in Section B7.1.1 for cancer risks and in Section B7.1.2 for noncancer health hazards.

B7.1.1 Characterization of Cancer Risks

Risks associated with exposure to chemicals classified as carcinogens are estimated as the incremental probability that an individual will develop cancer over a lifetime as a direct result of an exposure (EPA 1989). The estimated risk is expressed as a unitless probability.

Three steps are used in estimating cancer risks for chemicals classified as carcinogens. First, the chemical intake is multiplied by the chemical-specific SF to derive a cancer risk estimate for a single chemical and pathway. The calculation is based on the following relationship:

$$\textit{Chemical-Specific Cancer Risk} = \textit{Intake (mg/kg-day)} \times \textit{SF (mg/kg-day)}^{-1} \qquad \text{(B-4)}$$

Second, the individual chemical cancer risks are assumed to be additive to estimate the cancer risk associated with exposure to multiple carcinogens for a single exposure pathway, as follows:

$$Pathway\text{-}Specific\ Cancer\ Risk = \sum Chemical\text{-}Specific\ Cancer\ Risk \quad \text{(B-5)}$$

Third, pathway-specific risks are summed for each receptor to estimate the total cancer risk. For exposures scenarios for which both an adult and child receptor are evaluated (that is, residential and recreational), the estimated cancer risk is based on the sum of the risk estimated for the adult receptor plus the child receptor. Hence, for the residential receptor, the estimated cancer risk is based on the sum of the risk estimated for the adult resident and the child resident. Likewise, for the recreational receptor, the estimated cancer risk is based on the sum of the risk estimated for the adult recreational user and the child recreational user.

B7.1.2 Characterization of Noncancer Hazards

The potential for exposure that may result in adverse health effects other than cancer is evaluated by comparing the intake with an RfD for chemicals that are not classified as carcinogens and for those carcinogens known to cause adverse health effects other than cancer. A three-step approach is used as described below:

Calculate a chemical-specific hazard quotient (HQ) based on the following equation:

$$Hazard\ Quotient = \frac{Intake\ (mg/kg\text{-}day)}{RfD\ (mg/kg\text{-}day)} \quad \text{(B-6)}$$

Next, sum the HQs for all chemicals to evaluate the potential for noncancer health effects from simultaneous exposure to multiple chemicals, yielding an HI as follows:

$$Hazard\ Index = \sum HQ \quad \text{(B-7)}$$

Third, sum pathway-specific HIs to estimate a total HI for each receptor.

The total noncancer HI for the residential and recreational receptors is based on the total HI estimated for the child receptor because the intake for children of soil, groundwater, and air per unit body mass is higher than the intake for an adult receptor. (Hence, noncancer HIs for a child receptor are always higher than noncancer HIs for an adult receptor for similar exposures.)

B7.2 Risk Characterization for Residential and Industrial Exposure to Groundwater

Residential and industrial receptors were evaluated for exposure to groundwater from vapor intrusion. Residential receptors were also evaluated for exposure to groundwater from domestic use. Based on agreement between the EPA, DTSC, and Navy, the assessment of risks from these exposure pathways is based on a risk-based screening assessment.

The risk-based screening assessment is a streamlined approach that uses the ratio of EPCs to RBSLs. For this HHRA, RBSLs for domestic use of groundwater (DU-RBSL), calculated based on the EPA (2004a) Region 9 methodology for development of tap water PRGs, were used to estimate cancer risks and noncancer hazard indices from residential exposure to B-aquifer groundwater. RBSLs for groundwater vapor intrusion (VI-RBSL), calculated based on the EPA (2002a) methodology for development of groundwater vapor intrusion screening concentrations, were used to estimate cancer risks and hazard indices from residential and industrial exposure to A-aquifer groundwater. The calculated RBSLs correspond to a cancer risk of 1×10^{-6} or an HI of 1 based on standardized equations that combine standard exposure assumptions and EPA and Cal/EPA toxicity values.

The risk estimates developed using the risk-based screening approach represent the risk for all exposure pathways evaluated by the RBSLs (that is, the exposure pathways evaluated by the EPA Region 9 tap water PRGs and EPA groundwater screening levels for groundwater vapor intrusion). These risk estimates are numerically equivalent to risk estimates obtained using the EPA (1989) "forward calculation methodology," which involves calculating risks using contaminant concentrations, exposure assumptions, and toxicity values (see Section B6.0), if the exposure pathways and assumptions used to derive the RBSLs are the same as those used in the forward calculations.

DU-RBSLs for domestic use were calculated based on the EPA (2004a) Region 9 methodology for development of tap water PRGs. The calculated DU-RBSLs are identical to the EPA Region 9 tap water PRGs with one exception: the toxicity values used for calculation of the DU-RBSLs are based on the toxicity value hierarchy described in Section B6.0. (Tables B-11 and B-12 list the toxicity criteria used to calculate DU-RBSLs.) The EPA tap water PRGs evaluate residential exposure to groundwater from ingestion and from inhalation of VOCs released from groundwater to indoor air during household use. Similar to the EPA tap water PRGs, the calculated DU-RBSLs do not account for exposure from dermal contact with groundwater; Section B9.4 addresses the uncertainties associated with exclusion of this exposure pathway on the risk results.

VI-RBSLs were calculated based on the EPA (2002a) methodology for development of groundwater vapor intrusion screening concentrations. The calculated VI-RBSLs are identical to the groundwater vapor intrusion screening concentrations provided in Table 2c of EPA's "Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance)" (EPA 2002a) with one exception: the toxicity values used for calculation of the VI-RBSLs are based on the toxicity value hierarchy described in Section B6.0. (Tables B-11 and B-12 list the toxicity criteria used to calculate DU-RBSLs.) The following factors were considered in the use of the EPA (2002a) methodology for developing screening levels for groundwater vapor intrusion in the risk-based screening assessment for groundwater; these factors also apply to the calculated VI-RBSLs:

- The screening concentrations provided in Table 2c of EPA (2002a) are based on generic attenuation factors that assume minimum reduction of contaminant concentrations due to diffusive, advective, and other attenuating mechanisms. These conditions are similar to groundwater and soil conditions at HPS, where groundwater is relatively shallow and vadose zone soils are fairly coarse (see Section 2.0 of the Parcel D Revised FS Report).

- The screening concentrations provided in Table 2c of EPA (2002a) for some chemicals are based on federal maximum contaminant levels; for these chemicals, a VI-RBSL was calculated following the methodology provided in EPA (2002a) for deriving screening concentrations for vapor intrusion, and the calculated VI-RBSL was used in lieu of the maximum contaminant level.

- The screening levels provided in Table 2c of EPA (2002a) are considered protective of residential exposure. For evaluation of industrial exposures, VI-RBSLs for industrial exposure via groundwater for industrial exposure via groundwater vapor intrusion were calculated using the methodology provided in EPA (2002a) and the assumptions provided in Table B-6 of this appendix for industrial worker exposure to air.

Table B-13 lists the calculated DU-RBSLs and VI-RBSLs for groundwater used for this HHRA. Table B-13 indicates in boldface when use of the toxicity hierarchy described in Section B6.0 results in a DU-RBSL that differs from the respective EPA (2004a) tap water PRG, or a vapor intrusion RBSL that differs from the respective EPA (2002a) groundwater vapor intrusion screening concentration.

Cancer risks and noncancer hazards were calculated by comparing site EPCs of each COPC to the corresponding RBSL, as detailed in the following text.

B7.2.1 Characterization of Cancer Risks

For COPCs that are carcinogens, the cancer risk associated with exposure to a single chemical is calculated as follows:

$$\textit{Cancer risk} = (EPC/RBSL) \times 10^{-6} \qquad \text{(B-8)}$$

where:

EPC	=	Exposure point concentration (microgram per liter [µg/L])
RBSL	=	Risk-based screening level (µg/L)

At a given site, individuals may be exposed to more than one chemical. The total risk from exposure to multiple chemicals is calculated using the following equation:

$$Total\ risk = 10^{-6} \times \{EPC_1/RBSL_1 + EPC_2/RBSL_2 + \ldots EPC_n/RBSL_n\} \quad \text{(B-9)}$$

where:

Total risk = Total carcinogenic risk from exposure to all chemicals (unitless)

EPC_n = Exposure point concentration of chemical *n* (µg/L)

$RBSL_n$ = RBSL for chemical *n* (µg/L)

B7.2.2 Characterization of Noncancer Hazards

For COPCs not classified as carcinogens and for carcinogens known to cause adverse health effects other than cancer, the potential for receptors to develop adverse health effects is evaluated by comparing EPCs with noncancer RBSLs as follows:

$$Hazard\ quotient = EPC/RBSL \quad \text{(B-10)}$$

where

EPC = Exposure point concentration (µg/L)

RBSL = Risk-based screening level (µg/L)

To evaluate the potential for noncancer effects from exposure to multiple chemicals, the HQs for all chemicals are summed, yielding an HI as follows:

$$Hazard\ index = EPC_1/RBSL_1 + EPC_2/RBSL_2 + \ldots + EPC_n/RBSL_n \quad \text{(B-11)}$$

where:

EPC_n = Exposure point concentration of chemical *n* (µg/L)

$RBSL_n$ = RBSL for chemical *n* (µg/L)

B7.3 INTERPRETATION OF HAZARD AND RISK LEVELS

EPA guidance on exposure levels considered protective of human health is presented to aid in the interpretation of the results of the risk assessment. In the National Oil and Hazardous Substances Pollution Contingency Plan, EPA defined general remedial action goals for sites on the National Priorities List (Title 40 of the *Code of Federal Regulations* Part 300.430). The goals include a range for residual cancer risk, which is "an excess upper-bound lifetime cancer risk to an individual of between 10^{-4} and 10^{-6}," or 1 in 10,000 to 1 in 1,000,000. The goals set out in the National Oil and Hazardous Substances Pollution Contingency Plan are applied once a decision to remediate a site has been made. A more recent EPA directive (EPA 1991) provides additional guidance on the role of the HHRA in supporting risk management decisions, and in

particular, determining whether remedial action is necessary. Specifically, the guidance states, "Where cumulative carcinogenic risk to an individual based on reasonable maximum exposure for both current and future land use is less than 10^{-4}, and the noncancer HQ is less than 1, action generally is not warranted unless there are adverse environmental impacts." EPA Region 9 has stated, however, that action may be taken to address risks between 10^{-4} and 10^{-6}. In addition, DTSC has stated that it considers 1×10^{-6} as the point of departure for risk management decisions. To be protective of human health, the BCT has chosen to use 10^{-6}, the lower end of the residual 10^{-4} to 10^{-6} risk range set out in the National Oil and Hazardous Substances Pollution Contingency Plan, as a threshold level for cancer risks for HPS.

An HI of less than 1.0 indicates that adverse noncancer health effects are not expected. In accordance with EPA guidance (EPA 1989), the HHRA further evaluated exposure areas with total HIs that exceeded 1. Noncancer health effects associated with exposure to multiple COPCs may not be cumulative if the COPCs affect different target organs or systems within the body. Therefore, for exposure areas with HI values that exceeded 1 based on the summed HIs from multiple COPCs, the HHRA segregates the HI by target organ or system and assumes that the potential for noncancer health effects exists only if the highest total segregated HI for a target organ or system exceeded 1. Table B-14 identifies the target organs affected by each COPC for Parcel D; this information was used, as necessary, to segregate HIs by target organ. Information on target organs was obtained from Integrated Risk Information System (EPA 2005), Health Effects Assessment Summary Tables (EPA 1997), PPRTV database (EPA 2004c), and the Agency for Toxic Substances and Disease Registry (2005).

B7.4 EVALUATION OF LEAD

The HHRA evaluated the potential for human health effects from exposure to lead by comparing EPCs for lead with an HPS-specific risk-based concentration for lead (155 milligrams per kilogram [mg/kg]) for residential and recreational receptors and the EPA (2004a) Region 9 industrial PRG for lead (800 mg/kg) for industrial and construction worker receptors. The HPS risk-based concentration for lead was developed using the Cal/EPA (1999b) LeadSpread model and EPA's Integrated Exposure Uptake Biokinetic model. The methodology for development of the HPS risk-based concentration for lead is presented in Attachment B6 to this appendix. The Region 9 industrial PRG for lead was developed by EPA using EPA's adult lead model (EPA 1996). These models are designed to predict the soil lead concentration associated with a target blood lead level of 10 micrograms per deciliter, the EPA threshold level of concern (EPA 1994a). Adverse health effects are not expected to occur from exposure to lead below the risk-based concentration or PRG.

B8.0 RESULTS OF THE HUMAN HEALTH RISK ASSESSMENT

This section summarizes the results of this revised baseline HHRA for Parcel D. Future residential, industrial, construction worker, and recreational receptors were evaluated in the HHRA. For soil exposures, both total and incremental risks were evaluated in the HHRA. Results of the total risk evaluation include risks and hazards for metals present at or below ambient levels (that is, HPALs).

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
17	Total and incremental risks	Section 2.5.1	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Section 3.1. SulTech. November 30, 2007.

3.0 RISK EVALUATION SUMMARY AND REMEDIATION GOALS

This section summarizes the potential human health and environmental risks from exposure to chemicals present in soil and groundwater at Parcel D, identifies COCs for human health and environmental endpoints, and presents remediation goals for the identified COCs. The nature and extent of contamination of soil and groundwater at Parcel D is presented in Section 2.0.

3.1 HUMAN HEALTH RISK ASSESSMENT

A revised baseline HHRA was conducted for Parcel D. The objectives of the revised HHRA were to:

- Estimate the potential human health risks associated with potential future land use scenarios
- Identify the environmental media and contaminants that pose the primary health concerns
- Identify the environmental media and contaminants that are likely to pose little or no threat to human health
- Provide a foundation for assessing the need for further response actions

The original HHRA for Parcel D was conducted in 1996 as part of the RI for Parcel D (PRC, LFR, and U&A 1996). Since the RI was completed, additional data were collected at Parcel D during the TCRA in 2000 and 2001(Tetra Tech and IT Corp. 2001). Tetra Tech revised the original HHRA in 2002 as part of the draft revised FS to supplement the original HHRA with the soil data collected during the 2000 and 2001 TCRA. An additional TCRA in 2004 resulted in additional soil excavation and soil data collection (Tetra Tech and ITSI 2005). The HHRA presented in this FS report revises the HHRA presented in the 2002 draft revised FS report to account for the soil data collected during the 2004 TCRA and to incorporate changes in regulatory guidance and toxicological criteria that have occurred since the original HHRA was prepared in 1996. Soil data associated with sampling locations excavated and removed from HPS during the 2000, 2001, and 2004 TCRAs, as well as non-TCRAs for HPS, are excluded from this HHRA. Data for soil associated with sampling locations that have not been removed, including unremoved confirmation samples collected after removal actions, are included in the HHRA. In addition, groundwater data collected since the 2002 HHRA through quarter 18 (June 2004) as part of the basewide groundwater monitoring program for HPS are included in this HHRA. Lastly, the HHRA was revised based on HPS BCT agreements during 2003 and 2004.

The HHRA calculated cancer risks and noncancer hazards from exposure to chemicals of potential concern (COPC) in all affected environmental media for each pathway identified as potentially complete. Appendix B details the HHRA methodology and results for evaluating the COPC and assessing the COCs. This section provides an overview of the exposure scenarios and pathways evaluated in the HHRA and summarizes the results. In addition, remediation goals are presented for the COCs for Parcel D, as identified from the results of the HHRA.

3.1.1 Exposure Scenarios and Pathways

The Redevelopment Plan outlines the planned reuses for Parcel D (San Francisco Redevelopment Agency 1997). To help identify the areas of Parcel D associated with specific planned reuses, Parcel D was divided into redevelopment blocks. Each redevelopment block was then assigned a redevelopment block number. Figure 3-1 shows the locations of each of the redevelopment blocks assigned to Parcel D, the associated redevelopment block number, and the specific planned reuse for each redevelopment block. According to the Redevelopment Plan, most of the planned reuse for Parcel D is industrial (San Francisco Redevelopment Agency 1997). Other planned reuses of Parcel D include open space and mixed use—that is, reuse that consists of both residential and industrial use (San Francisco Redevelopment Agency 1997). Evaluation of the recently proposed football stadium plan at Parcel D was not part of the scope of this document. However, information provided in this FS is relevant to a stadium reuse plan. The HHRA includes scenarios for alternative reuse, including industrial reuse and recreational reuse for the entire parcel. The industrial reuse scenario is conservative for the areas of the stadium complex that are regularly occupied, and the recreational scenario is appropriate for the remainder.

The table below summarizes the planned reuses for each redevelopment block at Parcel D.

Redevelopment Block	Planned Reuse	Associated Exposure Scenario for HHRA
DMI-1	Maritime Industrial	Industrial
30B	Industrial	
37	Industrial	
38	Industrial	
42	Industrial	
29	Educational/Cultural	
DOS-1	Open Space	Recreational
39	Open Space	
A	Research and Development	Residential
30A	Mixed Use	

Based on the planned reuses for Parcel D, and the likelihood that excavation and trenching activities will be required to develop Parcel D for the planned reuses, the following receptors were selected for evaluation in the HHRA for Parcel D:

- Resident (adult and child)
- Industrial worker (adult)
- Recreational user (adult and child)
- Construction worker (adult)

Table 3-1 presents an exposure matrix that summarizes the exposure pathways identified as potentially complete for each of these receptors. Both direct exposure pathways (for example, ingestion) and indirect exposure pathways (for example, ingestion of home-grown produce) were identified as potentially complete (see Table 3-1).

For purposes of the HHRA, each redevelopment block at Parcel D was divided into 0.5-acre exposure areas (approximately 150 feet by 150 feet) and 2,500-square foot exposure areas. The 0.5-acre exposure area size was selected by the HPS BCT and City and County of San Francisco as a reasonable estimate for a light industrial lot in the Bay area. The 2,500-square foot exposure area was selected by the BCT as a reasonable estimate for a residential lot because it is a minimum residential lot size for a single-family home allowed by the San Francisco planning code (City and County of San Francisco 1995). This HHRA refers to each 0.5-acre exposure area at Parcel D as an "industrial grid" and each 2,500-square foot exposure area as a "residential grid." For purposes of the HHRA, each grid was assigned a unique identification number, referred to as the "grid number."

Risks from exposure to soil were evaluated for each grid for which soil sampling data was collected and where the sampling locations have not been subject to removal actions. Grids with no soil sampling data were not sampled because no environmental releases are suspected in these areas. Residential grids were used to assess residential exposures, while industrial grids were used to assess industrial, recreational, and construction worker exposures.

Risks from exposure to COPCs in groundwater were assessed for the A- and B-aquifers. For the A-aquifer, residential and industrial exposure to groundwater from inhalation of volatile COPCs in groundwater that migrates through the subsurface to indoor air (vapor intrusion) is the only complete exposure pathway for the planned reuses of Parcel D. For the construction worker scenario, exposure to groundwater in the A-aquifer may occur during trenching activities. Residential exposure to groundwater in the A-aquifer from domestic use (such as ingestion) was not evaluated in the HHRA because the A-aquifer at HPS is not considered a potential source of drinking water (see Section 2.2.9). However, because groundwater in the B-aquifer is considered to be a low potential source of drinking water, residential exposure to groundwater was evaluated for the B-aquifer.

Risks from residential, industrial, and construction worker exposure to COPCs in the groundwater in the A-aquifer were assessed for three risk plume-based exposure areas: the IR-09 risk plume, the IR-33 risk plume, and the IR-71 risk plume. These risk plumes are present in the A-aquifer only. The risk plumes were developed using a specific methodology developed for the HHRA based on agreements made with the BCT (see Attachment B4, Figures B4-1 and B4-2). The risk plumes are based on historical as well as more recent data, incorporating the 12 most recent sampling results for each analyte at each well. Groundwater data collected at Parcel D through June 2004 were used to delineate these risk plumes. Because this methodology includes historical data over 10 years old, the risk plumes reflect a worst-case scenario of groundwater contamination. Current conditions differ from the risk plumes (see Figures 2-29 and 2-30). The IR-33 and IR-71 risk plumes are based on delineation of VOC concentrations to respective laboratory reporting limits. The IR-71 risk plume is based on delineation of chromium VI concentrations to the laboratory reporting limit for chromium VI. Chemical concentrations measured from some groundwater monitoring locations at Parcel D were not

associated with risk plumes; these nonplume-based locations were evaluated on a grid-basis, using the same grid system that was used in the HHRA to evaluate soil exposures. This methodology serves as an efficient mechanism to locate each nonplume exposure area, and is consistent with the grid-based approach used to locate and evaluate soil exposures.

Although risk plumes are not present in the B-aquifer at Parcel D, for purposes of assessing the HHRA COPCs, plume boundaries delineated for the A-aquifer were extrapolated vertically and applied to the B-aquifer; the extrapolated plume boundaries were used to represent exposure areas for the B-aquifer for the residential domestic use evaluation. Similar to the approach used for the A-aquifer, chemical concentrations measured from groundwater monitoring locations in the B-aquifer at Parcel D that fell outside of the extrapolated plume boundaries were evaluated as nonplume exposure areas, using the exposure area grids established for soil.

For each redevelopment block, risks from exposure to COPCs in soil and groundwater were evaluated both for the specific exposure scenario associated with the planned reuse of the redevelopment block, and for the other potential exposure scenarios identified for Parcel D, regardless of the planned reuse of the redevelopment block. Using this approach, for each redevelopment block, risks were evaluated for residential, industrial, recreational, and construction worker exposures. The HHRA results summarized in this section are for the specific planned reuse of each redevelopment block. For groundwater in the B-aquifer, which was evaluated for residential exposure from domestic use, HHRA results are based on each exposure area evaluated, regardless of planned reuse. Risks associated with construction worker exposure at each redevelopment block are also summarized in this section, as exposures under this scenario may potentially occur, regardless of the planned reuse of the redevelopment block. Appendix B contains the risks results for all exposure scenarios evaluated for each redevelopment block.

3.1.2 Total and Incremental Risks for Soil Exposure

Both total and incremental risks were evaluated for exposure to soil at Parcel D. For the total risk evaluation, all detected chemicals were included as COPCs regardless of concentration, except for the essential nutrients calcium, magnesium, potassium, and sodium. The total risk evaluation provides an estimate of the risks posed by all chemicals at the site, including those present at concentrations at or below ambient levels. For the incremental risk evaluation, the above essential nutrients and metals with maximum measured concentrations below HPALs were excluded as COPCs. The incremental risk evaluation provides an estimate of risks posed by all chemicals at the site, except those that do not exceed ambient levels.

3.1.3 Soil Risk Summary

This section summarizes the results of the total and incremental risk evaluations for soil, based on planned reuse.

3.1.3.1 Total Risk Evaluation

For the total risk evaluation, risks from exposure to COPCs in soil were assessed for both surface soil (0 to 2 feet bgs) and subsurface soil (0 to 10 feet bgs). Figures 3-2 and 3-3 summarize the grid-specific total risk results for surface and subsurface soil, respectively, based on the planned reuse of the redevelopment block associated with each grid. Figure 3-4 summarizes the grid-specific total risk results for construction worker exposure to soil. The results for each grid are shown relative to the cancer risk threshold of 1×10^{-6}, highest segregated noncancer HI threshold of 1.0, and HPS RBC for lead (155 mg/kg for residential and recreational receptors, and 800 mg/kg for industrial and construction worker receptors). The specific calculated total cancer risk and noncancer HI results for each grid are listed in Tables 3-2, 3-3, and 3-4.

The risk results shown in the above referenced figures and tables represent total risk; that is, all detected chemicals not considered essential human nutrients were included in the risk evaluation. The total risk for most exposure areas exceeds the cancer risk threshold of 1×10^{-6}. For exposure areas planned for residential reuse, the total HI for all areas for which data are available (one exposure area for surface soil; three exposure areas for subsurface soil) also exceeds the threshold HI of 1.0.

Tables 3-5, 3-6, and 3-7 present a risk characterization analysis for those grids for which the total cancer risk exceeds 1×10^{-6} or highest segregated HI exceeds 1.0. For each of these grids, the tables identify the COCs and present their contribution to the calculated total risks and hazards for each potentially complete exposure pathway.

The following chemicals are identified as COCs in at least one grid, based on planned reuse and results of the total risk evaluation for soil.

Exposure Scenario	Surface Soil COCs, Total Risk	Subsurface Soil COCs, Total Risk
Industrial[1]	Arsenic Benzo(a)pyrene Benzo(b)fluoranthene Lead	Arsenic Benzo(a)pyrene Benzo(b)fluoranthene Lead
Recreational[1]	Arsenic Benzo(a)pyrene	Not applicable
Residential[1]	Arsenic Iron Manganese Vanadium	Arsenic Iron Nickel Manganese Vanadium
Construction Worker[2]	Not applicable	Arsenic Benzo(a)pyrene Lead Manganese

Notes:

1 COCs identified for this exposure scenario are based on the planned reuse for Parcel D.

2 The construction worker exposure scenario is not associated with a specific planned reuse for Parcel D. Based on discussions and an agreement with the BCT, evaluation of construction worker exposure to soil was based on subsurface soil from 0 to 10 feet bgs, which includes surface soil (0 to 2 feet bgs) exposure.

3.1.3.2 *Incremental Risk Evaluation*

For the incremental risk evaluation, risks from exposure to COPCs in soil were assessed for both surface soil (0 to 2 feet bgs) and subsurface soil (0 to 10 feet bgs). Figures 3-5 and 3-6 summarize the grid-specific incremental risk results for surface and subsurface soil, respectively, based on the planned reuse of the redevelopment block associated with each grid. Figure 3-7 summarizes the grid-specific incremental risk results for construction worker exposure to soil. The specific calculated incremental cancer risk and noncancer HI results for each grid are listed in Tables 3-8, 3-9, and 3-10.

The risk results shown in the above referenced figures and tables represent incremental risk; that is, all detected chemicals except essential human nutrients and metals below HPALs were included in the risk evaluation. Under the incremental risk evaluation, the most exposure areas at Parcel D do not exceed the cancer risk threshold of 1×10^{-6} or the noncancer threshold HI of 1.0, based on planned reuse.

Tables 3-11, 3-12, and 3-13 present a risk characterization analysis for those grids for which the incremental cancer risk exceeds 1×10^{-6} or highest segregated HI exceeds 1.0. For each of these grids, the tables identify the COCs and present their contribution to the calculated incremental risks and hazards for each potentially complete exposure pathway.

The following chemicals are identified as COCs in at least one grid, based on planned reuse and results of the incremental risk evaluation for soil.

Exposure Scenario	Surface Soil COCs, Incremental Risk	Subsurface Soil COCs, Incremental Risk
Industrial[1]	Arsenic Benzo(a)pyrene Benzo(b)fluoranthene Lead	Arsenic Benzo(a)pyrene Benzo(b)fluoranthene Lead
Recreational[1]	Arsenic Benzo(a)pyrene	Not applicable
Residential[1]	Manganese	Manganese
Construction Worker[2]	Not applicable	Arsenic Benzo(a)pyrene Lead Manganese

Notes:

1 COCs identified for this exposure scenario are based on the planned reuse for Parcel D.

2 The construction worker exposure scenario is not associated with a specific planned reuse for Parcel D. Based on discussions and an agreement with the BCT, evaluation of construction worker exposure to soil was based on subsurface soil from 0 to 10 feet bgs, which includes surface soil (0 to 2 feet bgs) exposure.

3.1.4 Groundwater Risk Summary

Risks from exposure to COPCs in groundwater were assessed for the A- and B-aquifers. Figure 3-8 summarizes the groundwater risk results for each of the identified risk plumes and nonplume exposure areas within the A-aquifer, based on the planned reuse for each

redevelopment block. Figure 3-9 summarizes the risk results for construction worker exposure to groundwater, for both plume- and nonplume-based exposures. The results in the figures are shown relative to the cancer risk threshold of 1×10^{-6} and highest segregated noncancer HI of 1.0.

Tables 3-14 and 3-15 present a risk characterization analysis for those exposure areas for which the cancer risk exceeds 1×10^{-6} or the highest segregated HI exceeds 1.0, for the exposure scenarios associated with planned reuse and the construction worker scenario, respectively. These tables identify the groundwater COCs associated with each Parcel D risk plume and the percent contribution of each COC to the total cancer risk and HI calculated for each plume. Exposure areas not associated with risk plumes with COCs are also shown on Tables 3-14 and 3-15. The following chemicals are identified as COCs in groundwater in the A-aquifer, based on planned reuse.

Exposure Scenario	Groundwater COCs, A-Aquifer
Industrial[1]	Benzene, Carbon Tetrachloride, Chloroform, Naphthalene, Tetrachloroethene, Trichloroethene, and Xylenes
Recreational[1]	Not applicable
Residential[1]	Chloroform, Methylene Chloride, and Trichloroethene
Construction Worker[2]	Arsenic, Benzene, Naphthalene, Tetrachloroethene, and Xylenes

Notes:

1 COCs identified for this exposure scenario are based on the planned reuse for Parcel D.

2 The construction worker exposure scenario is not associated with a specific planned reuse for Parcel D

Evaluation of exposure to groundwater in the B-aquifer was limited to residential exposure from domestic use. No COCs were identified for domestic use in the B-aquifer.

Figure 3-10 shows the risk results from residential exposure to groundwater in the B-aquifer from domestic use. As discussed in the HHRA (see Appendix B), risks from exposure to groundwater in the B-aquifer were evaluated for each exposure area for which monitoring data for the B-aquifer are available, regardless of the specific planned reuse of the exposure area. In addition, although contaminant plumes have not been identified in the B-aquifer and hydraulic communication does not occur between the A- and B-aquifers at Parcel D, data collected from the B-aquifer were grouped using the same risk plume delineation boundaries developed to evaluate risks for the A-aquifer. This approach was selected to facilitate reporting of risk results over collocated exposure areas. One A-aquifer plume-based exposure area (IR-71) and two A-aquifer nonplume-exposure areas (grid numbers 082075 and 085079) were evaluated for exposure to groundwater in the B-aquifer. Cancer risks were below 1×10^{-6} and noncancer HIs were below 1.0 for each of these exposure areas in the B-aquifer; hence, COCs were not identified for the B-aquifer at Parcel D.

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
18	Revised HHRA results	Section 2.5.1	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Tables 3-2 through 3-15. SulTech. November 30, 2007.

TABLE 3-2: TOTAL RISK - SUMMARY OF CANCER RISKS AND HAZARD INDICES BY PLANNED REUSE, SURFACE SOIL (0 TO 2 FEET BGS)

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Redevelopment Block	Planned Reuse	Grid Number	RME Cancer Risk	RME HI	RME Segregated HI
DMI-1	MI	AX20	**2E-06**	<1	<1
DMI-1	MI	BA19	**6E-06**	<1	<1
DMI-1	MI	BA20	2E-08	<1	<1
DMI-1	MI	BA21	**3E-06**	<1	<1
DMI-1	MI	BA22	**2E-05**	<1	<1
DMI-1	MI	BA26	**3E-05**	<1	<1
DMI-1	MI	BB20	**2E-05**	<1	<1
DMI-1	MI	BB21	**2E-05**	<1	<1
DMI-1	MI	BB22	6E-08	<1	<1
DMI-1	MI	BB23	**9E-06**	<1	<1
DMI-1	MI	BB25	**3E-05**	<1	<1
DMI-1	MI	BB26	**1E-05**	<1	<1
DMI-1	MI	BC21	**1E-05**	<1	<1
DMI-1	MI	BC26	**2E-05**	<1	<1
DMI-1	MI	BC27	2E-08	<1	<1
DMI-1	MI	BD25	**2E-05**	<1	<1
DMI-1	MI	BD26	**8E-06**	<1	<1
DMI-1	MI	BD27	**1E-05**	<1	<1
DMI-1	MI	BD29	**2E-05**	<1	<1
DMI-1	MI	BE25	**2E-05**	<1	<1
DMI-1	MI	BE26	**2E-05**	<1	<1
DMI-1	MI	BE27	**2E-05**	<1	<1
DMI-1	MI	BF20	**9E-06**	<1	<1
DMI-1	MI	BF23	3E-08	<1	<1
DMI-1	MI	BG29	**9E-06**	<1	<1
DMI-1	MI	BG30	**2E-05**	<1	<1
DMI-1	MI	BG31	**2E-05**	<1	<1
DMI-1	MI	BH30	**3E-05**	<1	<1
DMI-1	MI	BH31	**2E-05**	<1	<1
DMI-1	MI	BI29	**1E-05**	<1	<1
DMI-1	MI	BI30	**2E-05**	<1	<1
DMI-1	MI	BI31	**6E-06**	<1	<1
DMI-1	MI	BJ30	**2E-05**	<1	<1
DMI-1	MI	BJ31	**3E-05**	<1	<1
DMI-1	MI	BL24	**3E-05**	<1	<1
30B	IND	AR24	**8E-06**	<1	<1
30B	IND	AR25	**2E-05**	<1	<1
30B	IND	AS24	1E-08	<1	<1
30B	IND	AS25	2E-08	<1	<1
30B	IND	AT25	**4E-06**	<1	<1
37	IND	AT26	**2E-05**	<1	<1
37	IND	AT27	**3E-06**	<1	<1
37	IND	AU26	**2E-05**	<1	<1
37	IND	AV28	**2E-05**	<1	<1
38	IND	AU24	**2E-05**	<1	<1
38	IND	AV25	**7E-06**	<1	<1
38	IND	AW23	**1E-05**	<1	<1
38	IND	AW24	2E-08	<1	<1
38	IND	AW25	**1E-05**	<1	<1
38	IND	AX27	6E-09	<1	<1
38	IND	AY27	**5E-06**	<1	<1
38	IND	AZ26	**1E-05**	<1	<1

TABLE 3-2: TOTAL RISK - SUMMARY OF CANCER RISKS AND HAZARD INDICES BY PLANNED REUSE, SURFACE SOIL (0 TO 2 FEET BGS) (CONTINUED)

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Redevelopment Block	Planned Reuse	Grid Number	RME Cancer Risk	RME HI	RME Segregated HI
42	IND	AY28	**2E-05**	<1	<1
42	IND	BA28	**7E-06**	<1	<1
42	IND	BA29	**1E-05**	<1	<1
42	IND	BB28	**9E-06**	<1	<1
42	IND	BB29	**2E-05**	<1	<1
29	E/C	AS20	**2E-05**	<1	<1
29	E/C	AS22	**7E-06**	<1	<1
29	E/C	AS23	**3E-05**	<1	<1
29	E/C	AT21	**8E-06**	<1	<1
29	E/C	AT22	**2E-05**	<1	<1
29	E/C	AT23	**1E-05**	<1	<1
29	E/C	AT24	**3E-05**	<1	<1
29	E/C	AU22	**2E-05**	<1	<1
29	E/C	AU23	**1E-05**	<1	<1
29	E/C	AV22	**8E-06**	<1	<1
DOS-1	OS	AT19	2E-08	<1	<1
DOS-1	OS	AT20	**2E-05**	<1	<1
DOS-1	OS	AU19	**1E-05**	<1	<1
DOS-1	OS	AU20	**1E-05**	<1	<1
DOS-1	OS	AU21	2E-08	<1	<1
DOS-1	OS	AV20	**1E-05**	<1	<1
DOS-1	OS	AV21	**8E-06**	<1	<1
DOS-1	OS	AW20	**1E-05**	<1	<1
DOS-1	OS	AW21	**1E-05**	<1	<1
39	OS	AW22	3E-09	<1	<1
39	OS	AX21	**1E-05**	<1	<1
39	OS	AX23	**4E-06**	<1	<1
39	OS	AY23	**1E-04**	<1	<1
39	OS	AY24	**3E-06**	<1	<1
39	OS	AZ24	4E-09	<1	<1
39	OS	AZ25	3E-07	<1	<1
39	OS	BA23	**2E-05**	<1	<1
39	OS	BA24	**1E-05**	<1	<1
39	OS	BA25	**4E-06**	<1	<1
30A	MU	066068	**9E-05**	7E+00	**3E+00**

Notes: Values shown in boldface exceed the threshold level of 1E-06 for cancer risks and 1.0 for segregated noncancer hazards.

<1	Less than 1
--	Not applicable
bgs	Below ground surface
CR	Cancer risk
E/C	Educational/cultural (industrial exposure scenario)
HI	Hazard index
IND	Industrial (industrial exposure scenario)
MI	Maritime industrial (industrial exposure scenario)
MU	Mixed use (residential exposure scenario)
OS	Open space (recreational exposure scenario)
RME	Reasonable maximum exposure

TABLE 3-3: TOTAL RISK - SUMMARY OF CANCER RISKS AND HAZARD INDICES BY PLANNED REUSE, SUBSURFACE SOIL (0 TO 10 FEET BGS)

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Redevelopment Block	Planned Reuse	Grid Number	RME Cancer Risk	RME HI	RME Segregated HI
DMI-1	MI	AX20	**2E-06**	<1	<1
DMI-1	MI	BA19	**6E-06**	<1	<1
DMI-1	MI	BA20	2E-08	<1	<1
DMI-1	MI	BA21	**3E-06**	<1	<1
DMI-1	MI	BA22	**2E-05**	<1	<1
DMI-1	MI	BA26	**2E-05**	<1	<1
DMI-1	MI	BB20	**2E-05**	<1	<1
DMI-1	MI	BB21	**2E-05**	<1	<1
DMI-1	MI	BB22	5E-08	<1	<1
DMI-1	MI	BB23	**1E-05**	<1	<1
DMI-1	MI	BB25	**3E-05**	<1	<1
DMI-1	MI	BB26	**1E-05**	<1	<1
DMI-1	MI	BC21	**1E-05**	<1	<1
DMI-1	MI	BC22	**2E-05**	<1	<1
DMI-1	MI	BC24	**1E-05**	<1	<1
DMI-1	MI	BC26	**3E-05**	<1	<1
DMI-1	MI	BC27	3E-08	<1	<1
DMI-1	MI	BD25	**2E-05**	<1	<1
DMI-1	MI	BD26	**8E-06**	<1	<1
DMI-1	MI	BD27	**1E-05**	<1	<1
DMI-1	MI	BD29	**6E-05**	<1	<1
DMI-1	MI	BE25	**2E-05**	<1	<1
DMI-1	MI	BE26	**2E-05**	<1	<1
DMI-1	MI	BE27	**1E-05**	<1	<1
DMI-1	MI	BE29	**1E-05**	<1	<1
DMI-1	MI	BF20	**9E-06**	<1	<1
DMI-1	MI	BF23	3E-08	<1	<1
DMI-1	MI	BG24	**9E-06**	<1	<1
DMI-1	MI	BG29	**9E-06**	<1	<1
DMI-1	MI	BG30	**1E-05**	<1	<1
DMI-1	MI	BG31	**2E-05**	<1	<1
DMI-1	MI	BH23	**1E-05**	<1	<1
DMI-1	MI	BH24	**1E-05**	<1	<1
DMI-1	MI	BH30	**2E-05**	<1	<1
DMI-1	MI	BH31	**2E-05**	<1	<1
DMI-1	MI	BI29	**1E-05**	<1	<1
DMI-1	MI	BI30	**2E-05**	<1	<1
DMI-1	MI	BI31	**1E-05**	<1	<1
DMI-1	MI	BJ30	**2E-05**	<1	<1
DMI-1	MI	BJ31	**2E-05**	<1	<1
DMI-1	MI	BJ32	4E-07	<1	<1
DMI-1	MI	BK31	**2E-06**	<1	<1
DMI-1	MI	BK32	3E-07	<1	<1
DMI-1	MI	BL24	**2E-05**	<1	<1
30B	IND	AR24	**7E-06**	<1	<1
30B	IND	AR25	**1E-05**	<1	<1
30B	IND	AS24	**4E-06**	<1	<1
30B	IND	AS25	9E-08	<1	<1
30B	IND	AT25	**2E-05**	<1	<1
37	IND	AT26	**1E-05**	<1	<1
37	IND	AT27	**3E-06**	<1	<1

TABLE 3-3: TOTAL RISK - SUMMARY OF CANCER RISKS AND HAZARD INDICES BY PLANNED REUSE, SUBSURFACE SOIL (0 TO 10 FEET BGS) (CONTINUED)

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Redevelopment Block	Planned Reuse	Grid Number	RME Cancer Risk	RME HI	RME Segregated HI
37	IND	AU26	**2E-05**	<1	<1
37	IND	AV26	**7E-06**	<1	<1
37	IND	AV28	**2E-05**	<1	<1
38	IND	AU24	**2E-05**	<1	<1
38	IND	AV25	**2E-05**	<1	<1
38	IND	AW23	**1E-05**	<1	<1
38	IND	AW24	**3E-06**	<1	<1
38	IND	AW25	**1E-05**	<1	<1
38	IND	AW26	**1E-05**	<1	<1
38	IND	AX24	**3E-06**	<1	<1
38	IND	AX25	**1E-05**	<1	<1
38	IND	AX27	6E-09	<1	<1
38	IND	AY26	**4E-05**	<1	<1
38	IND	AY27	**4E-06**	<1	<1
38	IND	AZ26	**1E-05**	<1	<1
42	IND	AY28	**2E-05**	<1	<1
42	IND	AZ27	**1E-05**	<1	<1
42	IND	AZ28	2E-10	<1	<1
42	IND	BA28	**2E-05**	<1	<1
42	IND	BA29	**8E-06**	<1	<1
42	IND	BB28	**9E-06**	<1	<1
42	IND	BB29	**2E-05**	<1	<1
29	E/C	AS20	**2E-05**	<1	<1
29	E/C	AS22	**7E-06**	<1	<1
29	E/C	AS23	**1E-05**	<1	<1
29	E/C	AT21	**8E-06**	<1	<1
29	E/C	AT22	**2E-05**	<1	<1
29	E/C	AT23	**1E-05**	<1	<1
29	E/C	AT24	**2E-05**	<1	<1
29	E/C	AU22	**1E-05**	<1	<1
29	E/C	AU23	**1E-05**	<1	<1
29	E/C	AV22	**8E-06**	<1	<1
30A	MU	062069	**9E-05**	6E+00	**4E+00**
30A	MU	064065	**3E-04**	1E+01	**6E+00**
30A	MU	066068	**9E-05**	7E+00	**3E+00**

Notes: Values shown in boldface exceed the threshold level of 1E-06 for cancer risks and 1.0 for segregated noncancer hazards.

<1	Less than 1
--	Not applicable
bgs	Below ground surface
E/C	Educational/cultural (industrial exposure scenario)
HI	Hazard index
IND	Industrial (industrial exposure scenario)
MI	Maritime industrial (industrial exposure scenario)
MU	Mixed use (residential exposure scenario)
RB	Redevelopment block
RME	Reasonable maximum exposure
Seg	Segregated
MI	Maritime industrial (industrial exposure scenario)
MU	Mixed use (residential exposure scenario)
RME	Reasonable maximum exposure

TABLE 3-4: TOTAL RISK - SUMMARY OF CANCER RISKS AND HAZARD INDICES BY PLANNED REUSE, SURFACE SOIL (0 TO 10 FEET BGS), CONSTRUCTION WORKER SCENARIO

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Redevelopment Block	Planned Reuse	Grid Number	RME Cancer Risk	RME HI	RME Segregated HI
DMI-1	MI	AX20	4E-07	<1	<1
DMI-1	MI	BA19	1E-06	<1	<1
DMI-1	MI	BA20	9E-10	<1	<1
DMI-1	MI	BA21	5E-07	<1	<1
DMI-1	MI	BA22	**3E-06**	<1	<1
DMI-1	MI	BA26	**5E-06**	2E+00	<1
DMI-1	MI	BB20	**4E-06**	<1	<1
DMI-1	MI	BB21	**3E-06**	<1	<1
DMI-1	MI	BB22	2E-09	<1	<1
DMI-1	MI	BB23	**2E-06**	<1	<1
DMI-1	MI	BB25	**6E-06**	2E+00	<1
DMI-1	MI	BB26	**3E-06**	2E+00	<1
DMI-1	MI	BB29	**3E-06**	<1	<1
DMI-1	MI	BC21	**2E-06**	<1	<1
DMI-1	MI	BC22	**3E-06**	<1	<1
DMI-1	MI	BC24	**2E-06**	<1	<1
DMI-1	MI	BC26	**6E-06**	2E+00	<1
DMI-1	MI	BC27	1E-09	<1	<1
DMI-1	MI	BD25	**3E-06**	<1	<1
DMI-1	MI	BD26	1E-06	<1	<1
DMI-1	MI	BD27	**2E-06**	<1	<1
DMI-1	MI	BD29	**1E-05**	2E+00	<1
DMI-1	MI	BE25	**5E-06**	<1	<1
DMI-1	MI	BE26	**5E-06**	2E+00	<1
DMI-1	MI	BE27	**3E-06**	<1	<1
DMI-1	MI	BE29	**3E-06**	<1	<1
DMI-1	MI	BF20	**2E-06**	<1	<1
DMI-1	MI	BF23	4E-09	<1	<1
DMI-1	MI	BG24	**2E-06**	<1	<1
DMI-1	MI	BG29	**2E-06**	<1	<1
DMI-1	MI	BG30	**3E-06**	<1	<1
DMI-1	MI	BG31	**3E-06**	<1	<1
DMI-1	MI	BH23	**2E-06**	<1	<1
DMI-1	MI	BH24	**2E-06**	<1	<1
DMI-1	MI	BH30	**3E-06**	<1	<1
DMI-1	MI	BH31	**3E-06**	<1	<1
DMI-1	MI	BI29	**2E-06**	<1	<1
DMI-1	MI	BI30	**3E-06**	<1	<1
DMI-1	MI	BI31	**3E-06**	<1	<1
DMI-1	MI	BJ30	**4E-06**	<1	<1
DMI-1	MI	BJ31	**4E-06**	<1	<1
DMI-1	MI	BJ32	4E-08	<1	<1
DMI-1	MI	BK31	3E-07	<1	<1
DMI-1	MI	BK32	4E-08	<1	<1
DMI-1	MI	BL24	**4E-06**	<1	<1
30B	IND	AR24	1E-06	2E+00	<1
30B	IND	AR25	**3E-06**	<1	<1
30B	IND	AS24	8E-07	<1	<1
30B	IND	AS25	4E-09	<1	<1
30B	IND	AT25	**3E-06**	<1	<1
37	IND	AT26	**3E-06**	<1	<1
37	IND	AT27	6E-07	<1	<1

TABLE 3-4: TOTAL RISK - SUMMARY OF CANCER RISKS AND HAZARD INDICES BY PLANNED REUSE, SURFACE SOIL (0 TO 10 FEET BGS), CONSTRUCTION WORKER SCENARIO (CONTINUED)

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Redevelopment Block	Planned Reuse	Grid Number	RME Cancer Risk	RME HI	RME Segregated HI
37	IND	AU26	**4E-06**	<1	<1
37	IND	AV26	1E-06	<1	<1
37	IND	AV28	**3E-06**	<1	<1
38	IND	AU24	**4E-06**	<1	<1
38	IND	AV25	**5E-06**	2E+00	<1
38	IND	AW23	**2E-06**	<1	<1
38	IND	AW24	6E-07	2E+00	<1
38	IND	AW25	**3E-06**	<1	<1
38	IND	AW26	**2E-06**	<1	<1
38	IND	AX24	5E-07	2E+00	<1
38	IND	AX25	**2E-06**	<1	<1
38	IND	AX27	2E-10	<1	<1
38	IND	AY26	**7E-06**	<1	<1
38	IND	AY27	8E-07	<1	<1
38	IND	AZ26	**2E-06**	<1	<1
42	IND	AY28	**3E-06**	<1	<1
42	IND	AZ27	**2E-06**	<1	<1
42	IND	AZ28	7E-12	<1	<1
42	IND	BA28	**3E-06**	2E+00	<1
42	IND	BA29	1E-06	2E+00	<1
42	IND	BB28	**2E-06**	<1	<1
29	E/C	AS20	**5E-06**	<1	<1
29	E/C	AS22	1E-06	2E+00	<1
29	E/C	AS23	**3E-06**	2E+00	<1
29	E/C	AT21	1E-06	<1	<1
29	E/C	AT22	**4E-06**	<1	<1
29	E/C	AT23	**2E-06**	<1	<1
29	E/C	AT24	**5E-06**	2E+00	<1
29	E/C	AU22	**3E-06**	<1	<1
29	E/C	AU23	**2E-06**	<1	<1
DOS-1	OS	AT19	**4E-06**	<1	<1
DOS-1	OS	AT20	**3E-06**	<1	<1
DOS-1	OS	AU19	**2E-06**	<1	<1
DOS-1	OS	AU20	**3E-06**	2E+00	<1
DOS-1	OS	AU21	6E-09	<1	<1
DOS-1	OS	AV19	9E-07	<1	<1
DOS-1	OS	AV20	**3E-06**	<1	<1
DOS-1	OS	AV21	1E-06	<1	<1
DOS-1	OS	AV22	1E-06	<1	<1
DOS-1	OS	AW20	1E-06	<1	<1
DOS-1	OS	AW21	**2E-06**	<1	<1
39	OS	AW22	8E-10	<1	<1
39	OS	AX21	9E-07	<1	<1
39	OS	AX22	7E-07	<1	<1
39	OS	AX23	7E-07	<1	<1
39	OS	AY23	**3E-06**	<1	<1
39	OS	AY24	5E-07	<1	<1
39	OS	AZ22	1E-09	2E+00	<1
39	OS	AZ24	1E-06	2E+00	<1
39	OS	AZ25	**3E-06**	<1	<1
39	OS	BA23	**3E-06**	<1	<1
39	OS	BA24	**2E-06**	2E+00	<1

TABLE 3-4: TOTAL RISK - SUMMARY OF CANCER RISKS AND HAZARD INDICES BY PLANNED REUSE, SURFACE SOIL (0 TO 10 FEET BGS), CONSTRUCTION WORKER SCENARIO (CONTINUED)

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Redevelopment Block	Planned Reuse	Grid Number	RME Cancer Risk	RME HI	RME Segregated HI
39	OS	BA25	1E-06	<1	<1
30A	MU	AQ23	**5E-06**	<1	<1
30A	MU	AQ24	**2E-06**	<1	<1

Notes: Values shown in boldface exceed the threshold level of 1E-06 for cancer risks and 1.0 for segregated noncancer hazards.

<1	Less than 1
--	Not applicable
bgs	Below ground surface
E/C	Educational/cultural (industrial exposure scenario)
HI	Hazard index
IND	Industrial (industrial exposure scenario)
MI	Maritime industrial (industrial exposure scenario)
MU	Mixed use (residential exposure scenario)
OS	Open space (recreational exposure scenario)
RME	Reasonable maximum exposure

TABLE 3-5: TOTAL RISK - RISK CHARACTERIZATION ANALYSIS FOR SURFACE SOIL (0 TO 2 FEET BGS) BY PLANNED REUSE
Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Redevelopment Block	Planned Reuse	Grid Number	Total RME Cancer Risk	Total RME HI	RME Segregated HI	Chemicals of Concern		Basis for Chemical of Concern	Range of Detected Concentrations	RME EPC	Detection Frequency	Chemical-Specific Cancer Risk	Percent Contribution by Exposure Pathway to Total RME Cancer Risk: Incidental Ingestion	Dermal Contact	Inhalation (Releases to Ambient Air)	Home-grown Produce Ingestion	Chemical-Specific HI	Percent Contribution by Exposure Pathway to Total RME HI: Incidental Ingestion	Dermal Contact	Inhalation (Releases to Ambient Air)	Home-grown Produce Ingestion	Metals: HPAL	Maximum Concentration Exceeds HPAL?
DMI-1	MI	AX20	2.15E-06	<1	<1	Metal	Arsenic	C	0.92 - 0.92	9.20E-01	1/2	2.12E-06	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
DMI-1	MI	BA19	6.02E-06	<1	<1	Metal	Arsenic	C	2.6 - 2.6	2.60E+00	1/1	6.00E-06	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
DMI-1	MI	BA21	2.86E-06	<1	<1	Metal	Arsenic	C	0.7 - 0.98	9.80E-01	2/4	2.26E-06	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
DMI-1	MI	BA22	2.16E-05	<1	<1	Metal	Arsenic	C	3.9 - 5.9	5.52E+00	4/5	1.27E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
						PAH	Benzo(a)pyrene	C	0.057 - 1	1.00E+00	3/5	5.70E-06	36.8 %	63.2 %	0.0 %		--	--	--	--		--	--
							Benzo(b)fluoranthene	C	0.094 - 2.2	2.20E+00	3/5	1.25E-06	36.8 %	63.2 %	0.0 %		--	--	--	--		--	--
DMI-1	MI	BA26	3.13E-05	<1	<1	Metal	Arsenic	C	4.9 - 13.1	1.31E+01	3/3	3.02E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	Yes
DMI-1	MI	BB20	1.69E-05	<1	<1	Metal	Arsenic	C	5.7 - 7.3	7.30E+00	2/2	1.68E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
DMI-1	MI	BB21	2.13E-05	<1	<1	Metal	Arsenic	C	0.65 - 9	9.00E+00	3/3	2.08E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
DMI-1	MI	BB23	9.03E-06	<1	<1	Metal	Arsenic	C	2.4 - 3.9	3.90E+00	2/2	8.99E-06	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
DMI-1	MI	BB25	2.87E-05	<1	<1	Metal	Arsenic	C	7.9 - 12.4	1.24E+01	2/2	2.86E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	Yes
DMI-1	MI	BB26	1.34E-05	<1	<1	Metal	Arsenic	C	2 - 5.7	5.70E+00	3/3	1.31E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
DMI-1	MI	BC21	9.70E-06	<1	<1	Metal	Arsenic	C	4.2 - 4.2	4.20E+00	1/1	9.68E-06	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
DMI-1	MI	BC26	1.74E-05	<1	<1	Metal	Arsenic	C	1.6 - 9.5	6.91E+00	6/7	1.59E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
DMI-1	MI	BD25	1.64E-05	<1	<1	Metal	Arsenic	C	2.1 - 7.1	7.10E+00	3/3	1.64E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
DMI-1	MI	BD26	7.63E-06	<1	<1	Metal	Arsenic	C	3.3 - 3.3	3.30E+00	1/2	7.61E-06	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
DMI-1	MI	BD27	1.02E-05	<1	<1	Metal	Arsenic	C	4.2 - 4.2	4.20E+00	1/1	9.68E-06	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
DMI-1	MI	BD29	1.94E-05	<1	<1	Metal	Arsenic	C	8.4 - 8.4	8.40E+00	1/1	1.94E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
DMI-1	MI	BE25	2.50E-05	<1	<1	Metal	Arsenic	C	10.6 - 10.6	1.06E+01	1/1	2.44E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
DMI-1	MI	BE26	2.37E-05	<1	<1	Metal	Arsenic	C	3.7 - 8.6	8.60E+00	4/4	1.98E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
						PAH	Benzo(a)pyrene	C	0.47 - 0.47	4.70E-01	1/3	2.68E-06	36.8 %	63.2 %	0.0 %		--	--	--	--		--	--
DMI-1	MI	BE27	1.82E-05	<1	<1	Metal	Arsenic	C	2.4 - 7.9	7.90E+00	3/3	1.82E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
DMI-1	MI	BF20	8.76E-06	<1	<1	Metal	Arsenic	C	3.7 - 3.7	3.70E+00	1/1	8.53E-06	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
DMI-1	MI	BG29	9.05E-06	<1	<1	Metal	Arsenic	C	3.9 - 3.9	3.90E+00	1/1	8.99E-06	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
DMI-1	MI	BG30	1.67E-05	<1	<1	Metal	Arsenic	C	3.6 - 10.5	7.02E+00	15/16	1.62E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
DMI-1	MI	BG31	2.07E-05	<1	<1	Metal	Arsenic	C	1.6 - 11.1	6.68E+00	15/15	1.54E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	Yes
						PAH	Benzo(a)pyrene	C	0.88 - 0.88	8.80E-01	1/11	5.01E-06	36.8 %	63.2 %	0.0 %		--	--	--	--		--	--
DMI-1	MI	BH30	3.32E-05	<1	<1	Metal	Arsenic	C	4 - 13.9	1.39E+01	4/4	3.21E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	Yes
DMI-1	MI	BH31	1.66E-05	<1	<1	Metal	Arsenic	C	3.7 - 7.2	7.20E+00	2/2	1.66E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
DMI-1	MI	BI29	9.69E-06	<1	<1	Metal	Arsenic	C	4.2 - 4.2	4.20E+00	1/1	9.68E-06	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
DMI-1	MI	BI30	1.52E-05	<1	<1	Metal	Arsenic	C	5.1 - 6.6	6.60E+00	2/2	1.52E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
DMI-1	MI	BI31	6.00E-06	<1	<1	Metal	Arsenic	C	2.6 - 2.6	2.60E+00	1/1	6.00E-06	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
DMI-1	MI	BJ30	2.29E-05	<1	<1	Metal	Arsenic	C	3.8 - 11	8.64E+00	14/14	1.99E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
						PAH	Benzo(a)pyrene	C	0.011 - 0.51	2.82E-01	8/14	1.60E-06	36.8 %	63.2 %	0.0 %		--	--	--	--		--	--
DMI-1	MI	BJ31	3.17E-05	<1	<1	Metal	Arsenic	C	4.3 - 17	1.25E+01	8/8	2.88E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	Yes
						PAH	Benzo(a)pyrene	C	0.017 - 0.35	3.50E-01	3/8	1.99E-06	36.8 %	63.2 %	0.0 %		--	--	--	--		--	--
DMI-1	MI	BL24	2.55E-05	<1	<1	Metal	Arsenic	C	1.9 - 13.6	1.02E+01	9/9	2.35E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	Yes
						PAH	Benzo(a)pyrene	C	0.22 - 0.22	2.20E-01	1/7	1.25E-06	36.8 %	63.2 %	0.0 %		--	--	--	--		--	--
30B	IND	AR24	8.20E-06	<1	<1	Metal	Arsenic	C	3.2 - 3.5	3.50E+00	3/3	8.07E-06	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
30B	IND	AR25	1.89E-05	<1	<1	Metal	Arsenic	C	3 - 11	8.18E+00	8/8	1.89E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
30B	IND	AT25	3.93E-06	<1	<1	Metal	Arsenic	C	1.7 - 1.7	1.70E+00	1/1	3.92E-06	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No

TABLE 3-5: TOTAL RISK - RISK CHARACTERIZATION ANALYSIS FOR SURFACE SOIL (0 TO 2 FEET BGS) BY PLANNED REUSE (CONTINUED)
Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

													Percent Contribution by Exposure Pathway to Total RME Cancer Risk					Percent Contribution by Exposure Pathway to Total RME HI				Metals	
Redevelopment Block	Planned Reuse	Grid Number	Total RME Cancer Risk	Total RME HI	RME Segregated HI	Chemicals of Concern		Basis for Chemical of Concern	Range of Detected Concentrations	RME EPC	Detection Frequency	Chemical-Specific Cancer Risk	Incidental Ingestion	Dermal Contact	Inhalation (Releases to Ambient Air)	Home-grown Produce Ingestion	Chemical-Specific HI	Incidental Ingestion	Dermal Contact	Inhalation (Releases to Ambient Air)	Home-grown Produce Ingestion	HPAL	Maximum Concentration Exceeds HPAL?
37	IND	AT26	1.64E-05	<1	<1	Metal	Arsenic	C	1.9 - 7.1	7.10E+00	3/3	1.64E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
37	IND	AT27	3.01E-06	<1	<1	Metal	Arsenic	C	1.3 - 1.3	1.30E+00	1/1	3.00E-06	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
37	IND	AU26	1.80E-05	<1	<1	Metal	Arsenic	C	7.8 - 7.8	7.80E+00	1/1	1.80E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
37	IND	AV28	2.30E-05	<1	<1	Metal	Arsenic	C	1 - 10.9	9.97E+00	4/4	2.30E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
38	IND	AU24	2.20E-05	<1	<1	Metal	Arsenic	C	1.7 - 9.5	9.50E+00	3/4	2.19E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
38	IND	AV25	6.85E-06	<1	<1	Metal	Arsenic	C	2.5 - 2.5	2.50E+00	2/2	5.76E-06	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
38	IND	AW23	1.03E-05	<1	<1	Metal	Arsenic	C	4.4 - 4.4	4.40E+00	1/1	1.01E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
38	IND	AW25	1.22E-05	<1	<1	Metal	Arsenic	C	5.3 - 5.3	5.30E+00	1/1	1.22E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
38	IND	AY27	5.10E-06	<1	<1	Metal	Arsenic	C	1.9 - 2.2	2.20E+00	2/2	5.07E-06	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
38	IND	AZ26	1.00E-05	<1	<1	Metal	Arsenic	C	2.3 - 4.3	4.30E+00	2/2	9.92E-06	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
42	IND	AY28	1.61E-05	<1	<1	Metal	Arsenic	C	7 - 7	7.00E+00	1/1	1.61E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
42	IND	BA28	6.56E-06	<1	<1	Metal	Arsenic	C	2.4 - 2.4	2.40E+00	1/1	5.53E-06	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
42	IND	BA29	1.29E-05	<1	<1	Metal	Arsenic	C	2.8 - 5.3	5.30E+00	3/3	1.22E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
42	IND	BB28	9.27E-06	<1	<1	Metal	Arsenic	C	2.7 - 3.8	3.80E+00	2/2	8.76E-06	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
42	IND	BB29	1.71E-05	<1	<1	Metal	Arsenic	C	7.3 - 7.3	7.30E+00	1/1	1.68E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
29	E/C	AS20	2.47E-05	<1	<1	Metal	Arsenic	C	5.2 - 12.5	1.06E+01	5/6	2.44E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	Yes
29	E/C	AS22	6.94E-06	<1	<1	Metal	Arsenic	C	2.1 - 3	3.00E+00	2/2	6.92E-06	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
29	E/C	AS23	3.18E-05	<1	<1	Metal	Arsenic	C	0.4 - 15	1.34E+01	13/15	3.08E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	Yes
29	E/C	AT21	7.57E-06	<1	<1	Metal	Arsenic	C	3.1 - 3.1	3.10E+00	1/2	7.15E-06	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
29	E/C	AT22	2.27E-05	<1	<1	Metal	Arsenic	C	0.59 - 9.8	9.80E+00	3/3	2.26E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
							Lead	NC	7.7 - 920	9.20E+02	3/3	--	--	--	--		--	--	--	--		800	Yes
29	E/C	AT23	1.13E-05	<1	<1	Metal	Arsenic	C	1.1 - 6.5	4.85E+00	6/7	1.12E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
29	E/C	AT24	3.14E-05	<1	<1	Metal	Arsenic	C	1.9 - 14.2	1.28E+01	4/4	2.96E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	Yes
						PAH	Benzo(a)pyrene	C	0.3 - 0.3	3.00E-01	1/5	1.71E-06	36.8 %	63.2 %	0.0 %		--	--	--	--		--	--
29	E/C	AU22	1.81E-05	<1	<1	Metal	Arsenic	C	3.5 - 7.8	7.80E+00	3/3	1.80E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
29	E/C	AU23	1.03E-05	<1	<1	Metal	Arsenic	C	2 - 4.4	4.40E+00	3/4	1.01E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
29	E/C	AV22	7.63E-06	<1	<1	Metal	Arsenic	C	3.3 - 3.3	3.30E+00	1/2	7.61E-06	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
DOS-1	OS	AT20	1.99E-05	<1	<1	Metal	Arsenic	C	0.68 - 10.7	6.23E+00	11/15	1.68E-05	62.8 %	37.2 %	0.0 %		<1	--	--	--		11.1	No
						PAH	Benzo(a)pyrene	C	0.021 - 0.24	2.40E-01	3/15	1.84E-06	28 %	71.9 %	0.0 %		--	--	--	--		--	--
DOS-1	OS	AU19	1.43E-05	<1	<1	Metal	Arsenic	C	3.2 - 5.3	5.30E+00	2/2	1.43E-05	62.8 %	37.2 %	0.0 %		<1	--	--	--		11.1	No
DOS-1	OS	AU20	1.25E-05	<1	<1	Metal	Arsenic	C	1.3 - 6.2	4.62E+00	6/8	1.24E-05	62.8 %	37.2 %	0.0 %		<1	--	--	--		11.1	No
DOS-1	OS	AV20	1.15E-05	<1	<1	Metal	Arsenic	C	2.7 - 2.7	2.70E+00	1/1	7.27E-06	62.8 %	37.2 %	0.0 %		<1	--	--	--		11.1	No
						PAH	Benzo(a)pyrene	C	0.49 - 0.49	4.90E-01	1/1	3.75E-06	28 %	71.9 %	0.0 %		--	--	--	--		--	--
DOS-1	OS	AV21	7.81E-06	<1	<1	Metal	Arsenic	C	2.9 - 2.9	2.90E+00	1/1	7.81E-06	62.8 %	37.2 %	0.0 %		<1	--	--	--		11.1	No
DOS-1	OS	AW20	1.37E-05	<1	<1	Metal	Arsenic	C	1.8 - 3.7	3.70E+00	3/3	9.96E-06	62.8 %	37.2 %	0.0 %		<1	--	--	--		11.1	No
						PAH	Benzo(a)pyrene	C	0.27 - 0.27	2.70E-01	1/3	2.07E-06	28 %	71.9 %	0.0 %		--	--	--	--		--	--
DOS-1	OS	AW21	1.05E-05	<1	<1	Metal	Arsenic	C	0.33 - 4	3.89E+00	5/5	1.05E-05	62.8 %	37.2 %	0.0 %		<1	--	--	--		11.1	No
39	OS	AX21	1.10E-05	<1	<1	Metal	Arsenic	C	0.34 - 4.1	4.10E+00	5/7	1.10E-05	62.8 %	37.2 %	0.0 %		<1	--	--	--		11.1	No
39	OS	AX23	4.04E-06	<1	<1	Metal	Arsenic	C	1.5 - 1.5	1.50E+00	1/1	4.04E-06	62.8 %	37.2 %	0.0 %		<1	--	--	--		11.1	No
39	OS	AY23	1.27E-04	<1	<1	Metal	Arsenic	C	0.45 - 47.2	4.72E+01	3/5	1.27E-04	62.8 %	37.2 %	0.0 %		<1	--	--	--		11.1	Yes
39	OS	AY24	3.26E-06	<1	<1	Metal	Arsenic	C	1.2 - 1.2	1.20E+00	1/1	3.23E-06	62.8 %	37.2 %	0.0 %		<1	--	--	--		11.1	No

TABLE 3-5: TOTAL RISK - RISK CHARACTERIZATION ANALYSIS FOR SURFACE SOIL (0 TO 2 FEET BGS) BY PLANNED REUSE (CONTINUED)
Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Redevelopment Block	Planned Reuse	Grid Number	Total RME Cancer Risk	Total RME HI	RME Segregated HI	Chemicals of Concern		Basis for Chemical of Concern	Range of Detected Concentrations	RME EPC	Detection Frequency	Chemical-Specific Cancer Risk	Percent Contribution by Exposure Pathway to Total RME Cancer Risk: Incidental Ingestion	Dermal Contact	Inhalation (Releases to Ambient Air)	Home-grown Produce Ingestion	Chemical-Specific HI	Percent Contribution by Exposure Pathway to Total RME HI: Incidental Ingestion	Dermal Contact	Inhalation (Releases to Ambient Air)	Home-grown Produce Ingestion	Metals: HPAL	Maximum Concentration Exceeds HPAL?
39	OS	BA23	1.64E-05	<1	<1	Metal	Arsenic	C	4.7 - 6.1	6.10E+00	2/3	1.64E-05	62.8 %	37.2 %	0.0 %		<1	--	--	--		11.1	No
39	OS	BA24	1.02E-05	<1	<1	Metal	Arsenic	C	3.8 - 3.8	3.80E+00	1/1	1.02E-05	62.8 %	37.2 %	0.0 %		<1	--	--	--		11.1	No
39	OS	BA25	4.42E-06	<1	<1	Metal	Arsenic	C	0.92 - 2	1.62E+00	4/5	4.35E-06	62.8 %	37.2 %	0.0 %		<1	--	--	--		11.1	No
30A	MU	066068	9.15E-05	2.67E+00	2.15E+00	Metal	Arsenic	C	3.5 - 3.5	3.50E+00	1/1	9.14E-05	56.6 %	5.4 %	0.0 %	38 %	<1	--	--	--	--	11.1	No
							Iron	NC	38,600 - 38,600	3.86E+04	1/1	--	--	--	--	--	1.76E+00	93.6 %	0.0 %	0.0 %	6.4 %	58000	No
							Manganese	NC	1,520 - 2,020	2.02E+03	2/2	--	--	--	--	--	2.40E+00	44.9 %	0.0 %	2.9 %	52.2 %	1431.18	Yes
							Vanadium	NC	94.4 - 94.4	9.44E+01	1/1	--	--	--	--	--	1.46E+00	82.9 %	0.0 %	0.0 %	17.1 %	117.17	No

Notes: All concentrations shown in mg/kg.

<1 Less than 1
-- Not applicable or chemical is not a chemical of concern for this endpoint
Not evaluated because exposure pathway is incomplete

bgs Below ground surface
C Cancer effect
E/C Educational/cultural (industrial exposure scenario)
EPC Exposure point concentration
HI Hazard index
HPAL Hunters Point ambient level
IND Industrial (industrial exposure scenario)
MI Maritime industrial (industrial exposure scenario)
MU Mixed use (residential exposure scenario)
NC Noncancer effect
OS Open space (recreational exposure scenario)
PAH Polynuclear aromatic hydrocarbon
RME Reasonable maximum exposure

TABLE 3-6: TOTAL RISK - RISK CHARACTERIZATION ANALYSIS FOR SUBSURFACE SOIL (0 TO 10 FEET BGS) BY PLANNED REUSE
Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

													Percent Contribution by Exposure Pathway to Total RME Cancer Risk					Percent Contribution by Exposure Pathway to Total RME HI				Metals	
Redevelopment Block	Planned Reuse	Grid Number	Total RME Cancer Risk	Total RME HI	RME Segregated HI	Chemicals of Concern		Basis for Chemical of Concern	Range of Detected Concentrations	RME EPC	Detection Frequency	Chemical-Specific Cancer Risk	Incidental Ingestion	Dermal Contact	Inhalation (Releases to Ambient Air)	Home-grown Produce Ingestion	Chemical-Specific HI	Incidental Ingestion	Dermal Contact	Inhalation (Releases to Ambient Air)	Home-grown Produce Ingestion	HPAL	Maximum Concentration Exceeds HPAL?
DMI-1	MI	AX20	2.15E-06	<1	<1	Metal	Arsenic	C	0.63 - 0.92	9.20E-01	2/4	2.12E-06	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
DMI-1	MI	BA19	6.02E-06	<1	<1	Metal	Arsenic	C	2.6 - 2.6	2.60E+00	1/1	6.00E-06	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
DMI-1	MI	BA21	2.87E-06	<1	<1	Metal	Arsenic	C	0.7 - 0.98	9.80E-01	2/11	2.26E-06	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
DMI-1	MI	BA22	1.87E-05	<1	<1	Metal	Arsenic	C	2 - 5.9	4.26E+00	11/12	9.82E-06	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
						PAH	Benzo(a)pyrene	C	0.057 - 1	1.00E+00	3/12	5.70E-06	36.8 %	63.2 %	0.0 %		--	--	--	--		--	--
							Benzo(b)fluoranthene	C	0.094 - 2.2	2.20E+00	3/12	1.25E-06	36.8 %	63.2 %	0.0 %		--	--	--	--		--	--
DMI-1	MI	BA26	2.44E-05	<1	<1	Metal	Arsenic	C	2.5 - 13.1	1.01E+01	4/5	2.33E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	Yes
DMI-1	MI	BB20	1.78E-05	<1	<1	Metal	Arsenic	C	1.5 - 9.8	7.71E+00	6/6	1.78E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
DMI-1	MI	BB21	1.62E-05	<1	<1	Metal	Arsenic	C	0.65 - 9.7	6.80E+00	9/9	1.57E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
DMI-1	MI	BB23	1.02E-05	<1	<1	Metal	Arsenic	C	2.4 - 3.9	3.90E+00	5/6	8.99E-06	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
DMI-1	MI	BB25	2.87E-05	<1	<1	Metal	Arsenic	C	7.2 - 12.4	1.24E+01	3/3	2.86E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	Yes
DMI-1	MI	BB26	1.38E-05	<1	<1	Metal	Arsenic	C	0.62 - 6	5.89E+00	5/5	1.36E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
DMI-1	MI	BC21	9.74E-06	<1	<1	Metal	Arsenic	C	2.6 - 4.2	4.20E+00	2/3	9.68E-06	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
DMI-1	MI	BC22	1.52E-05	<1	<1	Metal	Arsenic	C	4.4 - 6.6	6.60E+00	3/3	1.52E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
DMI-1	MI	BC24	1.11E-05	<1	<1	Metal	Arsenic	C	4.6 - 4.8	4.80E+00	2/4	1.11E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
DMI-1	MI	BC26	3.28E-05	<1	<1	Metal	Arsenic	C	1.6 - 25.3	1.36E+01	16/19	3.13E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	Yes
DMI-1	MI	BD25	1.64E-05	<1	<1	Metal	Arsenic	C	0.55 - 7.1	7.10E+00	4/6	1.64E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
DMI-1	MI	BD26	7.63E-06	<1	<1	Metal	Arsenic	C	0.5 - 3.3	3.30E+00	3/5	7.61E-06	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
DMI-1	MI	BD27	1.02E-05	<1	<1	Metal	Arsenic	C	3.7 - 4.2	4.20E+00	2/2	9.68E-06	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
DMI-1	MI	BD29	5.67E-05	<1	<1	Metal	Arsenic	C	8.4 - 22.3	2.23E+01	2/2	5.14E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	Yes
						PAH	Benzo(a)pyrene	C	0.57 - 0.57	5.70E-01	1/1	3.25E-06	36.8 %	63.2 %	0.0 %		--	--	--	--		--	--
DMI-1	MI	BE25	2.50E-05	<1	<1	Metal	Arsenic	C	2.8 - 10.6	1.06E+01	3/3	2.44E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
DMI-1	MI	BE26	2.46E-05	<1	<1	Metal	Arsenic	C	2.6 - 24.8	8.93E+00	13/13	2.06E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	Yes
						PAH	Benzo(a)pyrene	C	0.47 - 0.47	4.70E-01	1/6	2.68E-06	36.8 %	63.2 %	0.0 %		--	--	--	--		--	--
DMI-1	MI	BE27	1.43E-05	<1	<1	Metal	Arsenic	C	2.4 - 7.9	6.18E+00	6/6	1.42E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
DMI-1	MI	BE29	1.28E-05	<1	<1	Metal	Arsenic	C	5.5 - 5.5	5.50E+00	1/1	1.27E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
DMI-1	MI	BF20	9.06E-06	<1	<1	Metal	Arsenic	C	3.7 - 3.7	3.70E+00	1/2	8.53E-06	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
DMI-1	MI	BG24	9.01E-06	<1	<1	Metal	Arsenic	C	2.1 - 3.9	3.90E+00	3/3	8.99E-06	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
DMI-1	MI	BG29	9.07E-06	<1	<1	Metal	Arsenic	C	2.9 - 3.9	3.90E+00	3/3	8.99E-06	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
DMI-1	MI	BG30	1.36E-05	<1	<1	Metal	Arsenic	C	2.6 - 16.6	5.66E+00	38/39	1.31E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	Yes
DMI-1	MI	BG31	1.89E-05	<1	<1	Metal	Arsenic	C	1.6 - 12	6.82E+00	29/29	1.57E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	Yes
						PAH	Benzo(a)pyrene	C	0.017 - 0.88	4.33E-01	7/31	2.46E-06	36.8 %	63.2 %	0.0 %		--	--	--	--		--	--
DMI-1	MI	BH23	1.03E-05	<1	<1	Metal	Arsenic	C	3.4 - 3.4	3.40E+00	1/3	7.84E-06	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
						PAH	Benzo(a)pyrene	C	0.32 - 0.32	3.20E-01	1/3	1.82E-06	36.8 %	63.2 %	0.0 %		--	--	--	--		--	--
DMI-1	MI	BH24	1.04E-05	<1	<1	Metal	Arsenic	C	3.2 - 4.5	4.50E+00	3/7	1.04E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
DMI-1	MI	BH30	1.72E-05	<1	<1	Metal	Arsenic	C	3.1 - 13.9	6.94E+00	18/19	1.60E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	Yes
DMI-1	MI	BH31	1.66E-05	<1	<1	Metal	Arsenic	C	3.7 - 7.2	7.20E+00	2/3	1.66E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
DMI-1	MI	BI29	9.69E-06	<1	<1	Metal	Arsenic	C	3.5 - 4.2	4.20E+00	4/4	9.68E-06	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
DMI-1	MI	BI30	1.53E-05	<1	<1	Metal	Arsenic	C	3.5 - 7.2	6.63E+00	8/8	1.53E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
DMI-1	MI	BI31	1.35E-05	<1	<1	Metal	Arsenic	C	2.3 - 10.5	5.71E+00	10/10	1.32E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No

TABLE 3-6: TOTAL RISK - RISK CHARACTERIZATION ANALYSIS FOR SUBSURFACE SOIL (0 TO 10 FEET BGS) BY PLANNED REUSE (CONTINUED)
Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

													Percent Contribution by Exposure Pathway to Total RME Cancer Risk					Percent Contribution by Exposure Pathway to Total RME HI				Metals	
Redevelopment Block	Planned Reuse	Grid Number	Total RME Cancer Risk	Total RME HI	RME Segregated HI	Chemicals of Concern		Basis for Chemical of Concern	Range of Detected Concentrations	RME EPC	Detection Frequency	Chemical-Specific Cancer Risk	Incidental Ingestion	Dermal Contact	Inhalation (Releases to Ambient Air)	Home-grown Produce Ingestion	Chemical-Specific HI	Incidental Ingestion	Dermal Contact	Inhalation (Releases to Ambient Air)	Home-grown Produce Ingestion	HPAL	Maximum Concentration Exceeds HPAL?
DMI-1	MI	BJ30	1.93E-05	<1	<1	Metal	Arsenic	C	3.3 - 11	7.27E+00	25/25	1.68E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
						PAH	Benzo(a)pyrene	C	0.011 - 0.51	2.65E-01	8/25	1.51E-06	36.8 %	63.2 %	0.0 %		--	--	--	--		--	--
DMI-1	MI	BJ31	2.33E-05	<1	<1	Metal	Arsenic	C	2.1 - 17	8.87E+00	19/19	2.05E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	Yes
						PAH	Benzo(a)pyrene	C	0.017 - 0.35	3.50E-01	3/28	1.99E-06	36.8 %	63.2 %	0.0 %		--	--	--	--		--	--
DMI-1	MI	BK31	2.39E-06	<1	<1	PAH	Benzo(a)pyrene	C	0.015 - 0.28	2.80E-01	3/12	1.59E-06	36.8 %	63.2 %	0.0 %		--	--	--	--		--	--
DMI-1	MI	BL24	2.10E-05	<1	<1	Metal	Arsenic	C	0.39 - 13.6	8.33E+00	19/30	1.92E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	Yes
						PAH	Benzo(a)pyrene	C	0.22 - 0.22	2.20E-01	1/27	1.25E-06	36.8 %	63.2 %	0.0 %		--	--	--	--		--	--
30B	IND	AR24	6.61E-06	<1	<1	Metal	Arsenic	C	1.6 - 3.5	2.70E+00	5/9	6.23E-06	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
30B	IND	AR25	1.45E-05	<1	<1	Metal	Arsenic	C	0.64 - 11	6.24E+00	13/23	1.44E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
30B	IND	AS24	4.04E-06	<1	<1	Metal	Arsenic	C	1.3 - 1.7	1.70E+00	2/3	3.92E-06	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
30B	IND	AT25	1.64E-05	<1	<1	Metal	Arsenic	C	1.7 - 7.1	7.10E+00	4/4	1.64E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
37	IND	AT26	1.49E-05	<1	<1	Metal	Arsenic	C	1.9 - 7.1	6.45E+00	5/6	1.49E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
37	IND	AT27	3.01E-06	<1	<1	Metal	Arsenic	C	1.3 - 1.3	1.30E+00	1/1	3.00E-06	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
37	IND	AU26	1.80E-05	<1	<1	Metal	Arsenic	C	7.8 - 7.8	7.80E+00	1/2	1.80E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
37	IND	AV26	7.41E-06	<1	<1	Metal	Arsenic	C	3.2 - 3.2	3.20E+00	1/1	7.38E-06	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
37	IND	AV28	1.60E-05	<1	<1	Metal	Arsenic	C	1 - 10.9	6.91E+00	7/8	1.59E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
38	IND	AU24	2.15E-05	<1	<1	Metal	Arsenic	C	1.3 - 9.5	9.27E+00	6/12	2.14E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
38	IND	AV25	2.40E-05	<1	<1	Metal	Arsenic	C	2.5 - 11.3	9.41E+00	7/8	2.17E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	Yes
						PAH	Benzo(a)pyrene	C	0.13 - 0.19	1.90E-01	2/7	1.08E-06	36.8 %	63.2 %	0.0 %		--	--	--	--		--	--
38	IND	AW23	1.03E-05	<1	<1	Metal	Arsenic	C	4.4 - 4.4	4.40E+00	1/1	1.01E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
38	IND	AW24	3.18E-06	<1	<1	Metal	Arsenic	C	1.3 - 1.3	1.30E+00	1/4	3.00E-06	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
38	IND	AW25	1.33E-05	<1	<1	Metal	Arsenic	C	2.4 - 5.3	5.30E+00	2/2	1.22E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
38	IND	AW26	1.23E-05	<1	<1	Metal	Arsenic	C	2.2 - 5.3	5.30E+00	3/4	1.22E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
38	IND	AX24	2.58E-06	<1	<1	Metal	Arsenic	C	0.87 - 1.1	1.10E+00	2/3	2.54E-06	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
38	IND	AX25	1.11E-05	<1	<1	Metal	Arsenic	C	1.6 - 4.8	4.80E+00	2/3	1.11E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
38	IND	AY26	3.51E-05	<1	<1	Metal	Arsenic	C	2 - 15.2	1.52E+01	4/4	3.50E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	Yes
38	IND	AY27	4.15E-06	<1	<1	Metal	Arsenic	C	1.5 - 2.2	1.79E+00	4/7	4.13E-06	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
38	IND	AZ26	9.81E-06	<1	<1	Metal	Arsenic	C	1.1 - 4.6	3.84E+00	5/6	8.85E-06	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
42	IND	AY28	1.62E-05	<1	<1	Metal	Arsenic	C	7 - 7	7.00E+00	1/2	1.61E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
42	IND	AZ27	1.11E-05	<1	<1	Metal	Arsenic	C	4.8 - 4.8	4.80E+00	1/1	1.11E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
42	IND	BA28	1.58E-05	<1	<1	Metal	Arsenic	C	1 - 6.4	6.40E+00	3/3	1.48E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
42	IND	BA29	7.62E-06	<1	<1	Metal	Arsenic	C	0.54 - 5.3	3.10E+00	11/11	7.15E-06	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
42	IND	BB28	9.27E-06	<1	<1	Metal	Arsenic	C	2.7 - 3.8	3.80E+00	2/3	8.76E-06	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
42	IND	BB29	1.71E-05	<1	<1	Metal	Arsenic	C	2.5 - 7.3	7.30E+00	3/3	1.68E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
29	E/C	AS20	2.46E-05	<1	<1	Metal	Arsenic	C	5.2 - 12.5	1.06E+01	6/7	2.44E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	Yes
29	E/C	AS22	7.34E-06	<1	<1	Metal	Arsenic	C	0.47 - 3.4	3.11E+00	6/6	7.17E-06	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
29	E/C	AS23	1.36E-05	<1	<1	Metal	Arsenic	C	0.3025 - 15	5.42E+00	34/41	1.25E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	Yes
29	E/C	AT21	7.66E-06	<1	<1	Metal	Arsenic	C	3.1 - 3.1	3.10E+00	1/7	7.15E-06	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
29	E/C	AT22	2.28E-05	<1	<1	Metal	Arsenic	C	0.46 - 9.8	9.80E+00	7/9	2.26E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
							Lead	NC	2.1 - 920	9.20E+02	8/9	--	--	--	--		--	--	--	--		800	Yes
29	E/C	AT23	1.21E-05	<1	<1	Metal	Arsenic	C	0.38 - 6.5	5.18E+00	16/25	1.1951E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No

TABLE 3-6: TOTAL RISK - RISK CHARACTERIZATION ANALYSIS FOR SUBSURFACE SOIL (0 TO 10 FEET BGS) BY PLANNED REUSE (CONTINUED)
Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

													Percent Contribution by Exposure Pathway to Total RME Cancer Risk					Percent Contribution by Exposure Pathway to Total RME HI				Metals	
Redevelopment Block	Planned Reuse	Grid Number	Total RME Cancer Risk	Total RME HI	RME Segregated HI	Chemicals of Concern		Basis for Chemical of Concern	Range of Detected Concentrations	RME EPC	Detection Frequency	Chemical-Specific Cancer Risk	Incidental Ingestion	Dermal Contact	Inhalation (Releases to Ambient Air)	Home-grown Produce Ingestion	Chemical-Specific HI	Incidental Ingestion	Dermal Contact	Inhalation (Releases to Ambient Air)	Home-grown Produce Ingestion	HPAL	Maximum Concentration Exceeds HPAL?
29	E/C	AT24	2.38E-05	<1	<1	Metal	Arsenic	C	0.47 - 14.2	9.47E+00	12/14	2.18E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	Yes
						PAH	Benzo(a)pyrene	C	0.3 - 0.3	3.00E-01	1/15	1.71E-06	36.8 %	63.2 %	0.0 %		--	--	--	--		--	--
29	E/C	AU22	1.47E-05	<1	<1	Metal	Arsenic	C	2.3 - 7.8	6.33E+00	7/13	1.46E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
29	E/C	AU23	1.24E-05	<1	<1	Metal	Arsenic	C	2 - 7.3	5.15E+00	9/10	1.19E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
29	E/C	AV22	7.63E-06	<1	<1	Metal	Arsenic	C	1.4 - 3.3	3.30E+00	4/10	7.61E-06	71.6 %	28.4 %	0.0 %		<1	--	--	--		11.1	No
30A	MU	062069	9.44E-05	6.24E+00	4.00E+00	Metal	Arsenic	C	1 - 3.6	3.60E+00	2/2	9.40E-05	56.6 %	5.4 %	0.0 %	38.0 %	<1	--	--	--	--	11.1	No
							Nickel	NC	45.6 - 1,220	1.22E+03	2/2	1.25E-07	--	--	--	--	4.00E+00	19.3 %	0.0 %	1.0 %	79.6 %	*	Yes
30A	MU	064065	2.72E-04	9.72E+00	4.62E+00	Metal	Arsenic	C	10.4 - 10.4	1.04E+01	1/1	2.72E-04	56.6 %	5.4 %	0.0 %	38.0 %	<1	--	--	--	--	11.1	No
							Manganese	NC	4,830 - 4,830	4.83E+03	1/1	--	--	--	--	--	4.47E+00	44.9 %	0.0 %	2.9 %	52.2 %	1431.18	Yes
							Nickel	NC	501 - 501	5.01E+02	1/1	5.15E-08	--	--	--	--	1.64E+00	19.3 %	0.0 %	1.0 %	79.6 %	*	Yes
30A	MU	066068	9.15E-05	7.47E+00	2.15E+00	Metal	Arsenic	C	3.5 - 3.5	3.50E+00	1/1	9.14E-05	56.6 %	5.4 %	0.0 %	38.0 %	<1	--	--	--	--	11.1	No
							Iron	NC	38,600 - 38,600	3.86E+04	1/1	--	--	--	--	--	1.76E+00	93.6 %	0.0 %	0.0 %	6.4 %	58000	No
							Manganese	NC	1,520 - 2,020	2.02E+03	2/2	--	--	--	--	--	1.87E+00	44.9 %	0.0 %	2.9 %	52.2 %	1431.18	Yes
							Vanadium	NC	94.4 - 94.4	9.44E+01	1/1	--	--	--	--	--	1.46E+00	82.9 %	0.0 %	0.0 %	17.1 %	117.17	No

Notes: All concentrations shown in mg/kg.

<1	Less than 1
--	Not applicable or chemical is not a chemical of concern for this endpoint
*	Not available; comparison to ambient levels based on regression analysis
	Not evaluated because exposure pathway is incomplete

bgs	Below ground surface
C	Cancer effect
E/C	Educational/cultural (industrial exposure scenario)
EPC	Exposure point concentration
HI	Hazard index
HPAL	Hunters Point ambient level
HPS	Hunters Point Shipyard
IND	Industrial (industrial exposure scenario)
mg/kg	Milligrams per kilogram
MI	Maritime industrial (industrial exposure scenario)
MU	Mixed use (residential exposure scenario)
NC	Noncancer effect
PAH	Polynuclear aromatic hydrocarbon
PRG	Preliminary remediation goal
OS	Open space (recreational exposure scenario)
RME	Reasonable maximum exposure

TABLE 3-7: TOTAL RISK - RISK CHARACTERIZATION ANALYSIS FOR SUBSURFACE SOIL (0 TO 10 FEET BGS), CONSTRUCTION WORKER SCENARIO
Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Redevelopment Block	Planned Reuse	Grid Number	Total RME Cancer Risk	Total RME HI	RME Segregated HI	Chemicals of Concern		Basis for Chemical of Concern	Range of Detected Concentrations	RME EPC	Detection Frequency	Chemical-Specific Cancer Risk	Chemical-Specific HI	Metals HPAL	Metals Maximum Concentration Exceeds HPAL?
DMI-1	MI	BA19	1.61E-06	1.05E+00	<1	Metal	Arsenic	C	2.6 - 2.6	2.60E+00	1/1	1.60E-06	<1	11.1	No
DMI-1	MI	BA22	5.02E-06	1.67E+00	<1	Metal	Arsenic	C	2 - 5.9	4.26E+00	11/12	2.63E-06	<1	11.1	No
						PAH	Benzo(a)pyrene	C	0.057 - 1	1.00E+00	3/12	1.55E-06	--	--	--
DMI-1	MI	BA26	6.51E-06	1.98E+00	<1	Metal	Arsenic	C	2.5 - 13.1	1.01E+01	4/5	6.23E-06	<1	11.1	Yes
DMI-1	MI	BB20	4.76E-06	1.11E+00	<1	Metal	Arsenic	C	1.5 - 9.8	7.71E+00	6/6	4.76E-06	<1	11.1	No
DMI-1	MI	BB21	4.32E-06	1.31E+00	<1	Metal	Arsenic	C	0.65 - 9.7	6.80E+00	9/9	4.19E-06	<1	11.1	No
DMI-1	MI	BB23	2.73E-06	1.29E+00	<1	Metal	Arsenic	C	2.4 - 3.9	3.90E+00	5/6	2.40E-06	<1	11.1	No
DMI-1	MI	BB25	7.67E-06	1.80E+00	<1	Metal	Arsenic	C	7.2 - 12.4	1.24E+01	3/3	7.65E-06	<1	11.1	Yes
DMI-1	MI	BB26	3.68E-06	1.60E+00	<1	Metal	Arsenic	C	0.62 - 6	5.89E+00	5/5	3.63E-06	<1	11.1	No
DMI-1	MI	BC21	2.60E-06	<1	<1	Metal	Arsenic	C	2.6 - 4.2	4.20E+00	2/3	2.59E-06	<1	11.1	No
DMI-1	MI	BC22	4.07E-06	1.04E+00	<1	Metal	Arsenic	C	4.4 - 6.6	6.60E+00	3/3	4.07E-06	<1	11.1	No
DMI-1	MI	BC24	2.96E-06	1.10E+00	<1	Metal	Arsenic	C	4.6 - 4.8	4.80E+00	2/4	2.96E-06	<1	11.1	No
DMI-1	MI	BC26	8.70E-06	2.07E+00	<1	Metal	Arsenic	C	1.6 - 25.3	1.36E+01	16/19	8.37E-06	<1	11.1	Yes
DMI-1	MI	BD25	4.38E-06	1.37E+00	<1	Metal	Arsenic	C	0.55 - 7.1	7.10E+00	4/6	4.38E-06	<1	11.1	No
DMI-1	MI	BD26	2.04E-06	1.24E+00	<1	Metal	Arsenic	C	0.5 - 3.3	3.30E+00	3/5	2.03E-06	<1	11.1	No
DMI-1	MI	BD27	2.72E-06	<1	<1	Metal	Arsenic	C	3.7 - 4.2	4.20E+00	2/2	2.59E-06	<1	11.1	No
DMI-1	MI	BD29	1.51E-05	1.69E+00	<1	Metal	Arsenic	C	8.4 - 22.3	2.23E+01	2/2	1.38E-05	<1	11.1	Yes
DMI-1	MI	BE25	6.68E-06	1.28E+00	<1	Metal	Arsenic	C	2.8 - 10.6	1.06E+01	3/3	6.54E-06	<1	11.1	No
DMI-1	MI	BE26	6.58E-06	2.53E+00	1.41E+00	Metal	Arsenic	C	2.6 - 24.8	8.93E+00	13/13	5.50E-06	<1	11.1	Yes
							Manganese	NC	99.4 - 9,270	9.27E+03	9/9	--	1.35E+00	1431.18	Yes
DMI-1	MI	BE27	3.81E-06	1.40E+00	<1	Metal	Arsenic	C	2.4 - 7.9	6.18E+00	6/6	3.81E-06	<1	11.1	No
DMI-1	MI	BE29	3.40E-06	1.34E+00	<1	Metal	Arsenic	C	5.5 - 5.5	5.50E+00	1/1	3.39E-06	<1	11.1	No
DMI-1	MI	BF20	2.42E-06	<1	<1	Metal	Arsenic	C	3.7 - 3.7	3.70E+00	1/2	2.28E-06	<1	11.1	No
DMI-1	MI	BG24	2.41E-06	<1	<1	Metal	Arsenic	C	2.1 - 3.9	3.90E+00	3/3	2.40E-06	<1	11.1	No
DMI-1	MI	BG29	2.42E-06	<1	<1	Metal	Arsenic	C	2.9 - 3.9	3.90E+00	3/3	2.40E-06	<1	11.1	No
DMI-1	MI	BG30	3.59E-06	<1	<1	Metal	Arsenic	C	2.6 - 16.6	5.66E+00	38/39	3.49E-06	<1	11.1	Yes
DMI-1	MI	BG31	5.06E-06	1.51E+00	<1	Metal	Arsenic	C	1.6 - 12	6.82E+00	29/29	4.21E-06	<1	11.1	Yes
DMI-1	MI	BH23	2.76E-06	1.06E+00	<1	Metal	Arsenic	C	3.4 - 3.4	3.40E+00	1/3	2.10E-06	<1	11.1	No
DMI-1	MI	BH24	2.78E-06	1.19E+00	<1	Metal	Arsenic	C	3.2 - 4.5	4.50E+00	3/7	2.77E-06	<1	11.1	No
DMI-1	MI	BH30	4.59E-06	1.27E+00	<1	Metal	Arsenic	C	3.1 - 13.9	6.94E+00	18/19	4.28E-06	<1	11.1	Yes
DMI-1	MI	BH31	4.44E-06	1.39E+00	<1	Metal	Arsenic	C	3.7 - 7.2	7.20E+00	2/3	4.44E-06	<1	11.1	No
DMI-1	MI	BI29	2.59E-06	<1	<1	Metal	Arsenic	C	3.5 - 4.2	4.20E+00	4/4	2.59E-06	<1	11.1	No
DMI-1	MI	BI30	4.09E-06	<1	<1	Metal	Arsenic	C	3.5 - 7.2	6.63E+00	8/8	4.09E-06	<1	11.1	No
DMI-1	MI	BI31	3.60E-06	<1	<1	Metal	Arsenic	C	2.3 - 10.5	5.71E+00	10/10	3.52E-06	<1	11.1	No

TABLE 3-7: TOTAL RISK - RISK CHARACTERIZATION ANALYSIS FOR SUBSURFACE SOIL (0 TO 10 FEET BGS), CONSTRUCTION WORKER SCENARIO (CONTINUED)
Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Redevelopment Block	Planned Reuse	Grid Number	Total RME Cancer Risk	Total RME HI	RME Segregated HI	Chemicals of Concern		Basis for Chemical of Concern	Range of Detected Concentrations	RME EPC	Detection Frequency	Chemical-Specific Cancer Risk	Chemical-Specific HI	Metals HPAL	Metals Maximum Concentration Exceeds HPAL?
DMI-1	MI	BJ30	5.17E-06	1.06E+00	<1	Metal	Arsenic	C	3.3 - 11	7.27E+00	25/25	4.48E-06	<1	11.1	No
DMI-1	MI	BJ31	6.24E-06	<1	<1	Metal	Arsenic	C	2.1 - 17	8.87E+00	19/19	5.47E-06	<1	11.1	Yes
DMI-1	MI	BL24	5.61E-06	1.14E+00	<1	Metal	Arsenic	C	0.39 - 13.6	8.33E+00	19/30	5.13E-06	<1	11.1	Yes
30B	IND	AR24	1.72E-06	1.71E+00	<1	Metal	Arsenic	C	1.6 - 3.5	2.70E+00	5/9	1.67E-06	<1	11.1	No
30B	IND	AR25	3.85E-06	1.43E+00	<1	Metal	Arsenic	C	0.64 - 11	6.24E+00	13/23	3.85E-06	<1	11.1	No
30B	IND	AS24	1.05E-06	1.03E+00	<1	Metal	Arsenic	C	1.3 - 1.7	1.70E+00	2/3	1.05E-06	<1	11.1	No
30B	IND	AT25	4.38E-06	1.17E+00	<1	Metal	Arsenic	C	1.7 - 7.1	7.10E+00	4/4	4.38E-06	<1	11.1	No
37	IND	AT26	3.98E-06	1.13E+00	<1	Metal	Arsenic	C	1.9 - 7.1	6.45E+00	5/6	3.98E-06	<1	11.1	No
37	IND	AU26	4.81E-06	1.27E+00	<1	Metal	Arsenic	C	7.8 - 7.8	7.80E+00	1/2	4.81E-06	<1	11.1	No
37	IND	AV26	1.97E-06	<1	<1	Metal	Arsenic	C	3.2 - 3.2	3.20E+00	1/1	1.97E-06	<1	11.1	No
37	IND	AV28	4.27E-06	1.44E+00	<1	Metal	Arsenic	C	1 - 10.9	6.91E+00	7/8	4.26E-06	<1	11.1	No
38	IND	AU24	5.73E-06	1.53E+00	<1	Metal	Arsenic	C	1.3 - 9.5	9.27E+00	6/12	5.72E-06	<1	11.1	No
38	IND	AV25	6.42E-06	1.86E+00	<1	Metal	Arsenic	C	2.5 - 11.3	9.41E+00	7/8	5.80E-06	<1	11.1	Yes
38	IND	AW23	2.74E-06	<1	<1	Metal	Arsenic	C	4.4 - 4.4	4.40E+00	1/1	2.71E-06	<1	11.1	No
38	IND	AW25	3.56E-06	1.08E+00	<1	Metal	Arsenic	C	2.4 - 5.3	5.30E+00	2/2	3.27E-06	<1	11.1	No
38	IND	AW26	3.27E-06	1.36E+00	<1	Metal	Arsenic	C	2.2 - 5.3	5.30E+00	3/4	3.27E-06	<1	11.1	No
38	IND	AX25	2.96E-06	1.43E+00	<1	Metal	Arsenic	C	1.6 - 4.8	4.80E+00	2/3	2.96E-06	<1	11.1	No
38	IND	AY26	9.38E-06	1.20E+00	<1	Metal	Arsenic	C	2 - 15.2	1.52E+01	4/4	9.37E-06	<1	11.1	Yes
38	IND	AY27	1.10E-06	1.34E+00	<1	Metal	Arsenic	C	1.5 - 2.2	1.79E+00	4/7	1.10E-06	<1	11.1	No
38	IND	AZ26	2.60E-06	1.47E+00	<1	Metal	Arsenic	C	1.1 - 4.6	3.84E+00	5/6	2.37E-06	<1	11.1	No
42	IND	AY28	4.32E-06	<1	<1	Metal	Arsenic	C	7 - 7	7.00E+00	1/2	4.32E-06	<1	11.1	No
42	IND	AZ27	2.97E-06	1.01E+00	<1	Metal	Arsenic	C	4.8 - 4.8	4.80E+00	1/1	2.96E-06	<1	11.1	No
42	IND	BA28	4.21E-06	1.96E+00	<1	Metal	Arsenic	C	1 - 6.4	6.40E+00	3/3	3.95E-06	<1	11.1	No
42	IND	BA29	2.00E-06	1.66E+00	<1	Metal	Arsenic	C	0.54 - 5.3	3.10E+00	11/11	1.91E-06	<1	11.1	No
42	IND	BB28	2.47E-06	1.57E+00	<1	Metal	Arsenic	C	2.7 - 3.8	3.80E+00	2/3	2.34E-06	<1	11.1	No
42	IND	BB29	4.57E-06	<1	<1	Metal	Arsenic	C	2.5 - 7.3	7.30E+00	3/3	4.50E-06	<1	11.1	No
29	E/C	AS20	6.59E-06	<1	<1	Metal	Arsenic	C	5.2 - 12.5	1.06E+01	6/7	6.53E-06	<1	11.1	Yes
29	E/C	AS22	1.92E-06	1.79E+00	<1	Metal	Arsenic	C	0.47 - 3.4	3.11E+00	6/6	1.92E-06	<1	11.1	No
29	E/C	AS23	3.58E-06	1.64E+00	<1	Metal	Arsenic	C	0.3025 - 15	5.42E+00	34/41	3.34E-06	<1	11.1	Yes
29	E/C	AT21	1.94E-06	1.24E+00	<1	Metal	Arsenic	C	3.1 - 3.1	3.10E+00	1/7	1.91E-06	<1	11.1	No
29	E/C	AT22	6.06E-06	1.32E+00	<1	Metal	Arsenic	C	0.46 - 9.8	9.80E+00	7/9	6.04E-06	<1	11.1	No
							Lead	NC	2.1 - 920	9.20E+02	8/9	--	--	800	Yes
29	E/C	AT23	3.20E-06	1.48E+00	<1	Metal	Arsenic	C	0.38 - 6.5	5.18E+00	16/25	3.20E-06	<1	11.1	No
29	E/C	AT24	6.33E-06	1.77E+00	<1	Metal	Arsenic	C	0.47 - 14.2	9.47E+00	12/14	5.84E-06	<1	11.1	Yes

TABLE 3-7: TOTAL RISK - RISK CHARACTERIZATION ANALYSIS FOR SUBSURFACE SOIL (0 TO 10 FEET BGS), CONSTRUCTION WORKER SCENARIO (CONTINUED)
Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Redevelopment Block	Planned Reuse	Grid Number	Total RME Cancer Risk	Total RME HI	RME Segregated HI	Chemicals of Concern		Basis for Chemical of Concern	Range of Detected Concentrations	RME EPC	Detection Frequency	Chemical-Specific Cancer Risk	Chemical-Specific HI	Metals	
														HPAL	Maximum Concentration Exceeds HPAL?
29	E/C	AU22	3.91E-06	1.37E+00	<1	Metal	Arsenic	C	2.3 - 7.8	6.33E+00	7/13	3.90E-06	<1	11.1	No
29	E/C	AU23	3.30E-06	1.29E+00	<1	Metal	Arsenic	C	2 - 7.3	5.15E+00	9/10	3.17E-06	<1	11.1	No
29	E/C	AV22	2.04E-06	1.43E+00	<1	Metal	Arsenic	C	1.4 - 3.3	3.30E+00	4/10	2.03E-06	<1	11.1	No
DOS-1	OS	AT19	5.39E-06	1.37E+00	<1	Metal	Arsenic	C	1.4 - 8.7	8.70E+00	4/8	5.36E-06	<1	11.1	No
DOS-1	OS	AT20	4.18E-06	1.49E+00	<1	Metal	Arsenic	C	0.68 - 10.7	5.77E+00	12/18	3.56E-06	<1	11.1	No
DOS-1	OS	AU19	2.78E-06	1.34E+00	<1	Metal	Arsenic	C	2.5 - 6.7	4.39E+00	5/8	2.71E-06	<1	11.1	No
DOS-1	OS	AU20	4.58E-06	1.71E+00	<1	Metal	Arsenic	C	0.55 - 24	7.32E+00	20/24	4.51E-06	<1	11.1	Yes
DOS-1	OS	AV19	1.23E-06	<1	<1	Metal	Arsenic	C	2 - 2	2.00E+00	1/1	1.23E-06	<1	11.1	No
DOS-1	OS	AV20	4.29E-06	1.46E+00	<1	Metal	Arsenic	C	2.3 - 6.1	5.33E+00	5/5	3.29E-06	<1	11.1	No
DOS-1	OS	AV21	1.92E-06	1.49E+00	<1	Metal	Arsenic	C	1.5 - 3.5	3.12E+00	5/5	1.92E-06	<1	11.1	No
DOS-1	OS	AW20	2.33E-06	1.32E+00	<1	Metal	Arsenic	C	0.85 - 3.7	2.55E+00	7/8	1.57E-06	<1	11.1	No
DOS-1	OS	AW21	3.32E-06	1.42E+00	<1	Metal	Arsenic	C	0.33 - 6.3	5.38E+00	13/16	3.32E-06	<1	11.1	No
39	OS	AX21	1.18E-06	1.30E+00	<1	Metal	Arsenic	C	0.34 - 4.1	1.91E+00	8/14	1.18E-06	<1	11.1	No
39	OS	AY23	4.59E-06	1.36E+00	<1	Metal	Arsenic	C	0.45 - 47.2	7.32E+00	13/20	4.51E-06	<1	11.1	Yes
39	OS	AZ24	1.86E-06	1.88E+00	<1	Metal	Arsenic	C	0.72 - 3	3.00E+00	2/5	1.85E-06	<1	11.1	No
39	OS	AZ25	3.52E-06	1.12E+00	<1	Metal	Arsenic	C	0.48 - 8.6	5.59E+00	8/17	3.45E-06	<1	11.1	No
39	OS	BA23	3.76E-06	1.26E+00	<1	Metal	Arsenic	C	1.2 - 6.1	6.10E+00	5/8	3.76E-06	<1	11.1	No
39	OS	BA24	2.35E-06	1.61E+00	<1	Metal	Arsenic	C	0.66 - 3.8	3.80E+00	3/3	2.34E-06	<1	11.1	No
39	OS	BA25	1.34E-06	1.29E+00	<1	Metal	Arsenic	C	0.77 - 4.4	2.14E+00	10/11	1.32E-06	<1	11.1	No
30A	MU	AQ23	6.42E-06	1.06E+00	<1	Metal	Arsenic	C	10.4 - 10.4	1.04E+01	1/1	6.41E-06	<1	11.1	No
30A	MU	AQ24	2.23E-06	<1	<1	Metal	Arsenic	C	1 - 3.6	3.60E+00	2/2	2.22E-06	<1	11.1	No

Notes: All concentrations shown in mg/kg.

<1 Less than 1
-- Not applicable or chemical is not a chemical of concern for this endpoint

bgs Below ground surface
C Cancer effect
E/C Educational/cultural (industrial exposure scenario)
EPC Exposure point concentration
HI Hazard index
HPAL Hunters Point ambient level
IND Industrial (industrial exposure scenario)
mg/kg Milligrams per kilogram
MI Maritime industrial (industrial exposure scenario)
MU Mixed use (residential exposure scenario)
NC Noncancer effect
PAH Polynuclear aromatic hydrocarbon
OS Open space (recreational exposure scenario)
RME Reasonable maximum exposure

TABLE 3-8: INCREMENTAL RISK - SUMMARY OF CANCER RISKS AND HAZARD INDICES BY PLANNED REUSE, SURFACE SOIL (0 TO 2 FEET BGS)

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Redevelopment Block	Planned Reuse	Grid Number	RME Cancer Risk	RME HI	RME Segregated HI
DMI-1	MI	AX20	4E-09	<1	<1
DMI-1	MI	BA19	4E-09	<1	<1
DMI-1	MI	BA20	--	<1	<1
DMI-1	MI	BA21	6E-07	<1	<1
DMI-1	MI	BA22	**9E-06**	<1	<1
DMI-1	MI	BA26	**3E-05**	<1	<1
DMI-1	MI	BB20	--	<1	<1
DMI-1	MI	BB21	5E-07	<1	<1
DMI-1	MI	BB22	2E-08	<1	<1
DMI-1	MI	BB23	--	<1	<1
DMI-1	MI	BB25	**3E-05**	<1	<1
DMI-1	MI	BB26	2E-07	<1	<1
DMI-1	MI	BC21	--	<1	<1
DMI-1	MI	BC26	1E-06	<1	<1
DMI-1	MI	BC27	--	<1	<1
DMI-1	MI	BD25	4E-10	<1	<1
DMI-1	MI	BD26	--	<1	<1
DMI-1	MI	BD27	5E-07	<1	<1
DMI-1	MI	BD29	4E-10	<1	<1
DMI-1	MI	BE25	5E-07	<1	<1
DMI-1	MI	BE26	**4E-06**	<1	<1
DMI-1	MI	BE27	--	<1	<1
DMI-1	MI	BF20	2E-07	<1	<1
DMI-1	MI	BF23	3E-08	<1	<1
DMI-1	MI	BG29	5E-08	<1	<1
DMI-1	MI	BG30	5E-07	<1	<1
DMI-1	MI	BG31	**5E-06**	<1	<1
DMI-1	MI	BH30	**3E-05**	<1	<1
DMI-1	MI	BH31	3E-09	<1	<1
DMI-1	MI	BI29	--	<1	<1
DMI-1	MI	BI30	--	<1	<1
DMI-1	MI	BI31	--	<1	<1
DMI-1	MI	BJ30	**3E-06**	<1	<1
DMI-1	MI	BJ31	**3E-05**	<1	<1
DMI-1	MI	BL24	**3E-05**	<1	<1
30B	IND	AR24	3E-08	<1	<1
30B	IND	AR25	1E-08	<1	<1
30B	IND	AS24	--	<1	<1
30B	IND	AS25	--	<1	<1
30B	IND	AT25	--	<1	<1
37	IND	AT26	--	<1	<1
37	IND	AT27	2E-09	<1	<1
37	IND	AU26	--	<1	<1
37	IND	AV28	--	<1	<1
38	IND	AU24	1E-08	<1	<1
38	IND	AV25	1E-06	<1	<1
38	IND	AW23	1E-07	<1	<1
38	IND	AW24	--	<1	<1
38	IND	AW25	4E-09	<1	<1
38	IND	AX27	--	<1	<1
38	IND	AY27	--	<1	<1
38	IND	AZ26	1E-07	<1	<1
42	IND	AY28	--	<1	<1

TABLE 3-8: INCREMENTAL RISK - SUMMARY OF CANCER RISKS AND HAZARD INDICES BY PLANNED REUSE, SURFACE SOIL (0 TO 2 FEET BGS) (CONTINUED)

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Redevelopment Block	Planned Reuse	Grid Number	RME Cancer Risk	RME HI	RME Segregated HI
42	IND	BA28	1E-06	<1	<1
42	IND	BA29	6E-07	<1	<1
42	IND	BB28	5E-07	<1	<1
42	IND	BB29	3E-07	<1	<1
29	E/C	AS20	**2E-05**	<1	<1
29	E/C	AS22	2E-08	<1	<1
29	E/C	AS23	**3E-05**	<1	<1
29	E/C	AT21	4E-07	<1	<1
29	E/C	AT22	2E-08	<1	<1
29	E/C	AT23	1E-08	<1	<1
29	E/C	AT24	**3E-05**	<1	<1
29	E/C	AU22	7E-08	<1	<1
29	E/C	AU23	6E-08	<1	<1
29	E/C	AV22	--	<1	<1
DOS-1	OS	AT19	--	<1	<1
DOS-1	OS	AT20	**3E-06**	<1	<1
DOS-1	OS	AU19	1E-08	<1	<1
DOS-1	OS	AU20	2E-08	<1	<1
DOS-1	OS	AU21	--	<1	<1
DOS-1	OS	AV20	**4E-06**	<1	<1
DOS-1	OS	AV21	--	<1	<1
DOS-1	OS	AW20	**4E-06**	<1	<1
DOS-1	OS	AW21	--	<1	<1
39	OS	AW22	--	<1	<1
39	OS	AX21	5E-10	<1	<1
39	OS	AX23	--	<1	<1
39	OS	AY23	**1E-04**	<1	<1
39	OS	AY24	3E-08	<1	<1
39	OS	AZ24	--	<1	<1
39	OS	AZ25	3E-07	<1	<1
39	OS	BA23	1E-09	<1	<1
39	OS	BA24	4E-10	<1	<1
39	OS	BA25	7E-08	<1	<1
30A	MU	066068	--	3E+00	**3E+00**

Notes: Values shown in boldface exceed the threshold level of 1E-06 for cancer risks and 1.0 for segregated noncancer hazards.

<1 Less than 1
-- Not applicable
bgs Below ground surface
E/C Educational/cultural (industrial exposure scenario)
HI Hazard index
IND Industrial (industrial exposure scenario)
MI Maritime industrial (industrial exposure scenario)
MU Mixed use (residential exposure scenario)
OS Open space (recreational exposure scenario)
RME Reasonable maximum exposure

TABLE 3-9: INCREMENTAL RISK - SUMMARY OF CANCER RISKS AND HAZARD INDICES BY PLANNED REUSE, SUBSURFACE SOIL (0 TO 10 FEET BGS)

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Redevelopment Block	Planned Reuse	Grid Number	RME Cancer Risk	RME HI	RME Segregated HI
DMI-1	MI	AX20	4E-09	<1	<1
DMI-1	MI	BA19	4E-09	<1	<1
DMI-1	MI	BA20	--	<1	<1
DMI-1	MI	BA21	6E-07	<1	<1
DMI-1	MI	BA22	**9E-06**	<1	<1
DMI-1	MI	BA26	**2E-05**	<1	<1
DMI-1	MI	BB20	9E-09	<1	<1
DMI-1	MI	BB21	5E-07	<1	<1
DMI-1	MI	BB22	4E-08	<1	<1
DMI-1	MI	BB23	1E-06	<1	<1
DMI-1	MI	BB25	**3E-05**	<1	<1
DMI-1	MI	BB26	2E-07	<1	<1
DMI-1	MI	BC21	4E-08	<1	<1
DMI-1	MI	BC22	--	<1	<1
DMI-1	MI	BC24	--	<1	<1
DMI-1	MI	BC26	**3E-05**	<1	<1
DMI-1	MI	BC27	--	<1	<1
DMI-1	MI	BD25	4E-10	<1	<1
DMI-1	MI	BD26	--	<1	<1
DMI-1	MI	BD27	5E-07	<1	<1
DMI-1	MI	BD29	**6E-05**	<1	<1
DMI-1	MI	BE25	5E-07	<1	<1
DMI-1	MI	BE26	**2E-05**	<1	<1
DMI-1	MI	BE27	--	<1	<1
DMI-1	MI	BE29	3E-08	<1	<1
DMI-1	MI	BF20	5E-07	<1	<1
DMI-1	MI	BF23	3E-08	<1	<1
DMI-1	MI	BG24	--	<1	<1
DMI-1	MI	BG29	7E-08	<1	<1
DMI-1	MI	BG30	**1E-05**	<1	<1
DMI-1	MI	BG31	**2E-05**	<1	<1
DMI-1	MI	BH23	**2E-06**	<1	<1
DMI-1	MI	BH24	--	<1	<1
DMI-1	MI	BH30	**2E-05**	<1	<1
DMI-1	MI	BH31	3E-09	<1	<1
DMI-1	MI	BI29	--	<1	<1
DMI-1	MI	BI30	2E-10	<1	<1
DMI-1	MI	BI31	3E-07	<1	<1
DMI-1	MI	BJ30	**3E-06**	<1	<1
DMI-1	MI	BJ31	**2E-05**	<1	<1
DMI-1	MI	BJ32	4E-07	<1	<1
DMI-1	MI	BK31	**2E-06**	<1	<1
DMI-1	MI	BK32	3E-07	<1	<1
DMI-1	MI	BL24	**2E-05**	<1	<1
30B	IND	AR24	2E-07	<1	<1
30B	IND	AR25	1E-08	<1	<1
30B	IND	AS24	--	<1	<1
30B	IND	AS25	--	<1	<1
30B	IND	AT25	3E-08	<1	<1
37	IND	AT26	--	<1	<1
37	IND	AT27	2E-09	<1	<1

TABLE 3-9: INCREMENTAL RISK - SUMMARY OF CANCER RISKS AND HAZARD INDICES BY PLANNED REUSE, SUBSURFACE SOIL (0 TO 10 FEET BGS) (CONTINUED)

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Redevelopment Block	Planned Reuse	Grid Number	RME Cancer Risk	RME HI	RME Segregated HI
37	IND	AU26	--	<1	<1
37	IND	AV26	--	<1	<1
37	IND	AV28	4E-08	<1	<1
38	IND	AU24	5E-08	<1	<1
38	IND	AV25	**2E-05**	<1	<1
38	IND	AW23	1E-07	<1	<1
38	IND	AW24	7E-08	<1	<1
38	IND	AW25	1E-06	<1	<1
38	IND	AW26	3E-10	<1	<1
38	IND	AX24	5E-09	<1	<1
38	IND	AX25	--	<1	<1
38	IND	AX27	--	<1	<1
38	IND	AY26	**4E-05**	<1	<1
38	IND	AY27	--	<1	<1
38	IND	AZ26	9E-07	<1	<1
42	IND	AY28	--	<1	<1
42	IND	AZ27	5E-08	<1	<1
42	IND	AZ28	2E-10	<1	<1
42	IND	BA28	1E-06	<1	<1
42	IND	BA29	3E-07	<1	<1
42	IND	BB28	5E-07	<1	<1
42	IND	BB29	3E-07	<1	<1
29	E/C	AS20	**2E-05**	<1	<1
29	E/C	AS22	6E-08	<1	<1
29	E/C	AS23	**1E-05**	<1	<1
29	E/C	AT21	4E-07	<1	<1
29	E/C	AT22	6E-08	<1	<1
29	E/C	AT23	1E-07	<1	<1
29	E/C	AT24	**2E-05**	<1	<1
29	E/C	AU22	7E-08	<1	<1
29	E/C	AU23	5E-07	<1	<1
29	E/C	AV22	2E-10	<1	<1
30A	MU	062069	2E-07	<1	<1
30A	MU	064065	1E-07	6E+00	**6E+00**
30A	MU	066068	--	3E+00	**3E+00**

Notes: Values shown in boldface exceed the threshold level of 1E-06 for cancer risks and 1.0 for segregated noncancer hazards.

<1 Less than 1
-- Not applicable
bgs Below ground surface
E/C Educational/cultural (industrial exposure scenario)
HI Hazard index
IND Industrial (industrial exposure scenario)
MI Maritime industrial (industrial exposure scenario)
MU Mixed use (residential exposure scenario)
RME Reasonable maximum exposure

TABLE 3-10: INCREMENTAL RISK - SUMMARY OF CANCER RISKS AND HAZARD INDICES BY PLANNED REUSE, SURFACE SOIL (0 TO 10 FEET BGS), CONSTRUCTION WORKER SCENARIO

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Redevelopment Block	Planned Reuse	Grid Number	RME Cancer Risk	RME HI	RME Segregated HI
DMI-1	MI	AX20	5E-10	<1	<1
DMI-1	MI	BA19	4E-10	<1	<1
DMI-1	MI	BA20	--	<1	<1
DMI-1	MI	BA21	7E-08	<1	<1
DMI-1	MI	BA22	1E-06	<1	<1
DMI-1	MI	BA26	**5E-06**	2E+00	<1
DMI-1	MI	BB20	3E-10	<1	<1
DMI-1	MI	BB21	6E-08	<1	<1
DMI-1	MI	BB22	2E-09	<1	<1
DMI-1	MI	BB23	1E-07	<1	<1
DMI-1	MI	BB25	**6E-06**	2E+00	<1
DMI-1	MI	BB26	2E-08	<1	<1
DMI-1	MI	BB29	3E-08	<1	<1
DMI-1	MI	BC21	5E-09	<1	<1
DMI-1	MI	BC22	--	<1	<1
DMI-1	MI	BC24	--	<1	<1
DMI-1	MI	BC26	**6E-06**	<1	<1
DMI-1	MI	BC27	--	<1	<1
DMI-1	MI	BD25	2E-11	<1	<1
DMI-1	MI	BD26	--	<1	<1
DMI-1	MI	BD27	6E-08	<1	<1
DMI-1	MI	BD29	**1E-05**	<1	<1
DMI-1	MI	BE25	6E-08	<1	<1
DMI-1	MI	BE26	**5E-06**	2E+00	<1
DMI-1	MI	BE27	--	<1	<1
DMI-1	MI	BE29	3E-09	<1	<1
DMI-1	MI	BF20	6E-08	<1	<1
DMI-1	MI	BF23	4E-09	<1	<1
DMI-1	MI	BG24	--	<1	<1
DMI-1	MI	BG29	7E-09	<1	<1
DMI-1	MI	BG30	**3E-06**	<1	<1
DMI-1	MI	BG31	**3E-06**	<1	<1
DMI-1	MI	BH23	3E-07	<1	<1
DMI-1	MI	BH24	--	<1	<1
DMI-1	MI	BH30	**3E-06**	<1	<1
DMI-1	MI	BH31	4E-10	<1	<1
DMI-1	MI	BI29	--	<1	<1
DMI-1	MI	BI30	3E-11	<1	<1
DMI-1	MI	BI31	3E-08	<1	<1
DMI-1	MI	BJ30	3E-07	<1	<1
DMI-1	MI	BJ31	**4E-06**	<1	<1
DMI-1	MI	BJ32	4E-08	<1	<1
DMI-1	MI	BK31	3E-07	<1	<1
DMI-1	MI	BK32	4E-08	<1	<1
DMI-1	MI	BL24	**4E-06**	<1	<1
30B	IND	AR24	2E-08	<1	<1
30B	IND	AR25	2E-09	<1	<1
30B	IND	AS24	--	<1	<1
30B	IND	AS25	--	<1	<1
30B	IND	AT25	2E-09	<1	<1
37	IND	AT26	--	<1	<1

TABLE 3-10: INCREMENTAL RISK - SUMMARY OF CANCER RISKS AND HAZARD INDICES BY PLANNED REUSE, SURFACE SOIL (0 TO 10 FEET BGS), CONSTRUCTION WORKER SCENARIO (CONTINUED)

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Redevelopment Block	Planned Reuse	Grid Number	RME Cancer Risk	RME HI	RME Segregated HI
37	IND	AT27	7E-11	<1	<1
37	IND	AU26	--	<1	<1
37	IND	AV26	--	<1	<1
37	IND	AV28	2E-09	<1	<1
38	IND	AU24	4E-09	<1	<1
38	IND	AV25	**5E-06**	<1	<1
38	IND	AW23	1E-08	<1	<1
38	IND	AW24	3E-09	<1	<1
38	IND	AW25	1E-07	<1	<1
38	IND	AW26	1E-11	<1	<1
38	IND	AX24	2E-10	<1	<1
38	IND	AX25	--	<1	<1
38	IND	AX27	--	<1	<1
38	IND	AY26	**7E-06**	<1	<1
38	IND	AY27	--	<1	<1
38	IND	AZ26	1E-07	<1	<1
42	IND	AY28	--	<1	<1
42	IND	AZ27	6E-09	<1	<1
42	IND	AZ28	7E-12	<1	<1
42	IND	BA28	1E-07	<1	<1
42	IND	BA29	4E-08	<1	<1
42	IND	BB28	5E-08	<1	<1
29	E/C	AS20	**5E-06**	<1	<1
29	E/C	AS22	2E-09	<1	<1
29	E/C	AS23	**3E-06**	<1	<1
29	E/C	AT21	2E-08	<1	<1
29	E/C	AT22	6E-09	<1	<1
29	E/C	AT23	4E-09	<1	<1
29	E/C	AT24	**5E-06**	<1	<1
29	E/C	AU22	6E-09	<1	<1
29	E/C	AU23	5E-08	<1	<1
DOS-1	OS	AT19	2E-08	<1	<1
DOS-1	OS	AT20	3E-07	<1	<1
DOS-1	OS	AU19	4E-08	<1	<1
DOS-1	OS	AU20	**3E-06**	2E+00	<1
DOS-1	OS	AU21	--	<1	<1
DOS-1	OS	AV19	7E-11	<1	<1
DOS-1	OS	AV20	4E-07	<1	<1
DOS-1	OS	AV21	5E-11	<1	<1
DOS-1	OS	AV22	7E-12	<1	<1
DOS-1	OS	AW20	3E-07	<1	<1
DOS-1	OS	AW21	5E-10	<1	<1
39	OS	AW22	--	<1	<1
39	OS	AX21	2E-09	<1	<1
39	OS	AX22	1E-10	<1	<1
39	OS	AX23	--	<1	<1
39	OS	AY23	**3E-06**	<1	<1
39	OS	AY24	2E-09	<1	<1
39	OS	AZ22	1E-10	<1	<1
39	OS	AZ24	5E-09	<1	<1
39	OS	AZ25	3E-08	<1	<1

TABLE 3-10: INCREMENTAL RISK - SUMMARY OF CANCER RISKS AND HAZARD INDICES BY PLANNED REUSE, SURFACE SOIL (0 TO 10 FEET BGS), CONSTRUCTION WORKER SCENARIO (CONTINUED)

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Redevelopment Block	Planned Reuse	Grid Number	RME Cancer Risk	RME HI	RME Segregated HI
39	OS	BA23	6E-10	<1	<1
39	OS	BA24	2E-09	<1	<1
39	OS	BA25	6E-09	<1	<1
30A	MU	AQ23	2E-09	<1	<1
30A	MU	AQ24	4E-09	<1	<1

Notes: Values shown in boldface exceed the threshold level of 1E-06 for cancer risks and 1.0 for segregated noncancer hazards.

<1 Less than 1
-- Not applicable
bgs Below ground surface
E/C Educational/cultural (industrial exposure scenario)
HI Hazard index
IND Industrial (industrial exposure scenario)
MI Maritime industrial (industrial exposure scenario)
MU Mixed use (residential exposure scenario)
RME Reasonable maximum exposure

TABLE 3-11: INCREMENTAL RISK - RISK CHARACTERIZATION ANALYSIS FOR SURFACE SOIL (0 TO 2 FEET BGS) BY PLANNED REUSE

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Redevelopment Block	Planned Reuse	Grid Number	Total RME Cancer Risk	Total RME HI	RME Segregated HI	Chemicals of Concern		Basis for Chemical of Conern	Range of Detected Concentrations	RME EPC	Detection Frequency	Chemical-Specific Cancer Risk	Percent Contribution by Exposure Pathway to Total RME Cancer Risk: Incidental Ingestion	Dermal Contact	Inhalation (Releases to Ambient Air)	Home-grown Produce Ingestion	Chemical-specific HI	Percent Contribution by Exposure Pathway to Total RME HI: Incidental Ingestion	Dermal Contact	Inhalation (Releases to Ambient Air)	Home-grown Produce Ingestion
DMI-1	MI	BA22	8.80E-06	<1	<1	PAH	Benzo(a)pyrene	C	0.057 - 1	1.00E+00	3/5	5.70E-06	36.8 %	63.2 %	0.0 %		--	--	--	--	
							Benzo(b)fluoranthene	C	0.094 - 2.2	2.20E+00	3/5	1.25E-06	36.8 %	63.2 %	0.0 %		--	--	--	--	
DMI-1	MI	BA26	3.13E-05	<1	<1	Metal	Arsenic	C	4.9 - 13.1	1.31E+01	3/3	3.02E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--	
DMI-1	MI	BB25	2.87E-05	<1	<1	Metal	Arsenic	C	7.9 - 12.4	1.24E+01	2/2	2.86E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--	
DMI-1	MI	BE26	3.80E-06	<1	<1	PAH	Benzo(a)pyrene	C	0.47 - 0.47	4.70E-01	1/3	2.68E-06	36.8 %	63.2 %	0.0 %		--	--	--	--	
DMI-1	MI	BG31	5.26E-06	<1	<1	PAH	Benzo(a)pyrene	C	0.88 - 0.88	8.80E-01	1/11	5.01E-06	36.8 %	63.2 %	0.0 %		--	--	--	--	
DMI-1	MI	BH30	3.32E-05	<1	<1	Metal	Arsenic	C	4 - 13.9	1.39E+01	4/4	3.21E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--	
DMI-1	MI	BJ30	3.01E-06	<1	<1	PAH	Benzo(a)pyrene	C	0.011 - 0.51	2.82E-01	8/14	1.60E-06	36.8 %	63.2 %	0.0 %		--	--	--	--	
DMI-1	MI	BJ31	3.17E-05	<1	<1	Metal	Arsenic	C	4.3 - 17	1.25E+01	8/8	2.88E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--	
							Benzo(a)pyrene	C	0.017 - 0.35	3.50E-01	3/8	1.99E-06	36.8 %	63.2 %	0.0 %		--	--	--	--	
DMI-1	MI	BL24	2.54E-05	<1	<1	Metal	Arsenic	C	1.9 - 13.6	1.02E+01	9/9	2.35E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--	
							Benzo(a)pyrene	C	0.22 - 0.22	2.20E-01	1/7	1.25E-06	36.8 %	63.2 %	0.0 %		--	--	--	--	
29	E/C	AS20	2.47E-05	<1	<1	Metal	Arsenic	C	5.2 - 12.5	1.06E+01	5/6	2.44E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--	
29	E/C	AS23	3.17E-05	<1	<1	Metal	Arsenic	C	0.4 - 15	1.34E+01	13/15	3.08E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--	
29	E/C	AT22	7.19E-02	<1	<1	Metal	Lead	NC	7.7 - 920	9.20E+02	3/3	--	--	--	--		--	--	--	--	
29	E/C	AT24	3.14E-05	<1	<1	Metal	Arsenic	C	1.9 - 14.2	1.28E+01	4/4	2.96E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--	
						PAH	Benzo(a)pyrene	C	0.3 - 0.3	3.00E-01	1/5	1.71E-06	36.8 %	63.2 %	0.0 %		--	--	--	--	
DOS-1	OS	AT20	3.14E-06	<1	<1	PAH	Benzo(a)pyrene	C	0.021 - 0.24	2.40E-01	3/15	1.84E-06	28 %	71.9 %	0.0 %		--	--	--	--	
DOS-1	OS	AV20	4.21E-06	<1	<1	PAH	Benzo(a)pyrene	C	0.49 - 0.49	4.90E-01	1/1	3.75E-06	28 %	71.9 %	0.0 %		--	--	--	--	
DOS-1	OS	AW20	3.75E-06	<1	<1	PAH	Benzo(a)pyrene	C	0.27 - 0.27	2.70E-01	1/3	2.07E-06	28 %	71.9 %	0.0 %		--	--	--	--	
39	OS	AY23	1.27E-04	<1	<1	Metal	Arsenic	C	0.45 - 47.2	4.72E+01	3/5	1.27E-04	62.8 %	37.2 %	0.0 %		<1	--	--	--	
30A	MU	066068	--	2.67E+00	2.67E+00	Metal	Manganese	NC	1,520 - 2,020	2.02E+03	2/2	--	--	--	--	--	2.40E+00	44.9 %	0.0 %	2.9 %	52.2 %

Notes: All concentrations shown in mg/kg.

<1 Less than 1
-- Not applicable or chemical is not a chemical of concern for this endpoint
Not evaluated because exposure pathway is incomplete

bgs Below ground surface
C Cancer effect
E/C Educational/cultural (industrial exposure scenario)
EPC Exposure point concentration
HI Hazard index
HPAL Hunters Point ambient level
MI Maritime industrial (industrial exposure scenario)
MU Mixed use (residential exposure scenario)
OS Open space (recreational exposure scenario)
RME Reasonable maximum exposure

TABLE 3-12: INCREMENTAL RISK - RISK CHARACTERIZATION ANALYSIS FOR SUBSURFACE SOIL (0 TO 10 FEET BGS) BY PLANNED REUSE
Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Redevelopment Block	Planned Reuse	Grid Number	Total RME Cancer Risk	Total RME HI	RME Segregated HI	Chemicals of Concern		Basis for Chemical of Concern	Range of Detected Concentrations	RME EPC	Detection Frequency	Chemical-Specific Cancer Risk	Percent Contribution by Exposure Pathway to Total RME Cancer Risk: Incidental Ingestion	Dermal Contact	Inhalation (Releases to Ambient Air)	Home-grown Produce Ingestion	Chemical-specific HI	Percent Contribution by Exposure Pathway to Total RME HI: Incidental Ingestion	Dermal Contact	Inhalation (Releases to Ambient Air)	Home-grown Produce Ingestion
DMI-1	MI	BA22	8.82E-06	<1	<1	PAH	Benzo(a)pyrene	C	0.057 - 1	1.00E+00	3/12	5.70E-06	36.8 %	63.2 %	0.0 %		--	--	--	--	
							Benzo(b)fluoranthene	C	0.094 - 2.2	2.20E+00	3/12	1.25E-06	36.8 %	63.2 %	0.0 %		--	--	--	--	
DMI-1	MI	BA26	2.43E-05	<1	<1	Metal	Arsenic	C	2.5 - 13.1	1.01E+01	4/5	2.33E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--	
DMI-1	MI	BB25	2.87E-05	<1	<1	Metal	Arsenic	C	7.2 - 12.4	1.24E+01	3/3	2.86E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--	
DMI-1	MI	BC26	3.27E-05	<1	<1	Metal	Arsenic	C	1.6 - 25.3	1.36E+01	16/19	3.13E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--	
DMI-1	MI	BD29	5.67E-05	<1	<1	Metal	Arsenic	C	8.4 - 22.3	2.23E+01	2/2	5.14E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--	
						PAH	Benzo(a)pyrene	C	0.57 - 0.57	5.70E-01	1/1	3.25E-06	36.8 %	63.2 %	0.0 %		--	--	--	--	
DMI-1	MI	BE26	2.45E-05	<1	<1	Metal	Arsenic	C	2.6 - 24.8	8.93E+00	13/13	2.06E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--	
						PAH	Benzo(a)pyrene	C	0.47 - 0.47	4.70E-01	1/6	2.68E-06	36.8 %	63.2 %	0.0 %		--	--	--	--	
DMI-1	MI	BG30	1.36E-05	<1	<1	Metal	Arsenic	C	2.6 - 16.6	5.66E+00	38/39	1.31E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--	
DMI-1	MI	BG31	1.89E-05	<1	<1	Metal	Arsenic	C	1.6 - 12	6.82E+00	29/29	1.57E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--	
						PAH	Benzo(a)pyrene	C	0.017 - 0.88	4.33E-01	7/31	2.46E-06	36.8 %	63.2 %	0.0 %		--	--	--	--	
DMI-1	MI	BH23	2.45E-06	<1	<1	PAH	Benzo(a)pyrene	C	0.32 - 0.32	3.20E-01	1/3	1.82E-06	36.8 %	63.2 %	0.0 %		--	--	--	--	
DMI-1	MI	BH30	1.71E-05	<1	<1	Metal	Arsenic	C	3.1 - 13.9	6.94E+00	18/19	1.60E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--	
DMI-1	MI	BJ30	2.51E-06	<1	<1	PAH	Benzo(a)pyrene	C	0.011 - 0.51	2.65E-01	8/25	1.51E-06	36.8 %	63.2 %	0.0 %		--	--	--	--	
DMI-1	MI	BJ31	2.33E-05	<1	<1	Metal	Arsenic	C	2.1 - 17	8.87E+00	19/19	2.05E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--	
						PAH	Benzo(a)pyrene	C	0.017 - 0.35	3.50E-01	3/28	1.99E-06	36.8 %	63.2 %	0.0 %		--	--	--	--	
DMI-1	MI	BK31	2.39E-06	<1	<1	PAH	Benzo(a)pyrene	C	0.015 - 0.28	2.80E-01	3/12	1.59E-06	36.8 %	63.2 %	0.0 %		--	--	--	--	
DMI-1	MI	BL24	2.10E-05	<1	<1	Metal	Arsenic	C	0.39 - 13.6	8.33E+00	19/30	1.92E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--	
						PAH	Benzo(a)pyrene	C	0.22 - 0.22	2.20E-01	1/27	1.25E-06	36.8 %	63.2 %	0.0 %		--	--	--	--	
38	IND	AV25	2.40E-05	<1	<1	Metal	Arsenic	C	2.5 - 11.3	9.41E+00	7/8	2.17E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--	
						PAH	Benzo(a)pyrene	C	0.13 - 0.19	1.90E-01	2/7	1.08E-06	36.8 %	63.2 %	0.0 %		--	--	--	--	
38	IND	AY26	3.51E-05	<1	<1	Metal	Arsenic	C	2 - 15.2	1.52E+01	4/4	3.50E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--	
29	E/C	AS20	2.46E-05	<1	<1	Metal	Arsenic	C	5.2 - 12.5	1.06E+01	6/7	2.44E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--	
29	E/C	AS23	1.36E-05	<1	<1	Metal	Arsenic	C	0.3025 - 15	5.42E+00	34/41	1.25E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--	
29	E/C	AT22	5.19E-02	<1	<1	Metal	Lead	NC	2.1 - 920	9.20E+02	8/9	--	--	--	--		--	--	--	--	
29	E/C	AT24	2.37E-05	<1	<1	Metal	Arsenic	C	0.47 - 14.2	9.47E+00	12/14	2.18E-05	71.6 %	28.4 %	0.0 %		<1	--	--	--	
						PAH	Benzo(a)pyrene	C	0.3 - 0.3	3.00E-01	1/15	1.71E-06	36.8 %	63.2 %	0.0 %		--	--	--	--	
30A	MU	064065	1.28E-07	6.07E+00	5.88E+00	Metal	Manganese	NC	4,830 - 4,830	4.83E+03	1/1	--	--	--	--	--	5.73E+00	44.9 %	0.0 %	2.9 %	52.2 %
30A	MU	066068	--	2.67E+00	2.67E+00	Metal	Manganese	NC	1,520 - 2,020	2.02E+03	2/2	--	--	--	--	--	2.40E+00	44.9 %	0.0 %	2.9 %	52.2 %

Notes: All concentrations shown in mg/kg.

<1	Less than 1
--	Not applicable or chemical is not a chemical of concern for this endpoint
*	Not available; comparison to ambient levels based on regression analysis
	Not evaluated because exposure pathway is incomplete
bgs	Below ground surface
C	Cancer effect
E/C	Educational/cultural (industrial exposure scenario)
EPC	Exposure point concentration
HI	Hazard index
HPAL	Hunters Point ambient level
IND	Industrial (industrial exposure scenario)
mg/kg	Milligrams per kilogram
MI	Maritime industrial (industrial exposure scenario)
MU	Mixed use (residential exposure scenario)
NC	Noncancer effect
PAH	Polynuclear aromatic hydrocarbon
PRG	Preliminary remediation goal
OS	Open space (recreational exposure scenario)
RME	Reasonable maximum exposure

TABLE 3-13: INCREMENTAL RISK - RISK CHARACTERIZATION ANALYSIS FOR SUBSURFACE SOIL (0 TO 10 FEET BGS), CONSTRUCTION WORKER SCENARIO

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Redevelopment Block	Planned Reuse	Grid Number	Total RME Cancer Risk	Total RME HI	RME Segregated HI	Chemicals of Concern		Basis for Chemical of Concern	Range of Detected Concentrations	RME EPC	Detection Frequency	Chemical-Specific Cancer Risk	Chemical-Specific HI	Metals: HPAL	Metals: Maximum Concentration Exceeds HPAL?
DMI-1	MI	BA22	2.39E-06	1.09E+00	<1	PAH	Benzo(a)pyrene	C	0.057 - 1	1.00E+00	3/12	1.55E-06	--	--	--
DMI-1	MI	BA26	6.51E-06	1.67E+00	<1	Metal	Arsenic	C	2.5 - 13.1	1.01E+01	4/5	6.23E-06	<1	11.1	Yes
DMI-1	MI	BB25	7.66E-06	1.75E+00	<1	Metal	Arsenic	C	7.2 - 12.4	1.24E+01	3/3	7.65E-06	<1	11.1	Yes
DMI-1	MI	BC26	8.69E-06	1.48E+00	<1	Metal	Arsenic	C	1.6 - 25.3	1.36E+01	16/19	8.37E-06	<1	11.1	Yes
DMI-1	MI	BD29	1.51E-05	<1	<1	Metal	Arsenic	C	8.4 - 22.3	2.23E+01	2/2	1.38E-05	<1	11.1	Yes
DMI-1	MI	BE26	6.58E-06	2.47E+00	1.41E+00	Metal	Arsenic	C	2.6 - 24.8	8.93E+00	13/13	5.50E-06	<1	11.1	Yes
							Manganese	NC	99.4 - 9,270	9.27E+03	9/9	--	1.35E+00	1431.18	Yes
DMI-1	MI	BG30	3.59E-06	<1	<1	Metal	Arsenic	C	2.6 - 16.6	5.66E+00	38/39	3.49E-06	<1	11.1	Yes
DMI-1	MI	BG31	5.06E-06	1.38E+00	<1	Metal	Arsenic	C	1.6 - 12	6.82E+00	29/29	4.21E-06	<1	11.1	Yes
DMI-1	MI	BH30	4.59E-06	1.24E+00	<1	Metal	Arsenic	C	3.1 - 13.9	6.94E+00	18/19	4.28E-06	<1	11.1	Yes
DMI-1	MI	BJ31	6.24E-06	<1	<1	Metal	Arsenic	C	2.1 - 17	8.87E+00	19/19	5.47E-06	<1	11.1	Yes
DMI-1	MI	BL24	5.61E-06	<1	<1	Metal	Arsenic	C	0.39 - 13.6	8.33E+00	19/30	5.13E-06	<1	11.1	Yes
38	IND	AV25	6.42E-06	1.18E+00	<1	Metal	Arsenic	C	2.5 - 11.3	9.41E+00	7/8	5.80E-06	<1	11.1	Yes
38	IND	AY26	9.38E-06	<1	<1	Metal	Arsenic	C	2 - 15.2	1.52E+01	4/4	9.37E-06	<1	11.1	Yes
29	E/C	AS20	6.59E-06	<1	<1	Metal	Arsenic	C	5.2 - 12.5	1.06E+01	6/7	6.53E-06	<1	11.1	Yes
29	E/C	AS23	3.58E-06	1.53E+00	<1	Metal	Arsenic	C	0.3025 - 15	5.42E+00	34/41	3.34E-06	<1	11.1	Yes
29	E/C	AT22	5.19E-02	<1	<1	Metal	Lead	NC	2.1 - 920	9.20E+02	8/9	--	--	8.99	Yes
29	E/C	AT24	6.33E-06	<1	<1	Metal	Arsenic	C	0.47 - 14.2	9.47E+00	12/14	5.84E-06	<1	11.1	Yes
DOS-1	OS	AU20	4.58E-06	1.64E+00	<1	Metal	Arsenic	C	0.55 - 24	7.32E+00	20/24	4.51E-06	<1	11.1	Yes
39	OS	AY23	4.59E-06	<1	<1	Metal	Arsenic	C	0.45 - 47.2	7.32E+00	13/20	4.51E-06	<1	11.1	Yes

Notes: All concentrations shown in mg/kg.

<1 Less than 1
-- Not applicable or chemical is not a chemical of concern for this endpoint
bgs Below ground surface
C Cancer effect
E/C Educational/cultural (industrial exposure scenario)
EPC Exposure point concentration
HI Hazard index
HPAL Hunters Point ambient level
IND Industrial (industrial exposure scenario)
mg/kg Milligrams per kilogram
MI Maritime industrial (industrial exposure scenario)
NC Noncancer effect
PAH Polynuclear aromatic hydrocarbon
OS Open space (recreational exposure scenario)
RME Reasonable maximum exposure

TABLE 3-14: RISK CHARACTERIZATION ANALYSIS FOR A-AQUIFER GROUNDWATER BASED ON PLANNED REUSE

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Redevelopment Block	Planned Reuse	Exposure Area	Total RME Cancer Risk	Total RME HI	RME Segregated HI	Exposure Pathway	Source Aquifer for Exposure Pathway	Total RME Cancer Risk for Exposure Pathway	Total RME HI for Exposure Pathway	Chemicals of Concern		Basis for Chemical of Concern	Detection Frequency	RME Concentration	Chemical-Specific Cancer Risk	Percent Contribution to Total RME Cancer Risk for Exposure Pathway	Chemical-Specific HI	Percent Contribution to Total RME HI for Exposure Pathway
30A	MU	IR-09 Plume	2.20E-05	6.49E-01	6.42E-01	Vapor Intrusion	A	2.20E-05	6.49E-01	VOC	Chloroform	C	7 / 34	1.3E+00	1.8E-06	8.4	--	--
											Methylene Chloride	C	1 / 34	4.5E+01	1.7E-06	7.6	--	--
											Trichloroethene	C	6 / 34	5.3E+01	1.8E-05	84.1	--	--
30B, 29, 37, 38	IND and E/C	IR-09 Plume	1.31E-05	6.49E-01	6.42E-01	Vapor Intrusion	A	1.31E-05	6.49E-01	VOC	Chloroform	C	7 / 34	1.3E+00	1.1E-06	8.4	--	--
											Trichloroethene	C	6 / 34	5.3E+01	1.1E-05	84.1	--	--
29, 38, DMI-1	IND, E/C and MI	IR-33 Plume	9.81E-04	8.59E+00	4.58E+00	Vapor Intrusion	A	9.81E-04	8.59E+00	VOC	Benzene	C, NC	6 / 37	6.1E+02	9.6E-04	98.1	4.6E+00	53.3
											Carbon Tetrachloride	C	2 / 37	3.0E-01	3.9E-06	0.4	--	--
											Chloroform	C	16 / 37	4.7E+00	4.0E-06	0.4	--	--
											Naphthalene	C	2 / 24	5.6E+01	9.3E-06	0.9	--	--
											Xylene (Total)	NC	7 / 37	1.1E+03	--	--	3.3E+00	38
38, 42, DMI-1	IND and MI	IR-71 Plume	3.81E-05	1.09E+00	4.58E-01	Vapor Intrusion	A	3.81E-05	1.09E+00	VOC	Carbon Tetrachloride	C	2 / 13	9.00E-01	1.18E-05	30.9	--	--
											Chloroform	C	10 / 13	1.96E+00	1.67E-06	4.4	--	--
											Tetrachloroethene	C	6 / 13	1.97E+01	2.18E-05	57.2	--	--
											Trichloroethene	C	7 / 13	1.39E+01	2.88E-06	7.5	--	--
DMI-1	IND	BH24	8.09E-06	2.92E-02	2.92E-02	Vapor Intrusion	A	8.09E-06	2.92E-02	VOC	Chloroform	C	1 / 3	9.50E+00	8.09E-06	100	2.92E-02	100
38	IND	AU25	5.96E-06	2.15E-02	2.15E-02	Vapor Intrusion	A	5.96E-06	2.15E-02	VOC	Chloroform	C	2 / 6	7.00E+00	5.96E-06	100	2.15E-02	100
38	IND	AX27	1.76E-05	7.02E-02	7.02E-02	Vapor Intrusion	A	1.76E-05	7.02E-02	VOC	Chloroform	C	1 / 4	2.05E+01	1.75E-05	99.3	6.30E-02	89.7

Notes: All concentrations shown in micrograms per liter.

--	Not applicable or chemical is not a chemical of concern for this endpoint
C	Cancer effect
E/C	Educational/cultural (industrial exposure scenario)
HI	Hazard index
IND	Industrial (industrial exposure scenario)
IR	Installation Restoration
MI	Maritime industrial (industrial exposure scenario)
MU	Mixed use (residential exposure scenario)
NC	Noncancer effect
RME	Reasonable maximum exposure
VOC	Volatile organic compound

TABLE 3-15: RISK CHARACTERIZATION SUMMARY FOR A-AQUIFER GROUNDWATER, CONSTRUCTION WORKER SCENARIO
Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Redevelopment Block	Planned Reuse	Exposure Area	Total RME Cancer Risk	Total RME HI	RME Segregated HI	Exposure Pathway	Source Aquifer for Exposure Pathway	Total RME Cancer Risk for Exposure Pathway	Total RME HI for Exposure Pathway	Chemicals of Concern		Basis for Chemical of Concern	Detection Frequency	RME Concentration	Chemical-Specific Cancer Risk	Percent Contribution to Total RME Cancer Risk for Exposure Pathway	Chemical-Specific HI	Percent Contribution to Total RME HI for Exposure Pathway
29, 38, DMI-1	IND, E/C, and MI	IR-33 Plume	3.92E-05	6.91E+00	3.06E+00	Trench Vapor Inhalation	A	3.52E-05	5.83E+00	VOC	Benzene	C, NC	6 / 37	6.1E+02	3.2E-05	92.1	2.6E+00	45.3
											Naphthalene	C, NC	2 / 24	5.6E+01	2.5E-06	7.2	1.7E+00	29.7
											Xylene (Total)	NC	7 / 37	1.1E+03	--	--	1.2E+00	20.9
						Trench Dermal Contact	A	4.08E-06	1.08E+00	VOC	Benzene	C, NC	6 / 37	6.1E+02	2.4E-06	57.9	--	--
42, 38, DMI-1	IND and MI	IR-71 Plume	1.67E-06	9.76E-01	6.68E-01	Trench Vapor Inhalation	A	3.15E-07	1.57E-01	VOC	Tetrachloroethene	C	6 / 13	1.97E+01	1.5E-07	48.6	--	--
						Trench Dermal Contact	A	1.35E-06	8.19E-01	VOC	Tetrachloroethene	C	6 / 13	1.97E+01	9.3E-07	68.8	--	--
DMI-1	MI	BB20	1.57E-06	3.92E-02	3.86E-02	Trench Dermal Contact	A	1.6E-06	3.9E-02	Metal	Arsenic	C	1 / 5	6.3E+01 J	1.6E-06	100	3.9E-02	100

Notes: All concentrations shown in micrograms per liter.

-- Not applicable or chemical is not a chemical of concern for this endpoint
C Cancer effect
E/C Educational/cultural
HI Hazard index
IND Industrial
IR Installation Restoration
MI Maritime industrial
NC Noncancer effect
RME Reasonable maximum exposure
VOC Volatile organic compound

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
19	Radiological risks	Section 2.5.1	Final Radiological Addendum to the Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Tables 3-3 and 3-4. Tetra Tech EC Inc. April 11, 2008.

TABLE 3-3

RESRAD-BUILD RESULTS[a]

Parcel D Impacted Sites	Radiological Risk[b]	Dose[c]
Building 274	3.46×10^{-6}	3.57
Building 351	4.17×10^{-6}	28.5
Building 351A	4.73×10^{-6}	32.9
Building 366/351B	3.46×10^{-6}	3.57
Building 401	1.34×10^{-6}	0.644
Building 411	9.26×10^{-6}	11.0
Building 813	2.77×10^{-7}	0.69
Building 819	3.18×10^{-6}	2.89

Abbreviations and Acronyms:

[a] Total risk and dose is equivalent to incremental risk and dose
[b] Total excess lifetime carcinogen risk
[c] millirem per year

TABLE 3-4

RESRAD RESULTS

TOTAL DOSE AND RISK		
Impacted Soil Areas	**Radiological Risk[a]**	**Dose[b]**
313 Site	1.02×10^{-4}	4.66
313A Site	8.90×10^{-5}	4.04
317 Site	6.37×10^{-5}	2.93
322 Site	9.07×10^{-5}	4.11
364 Site	3.17×10^{-5}	1.50
365 Site	3.60×10^{-5}	1.67
383 Site	6.52×10^{-5}	2.98
408 Site	2.43×10^{-4}	11.0
Gun Mole Pier	5.08×10^{-5}	2.40
Naval Radiological Defense Laboratory Site on Mahan Street	5.08×10^{-5}	2.40
Sanitary Sewers/Storm Drains	6.75×10^{-5}	3.09
Incremental Dose and Risk		
Impacted Soil Areas	**Radiological Risk[a]**	**Dose[b]**
313 Site	8.97×10^{-5}	4.08
313A Site	7.80×10^{-5}	3.54
317 Site	4.28×10^{-5}	1.97
322 Site	7.95×10^{-5}	3.60
364 Site	2.15×10^{-5}	1.04
365 Site	2.43×10^{-5}	1.13
383 Site	4.35×10^{-5}	1.98
408 Site	2.13×10^{-4}	9.60
Gun Mole Pier	3.42×10^{-5}	1.64
Naval Radiological Defense Laboratory Site on Mahan Street	3.42×10^{-5}	1.64
Sanitary Sewers/Storm Drains	4.54×10^{-5}	2.08

Notes:

a Total excess lifetime carcinogen risk

b mrem/yr

Abbreviations and Acronyms:

Mem/yr – millirem per year
NRDL – Naval Radiological Defense Laboratory

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
20	Combined chemical and radiological risks	Section 2.5.1	Final Radiological Addendum to the Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Tables 3-5 and 3-6. Tetra Tech EC Inc. April 11, 2008.

TABLE 3-5

COMBINED TOTAL RISK FROM CHEMICAL AND RADIOLOGICAL RISKS

Parcel D Impacted Sites	Radiological Risk[b]	Chemical Risk[a,b]	Redevelpment Block	Parcel D Grid(s)	Risk Combination Results
Building 274	3.46×10^{-6}	2.00×10^{-5}	DMI-1	BA22	2.35×10^{-5}
Building 313 Site	1.02×10^{-4}	3.00×10^{-6}	DMI-1	BA21	1.05×10^{-4}
Building 313A Site	8.90×10^{-5}	3.00×10^{-6}	DMI-1	BA21	9.20×10^{-5}
Building 317 Site	6.37×10^{-5}	1.00×10^{-4}	39	AY23	1.64×10^{-4}
Building 322 Site	9.07×10^{-5}	Not Evaluated	DMI-1	AZ21	9.07×10^{-5}
Building 351	4.17×10^{-6}	1.00×10^{-5}	39	AW23	1.42×10^{-5}
Building 351A	4.73×10^{-6}	3.00×10^{-6}	39	AX24	7.73×10^{-6}
Building 364 Site	3.17×10^{-5}	1.00×10^{-4}	39	AY23	1.32×10^{-4}
Building 365 Site	3.60×10^{-5}	3.00×10^{-6}	39	AY24	3.90×10^{-5}
Building 366/351B	3.46×10^{-6}	1.00×10^{-5}	39	AW20, AW21, AX21	1.35×10^{-5}
Building 383 Area	6.52×10^{-5}	1.00×10^{-5}	DMI-1	BH23, BH24	7.52×10^{-5}
Building 401	1.34×10^{-6}	8.00×10^{-6}	30A	AR24	9.34×10^{-6}
Building 408 Site	2.43×10^{-4}	5.00×10^{-6}	38	AY27	2.48×10^{-4}
Building 411	9.26×10^{-6}	2.00×10^{-5}	38	AU24, AV25	2.93×10^{-5}
Building 813	2.77×10^{-7}	5.00×10^{-6}	A		5.28×10^{-6}
Building 819	3.18×10^{-6}	5.00×10^{-6}	A		8.18×10^{-6}
Gun Mole Pier	5.08×10^{-5}	3.00×10^{-5}	DMI-1	BB25, BL24	8.08×10^{-5}
NRDL Site on Mahan Street	5.08×10^{-5}	2.00×10^{-5}	DMI-1	BE27	7.08×10^{-5}
Sanitary Sewers	6.75×10^{-5}	1.00×10^{-4}	All Blocks	AY-23	1.68×10^{-4}
Storm Drains	6.75×10^{-5}	1.00×10^{-4}	All Blocks	AY-23	1.68×10^{-4}

Notes:

[a] Chemical risk was taken from Revised FS for Parcel D, Tables B-15 and B-16.
[b] Excess lifetime carcinogen risk

Abbreviations and Acronyms:

NRDL – Naval Radiological Defense Laboratory

TABLE 3-6

COMBINED INCREMENTAL RISK FROM CHEMICAL AND RADIOLOGICAL RISKS

Parcel D Impacted Sites	Radiological Risk[b]	Chemical Risk[a,b]	Redevelpment Block	Parcel D Grid(s)	Risk Combination Results
Building 274	3.46×10^{-6}	4.00×10^{-8}	DMI-1	BB22	3.50×10^{-6}
Building 313 Site	8.97×10^{-5}	6.00×10^{-7}	DMI-1	BA21	9.03×10^{-5}
Building 313A Site	7.80×10^{-5}	6.00×10^{-7}	DMI-1	BA21	7.86×10^{-5}
Building 317 Site	4.28×10^{-5}	1.00×10^{-4}	39	AY23	1.43×10^{-4}
Building 322 Site	7.95×10^{-5}	Not Evaluated	DMI-1	AZ21	7.95×10^{-5}
Building 351	4.17×10^{-6}	1.00×10^{-7}	39	AW23	4.27×10^{-6}
Building 351A	4.73×10^{-6}	1.00×10^{-4}	39	AY23	4.83×10^{-6}
Building 364 Site	2.15×10^{-5}	1.00×10^{-4}	39	AY23	1.22×10^{-4}
Building 365 Site	2.43×10^{-5}	3.00×10^{-8}	39	AY24	2.43×10^{-5}
Building 366/351B Site	3.46×10^{-6}	Not Evaluated	39	AV22	3.46×10^{-6}
Building 383	4.35×10^{-5}	2.00×10^{-6}	DMI-1	BH23	4.55×10^{-5}
Building 401	1.34×10^{-6}	Not Evaluated	30A	AQ23	1.34×10^{-6}
Building 408 Site	2.13×10^{-4}	Not Evaluated	38	AX27	2.13×10^{-4}
Building 411	9.26×10^{-6}	1.00×10^{-6}	38	AW25	1.03×10^{-5}
Building 813	2.77×10^{-7}	5.00×10^{-6}	A		5.28×10^{-6}
Building 819	3.18×10^{-6}	5.00×10^{-6}	A		8.18×10^{-6}
Gun Mole Pier	3.42×10^{-5}	3.00×10^{-5}	DMI-1	BB24, BL24	6.42×10^{-5}
NRDL Site on Mahan Street	3.42×10^{-5}	Not Evaluated	DMI-1	BE27, BF27	3.42×10^{-5}
Sanitary Sewers	4.54×10^{-5}	1.00×10^{-4}	All Blocks	AY23	1.45×10^{-4}
Storm Drains	4.54×10^{-5}	1.00×10^{-4}	All Blocks	AY23	1.45×10^{-4}

Notes:

[a] Chemical risk was taken from Revised FS for Parcel D, Tables B-19 and B-20.
[b] Excess lifetime carcinogen risk

Abbreviations and Acronyms:

NRDL – Naval Radiological Defense Laboratory

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
21	Assumptions and uncertainties	Section 2.5.1	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Appendix B, Section B9.0. SulTech. November 30, 2007.

B9.0 UNCERTAINTY ANALYSIS

Varying degrees of uncertainty at each stage of the HHRA arise from assumptions made in the risk assessment and the limitations of the data used to calculate risks. Uncertainty and variability are also inherent in the exposure assessment, toxicity values, and risk characterization. Table B-24 lists both general and site-specific uncertainties associated with this HHRA.

The effect of uncertainties is overestimation or underestimation of the actual cancer risk or HI. In general, the risk assessment process is based on use of conservative (health-protective) assumptions that when combined, are intended to overestimate the actual risk. However, a small possibility exists that risks were underestimated.

The remainder of this discussion focuses on the following uncertainties specific to this HHRA:

- The influence of metals in soil at or below ambient levels on this HHRA
- Use of a SF for TCE developed by Cal/EPA, rather than the EPA provisional SF for TCE
- Assumption that the exposure area for groundwater vapor intrusion risks is consistent with the risk plume boundaries delineated for groundwater COPCs
- Dermal contact with groundwater for the residential exposure scenario
- Use of generic, non-site-specific RBSLs to calculate risks from groundwater vapor intrusion.

B9.1 METALS IN SOIL BELOW AMBIENT LEVELS

To account for the contribution of naturally occurring concentrations of metals at HPS, both total risks and incremental risks were assessed for exposure to soil. The total risk evaluation for soil included all chemicals regardless of concentration, except for the essential nutrients calcium, magnesium, potassium, and sodium. For the incremental risk evaluation, the above essential nutrients and metals with maximum measured concentrations below HPALs were excluded as COPCs.

The differences in risk and hazard results between the total risk evaluation and the incremental risk evaluation are attributed to the risks and hazards associated with ambient levels of metals at HPS. At ambient concentrations (that is, HPALs), some metals at HPS are associated with cancer risks in excess of 1E-06 and noncancer hazards in excess of 1.0. Table B-25 presents the

cancer risks and noncancer hazards associated with exposure to metals at concentrations equal to HPALs; risks and hazards are presented in this table for each of the exposure scenarios associated with planned reuse (residential, industrial, recreational). As shown in Table B-25, the contribution of ambient levels of metals to cancer risk and HI estimates is significant. For example, the cancer risk associated with residential exposure to arsenic at a concentration equal to the HPAL for arsenic (11.1 mg/kg) is 2.9E-04. The HI associated with residential exposure to manganese at a concentration equal to the HPAL for manganese (1,431 mg/kg) is 1.7. Collectively, all metals at ambient levels contribute to a cancer risk of 3E-04 for a residential receptor, and 3E-05 for industrial and recreational receptors. For noncancer hazards, metals at ambient levels collectively contribute to an HI of 11 for residential receptors, 0.2 for industrial receptors, and 0.7 for recreational receptors.

This evaluation of risks and hazards associated with metals at HPALs shows that the total risk evaluation, which includes metals present at concentrations at or below HPALs, likely overestimates risks and hazards associated with Navy releases of chemicals, as concentrations of metals are at or below HPALs in many exposure areas at Parcel D. While the incremental risk evaluation excludes risks and hazards from metals for which maximum concentrations do not exceed HPALs, the results of the incremental evaluation should be considered with the information contained in Table B-25, as the contribution of ambient levels to risks and hazards at HPS is significant for some metals.

B9.2 SLOPE FACTOR FOR TCE

As discussed in Section B6.0, the provisional cancer SFs derived by EPA (2001) for TCE, although more conservative than the SFs derived by Cal/EPA, were not used in the HHRA. The draft risk assessment that is the basis for the provisional EPA SFs for TCE is being reviewed currently by the National Academy of Sciences, and as such, does not represent EPA policy. For this HHRA, the SFs developed by Cal/EPA were used to evaluate cancer risks from exposure to TCE. Uncertainties specific to the provisional cancer SFs for TCE were analyzed in this HHRA because the difference between the provisional SFs for TCE and the Cal/EPA SFs for TCE is significant, and can affect the risk results. Attachment B7 contains a detailed discussion of the uncertainties associated with the SFs for TCE.

B9.3 BOUNDARIES FOR VAPOR INTRUSION RISKS

As discussed in Section B4.3.2, risk plume boundaries for evaluation of groundwater vapor intrusion were established based on delineation of volatile COPCs in the A-aquifer to nondetectable (below reporting limit) levels, and vapor intrusion risks were applied to each residential and industrial grid encompassed by the boundaries of the risk plumes. This approach assumes that the exposure area for groundwater vapor intrusion risks is consistent with the risk plume boundaries; however; EPA states that it is reasonable to assume that subsurface vapors may migrate laterally up to 100 feet (EPA 2002a). Figure B-8 portrays the potential lateral extent, or 100-foot “inhalation risk buffer zone” to which the groundwater vapor intrusion risks calculated for Parcel D may extend. In this figure, the risk plume

boundaries delineated in Section B4.3.2 were expanded laterally in each direction by 100 feet to account for the distance that vapors may travel laterally from a groundwater source. This inhalation risk buffer zone was also applied to non-plume well locations with volatile COPCs (see Figure B-8).

Preferential pathways, which consist of utility conduits, subsurface drains, and buried pipelines that intersect vapor sources or vapor migration pathways, may allow subsurface vapors to migrate more than 100 feet laterally (EPA 2002a). These preferential pathways are considered significant if they are associated with a high gas permeability and are of sufficient volume and proximity to a building such that the pathways may influence vapor intrusion into the building (EPA 2002a). Figure B-9 shows the subsurface utilities at Parcel D; these utilities may influence the extent to which subsurface vapors may migrate beyond the 100-foot inhalation risk buffer zone depicted in Figure B-8.

B9.4 DERMAL CONTACT WITH GROUNDWATER FOR RESIDENTIAL SCENARIO

As discussed in Section B7.2, tap water PRGs were used in this HHRA to evaluate domestic use of groundwater for the residential receptor. The tap water PRGs are used to evaluate residential exposure to groundwater from ingestion and from inhalation of VOCs released from groundwater to indoor air during household use. The tap water PRGs are limited to an assessment of exposure to groundwater from the oral and inhalation exposure pathways, and do not account for exposure from the dermal exposure pathway.

To address the uncertainties associated with exclusion of the dermal exposure pathway on the risk results for residential domestic use of groundwater, the potential for intake of COPCs from the dermal exposure pathway relative to intake of COPCs from the oral exposure pathway was evaluated using information provided in EPA (2004d) on the relative percentage of dermal exposure compared to oral exposures for non-volatile COPCs. This information is presented in the table below for the non-volatile COPCs identified for the B-aquifer. In this table, exposure from the oral route is represented by ingestion of two liters of water per day (EPA 2004d). Although several volatile COPCs were identified for the B-aquifer, partitioning risks between oral and dermal exposures for volatile COPCs is not necessary because the tap water PRGs account for the inhalation route of exposure. Non-volatile COPCs for the B-aquifer were limited to metals. Information was not available for two metals identified as COPCs for the B-aquifer, molybdenum and zinc.

Chemical of Potential Concern	Dermal/Oral (%)*	Chemical of Potential Concern	Dermal/Oral (%)*
Barium	7.5	Nickel	2.6
Chromium	40	Selenium	1.8
Manganese	8.8	Vanadium	20

Source: EPA (2004d)

This evaluation shows that risks from exposure to groundwater in the B-aquifer, which were calculated using a risk-based screening assessment and EPA Region 9 tap water PRGs, may be slightly to moderately underestimated for some metals in the B-aquifer (from 1.8 for selenium to 40 percent for chromium). The potential for dermal noncancer hazards was assessed for the B-aquifer by applying the percentages above to the calculated dermal HIs for the B-aquifer (shown on Table B3-21 of Attachment B3); this assessment showed that none of the chemical-specific HIs calculated for each of the non-volatile COPCs in the B-aquifer (see Table B3-21 of Attachment B3) would exceed a threshold HI of 1.0. This assessment did not evaluate cancer risks because none of the non-volatile COPCs identified for the B-aquifer is associated with cancer effects.

B9.5 SCREENING LEVELS FOR GROUNDWATER VAPOR INTRUSION

Based on meetings between EPA, DTSC, and Navy in 2003 and 2004, VI-RBSLs that are based on the generic screening concentrations provided in Table 2c of EPA (2002a) were used in this HHRA to calculate risks for the groundwater vapor intrusion exposure pathway. This approach was used in lieu of site-specific modeling with the Johnson-Ettinger (1991) vapor model because the EPA (2002a) model assumptions (such a depth to groundwater and soil physical properties) used to calculate the generic screening criteria are similar to the properties of soil and groundwater at HPS. Site conditions at HPS (shallow depth to groundwater and coarse soils; see Section 2.0 of the Parcel D Revised FS Report) do not differ significantly enough from conditions assumed for the generic screening values to warrant detailed modeling using the Johnson-Ettinger model.

To evaluate whether use of the generic values would represent conditions at HPS and would not result in a significant overestimate of potential risks, the Navy evaluated risks from vapor intrusion for selected groundwater risk plumes at HPS using both generic EPA (2002a) risk-based screening values for vapor intrusion and site-specific modeling. The results of this evaluation showed that risks calculated ratiometrically using generic EPA risk-based vapor intrusion screening values are comparable to site-specific risks calculated using the Johnson-Ettinger model adjusted for HPS-specific values for depth to groundwater and physical properties of the soil. Risks calculated using the generic EPA screening values were higher than modeled results by approximately a factor of two. The difference results from an assumed basement exposure scenario in the generic EPA screening values, whereas the modeled results were based on a slab-on-grade exposure scenario because of the shallow depth to groundwater at HPS (roughly 7 to 8 feet bgs). This difference is not considered significant for risk results, which are represented by order-of-magnitude estimates.

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
22	Surface water quality	Section 2.5.2	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Appendix H, Table H-1. SulTech. November 30, 2007.

TABLE H-1: SURFACE WATER QUALITY CRITERIA FOR THE SAN FRANCISCO BAY
Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Analyte Monitored Under Naval Station Treasure Island Groundwater Program	Pseudonym	San Francisco Bay Basin Plan[a] (µg/L)		California Toxics Rule Criteria for Enclosed Bays and Estuaries[e] (µg/L)								National Recommended Water Quality Criteria[k] (µg/L) Saltwater Aquatic Life					National Ambient Water Quality Criteria (AWQC) for Protection of Saltwater Aquatic Life[i] (µg/L) Lowest Observed Effect Level (LOEL)							Other Criteria (footnotes indicate source) (µg/L)		Selected Water Quality Criteria (µg/L)
				Chronic[g]		Acute[g]			Instantaneous Maximum			Chronic[g]		Acute[g]			Chronic[h]		Acute[i]			Other[j]				
		Concentration	Footnotes	Concentration	Footnotes	Concentration	20% of Concentration[f]	Footnotes	Concentration	10% of Concentration[f]	Footnotes	Concentration	Footnotes	Concentration	20% of Concentration[f]	Footnotes	Concentration	Footnotes	Concentration	20% of Concentration[f]	Footnotes	Concentration	Footnotes	Other	Footnotes	
1,1,1-Trichloroethane		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		--	31,200	6,240	--	--	--	--	--	6,240
1,1,2,2-Tetrachloroethane		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	9,020	1,804	--	--	--	--	--	1804
1,1-Dichloroethene	1,1-Dichloroethylene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	224,000	44800	(27)	--	--	--	--	44,800
1,2,4,5-Tetrachlorobenzene		--	--	--	--	--	--	--	--	--	--						--	--	250	50	(22)	50	(22.23)	--	--	50
1,2,4-Trichlorobenzene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	129	(22)	160	--	(22)	--	--	--	--	129
1,2-Dichlorobenzene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	129	(22)	1,970	--	(24)	--	--	--	--	129
1,2-Dichloroethane		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	113,000	22,600	--	--	--	--	--	22,600
1,2-Dichloroethene (total)	1,2-Dichloroethene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	224,000	44,800	(27)	--	--	--	--	44,800
1,2-Dichloropropane	Propylene dichloride	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3,040	(28)	10,300	--	(28)			--	--	3,040
1,3-Dichlorobenzene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	129	(22)	1,970	--	(24)			--	--	129
1,3-Dichloropropene (total)		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	790	158	(29)	--	--	--	--	158
1,4-Dichlorobenzene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	129	(22)	1,970	--	(24)	--	--	--	--	129
2,4-Dinitrophenol		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	230	46	(88)	150	(38,88)	--	--	46
2,4-Dinitrotoluene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	590	118	(53)	370	(53, 82)	--	--	118
2,6-Dinitrotoluene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	590	118	(53)	370	(53, 82)	--	--	118
2-Chloronaphthalene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	7.5	1.5	(48)	--	--	--	--	1.5
2-Nitrophenol	Nitrophenol	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4,850	970	(88)	--	--	--	--	970
4,4'-DDD	2,4-DDD; DDD	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.6	0.72	--	--	--	--	--	.72
4,4'-DDE	2,4-DDE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	14	2.8	--	--	--	--	--	2.8
4,4'-DDT		--	--	0.001	(114)	0.13	--	--	--	--	--	0.001	G,aa,ii	0.13	--	G,ii	--	--	--	--	--	--	--	--	--	.001
4,6-Dinitro-2-methylphenol	4,6-Dinitro-o-cresol	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4,850	970	(88)	--	--	--	--	970
4-Amino-2,6-dinitrotoluene	Dinitrotoluenes; 4-Methyl-3,5-dinitroaniline	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	590	118	--	370	(82)	--	--	118
4-Nitrophenol		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4,850	970	(88)	--	--	--	--	970
Acenaphthene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	710	--	970	--	--	500	(38)	--	--	710
Acenaphthylene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	300	60	(52)	--	--	--	--	60
Aldrin		--	--	--	--	--	--	--	1.3	--	II	--	--	1.3	0.26	G	--	--	--	--	--	--	--	--	--	.26
Alpha-chlordane	Chlordane	--	--	0.004	(114)	--	--	--	0.09	--	--	0.004	G,aa,o	0.09	--	G,o	--	--	--	--	--	--	--	--	--	.004
Anthracene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	300	60	(52)	--	--	--	--	60
Aroclor 1016	Polychlorinated biphenyls (PCBs)	--	--	0.03	rr	--	--	--	--	--	--	0.03	N,aa	--	--	--	--	--	10	--	--	--	--	--	--	.03
Aroclor 1221	Polychlorinated biphenyls (PCBs)	--	--	0.03	rr	--	--	--	--	--	--	0.03	N,aa	--	--	--	--	--	10	--	--	--	--	--	--	.03
Aroclor 1232	Polychlorinated biphenyls (PCBs)	--	--	0.03	rr	--	--	--	--	--	--	0.03	N,aa	--	--	--	--	--	10	--	--	--	--	--	--	.03
Aroclor 1242	Polychlorinated biphenyls (PCBs)	--	--	0.03	rr	--	--	--	--	--	--	0.03	N,aa	--	--	--	--	--	10	--	--	--	--	--	--	.03
Aroclor 1248	Polychlorinated biphenyls (PCBs)	--	--	0.03	rr	--	--	--	--	--	--	0.03	N,aa	--	--	--	--	--	10	--	--	--	--	--	--	.03
Aroclor 1254	Polychlorinated biphenyls (PCBs)	--	--	0.03	rr	--	--	--	--	--	--	0.03	N,aa	--	--	--	--	--	10	--	--	--	--	--	--	.03
Aroclor 1260	Polychlorinated biphenyls (PCBs)	--	--	0.03	rr	--	--	--	--	--	--	0.03	N,aa	--	--	--	--	--	10	--	--	--	--	--	--	.03
Arsenic		36	b	36	mm, oo	69	--	mm, oo	--	--	--	36	A,D,bb	69	--	A,D,bb	--	--	2,319	--	(95)	13	(6)	--	--	36
Atrazine		--	--	--	--	--	--	--	--	--	--	11	r,(68)	310	--	r,(68)	--	--	--	--	--	--	--	--	--	11
Benzene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5,100	--	--	700	--	--	--	700
Benzo(a)anthracene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	300	60	(52)	--	--	--	--	60
Benzo(a)pyrene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	300	60	(52)	--	--	--	--	60
Benzo(b)fluoranthene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	300	60	(52)	--	--	--	--	60
Benzo(g,h,i)perylene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	300	60	(52)	--	--	--	--	60
Benzo(k)fluoranthene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	300	60	(52)	--	--	--	--	60
Bromochloromethane		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6,400	(20)	12,000	--	(20)	11,500	(20, 83)	--	--	6,400
Bromodichloromethane		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6,400	(20)	12,000	--	(20)	11,500	(20, 83)	--	--	6,400
Bromoform		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6,400	(20)	12,000	--	(20)	11,500	(20, 83)	--	--	6,400
Bromomethane		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6,400	(20)	12,000	--	(20)	11,500	(20, 83)	--	--	6,400
Butylbenzylphthalate	n-Butyl benzyl phthalate	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2,944	588.8	(45)	3.4	(38, 45)	--	--	588.8
Cadmium		9.3	b	9.3	(1, 142)	42	--	(1, 142)	--	--	--	8.8	D,bb,gg	40	--	D,bb,gg	--	--	--	--	--	--	--	--	--	8.8
Carbon tetrachloride		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6,400	(20)	50,000	--	--	11,500	(20, 82)	--	--	6,400
Chlordane				0.004	(114)	--	--	--	0.09	0.009	--	0.004	G,aa	0.09	0.009	G	--	--	--	--	--	--	--	--	--	.004
Chlorobenzene	Monochlorobenzene	--	--	--	--	--		--				--	--	--	--	--	129	(22)	160	--	(22)	--	--	--	--	129
Chloroform		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6,400	(20)	12,000	--	(20)	11,500	(20, 82)	--	--	6,400
Chloromethane		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6,400	(20)	12,000	--	(20)	11,500	(20, 82)	--	--	6,400
Chromium (total)		50 (VI)	b,o	50 (VI)	o	1100 (VI)	--	--	--	--	--	50 (VI)	D,bb,o	1100 (VI)	--	D,bb,o	--	--	--	--	--	--	--	--	--	50

TABLE H-1: SURFACE WATER QUALITY CRITERIA FOR THE SAN FRANCISCO BAY (CONTINUED)
Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Analyte Monitored Under Naval Station Treasure Island Groundwater Program	Pseudonym	San Francisco Bay Basin Plan[a] (µg/L)		California Toxics Rule Criteria for Enclosed Bays and Estuaries[e] (µg/L)									National Recommended Water Quality Criteria[k] (µg/L) Saltwater Aquatic Life					National Ambient Water Quality Criteria (AWQC) for Protection of Saltwater Aquatic Life[l] (µg/L) Lowest Observed Effect Level (LOEL)							Other Criteria (footnotes indicate source) (µg/L)		Selected Water Quality Criteria (µg/L)
				Chronic[g]		Acute[g]			Instantaneous Maximum			Chronic[g]		Acute[g]			Chronic[h]		Acute[i]			Other[j]				
		Concentration	Footnotes	Concentration	Footnotes	Concentration	20% of Concentration[f]	Footnotes	Concentration	10% of Concentration[f]	Footnotes	Concentration	Footnotes	Concentration	20% of Concentration[f]	Footnotes	Concentration	Footnotes	Concentration	20% of Concentration[f]	Footnotes	Concentration	Footnotes	Other	Footnotes	
Chrysene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	300	60	(52)	--	--	--	--	60
Cis-1,2-dichloroethene	Cis-1,2-dichloroethylene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	224,000	44,800	(27)	--	--	--	--	44,800
Copper		4.9	c	3.1	nn, oo	4.8	--	oo	--	--	--	3.1	D,cc,ff	4.8	--	D,cc,ff	--	--	--	--	--	--	--	--	--	3.1
Cyanide		5	c	1	pp	1	--	pp	--	--	--	1	Q,bb	1	--	Q,bb	--	--	--	--	--	--	--			1
Dibenz(a,h)anthracene	1,2:5,6-Dibenzanthracene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	300	60	(52)	--	--	--	--	60
Dibromochloromethane		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6,400	(20)	12,000	--	(20)	11,500	(20, 83)	--	--	6,400
Dieldrin		--	--	0.0019	(114), II	--	--	--	0.71	--	II	0.0019	G,aa	0.71	.142	G	--	--	--	--	--	--	--	--	--	.142
Diethylphthalate		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2,944	588.8	(45)	3.4	(38, 45)	--	--	588.8
Dimethylphthalate		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2,944	--	(45)	3.4	(38, 45)	--	--	3.4
Di-n-butylphthalate	Dibutyl phthalate	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2,944	588.8	(45)	3.4	(38, 45)	--	--	588.8
Di-n-octylphthalate	Bis-n-octyl phthalate	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2,944	588.8	(45)	3.4	(38, 45)	--	--	588.8
Endosulfan I	Endosulfan (alpha)	--	--	0.0087	II	--	--	--	0.034	--	(115), II	0.0087	G,Y,o	0.034	--	G,Y,o	--	--	--	--	--	--	--	--	--	0.0087
Endosulfan II	Endosulfan (beta)	--	--	0.0087	II	--	--	--	0.034	--	(115), II	0.0087	G,Y,o	0.034	--	G,Y,o	--	--	--	--	--	--	--	--	--	0.0087
Endrin		--	--	0.0023	(114), II	--	--	--	0.037	--	II	0.0023	G,aa	0.037	--	G	--	--	--	--	--	--	--	--	--	0.0023
Ethylbenzene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	430	86	--	--	--	--	--	86
Fluoranthene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	16	--	40	--	--	--	--	--	--	16
Fluorene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	300	60	(52)	--	--	--	--	60
Gamma-BHC (lindane)	Gamma-Benzene hexachloride	--	--	--	--	--	--	--	0.16	--	II	--	--	0.16	0.032	G	--	--	--	--	--	--	--	--	--	.032
Gamma-chlordane	Chlordane	--	--	0.004	(114)	--	--	--	0.09	--	--	0.004	G,aa,o	0.09	--	G,o	--	--	--	--	--	--	--	--	--	.004
Heptachlor		--	--	0.0036	(114)	II	--	--	0.053	--	II	0.0036	G,aa	0.053	--	G	--	--	--	--	--	--	--	--	--	.0036
Heptachlor epoxide		--	--	0.0036	(114)	II		--	0.053	--	II	0.0036	G,V,aa	0.053	--	G,V	--	--	--	--	--	--	--	--	--	.0036
Hexachlorobenzene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	129	(22)	160	--	(22)	--	--	--	--	129
Hexachlorobutadiene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	32	6.4	--	--	--	--	--	6.4
Hexachlorocyclopentadiene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	7.0	1.4	--	--	--	--	--	1.4
Hexachloroethane		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	940	188	--	--	--	--	--	188
Indeno(1,2,3-cd)pyrene	Ideno(1,2,3-cd)pyrene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	300	60	(52)	--	--	--	--	60
Isophorone		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	12,900	2,580	--	--	--	--	--	2,580
Lead		5.6	b	8.1	(1, 142), m	210	--	(1, 142), m	--	--	--	8.1	D,bb	210	--	D,bb	--	--	--	--	--	--	--	--	--	5.6
Mercury	Mercury, inorganic	0.025	b	--	--	--	--	--	--	--	--	0.94	D,ee,hh	1.8	--	D,ee,hh	--	--	--	--	--	--	--	--	--	0.025
Methoxychlor		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.003	(51),f	0.003
Methyl-tert-butyl-ether	Methyl t-butyl ether (MTBE), Methyl tertiary	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8,000	p	8,000
Methylene chloride	Dichloromethane	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6,400	(20)	12,000	--	(20)	11,500	(20, 82)	--	--	6,400
Mirex		--	--	--	--	--	--	--	--	--	--	0.001	F	--	--	--	--	--	--	--	--	--	--	--	--	0.001
Naphthalene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2,350	470	--	--	--	--	--	470
Nickel		8.3	b	8.2	(2, 142), oo	74	--	(1, 142), oo	--	--	--	8.2	D,bb	74	--	D,bb	--	--	--	--	--	--	--	--	--	8.2
Nitrobenzene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6,680	1,336	--	--	--	--	--	1,336
N-Nitroso-di-n-propylamine	N-Nitrosodi-n-propylamine; N-Nitrosodi	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3,300,000	660,000	(56)	--	--	--	--	660,000
N-nitrosodiphenylamine		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3,300,000	660,000	(56)	--	--	--	--	660,000
Pentachlorophenol		--	--	7.9	--	13	--	--	--	--	--	7.9	bb	13	--	bb	--	--	--	--	--	--	--	--	--	7.9
Phenanthrene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	300	60	(52)	--	--	--	--	60
Phenol		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5,800	1,160	--	--	--	--	--	1,160
Pyrene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	300	60	(52)	--	--	--	--	60
Selenium		--	--	71	(1, 142)	290	--	(1, 142)	--	--	--	71	D,bb,dd	290	--	D,bb,dd	--	--	--	--	--	--	--	--	--	71
Silver		2.3	d	--	--	1.9	0.38	(1, 142)	--	--	--	--	--	1.9	0.38	D,G	--	--	--	--	--	--	--	--	--	0.38
Sulfide	Sulfide-Hydrogen Sulfide	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.2	(51),f	0.2
Tetrachloroethene	Tetrachloroethylene (PCE)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	450	--	10,200	--	--	--	--	--	--	450
Thallium		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2,130	426	--	--	--	--	--	426
Toluene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5,000	--	6,300	--	--	--	--	--	--	5,000
Toxaphene		--	--	0.0002	--	0.21	--	--	--	--	--	0.0002	aa	0.21	--	--	--	--	--	--	--	--	--	--	--	0.0002
TPH-Diesel	Diesel range organics; Diesel Fuel; Diesel	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1,400	q	1,400
TPH-Gasoline	Gasoline range organics; Gasoline	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1,400	q	1,400
TPH-Motor Oil	Motor oil; motor oil range organics	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1,400	q	1,400
trans-1,2-Dichloroethene	trans-1,2-Dichloroethylene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	224,000	44,800	(27)	--	--	--	--	44,800
Trichloroethene	Trichloroethylene (TCE)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2,000	400	--	--	--	--	--	400
Zinc		58	c	81	mm, oo	90	--	oo	--	--	--	81	D,bb	90	--	D,bb	--	--	--	--	--	--	--	--	--	81

Notes: **Values shaded are those selected as screening criteria.**
Footnotes and references are detailed below.

--	No criterion available
ug/L	Microgram per liter
BHC	Benzene Hexachloride (Lindane)
DDD	Dichlorodiphenyldichloroethane
DDE	1,1-dichloro-2,2-bis(p-chlorophenyl)ethylene
DDT	1,1,1-Trichloro-2,2-bis(p-chlorophenyl)ethane
TPH	Total petroleum hydrocarbons

Footnotes:

a California Environmental Protection Agency, Regional Water Quality Control Board, San Francisco Bay Area Region (Water Board). 1995. "San Francisco Bay Basin Plan Water Quality Control Plan." June 21. Table 3-3 Water Quality Objectives for Toxic Pollutants for Surface Water With Salinities Greater Than 5 Parts Per Billion.
b From Water Board "Basin Plan" 4-Day Average (Chronic)
c From Water Board "Basin Plan" 24-Hour and 1-Hour Average (Acute)
d From Water Board "Basin Plan" Instantaneous Maximum
e From "Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California" (CTR) (EPA 2000) and "Water Quality Control Plan, San Francisco Bay Basin Region" (Water Board 1995). The most appropriate criteria were used.
f Criterion made more suitably protective by means of standard convention of lowering acute values by 80 percent and instantaneous values by 90 percent to make them more appropriate for use under chronic exposure scenarios.
g An acute criterion (EPA identified as Criteria Maximum Concentration [CMC]) is an estimate of the highest concentration of a material in surface water to which an aquatic community can be exposed briefly without resulting in an unacceptable effect. The chronic concentration (EPA identified as Criterion Continuous Concentration [CCC]) is an estimate of the highest concentration of a material in surface water to which an aquatic community can be exposed indefinitely without resulting in an unacceptable effect. The CMC and CCC are just two if the six parts of an aquatic life criterion; the other four parts are the acute averaging period, chronic averaging period, acute frequency of allowed exceedance, and chronic frequency of allowed exceedance. Because 304(a) aquatic life criteria are national guidance, they are intended to be protective of the vast majority of the aquatic communities in the United States (EPA 2002a).
h EPA National "AWQC Lowest Observed Effect Level (Chronic)" (Water Board 2000)
i EPA National "AWQC Lowest Observed Effect Level (Acute)" (Water Board 2000)
j EPA National "AWQC Lowest Observed Effect Level (Other)" (Water Board 2000)
k From "National Recommended Water Quality Criteria: 2002" (EPA 2002a) and "Revision of National Recommended Water Quality Criteria." (EPA 2002b), unless otherwise noted.
l From "Final Technical Memorandum Estimation of Ambient Concentrations of Metals in Groundwater" (Tetra Tech 2001)
m In instances where criteria from "Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California" (EPA 2000) refer to the "Water Quality Control Plan, San Francisco Bay Basin Region" (Water Board 1995), Water Board 1995 criteria were used. The Water Board 1995 criteria are distinguished by an "m" in the footnote column.
o Detailed application of this toxicity criterion may require the review and/or summation of analyte isomer, congener, or speciation results, as applicable. Please see applicable regulatory agency source document for additional detail.
p Water Board 1998
q Tetra Tech EM Inc. 1999
r Water Board 2000

The following lettered footnotes are derived from EPA "National Recommended Water Quality Criteria: 2002" (EPA 2002a), Table 1 - Priority Toxic Pollutants:

A This recommended water quality criterion was derived from data for arsenic (III), but is applied here to total arsenic, which might imply that arsenic (III) and arsenic (V) are equally toxic to aquatic life and that their toxicities are additive. In the arsenic criteria document (EPA 440/5-84-033, January 1985), Species Mean Acute Values (SMAVs) are given for both arsenic (III) and arsenic (V) for five species, and the ratios of the SMAVs for each species range from 0.6 to 1.7. Chronic values are available for both arsenic (III) and arsenic (V) for one species; for the fathead minnow, the chronic value for arsenic (V) is 0.29 times the chronic value for arsenic (III). No data are known to be available concerning whether the toxicities of the forms of arsenic to aquatic organisms are additive.
D Freshwater and saltwater criteria for metals are expressed in terms of the dissolved metal in the water column. The recommended water quality criteria value was calculated by using the previous 304(a) aquatic life criteria expressed in terms of total recoverable metal, and multiplying it by a conversion factor (CF). The term "Conversion Factor" (CF) represents the recommended conversion factor for converting a metal criterion expressed as the total recoverable fraction in the water column to a criterion expressed as the dissolved fraction in the water column. (Conversion Factors for saltwater CCCs are currently unavailable. Conversion factors derived for saltwater CMCs have been used for both saltwater CMCs and CCCs). See "Office of Water Policy and Technical Guidance on Interpretation and Implementation of Aquatic Life Metals Criteria," October 1, 1993, by Martha G. Prothro, Acting Assistant Administrator for Water, available from the Water Resource center, USEPA, 401 M St., SW, mail code RC4100, Washington DC 20460; and 40CFR 131.36(b)(1). Conversion Factors applied in the table can be found in Appendix A to the Preamble - Conversion Factors for Dissolved Metals.
F The deviation of this value is presented in the Red Book (EPA 440/9-76-023, July 1976).
G The criterion is based on 304(a) aquatic life criterion issued in 1980 and was issued in one of the following documents: Aldrin/Dieldrin (EPA 440/5-80-019), Chlordane (EPA 440/5-80-027), Dichlorodiphenyltrichloroethane (DDT) (EPA 440/5-80-38), Endosulfan (EPA 440/5-80-046), Endrin (EPA 440/5-80-047), Heptachlor (EPA 440/5-80-052), Hexachlorocyclohexane (EPA 440/5-80-054), Silver (EPA 440/5-80-071), The minimum data requirements and derivation procedures were different in the 1980 Guidelines than in the 1985 Guidelines. For example, a "CMC" derived using the 1980 Guidelines was derived to be used as an instantaneous maximum. If assessment is to be done using an averaging period, the values given should be divided by 2 to obtain a value that is more comparable to a CMC derived using the 1985 Guidelines.
N This criterion applies to total polychlorinated biphenyls (e.g. the sum of all congener or all isomer or homolog or Aroclor analyses.)
Q This recommended water quality criterion is expressed as mg free cyanide (as CN)/L.
V This value was derived from data for heptachlor, and the criteria document provides insufficient data to estimate the relative toxicities of heptachlor and heptachlor epoxide.
Y This value was derived from data for endosulfan and is most appropriately applied to the sum of alpha-endosulfan and beta-endosulfan.
aa This criterion is based on a 304(a) aquatic life criterion issued in 1980 or 1986, and was issued in one of the following documents : Aldrin/Dieldrin (EPA 440/5-80-019), Chlordane (EPA 440/5-80-027), DDT (EPA 440/5-80-038), Endrin (EPA 4405-80-047), Heptachlor (EPA 440/5-80-052), Polychlorinated biphenyls (EPA 440/5-80-068), Toxaphene (EPA 440/5-86-006). This CCC is currently based on the Final Residue Value (FRV) procedure. Since the publication of the Great Lakes Aquatic Life Criteria Guidelines in 1995 (60 FR 15393-15399, March 23, 1995), the EPA no longer uses the Final Residue Value procedure for deriving CCCs for new or revised 304(a) aquatic life criteria. Therefore, the EPA anticipates that future revisions of this CCC will not be based on FRV procedure.
bb This water quality criterion is based on a 304(a) aquatic life criterion that was derived using the 1985 Guidelines (*Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses*, PB85-227046, January 1985) and was issued in one of the following criteria documents: Arsenic (EPA 440/5-84-033), Cadmium (EPA 882-R-01-001), Chromium (EPA 440/5-84-029), Copper (EPA 440/5-84-031), Cyanide (EPA 440/5-84-028), Lead (EPA 440/5-84-027), Nickel (EPA 440/5-86-004), Pentachlorophenol (EPA 440/5-86-009), Toxaphene (EPA 440/5-86-006), Zinc (EPA 440/5-87-003).
cc When the concentration of dissolved organic carbon is elevated, copper is substantially less toxic, and use of Water-Effect Rations might be appropriate.
dd The selenium criteria document (EPA 440/5-87-006, September 1987) provides that if selenium is as toxic to saltwater fishes in the field as it is to freshwater fish in the field, the status of the fish community should be monitored whenever the concentration of selenium exceeds 5.0 mg/L in salt water because the saltwater CCC does not take into account uptake via the food chain.
ee This recommended water quality criterion was derived on page 43 of the mercury document (EPA 440/5-84-026, January1985). The saltwater CCC of 0.025 µg/L given on page 23 of the criteria document is based on the Final Residue Value procedure in the 1985 Guidelines. Since the publication of the Great Lakes Aquatic Life Criteria Guidelines in 1995 (60 FR 15393-15399, March 23, 1995), the Agency no longer uses the Final Residue Value procedure for deriving CCCs for new or revised 304(a) aquatic life criteria.
ff This recommended water quality criterion was derived in Ambient Water Quality Criteria Saltwater Copper Addendum (draft, April 14, 1995) and was promulgated in the Interim final National Toxics Rule (60 FR 22228-222237, May 4, 1995).
gg EPA is actively working on this criterion, and so this recommended water quality criterion may change substantially in the near future.
hh This recommended water quality criterion was derived from data for inorganic mercury (II), but is applied here to total mercury. If a substantial portion of the mercury in the water column is methylmercury, this criterion will probably be under protective. In addition, even though inorganic mercury is converted to methylmercury, and methylmercury bioaccumulates to a great extent, this criterion does not account for uptake via the food chain because sufficient data were not available when the criterion was derived.
ii This criterion applies to DDT and its metabolites (that is, the total concentration of DDT and its metabolites should not exceed this value.)

TABLE H-1: SURFACE WATER QUALITY CRITERIA FOR THE SAN FRANCISCO BAY (CONTINUED)

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

The following lettered footnotes are derived from EPA "Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California" (EPA 2000).

ll This criterion is based on 304(a) aquatic life criterion issued in 1980, and was issued in one of the following documents: Aldrin/ Dieldrin (EPA 440/5-80-019), Chlordane (EPA 440/5-80-027), DDT (EPA 440/5-80-038), Endosulfan (EPA 440/5-80-046), Endrin (EPA 440/5-80-047), Heptochlor (440/5-80-025), Hexachlorocyclohexane (EPA 440/5/80/054), Silver (EPA 440/5-80-071) (originally footnote g in CTR).

mm Criteria for these metals are expressed as a function of the water-effect ratio (WER) (originally footnote I in the CTR).

nn No criterion for protection of human health from consumption of aquatic organisms (excluding water) was presented in the 1980 criteria document or in the 1986 Quality Criteria for Water. Nevertheless, sufficient information was presented in the 1980 document to allow a calculation of a criterion, even though the results of such calculations were not shown in the document.

oo These freshwater and saltwater criteria for metals are expressed in terms of dissolved fraction of the metal in the water column. Criterion values were calculated by using EPA's Clean Water Act 304(a) guidance values (described in the total recoverable fraction) and then applying the conversion factors in 131.36(b)() and (2).

pp These criteria were promulgated for specific waters in California in the National Toxics Rule (NTR). The specific waters to which the NTR criteria apply include Waters of the State defined as bays or estuaries, including the San Francisco Bay upstream to and including Suisun Bay and the Sacramento-San Joaquin Delta. This section does not apply instead of the NTR for these criteria.

rr PCBs are a class of chemicals that include Aroclors 1242,1254,1221,1232,1248,1260, and 1016. The aquatic life criteria apply to the sum of this set of seven Aroclors.

The following numbered footnotes are derived from "A Compilation of Water Quality Goals" (Water Board 2000). These footnotes directly correlate with the source document.

1 Expressed as dissolved
2 Expressed as total recoverable
6 Pentavalent arsenic [As(V)] effects on plants.
20 For halomethanes
22 For chlorinated benzenes
23 Toxicity to a fish species exposed for 7.5 days
24 For dichlorobenzenes
27 For dichloroethylenes
28 For dichloropropanes
29 For dichloropropenes
38 Toxicity to algae occurs
45 For phthalate esters
48 For chlorinated naphthalenes
51 From U.S. Environmental Protection Agency, *Quality Criteria for Water* (1976) "The Red Book."
52 For polycyclic aromatic hydrocarbons
53 For dinitrotoluenes
56 For nitrosamines
68 Draft/tentative/provisional; applies only to second value if more than one value is listed.
82 A decrease in the number of algal cells occurs.
83 Adverse effects on a fish species exposed for 168 days.
88 For nitrophenols
95 For the pentavalent form
114 Developed as 24-hour average using 1980 EPA guidelines, but applied as 4-day average in the National Toxics Rule and/or Proposed California Toxics Rule.
115 Criterion most appropriately applied to the sum of alpha-endosulfan and beta-endosulfan.
116 Applies separately to Aroclors 1242, 1254, 1221, 1232, 1248, 1260, and 1016; based on carcinogenicity at 1-in-a-million risk level.
142 Criteria do not apply to waters subject to water quality objectives in Tables III-2A and III-2B of the San Francisco Bay Regional Water Quality Control Board's 1986 Basin Plan.
143 These criteria were promulgated for specific California waters in the National Toxics Rule.
144 The ambient level was set at or below the minimum reported detection limit.
145 The ambient concentration represents the 95th percentile of the distribution. Additionally, the 95th percentile of the distribution was calculated using distribution dependent formulae. For normal and lognormal distributions, the 95th percentile calculation used the parameters of the best-fitted regression line drawn through the detected values on the probability plot. For nonparametric distribution, the analytical formula was used (Gilbert 1987).

References:

Gibert, R.O. 1987 *Statistical Methods for Environmental Pollution Monitoring*. Van Nostrand Reinhold, New York.

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Water Board. 2000. "A Compilation of Water Quality Goals." Prepared by Jon B. Marshack, Central Valley Region. August.

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Tetra Tech EM Inc. 1999. "Draft Remedial Investigation Report, Site 12 Operable Unit, Naval Station Treasure Island, San Francisco, California." June 1.

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U.S. Environmental Protection Agency (EPA). 2000. "Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California." 40 CFR Part 131, RIN 2040-AC44. May 18.

EPA. 2002a. "National Recommended Water Quality Criteria: 2002." EPA-822-R-02-047. November.

EPA. 2002b. "Revision of National Recommended Water Quality Criteria." FRL-OW-7431-3. December 27.

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
23	Chromium VI and nickel	Section 2.5.2	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Section 3.2. SulTech. November 30, 2007.

3.2 ENVIRONMENTAL EVALUATION

Chemicals present in both the A-aquifer and the B-aquifer groundwater at Parcel D were evaluated to assess potential environmental impacts to the Bay. This evaluation was completed as part of the derivation of trigger levels for chemicals that present a potential impact to the Bay in Appendix I. The first step of this evaluation consisted of a screening-level comparison of chemical concentrations measured in groundwater to surface water criteria and HGAL (for metals only). Appendix H lists available state and federal surface water criteria and summarizes the criteria selected for use in the screening-level evaluation. Although complete exposure pathways from known groundwater plumes at Parcel D to the Bay are not known to currently exist, a potential threat to the Bay exists if chemicals currently present in groundwater at concentrations above the screening criteria reach the Bay.

Concentrations of all chemicals detected in the A- and B-aquifers were compared to the selected screening criteria; those chemicals for which maximum concentrations exceeded screening criteria were identified as COPECs. This comparison is shown in Appendix H, Section H3.0. As shown in these tables, 12 COPECs were identified as a result of this comparison (9 metals; a VOC, ethylbenzene; an SVOC, acenaphthylene; and cyanide).

The next step of the environmental evaluation involved a well-by-well analysis of the analytical results for the 12 identified COPECs to assess potential threats to the Bay (see Appendix H, Section H3.0). Based on this evaluation, chromium VI and nickel were identified as COCs in the A-aquifer based on the environmental evaluation in Appendix H.

- **Chromium VI** is identified as a COC due to detections in both the defined plumes and in individual wells in the A-aquifer, which contain concentrations of this metal that consistently exceeded the surface water criteria. The locations of the elevated chromium VI concentrations are mostly near IR-09 where there was a known source of chromium from painting operations. Twenty-five samples contained concentrations exceeding the surface water criteria based on results from 171 groundwater samples collected from the A-aquifer at Parcel D. Consistent elevated concentrations of chromium VI were detected in wells IR09MW35A and IR09PPY1, and recent results exceeded the surface water screening criteria in groundwater from wells IR09MW63A and IR33MW61A. Chromium VI is also present in several other A-aquifer wells at Parcel D, although it does not exceed the surface water criteria. No chromium VI was detected in samples collected from the B-aquifer. The current locations of chromium VI in the A-aquifer groundwater at Parcel D are not near the Bay and do not appear to pose an immediate threat to the surface water.

- **Nickel** is identified as a COC due to detections in a single well that consistently exceeded surface water criteria, and historical detections of nickel in an adjacent well that also exceeded surface water criteria. These concentrations of nickel indicate a localized area of nickel-impacted groundwater. The source of the nickel is not known. 121 samples contained concentrations exceeding the surface water criteria, and 18 samples contained concentrations exceeding the HGAL for nickel, based on results from 275 groundwater samples collected at Parcel D. Consistent elevated concentrations of nickel were detected in well IR09P043A and sporadic detections of nickel that exceeded the HGAL were detected in other nearby wells. Nickel is also present in samples from several other A-aquifer wells at Parcel D. However, results from these samples do not exceed the respective HGAL, indicating natural concentrations of nickel from the native and non-native soils in contact with the A-aquifer. Nickel was not detected at concentrations exceeding the surface water criteria in the B-aquifer. The current location of elevated nickel in the A-aquifer groundwater at Parcel D is not near the Bay and does not appear to pose an immediate threat to the surface water.

The other 10 COPECs were not identified as COCs during the evaluation in Appendix H.

3.3 REMEDIATION GOALS AND GROUNDWATER TRIGGER LEVELS

Remediation goals were developed for the COCs identified for soil and groundwater, using the methodology described below. In accordance with CERCLA guidance, development of remediation goals for soil was limited to the COCs identified based on the incremental risk evaluation, which excludes the risks posed by metals at concentrations below ambient levels. Remedial goals for groundwater were developed based on the results of the HHRA accounting for the HGAL levels.

An ecological evaluation was performed to assess whether groundwater was impacting surface water. Trigger levels were developed for this pathway as part of this ecological evaluation for groundwater plumes identified as potential risks to the surface water of the Bay. The trigger levels are unique to each plume source, primarily based on the source width and the distance from the plume source to the Bay, and are a means of relating the surface water quality criteria to the groundwater. As explained below, the trigger levels would provide a means to determine when further studies or remedial action may be required to protect the Bay.

3.3.1 Soil

Remediation goals for COCs in soil were selected based on a comparison of the COC-specific RBC, the laboratory practical quantitation limit (PQL) based on standard EPA analytical methods, and the HPAL (metals only). The highest of these three concentrations was selected as the remediation goal for soil for each COC. Exposure scenario-specific RBCs were calculated based on a target cancer risk level of 1×10^{-6} and target noncancer HI of 1.0, consistent with the exposure pathways and assumptions used in the HHRA to assess risks. Table 3-16 presents the remediation goals for COCs in soil.

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
24	Environmental impacts to the Bay	Section 2.5.2	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Appendix H. SulTech. November 30, 2007.

APPENDIX H
PRELIMINARY SCREENING OF GROUNDWATER IMPACTS TO SAN FRANCISCO BAY

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ACRONYMS AND ABBREVIATIONS

µg/L	Microgram per liter
Basin Plan	Water Quality Control Plan for the San Francisco Bay Basin
CCC	Criterion continuous concentration
CMC	Criterion maximum concentration
COC	Chemical of concern
COPEC	Chemical of potential ecological concern
CTR	California Toxics Rule
EPA	U.S. Environmental Protection Agency
FAV	Final acute values
FCV	Final chronic values
FPV	Final plant values
FRV	Final residue values
FS	Feasibility Study
HGAL	Hunters Point groundwater ambient level
HPS	Hunters Point Shipyard
Navy	U.S. Department of the Navy
NAWQC	National Ambient Water Quality Criteria
NRWQC	National Recommended Water Quality Criteria
Water Board	San Francisco Bay Regional Water Quality Control Board

H1.0 INTRODUCTION

This appendix summarizes the screening evaluation of chemicals detected in groundwater at Parcel D. This evaluation was developed because chemicals in groundwater at Hunters Point Shipyard (HPS) have the potential to affect surface waters if they migrate and discharge to San Francisco Bay at sufficiently high concentrations. Surface water quality criteria, such as the National Ambient Water Quality Criteria (NAWQC) and the California Toxics Rule (CTR), have been developed to protect the environment, including marine organisms, from effects caused by chemicals in surface water. The beneficial uses of groundwater do not include maintenance of freshwater or marine organisms because these organisms do not live in groundwater. No water quality criteria for the protection of organisms exist for groundwater; therefore, alternative water quality criteria for groundwater must be developed to evaluate the potential for chemicals in groundwater at HPS to result in effects to the bay.

There are no surface water bodies on Parcel D; however, the Navy evaluated federal and state surface water quality criteria as potential applicable or relevant and appropriate requirements (ARAR) for Parcel D because groundwater discharges to the bay. The Navy has concluded that the state standards promulgated in Table 3-3 of the Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) and the federal standards promulgated in the CTR are potential ARARs for the A- and B-aquifers at Parcel D to be met at the interface of groundwater and the bay. Conversely, the Navy has concluded that the guidelines in the National Recommended Water Quality Criteria (NRWQC) (U.S. Environmental Protection Agency [EPA] 2006) and the NAWQC are not ARARs for the interface of the A- and B-aquifer groundwater and the bay because other standards (such as Table 3-3 and CTR) are better suited to Parcel D. (Refer to Section D2.1.3 in Appendix D for a detailed discussion of ARARs for surface water.) All of these standards apply to surface water; none of them applies to groundwater. Therefore, these potential ARARs for surface water would be applied to the surface water at the interface of A- and B-aquifer groundwater but would not be used to set cleanup standards for in situ A- or B-aquifer groundwater at Parcel D.

The evaluations in this appendix consider both ARAR-based surface water quality criteria (Table 3-3 and CTR) and non-ARAR-based criteria (NRWQC and NAWQC) for screening data at Parcel D to provide a comprehensive analysis based on agreements with the regulatory agencies. However, chemicals of concern (COC) are identified based on ARARs (Table 3-3 and CTR), as well as on the screening evaluation. The identified COCs will be included in the remedial design during preparation of the groundwater monitoring plan.

The nearest surface water body to Parcel D, where CTR is applicable, is the bay. Chemicals in groundwater at Parcel D could affect surface water quality as the contaminated groundwater migrates and discharges to the bay. Therefore, the Navy developed trigger levels at various inland locations to ensure surface water quality criteria are not exceeded if groundwater at Parcel D discharges to the bay. These trigger levels are intended to prevent discharging chemicals to the bay at concentrations sufficient to affect the surface water quality. The trigger levels are intended to serve as comparison values for groundwater to indicate when additional evaluation may be necessary. The development of the trigger levels is discussed in Appendix I;

however, the appropriate surface water quality criteria to use for the bay near Parcel D had to be selected before the inland concentrations could be developed. Once these criteria were selected, the surface water quality criteria were screened against the chemical concentrations in groundwater to identify the chemicals that would be considered chemicals of potential ecological concern (COPEC) for surface water quality. Site-specific data were then evaluated to identify COCs in groundwater.

Section H2.0 of this appendix identifies the surface water quality criteria that are protective of marine organisms in the bay under long-term (chronic) exposure scenarios. Section H3.0 summarizes the results of the screening of concentrations in groundwater at Parcel D with the appropriate surface water quality criteria, highlighting chemicals where the maximum concentrations in groundwater exceeded the surface water quality criteria for the bay, and identifies COCs for groundwater. These chemicals were then further evaluated, considering frequency of detection and location to select COCs. A series of tables presents this evaluation. Section H4.0 summarizes the review of uncertainty related to the use of promulgated surface water quality criteria for the bay. Section H5.0 presents the results of the evaluation, listing the COCs. References for this appendix are provided in Section H6.0.

H2.0 SELECTION OF SURFACE WATER QUALITY SCREENING CRITERIA

Surface water quality criteria are not applicable to groundwater; however, potential impacts to the bay could occur if concentrations of chemicals in groundwater that exceed surface water quality criteria were to discharge to surface waters. This highly conservative screening method minimizes the potential that discharge of groundwater from Parcel D would affect marine organisms in the bay.

As directed by Section 304(a) of the Clean Water Act, EPA develops and publishes NRWQC as guidance to states and tribes for the promulgation of their respective surface water quality standards (EPA 2006). The law requires that these criteria be based on the latest scientific knowledge. State and regional regulatory agencies responsible for monitoring and maintaining beneficial use of the waters of the state often adopt national criteria, with modifications that reflect regional conditions, including naturally occurring (ambient) concentrations of metals or other variables. As noted in Section H1.0, criteria from the Basin Plan and the CTR are ARARs, while the other criteria are not.

Surface water quality criteria selected for consideration at HPS were compiled through a review of published regulatory standards, goals, and guidance, including those established by the San Francisco Bay Regional Water Quality Control Board (Water Board) in "Water Quality Control Plan, San Francisco Bay Basin Region" (Water Board 2006a) and "A Compilation of Water Quality Goals" (Marshack 2007); the EPA in the CTR (EPA 2000) and NRWQC (EPA 2006); and other sources, as appropriate (Water Board 1998). Although only the Basin Plan and the CTR are applicable, this wider screening evaluation was completed at the request of the Base Realignment and Closure Cleanup Team. Table H-1 presents this compilation of surface water quality criteria and the relevant sources for each criterion.

The compilation and selection of surface water quality criteria to be used for a preliminary screening of the groundwater data are described in Section H2.1. Because the only available criterion for chromium was based on chromium VI, the U.S. Department of the Navy (Navy) derived a surface water quality criterion for chromium III for this project; the methods and rationale for the derivation of the chromium III value are presented in Section H2.2. Like the NAWQC and NRWQC, the criterion for chromium III is not an ARAR. Results for groundwater samples at Parcel D also were compared with Hunters Point groundwater ambient levels (HGAL) to distinguish site-related chemicals from those present at ambient concentrations (PRC Environmental Management, Inc. 1996), as discussed in Section H2.3.

H2.1 COMPILATION AND SELECTION OF SURFACE WATER QUALITY CRITERIA

Two levels of protectiveness, differentiated by estimates of exposure duration, are addressed by surface water quality criteria. Acute exposure is generally defined as less than 96 hours, while chronic exposure is a period of time longer than acute exposure, and includes durations up to the organism's entire lifetime. In general, the acute exposure criteria are much higher than the chronic exposure criteria because of the much shorter exposure duration under the acute scenario. The surface water quality criteria are not simply numerical targets; the criteria specify a magnitude, duration, and frequency to be met in order to provide protection of marine organisms. For example, chronic criteria are applied as a limit on the 4-day average concentration in the environment. Both the acute and chronic criteria are values that are not to be exceeded more than once in 3 years.

The connection between groundwater at Parcel D and the bay is assumed to be complete. However, selection of appropriate surface water quality criteria (acute or chronic) for the protection of marine organisms at a given site requires that the exposure scenario be defined. Normally, short-term exposure to a groundwater discharge prior to dilution in the receiving waters would be considered an acute exposure. This acute exposure could occur only very close to the discharge point. The longer-term exposures that occur within the receiving water, after dilution and mixing have occurred, are considered chronic exposures. However, for identifying the COPECs (1) the chronic (long-term) surface water criteria were used as screening criteria, and (2) no dilution of the groundwater within the bay was assumed. These two conditions cannot realistically co-occur because mixing of groundwater and the bay must occur as chronic exposure occurs (more than 96 hours); still, both assumptions are used initially to select COPECs. Although the Navy and the regulatory agencies debated the merits and drawbacks of adopting a conservative approach, the regulatory agencies' opinion was that a very high level of conservatism was required. The Navy therefore agreed to pursue this evaluation using several highly conservative assumptions.

Available surface water quality criteria are shown in Table H-1. For some chemicals, no chronic laboratory tests have been conducted, so the acute test results were adjusted to estimate a chronic value (by lowering the value by 80 percent [EPA 1986]). Acute exposure is represented by the criterion maximum concentration (CMC), which is an estimate of the highest concentration of a chemical in surface water to which an aquatic community can be exposed briefly (generally from 48 to 96 hours) without resulting in an unacceptable effect (EPA 2006).

Chronic exposure is represented by the criterion continuous concentration (CCC), which is an estimate of the highest concentration of a chemical in surface water to which an aquatic community can be exposed indefinitely without resulting in an unacceptable effect (EPA 2006).

As a practical matter, marine organisms in the bay will be exposed to undiluted groundwater only briefly and at the precise point of its entry to the bay. Even at the point of entry into the bay, some dilution of the chemical concentrations in groundwater will already have occurred within the tidal mixing zone that extends landward from the sediment-to-water interface. The acute exposure scenario best represents the actual exposure of organisms to chemicals in the groundwater plume living at the sediment-water interface because of the short time before groundwater mixes with the surrounding surface water. Once the expected mixing of discharged groundwater with receiving waters occurs, a chronic exposure scenario is more representative of conditions experienced by marine organisms.

The Water Board (2006b) has requested that the Navy focus on the point at which groundwater enters the bay rather than on the post-mixing conditions that prevail more generally; elimination of mixing within the bay adds a significant conservative element to the evaluation. Therefore, the acute exposure scenario, represented by the CMCs, is the most relevant and appropriate set of surface water criteria for this evaluation. However, the chronic surface water quality criteria were used for this evaluation to maintain consistency with agreements between the Navy and the Water Board to provide a highly conservative approach. Use of chronic instead of acute criteria adds a further degree of conservatism to the assessment. Uncertainties associated with use of the chronic criteria in an acute exposure scenario are discussed in Section H4.0.

A set of surface water quality criteria was selected for use in the screening-level evaluation from available regional, state, and federal surface water criteria, as shown in Table H-1. Individual toxicity criteria were selected using a methodology that sorts and selects criteria according to applicability and quality of data. First, criteria were sorted by applicability and quality of data into one of four tiers. Chronic exposure toxicity criteria were identified as most applicable for the exposure scenario at Parcel D and more protective (lower concentration values) than short-duration acute or instantaneous exposure toxicity criteria (higher concentration values). As a result, applicable chronic exposure toxicity criteria were placed in the first tier of applicability. Where more than one applicable toxicity value was available in the same tier, the most protective (lowest) value was selected for screening purposes.

If no first tier criterion was available for a specific chemical, an acute value was selected as a second tier criterion. Each acute criterion was made more protective by applying the standard convention of lowering the value by 80 percent to make the acute criteria more appropriate for use in chronic exposure scenarios (EPA 1986). Where no first or second tier criteria were available, instantaneous criteria were used as third tier criteria. Each instantaneous criterion was made more protective by lowering the value by 90 percent to make the instantaneous criteria more appropriate for use in chronic exposure scenarios (EPA 1986). The last column in Table H-1 indicates the surface water quality criteria that were selected as screening criteria for groundwater.

H2.2 DERIVATION OF CHROMIUM III WATER QUALITY CRITERIA

No marine chronic value for chromium III has been derived by the regulatory agencies responsible for maintaining water quality because chromium III is not considered a major environmental threat. As discussed later in this section, EPA (1980) found that data were not sufficient to justify setting a marine criterion for chromium III. Attention has been focused on chromium VI, for which toxic effects have been well demonstrated. Likewise, during the groundwater assessments at HPS, chromium III is not considered of great concern; however, concentrations of chromium III may increase as a byproduct of natural or induced degradation of the chromium VI plumes. Chromium III concentrations in groundwater will be screened against a derived chromium III surface water criterion. The chromium VI criteria are generally the only standards for chromium in marine surface water (EPA 2006). Instead of surface water criteria for chromium III in marine waters, states often use the chromium VI value as a default, with an acknowledgement that chromium III is considerably less toxic.

Although a wide variety of procedures has been used to derive surface water criteria, most of these procedures have been developed using some variation of the theoretical toxicological approach, which is an effects-based approach that relies on published toxicity data from the scientific literature.

EPA's formal protocol for deriving surface water criteria for the protection of marine organisms and their uses requires information on the physical and chemical properties of the substance under consideration, on its toxicity to aquatic plants and animals, on its bioaccumulation in marine organisms, and on its potential effects on consumers of aquatic biota (Stephan and others 1985). The formalized protocol includes specific procedures for calculating final acute values (FAV), final chronic values (FCV), final plant values (FPV), and final residue values (FRV) from the available data, provided that the minimum data requirements have been met. For example, derivation of a FAV for marine and estuarine waters requires acute toxicity data on at least eight families of marine organisms, including at least two families of chordates, five families of invertebrates, and one other family (such as a plant). The short-term CMC of the substance is then calculated by applying a safety factor (0.5) to the FAV. The lowest of the FCV, FPV, and FRV is used directly to establish the long-term mean CCC. The criteria are then subjected to critical review to evaluate the completeness of the data and the appropriateness of the results.

When EPA developed surface water criteria in the 1980s, it was known that chromium VI was the form of chromium that was most readily absorbed by living organisms, and that chromium III had low solubility and toxicity in saltwater. A review of the literature on toxicity of chromium III to marine organisms in EPA (1980) listed no chronic studies and only two acute studies (oyster and crab zoea). The data were considered insufficient at that time to support the development of an acute or chronic marine criterion for chromium III. A review of toxicity of chromium III to marine organisms yielded no new studies conducted since the original surface water criteria were developed. The available toxicity data are reviewed below.

The mean acute toxicity value for the oyster was 10,300 micrograms per liter (µg/L) of total recoverable chromium III (Calabrese 1973, as cited in EPA 1980); for crab zoea, the mean acute value was 56,000 µg/L. Based on these data, EPA (1980, page B-7) concluded that "…probably because of precipitation, a large amount of trivalent chromium must be added to saltwater to kill aquatic organisms." For example, polychaete worms exposed to 50,400 µg/L were killed, likely because of a drop in pH (4.5) from chromium precipitation. When pH was held stable, the worms survived and reproduced at the 50,400 µg/L exposure concentration (Mearns and others 1976, as cited in EPA 1980).

In a review of chromium III hazards to marine organisms, Eisler (1986) listed a range of acute toxicity values from 3,300 µg/L (fish, 96 hours) to 56,000 µg/L (crab, 96 hours). The only chronic value available (12,500 µg/L) was based on a 21-day test of the polychaete worm *Neanthes arenaceodentata*. In acute tests, this polychaete was the most sensitive species tested.

The lack of chronic marine data for chromium III requires that some assumptions be made to derive a surface water criterion for this metal. Acute criteria are typically reduced by 80 percent to make acute water criteria more appropriate for use in chronic exposure scenarios (EPA 1986). The table below presents acute toxicity data for marine species exposed to chromium III with adjustments for chronic exposure. The lowest chronic value for chromium III in marine water (400 µg/L) was selected as the surface water criterion for Parcel D. Use of chronic instead of acute criteria and use of the lowest estimated chronic value add a further degree of conservatism to the assessment, as agreed to with the regulatory agencies.

Chromium III Toxicity to Marine Organisms

Exposure			
Acute (µg/L)	**Estimated Chronic* (µg/L)**	**Effect**	**Reference**
2,000 to 105,000	400 to 21,000	Mean acute toxicity, multiple Species	EPA 1980
3,300 to 56,000	660 to 11,200	Acute (96 hours) toxicity, multiple species	Eisler 1986
10,300	2,060	Acute toxicity to American oyster	Calabrese 1973, as cited in EPA 1980
None	12,500 (actual chronic exposure)	Toxicity to *Neanthes arenaceodentata*	Eisler 1986
50,800	Not applicable	No effect on survival or reproduction in *Neanthes arenaceodentata*	Mearns and others, as cited in EPA 1980

Notes:

* Acute-to-chronic adjustment defined as a reduction of the acute level by 80 percent (EPA 1986).

H2.3 CONSIDERATION OF AMBIENT GROUNDWATER CONCENTRATIONS

Navy policy requires that regional background or ambient concentrations of chemicals be explicitly considered during the selection of COPECs (Navy 2004). To avoid selecting chemicals for which the allowable concentration in groundwater is less than the HGAL, the higher of the water quality criteria or the HGAL was selected as the water quality screening criterion that was used to identify COPECs. HGALs for metals are included in the groundwater screening presented in Section H3.0.

H3.0 GROUNDWATER SCREENING RESULTS

The data set used for the groundwater screening includes data through November 2004. Groundwater data are included from both the A-aquifer and the B-aquifer at Parcel D. (Refer to Section 2.2.8.1 of the main text of this Revised Feasibility Study [FS] Report for a discussion of the hydrogeology of Parcel D, and see Figure 2-8 for a cross section illustrating the relationships between the aquifers.) Groundwater data are available in Appendix A. Maximum concentrations of chemicals detected in both the A-aquifer and the B-aquifer groundwater at Parcel D were screened against the surface water quality screening criteria identified in Section H2.0 and in Table H-1. Chemicals were eliminated from the analysis when no surface water criteria or HGALs were available.

The chemicals in the following table were eliminated based on the lack of an established criterion for surface water quality.

Chemical Eliminated Because No Established Criterion for Surface Water Quality was Available	
1,1,2-Trichloroethane	Carbon disulfide
1,1-Dichloroethane	Chloride
2,4-Dimethylphenol	Cobalt
2-Hexanone	Dibenzofuran
2-Methylnaphthalene	Iron
2-Methyl-2-pentanone	Magnesium
4-Methylphenol	Manganese
Acetone	Molybdenum
Aluminum	Potassium
Antimony	Sodium
Barium	Vanadium
Beryllium	Xylene (total)
Bis(2-ethylhexyl)phthalate	Vinyl chloride
Calcium	

In the A-aquifer, chemicals detected at maximum concentrations that exceeded water quality screening criteria were identified as COPECs. Nine metals (see Table H-2); one volatile organic compound, ethylbenzene (see Table H-3); one semivolatile organic compound, acenaphthylene (see Table H-4); and cyanide (see Table H-5) were identified as COPECs in the A-aquifer samples because they exceeded the water quality screening criteria.

In the B-aquifer, only zinc exceeded water quality screening criteria, in a single sample collected in October 2000. As a result, no further environmental evaluation of B-aquifer groundwater was performed. All of the B-aquifer data are presented in Appendix A of this Revised FS Report.

Concentrations of each of the selected COPECs were further evaluated using the following criteria to evaluate the likelihood that they would affect the bay:

1. Do measured concentrations consistently exceed surface water quality criteria during subsequent sampling events?

2. When was the most recent sample collected that exceeded the surface water quality criterion?

3. Can concerns about the COPEC be eliminated based on professional judgment of the extent and degree of the interpreted effect to the groundwater? The extent and degree of effect was assessed by reviewing the locations of recently detected concentrations, the likelihood that recently detected concentrations pose a threat to the bay, and concentration trends on a well-by-well basis.

Finally, ARARs were reviewed to determine where chemical-specific ARARs are potentially applicable (see Appendix D of this Revised FS Report). The Navy has identified the substantive provisions of the CTR (Title 40 of the *Code of Federal Regulations* Section 131.38) as potentially applicable federal chemical-specific ARARs and Table 3-3 of the Basin Plan as potentially applicable state chemical-specific ARARs for surface water, at the interface of the groundwater and the bay.

These evaluation criteria were applied on a well-by-well basis for each well with detected concentrations of COPECs (see Tables H-5 and H-6).

H3.1 CHEMICALS ELIMINATED AS CHEMICALS OF POTENTIAL ECOLOGICAL CONCERN

Refinement of the list of COPECs included evaluation of the frequency of exceedance of the water quality screening level and the date the most recent exceedance was detected. The evaluation focused on the trend in detections—especially consistency, magnitude that a criterion was exceeded, and whether concentrations detected below the surface water quality criterion were found in samples collected after samples with concentrations that exceeded the criterion. Concentration data indicated that detections for all 12 COPECs at Parcel D that exceeded each surface water quality criterion were isolated and infrequent, but no COPECs were eliminated

based only on frequency of detection or date of sample collection. Nine COPECs were eliminated from further consideration based on the results presented below.

Chemical	Frequency of Exceedance	Table Reference	Date of Most Recent Exceedance*
Arsenic	3/223	H-2	Jan-94
Cadmium	3/223	H-2	Feb-96
Copper	8/224	H-2	Nov-04
Lead	8/220	H-2	Sep-04
Mercury	2/220	H-2	Feb-96
Zinc	8/229	H-2	Jan-01
Cyanide	7/113	H-5	Sep-94
Ethylbenzene	2/208	H-3	Feb-01
Acenaphthylene	1/226	H-4	Dec-91

Note:

* See Table H-6 for exceedances of criteria

H3.2 CHEMICALS OF CONCERN

Based on the chemical-specific ARARs and the well-by-well evaluation, chromium VI and nickel were identified as COCs. Each chemical is considered a COC for groundwater in the vicinity of the well where it exceeds the corresponding surface water quality criterion, but not for all groundwater at Parcel D.

Nickel concentrations consistently exceeded the HGAL during several continuous sampling events, suggesting that detections of nickel exceeding the HGAL may be caused by site-related activities (see Table H-2). Maximum concentrations in the analysis of chromium VI and nickel in groundwater also exceeded chronic water quality criteria, raising the possibility that marine organisms may be at risk if they were continuously exposed to undiluted groundwater discharged to the bay. It is important to note, however, that the maximum concentration of chromium VI is well below the acute surface water criterion of 1,100 µg/L. The acute criterion for nickel (74 µg/L) is not considered appropriate for HPS because it is lower than the HGAL. The distribution of chromium VI and nickel is described below.

H3.2.1 Chromium VI

Chromium VI was identified as a COC because it was detected in samples collected from both defined plumes and in individual wells in the A-aquifer at concentrations that consistently exceeded the chronic surface water criterion (50 µg/L). The locations of the elevated concentrations of chromium VI are mostly near Installation Restoration Site 09, where there was a known source of chromium from painting operations (see Figure 2-28 in this Revised FS Report for Parcel D). Of 171 groundwater samples collected at Parcel D, 25 samples contained

concentrations that exceeded the chronic surface water criterion for chromium VI (see Table H-2). Chromium VI was consistently elevated in wells IR09MW35A and IR09PPY1, and also in wells IR09MW63A and IR33MW61A (see Table H-2). Chromium VI was present at concentrations below the criterion in several other A-aquifer wells at Parcel D. No chromium VI was detected in samples collected from the B-aquifer.

H3.2.2 Nickel

Nickel was identified as a COC because of repeated exceedances of the HGAL in samples collected from a single well, as well as historical elevated detections of nickel in an adjacent well. These concentrations of nickel indicate a localized area of nickel-impacted groundwater. The source of the nickel is not known. Of the 275 groundwater samples collected at Parcel D from A-aquifer wells, 18 samples exceeded the HGAL (96.48 µg/L) for nickel.

Table H-6 shows consistent elevated concentrations of nickel in samples from wells IR09P043A and sporadic detections of nickel that exceeded the HGAL in other nearby wells (see Figure 2-28 in this Revised FS Report for Parcel D). Nickel is present at concentrations lower than the HGAL in samples from several other A-aquifer wells at Parcel D, reflecting natural concentrations of nickel from the native and non-native soils in contact with the A-aquifer. Nickel was not detected at concentrations exceeding the screening criterion (8.2 µg/L) in the B-aquifer.

H4.0 UNCERTAINTY

Uncertainty plays an important role in risk-based decision-making; therefore, uncertainty is incorporated explicitly into the characterization of potential risk posed by chromium VI and nickel in the A-aquifer at Parcel D. By design, this screening-level evaluation is centered on conservative default assumptions that result in overestimates of risk (EPA 1997). This section describes the magnitude and directional bias in known sources of uncertainty in this evaluation.

Uncertainty is generally defined as a component of risk or degree of hazard resulting from imperfect knowledge of the present or future state of the system under consideration (Suter 1993). Most uncertainty in environmental assessments can be categorized as follows:

- Mistakes in execution of assessment
- Imperfect knowledge of factors that could be known
- Inherent randomness of the natural environment

Compared with the strict numerical criteria that dominate human health evaluations, the use of ecological models and criteria tends to increase the level of uncertainty associated with a groundwater investigation. The sections below include brief reviews of some sources of uncertainty associated with the use of surface water criteria in relation to Parcel D groundwater.

H4.1 UNCERTAINTY IN DEVELOPMENT OF SURFACE WATER QUALITY CRITERIA

For marine organisms, the NRWQC are derived using a methodology published in "Guidelines for Deriving Numeric National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses" (Stephan and others 1985). Under these guidelines, criteria are developed from data quantifying the sensitivity of species to toxic compounds in controlled studies. Almost all of the data used to derive the criteria are from studies on animals and plants under controlled laboratory conditions. No adjustment for laboratory to field variance is typically made.

It is possible to conduct long-term sublethal laboratory tests to derive chronic water quality criteria. In reality, though, chronic toxicity tests are much more expensive than acute tests and are not as frequently conducted. For many chemicals, chronic toxicity testing data are inadequate to meet the minimum requirement of eight families of marine organisms to develop surface water criteria. In such instances, EPA allows the estimation of a chronic criterion from the FAV using ratios derived from studies in which both acute and chronic tests have been conducted simultaneously for the same species. Acute-to-chronic ratios are calculated for each set of parallel tests, then averaged (using the geometric mean) to arrive at the final acute-to-chronic ratio. The acute-to-chronic ratio is the ratio of the acute toxicity to chronic toxicity of a chemical or sample that can be used to predict acute toxicity from chronic data and vice-versa. Three studies with parallel testing are required to calculate a valid final ratio. The chronic criterion is then calculated from the FAV (not the acute criterion) by dividing it by the final acute-to-chronic ratio. Although the protocol is well-defined, the resulting chronic criterion may bear little relation to actual toxicity experienced by marine organisms in the field.

The saltwater criteria for metals are expressed in terms of dissolved metal in the water column, following EPA protocols. The chronic chromium VI criterion of 50 µg/L was back-calculated from the published dissolved value, which was derived by multiplying the total recoverable concentration by a conversion factor, such as the acute-to-chronic ratio.

For nickel, acute-to-chronic ratios vary widely within and among taxonomic groups. For example, acute-to-chronic ratios determined for soluble nickel for a single aquatic invertebrate (*Daphnia magna*), ranged from 14 to 122 with an average of 51. For a fish (fathead minnow), the acute-to-chronic ratios for soluble nickel ranged from 24 to 53, and for Mysid shrimp a single value of 5.5 was reported. However, the complexity of biological factors that control both acute and chronic responses, and the enormous variety of organism-specific chemistry, suggest that acute-to-chronic ratios should be used with caution, and that uncertainties will certainly limit the accuracy of the resulting water quality criteria (Nickel Institute 2006). The chronic water quality criterion for nickel was less than the HGAL, so the toxicity data were not even considered in this environmental evaluation. The uncertainty associated with predicting toxic effects of nickel in the surface receiving water (San Francisco Bay) illustrates the difficulty of making technically sound remedial decisions using a risk-based approach to an exposure scenario that does not actually occur.

H4.1.1 Speciation and Bioavailability of Chromium III in Receiving Water

Because local, state, and federal applicable or relevant and appropriate requirements do not provide criteria for chromium III in marine waters, most regulatory agencies, including those in California, default to using the chromium VI criteria for all species of chrome. However, chromium III is dramatically less toxic than chromium VI to polychaetes and crustaceans (but not to molluscs or teleosts) in saltwater (Eisler 1986). Given that chromium exists in two major valence states, depending upon the presence of oxygen in the sediment and the water column of the receiving water body, it is essential to distinguish between chromium III and chromium VI. Also, natural and induced degradation of chromium VI may result in increased chromium III concentrations. In saltwater, chromium III is relatively nontoxic and chromium VI is highly toxic. The current science indicates that reduction/oxidation conditions present within the water column and sediment govern the chemistry of chromium, as a recent investigation in Baltimore Harbor has demonstrated (Maryland Department of the Environment 2004). In Baltimore Harbor, low dissolved oxygen in the water column and high biological oxygen demand in the sediment pushed the conversion of chromium VI to chromium III (Maryland Department of the Environment 2004). Much of the chromium III adsorbed to the sediment, where it was involved in reactions that created stable oxides and hydroxides that were unavailable for partitioning into porewater (Maryland Department of Environment 2004).

Uncertainty related to speciation of chromium in receiving waters is by no means a trivial variable. Sensitivity of marine organisms to chromium VI and chromium III varies by several orders of magnitude. *Neanthes arenaceodentata,* a marine polychaete worm, is the most sensitive marine organism reported in the literature (Eisler 1986). Concentrations of chromium VI of less than 100 µg/L interfered with feeding, reproduction, and larval development (Eisler 1986). Yet this same marine species demonstrated no adverse reaction whatsoever to concentrations of chromium III more than 3 orders of magnitude greater than the effect level of chromium VI.

The two forms of chromium differ markedly in their availability to marine organisms. Because of its very low solubility in seawater, chromium III is not readily taken up by organisms. Barnacles (*Balanus* sp.) accumulated chromium VI in their tissues at concentrations up to 1,000 times greater than ambient concentrations. In contrast, chromium III was quickly removed by the filtering activity of the barnacle and was not concentrated in soft tissues. Instead, the barnacle eliminated chromium III via the digestive system, according to studies reported in Eisler (1986).

Studies such as these illustrate the technical flaws in adopting surface water criteria for chromium III developed using test results for chromium VI. The two chemicals are similar in name, but not in toxicity.

H4.1.2 Speciation and Bioavailability of Nickel in Receiving Water

The ultimate fate of nickel in the bay is controlled by physical and chemical properties of the surface water, including pH, oxidation/reduction potential, hardness, alkalinity, organic and inorganic ligands, and other cations that compete for binding sites, water temperature, and other factors.

The actual bioavailability and toxicity of dissolved nickel released in groundwater to the bay cannot be predicted using available data. The water quality criterion is lower than the background concentration of nickel in the groundwater at Parcel D. This lower value could mean that local conditions favor organisms that are tolerant to nickel, or that organisms that are sensitive to the toxic effects of nickel do not occur in the area. No site-specific tests of nickel toxicity were conducted, so this question remains unanswered. It is well known, however, that the background concentration of nickel in the bay sediment derived by the Water Board is higher than the effects range generally used to screen risk to estuarine organisms throughout the country (Long and others 1995; Water Board 1998).

The toxicity benchmarks for nickel, which are based on laboratory tests using specially constituted water, may be poor predictors of toxicity observed in the bay because the composition of water used for marine testing has a substantial influence on the outcome of the test. This is because of the large number of parameters that interact to control the bioavailability of the metal ion, allowing it to enter the organism or be adsorbed onto external membranes (Nickel Institute 2006). Use of the HGAL as the water quality screening criterion circumvents the issue of uncertainty in the toxicity benchmark, but does not provide a risk-based substitute for predicting or interpreting actual effects on the marine environment.

H5.0 SUMMARY AND CONCLUSIONS

Water quality criteria have been established for the protection of marine organisms in surface water and generally exist for both an acute and a chronic exposure scenario. These surface water criteria were evaluated, and appropriate surface water criteria for the protection of the bay were selected. Selection criteria included use of chronic criteria if available, use of acute criteria adjusted for chronic conditions if no chronic criteria exist, and selection of the lowest level of two criteria existing for the same exposure scenario.

Maximum concentrations of chemicals detected in both the A-aquifer and the B-aquifer groundwater at Parcel D were compared with the water quality screening criteria identified in Section H2.0 and presented in Table H-1. If no surface water criteria or HGALs were available, the chemicals were eliminated from the analysis. Based on the screening of chemical concentrations with surface water criteria and the well-by-well evaluation, chromium VI and nickel were identified as COCs. Nickel concentrations consistently exceeded the HGAL during several continuous sampling events, suggesting nickel detections that exceed the HGAL may be a result of site-related activities (see Table H-2). Maximum concentrations of chromium VI and nickel in groundwater also exceeded chronic water quality criteria, raising the possibility that marine organisms may be at risk if they were continuously exposed to undiluted groundwater

discharged to the bay that contained the concentrations of chromium VI and nickel found in the inland plumes at Parcel D. The Navy has established trigger levels to protect against effects on marine organisms in the bay (see Appendix I of this Revised FS Report for Parcel D).

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TABLES

TABLE H-1: SURFACE WATER QUALITY CRITERIA FOR THE SAN FRANCISCO BAY
Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Analyte Monitored Under Naval Station Treasure Island Groundwater Program	Pseudonym	San Francisco Bay Basin Plan[a] (µg/L)		California Toxics Rule Criteria for Enclosed Bays and Estuaries[e] (µg/L)								National Recommended Water Quality Criteria[k] (µg/L) Saltwater Aquatic Life					National Ambient Water Quality Criteria (AWQC) for Protection of Saltwater Aquatic Life[l] (µg/L) Lowest Observed Effect Level (LOEL)							Other Criteria (footnotes indicate source) (µg/L)		Selected Water Quality Criteria (µg/L)
				Chronic[g]		Acute[g]			Instantaneous Maximum			Chronic[g]		Acute[g]			Chronic[h]		Acute[i]			Other[j]				
		Concentration	Footnotes	Concentration	Footnotes	Concentration	20% of Concentration[f]	Footnotes	Concentration	10% of Concentration[f]	Footnotes	Concentration	Footnotes	Concentration	20% of Concentration[f]	Footnotes	Concentration	Footnotes	Concentration	20% of Concentration[f]	Footnotes	Concentration	Footnotes	Other	Footnotes	
1,1,1-Trichloroethane		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		--	31,200	6,240	--	--	--	--	--	6,240
1,1,2,2-Tetrachloroethane		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	9,020	1,804	--	--	--	--	--	1804
1,1-Dichloroethene	1,1-Dichloroethylene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	224,000	44800	(27)	--	--	--	--	44,800
1,2,4,5-Tetrachlorobenzene		--	--	--	--	--	--	--	--	--	--						--	--	250	50	(22)	50	(22.23)	--	--	50
1,2,4-Trichlorobenzene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	129	(22)	160	--	(22)	--	--	--	--	129
1,2-Dichlorobenzene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	129	(22)	1,970	--	(24)	--	--	--	--	129
1,2-Dichloroethane		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	113,000	22,600	--	--	--	--	--	22,600
1,2-Dichloroethene (total)	1,2-Dichloroethene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	224,000	44,800	(27)	--	--	--	--	44,800
1,2-Dichloropropane	Propylene dichloride	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3,040	(28)	10,300	--	(28)			--	--	3,040
1,3-Dichlorobenzene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	129	(22)	1,970	--	(24)			--	--	129
1,3-Dichloropropene (total)		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	790	158	(29)	--	--	--	--	158
1,4-Dichlorobenzene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	129	(22)	1,970	--	(24)	--	--	--	--	129
2,4-Dinitrophenol		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	230	46	(88)	150	(38,88)	--	--	46
2,4-Dinitrotoluene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	590	118	(53)	370	(53, 82)	--	--	118
2,6-Dinitrotoluene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	590	118	(53)	370	(53, 82)	--	--	118
2-Chloronaphthalene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	7.5	1.5	(48)	--	--	--	--	1.5
2-Nitrophenol	Nitrophenol	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4,850	970	(88)	--	--	--	--	970
4,4'-DDD	2,4-DDD; DDD	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.6	0.72	--	--	--	--	--	.72
4,4'-DDE	2,4-DDE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	14	2.8	--	--	--	--	--	2.8
4,4'-DDT		--	--	0.001	(114)	0.13	--	--	--	--	--	0.001	G,aa,ii	0.13	--	G,ii	--	--	--	--	--	--	--	--	--	.001
4,6-Dinitro-2-methylphenol	4,6-Dinitro-o-cresol	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4,850	970	(88)	--	--	--	--	970
4-Amino-2,6-dinitrotoluene	Dinitrotoluenes; 4-Methyl-3,5-dinitroaniline	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	590	118	--	370	(82)	--	--	118
4-Nitrophenol		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4,850	970	(88)	--	--	--	--	970
Acenaphthene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	710	--	970	--	--	500	(38)	--	--	710
Acenaphthylene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	300	60	(52)	--	--	--	--	60
Aldrin		--	--	--	--	--	--	--	1.3	--	II	--	--	1.3	0.26	G	--	--	--	--	--	--	--	--	--	.26
Alpha-chlordane	Chlordane	--	--	0.004	(114)	--	--	--	0.09	--	--	0.004	G,aa,o	0.09	--	G,o	--	--	--	--	--	--	--	--	--	.004
Anthracene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	300	60	(52)	--	--	--	--	60
Aroclor 1016	Polychlorinated biphenyls (PCBs)	--	--	0.03	rr	--	--	--	--	--	--	0.03	N,aa	--	--	--	--	--	10	--	--	--	--	--	--	.03
Aroclor 1221	Polychlorinated biphenyls (PCBs)	--	--	0.03	rr	--	--	--	--	--	--	0.03	N,aa	--	--	--	--	--	10	--	--	--	--	--	--	.03
Aroclor 1232	Polychlorinated biphenyls (PCBs)	--	--	0.03	rr	--	--	--	--	--	--	0.03	N,aa	--	--	--	--	--	10	--	--	--	--	--	--	.03
Aroclor 1242	Polychlorinated biphenyls (PCBs)	--	--	0.03	rr	--	--	--	--	--	--	0.03	N,aa	--	--	--	--	--	10	--	--	--	--	--	--	.03
Aroclor 1248	Polychlorinated biphenyls (PCBs)	--	--	0.03	rr	--	--	--	--	--	--	0.03	N,aa	--	--	--	--	--	10	--	--	--	--	--	--	.03
Aroclor 1254	Polychlorinated biphenyls (PCBs)	--	--	0.03	rr	--	--	--	--	--	--	0.03	N,aa	--	--	--	--	--	10	--	--	--	--	--	--	.03
Aroclor 1260	Polychlorinated biphenyls (PCBs)	--	--	0.03	rr	--	--	--	--	--	--	0.03	N,aa	--	--	--	--	--	10	--	--	--	--	--	--	.03
Arsenic		36	b	36	mm, oo	69	--	mm, oo	--	--	--	36	A,D,bb	69	--	A,D,bb	--	--	2,319	--	(95)	13	(6)	--	--	36
Atrazine		--	--	--	--	--	--	--	--	--	--	11	r,(68)	310	--	r,(68)	--	--	--	--	--	--	--	--	--	11
Benzene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5,100	--	--	700	--	--	--	700
Benzo(a)anthracene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	300	60	(52)	--	--	--	--	60
Benzo(a)pyrene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	300	60	(52)	--	--	--	--	60
Benzo(b)fluoranthene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	300	60	(52)	--	--	--	--	60
Benzo(g,h,i)perylene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	300	60	(52)	--	--	--	--	60
Benzo(k)fluoranthene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	300	60	(52)	--	--	--	--	60
Bromochloromethane		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6,400	(20)	12,000	--	(20)	11,500	(20, 83)	--	--	6,400
Bromodichloromethane		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6,400	(20)	12,000	--	(20)	11,500	(20, 83)	--	--	6,400
Bromoform		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6,400	(20)	12,000	--	(20)	11,500	(20, 83)	--	--	6,400
Bromomethane		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6,400	(20)	12,000	--	(20)	11,500	(20, 83)	--	--	6,400
Butylbenzylphthalate	n-Butyl benzyl phthalate	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2,944	588.8	(45)	3.4	(38, 45)	--	--	588.8
Cadmium		9.3	b	9.3	(1, 142)	42	--	(1, 142)	--	--	--	8.8	D,bb,gg	40	--	D,bb,gg	--	--	--	--	--	--	--	--	--	8.8
Carbon tetrachloride		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6,400	(20)	50,000	--	--	11,500	(20, 82)	--	--	6,400
Chlordane				0.004	(114)	--	--	--	0.09	0.009	--	0.004	G,aa	0.09	0.009	G	--	--	--	--	--	--	--	--	--	.004
Chlorobenzene	Monochlorobenzene	--	--	--	--	--		--				--	--	--	--	--	129	(22)	160	--	(22)	--	--	--	--	129
Chloroform		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6,400	(20)	12,000	--	(20)	11,500	(20, 82)	--	--	6,400
Chloromethane		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6,400	(20)	12,000	--	(20)	11,500	(20, 82)	--	--	6,400
Chromium (total)		50 (VI)	b,o	50 (VI)	o	1100 (VI)	--	--	--	--	--	50 (VI)	D,bb,o	1100 (VI)	--	D,bb,o	--	--	--	--	--	--	--	--	--	50

TABLE H-1: SURFACE WATER QUALITY CRITERIA FOR THE SAN FRANCISCO BAY (CONTINUED)
Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Analyte Monitored Under Naval Station Treasure Island Groundwater Program	Pseudonym	San Francisco Bay Basin Plan[a] (µg/L)		California Toxics Rule Criteria for Enclosed Bays and Estuaries[e] (µg/L)									National Recommended Water Quality Criteria[k] (µg/L) Saltwater Aquatic Life					National Ambient Water Quality Criteria (AWQC) for Protection of Saltwater Aquatic Life[l] (µg/L) Lowest Observed Effect Level (LOEL)							Other Criteria (footnotes indicate source) (µg/L)		Selected Water Quality Criteria (µg/L)
				Chronic[g]		Acute[g]			Instantaneous Maximum			Chronic[g]		Acute[g]			Chronic[h]		Acute[i]			Other[j]				
		Concentration	Footnotes	Concentration	Footnotes	Concentration	20% of Concentration[f]	Footnotes	Concentration	10% of Concentration[f]	Footnotes	Concentration	Footnotes	Concentration	20% of Concentration[f]	Footnotes	Concentration	Footnotes	Concentration	20% of Concentration[f]	Footnotes	Concentration	Footnotes	Other	Footnotes	
Chrysene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	300	60	(52)	--	--	--	--	60
Cis-1,2-dichloroethene	Cis-1,2-dichloroethylene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	224,000	44,800	(27)	--	--	--	--	44,800
Copper		4.9	c	3.1	nn, oo	4.8	--	oo	--	--	--	3.1	D,cc,ff	4.8	--	D,cc,ff	--	--	--	--	--	--	--	--	--	3.1
Cyanide		5	c	1	pp	1	--	pp	--	--	--	1	Q,bb	1	--	Q,bb	--	--	--	--	--	--	--			1
Dibenz(a,h)anthracene	1,2:5,6-Dibenzanthracene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	300	60	(52)	--	--	--	--	60
Dibromochloromethane		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6,400	(20)	12,000	--	(20)	11,500	(20, 83)	--	--	6,400
Dieldrin		--	--	0.0019	(114), II	--	--	--	0.71	--	II	0.0019	G,aa	0.71	.142	G	--	--	--	--	--	--	--	--	--	.142
Diethylphthalate		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2,944	588.8	(45)	3.4	(38, 45)	--	--	588.8
Dimethylphthalate		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2,944	--	(45)	3.4	(38, 45)	--	--	3.4
Di-n-butylphthalate	Dibutyl phthalate	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2,944	588.8	(45)	3.4	(38, 45)	--	--	588.8
Di-n-octylphthalate	Bis-n-octyl phthalate	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2,944	588.8	(45)	3.4	(38, 45)	--	--	588.8
Endosulfan I	Endosulfan (alpha)	--	--	0.0087	II	--	--	--	0.034	--	(115), II	0.0087	G,Y,o	0.034	--	G,Y,o	--	--	--	--	--	--	--	--	--	0.0087
Endosulfan II	Endosulfan (beta)	--	--	0.0087	II	--	--	--	0.034	--	(115), II	0.0087	G,Y,o	0.034	--	G,Y,o	--	--	--	--	--	--	--	--	--	0.0087
Endrin		--	--	0.0023	(114), II	--	--	--	0.037	--	II	0.0023	G,aa	0.037	--	G	--	--	--	--	--	--	--	--	--	0.0023
Ethylbenzene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	430	86	--	--	--	--	--	86
Fluoranthene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	16	--	40	--	--	--	--	--	--	16
Fluorene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	300	60	(52)	--	--	--	--	60
Gamma-BHC (lindane)	Gamma-Benzene hexachloride	--	--	--	--	--	--	--	0.16	--	II	--	--	0.16	0.032	G	--	--	--	--	--	--	--	--	--	.032
Gamma-chlordane	Chlordane	--	--	0.004	(114)	--	--	--	0.09	--	--	0.004	G,aa,o	0.09	--	G,o	--	--	--	--	--	--	--	--	--	.004
Heptachlor		--	--	0.0036	(114)	II	--	--	0.053	--	II	0.0036	G,aa	0.053	--	G	--	--	--	--	--	--	--	--	--	.0036
Heptachlor epoxide		--	--	0.0036	(114)	II		--	0.053	--	II	0.0036	G,V,aa	0.053	--	G,V	--	--	--	--	--	--	--	--	--	.0036
Hexachlorobenzene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	129	(22)	160	--	(22)	--	--	--	--	129
Hexachlorobutadiene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	32	6.4	--	--	--	--	--	6.4
Hexachlorocyclopentadiene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	7.0	1.4	--	--	--	--	--	1.4
Hexachloroethane		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	940	188	--	--	--	--	--	188
Indeno(1,2,3-cd)pyrene	Ideno(1,2,3-cd)pyrene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	300	60	(52)	--	--	--	--	60
Isophorone		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	12,900	2,580	--	--	--	--	--	2,580
Lead		5.6	b	8.1	(1, 142), m	210	--	(1, 142), m	--	--	--	8.1	D,bb	210	--	D,bb	--	--	--	--	--	--	--	--	--	5.6
Mercury	Mercury, inorganic	0.025	b	--	--	--	--	--	--	--	--	0.94	D,ee,hh	1.8	--	D,ee,hh	--	--	--	--	--	--	--	--	--	0.025
Methoxychlor		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.003	(51),f	0.003
Methyl-tert-butyl-ether	Methyl t-butyl ether (MTBE), Methyl tertiary	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8,000	p	8,000
Methylene chloride	Dichloromethane	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6,400	(20)	12,000	--	(20)	11,500	(20, 82)	--	--	6,400
Mirex		--	--	--	--	--	--	--	--	--	--	0.001	F	--	--	--	--	--	--	--	--	--	--	--	--	0.001
Naphthalene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2,350	470	--	--	--	--	--	470
Nickel		8.3	b	8.2	(2, 142), oo	74	--	(1, 142), oo	--	--	--	8.2	D,bb	74	--	D,bb	--	--	--	--	--	--	--	--	--	8.2
Nitrobenzene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6,680	1,336	--	--	--	--	--	1,336
N-Nitroso-di-n-propylamine	N-Nitrosodi-n-propylamine; N-Nitrosodi	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3,300,000	660,000	(56)	--	--	--	--	660,000
N-nitrosodiphenylamine		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3,300,000	660,000	(56)	--	--	--	--	660,000
Pentachlorophenol		--	--	7.9	--	13	--	--	--	--	--	7.9	bb	13	--	bb	--	--	--	--	--	--	--	--	--	7.9
Phenanthrene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	300	60	(52)	--	--	--	--	60
Phenol		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5,800	1,160	--	--	--	--	--	1,160
Pyrene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	300	60	(52)	--	--	--	--	60
Selenium		--	--	71	(1, 142)	290	--	(1, 142)	--	--	--	71	D,bb,dd	290	--	D,bb,dd	--	--	--	--	--	--	--	--	--	71
Silver		2.3	d	--	--	1.9	0.38	(1, 142)	--	--	--	--	--	1.9	0.38	D,G	--	--	--	--	--	--	--	--	--	0.38
Sulfide	Sulfide-Hydrogen Sulfide	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.2	(51),f	0.2
Tetrachloroethene	Tetrachloroethylene (PCE)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	450	--	10,200	--	--	--	--	--	--	450
Thallium		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2,130	426	--	--	--	--	--	426
Toluene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5,000	--	6,300	--	--	--	--	--	--	5,000
Toxaphene		--	--	0.0002	--	0.21	--	--	--	--	--	0.0002	aa	0.21	--	--	--	--	--	--	--	--	--	--	--	0.0002
TPH-Diesel	Diesel range organics; Diesel Fuel; Diesel	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1,400	q	1,400
TPH-Gasoline	Gasoline range organics; Gasoline	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1,400	q	1,400
TPH-Motor Oil	Motor oil; motor oil range organics	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1,400	q	1,400
trans-1,2-Dichloroethene	trans-1,2-Dichloroethylene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	224,000	44,800	(27)	--	--	--	--	44,800
Trichloroethene	Trichloroethylene (TCE)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2,000	400	--	--	--	--	--	400
Zinc		58	c	81	mm, oo	90	--	oo	--	--	--	81	D,bb	90	--	D,bb	--	--	--	--	--	--	--	--	--	81

Notes: **Values shaded are those selected as screening criteria.**
Footnotes and references are detailed below.

--	No criterion available
ug/L	Microgram per liter
BHC	Benzene Hexachloride (Lindane)
DDD	Dichlorodiphenyldichloroethane
DDE	1,1-dichloro-2,2-bis(p-chlorophenyl)ethylene
DDT	1,1,1-Trichloro-2,2-bis(p-chlorophenyl)ethane
TPH	Total petroleum hydrocarbons

Footnotes:

a California Environmental Protection Agency, Regional Water Quality Control Board, San Francisco Bay Area Region (Water Board). 1995. "San Francisco Bay Basin Plan Water Quality Control Plan." June 21. Table 3-3 Water Quality Objectives for Toxic Pollutants for Surface Water With Salinities Greater Than 5 Parts Per Billion.
b From Water Board "Basin Plan" 4-Day Average (Chronic)
c From Water Board "Basin Plan" 24-Hour and 1-Hour Average (Acute)
d From Water Board "Basin Plan" Instantaneous Maximum
e From "Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California" (CTR) (EPA 2000) and "Water Quality Control Plan, San Francisco Bay Basin Region" (Water Board 1995). The most appropriate criteria were used.
f Criterion made more suitably protective by means of standard convention of lowering acute values by 80 percent and instantaneous values by 90 percent to make them more appropriate for use under chronic exposure scenarios.
g An acute criterion (EPA identified as Criteria Maximum Concentration [CMC]) is an estimate of the highest concentration of a material in surface water to which an aquatic community can be exposed briefly without resulting in an unacceptable effect. The chronic concentration (EPA identified as Criterion Continuous Concentration [CCC]) is an estimate of the highest concentration of a material in surface water to which an aquatic community can be exposed indefinitely without resulting in an unacceptable effect. The CMC and CCC are just two if the six parts of an aquatic life criterion; the other four parts are the acute averaging period, chronic averaging period, acute frequency of allowed exceedance, and chronic frequency of allowed exceedance. Because 304(a) aquatic life criteria are national guidance, they are intended to be protective of the vast majority of the aquatic communities in the United States (EPA 2002a).
h EPA National "AWQC Lowest Observed Effect Level (Chronic)" (Water Board 2000)
i EPA National "AWQC Lowest Observed Effect Level (Acute)" (Water Board 2000)
j EPA National "AWQC Lowest Observed Effect Level (Other)" (Water Board 2000)
k From "National Recommended Water Quality Criteria: 2002" (EPA 2002a) and "Revision of National Recommended Water Quality Criteria." (EPA 2002b), unless otherwise noted.
l From "Final Technical Memorandum Estimation of Ambient Concentrations of Metals in Groundwater" (Tetra Tech 2001)
m In instances where criteria from "Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California" (EPA 2000) refer to the "Water Quality Control Plan, San Francisco Bay Basin Region" (Water Board 1995), Water Board 1995 criteria were used. The Water Board 1995 criteria are distinguished by an "m" in the footnote column.
o Detailed application of this toxicity criterion may require the review and/or summation of analyte isomer, congener, or speciation results, as applicable. Please see applicable regulatory agency source document for additional detail.
p Water Board 1998
q Tetra Tech EM Inc. 1999
r Water Board 2000

The following lettered footnotes are derived from EPA "National Recommended Water Quality Criteria: 2002" (EPA 2002a), Table 1 - Priority Toxic Pollutants:

A This recommended water quality criterion was derived from data for arsenic (III), but is applied here to total arsenic, which might imply that arsenic (III) and arsenic (V) are equally toxic to aquatic life and that their toxicities are additive. In the arsenic criteria document (EPA 440/5-84-033, January 1985), Species Mean Acute Values (SMAVs) are given for both arsenic (III) and arsenic (V) for five species, and the ratios of the SMAVs for each species range from 0.6 to 1.7. Chronic values are available for both arsenic (III) and arsenic (V) for one species; for the fathead minnow, the chronic value for arsenic (V) is 0.29 times the chronic value for arsenic (III). No data are known to be available concerning whether the toxicities of the forms of arsenic to aquatic organisms are additive.
D Freshwater and saltwater criteria for metals are expressed in terms of the dissolved metal in the water column. The recommended water quality criteria value was calculated by using the previous 304(a) aquatic life criteria expressed in terms of total recoverable metal, and multiplying it by a conversion factor (CF). The term "Conversion Factor" (CF) represents the recommended conversion factor for converting a metal criterion expressed as the total recoverable fraction in the water column to a criterion expressed as the dissolved fraction in the water column. (Conversion Factors for saltwater CCCs are currently unavailable. Conversion factors derived for saltwater CMCs have been used for both saltwater CMCs and CCCs). See "Office of Water Policy and Technical Guidance on Interpretation and Implementation of Aquatic Life Metals Criteria," October 1, 1993, by Martha G. Prothro, Acting Assistant Administrator for Water, available from the Water Resource center, USEPA, 401 M St., SW, mail code RC4100, Washington DC 20460; and 40CFR 131.36(b)(1). Conversion Factors applied in the table can be found in Appendix A to the Preamble - Conversion Factors for Dissolved Metals.
F The deviation of this value is presented in the Red Book (EPA 440/9-76-023, July 1976).
G The criterion is based on 304(a) aquatic life criterion issued in 1980 and was issued in one of the following documents: Aldrin/Dieldrin (EPA 440/5-80-019), Chlordane (EPA 440/5-80-027), Dichlorodiphenyltrichloroethane (DDT) (EPA 440/5-80-38), Endosulfan (EPA 440/5-80-046), Endrin (EPA 440/5-80-047), Heptachlor (EPA 440/5-80-052), Hexachlorocyclohexane (EPA 440/5-80-054), Silver (EPA 440/5-80-071), The minimum data requirements and derivation procedures were different in the 1980 Guidelines than in the 1985 Guidelines. For example, a "CMC" derived using the 1980 Guidelines was derived to be used as an instantaneous maximum. If assessment is to be done using an averaging period, the values given should be divided by 2 to obtain a value that is more comparable to a CMC derived using the 1985 Guidelines.
N This criterion applies to total polychlorinated biphenyls (e.g. the sum of all congener or all isomer or homolog or Aroclor analyses.)
Q This recommended water quality criterion is expressed as mg free cyanide (as CN)/L.
V This value was derived from data for heptachlor, and the criteria document provides insufficient data to estimate the relative toxicities of heptachlor and heptachlor epoxide.
Y This value was derived from data for endosulfan and is most appropriately applied to the sum of alpha-endosulfan and beta-endosulfan.
aa This criterion is based on a 304(a) aquatic life criterion issued in 1980 or 1986, and was issued in one of the following documents : Aldrin/Dieldrin (EPA 440/5-80-019), Chlordane (EPA 440/5-80-027), DDT (EPA 440/5-80-038), Endrin (EPA 4405-80-047), Heptachlor (EPA 440/5-80-052), Polychlorinated biphenyls (EPA 440/5-80-068), Toxaphene (EPA 440/5-86-006). This CCC is currently based on the Final Residue Value (FRV) procedure. Since the publication of the Great Lakes Aquatic Life Criteria Guidelines in 1995 (60 FR 15393-15399, March 23, 1995), the EPA no longer uses the Final Residue Value procedure for deriving CCCs for new or revised 304(a) aquatic life criteria. Therefore, the EPA anticipates that future revisions of this CCC will not be based on FRV procedure.
bb This water quality criterion is based on a 304(a) aquatic life criterion that was derived using the 1985 Guidelines (*Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses*, PB85-227046, January 1985) and was issued in one of the following criteria documents: Arsenic (EPA 440/5-84-033), Cadmium (EPA 882-R-01-001), Chromium (EPA 440/5-84-029), Copper (EPA 440/5-84-031), Cyanide (EPA 440/5-84-028), Lead (EPA 440/5-84-027), Nickel (EPA 440/5-86-004), Pentachlorophenol (EPA 440/5-86-009), Toxaphene (EPA 440/5-86-006), Zinc (EPA 440/5-87-003).
cc When the concentration of dissolved organic carbon is elevated, copper is substantially less toxic, and use of Water-Effect Rations might be appropriate.
dd The selenium criteria document (EPA 440/5-87-006, September 1987) provides that if selenium is as toxic to saltwater fishes in the field as it is to freshwater fish in the field, the status of the fish community should be monitored whenever the concentration of selenium exceeds 5.0 mg/L in salt water because the saltwater CCC does not take into account uptake via the food chain.
ee This recommended water quality criterion was derived on page 43 of the mercury document (EPA 440/5-84-026, January1985). The saltwater CCC of 0.025 µg/L given on page 23 of the criteria document is based on the Final Residue Value procedure in the 1985 Guidelines. Since the publication of the Great Lakes Aquatic Life Criteria Guidelines in 1995 (60 FR 15393-15399, March 23, 1995), the Agency no longer uses the Final Residue Value procedure for deriving CCCs for new or revised 304(a) aquatic life criteria.
ff This recommended water quality criterion was derived in Ambient Water Quality Criteria Saltwater Copper Addendum (draft, April 14, 1995) and was promulgated in the Interim final National Toxics Rule (60 FR 22228-222237, May 4, 1995).
gg EPA is actively working on this criterion, and so this recommended water quality criterion may change substantially in the near future.
hh This recommended water quality criterion was derived from data for inorganic mercury (II), but is applied here to total mercury. If a substantial portion of the mercury in the water column is methylmercury, this criterion will probably be under protective. In addition, even though inorganic mercury is converted to methylmercury, and methylmercury bioaccumulates to a great extent, this criterion does not account for uptake via the food chain because sufficient data were not available when the criterion was derived.
ii This criterion applies to DDT and its metabolites (that is, the total concentration of DDT and its metabolites should not exceed this value.)

TABLE H-1: SURFACE WATER QUALITY CRITERIA FOR THE SAN FRANCISCO BAY (CONTINUED)

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

The following lettered footnotes are derived from EPA "Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California" (EPA 2000).

ll This criterion is based on 304(a) aquatic life criterion issued in 1980, and was issued in one of the following documents: Aldrin/ Dieldrin (EPA 440/5-80-019), Chlordane (EPA 440/5-80-027), DDT (EPA 440/5-80-038), Endosulfan (EPA 440/5-80-046), Endrin (EPA 440/5-80-047), Heptochlor (440/5-80-025), Hexachlorocyclohexane (EPA 440/5/80/054), Silver (EPA 440/5-80-071) (originally footnote g in CTR).

mm Criteria for these metals are expressed as a function of the water-effect ratio (WER) (originally footnote I in the CTR).

nn No criterion for protection of human health from consumption of aquatic organisms (excluding water) was presented in the 1980 criteria document or in the 1986 Quality Criteria for Water. Nevertheless, sufficient information was presented in the 1980 document to allow a calculation of a criterion, even though the results of such calculations were not shown in the document.

oo These freshwater and saltwater criteria for metals are expressed in terms of dissolved fraction of the metal in the water column. Criterion values were calculated by using EPA's Clean Water Act 304(a) guidance values (described in the total recoverable fraction) and then applying the conversion factors in 131.36(b)() and (2).

pp These criteria were promulgated for specific waters in California in the National Toxics Rule (NTR). The specific waters to which the NTR criteria apply include Waters of the State defined as bays or estuaries, including the San Francisco Bay upstream to and including Suisun Bay and the Sacramento-San Joaquin Delta. This section does not apply instead of the NTR for these criteria.

rr PCBs are a class of chemicals that include Aroclors 1242,1254,1221,1232,1248,1260, and 1016. The aquatic life criteria apply to the sum of this set of seven Aroclors.

The following numbered footnotes are derived from "A Compilation of Water Quality Goals" (Water Board 2000). These footnotes directly correlate with the source document.

1 Expressed as dissolved
2 Expressed as total recoverable
6 Pentavalent arsenic [As(V)] effects on plants.
20 For halomethanes
22 For chlorinated benzenes
23 Toxicity to a fish species exposed for 7.5 days
24 For dichlorobenzenes
27 For dichloroethylenes
28 For dichloropropanes
29 For dichloropropenes
38 Toxicity to algae occurs
45 For phthalate esters
48 For chlorinated naphthalenes
51 From U.S. Environmental Protection Agency, *Quality Criteria for Water* (1976) "The Red Book."
52 For polycyclic aromatic hydrocarbons
53 For dinitrotoluenes
56 For nitrosamines
68 Draft/tentative/provisional; applies only to second value if more than one value is listed.
82 A decrease in the number of algal cells occurs.
83 Adverse effects on a fish species exposed for 168 days.
88 For nitrophenols
95 For the pentavalent form
114 Developed as 24-hour average using 1980 EPA guidelines, but applied as 4-day average in the National Toxics Rule and/or Proposed California Toxics Rule.
115 Criterion most appropriately applied to the sum of alpha-endosulfan and beta-endosulfan.
116 Applies separately to Aroclors 1242, 1254, 1221, 1232, 1248, 1260, and 1016; based on carcinogenicity at 1-in-a-million risk level.
142 Criteria do not apply to waters subject to water quality objectives in Tables III-2A and III-2B of the San Francisco Bay Regional Water Quality Control Board's 1986 Basin Plan.
143 These criteria were promulgated for specific California waters in the National Toxics Rule.
144 The ambient level was set at or below the minimum reported detection limit.
145 The ambient concentration represents the 95th percentile of the distribution. Additionally, the 95th percentile of the distribution was calculated using distribution dependent formulae. For normal and lognormal distributions, the 95th percentile calculation used the parameters of the best-fitted regression line drawn through the detected values on the probability plot. For nonparametric distribution, the analytical formula was used (Gilbert 1987).

References:

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EPA. 2002a. "National Recommended Water Quality Criteria: 2002." EPA-822-R-02-047. November.

EPA. 2002b. "Revision of National Recommended Water Quality Criteria." FRL-OW-7431-3. December 27.

TABLE H-2: COMPARISON OF CHEMICAL CONCENTRATIONS IN A-AQUIFER GROUNDWATER TO SURFACE WATER QUALITY SCREENING CRITERIA - METALS

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

				Comparison of HGALs					Comparison of Surface Water Criteria				
Chemical	Number Analyzed	Number Detected	Percent Detected (%)	HGAL Screening Level (µg/L)	Number of Detects > HGAL	Percent of Detects > HGAL	Number of Nondetects with Limits > HGAL	Percent of Nondetects with Limits > HGAL	Surface Water Criteria[1] (µg/L)	Number of Detects > Surface Water Criteria	Percent of Detects > Surface Water Criteria (%)	Number of Nondetects with Limits > Surface Water Criteria	Percent of Nondetects with Limits > Surface Water Criteria (%)
Aluminum	215	29	13.49	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	213	15	7.04	43.26	0	0.00	1	0.51	NA	NA	NA	NA	NA
Arsenic	214	95	44.39	27.3	10	10.53	1	0.84	36	3	3.16	0	0.00
Barium	213	207	97.18	504.2	7	3.38	0	0.00	NA	NA	NA	NA	NA
Beryllium	213	13	6.10	1.4	3	23.08	14	7.00	NA	NA	NA	NA	NA
Cadmium	214	21	9.81	5.1	5	23.81	0	0.00	8.8	3	14.29	0	0.00
Calcium	220	217	98.64	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	284	76	26.76	15.66	51	67.11	1	0.48	400	2	1.72	0	0.00
Chromium VI	171	39	22.81	NA	NA	NA	NA	NA	50	25	64.10	1	0.76
Cobalt	213	93	43.66	20.8	3	3.23	0	0.00	NA	NA	NA	NA	NA
Copper	215	42	19.53	28.04	7	16.67	0	0.00	3.1	28	66.67	60	34.68
Iron	220	75	34.09	2,380	12	16.00	0	0.00	NA	NA	NA	NA	NA
Iron (II)	13	6	46.15	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	213	19	8.92	14.44	7	36.84	0	0.00	5.6	10	52.63	10	5.15
Magnesium	220	216	98.18	1,440,000	6	2.78	0	0.00	NA	NA	NA	NA	NA
Manganese	214	201	93.93	8,140	13	6.47	0	0.00	NA	NA	NA	NA	NA
Manganese (II)	7	7	100.00	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	212	12	5.66	0.6	2	16.67	0	0.00	0.025	12	100.00	200	100.00
Molybdenum	195	80	41.03	61.9	9	11.25	0	0.00	NA	NA	NA	NA	NA
Nickel	275	152	55.27	96.48	18	11.84	0	0.00	8.2	121	79.61	46	37.40
Potassium	220	219	99.55	448,000	1	0.46	0	0.00	NA	NA	NA	NA	NA
Selenium	207	27	13.04	14.5	1	3.70	11	6.11	71	0	0.00	0	0.00
Silver	212	13	6.13	7.43	0	0.00	1	0.50	0.38	12	92.31	199	100.00
Sodium	220	220	100.00	9,242,000	0	0.00	NA	All Detected	NA	NA	NA	NA	All Detected
Thallium	197	33	16.75	12.97	3	9.09	14	8.54	426	0	0.00	0	0.00
Vanadium	210	130	61.90	26.62	9	6.92	1	1.25	NA	NA	NA	NA	NA
Zinc	216	43	19.91	75.68	9	20.93	0	0.00	81	7	16.28	0	0.00

Notes:

[1] The published sources are provided in the footnotes to Table H-1.

µg/L Microgram per liter

HGAL Hunters Point groundwater ambient level

NA Not available

TABLE H-3: COMPARISON OF CHEMICAL CONCENTRATIONS IN A-AQUIFER GROUNDWATER TO SURFACE WATER QUALITY SCREENING CRITERIA - VOLATILE ORGANIC COMPOUNDS

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

				Comparison of Surface Water Criteria				
Chemical	Number Analyzed	Number Detected	Percent Detected (%)	Surface Water Criteria[1] (µg/L)	Number of Detects Exceeding Surface Water Criteria	Percent of Detects Exceeding Surface Water Criteria (%)	Number of Nondetects with Limits Exceeding Surface Water Criteria	Percent of Nondetects with Limits Exceeding Surface Water Criteria (%)
1,1,1,2-Tetrachloroethane	12	0	0.00	NA	NA	NA	NA	NA
1,1,1-Trichloroethane	252	2	0.79	6,240	0	0.00	0	0.00
1,1,2,2-Tetrachloroethane	252	0	0.00	1,804	ND	ND	0	0.00
1,1,2-Trichloro-1,2,2-Trifluoroethane	79	0	0.00	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	252	1	0.40	NA	NA	NA	NA	NA
1,1-Dichloroethane	252	2	0.79	NA	NA	NA	NA	NA
1,1-Dichloroethene	252	0	0.00	44,800	ND	ND	0	0.00
1,2,3-Trichloropropane	12	0	0.00	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	221	0	0.00	129	ND	ND	0	0.00
1,2-Dibromo-3-Chloropropane	28	0	0.00	NA	NA	NA	NA	NA
1,2-Dibromethane	36	0	0.00	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	243	1	0.41	129	0	0.00	0	0.00
1,2-Dichloroethane	252	1	0.40	22,600	0	0.00	0	0.00
1,2-Dichloroethene (total)	177	11	6.21	44,800	0	0.00	0	0.00
1,2-Dichloropropane	252	0	0.00	3,040	ND	ND	0	0.00
1,3-Dichlorobenzene	243	0	0.00	129	ND	ND	0	0.00
1,4-Dichlorobenzene	243	1	0.41	129	0	0.00	0	0.00
2-Butanone	174	0	0.00	NA	NA	NA	NA	NA
2-Chloroethyl Vinyl Ether	47	0	0.00	NA	NA	NA	NA	NA
2-Hexanone	139	1	0.72	NA	NA	NA	NA	NA
4-Methyl-2-Pentanone	172	1	0.58	NA	NA	NA	NA	NA
Acetone	173	2	1.16	NA	NA	NA	NA	NA
Benzene	208	7	3.37	700	0	0.00	0	0.00
Bromobenzene	12	0	0.00	NA	NA	NA	NA	NA
Bromochloromethane	16	0	0.00	6,400	ND	ND	0	0.00
Bromodichloromethane	252	0	0.00	6,400	ND	ND	0	0.00
Bromoform	252	0	0.00	6,400	ND	ND	0	0.00
Bromomethane	252	0	0.00	6,400	ND	ND	0	0.00
Carbon disulfide	173	4	2.31	NA	NA	NA	NA	NA
Carbon tetrachloride	252	4	1.59	6,400	0	0.00	0	0.00
Chlorobezene	253	0	0.00	129	ND	ND	0	0.00
Chloroethane	252	0	0.00	NA	NA	NA	NA	NA
Chloroform	252	40	15.87	6,400	0	0.00	0	0.00
Chloromethane	252	1	0.40	6,400	0	0.00	0	0.00

TABLE H-3: COMPARISON OF CHEMICAL CONCENTRATIONS IN A-AQUIFER GROUNDWATER TO SURFACE WATER QUALITY SCREENING CRITERIA - VOLATILE ORGANIC COMPOUNDS (CONTINUED)

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

				Comparison of Surface Water Criteria				
Chemical	Number Analyzed	Number Detected	Percent Detected (%)	Surface Water Criteria[1] (µg/L)	Number of Detects Exceeding Surface Water Criteria	Percent of Detects Exceeding Surface Water Criteria (%)	Number of Nondetects with Limits Exceeding Surface Water Criteria	Percent of Nondetects with Limits Exceeding Surface Water Criteria (%)
cis-1,2-Dichloroethene	75	3	4.00	44,800	0	0.00	0	0.00
cis-1,3-Dichloropropene	252	0	0.00	NA	NA	NA	NA	NA
Dibromochloromethane	252	0	0.00	6,400	ND	ND	0	0.00
Dibromomethane	12	0	0.00	NA	NA	NA	NA	NA
Dichlorodifluoromethane	59	0	0.00	NA	NA	NA	NA	NA
Ethane	19	0	0.00	NA	NA	NA	NA	NA
Ethene	19	0	0.00	NA	NA	NA	NA	NA
Ethylbenzene	208	8	3.85	86	2	25.00	0	0.00
m,p-Xylenes	1	0	0.00	NA	NA	NA	NA	NA
Methane	20	10	50.00	NA	NA	NA	NA	NA
Methylene chloride	252	1	0.40	6,400	0	0.00	0	0.00
o-Xylene	1	0	0.00	NA	NA	NA	NA	NA
Styrene	173	0	0.00	NA	NA	NA	NA	NA
Tert-butyl methyl ether	32	4	12.50	8,000	0	0.00	0	0.00
Tetrachloroethene	252	8	3.17	450	0	0.00	0	0.00
Toluene	208	6	2.88	5,000	0	0.00	0	0.00
trans-1,2-Dichloroethene	75	0	0.00	44,800	ND	ND	0	0.00
trans-1,3-Dichloropropene	252	0	0.00	NA	NA	NA	NA	NA
Trichloroethene	252	23	9.13	400	0	0.00	0	0.00
Trichlorofluoromethane	59	0	0.00	NA	NA	NA	NA	NA
Vinyl acetate	26	0	0.00	NA	NA	NA	NA	NA
Vinyl chloride	252	0	0.00	NA	NA	NA	NA	NA
Xylene (total)	207	8	3.86	NA	NA	NA	NA	NA

Notes:

1 The published sources are provided in the footnotes to Table H-1.

µg/L Microgram per liter

NA Not available

ND Nondetect

TABLE H-4: COMPARISON OF CHEMICAL CONCENTRATIONS IN A-AQUIFER GROUNDWATER TO SURFACE WATER QUALITY SCREENING CRITERIA - SEMIVOLATILE ORGANIC COMPOUNDS

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

				Comparison of Surface Water Criteria				
Chemical	Number Analyzed	Number Detected	Percent Detected (%)	Surface Water Criteria[1] (µg/L)	Number of Detects Exceeding Surface Water Criteria	Percent of Detects Exceeding Surface Water Criteria (%)	Number of Nondetects with Limits Exceeding Surface Water Criteria	Percent of Nondetects with Limits Exceeding Surface Water Criteria (%)
1,4-Dioxane	1	0	0.00	NA	NA	NA	NA	NA
2,2'-Oxybis(1-Chloropropane)	193	0	0.00	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	183	0	0.00	NA	NA	NA	NA	NA
2,4,6-Trichlorophenol	183	0	0.00	NA	NA	NA	NA	NA
2,4-Dichlorophenol	183	0	0.00	NA	NA	NA	NA	NA
2,4-Dimethylphenol	183	1	0.55	NA	NA	NA	NA	NA
2,4-Dinitrophenol	179	0	0.00	46	ND	ND	14	7.82
2,4-Dinitrotoluene	193	0	0.00	118	ND	ND	0	0.00
2,6-Dinitrotoluene	193	0	0.00	118	ND	ND	0	0.00
2-Chloronaphthalene	193	0	0.00	1.5	ND	ND	193	100.00
2-Chlorophenol	184	0	0.00	NA	NA	NA	NA	NA
2-Methylnaphthalene	200	2	1.00	NA	NA	NA	NA	NA
2-Methylphenol	183	0	0.00	NA	NA	NA	NA	NA
2-Nitroaniline	192	0	0.00	NA	NA	NA	NA	NA
2-Nitrophenol	184	0	0.00	970	ND	ND	0	0.00
3,3'-Dichlorobenzidine	189	0	0.00	NA	NA	NA	NA	NA
3-Nitroaniline	193	0	0.00	NA	NA	NA	NA	NA
4,6-Dinitro-2-Methylphenol	179	0	0.00	970	ND	ND	0	0.00
4-Bromophenyl-Phenylether	193	0	0.00	NA	NA	NA	NA	NA
4-Chloro-3-Methylphenol	183	0	0.00	NA	NA	NA	NA	NA
4-Chloroaniline	193	0	0.00	NA	NA	NA	NA	NA
4-Chlorophenyl-Phenylether	193	0	0.00	NA	NA	NA	NA	NA
4-Methylphenol	183	1	0.55	NA	NA	NA	NA	NA
4-Nitroaniline	193	0	0.00	NA	NA	NA	NA	NA
4-Nitrophenol	184	0	0.00	970	ND	ND	0	0.00
Acenaphthene	226	1	0.44	710	0	0.00	0	0.00
Acenaphthylene	226	1	0.44	60	1	100.00	0	0.00
Anthracene	226	1	0.44	60	0	0.00	0	0.00

TABLE H-4: COMPARISON OF CHEMICAL CONCENTRATIONS IN A-AQUIFER GROUNDWATER TO SURFACE WATER QUALITY SCREENING CRITERIA - SEMIVOLATILE ORGANIC COMPOUNDS (CONTINUED)

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

				Comparison of Surface Water Criteria				
Chemical	Number Analyzed	Number Detected	Percent Detected (%)	Surface Water Criteria[1] (µg/L)	Number of Detects Exceeding Surface Water Criteria	Percent of Detects Exceeding Surface Water Criteria (%)	Number of Nondetects with Limits Exceeding Surface Water Criteria	Percent of Nondetects with Limits Exceeding Surface Water Criteria (%)
Benzo(a)anthracene	226	0	0.00	60	ND	ND	0	0.00
Benzo(a)pyrene	223	4	1.79	60	0	0.00	1	0.46
Benzo(b)fluoranthene	223	6	2.69	60	0	0.00	1	0.46
Benzo(g,h,i)perylene	223	2	0.90	60	0	0.00	2	0.90
Benzo(k)fluoranthene	223	3	1.35	60	0	0.00	1	0.45
Benzoic acid	13	0	0.00	NA	NA	NA	NA	NA
Benzyl alcohol	12	0	0.00	NA	NA	NA	NA	NA
Bis(2-chloroethoxy)methane	193	0	0.00	NA	NA	NA	NA	NA
bis(2-chloroethyl)ether	193	0	0.00	NA	NA	NA	NA	NA
bis(2-ethylhexyl)phthalate	193	2	1.04	NA	NA	NA	NA	NA
Butylbenzylphthalate	193	0	0.00	588.8	ND	ND	0	0.00
Carbazole	180	0	0.00	NA	NA	NA	NA	NA
Chrysene	226	0	0.00	60	ND	ND	0	0.00
Dibenz(a,h)anthracene	223	0	0.00	60	ND	ND	1	0.45
Dibenzofuran	193	0	0.00	NA	NA	NA	NA	NA
Diethylphthalate	193	0	0.00	588.8	ND	ND	0	0.00
Dimethylphthalate	193	0	0.00	3.4	ND	ND	193	100.00
Di-n-butylphthalate	193	0	0.00	588.8	ND	ND	0	0.00
Di-n-octylphthalate	190	0	0.00	588.8	ND	ND	0	0.00
Fluoranthene	226	1	0.44	16	0	0.00	2	0.89
Fluorene	226	5	2.21	60	0	0.00	0	0.00
Hexachlorobenzene	193	0	0.00	129	ND	ND	0	0.00
Hexachlorobutadiene	193	0	0.00	6.4	ND	ND	193	100.00
Hexachlorocyclopentadiene	191	0	0.00	1.4	ND	ND	191	100.00
Hexachloroethane	193	4	2.07	188	0	0.00	0	0.00
Indeno(1,2,3-cd)pyrene	223	1	0.45	60	0	0.00	1	0.45
Isophorone	193	0	0.00	2,580	ND	ND	0	0.00
Naphthalene	226	2	0.88	470	0	0.00	0	0.00

TABLE H-4: COMPARISON OF CHEMICAL CONCENTRATIONS IN A-AQUIFER GROUNDWATER TO SURFACE WATER QUALITY SCREENING CRITERIA - SEMIVOLATILE ORGANIC COMPOUNDS (CONTINUED)

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

				Comparison of Surface Water Criteria				
Chemical	Number Analyzed	Number Detected	Percent Detected (%)	Surface Water Criteria[1] (µg/L)	Number of Detects Exceeding Surface Water Criteria	Percent of Detects Exceeding Surface Water Criteria (%)	Number of Nondetects with Limits Exceeding Surface Water Criteria	Percent of Nondetects with Limits Exceeding Surface Water Criteria (%)
Nitrobenzene	193	0	0.00	1,336	ND	ND	0	0.00
n-Nitroso-di-n-propylamine	193	0	0.00	660,000	ND	ND	0	0.00
n-Nitrosodiphenylamine	193	0	0.00	660,000	ND	ND	0	0.00
Pentachlorophenol	183	0	0.00	7.9	ND	ND	183	100.00
Phenanthrene	226	0	0.00	60	ND	ND	0	0.00
Phenol	183	1	0.55	1,160	0	0.00	0	0.00
Pyrene	226	1	0.44	60	0	0.00	0	0.00
Total Chlordane	193	0	0.00	NA	NA	NA	NA	NA
Total HMW PAH	226	6	2.65	NA	NA	NA	NA	NA
Total LMW PAH	226	6	2.65	NA	NA	NA	NA	NA
Total PAH	226	11	4.87	NA	NA	NA	NA	NA

Notes:

1	The published sources are provided in the footnotes to Table H-1.
µg/L	Microgram per liter
HMW	High molecular weight
LMW	Low molecular weight
NA	Not available
ND	Nondetected
PAH	Polynuclear aromatic hydrocarbon

TABLE H-5: COMPARISON OF CHEMICAL CONCENTRATIONS IN A-AQUIFER GROUNDWATER TO SURFACE WATER QUALITY SCREENING CRITERIA - PESTICIDES, PCBS, AND CYANIDE

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

				Comparison of Surface Water Criteria				
Chemical	Number Analyzed	Number Detected	Percent Detected (%)	Surface Water Criteria[1] (µg/L)	Number of Detects Exceeding Surface Water Criteria	Percent of Detects Exceeding Surface Water Criteria (%)	Number of Nondetects with Limits Exceeding Surface Water Criteria	Percent of Nondetects with Limits Exceeding Surface Water Criteria (%)
4,4'-DDD	138	0	0.00	0.72	ND	ND	0	0.00
4,4'-DDE	138	0	0.00	2.8	ND	ND	0	0.00
4,4'-DDT	138	0	0.00	0.001	ND	ND	138	100.00
Aldrin	138	0	0.00	0.26	ND	ND	0	0.00
alpha-BHC	138	0	0.00	NA	NA	NA	NA	NA
alpha-Chlordane	138	0	0.00	0.004	ND	ND	138	100.00
Aroclor-1016	141	0	0.00	0.03	ND	ND	141	100.00
Aroclor-1221	141	0	0.00	0.03	ND	ND	141	100.00
Aroclor-1232	141	0	0.00	0.03	ND	ND	141	100.00
Aroclor-1242	141	0	0.00	0.03	ND	ND	141	100.00
Aroclor-1248	141	0	0.00	0.03	ND	ND	141	100.00
Aroclor-1254	141	0	0.00	0.03	ND	ND	141	100.00
Aroclor-1260	141	0	0.00	0.03	ND	ND	141	100.00
Aroclor (total)	141	0	0.00	NA	NA	NA	NA	NA
beta-BHC	138	0	0.00	NA	NA	NA	NA	NA
Chlordane (total)	138	0	0.00	NA	NA	NA	NA	NA
Cyanide	103	8	7.77	1	7	87.50	68	71.58
DDT (total)	138	0	0.00	NA	NA	NA	NA	NA
delta-BHC	138	0	0.00	NA	NA	NA	NA	NA
Dieldrin	138	0	0.00	0.142	ND	ND	0	0.00
Endosulfan I	138	0	0.00	0.0087	ND	ND	138	100.00
Endosulfan II	138	0	0.00	0.0087	ND	ND	138	100.00
Endosulfan sulfate	138	0	0.00	NA	NA	NA	NA	NA
Endrin	138	0	0.00	0.0023	ND	ND	138	100.00
Endrin aldehyde	130	0	0.00	NA	NA	NA	NA	NA
Endrin ketone	138	0	0.00	NA	NA	NA	NA	NA
gamma-BHC (lindane)	138	0	0.00	0.032	ND	ND	138	100.00
gamma-Chlordane	138	0	0.00	0.004	ND	ND	138	100.00
Heptachlor	138	0	0.00	0.0036	ND	ND	138	100.00

TABLE H-5: COMPARISON OF CHEMICAL CONCENTRATIONS IN A-AQUIFER GROUNDWATER TO SURFACE WATER QUALITY SCREENING CRITERIA - PESTICIDES, PCBS, AND CYANIDE (CONTINUED)

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

				Comparison of Surface Water Criteria				
Chemical	Number Analyzed	Number Detected	Percent Detected (%)	Surface Water Criteria[1] (µg/L)	Number of Detects Exceeding Surface Water Criteria	Percent of Detects Exceeding Surface Water Criteria (%)	Number of Nondetects with Limits Exceeding Surface Water Criteria	Percent of Nondetects with Limits Exceeding Surface Water Criteria (%)
Heptachlor epoxide	137	0	0.00	0.0036	ND	ND	137	100.00
Methoxychlor	138	0	0.00	0.003	ND	ND	138	100.00
Toxaphene	138	0	0.00	0.0002	ND	ND	138	100.00

Notes:

1	The published sources are provided in the footnotes to Table H-1.
µg/L	Microgram per liter
BHC	Benzene hexachloride
DDD	Dichlorodiphenyldichloroethane
DDE	Dichlorodiphenyldichloroethene
DDT	Dichlorodiphenyltrichloroethane
HGAL	Hunters Point groundwater ambient level
NA	Not available
ND	Nondetected
PCB	Polychlorinated biphenyl

TABLE H-6: EVALUATION OF GROUNDWATER SAMPLES THAT EXCEED SURFACE WATER QUALITY CRITERIA

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Sampling Location	Sample Date	Result (µg/L)	Detection Limit (µg/L)	Exceeded Criteria
Arsenic (Surface Water Screening Criteria = 36 µg/L)				
IR09MW39A	7-Oct-91	**60**	10	**Yes**
IR09MW39A	18-Dec-91	*10* [U]	10	No
IR09MW39A	12-Nov-93	23	10.9	No
IR09MW39A	23-Feb-94	48.8 [U]	48.8	Limit > criteria
IR09MW39A	12-May-94	25.1	10	No
IR09MW39A	6-Sep-94	28.8 [U]	28.8	No
IR09MW39A	9-Jun-04	20 [U]	20	No
IR09MW39A	13-Sep-04	20 [U]	20	No
IR09MW39A	29-Nov-04	20 [U]	20	No
IR22MW07A	18-May-93	*2.6* [U]	2.6	No
IR22MW07A	9-Sep-93	6 [U2]	6	No
IR22MW07A	14-Jan-94	**62.5** [J7]	3.2	**Yes**
IR22MW07A	1-Feb-01	5 [U2]	2.5	No
IR22MW07A	10-Jun-02	5 [U]	5	No
IR22MW16A	6-May-93	3.1	2.6	No
IR22MW16A	9-Sep-93	4.3 [U2]	4.3	No
IR22MW16A	14-Jan-94	**50.4**	3.2	**Yes**
IR22MW16A	19-Feb-01	*2.5* [U]	2.5	No
IR22MW16A	10-Jun-02	5 [U]	5	No
Cadmium (Surface Water Screening Criteria = 8.8 µg/L)				
IR44MW08A	20-Oct-95	**24.9** [J4]	0.2	**Yes**
IR44MW08A	22-Jan-96	*0.2* [U]	0.2	No
IR44MW08A	23-Feb-96	1 [U]	1	No
IR70MW11A	1-Nov-95	7.7	0.2	No
IR70MW11A	12-Jan-96	*0.2* [U]	0.2	No
IR70MW11A	14-Feb-96	**24.3**	0.2	**Yes**
IR70MW11A	7-Feb-01	0.68 [U1J9]	0.6	No
IR70MW12A	20-Oct-95	1.8 [J4]	0.2	No
IR70MW12A	12-Jan-96	*0.2* [U]	0.2	No
IR70MW12A	14-Feb-96	**9.2**	0.2	**Yes**

TABLE H-6: EVALUATION OF GROUNDWATER SAMPLES THAT EXCEED SURFACE WATER QUALITY CRITERIA (CONTINUED)
Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Sampling Location	Sample Date	Result (µg/L)	Detection Limit (µg/L)	Exceeded Criteria
Chromium VI (Surface Water Screening Criteria = 50 µg/L)				
IR09MW35A	25-Apr-90	63	10	**Yes**
IR09MW35A	2-Jan-91	63	10	**Yes**
IR09MW35A	8-Jul-91	100	10	**Yes**
IR09MW35A	16-Dec-91	**130**	10	**Yes**
IR09MW35A	9-Nov-93	76.4	10	**Yes**
IR09MW35A	22-Feb-94	70	10	**Yes**
IR09MW35A	12-May-94	106	10	**Yes**
IR09MW35A	2-Sep-94	78.3	10	**Yes**
IR09MW35A	28-Jul-95	120	10	**Yes**
IR09MW35A	15-Aug-00	60	10	**Yes**
IR09MW35A	1-Feb-01	60	10	**Yes**
IR09MW35A	9-Jun-04	73	20	**Yes**
IR09MW35A	7-Sep-04	70	20	**Yes**
IR09MW35A	22-Nov-04	*60*	20	**Yes**
IR09MW39A	7-Oct-91	**60**	10	**Yes**
IR09MW39A	18-Dec-91	*10* [U]	10	No
IR09MW39A	12-Nov-93	23	10.9	No
IR09MW39A	23-Feb-94	48.8 [U]	48.8	No
IR09MW39A	12-May-94	25.1	10	No
IR09MW39A	6-Sep-94	28.8 [U]	28.8	No
IR09MW39A	9-Jun-04	20 [U]	20	No
IR09MW39A	13-Sep-04	20 [U]	20	No
IR09MW39A	29-Nov-04	20 [U]	20	No
IR09MW51F	15-Feb-96	**56**	10	**Yes**
IR09MW51F	18-Mar-96	48	10	No
IR09MW51F	9-Apr-96	49	10	No
IR09MW51F	14-May-96	47	10	No
IR09MW51F	15-Aug-00	*30*	10	No
IR09MW51F	2-Feb-01	*30*	10	No
IR09MW51F	8-Jun-04	37	20	No
IR09MW51F	13-Sep-04	40	20	No
IR09MW51F	29-Nov-04	40	20	No

TABLE H-6: EVALUATION OF GROUNDWATER SAMPLES THAT EXCEED SURFACE WATER QUALITY CRITERIA (CONTINUED)
Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Sampling Location	Sample Date	Result (µg/L)	Detection Limit (µg/L)	Exceeded Criteria
Chromium VI (Surface Water Screening Criteria = 50 µg/L) (Continued)				
IR09MW63A	10-Jun-04	36	20	No
IR09MW63A	13-Sep-04	*20*	20	No
IR09MW63A	30-Nov-04	**60**	20	**Yes**
IR09PPY1	24-Apr-90	100	10	**Yes**
IR09PPY1	3-Jan-91	320	10	**Yes**
IR09PPY1	9-Jul-91	380	10	**Yes**
IR09PPY1	16-Dec-91	460	10	**Yes**
IR09PPY1	23-Feb-94	409	21.9	**Yes**
IR09PPY1	9-May-94	**493**	20	**Yes**
IR09PPY1	7-Sep-94	221	12.5	**Yes**
IR09PPY1	17-Oct-00	380	10	**Yes**
IR09PPY1	2-Feb-01	260	10	**Yes**
IR33MW61A	5-Feb-01	90	10	**Yes**
IR33MW61A	10-Jun-04	54	20	**Yes**
IR33MW61A	13-Sep-04	40	20	No
IR33MW61A	30-Nov-04	**250**	20	**Yes**
Copper (HGAL = 28.04 µg/L)				
IR33MW61A	8-Aug-94	*9.3*	1.7	No
IR33MW61A	8-Aug-94	37.6	1.7	**Yes**
IR33MW61A	16-Jan-96	55.9	0.5	**Yes**
IR33MW61A	16-Feb-96	**81.7**	0.5	**Yes**
IR33MW61A	1-Aug-00	66.2	1.9	**Yes**
IR33MW61A	5-Feb-01	36.4	1.5	**Yes**
IR33MW61A	10-Jun-04	21.2	5	No
IR33MW61A	13-Sep-04	21.2	5	No
IR33MW61A	30-Nov-04	30.5	5	**Yes**
IR34MW01A	23-Sep-94	*2.4* [U1]	2.4	No
IR34MW01A	23-Sep-94	11.1	1.7	No
IR34MW01A	17-Jan-96	5.1 [U2]	5.1	No
IR34MW01A	21-Feb-96	51	0.5	**Yes**
IR34MW01A	3-Aug-00	**140**	1.9	**Yes**
IR34MW01A	8-Feb-01	4 [U1]	1.5	No

TABLE H-6: EVALUATION OF GROUNDWATER SAMPLES THAT EXCEED SURFACE WATER QUALITY CRITERIA (CONTINUED)
Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Sampling Location	Sample Date	Result (µg/L)	Detection Limit (µg/L)	Exceeded Criteria
Lead (HGAL = 14.44 µg/L)				
IR22MW07A	18-May-93	9.5 [U]	9.5	No
IR22MW07A	9-Sep-93	14 [U]	14	No
IR22MW07A	14-Jan-94	**15.4**	1.2	**Yes**
IR22MW07A	1-Feb-01	*1.6* [U]	1.6	No
IR22MW07A	10-Jun-02	1.63	0.08	No
IR22MW08A	9-Sep-93	**20.3** [UJ23]	1.4	**Yes**
IR22MW08A	13-Jan-94	12 [U]	12	No
IR22MW08A	19-Feb-01	1.6 [U]	1.6	No
IR22MW08A	31-Jul-02	*0.046* [U2]	0.008	No
IR22MW15A	4-May-93	**18.5**	13	**Yes**
IR22MW15A	9-Sep-93	14 [U]	14	No
IR22MW15A	13-Jan-94	12 [U]	12	No
IR22MW15A	1-Feb-01	*1.6* [U]	1.6	No
IR22MW15A	11-Jun-02	3 [U]	3	No
IR22MW16A	9-Sep-93	20.2 [UJ23]	1.4	**Yes**
IR22MW16A	14-Jan-94	**26.1**	1.2	**Yes**
IR22MW16A	19-Feb-01	*1.6* [U]	1.6	No
IR22MW16A	10-Jun-02	2.68	0.08	No
IR22MW16A	9-Jun-04	5 [U]	5	No
IR22MW16A	14-Sep-04	25 [U]	25	No
IR22MW16A	6-Dec-04	25 [U]	25	No
IR22MW20A	17-Oct-94	2.4 [U2]	2.4	No
IR22MW20A	19-Jan-96	*0.8* [U]	0.8	No
IR22MW20A	20-Feb-96	*0.8* [U]	0.8	No
IR22MW20A	31-Jan-01	**22.4**	1.6	**Yes**
IR22MW20A	10-Jun-02	1.91	0.08	No
IR22MW20A	9-Jun-04	5 [U]	5	No
IR22MW20A	14-Sep-04	25 [U]	25	Limit > criteria
IR22MW20A	6-Dec-04	10 [U]	10	No

TABLE H-6: EVALUATION OF GROUNDWATER SAMPLES THAT EXCEED SURFACE WATER QUALITY CRITERIA (CONTINUED)
Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Sampling Location	Sample Date	Result (µg/L)	Detection Limit (µg/L)	Exceeded Criteria
Lead (HGAL = 14.44 µg/L) (Continued)				
PA33MW37A	25-Mar-93	2.6 [U]	2.6	No
PA33MW37A	25-Mar-93	**15.1** [UJ23]	1.3	**Yes**
PA33MW37A	28-Jul-95	1.6	1.5	No
PA33MW37A	12-Feb-96	*0.8* [U]	0.8	No
PA33MW37A	16-Aug-00	1.7 [U]	1.7	No
PA33MW37A	7-Feb-01	1.6 [UJ9]	1.6	No
PA50MW07A	26-Apr-93	1.4 [U1J2]	1.4	No
PA50MW07A	20-Mar-96	*0.8* [U]	0.8	No
PA50MW07A	2-May-96	1 [U]	1	No
PA50MW07A	9-Jun-04	5 [U]	5	No
PA50MW07A	13-Sep-04	**17.7**	5	**Yes**
PA50MW07A	3-Dec-04	5 [UJ3]	5	No
Mercury (HGAL = 0.6 µg/L)				
IR50MW14A	21-Jun-94	**0.99**	0.04	**Yes**
IR50MW14A	30-Jan-96	*0.1* [U]	0.1	No
IR50MW14A	1-Mar-96	0.12 [U1]	0.12	No
PA16MW16A	16-Nov-95	*0.1* [U]	0.1	No
PA16MW16A	16-Jan-96	*0.1* [U]	0.1	No
PA16MW16A	21-Feb-96	**1.1**	0.1	**Yes**
Nickel (HGAL = 96.48 µg/L)				
IR09MW35A	25-Apr-90	112.0	20.2	**Yes**
IR09MW35A	2-Jan-91	**130.0**	22.9	**Yes**
IR09MW35A	8-Jul-91	**130.0**	14.1	**Yes**
IR09MW35A	16-Dec-91	112.0	17.8	**Yes**
IR09MW35A	9-Nov-93	114.0	6.8	**Yes**
IR09MW35A	22-Feb-94	55.7	7.2	No
IR09MW35A	12-May-94	52.3	1.8	No
IR09MW35A	2-Sep-94	61.5	2.5	No
IR09MW35A	28-Jul-95	*35.5*	3.3	No
IR09MW35A	23-Aug-00	65.5	2.1	No
IR09MW35A	1-Feb-01	49.4	1.7	No

TABLE H-6: EVALUATION OF GROUNDWATER SAMPLES THAT EXCEED SURFACE WATER QUALITY CRITERIA (CONTINUED)
Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Sampling Location	Sample Date	Result (µg/L)	Detection Limit (µg/L)	Exceeded Criteria
Nickel (HGAL = 96.48 µg/L) (Continued)				
IR09MW44A	8-Oct-91	49.8 [U1]	49.8	No
IR09MW44A	18-Dec-91	51.4 [J7]	17.8	No
IR09MW44A	10-Nov-93	**101.0**	6.8	**Yes**
IR09MW44A	22-Feb-94	63.5	7.2	No
IR09MW44A	11-May-94	*47.4*	1.8	No
IR09MW44A	7-Sep-94	50.6	2.5	No
IR09MW44A	23-Aug-00	58.6	2.1	No
IR09MW44A	30-Jan-01	52.8	1.3	No
IR09P043A	8-Oct-91	**185.0**	15.2	**Yes**
IR09P043A	18-Dec-91	134.0	17.8	**Yes**
IR09P043A	10-Nov-93	141.0	6.8	**Yes**
IR09P043A	24-Feb-94	119.0	7.2	**Yes**
IR09P043A	12-May-94	*99.6*	1.8	**Yes**
IR09P043A	8-Sep-94	112.0	2.5	**Yes**
IR09P043A	6-Oct-00	147.0	2.1	**Yes**
IR09P043A	7-Feb-01	157.0	1.7	**Yes**
IR34MW01A	23-Sep-94	5.2 [U1]	5.2	No
IR34MW01A	17-Jan-96	2.6 [U1]	2.6	No
IR34MW01A	21-Feb-96	65.0	0.7	No
IR34MW01A	3-Aug-00	**174.0**	2.1	**Yes**
IR34MW01A	8-Feb-01	*1.3* [U]	1.3	No
PA33MW37A	25-Mar-93	61.2	7.4	No
PA33MW37A	28-Jul-95	**317.0**	3.3	**Yes**
PA33MW37A	12-Feb-96	38.9	0.7	No
PA33MW37A	16-Aug-00	132.0	2.1	**Yes**
PA33MW37A	7-Feb-01	*10.9* [U1J9]	1.3	No
IR37MW01A	1-Nov-94	**99.0**	1.4	**Yes**
IR37MW01A	19-Jan-96	*31.7*	0.7	No
IR37MW01A	21-Feb-96	33.5	0.7	No

TABLE H-6: EVALUATION OF GROUNDWATER SAMPLES THAT EXCEED SURFACE WATER QUALITY CRITERIA (CONTINUED)
Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Sampling Location	Sample Date	Result (µg/L)	Detection Limit (µg/L)	Exceeded Criteria
Silver (HGAL = 7.43 µg/L)				
IR08MW39A	10-Jul-90	1.6 [U]	1.6	No
IR08MW39A	3-Jan-91	8.9 [U1]	8.9	Limit > criteria
IR08MW39A	10-Jul-91	*1.1* [U]	1.1	No
IR08MW39A	20-Dec-91	4.9 [U]	4.9	No
Zinc (Surface Water Criteria = 81 µg/L)				
IR22MW20A	17-Oct-94	49.1 [U2]	49.1	No
IR22MW20A	19-Jan-96	9.5 [U2]	9.5	No
IR22MW20A	20-Feb-96	4.6 [U1]	4.6	No
IR22MW20A	31-Jan-01	**492**	0.8	**Yes**
IR22MW20A	10-Jun-02	*4.4* [U2]	2	No
IR22MW20A	9-Jun-04	50 [U]	50	No
IR22MW20A	14-Sep-04	250 [U]	250	Limit > criteria
IR22MW20A	6-Dec-04	100 [U]	100	Limit > criteria
IR33MW121B	17-Oct-00	**311**	1.4	**Yes**
IR33MW121B	5-Feb-01	*2.9* [J]	1.4	No
IR34MW01A	23-Sep-94	16.2 [U1]	16.2	No
IR34MW01A	17-Jan-96	12.2 [U2]	12.2	No
IR34MW01A	21-Feb-96	90	1	**Yes**
IR34MW01A	3-Aug-00	**120**	1.4	**Yes**
IR34MW01A	8-Feb-01	*1.4* [U]	1.4	No
IR34MW36B	4-Oct-00	**708**	1.4	**Yes**
IR34MW36B	31-Jan-01	*125*	0.8	**Yes**
IR34MW37B	4-Oct-00	**874**	1.4	**Yes**
IR34MW37B	1-Feb-01	*0.8* [U]	0.8	No
PA16MW17A	21-Nov-95	**143**	1.2	**Yes**
PA16MW17A	22-Feb-96	*23.9* [U1]	23.9	No

TABLE H-6: EVALUATION OF GROUNDWATER SAMPLES THAT EXCEED SURFACE WATER QUALITY CRITERIA (CONTINUED)
Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Sampling Location	Sample Date	Result (µg/L)	Detection Limit (µg/L)	Exceeded Criteria
Ethylbenzene (Surface Water Criteria = 86 µg/L)				
IR33MW61A	8-Aug-94	350	100	**Yes**
IR33MW61A	8-Aug-94	300	100	**Yes**
IR33MW61A	16-Jan-96	20	0.5	No
IR33MW61A	16-Feb-96	1.0	0.5	No
IR33MW61A	16-Feb-96	1.0	0.5	No
IR33MW61A	28-Apr-99	17	5	No
IR33MW61A	1-Aug-00	28	3	No
IR33MW61A	5-Feb-01	140	6	**Yes**
IR33MW61A	5-Feb-01	110	7	**Yes**
IR33MW61A	10-Jun-04	0.54	0.5	No
IR33MW61A	13-Sep-04	4.3	0.5	No
IR33MW61A	30-Nov-04	1.1	0.5	No
IR33MW61A	30-Nov-04	0.8	0.5	No
Acenaphthylene (Surface Water Criteria = 60 µg/L)				
IR09MW38A	24-Apr-90	10 [U]	10	No
IR09MW38A	24-Apr-90	10 [U]	10	No
IR09MW38A	3-Jan-91	*2* [U]	2	No
IR09MW38A	8-Jul-91	*2* [U]	2	No
IR09MW38A	17-Dec-91	**83**	2	**Yes**
IR09MW38A	11-Nov-93	50 [U]	50	No
IR09MW38A	23-Feb-94	10 [U]	10	No
IR09MW38A	23-Feb-94	10 [U]	10	No
IR09MW38A	11-May-94	10 [U]	10	No
IR09MW38A	11-May-94	10 [U]	10	No
IR09MW38A	6-Sep-94	10 [U]	10	No
IR09MW38A	6-Sep-94	10 [U]	10	No
Cyanide (Surface Water Criteria = 1 µg/L)				
IR09MW35A	25-Apr-90	10 [UJ3]	10	Limit > criteria
IR09MW35A	2-Jan-91	**12**	10	**Yes**
IR09MW35A	8-Jul-91	10 [U]	10	Limit > criteria
IR09MW35A	16-Dec-91	10 [U]	10	Limit > criteria
IR09MW35A	9-Nov-93	*0.8* [U]	0.8	No
IR09MW35A	22-Feb-94	1.8 [U2]	1.8	Limit > criteria
IR09MW35A	12-May-94	2 [J6]	1.2	**Yes**
IR09MW35A	2-Sep-94	1.1 [U]	1.1	Limit > criteria

TABLE H-6: EVALUATION OF GROUNDWATER SAMPLES THAT EXCEED SURFACE WATER QUALITY CRITERIA (CONTINUED)
Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Sampling Location	Sample Date	Result (µg/L)	Detection Limit (µg/L)	Exceeded Criteria
IR09MW35A	9-Jun-04	10 [U]	10	Limit > criteria
Cyanide (Surface Water Criteria = 1 µg/L) (Continued)				
IR09MW35A	7-Sep-04	10 [U]	10	Limit > criteria
IR09MW35A	22-Nov-04	10 [U]	10	Limit > criteria
IR09MW36A	25-Apr-90	10 [U]	10	Limit > criteria
IR09MW36A	2-Jan-91	10 [U]	10	Limit > criteria
IR09MW36A	9-Jul-91	10 [U]	10	Limit > criteria
IR09MW36A	16-Dec-91	10 [U]	10	Limit > criteria
IR09MW36A	12-Nov-93	*0.8* [U]	0.8	No
IR09MW36A	24-Feb-94	1.1 [U2]	1.1	Limit > criteria
IR09MW36A	11-May-94	1.2 [U]	1.2	Limit > criteria
IR09MW36A	6-Sep-94	**1.3** [J5]	1.1	**Yes**
IR09MW36A	17-Jun-04	10 [U]	10	Limit > criteria
IR09MW36A	13-Sep-04	10 [U]	10	Limit > criteria
IR09MW36A	23-Nov-04	10 [U]	10	Limit > criteria
IR09MW37A	25-Apr-90	10 [U]	10	Limit > criteria
IR09MW37A	3-Jan-91	**12**	10	**Yes**
IR09MW37A	9-Jul-91	10 [U]	10	Limit > criteria
IR09MW37A	17-Dec-91	10 [U]	10	Limit > criteria
IR09MW37A	12-Nov-93	*0.08* [J]	0.8	No
IR09MW37A	24-Feb-94	1.6 [U2]	1.6	Limit > criteria
IR09MW37A	12-May-94	1.2 [U]	1.2	Limit > criteria
IR09MW37A	7-Sep-94	1.1 [U]	1.1	Limit > criteria
IR09MW44A	8-Oct-91	10 [U]	10	Limit > criteria
IR09MW44A	18-Dec-91	10 [U]	10	Limit > criteria
IR09MW44A	10-Nov-93	*0.8* [U]	0.8	Limit > criteria
IR09MW44A	22-Feb-94	1.3 [U2]	1.3	Limit > criteria
IR09MW44A	11-May-94	1.2 [U]	1.2	Limit > criteria
IR09MW44A	7-Sep-94	**1.6** [J6]	1.1	**Yes**
IR09P040A	8-Oct-91	10 [U]	10	Limit > criteria
IR09P040A	17-Dec-91	10 [U]	10	Limit > criteria
IR09P040A	12-Nov-93	*0.8* [U]	0.8	No

TABLE H-6: EVALUATION OF GROUNDWATER SAMPLES THAT EXCEED SURFACE WATER QUALITY CRITERIA (CONTINUED)

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Sampling Location	Sample Date	Result (µg/L)	Detection Limit (µg/L)	Exceeded Criteria
IR09P040A	24-Feb-94	1.3 U2	1.3	Limit > criteria
IR09P040A	11-May-94	1.2 U	1.2	Limit > criteria
Cyanide (Surface Water Criteria = 1 µg/L) (Continued)				
IR09P040A	8-Sep-94	**1.3**	1.1	**Yes**
IR09P040A	29-Jun-04	10 U	10	Limit > criteria
IR09P040A	13-Sep-04	10 U	10	Limit > criteria
IR09PPY1	24-Apr-90	10 U	10	Limit > criteria
IR09PPY1	3-Jan-91	10 U	10	Limit > criteria
IR09PPY1	9-Jul-91	10 U	10	Limit > criteria
IR09PPY1	16-Dec-91	10 U	10	Limit > criteria
IR09PPY1	23-Feb-94	*2.5 U2*	2.5	Limit > criteria
IR09PPY1	9-May-94	4.3 U2J5	4.3	Limit > criteria
IR09PPY1	7-Sep-94	**1.6**	1.1	**Yes**

Notes: **Bold** results indicate the maximum detected concentration for each well.
Italicized results indicate the lowest concentration identified for each well.
Surface water criteria derivation discussed in Section H2.1 of this appendix, and listed in Table H-1.
The listed detection limit for cyanide reflects the maximum sensitivity of current, routinely used analytical methods. The listed detection limit will be used as the project screening criteria unless reasonable grounds are established for pursuing non-routine methods.

--	Not applicable
µg/L	Microgram gram per liter
HGAL	Hunters Point groundwater ambient level
J	Estimated detected result that is greater than the detection limit but less than the reporting limit.
J2	Estimated detected result based on matrix duplicate
J4	Estimated detected result due to serial dilution
J5	Estimated detected result due to holding time
J6	Estimated detected result based on matrix duplicate
J7	Estimated detected result due to initial and continuing calibration
J9	Estimated detected result due to interference check sample in metals, and due to percent detected between columns in organics
U	Nondetected result
U1	Nondetected result with method blank contamination
U2	Nondetected result with field blank contamination
UJ2	Nondetected result with the quantitation limit estimated based on matrix duplicate
UJ3	Nondetected result with the quantitation limit estimated due to inaccuracies from a blank spike, surrogate spike, or matrix spike
UJ9	Nondetected results with the quantitation limit estimated due to interference check sample in metals, and due to percent detected between columns in organics

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
25	Trigger levels	Section 2.5.2	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Appendix I. SulTech. November 30, 2007.

APPENDIX I
TRIGGER LEVELS FOR GROUNDWATER IMPACTS TO SAN FRANCISCO BAY

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ACRONYMS AND ABBREVIATIONS

µg/L	Microgram per liter
AF	Attenuation factor
ARAR	Applicable or relevant and appropriate requirement
COC	Chemical of concern
CPRD	Coastal Protection and Restoration Division
EI	Environmental Indicator
EPA	U.S. Environmental Protection Agency
FS	Feasibility Study
HGAL	Hunters Point groundwater ambient level
HPS	Hunters Point Shipyard
IR	Installation Restoration
NOAA	National Oceanic and Atmospheric Administration
RCRA	Resource Conservation and Recovery Act
Water Board	San Francisco Bay Regional Water Quality Control Board

I1.0 INTRODUCTION

Chemicals present in groundwater at Hunters Point Shipyard (HPS) have the potential to cause degradation of surface waters as they migrate and discharge to the San Francisco Bay. No water quality criteria for the protection of organisms exist for groundwater; therefore, alternative screening criteria for groundwater must be developed to evaluate the potential for chemicals in groundwater to result in degradation of the adjacent surface water body (the bay).

In Appendix H of this Revised Feasibility Study (FS) Report, the analytical results of all detected analytes in the A- and B-aquifers are screened by a comparison with the applicable surface water criteria and an evaluation using engineering judgment. The results of this screening identified two metals, chromium VI and nickel, as chemicals of concern (COC) in groundwater that pose potential risk to the bay. Although the surface water criteria can be considered applicable or relevant and appropriate requirements (ARAR) for the surface water, and remediation goals can be derived for the surface water beyond the interface of the groundwater and the bay using these ARARs, these ARARs and remediation goals can not be directly applied to the groundwater at the inland plumes at HPS.

A variety of processes occur in the subsurface that serve to reduce chemical concentrations in groundwater as groundwater migrates toward a discharge point such as a lake, stream, or bay. These processes include hydrodynamic dispersion, sorption, chemical and biological transformation, dilution in the tidal mixing zone, and dilution upon discharge to a surface water body. Therefore, it is not appropriate to apply surface water criteria directly to groundwater; rather, surface water criteria apply only to surface waters. The purposes of this appendix are presented below.

1. Discuss the applicable toxicological and physicochemical factors relevant to developing trigger levels for Parcel D groundwater that would result in meeting the remediation goals at the point of compliance in the bay.

2. Review a variety of lines of evidence that indicate the magnitude of the reduction in chemical concentrations when groundwater discharges to the bay.

3. Based on items 1 and 2, develop appropriate trigger levels for groundwater that will ensure surface water criteria are not exceeded if groundwater at Parcel D comes in contact with marine organisms when it is discharged to the bay.

Section I2.0 of this appendix presents a review of the lines of evidence that indicate the magnitude of the reduction in chemical concentrations that can be expected as groundwater migrates toward a surface water body and when the groundwater discharges to the surface water body. Section I3.0 proposes trigger levels for groundwater based on the lines of evidence presented in Section I2.0 for each of the areas at Parcel D where groundwater concentrations exceeded surface water quality criteria. Section I4.0 presents a review of the uncertainty related to establishing trigger levels for groundwater that will meet the promulgated surface water quality criteria (ARARs) for the bay. Section I5.0 provides a summary and conclusions for the

development of trigger levels for groundwater for Parcel D. References for this appendix are provided in Section I6.0.

I2.0 LINES OF EVIDENCE FOR ATTENUATION OF CHEMICAL CONCENTRATIONS IN GROUNDWATER

As chemicals migrate through soil and groundwater, they are subjected to physical, chemical, and biological processes that tend to reduce their concentrations. These processes include sorption of chemicals to soil particles, volatilization, hydrodynamic dispersion and molecular diffusion, and chemical and biological transformation (biodegradation).

Additional reduction in chemical concentrations takes place in the tidal mixing zone near the shoreline. This is the zone where surface water from the bay moves inland through the aquifer, mixing with the groundwater. The net discharge of groundwater may not be changed by tidal influence, but rising tides introduce surface water into the aquifer so that the concentration of chemicals in the groundwater that discharges during low tide is reduced by near-shore mixing of the bay water and groundwater in the aquifer. Finally, concentrations of chemicals entering the bay with the discharging groundwater will be further reduced through dilution of groundwater with the bay water at the interface of the groundwater and the bay. This section of the appendix describes the attenuation of chemical concentrations in groundwater as it migrates through these three different zones, from the source areas through the tidal mixing zone and on to bay discharge points. As described below, the attenuation factors (AF) for the tidal mixing zone and for discharge to the surface water body are set to 1 (no attenuation) in this evaluation to provide a highly conservative approach, as agreed to with the regulatory agencies.

I2.1 ATTENUATION DURING GROUNDWATER TRANSPORT TO TIDAL MIXING ZONE

Groundwater modeling was performed to estimate peak concentrations of chemicals that may discharge to the bay for a variety of general plume widths and distances from the plume to the bay observed at HPS. Plume-specific modeling was performed for the four known plumes at Parcel D that contain the two COCs identified during the surface water quality screening: chromium VI and nickel. The methodology and results for the groundwater modeling are presented in Appendix G, and the surface water screening is presented in Appendix H. Based on the maximum detected concentration in the source area and predicted peak concentration at the point of discharge to the bay from the modeling results, an AF was calculated for each of the four plumes. The AF was derived by dividing the maximum source area concentration by the predicted peak concentration at the bay. These AFs are not chemical specific, but are plume-source and plume-location specific.

The U.S Environmental Protection Agency (EPA) analytical solute transport model BIOSCREEN (EPA 1997a) was used to predict maximum concentrations at the point of discharge. The sediment/bay interface was used as the point of discharge in the model and then to calculate AFs. BIOSCREEN can simulate adsorption and degradation processes during advective transport of the solute; however in this model, adsorption and degradation parameters were set to zero to ensure that hydrodynamic dispersion was the only mechanism causing a reduction in chemical concentrations in groundwater. By hydrodynamic modeling dispersion as

the only attenuation mechanism, the results can be applied to any chemical and the calculated AFs are not chemical-specific; however, the AFs are plume-specific based on the source width and distance from the source of the plume to the nearest receptor location. Considering only hydrodynamic dispersion for attenuation adds conservatism to the assessment, as agreed to with the regulatory agencies.

The intent of this modeling approach is to provide conservative estimates of the maximum groundwater concentrations expected at the points of discharge. Based on model sensitivity analysis, the values for input parameters were chosen to result in realistic, yet conservatively high, estimates of the maximum groundwater concentrations at the points of discharge, providing an added layer of conservatism to the calculations. The results of the modeling indicated a range of AFs, depending on the source width and the distance to receptors. A complete presentation of the modeling methodology and results is provided in Appendix G. The following table provides typical ranges of AFs calculated using the BIOSCREEN model for various plume widths and distances from the bay.

Source Width (feet)	Distance to Receptor (feet)	Attenuation Factor	Source Width (feet)	Distance to Receptor (feet)	Attenuation Factor
40	50	1.0	200	50	1.0
40	500	6.3	200	500	1.9
40	1,600	58.0	200	1,600	15.3
60	50	1.0	240	50	1.0
60	500	4.4	240	500	1.8
60	1,600	40.4	240	1,600	13.5
80	50	1.0	280	50	1.0
80	500	3.4	280	500	1.8
80	1,600	31.5	280	1,600	12.2
120	50	1.0	320	50	1.0
120	500	2.5	320	500	1.7
120	1,600	22.6	320	1,600	11.3
160	50	1.0	360	50	1.0
160	500	2.1	360	500	1.7
160	1,600	18.1	360	1,600	10.5

These data indicate that the amount of attenuation caused by hydrodynamic dispersion during groundwater transport can be quite significant, and the longer the travel distance (distance to receptor), the greater the AF.

I2.2 ATTENUATION IN THE TIDAL MIXING ZONE

Several studies in the vicinity of HPS attempted to quantify the amount of attenuation that occurs in the tidal mixing zone caused by dilution by seawater. These studies are discussed below.

The tidal mixing zone is defined as the area near and inland of the shoreline where groundwater and seawater mix as a result of tidal fluctuations. Groundwater flow in the tidal mixing zone can be fairly complex because of the diurnal nature of tides. At high tide, the flow direction may be from the shore inland, in response to the hydraulic gradient created by the high tide. Conversely, at low tide, the flow direction may be from land to the shore, in response to the hydraulic gradient created by the low tide. The tidally influenced water-level fluctuations change the direction of groundwater flow daily in the tidal mixing zone, and result in the movement of seawater back and forth in the tidal mixing zone. Assuming that seawater has lower concentrations than the groundwater that is discharging, a certain amount of attenuation of chemical concentrations in groundwater occurs because of the dilution of groundwater within the aquifer by the seawater.

I2.2.1 Modeling Conducted at Mission Bay, San Francisco

A one-dimensional mathematical model (ENVIRON International Corporation 1998) was developed for the area within a 50-foot distance from the bay fringe. The model simulated the influence of tides on chemical concentrations in groundwater as the groundwater flows toward the bay and was based on a method developed by Yim and Mohsen (1992). The model incorporated the effects of dilution, hydrodynamic dispersion, and sorption within the groundwater system. No dilution within the bay was considered. A total of 63 model runs was carried out to provide a sample of reasonable dispersivity characteristics, sorption parameters, and initial concentration distribution. The minimum attenuation predicted by the model over the last 50 feet to the bay was a factor of about 6.5, the maximum attenuation was 12.8, and the average attenuation was 9.7. As additional support for the model results, the authors used the real case where the tidal influences reduced the highest observed chemical concentration inland of 600 micrograms per liter (µg/L) to about 15 µg/L near the tidal river (which results in an AF of 40).

I2.2.2 Modeling Conducted Near Pier 64, San Francisco

Clayton Group Services (2001), in association with S.S. Papadopulos & Associates, Inc., developed a flow and transport model using MODFLOW and MT3D to evaluate attenuation of chemical concentrations in groundwater due to dilution associated with tidal mixing in the fill close to the bay. The base case model showed a 65 percent reduction (approximately a factor of 3) in the average concentration of chemicals in groundwater before it enters the bay, which is a more conservative result than the results from the model developed for Mission Bay. However, the estimated inland extent of mixing was only 30 feet into the aquifer from the Bay, as opposed to the 50 feet used for the Mission Bay model. Additionally, the Pier 64 model used a much higher hydraulic conductivity value (75 feet per day) than the Mission Bay model (2.8 feet per day). Data from HPS studies indicated that the tidal mixing zone is greater than 50

that hydraulic conductivities are generally on the order of 1 to 20 feet per day. Therefore, it appears that the modeling results from Mission Bay would be more representative of the conditions at HPS than the modeling results from near Pier 64.

I2.2.3 Tidal Mixing Study at Hunters Point Shipyard

The Navy studied the extent of tidal mixing within the A-aquifer at Parcel E at HPS in 2002 (Tetra Tech EM Inc. 2004). Specific conductance, a temperature-independent surrogate for salinity, was used to evaluate the relationship between fluctuations in salinity and tidal fluctuations. Fluctuations in specific conductance related to tidal fluctuations in water levels were observed along the Parcel E shoreline in a near-shore well (IR02MW206A1 located 70 feet from the bay in the area east of IR-03), but not in an inland well (IR15MW06A located 335 feet from the bay at IR-15). These data indicate that the tidal mixing zone in Parcel E extends at least 70 feet inland from the shoreline.

I2.3 ATTENUATION ON DISCHARGE TO BAY

When groundwater discharges to the bay, dilution of the chemical concentrations in groundwater likely occurs because of the relatively small volume of groundwater discharging into a large surface water body. However, measuring groundwater discharge is a difficult task and is seldom performed. It is also difficult to measure the chemical concentrations in the surface water body because of uncertainty about locations and depths for sampling and potential temporal variations in concentrations. Several agencies have assumed a 10 times dilution factor as a "rule of thumb" to account for the dilution in chemical concentrations that occurs when groundwater discharges to a surface water body. The following sections describe the approaches that these regulatory agencies have taken.

I2.3.1 National Oceanic and Atmospheric Administration Approach

The Coastal Protection and Restoration Division (CPRD) of National Oceanic and Atmospheric Administration (NOAA) is charged with protecting and restoring coastal habitats and resources affected by hazardous materials releases. CPRD works closely with EPA, Department of Defense, states, and other natural resource trustees throughout the Comprehensive Environmental Response, Compensation, and Liability Act remedial process to ensure that selected remedies are protective and that appropriate measures are implemented to restore NOAA trust resources (NOAA 2006a).

CPRD developed Screening Quick Reference Tables that present screening concentrations for inorganic and organic contaminants in various environmental media (NOAA 1999). The CPRD of NOAA discusses the comparison of screening of groundwater data with EPA's National Ambient Water Quality Criteria on the Frequently Asked Questions webpage, as follows (NOAA 2006b):

"Groundwater concentrations are also screened against AWQC (ambient water quality criteria). However, given the dilution expected during migration and upon discharge of groundwater to surface water, CPRD uses 10 times the applicable AWQC for screening."

Why does NOAA apply a default dilution factor of only 10x for the discharge of groundwater to surface water?

"We prefer to use site-specific information whenever it is available. But because such data have not been derived, we acknowledge that some level of dilution would occur. We chose to use a conservative, order of magnitude dilution factor for screening purposes to ensure a high degree of confidence that any contaminant source eliminated from further consideration is not likely to pose substantial risk. Conversely, this is not meant to imply that contaminant sources that do not pass this screening do pose risk."

The information presented on NOAA's website indicates that NOAA considers a 10 times dilution of groundwater concentrations during transport and discharge to surface water to be an appropriate, conservative estimate of the amount of attenuation in chemical concentrations that can be expected when groundwater discharges to a surface water body.

I2.3.2 U.S. Environmental Protection Agency Resource Conservation and Recovery Act Approach

The Resource Conservation and Recovery Act (RCRA) grants EPA and authorized states the authority to regulate hazardous waste management facilities that treat, store, or dispose of hazardous waste. The RCRA Corrective Action program uses Environmental Indicators (EI) to assess progress at RCRA sites. The EIs are a means of evaluating and reporting on the acceptability of current site conditions (that is, they are interim milestones and not final remedy or site closure goals). They are used to summarize and report on the site-wide environmental conditions at the RCRA Corrective Action Program's highest priority sites (that is, those on RCRA Cleanup Baseline). One of the EIs is "Migration of Contaminated Groundwater Under Control" (the "groundwater EI").

On the EPA RCRA Corrective Action Environmental Indicators – Frequently Asked Questions webpage (EPA 2006b), the following information is provided:

For the purpose of making a Groundwater Environmental Indicator determination, how do I address groundwater-to-surface-water interaction?

"In cases where groundwater is being discharged to surface water, you should, as a general matter, focus your groundwater environmental indicator evaluation on the question of whether or not contaminated groundwater is significantly impairing the quality of the surface water body. A positive environmental indicator determination would generally be appropriate where the groundwater is not significantly affecting the surface water body in a way that leads it to fail basic water-quality criteria."

Is the discharge of "contaminated" groundwater into surface water likely to be "insignificant?"

> *"In some cases, overseeing agencies are likely to be able to conclude that a release from groundwater into surface water will be "insignificant" – and therefore "under control" – based on the levels of contaminants in the groundwater, without consideration of the volume or flow of the surface water body. As a rule of thumb, we have found that, if the groundwater concentrations for all constituents are less than 10 times the appropriate surface water quality criteria for both human health and aquatic life, the current groundwater discharge should be "insignificant" for environmental indicator purposes. In this case, the regulator would conclude that the groundwater environmental indicator had been met (at least with respect to the discharge to surface water)."*

The information provided in the interim-final guidance and on the RCRA Corrective Action Program's webpages clearly indicate that for RCRA sites, it is appropriate to assume a 10 times dilution factor for estimating concentrations of contaminants in groundwater discharging into surface water bodies (EPA 2006a, 2006b).

I2.3.3 San Francisco Bay Regional Water Quality Control Board Approach

The San Francisco Bay Regional Water Quality Control Board (Water Board) has allowed a 10 times dilution factor in at least one instance: for the proposed Eastshore Park Property in Berkeley, Albany, and Richmond. In Site Cleanup Requirements Order No. 98-072 for Catellus Development Corporation and SF Pacific Property, Inc., the Water Board states "Action levels for groundwater are based on water quality objectives for saltwater species…In the uplands above the 50-foot shoreline buffer, groundwater action levels are ten times the water quality objectives. This multiple reflects the predicted attenuation of constituents in groundwater that occurs at the site as discussed in the Remediation and Risk Management Plan, given the chemical-specific characteristics, site-specific hydrogeological conditions, and the Board's prior experience with groundwater at various shoreline sites." The Water Board's position related to the Eastshore Park Property is that the 10 times dilution was a site-specific determination and is not directly applicable to HPS. The Water Board does not allow modeling to incorporate dilution of groundwater contaminants in surface water. Instead, the Water Board's position regarding attenuation of groundwater discharge to the bay at HPS is further discussed in a letter to the Navy dated March 16, 2006 (Water Board 2006).

I2.4 SUMMARY OF ATTENUATION MECHANISMS FOR CHEMICALS IN GROUNDWATER

There are three discrete zones where chemical concentrations in groundwater are reduced during groundwater transport from a source zone to the bay. These zones are (1) the area of groundwater transport to the tidal mixing zone, (2) the tidal mixing zone, and (3) zone of groundwater discharge to the bay. The mechanisms of attenuation and amount of attenuation in each of these three zones are different. As described below, the AFs for the tidal mixing zone

and for discharge to the surface water body are set to 1 (no attenuation) in this evaluation to provide a highly conservative approach, as agreed to with the regulatory agencies.

During groundwater transport, mechanisms such as sorption, biological and chemical transformation, and hydrodynamic dispersion are at work. Groundwater flow modeling conducted for Parcel D evaluated the amount of attenuation that would be expected due only to hydrodynamic dispersion in the groundwater transport zone. Under conservative assumptions (see Appendix G), the amount of attenuation that occurred ranged from a factor of 1 to 58, depending upon the width of the source area and the distance to the receptor. For small plume widths (40 feet), and distances of 500 feet and greater, AFs were greater than 6. For relatively large plume widths (170 feet) and distances of 500 feet and greater, AFs were greater than 2, and at distances of 1,000 feet, AFs were greater than 6, even with plume widths up to 340 feet. The chromium VI and nickel plumes identified at Parcel D were generally on the order of 60 feet wide, and were all greater than 1,000 feet from the bay.

Within the tidal mixing zone, at least two studies have been performed in the San Francisco Bay area that indicated dilution of chemical concentrations occurs in this zone. The Mission Bay study indicated AFs of 6.5 to 12.8, with an average value of 9.7 within a 50-foot tidal mixing zone. The study conducted near Pier 64 indicated a 65 percent reduction in chemical concentrations within a 30-foot tidal mixing zone. Tidal mixing studies conducted at HPS have indicated a tidal mixing zone of at least 70 feet. The hydraulic conductivities used for the Mission Bay (2.8 feet per day) and Pier 64 (75 feet per day) studies indicate that the Mission Bay study more closely reflects conditions at HPS.

When groundwater discharges into a surface water body, it is expected that some dilution of chemical concentrations in groundwater will occur because of the much larger volume of water in the surface water body as compared with the volume of groundwater discharge. However, measuring the actual amount of dilution that occurs upon groundwater discharge is difficult. NOAA, EPA, and the Water Board have all indicated that a 10 times dilution "rule of thumb" is appropriate to evaluate groundwater concentrations upland of the point of discharge, and the potential for this groundwater to negatively impact the surface water body. All three agencies have indicated that they consider the 10 times rule to be a conservative assessment of the amount of dilution that can be expected.

The amount of attenuation that occurs in each of these zones is not additive, it is multiplicative. However, the AFs for the tidal mixing zone and for discharge to the surface water body are set to 1 (no attenuation) in this evaluation to provide a highly conservative approach, as agreed to with the regulatory agencies.

I3.0 DEVELOPMENT OF PARCEL D TRIGGER LEVELS

This section of this appendix summarizes development of proposed trigger levels for each of the COCs identified in Appendix H. The trigger level development takes an extremely conservative approach because it does not take into account attenuation in the tidal mixing zone or attenuation from discharge to the surface water body. Instead, it relies exclusively on the hydrodynamic

dispersion calculated for the groundwater transport zone. Considering only hydrodynamic dispersion for attenuation adds conservatism to the assessment, as agreed to with the regulatory agencies. The resulting trigger levels therefore overestimate the potential impacts of the groundwater plumes on the bay.

Several installation restoration (IR) sites with concentrations of metals above the surface water quality screening criteria have been identified at Parcel D, as follows:

- IR-09 northern area, chromium VI
- IR-09 southern area, chromium VI and nickel
- IR-33 area, chromium VI

The nature and extent of these areas are discussed in more detail in Section 2.5.2 of this Revised FS Report. The groundwater modeling indicated that chemical concentrations in these source areas will attenuate as the groundwater migrates toward discharge points to the bay. The magnitude of the attenuation is a function of the distance of migration and the width of the source area.

Trigger levels can be derived for these source areas in Parcel D by multiplying the AF calculated for the source area by the appropriate surface water quality criteria for the COC or the HPS Hunters Point groundwater ambient level (HGAL), whichever is the greater. The modeling approach and resultant AFs are described in detail in Appendix G and summarized in Section I2.1. The table below summarizes the proposed trigger levels for these source areas and COCs.

Area	Attenuation Factor	HPS HGAL (µg/L)	Surface Water Quality Criteria (µg/L)[1]	Proposed Trigger Level at Source Well (µg/L)	Maximum Concentration at Source Well (µg/L)	Maximum Concentration Exceeds Proposed Trigger Level?
IR-09 North, chromium VI	12	Not Available	**50**	600	493	No
IR-09 South, chromium VI	18	Not Available	**50**	900	130	No
IR-09 South, nickel	16	**96.48**	8.2	1,544	636	No
IR-33, chromium VI	14	Not Available	**50**	700	250	No

Notes:

1 The selected surface water quality criteria are listed in Table H-1 of Appendix H, Preliminary Screening of Groundwater Impacts to San Francisco Bay, of this Revised Parcel D FS Report. The published sources are provided in the footnotes to Table H-1.

µg/L Micrograms per liter

These proposed trigger levels are extremely conservative because (1) they rely on conservative AFs calculated from groundwater flow modeling, and (2) they only take into account hydrodynamic dispersion during groundwater transport, and do not include attenuation in the tidal mixing zone or attenuation upon groundwater discharge to the surface water body. Considering only hydrodynamic dispersion for attenuation adds conservatism to the assessment and provides maximum protectiveness for the bay, as agreed to with the regulatory agencies.

As discussed in Section 5.3.2 of the main text of this Revised FS Report, the details of groundwater monitoring program will be identified during the remedial design. Inclusion of the source areas listed above in the groundwater monitoring program will be based on the concentrations observed in groundwater at these locations for a period of approximately 3 years (12 rounds of sampling) before the design is prepared. In addition, the Navy is planning a treatability study at Parcel D that will likely affect the concentrations in groundwater and the need for long-term monitoring. Complete discussions of these evaluations will be contained in the remedial design for review by the regulatory agencies.

The following additional evaluations may occur for the cases where the current data indicate concentrations consistently exceed a trigger level:

- Increasing the frequency of monitoring in the well where the trigger level was exceeded to evaluate whether the elevated level is persistent;
- Monitoring groundwater at a location farther downgradient to evaluate whether the attenuation estimated in establishing the trigger level has occurred;
- Using site-specific detailed information to more accurately estimate attenuation (including processes such as adsorption and degradation); or
- Implementing a selected remediation alternative for groundwater treatment.

Chemicals that are identified in the remedial design as requiring monitoring based on the trigger levels will follow a process similar to the process envisioned for other COCs (such as volatile organic compounds and chromium VI) in groundwater that is described in Section 5.3.2 of this Revised FS Report. This process will include regular monitoring followed by a "proof period" to demonstrate that concentrations are below the trigger level. Details of the groundwater monitoring plan will be developed during the remedial design, but are expected to include criteria (perhaps as a decision-tree matrix) to guide decisions for active treatment of groundwater in a case where a chemical concentration consistently exceeds a trigger level.

The uncertainty involved in the development of these trigger levels is described in the following section.

I4.0 UNCERTAINTY

Uncertainty plays an important role in risk-based decision-making; therefore, uncertainty is incorporated explicitly into the characterization of potential risk posed by chromium VI and nickel in the A-aquifer at Parcel D. By design, a screening-level evaluation is centered on conservative default assumptions that result in overestimates of risk (EPA 1997b). This section describes the magnitude and directional bias in known sources of uncertainty in this evaluation.

Uncertainty is generally defined as a component of risk or degree of hazard resulting from imperfect knowledge of the present or future state of the system under consideration (Suter 1993). Most uncertainty in environmental assessments can be categorized as follows:

- Mistakes in execution of assessment
- Imperfect knowledge of factors that could be known
- Inherent randomness of the natural environment

Compared with the strict numerical criteria that dominate human health evaluations, the use of ecological models and criteria tends to increase the level of uncertainty associated with a groundwater investigation. The sections below include brief reviews of some sources of uncertainty associated with the development of trigger levels for Parcel D groundwater.

I4.1 UNCERTAINTY IN DERIVING ATTENUATION FACTORS

The derivation of AFs for chromium VI and nickel in the Parcel D groundwater relies on estimates of physical, chemical, and biological conditions that prevail below the surface of the ground across a wide area of heterogeneous fill material. Processes such as sorption of chemicals to soil particles, volatilization, hydrodynamic dispersion and molecular diffusion, and chemical and biological transformation are complex processes that are difficult to precisely quantify even under controlled laboratory conditions.

Although general trends, such as the tendency for chemical concentrations to decrease as the groundwater moves away from the source of contamination, are understood, the precise measurements of the parameter values desired in the model are rarely available. Instead, conservative default values are substituted; or in some cases, a range of values is applied in an effort to bracket the correct value. For example, in the model described in Appendix G and summarized in Section I2.1 of this appendix, adsorption and degradation parameters were set to zero to ensure that hydrodynamic dispersion was the only mechanism causing a reduction in chemical concentrations in groundwater. This approach likely underestimates the reduction in chemical concentrations and results in a conservatively low AF.

Often the uncertainty in site-specific conditions is implicitly addressed in the decision not to attempt to quantify attenuation, but to default to a conservative value, such as the 10 times dilution recommended by NOAA (1999). The default value acknowledges the inherent uncertainty in site-specific conditions, and is intended to bias the decision-making process toward increased protectiveness. In some cases, the purposeful bias in parameter values used for the Parcel D assessment resulted in AFs that are even more conservative (lower) than the 10 times factor typically used by regulatory agencies (see Section I2.1).

I4.2 UNCERTAINTY IN CALCULATING TRIGGER LEVELS

Calculation of a trigger level for groundwater is a deceptively simple multiplication of the AF by the surface water quality screening criterion. However, as a product of two terms that are each the result of a series of estimates, the trigger level carries with it the uncertainties of the individual terms that contributed to the final equation. As discussed in Appendix H, Section H4.1, and in Section I4.1, neither the water quality criteria nor the AF are easily derived, bright-line quantities. On the contrary, these values are themselves derived via a process of estimation and back-calculation that is fraught with uncertainty.

The data set used to derive the AFs adds some uncertainty. In some cases, few measurements were collected at a location, or the only data available were collected many years ago. Both of these factors may limit the representativeness of the data evaluated for these wells. However, data for all wells were considered in the evaluation, and trigger levels were developed despite these limitations.

Even if it were assumed that both the surface water quality criteria and the AF were accurately estimated, the assumptions in the trigger level calculation would introduce additional uncertainty in the form of purposeful bias toward conservatism. The underlying assumption in the development of the trigger level is that the most sensitive life stage of the most sensitive marine organism known is exposed for its entire lifetime to the maximum concentration of chromium or nickel in groundwater, reduced only by the conservatively calculated AF. The calculation also assumes that 100 percent of the chromium VI and nickel remain in the dissolved state even after being discharged to the bay, despite expectations that some constituents may be quickly adsorbed to sediment.

I5.0 SUMMARY AND CONCLUSIONS

The direct application of surface water quality criteria to groundwater to protect aquatic organisms from groundwater discharging to a surface water body is inappropriate because chemical concentrations in groundwater will tend to attenuate as the groundwater migrates toward its discharge point. Furthermore, surface water quality criteria are not legally applicable to groundwater. However, the surface water quality criteria were applied to groundwater at Parcel D as screening levels to evaluate the potential for groundwater to impact the bay. This screening analysis found that chromium VI (in three areas) and nickel (in one of the chromium VI areas) were present at high enough concentrations to indicate a potential impact to the bay based on very conservative AF evaluations.

.For HPS, three discrete zones exist along the groundwater migration pathway: (1) the zone of groundwater transport from the source area to the tidal mixing zone, (2) the tidal mixing zone, and (3) the zone of groundwater discharge to the surface water body. Attenuation in the zone of groundwater transport occurs due to hydrodynamic dispersion, sorption, and biological and chemical transformation. Attenuation in the tidal mixing zone occurs due to these processes, and also due to dilution from the mixing of bay water with groundwater as high tides cause bay water to move inland into the aquifer. Attenuation in the groundwater discharge zone occurs primarily as a result of dilution with the much larger volume of water present in the surface water body. The AFs for the tidal mixing zone and for discharge to the surface water body are set to 1 (no attenuation) in this evaluation to provide a highly conservative approach, as agreed to with the regulatory agencies.

The amount of attenuation that occurs in each of these zones can be estimated, primarily using some type of modeling. Modeling results for the groundwater transport zone indicated that attenuation resulting from hydrodynamic dispersion alone can be substantial, depending on the width of the plume and the distance to the discharge point. AFs calculated from the model ranged from 1 (for plumes traveling 50 feet to a discharge point) to 58 (for a small plume of 40-foot source width traveling 1,600 feet to a discharge point). AFs based solely on hydrodynamic dispersion estimated for the chromium VI and nickel plumes at Parcel D ranged from 12 to 18.

Groundwater modeling performed to study the tidal mixing zone at other sites near HPS indicated AFs ranging from approximately 3 to 12 for tidal mixing zones that were 30 to 50 feet from the shoreline. Although no other modeling efforts to estimate the amount of dilution that occurs when groundwater discharges to the bay were identified, EPA, NOAA, and the Water Board have indicated that a dilution factor of 10 would be a conservative estimate of the amount of dilution that occurs when groundwater discharges to a surface water body.

Plume-specific trigger levels were developed by multiplying the appropriate AFs calculated for the groundwater transport zone and the surface water quality criteria selected for chromium VI and nickel, or the HGAL, whichever is the greater. These trigger levels reflected extremely conservative assumptions, as follows:

1. The groundwater modeling for the transport zone assumed no sorption or biological/chemical transformation reactions, and relied exclusively on hydrodynamic dispersion to simulate attenuation of chemical concentrations.

2. The AF did not include attenuation in the tidal mixing zone or attenuation upon discharge into the bay, and only included attenuation in the groundwater transport zone.

3. The surface water quality criteria selected for chromium VI was the chronic exposure scenario, even though the AF assumed there was no mixing of groundwater with the bay water. Under a no mixing scenario, the appropriate surface water quality criterion would be the acute scenario, which typically is a higher number.

Nevertheless, the Navy agreed to use highly conservative measures throughout this evaluation, as agreed to with the regulatory agencies.

When the resulting trigger levels were compared with the maximum concentrations in the plume source areas, none of the source concentrations exceeded their respective trigger level. The groundwater monitoring plan for Parcel D will address the need for monitoring in response to confirming the concentrations in the plume source areas, the temporal stability of the plumes, and the degree, if any, that the plumes are migrating toward the bay. Based on the calculated trigger levels, and the comparison with the plume source conditions, the amount of attenuation that is expected by the time groundwater from the plumes discharges to the bay will ensure that surface water quality criteria will not be exceeded at the points of discharge.

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Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
26	Chromium VI	Section 2.5.2	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Appendix H, Table H-2. SulTech. November 30, 2007.

TABLE H-2: COMPARISON OF CHEMICAL CONCENTRATIONS IN A-AQUIFER GROUNDWATER TO SURFACE WATER QUALITY SCREENING CRITERIA - METALS

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

				Comparison of HGALs					Comparison of Surface Water Criteria				
Chemical	Number Analyzed	Number Detected	Percent Detected (%)	HGAL Screening Level (µg/L)	Number of Detects > HGAL	Percent of Detects > HGAL	Number of Nondetects with Limits > HGAL	Percent of Nondetects with Limits > HGAL	Surface Water Criteria[1] (µg/L)	Number of Detects > Surface Water Criteria	Percent of Detects > Surface Water Criteria (%)	Number of Nondetects with Limits > Surface Water Criteria	Percent of Nondetects with Limits > Surface Water Criteria (%)
Aluminum	215	29	13.49	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	213	15	7.04	43.26	0	0.00	1	0.51	NA	NA	NA	NA	NA
Arsenic	214	95	44.39	27.3	10	10.53	1	0.84	36	3	3.16	0	0.00
Barium	213	207	97.18	504.2	7	3.38	0	0.00	NA	NA	NA	NA	NA
Beryllium	213	13	6.10	1.4	3	23.08	14	7.00	NA	NA	NA	NA	NA
Cadmium	214	21	9.81	5.1	5	23.81	0	0.00	8.8	3	14.29	0	0.00
Calcium	220	217	98.64	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	284	76	26.76	15.66	51	67.11	1	0.48	400	2	1.72	0	0.00
Chromium VI	171	39	22.81	NA	NA	NA	NA	NA	50	25	64.10	1	0.76
Cobalt	213	93	43.66	20.8	3	3.23	0	0.00	NA	NA	NA	NA	NA
Copper	215	42	19.53	28.04	7	16.67	0	0.00	3.1	28	66.67	60	34.68
Iron	220	75	34.09	2,380	12	16.00	0	0.00	NA	NA	NA	NA	NA
Iron (II)	13	6	46.15	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	213	19	8.92	14.44	7	36.84	0	0.00	5.6	10	52.63	10	5.15
Magnesium	220	216	98.18	1,440,000	6	2.78	0	0.00	NA	NA	NA	NA	NA
Manganese	214	201	93.93	8,140	13	6.47	0	0.00	NA	NA	NA	NA	NA
Manganese (II)	7	7	100.00	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	212	12	5.66	0.6	2	16.67	0	0.00	0.025	12	100.00	200	100.00
Molybdenum	195	80	41.03	61.9	9	11.25	0	0.00	NA	NA	NA	NA	NA
Nickel	275	152	55.27	96.48	18	11.84	0	0.00	8.2	121	79.61	46	37.40
Potassium	220	219	99.55	448,000	1	0.46	0	0.00	NA	NA	NA	NA	NA
Selenium	207	27	13.04	14.5	1	3.70	11	6.11	71	0	0.00	0	0.00
Silver	212	13	6.13	7.43	0	0.00	1	0.50	0.38	12	92.31	199	100.00
Sodium	220	220	100.00	9,242,000	0	0.00	NA	All Detected	NA	NA	NA	NA	All Detected
Thallium	197	33	16.75	12.97	3	9.09	14	8.54	426	0	0.00	0	0.00
Vanadium	210	130	61.90	26.62	9	6.92	1	1.25	NA	NA	NA	NA	NA
Zinc	216	43	19.91	75.68	9	20.93	0	0.00	81	7	16.28	0	0.00

Notes:

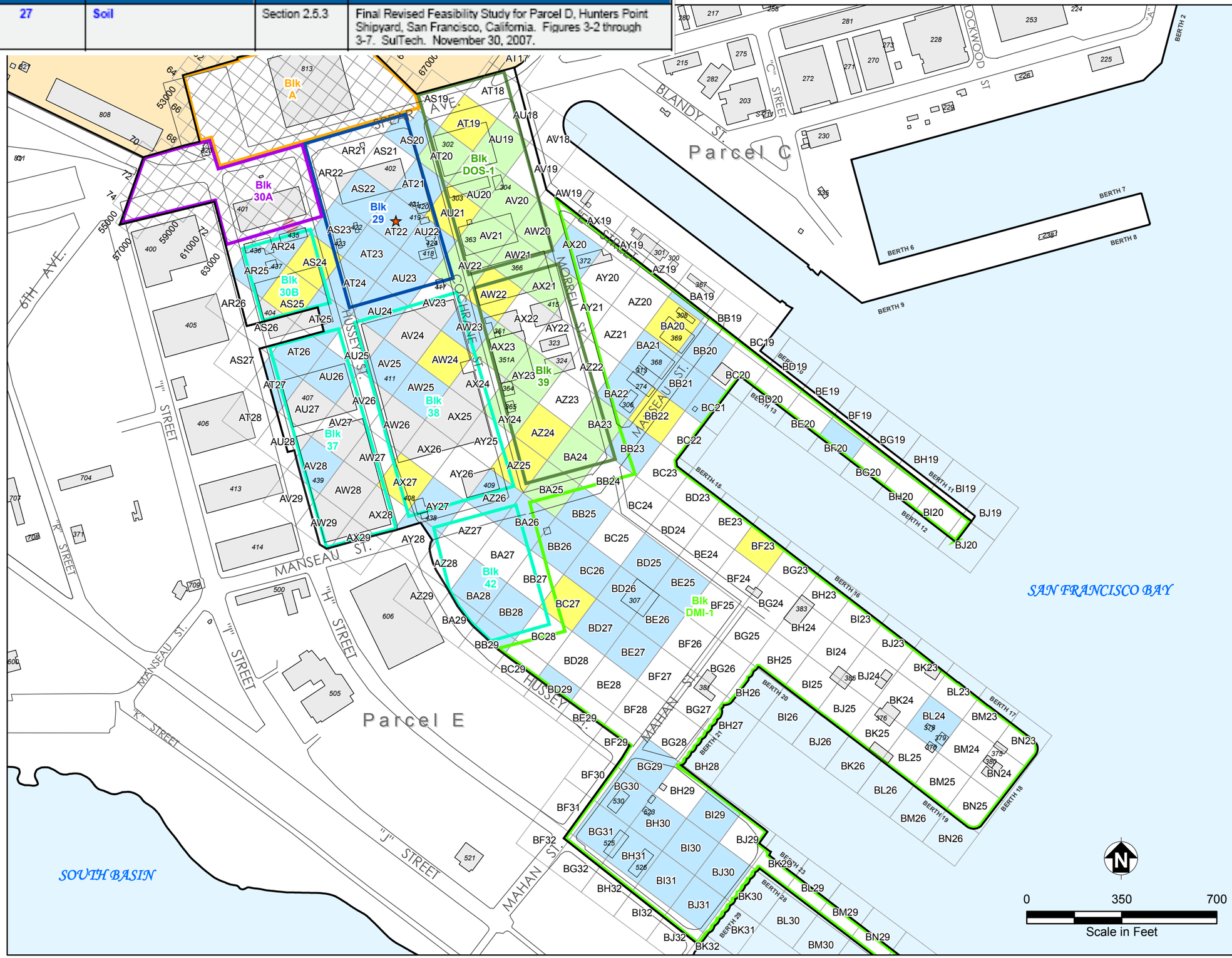
[1] The published sources are provided in the footnotes to Table H-1.

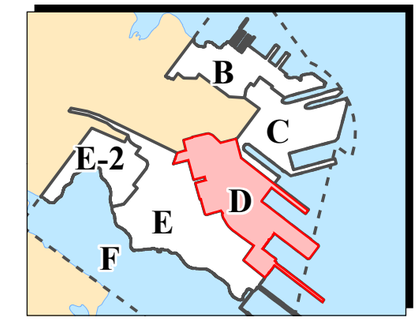
µg/L Microgram per liter

HGAL Hunters Point groundwater ambient level

NA Not available

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
27	Soil	Section 2.5.3	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Figures 3-2 through 3-7. SulTech. November 30, 2007.





Location Map

- Industrial Lead Concentration > 800 mg/kg
- Road
- Residential Cancer Risk > 1E-06
- Industrial Cancer Risk > 1E-06
- Recreational Cancer Risk > 1E-06
- Cancer Risk ≤ 1E-06
- Highest Segregated Hazard Index > 1
- No Data
- Parcel Boundary
- Industrial
- Research and Development
- Mixed Use
- Open Space
- Maritime Industrial
- Educational/Cultural
- Building
- Non-Navy Property
- San Francisco Bay

Notes:
1. A 50-foot by 50-foot exposure area (residential grid) is used to evaluate risks associated with Mixed Use and Research and Development planned reuses.
2. A 150-foot by 150-foot exposure area (industrial grid) is used to evaluate risks associated with Industrial, Maritime Industrial, and Educational/Cultural planned reuses.

Blk Block
ft bgs Feet below ground surface
mg/kg Milligram per kilogram

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Hunters Point Shipyard, San Francisco, California
U.S. Department of the Navy, BRAC PMO West, San Diego, California

FIGURE 3-2
TOTAL RISK - SURFACE SOIL (0 TO 2 FT BGS) RISKS BASED ON PLANNED REUSE

Revised Feasibility Study Report for Parcel D

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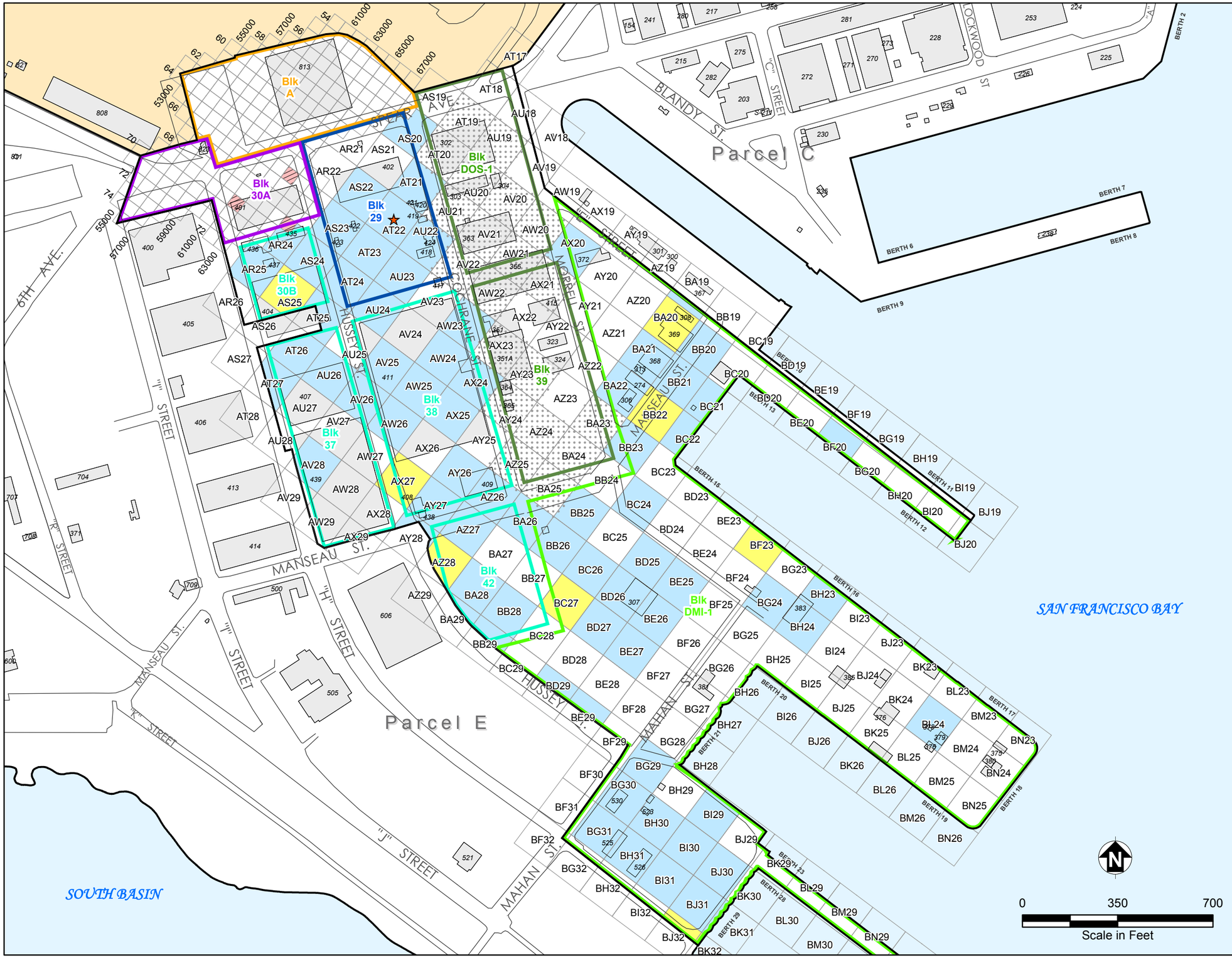

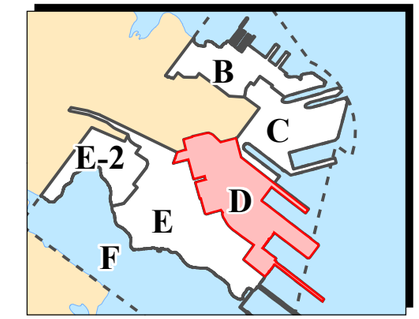

Location Map

- Industrial Lead Concentration > 800 mg/kg
- Road
- Residential Cancer Risk > 1E-06
- Industrial Cancer Risk > 1E-06
- Cancer Risk ≤ 1E-06
- Highest Segregated Hazard Index > 1
- Data Available; Recreational Scenario Not Evaluated for Subsurface Soil
- No Data
- Parcel Boundary
- Industrial
- Research and Development
- Mixed Use
- Open Space
- Maritime Industrial
- Educational/Cultural
- Building
- Non-Navy Property
- San Francisco Bay

Notes:
1. A 50-foot by 50-foot exposure area (residential grid) is used to evaluate risks associated with Mixed Use and Research and Development planned reuses.
2. A 150-foot by 150-foot exposure area (industrial grid) is used to evaluate risks associated with Industrial, Maritime Industrial, and Educational/Cultural planned reuses.

Blk Block
ft bgs Feet below ground surface
mg/kg Milligram per kilogram

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U.S. Department of the Navy, BRAC PMO West, San Diego, California

FIGURE 3-3
TOTAL RISK - SUBSURFACE SOIL (0 TO 10 FT BGS) RISKS BASED ON PLANNED REUSE

Revised Feasibility Study Report for Parcel D

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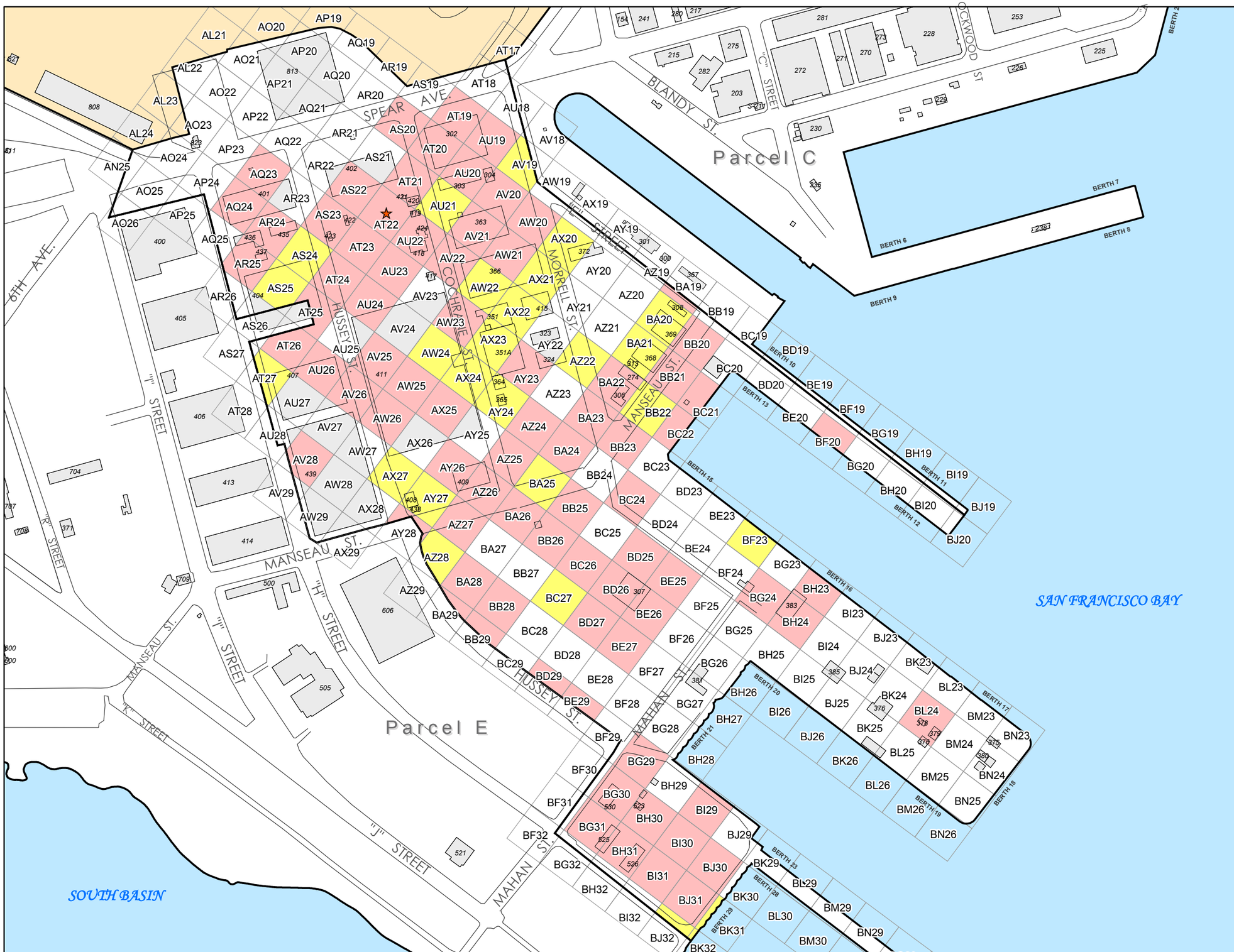
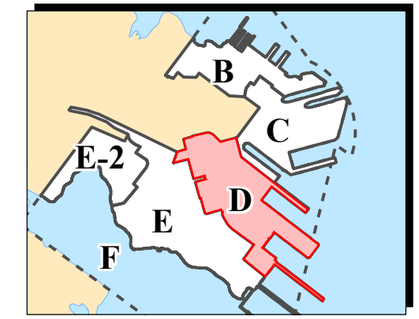




Location Map

- Industrial Lead Concentration > 800 mg/kg
- Road
- Construction Worker Cancer Risk > 1E-06
- Construction Worker Cancer Risk ≤ 1E-06
- No Data
- Parcel Boundary
- Building
- Non-Navy Property
- San Francisco Bay

Notes:
1. Highest segregated hazard indices ≤ 1 for all grids with data.
2. A 150-foot by 150-foot exposure area (industrial grid) is used to evaluate risks associated with construction worker exposures.

ft bgs Feet below ground surface
mg/kg Milligram per kilogram

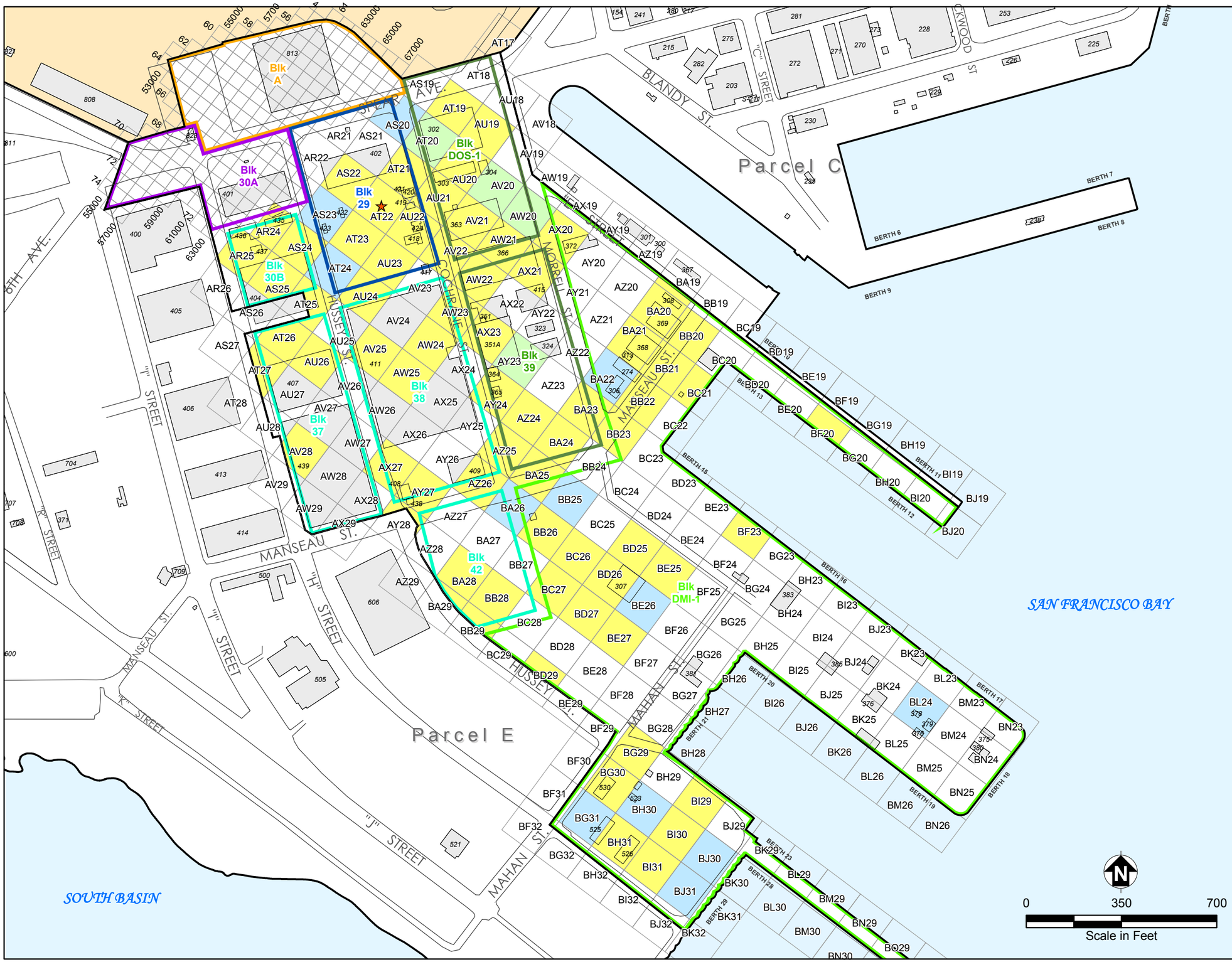
0 350 700
Scale in Feet

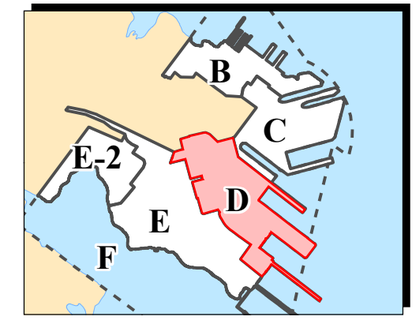
SulTech

Hunters Point Shipyard, San Francisco, California
U.S. Department of the Navy, BRAC PMO West, San Diego, California

FIGURE 3-4
TOTAL RISK - SUBSURFACE SOIL (0 TO 10 FT BGS) RISKS, CONSTRUCTION WORKER EXPOSURE SCENARIO

Revised Feasibility Study Report for Parcel D





Location Map

- Industrial Lead Concentration > 800 mg/kg
- Road
- Industrial Cancer Risk > 1E-06
- Recreational Cancer Risk > 1E-06
- Cancer Risk ≤ 1E-06
- Highest Segregated Hazard Index > 1
- Parcel Boundary
- No Data
- Industrial
- Research and Development
- Mixed Use
- Open Space
- Maritime Industrial
- Educational/Cultural
- Building
- Non-Navy Property
- San Francisco Bay

Notes:
1. A 50-foot by 50-foot exposure area (residential grid) is used to evaluate risks associated with Mixed Use and Research and Development planned reuses.
2. A 150-foot by 150-foot exposure area (industrial grid) is used to evaluate risks associated with Industrial, Maritime Industrial, and Educational/Cultural planned reuses.

Blk Block
ft bgs Feet below ground surface
mg/kg Milligram per kilogram

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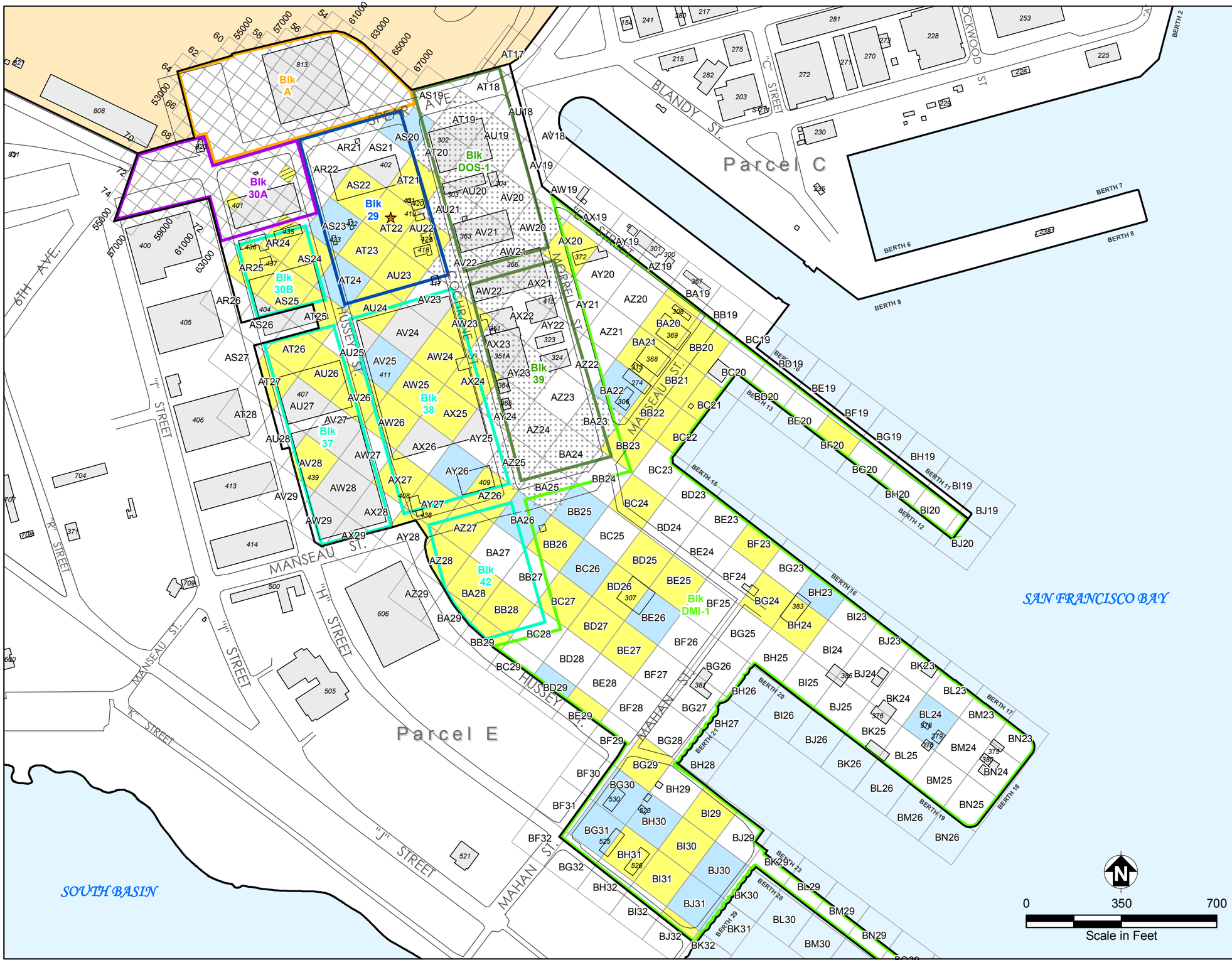
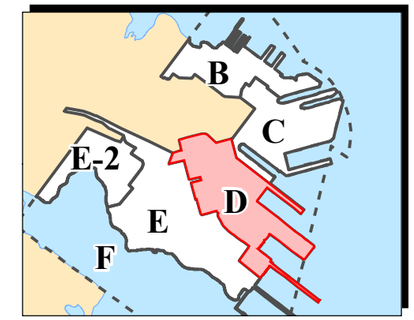
Hunters Point Shipyard, San Francisco, California
U.S. Department of the Navy, BRAC PMO West, San Diego, California

FIGURE 3-5
INCREMENTAL RISK - SURFACE SOIL (0 TO 2 FT BGS) RISKS BASED ON PLANNED REUSE

Revised Feasibility Study Report for Parcel D





Location Map

- Industrial Lead Concentration > 800 mg/kg
- Road
- Industrial Cancer Risk > 1E-06
- Cancer Risk ≤ 1E-06
- Highest Segregated Hazard Index > 1
- Parcel Boundary
- Data Available; Recreational Scenario Not Evaluated for Subsurface Soil
- No Data
- Industrial
- Research and Development
- Mixed Use
- Open Space
- Maritime Industrial
- Educational/Cultural
- Building
- Non-Navy Property
- San Francisco Bay

Notes:
1. A 50-foot by 50-foot exposure area (residential grid) is used to evaluate risks associated with Mixed Use and Research and Development planned reuses.
2. A 150-foot by 150-foot exposure area (industrial grid) is used to evaluate risks associated with Industrial, Maritime Industrial, and Educational/Cultural planned reuses.

Blk Block
ft bgs Feet below ground surface
mg/kg Milligram per kilogram

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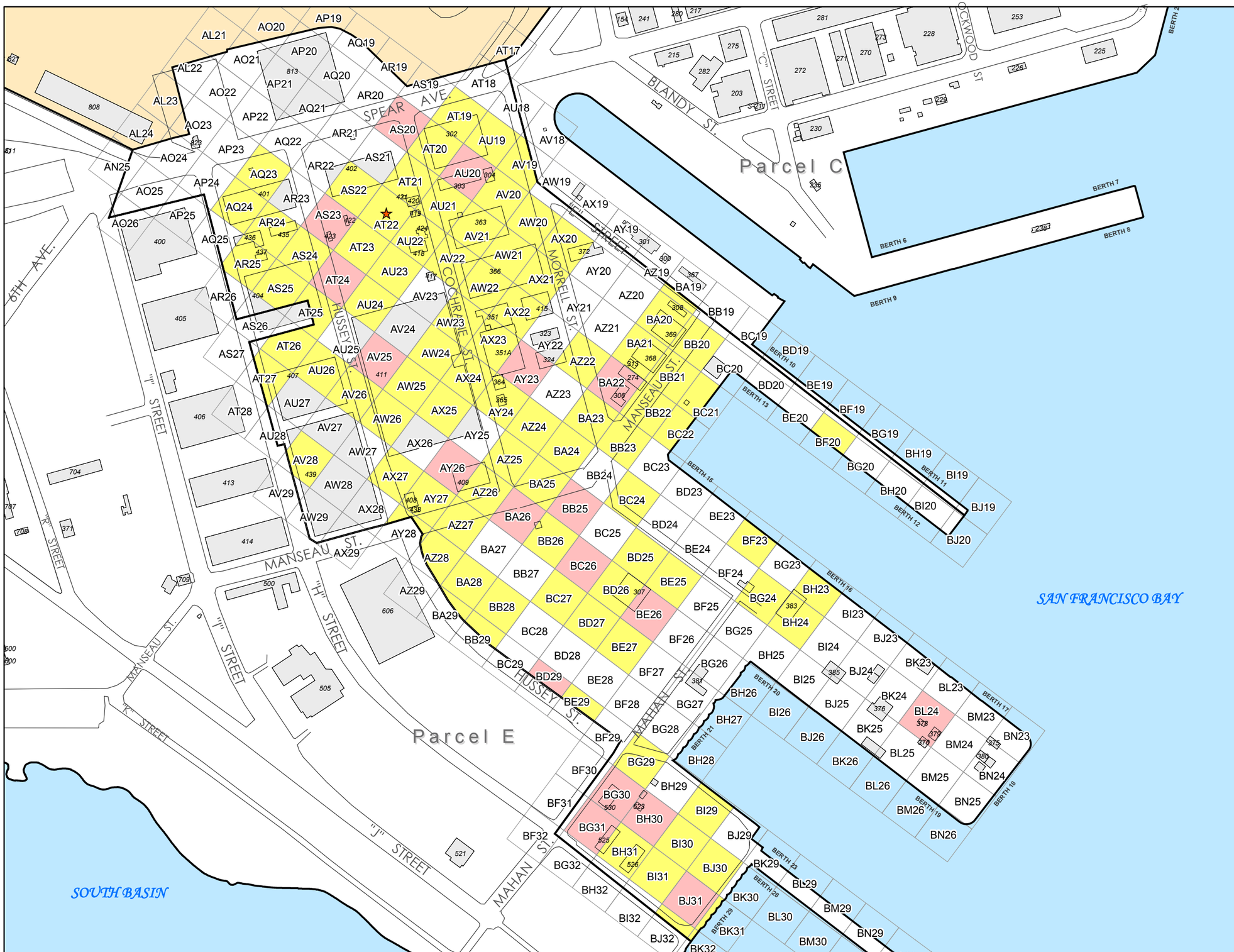
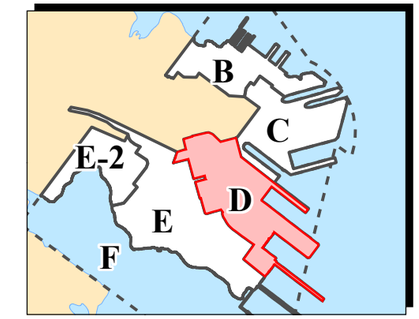
Hunters Point Shipyard, San Francisco, California
U.S. Department of the Navy, BRAC PMO West, San Diego, California

FIGURE 3-6
INCREMENTAL RISK - SUBSURFACE SOIL (0 TO 10 FT BGS) RISKS BASED ON PLANNED REUSE
Revised Feasibility Study Report for Parcel D





Location Map

★ Industrial Lead Concentration > 800 mg/kg
Road
Construction Worker Cancer Risk > 1E-06
Construction Worker Cancer Risk ≤ 1E-06
Parcel Boundary
No Data
401 Building
Non-Navy Property
San Francisco Bay

Notes:
1. Highest segregated hazard indices ≤ 1 for all grids with data.
2. A 150-foot by 150-foot exposure area (industrial grid) is used to evaluate risks associated with construction worker exposures.

ft bgs Feet below ground surface
mg/kg Milligram per kilogram

N

0 350 700
Scale in Feet

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Hunters Point Shipyard, San Francisco, California
U.S. Department of the Navy, BRAC PMO West, San Diego, California

FIGURE 3-7
INCREMENTAL RISK - SUBSURFACE SOIL (0 TO 10 FT BGS) RISKS, CONSTRUCTION WORKER EXPOSURE SCENARIO
Revised Feasibility Study Report for Parcel D

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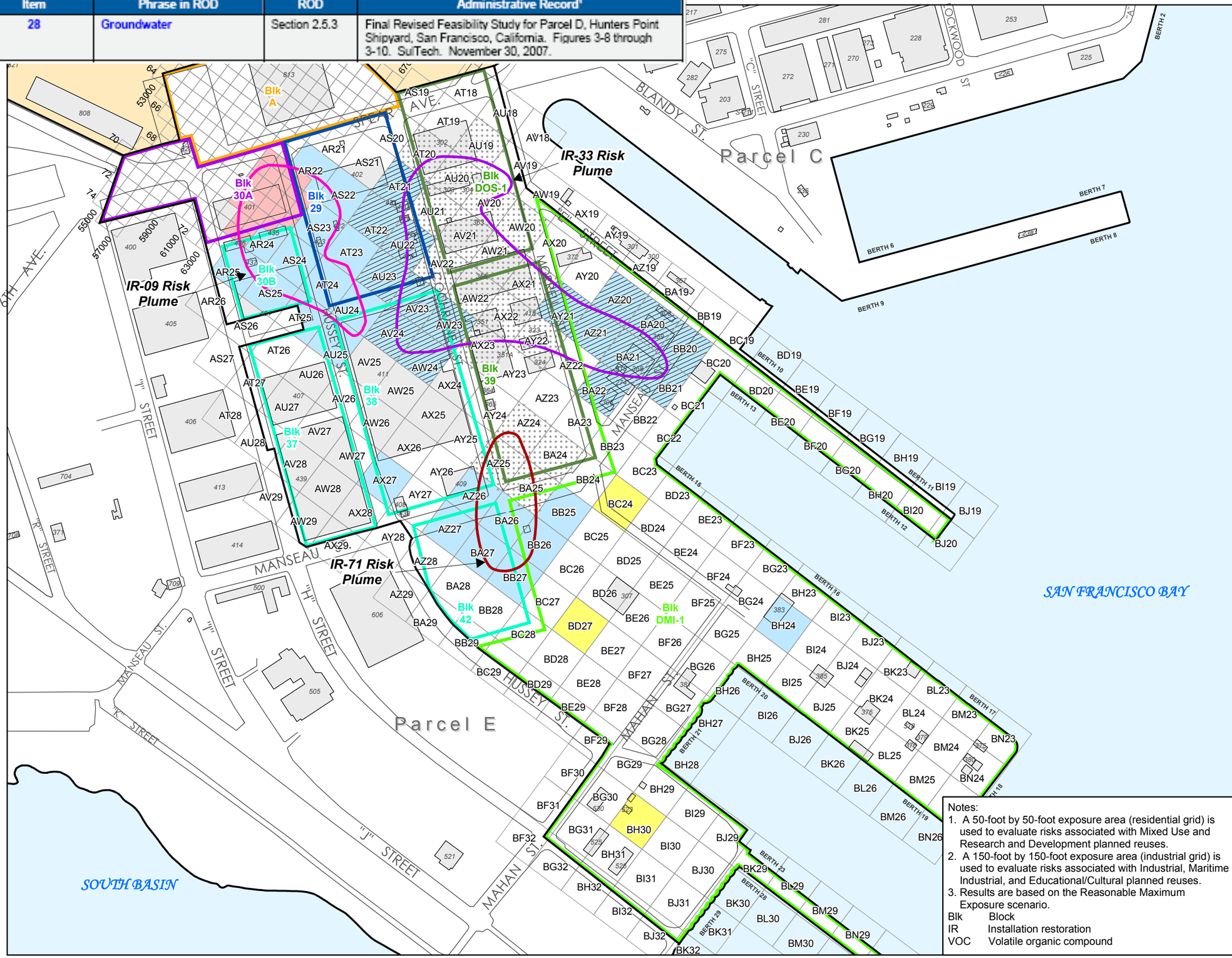
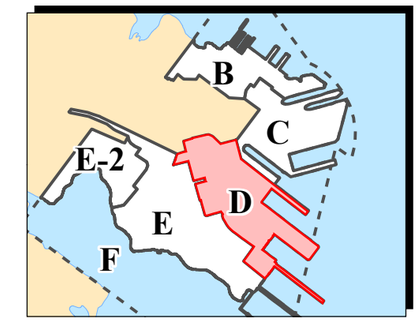
Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[a]
28	Groundwater	Section 2.5.3	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Figures 3-8 through 3-10. SulTech. November 30, 2007.





Location Map

- Road
- IR-09 Risk Plume
- IR-33 Risk Plume
- IR-71 Risk Plume
- Residential Cancer Risk > 1E-06
- Industrial Cancer Risk > 1E-06
- Industrial Cancer Risk ≤ 1E-06
- Parcel Boundary
- Highest Segregated Hazard Index > 1
- Data Available; Recreational Scenario Not Evaluated for Vapor Intrusion
- No Data
- Industrial
- Research and Development
- Mixed Use
- Open Space
- Maritime Industrial
- Educational/Cultural
- Building
- Non-Navy Property
- San Francisco Bay

0 350 700

Scale in Feet

Notes:
1. A 50-foot by 50-foot exposure area (residential grid) is used to evaluate risks associated with Mixed Use and Research and Development planned reuses.
2. A 150-foot by 150-foot exposure area (industrial grid) is used to evaluate risks associated with Industrial, Maritime Industrial, and Educational/Cultural planned reuses.
3. Results are based on the Reasonable Maximum Exposure scenario.

Blk Block
IR Installation restoration
VOC Volatile organic compound

Hunters Point Shipyard, San Francisco, California

U.S. Department of the Navy, BRAC PMO West, San Diego, California

FIGURE 3-8
GROUNDWATER VAPOR INTRUSION RISKS IN A-AQUIFER BASED ON PLANNED REUSE

Revised Feasibility Study Report for Parcel D

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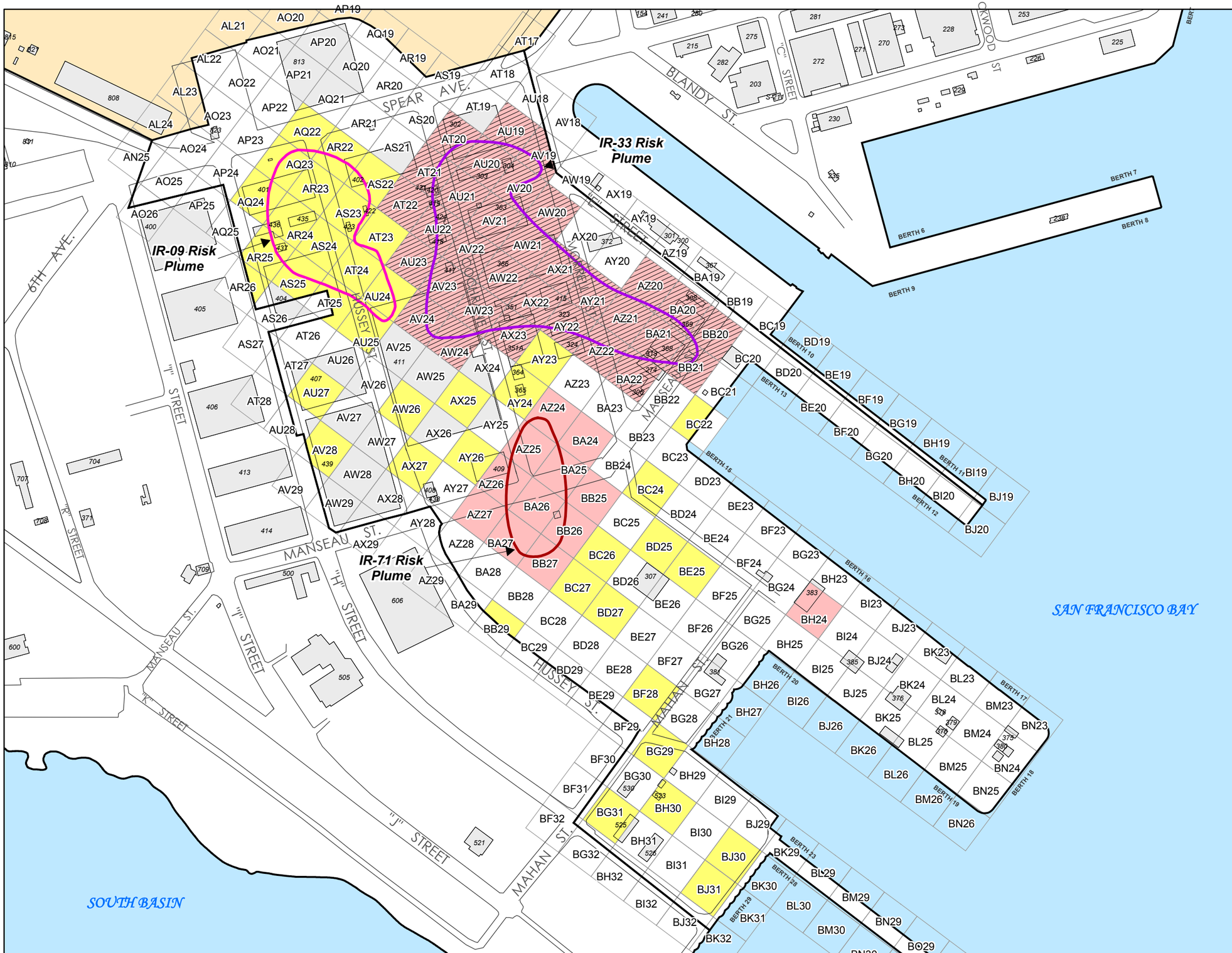

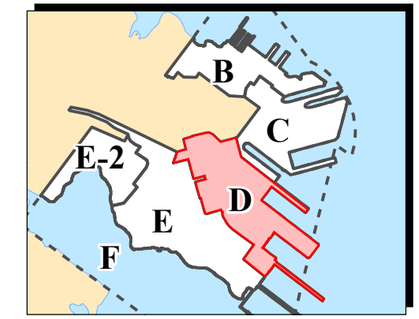

Location Map

- Road
- IR-09 Risk Plume
- IR-33 Risk Plume
- IR-71 Risk Plume
- Cancer Risk > 1E-06
- Cancer Risk ≤ 1E-06
- Highest Segregated Hazard Index > 1
- No Data
- Parcel Boundary
- Building
- Non-Navy Property
- San Francisco Bay

Notes:
1. A 150-foot by 150-foot exposure area (industrial grid) is used to evaluate risks associated with construction worker exposures.
2. Results are based on the reasonable maximum exposure scenario.

IR Installation Restoration
VOC Volatile organic compound

0 350 700
Scale in Feet

SulTech

Hunters Point Shipyard, San Francisco, California
U.S. Department of the Navy, BRAC PMO West, San Diego, California

FIGURE 3-9
TRENCH GROUNDWATER RISKS IN A-AQUIFER, CONSTRUCTION WORKER EXPOSURE SCENARIO

Revised Feasibility Study Report for Parcel D

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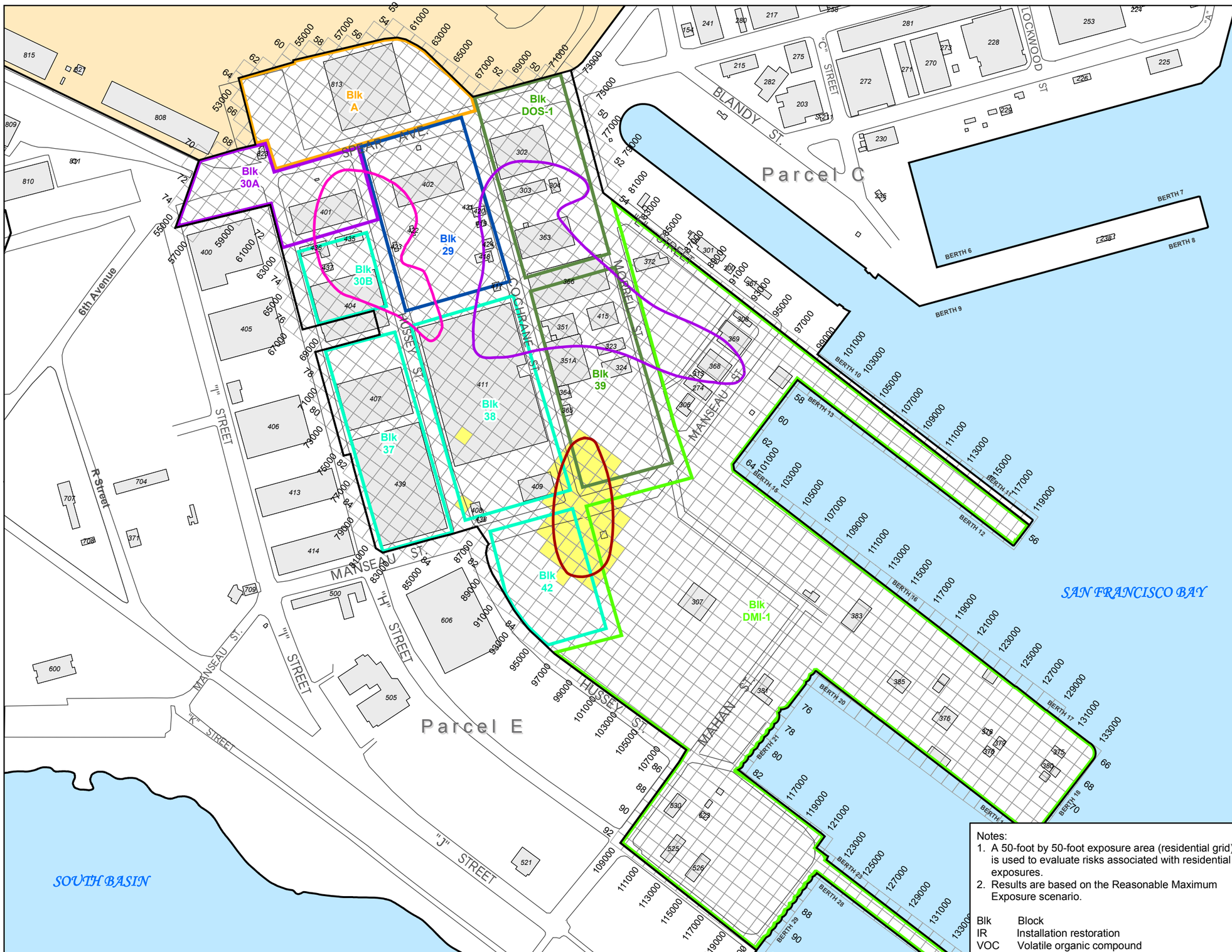

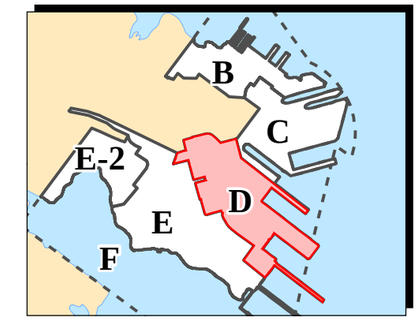

Location Map

- IR-09 Plume
- IR-33 Plume
- IR-71 Plume
- Residential Cancer Risk ≤ 1E-06
- No Data
- Parcel Boundary
- Industrial
- Research and Development
- Mixed Use
- Open Space
- Maritime Industrial
- Educational/Cultural
- Building
- Non-Navy Property
- San Francisco Bay
- Road

0 350 700
Scale in Feet

Notes:
1. A 50-foot by 50-foot exposure area (residential grid) is used to evaluate risks associated with residential exposures.
2. Results are based on the Reasonable Maximum Exposure scenario.

Blk Block
IR Installation restoration
VOC Volatile organic compound

Hunters Point Shipyard, San Francisco, California
U.S. Department of the Navy, BRAC PMO West, San Diego, California

FIGURE 3-10
GROUNDWATER DOMESTIC USE RISKS IN B-AQUIFER, RESIDENTIAL EXPOSURE SCENARIO
Revised Feasibility Study Report for Parcel D

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Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
29	Radiologically impacted structures and soil	Section 2.5.3	Final Radiological Addendum to the Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Tables 3-3 to 3-6. Tetra Tech EC Inc. April 11, 2008.

TABLE 3-3

RESRAD-BUILD RESULTS[a]

Parcel D Impacted Sites	Radiological Risk[b]	Dose[c]
Building 274	3.46×10^{-6}	3.57
Building 351	4.17×10^{-6}	28.5
Building 351A	4.73×10^{-6}	32.9
Building 366/351B	3.46×10^{-6}	3.57
Building 401	1.34×10^{-6}	0.644
Building 411	9.26×10^{-6}	11.0
Building 813	2.77×10^{-7}	0.69
Building 819	3.18×10^{-6}	2.89

Abbreviations and Acronyms:

[a] Total risk and dose is equivalent to incremental risk and dose
[b] Total excess lifetime carcinogen risk
[c] millirem per year

TABLE 3-4

RESRAD RESULTS

TOTAL DOSE AND RISK		
Impacted Soil Areas	**Radiological Risk[a]**	**Dose[b]**
313 Site	1.02×10^{-4}	4.66
313A Site	8.90×10^{-5}	4.04
317 Site	6.37×10^{-5}	2.93
322 Site	9.07×10^{-5}	4.11
364 Site	3.17×10^{-5}	1.50
365 Site	3.60×10^{-5}	1.67
383 Site	6.52×10^{-5}	2.98
408 Site	2.43×10^{-4}	11.0
Gun Mole Pier	5.08×10^{-5}	2.40
Naval Radiological Defense Laboratory Site on Mahan Street	5.08×10^{-5}	2.40
Sanitary Sewers/Storm Drains	6.75×10^{-5}	3.09
Incremental Dose and Risk		
Impacted Soil Areas	**Radiological Risk[a]**	**Dose[b]**
313 Site	8.97×10^{-5}	4.08
313A Site	7.80×10^{-5}	3.54
317 Site	4.28×10^{-5}	1.97
322 Site	7.95×10^{-5}	3.60
364 Site	2.15×10^{-5}	1.04
365 Site	2.43×10^{-5}	1.13
383 Site	4.35×10^{-5}	1.98
408 Site	2.13×10^{-4}	9.60
Gun Mole Pier	3.42×10^{-5}	1.64
Naval Radiological Defense Laboratory Site on Mahan Street	3.42×10^{-5}	1.64
Sanitary Sewers/Storm Drains	4.54×10^{-5}	2.08

Notes:

a Total excess lifetime carcinogen risk

b mrem/yr

Abbreviations and Acronyms:

Mem/yr – millirem per year
NRDL – Naval Radiological Defense Laboratory

TABLE 3-5

COMBINED TOTAL RISK FROM CHEMICAL AND RADIOLOGICAL RISKS

Parcel D Impacted Sites	Radiological Risk[b]	Chemical Risk[a,b]	Redevelpment Block	Parcel D Grid(s)	Risk Combination Results
Building 274	3.46×10^{-6}	2.00×10^{-5}	DMI-1	BA22	2.35×10^{-5}
Building 313 Site	1.02×10^{-4}	3.00×10^{-6}	DMI-1	BA21	1.05×10^{-4}
Building 313A Site	8.90×10^{-5}	3.00×10^{-6}	DMI-1	BA21	9.20×10^{-5}
Building 317 Site	6.37×10^{-5}	1.00×10^{-4}	39	AY23	1.64×10^{-4}
Building 322 Site	9.07×10^{-5}	Not Evaluated	DMI-1	AZ21	9.07×10^{-5}
Building 351	4.17×10^{-6}	1.00×10^{-5}	39	AW23	1.42×10^{-5}
Building 351A	4.73×10^{-6}	3.00×10^{-6}	39	AX24	7.73×10^{-6}
Building 364 Site	3.17×10^{-5}	1.00×10^{-4}	39	AY23	1.32×10^{-4}
Building 365 Site	3.60×10^{-5}	3.00×10^{-6}	39	AY24	3.90×10^{-5}
Building 366/351B	3.46×10^{-6}	1.00×10^{-5}	39	AW20, AW21, AX21	1.35×10^{-5}
Building 383 Area	6.52×10^{-5}	1.00×10^{-5}	DMI-1	BH23, BH24	7.52×10^{-5}
Building 401	1.34×10^{-6}	8.00×10^{-6}	30A	AR24	9.34×10^{-6}
Building 408 Site	2.43×10^{-4}	5.00×10^{-6}	38	AY27	2.48×10^{-4}
Building 411	9.26×10^{-6}	2.00×10^{-5}	38	AU24, AV25	2.93×10^{-5}
Building 813	2.77×10^{-7}	5.00×10^{-6}	A		5.28×10^{-6}
Building 819	3.18×10^{-6}	5.00×10^{-6}	A		8.18×10^{-6}
Gun Mole Pier	5.08×10^{-5}	3.00×10^{-5}	DMI-1	BB25, BL24	8.08×10^{-5}
NRDL Site on Mahan Street	5.08×10^{-5}	2.00×10^{-5}	DMI-1	BE27	7.08×10^{-5}
Sanitary Sewers	6.75×10^{-5}	1.00×10^{-4}	All Blocks	AY-23	1.68×10^{-4}
Storm Drains	6.75×10^{-5}	1.00×10^{-4}	All Blocks	AY-23	1.68×10^{-4}

Notes:

[a] Chemical risk was taken from Revised FS for Parcel D, Tables B-15 and B-16.
[b] Excess lifetime carcinogen risk

Abbreviations and Acronyms:

NRDL – Naval Radiological Defense Laboratory

TABLE 3-6

COMBINED INCREMENTAL RISK FROM CHEMICAL AND RADIOLOGICAL RISKS

Parcel D Impacted Sites	Radiological Risk[b]	Chemical Risk[a,b]	Redevelpment Block	Parcel D Grid(s)	Risk Combination Results
Building 274	3.46×10^{-6}	4.00×10^{-8}	DMI-1	BB22	3.50×10^{-6}
Building 313 Site	8.97×10^{-5}	6.00×10^{-7}	DMI-1	BA21	9.03×10^{-5}
Building 313A Site	7.80×10^{-5}	6.00×10^{-7}	DMI-1	BA21	7.86×10^{-5}
Building 317 Site	4.28×10^{-5}	1.00×10^{-4}	39	AY23	1.43×10^{-4}
Building 322 Site	7.95×10^{-5}	Not Evaluated	DMI-1	AZ21	7.95×10^{-5}
Building 351	4.17×10^{-6}	1.00×10^{-7}	39	AW23	4.27×10^{-6}
Building 351A	4.73×10^{-6}	1.00×10^{-4}	39	AY23	4.83×10^{-6}
Building 364 Site	2.15×10^{-5}	1.00×10^{-4}	39	AY23	1.22×10^{-4}
Building 365 Site	2.43×10^{-5}	3.00×10^{-8}	39	AY24	2.43×10^{-5}
Building 366/351B Site	3.46×10^{-6}	Not Evaluated	39	AV22	3.46×10^{-6}
Building 383	4.35×10^{-5}	2.00×10^{-6}	DMI-1	BH23	4.55×10^{-5}
Building 401	1.34×10^{-6}	Not Evaluated	30A	AQ23	1.34×10^{-6}
Building 408 Site	2.13×10^{-4}	Not Evaluated	38	AX27	2.13×10^{-4}
Building 411	9.26×10^{-6}	1.00×10^{-6}	38	AW25	1.03×10^{-5}
Building 813	2.77×10^{-7}	5.00×10^{-6}	A		5.28×10^{-6}
Building 819	3.18×10^{-6}	5.00×10^{-6}	A		8.18×10^{-6}
Gun Mole Pier	3.42×10^{-5}	3.00×10^{-5}	DMI-1	BB24, BL24	6.42×10^{-5}
NRDL Site on Mahan Street	3.42×10^{-5}	Not Evaluated	DMI-1	BE27, BF27	3.42×10^{-5}
Sanitary Sewers	4.54×10^{-5}	1.00×10^{-4}	All Blocks	AY23	1.45×10^{-4}
Storm Drains	4.54×10^{-5}	1.00×10^{-4}	All Blocks	AY23	1.45×10^{-4}

Notes:

[a] Chemical risk was taken from Revised FS for Parcel D, Tables B-19 and B-20.
[b] Excess lifetime carcinogen risk

Abbreviations and Acronyms:

NRDL – Naval Radiological Defense Laboratory

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[4]
30	Radionuclides of concern	Section 2.5.3	Final Radiological Addendum to the Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Section 3.4, pages 3-2 through 3-5. Tetra Tech EC Inc. April 11, 2008.

For the potentially contaminated structure surfaces the exposure pathways are external radiation from contaminated surfaces and inhalation of re-suspended contaminated dust.

The exposure pathways for the impacted soils at Parcel D present a more complicated analysis. The complete pathways, based on the four criteria listed above, are external radiation, soil ingestion, inhalation, and drinking water ingestion (e.g., groundwater).

3.3 REMEDIATION GOALS

Remediation goals (RGs) are selected to achieve the RAOs. Table 3-2 identifies the RG for each ROC. The soil RGs were derived from the EPA preliminary remediation goals (PRGs) based on an increased lifetime cancer risk range of 10^{-6} to 10^{-4} for future use scenarios except for ^{226}Ra, which is based on an agreement with EPA (DON, 2006). The RGs for building and equipment surfaces were based on the AEC Reg Guide 1.86 to meet the 25 millirem per year (mrem/y) dose limits of the Nuclear Regulatory Commission. The water RGs were derived from *Radionuclides Notice of Data Availability Technical Document*, (EPA, 2000) by comparing the limits from two criteria and using the most conservative limit.

3.3.1 Constituents of Potential Concern

The ROCs, ^{137}Cs, ^{60}Co, ^{3}H, ^{232}Th, ^{235}U, ^{239}Pu, ^{226}Ra, and ^{90}Sr, have been associated with Parcel D radiologically-impacted buildings (NAVSEA, 2004). The ROCs, ^{137}Cs, ^{232}Th, ^{239}Pu, ^{226}Ra, and ^{90}Sr have been associated with Parcel D radiologically-impacted soils (NAVSEA, 2004). This information is summarized in Table 2-2.

3.3.2 Media of Concern

The media of concern are the remaining radiologically-impacted structures (274, 351, 351A, 364, 365, 366/351B, 401, 408, 411, 813, and 819); soils of former building sites (313, 313A, 317, 322 and 383 area); soils in outdoor areas (Gun Mole Pier and NRDL Site on Mahan Street); trenches resulting from sewer and storm line removal; soils of remediated storm drains and sanitary sewers; and groundwater.

3.4 RISK EVALUATION BY REDEVELOPMENT BLOCK

The following sections list the redevelopment blocks and associated evaluation scenario. Figure 2-3 shows the redevelopment blocks, impacted areas and structures, and planned reuses. The radiologically-impacted sites in Parcel D will be identified in each redevelopment block section. Radiologically-impacted sewer and storm drains are present throughout Parcel D and will not be individually listed for a particular development block. The residential scenario provided the

most conservative risk estimate and was therefore used to model the risk from ROCs associated with each redevelopment block.

3.4.1 Redevelopment Block A

Redevelopment Block A is located in the northern portion of Parcel D and is identified for research and development use. Redevelopment Block A includes radiologically-impacted buildings 813 (general warehouse and offices, supply storehouse, and Disaster Control Center) with ROC ^{90}Sr and 819 (Sewer Pump Station A) with ROCs ^{137}Cs and ^{226}Ra. Buildings 813 and 819 were evaluated using a Residual Radioactivity-Building (RESRAD-BUILD) residential exposure scenario.

3.4.2 Redevelopment Block 30A

Redevelopment Block 30A includes Building 401 and is in the northwestern portion of Parcel D. Redevelopment Block 30A includes radiologically-impacted Building 401. Building 401 has ROCs of ^{226}Ra from the collection and storage of radioluminescent devices.

Redevelopment Block 30A is identified for mixed-use reuse. Building 401 was evaluated using a RESRAD-BUILD residential exposure scenario.

3.4.3 Redevelopment Block 30B

Redevelopment Block 30B is in the west-central portion of Parcel D and is identified for industrial reuse. It does not include any radiologically-impacted buildings, former building sites, or outdoor areas, and therefore it was not evaluated.

3.4.4 Redevelopment Block 29

Redevelopment Block 29 is in the north-central portion of Parcel D and is identified for educational/cultural reuse. It does not include any radiologically-impacted buildings, former building sites, or outdoor areas, and therefore was not evaluated.

3.4.5 Redevelopment Block DOS-1

Redevelopment Block DOS-1 is in the northeastern corner of Parcel D and is identified for open space reuse. It does not include any radiologically-impacted buildings, former building sites, or outdoor areas, and therefore it was not evaluated.

3.4.6 Redevelopment Block 37

Redevelopment Block 37 is on the west-central area of Parcel D and is identified for industrial reuse. It does not include any radiologically-impacted buildings, former building sites, or outdoor areas, and therefore it was not evaluated.

3.4.7 Redevelopment Block 38

Redevelopment Block 38 is in the central portion of Parcel D. Redevelopment Block 38 includes radiologically-impacted Buildings 408 and 411. Building 408 (furnace-smelter) has ROCs of ^{226}Ra from prior smelting operations and natural thorium in the firebrick. Activities for Building 411 included radioactive source storage and radiography shop activities, and the ROCs are ^{60}Co, ^{137}Cs, and ^{226}Ra.

Redevelopment Block 38 is identified for industrial reuse. Building 408 will be surveyed and dismantled. Therefore, the former Building 408 site was evaluated using a RESRAD residential exposure scenario. Building 411 was evaluated using a RESRAD-BUILD residential exposure scenario.

3.4.8 Redevelopment Block 39

Redevelopment Block 39 is in the east-central portion of Parcel D. Redevelopment Block 39 includes radiologically-impacted Buildings 351, 351A, 364, 365, 366/351B, and former building site 317. Activities inside of Building 351 that may have been the cause of contamination were related to electronic work areas, industrial shops, and NRDL laboratories. The ROCs include ^{90}Sr, ^{137}Cs, ^{232}Th and ^{226}Ra. Activities at Building 351A included the NRDL chemical technology division and applied research branch. The ROCs are ^{90}Sr, ^{137}Cs, ^{232}Th, ^{239}Pu, and ^{226}Ra. Activities at Building 364 included animal irradiation, liquid radioactive waste collection, and hot cell work. The ROCs are ^{90}Sr, ^{137}Cs, ^{235}U, ^{239}Pu, and ^{226}Ra. Activities at Building 365 included personnel decontamination and personnel change house and office activities. The ROCs are ^{90}Sr, ^{137}Cs, ^{235}U, ^{239}Pu, and ^{226}Ra. Activities at Building 366/351B were the NRDL instrument calibration (sources) and offices. The ROCs are ^{90}Sr, ^{137}Cs, and ^{226}Ra. Activities at the former building 317 site included temporary animal quarters for the NRDL, and the ROCs are ^{90}Sr, ^{137}Cs, and ^{226}Ra.

Redevelopment Block 39 is identified for open space reuse. Buildings 364 and 365 will be surveyed and dismantled. Therefore, the former Building 364 and 365 sites were evaluated using a RESRAD residential exposure scenario. Buildings 351, 351A, and 366/351B were evaluated using a RESRAD-BUILD residential exposure scenario. The former site of Building 317 was evaluated using a RESRAD residential exposure scenario.

3.4.9 Redevelopment Block 42

Redevelopment Block 42 is in the south-central portion of Parcel D and is identified for industrial reuse. Redevelopment Block 42 does not include any radiologically-impacted buildings, former building sites, or outdoor areas, and therefore no evaluations were performed.

3.4.10 Redevelopment Block DMI-1

Redevelopment Block DMI-1 is in the southeastern portion of Parcel D. Redevelopment Block DMI-1 includes radiologically-impacted Building 274, former building sites 313, 313A, and 322, the building 383 area, and outdoor areas identified as Gun Mole Pier and the NRDL Site on Mahan Street. Activities at Building 274 included decontamination training and the ROCs are ^{90}Sr, ^{137}Cs, and ^{226}Ra. Activities at the Building 383 area included the collection and storage of radioluminescent devices. The ROCs are ^{90}Sr, ^{3}H, and ^{226}Ra. Activities at the former Building 313, 313A, and 322 sites included use as a NRDL stockroom, NRDL offices, the radiological instrument branch, training facilities, and storage locations. The ROCs are ^{90}Sr, ^{137}Cs, ^{232}Th, ^{239}Pu, and ^{226}Ra. Activities at the Gun Mole Pier included a radioactive pavement decontamination study, decontamination studies on NRDL Experimental Barge YFN-809 and on a contaminated B-17 aircraft. Decontamination facilities were also in a structure near Barge YFNX-16. The ex-INDEPENDENCE was berthed at the Gun Mole Pier and it was a loading point for radioactive wastes. An ocean disposal barge was also loaded from the Gun Mole Pier. The ROCs are ^{90}Sr, ^{137}Cs, ^{239}Pu, and ^{226}Ra. The NRDL Site on Mahan Street was used as a potential storage site of OPERATION CROSSROADS material. ROCs for the NRDL Site on Mahan Street are ^{90}Sr, ^{137}Cs, ^{239}Pu, and ^{226}Ra.

Redevelopment Block DMI-1 is identified for maritime-industrial reuse. Building 274 was evaluated using a RESRAD-BUILD residential exposure scenario. Former building sites 313, 313A, 322, the building 383 area and outdoor areas Gun Mole Pier and the NRDL Site on Mahan Street were evaluated using a RESRAD residential scenario.

3.5 ANALYSIS OF RADIOLOGICAL DOSE AND RISK

As described above, each radiologically-impacted site described above in each redevelopment block was modeled using either RESRAD or RESRAD-BUILD. Appendix A provides a discussion of the input parameters and modeling results for the radiological dose and risk for each radiologically-impacted site. The results were compared against the increased lifetime cancer risk range of 10^{-6} to 10^{-4} and the 25 mrem/y dose limits. Tables 3-3 and 3-4 provide a summary of the modeling results.

The modeling reported in Appendix A is based on the RGs. Actual calculated dose and risk will be based on field measurements from the final status survey results associated with each radiologically-impacted site. For example the risk calculated for survey units one and two of radiologically-impacted site of former Building 114 were calculated to be $4x10^{-7}$ and $2x10^{-7}$ respectively.

The modeling was performed with conservative input parameters to ensure that uncertainties would be minimized, and a separate set of models and results for uncertainty analysis would not be needed. Uncertainty analysis for the various modeling input parameters, as well as various assumptions required for the modeling, are discussed in Appendix A.

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
31	General response actions (GRAs)	Section 2.8	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Section 4.3, pages 4-15 and 4-16. SulTech. November 30, 2007.

Institutional Controls

Specific institutional control objectives are discussed in Section 5.0 with the discussion of each groundwater remedial alternative that may include institutional controls. Potential ARARs identified in Section 4.2.3 are also potential ARARs for the groundwater institutional controls.

4.3 GENERAL RESPONSE ACTIONS AND PROCESS OPTIONS ANALYSES

GRAs are categories of actions that are made up of specific process options. These GRAs are responses or remedies that will meet the RAOs to protect human health and the environment from the known contamination at Parcel D. Process options are specific technologies used to carry out a GRA. Section 4.3.1 describes the GRAs for Parcel D soil and groundwater, and Section 4.3.2 presents the results of the analysis for the proposed GRAs.

4.3.1 Development of General Response Actions

GRAs were derived from engineering judgment and past experience with remedial actions proven to be successful for the applicable COCs at Parcel D. Because the RAOs were developed based on the planned future land use, the GRAs were also developed considering the planned future land use of each redevelopment block. The GRAs for Parcel D and their respective process options are presented in Table 4-1 for soil and in Table 4-2 for groundwater. The following GRAs were identified to ensure that the soil and groundwater RAOs are met.

Soil

- No action – Required GRA for CERCLA evaluation
- Removal – Includes passive venting, excavating and off-site disposal of excavated soils as well as off-site disposal of stockpiled soil
- Treatment – Includes *in situ* and *ex situ* treatment of soils to reduce the toxicity of the contaminants
- Containment – Includes covering contaminated soils to break the direct exposure pathway
- Institutional controls – Includes legal and administrative mechanisms to restrict land use, and
- Access restrictions – Includes physical barriers such as fences and informational devices such as warning signs

Groundwater

- No action – Required GRA for CERCLA evaluation
- Treatment – Includes *in situ* and *ex situ* treatment of contaminated groundwater
- Removal – Includes pumping to remove the groundwater prior to disposal
- Containment – Includes installing slurry wall to control groundwater flow
- Institutional controls – Includes legal and administrative mechanisms to restrict groundwater use
- Access restrictions – Includes physical barriers such as fences and informational devices such as warning signs

Process options for these GRAs are evaluated below in Section 4.3.2.

4.3.2 Analysis of General Response Actions and Process Options

GRAs selected for this revised FS report underwent an initial screening and a subsequent detailed analysis. During the initial screening, the range of technology types and process options are evaluated with respect to technical implementability, site conditions, waste characteristics, contaminant properties, and the ability to meet NCP requirements and RAOs. The initial screening results are summarized in Tables 4-1 and 4-2 for soil and groundwater, respectively. Those GRAs and process options that were carried forward from the initial screening are then analyzed with respect to effectiveness, implementability, and cost. Table 4-3 summarizes the results of this detailed analysis. The screening and analysis of GRAs and process options is presented separately for soil and groundwater. Section 4.3.2.1 presents the analysis for the applicable soil process options, and Section 4.3.2.2 presents the analysis for the applicable groundwater process options.

4.3.2.1 Evaluation of Applicable Soil Process Options

Potentially applicable GRAs identified for soil at Parcel D consist of (1) no action, (2) institutional controls, (3) removal, (4) treatment, and (5) containment. The initial screening of process options for the remedial technology types for these soil GRAs is shown in Table 4-1. This table presents the various technology types, process options, and screening analysis results for each soil GRA. The rationale for those options eliminated from further evaluation is presented in Table 4-1; these options are not discussed further.

Four GRAs are retained for further evaluation including no action. The fifth GRA, treatment, was eliminated during the initial screening of process options for soil at Parcel D. Several treatment options were considered for the COCs in soil. However, none of the treatment options are implementable for ubiquitous metals that are present in bedrock-derived fill material at

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
32	Preliminary remedial alternatives	Section 2.8	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Section 5.0, page 5-1. SulTech. November 30, 2007.

5.0 DEVELOPMENT AND DESCRIPTION OF REMEDIAL ALTERNATIVES

This section presents potential remedial alternatives developed for soil and groundwater at Parcel D based on the GRAs and process options evaluated in Section 4.0. The NCP states that the development and evaluation of remedial alternatives will reflect the scope and complexity of the remedial actions under consideration with regards to the environmental issues defined at the site. The number and types of alternatives to be analyzed will be determined for each site by taking into account the scope and characteristics of the environmental issues at Parcel D.

5.1 DEVELOPMENT OF REMEDIAL ALTERNATIVES

Combinations of retained process options were developed into remedial alternatives that also satisfy the RAOs and meet the requirements of the ARARs. The remedial alternatives were derived using experience and engineering judgment to formulate process options into the most plausible site-specific remedial actions.

For soils remedial alternatives, the Navy's strategy is to remove the contaminated soils from the site by excavation and disposal wherever practical, and to remediate those soils that cannot be removed by preventing complete exposure pathways to the receptors. Based on the COCs identified in Section 3.0, and on their location and extent defined in Section 2.0, the lead- and PAH-contaminated soil can be removed, while the arsenic and manganese contamination will require remedial actions that prevent completion of exposure pathways. Various institutional controls are also integrated with each alternative to assure that the RAOs and ARARs are satisfied.

For groundwater remedial alternatives, the Navy's strategy is primarily to prevent complete exposure pathways to the receptors and to monitor the known impacted areas while the aquifer recovers. Various institutional controls are included in the groundwater remedial alternatives to assure that the RAOs and ARARs are satisfied. Two remedial alternatives that include *in situ* treatment are also considered. Only the A-aquifer is considered for these remedial alternatives because no COCs were identified in the B-aquifer.

Alternatives would become simpler under the recently stadium reuse plan at Parcel D. Fewer areas would be planned for excavation because of the change to the shallower 2-foot depth. An alternative that includes a cover would be similar under this reuse, but the type of cover would be determined in the RD stage. Groundwater alternatives would not be affected, except that the areas determined to require remediation would likely be smaller because of the recreational reuse.

Both soil and groundwater remedial alternatives include five-year reviews to confirm that the remedies are continuing to protect human health and the environment when residual concentrations of COCs are left in place. Costs for five-year reviews, as well as other long-term monitoring activities, are included in the cost estimates for all alternatives.

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[a]
33	Nine evaluation criteria	Section 2.8.2	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Section 6.0, pages 6-1 and 6-2. SulTech. November 30, 2007.

6.0 DETAILED ANALYSIS OF REMEDIAL ALTERNATIVES

This section provides a detailed analysis of each remedial alternative developed in Section 5.0. This information will be used to help select a final remedy for Parcel D. The alternatives are evaluated using criteria based on statutory requirements of CERCLA as amended by Superfund Amendments and Reauthorization Act, Section 121; the NCP; and "Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA" (EPA 1988).

The NCP specifies nine criteria to be used in the comparative analysis. The first two criteria are threshold criteria that must be satisfied in order for a remedy to be eligible for selection; the next five criteria are balancing criteria used to evaluate the comparative advantages and disadvantages of the remedies; and the final two criteria are modifying criteria generally taken into account after agency and public comments are received on the FS and proposed plan. The nine criteria are summarized below.

Overall protection of human health and the environment: This criterion describes how each alternative, as a whole, protects human health and the environment and indicates how each hazardous substance source is to be eliminated, reduced, or controlled.

Compliance with ARARs: This criterion evaluates each alternative's compliance with ARARs, or, if an ARAR waiver is required, how the waiver is justified. ARARs consider location-specific, chemical-specific, and action-specific concerns.

Long-term effectiveness and permanence: This criterion evaluates the effectiveness of each alternative in protecting human health and the environment after the remedial action is complete. Factors considered include magnitude of residual risks and adequacy and reliability of release controls.

Reduction of toxicity, mobility, or volume through treatment: This evaluation criterion addresses the statutory preference for selecting remedial actions that employ treatment technologies that permanently and significantly reduce toxicity, mobility, or volume of the hazardous substances as their principal element. This preference is satisfied when treatment is used to reduce the principal threats at a site through destruction of toxic contaminants, reduction of the total mass of toxic contaminants, irreversible reduction in contaminant mobility, or reduction of total volume of contaminated media.

Short-term effectiveness: This criterion addresses the effectiveness of each alternative in protecting human health and the environment during the construction and implementation phase. Factors considered include:

- Protection of the community during remedial actions
- Protection of the workers during construction

- Environmental impacts
- Time required to achieve response objectives (achieve protection for the site or individual elements associated with specific risks)

Implementability: This criterion addresses the technical and administrative feasibility of implementing an alternative and the availability of the required services and materials during its implementation. Factors considered include:

- Ability to construct and operate the technology
- Availability and reliability of the technology
- Ease of undertaking additional remedial action
- Administrative implementability
- Coordination activities with other agencies
- Monitoring considerations
- Availability of equipment and specialists

Cost: This criterion evaluates the present value of the capitol and operation and maintenance (O&M) costs for each alternative. Capital and O&M cost estimates are order-of-magnitude-level estimates and have an expected accuracy of minus 30 to plus 50 percent (EPA 2000b). Table 6-1 summarizes the cost for each alternative.

Community Acceptance: This criterion evaluates issues and concerns the public may have regarding each alternative. This criterion will be assessed following receipt of community comments on the FS and the proposed plan.

Regulatory Agency Acceptance: This criterion evaluates technical and administrative issues and concerns the regulatory agencies may have about each alternative. This criterion will be assessed following receipt of agency comments on the FS and the proposed plan.

In the following sections, each remedial alternative is evaluated in comparison to the two threshold and five balancing NCP criteria, and subsequently compared to other alternatives to assess the relative performance with respect to these criteria. Comparison to the two modifying criteria of community and regulatory acceptance will be included in the proposed plan and ROD for Parcel D; further discussion of these criteria is not included in this revised FS report. Soil remedial alternatives are evaluated individually in Section 6.1 and compared with each other in Section 6.2. Groundwater remedial alternatives are evaluated individually in Section 6.3 and compared with each other in Section 6.4.

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
34	Present-Worth Cost: $344,000	Table 6	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Appendix F, Table F-2A. SulTech. November 30, 2007.

TABLE F-2A: CAPITAL AND LABOR COST ESTIMATE, ALTERNATIVE S-2

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Alternative S-2: Institutional Controls

Location Factors

Labor:	100.0%	(San Francisco - Means Section 1)	133.8%
Equipment:	100.0%	(San Francisco - Means Section 1)	112.6%
Material:	100.0%	(San Francisco - Means Section 1)	112.6%
Assembly:	124.0%		122.0% Level D
Professional Labor Multiplier:	1.6	(RACER)	
Labor Overhead & Profit Multiplier.:	1.719	(Includes 10% to account for PPE [modified Level D])	
Material and Equipment Profit:	9%	(RACER)	

Project Duration: 6.0 Months or 133 working days

Institutional Controls

Engineering Controls

Description	Quantity	Unit	Unloaded Labor Unit Cost	Total Labor (including O&P)	Unloaded Equipment Unit Cost	Total Equipment (including profit)	Unloaded Material Unit Cost	Total Material (including profit)	Unloaded Assembly Unit Cost	Total Assembly Cost (including profit)	Total Unit Cost (including O&P)	Total Cost (including O&P)	Comments
Fence and Signage Capital Cost											Fence and Signage Capital Cost Subtotal =	$ 248,051	
Blk 29 signs (24" x 24" reflectorized)	6	ea	$ 75.00	$ 450	$ -	$ -	$ 30.66	$ 184	$ -	$ -	$ 105.66	$ 634	One sign per industrial risk grid block side excluding non-risk outparcels within risk boundaries; Means 18, 01, 04, 11
Blk 30A signs (24" x 24" reflectorized)	10	ea	$ 75.00	$ 750	$ -	$ -	$ 30.66	$ 307	$ -	$ -	$ 105.66	$ 1,057	One sign per industrial risk grid block side excluding non-risk outparcels within risk boundaries; Means 18, 01, 04, 11
Blk 30B signs (24" x 24" reflectorized)	5	ea	$ 75.00	$ 375	$ -	$ -	$ 30.66	$ 153	$ -	$ -	$ 105.66	$ 528	One sign per industrial risk grid block side excluding non-risk outparcels within risk boundaries; Means 18, 01, 04, 11
Blk 37 signs (24" x 24" reflectorized)	14	ea	$ 75.00	$ 1,050	$ -	$ -	$ 30.66	$ 429	$ -	$ -	$ 105.66	$ 1,479	One sign per industrial risk grid block side excluding non-risk outparcels within risk boundaries; Means 18, 01, 04, 11
Blk 38 signs (24" x 24" reflectorized)	9	ea	$ 75.00	$ 675	$ -	$ -	$ 30.66	$ 276	$ -	$ -	$ 105.66	$ 951	One sign per industrial risk grid block side excluding non-risk outparcels within risk boundaries; Means 18, 01, 04, 11
Blk 39 signs (24" x 24" reflectorized)	12	ea	$ 75.00	$ 900	$ -	$ -	$ 30.66	$ 368	$ -	$ -	$ 105.66	$ 1,268	One sign per industrial risk grid block side excluding non-risk outparcels within risk boundaries; Means 18, 01, 04, 11
Blk 42 signs (24" x 24" reflectorized)	14	ea	$ 75.00	$ 1,050	$ -	$ -	$ 30.66	$ 429	$ -	$ -	$ 105.66	$ 1,479	One sign per industrial risk grid block side excluding non-risk outparcels within risk boundaries; Means 18, 01, 04, 11
DOS 1 signs (24" x 24" reflectorized)	7	ea	$ 75.00	$ 525	$ -	$ -	$ 30.66	$ 215	$ -	$ -	$ 105.66	$ 740	One sign per industrial risk grid block side excluding non-risk outparcels within risk boundaries; Means 18, 01, 04, 11
DMI 1 signs (24" x 24" reflectorized)	60	ea	$ 75.00	$ 4,500	$ -	$ -	$ 30.66	$ 1,840	$ -	$ -	$ 105.66	$ 6,340	One sign per industrial risk grid block side excluding non-risk outparcels within risk boundaries; Means 18, 01, 04, 11
Fence (6' tall, industrial fence) around Block-39, 42 and DMI-1	10,000	ft	$ 2.75	$ 27,500	$ 0.56	$ 6,076	$ 20.00	$ 200,000		$ -	$ 23.36	$ 233,576	Fence installed only where buildings or asphalt caps are not present; Means Heavy Construction 02820 130 0500
Fenced Area Vegetation											Fenced Area Vegetation Subtotal =	$ 8,067	
Hydroseeding (20% of fenced area)	214	csy	$ 2.59	$ 554	$ 2.25	$ 522	$ 9.37	$ 2,176	$ -	$ -	$ 15.19	$ 3,252	Means 18, 05, 04, 01
Hydro fertilizer	214	csy	$ 1.03	$ 220	$ 0.75	$ 174	$ 2.18	$ 506	$ -	$ -	$ 4.21	$ 900	Means 18, 05, 04, 08
Water - 10 times	214	csy	$ 8.89	$ 1,902	$ 7.69	$ 1,786	$ 0.98	$ 228	$ -	$ -	$ 18.30	$ 3,916	Means 18, 05, 04, 08
Total Engineering Controls Capital Costs											**Total Engineering Controls Capital Costs Subtotal =**	**$ 256,119**	
Design Cost											**Design Cost Subtotal =**	**$ 30,734**	*Calcualted as overall cost - not per individual excavation; 12% of Total Construction Cap Cost
Assume 12% of construction cost												$ 30,734	

TABLE F-2A: CAPITAL AND LABOR COST ESTIMATE, ALTERNATIVE S-2 (CONTINUED)

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Alternative S-2: Institutional Controls

Location Factors				
Labor:	100.0%	(San Francisco - Means Section 1)	133.8%	
Equipment:	100.0%	(San Francisco - Means Section 1)	112.6%	
Material:	100.0%	(San Francisco - Means Section 1)	112.6%	
Assembly:	124.0%		122.0%	Level D
Professional Labor Multiplier:	1.6	(RACER)		
Labor Overhead & Profit Multiplier.:	1.719	(Includes 10% to account for PPE [modified Level D])		
Material and Equipment Profit:	9%	(RACER)		

Project Duration: 6.0 Months or 133 working days

Legal Controls

	P4		P3		P2		P1		Lawyer		Total					
	Quantity	Unit	Loaded Labor Unit Cost	Total Labor	Loaded Labor Unit Cost	Total Labor	Loaded Labor Unit Cost	Total Labor	Loaded Labor Unit Cost	Total Labor	Loaded Labor Unit Cost	Total Labor	Labor Cost	ODCs	Subtask Cost	Comments
Professional Unit Costs	$ 97.00		$ 75.00		$ 48.00		$ 36.00		$ 198.00		$ 83.00					
Institutional Control Implementation and Certification													Institutional Control Implementation and Certification Subtotal =		$ 52,125	
LUC RD scoping meeting	32	hours	100	$ 3,200.00	0	$ -	0	$ -	0	$ -	100	$ 3,200.00	$ 3,200	$ 125	$ 3,325	Hours Tetra Tech
Prepare draft LUC RD	136	hours	100	$ 13,600.00	0	$ -	0	$ -	0	$ -	100	$ 13,600.00	$ 13,600	$ -	$ 13,600	Hours Tetra Tech 2002.
Submit draft LUC RD	32	hours	100	$ 3,200.00	0	$ -	0	$ -	0	$ -	100	$ 3,200.00	$ 3,200	$ 100	$ 3,300	Hours Tetra Tech
BCT review period	20	hours	100	$ 2,000.00	0	$ -	0	$ -	0	$ -	100	$ 2,000.00	$ 2,000	$ -	$ 2,000	Hours Tetra Tech
BCT comments due	20	hours	100	$ 2,000.00	0	$ -	0	$ -	0	$ -	100	$ 2,000.00	$ 2,000	$ -	$ 2,000	Hours Tetra Tech
RTC meeting and BCT concurrence	20	hours	100	$ 2,000.00	0	$ -	0	$ -	0	$ -	100	$ 2,000.00	$ 2,000	$ 500	$ 2,500	Hours Tetra Tech
Prepare draft final LUC RD	88	hours	100	$ 8,800.00	0	$ -	0	$ -	0	$ -	100	$ 8,800.00	$ 8,800	$ -	$ 8,800	Hours Tetra Tech
Submit draft final LUC RD	8	hours	100	$ 800.00	0	$ -	0	$ -	0	$ -	100	$ 800.00	$ 800	$ 100	$ 900	Hours Tetra Tech
BCT review and concurrence period	56	hours	100	$ 5,600.00	0	$ -	0	$ -	0	$ -	100	$ 5,600.00	$ 5,600	$ -	$ 5,600	Hours Tetra Tech
BCT concurrence letters due	40	hours	100	$ 4,000.00	0	$ -	0	$ -	0	$ -	100	$ 4,000.00	$ 4,000	$ -	$ 4,000	Hours Tetra Tech
Prepare final LUC RD with RTC	48	hours	100	$ 4,800.00	0	$ -	0	$ -	0	$ -	100	$ 4,800.00	$ 4,800	$ -	$ 4,800	Hours Tetra Tech
Submit final LUC RD with RTC	12	hours	100	$ 1,200.00	0	$ -	0	$ -	0	$ -	100	$ 1,200.00	$ 1,200	$ 100	$ 1,300	Hours Tetra Tech
Covenant to Restrict Use of Property													Covenant to Restrict Use of Property Subtotal =		$ 11,400	
Prepare draft covenant	88	hours	100	$ 8,800.00	0	$ -	0	$ -	0	$ -	100	$ 8,800.00	$ 8,800	$ 100	$ 8,900	Hours Tetra Tech
File covenant	24	hours	100	$ 2,400.00	0	$ -	0	$ -	0	$ -	100	$ 2,400.00	$ 2,400	$ 100	$ 2,500	Hours Tetra Tech
Total Legal Controls Capital Costs													**Total Legal Controls Capital Costs Subtotal =**		**$ 63,525**	
Total Institutional Controls Capital Costs													**Total Institutional Controls Capital Costs Subtotal =**		**$ 350,378**	

		2005 Costs	2007 Costs
Annual Inflation Rate	**3.1%**		
Project Capital & Labor Cost =		**$ 350,378**	**$ 372,438**
Present Value of 30 Years of Periodic Costs =		**$ 295,225**	**$ 313,813**
(Five-Year Reviews)			
SubTotal =		**$ 645,603**	**$ 686,251**
20% Contingency =		**$ 129,121**	**$ 137,250**
Total Project Cost =		**$ 774,724**	**$ 823,501**

Notes:

"	Inch	O&M	Operation and maintenance
%	Percent	O&P	Overhead and profit
BCT	Base Realignment and Closure Cleanup Team	ODC	Other direct cost
ea	Each	PPE	Personal protective equipment
FOST	Finding of suitability to transfer	RACER	Remedial Action Cost Engineering and Requirements System
LUC RD	Land Use Control Remedial Design	RTC	Response to comments
Means	RS Means Company, Inc. 2004. "Environmental Remediation Cost Data – Unit Price, 10th Annual Edition, Environmental Cost Handling Options and Solutions." Kingston, Massachusetts. October.	Tetra Tech	Tetra Tech EM Inc. 2002. "Draft Revised Parcel D Feasibility Study Hunters Point Shipyard San Francisco, California." March 8.

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
35	Present-Worth Cost: $706,000	Table 6	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Appendix F, Table F-3A. SulTech. November 30, 2007.

TABLE F-3A: CAPITAL AND LABOR COST ESTIMATE, ALTERNATIVE S-3

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Alternative S-3: Excavation, Disposal and Institutional Controls

Location Factors

Labor:	100.0%	(San Francisco - Means Sectio	133.8%
Equipment:	100.0%	(San Francisco - Means Sectio	112.6%
Material:	100.0%	(San Francisco - Means Sectio	112.6%
Assembly:	124.0%		
Professional Labor Multiplier:	1.6	(Racer)	
Labor Overhead & Profit Multiplier.:	1.719	(includes 10% to account for PPE [modified Level D])	
Material and Equipment Profit:	9%	(RACER)	
Project Duration:	2.0 Months or 44 working days		

Description		Quantity	Unit	Unloaded Labor Unit Cost	Total Labor (including O&P)	Unloaded Equipment Unit Cost	Total Equipment (including profit)	Unloaded Material Unit Cost	Total Material (including profit)	Unloaded Assembly Unit Cost	Total Assembly Cost (including profit)	Total Unit Cost (including O&P)	Total Cost (including O&P)	Comments
Site Wide Costs														
Distributive Costs												Distributive Costs Subtotal =	$ 139,462	
1 Project Manager	50%	176	hr	$ 50.00	$ 14,080	$ -	$ -	$200.00 /day	$ 4,400	$ -	$ -	$ 105.00	$ 18,480	
1 Superintendent	100%	352	hr	$ 42.00	$ 23,654	$ -	$ -	$200.00 /day	$ 8,800	$ -	$ -	$ 92.20	$ 32,454	
1 Engineer	100%	352	hr	$ 35.00	$ 19,712	$ -	$ -	$200.00 /day	$ 8,800	$ -	$ -	$ 81.00	$ 28,512	
1 Health & Safety Officer	100%	352	hr	$ 25.00	$ 14,080	$ -	$ -	$200.00 /day	$ 8,800	$ -	$ -	$ 65.00	$ 22,880	
1 Quality Control Officer	100%	352	hr	$ 25.00	$ 14,080	$ -	$ -	$200.00 /day	$ 8,800	$ -	$ -	$ 65.00	$ 22,880	
1 Procurement Specialist	50%	176	hr	$ 35.00	$ 9,856	$ -	$ -	$200.00 /day	$ 4,400	$ -	$ -	$ 81.00	$ 14,256	
Temporary Facilities												Temporary Facilities Subtotal =	$ 9,888	*Assume that we will not be setting up buildings/work areas/etc. Numbers same as previous.
Portable Toilets (2)		2	mo	$ -	$ -	$ -	$ -	$ 1,006.40	$ 2,184	$ -	$ -	$ 1,092.00	$ 2,184	Means 2004 Heavy Construction. Pg. 24. 01590 400 6410
Rental Trucks (5) (for supervisory staff)		2	mo	$ -	$ -	$ -	$ -	$ 3,550.00	$ 7,704	$ -	$ -	$ 3,852.00	$ 7,704	Assuming rental from Enterprise
Mobilization												Mobilization Subtotal =	$ 3,044	*Assume that these will be used overall (not calced for every excavation).
Crawler mounted backhoes		5	ea	$ 53.00	$ 456	$ 168.00	$ 911	$ -	$ -	$ -	$ -	$ 273.40	$ 1,367	Means 2004 Heavy Construction. Pg. 139. 03110 420 1000
Graders		5	ea	$ 53.00	$ 456	$ 168.00	$ 911	$ -	$ -	$ -	$ -	$ 273.40	$ 1,367	Means 2004 Heavy Construction. Pg. 139. 03110 420 1000
20 ton dump truck		5	ea	$ -	$ -	$ -	$ -	$ -	$ -	$ 50.00	$ 310	$ 62.00	$ 310	Assumed $1 per mile for 50 miles; location factor and O&P N/A
Demobilization												Demobilization Subtotal =	$ 3,044	*Assume that these will be used overall (not calced for every excavation).
Crawler mounted backhoes		5	ea	$ 53.00	$ 456	$ 168.00	$ 911	$ -	$ -	$ -	$ -	$ 273.40	$ 1,367	
Graders		5	ea	$ 53.00	$ 456	$ 168.00	$ 911	$ -	$ -	$ -	$ -	$ 273.40	$ 1,367	
20 ton dump truck		5	ea	$ -	$ -	$ -	$ -	$ -	$ -	$ 50.00	$ 310	$ 62.00	$ 310	
Oversight												Oversight Subtotal =	$ 21,178	
Engineer	100% on project; location factor N/A	352	hr	$ 35.00	$ 21,178	$ -	$ -	$ -	$ -	$ -	$ -	$ 60.16	$ 21,178	*Calculated as overall cost - not per individual excavation. Unit cost numbers same as previous.
Total Site Wide Capital Costs												**Total Site Wide Capital Costs Subtotal =**	**$ 176,616**	
IR09 Vats Area Chromium-VI Investigation Costs														
Sampling and Analysis												Sampling and Analysis Subtotal =	$ 12,977	
CPT Rig														
Mob/demob		1	ea	$ -	$ -	$ 2,568.00	$ 2,786	$ -	$ -	$ -	$ -	$ 2,786.00	$ 2,786	ECHOS 2006, 33 02 0640
Soil sampling														
Sampling with CPT rig		1	day		$ -		$ -	$ 3,548.00	$ 3,850	$ -	$ -	$ 3,850.00	$ 3,850	ECHOS 2006, 33 02 0639; assuming 5 samples per day at 20-30 ft bgs
Field analysis of soil samples														
XRF analyzer rental		1	week	$ -	$ -	$ 800.00	$ 868		$ -	$ -	$ -	$ 868.00	$ 868	Professional judgement; assuming one week rental to cover shipping time
Lab analysis of soil samples														
Metals, EPA 200.7 (QC samples)		2	ea	$ -	$ -	$ -	$ -		$ -	$ 543	$ 1,347	$ 673.50	$ 1,347	ECHOS 2006, 33 02 0612; assuming 2 XRF samples will be analyzed in lab for QC
Oversight, sample analysis and reporting														
Professional labor (incl. field and office; local staff)		24	man-hr	$ 100.0	$ 4,126	$ -	$ -		$ -	$ -	$ -	$ 171.92	$ 4,126	Professional judgement; assuming 2 persons in field for 1 day + I day office labor
Total IR09 Chromium-VI Investigation Cost												**Total IR09 Chromium-VI Investigation Cost Subtotal =**	**$ 12,977**	

TABLE F-3A: CAPITAL AND LABOR COST ESTIMATE, ALTERNATIVE S-3 (CONTINUED)

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Alternative S-3: Excavation, Disposal and Institutional Controls

Location Factors

Labor:	100.0%	(San Francisco - Means Sectio	133.8%
Equipment:	100.0%	(San Francisco - Means Sectio	112.6%
Material:	100.0%	(San Francisco - Means Sectio	112.6%
Assembly:	124.0%		
Professional Labor Multiplier:	1.6	(Racer)	
Labor Overhead & Profit Multiplier.:	1.719	(includes 10% to account for PPE [modified Level D])	
Material and Equipment Profit:	9%	(RACER)	
Project Duration:	2.0 Months or 44 working days		

Description	Quantity	Unit	Unloaded Labor Unit Cost	Total Labor (including O&P)	Unloaded Equipment Unit Cost	Total Equipment (including profit)	Unloaded Material Unit Cost	Total Material (including profit)	Unloaded Assembly Unit Cost	Total Assembly Cost (including profit)	Total Unit Cost (including O&P)	Total Cost (including O&P)	Comments
Excavation Costs													
Excavation Costs Site ID IR09B030													
Site Preparation											Site Preparation Subtotal =	$ 875	
Clearing bituminous driveway	25	sy	$ 15.39	$ 661	$ 7.89	$ 214	$ -	$ -	$ -	$ -	35	$ 875	Means 2004 17, 02; assume site preparation only includes clearing existing asphalt if necessary; current cover is asphalt based on 2004 aerial photograph.
Excavation											Excavation Subtotal =	$ 13,048	
Standard soil excavation													
Excavation	56	cy	$ 1.35	$ 130	$ 1.71	$ 104	$ -	$ -	$ -	$ -	$ 4.18	$ 234	Means 17, 03, 02, 77
Utility buffer soil excavation													
Excavation and utility shoring	28	cy	$ 34.05	$ 1,639	$ 2.47	$ 75	$ 5.22	$ 159	$ -	$ -	$ 66.89	$ 1,873	Means 17, 03 includes excavation, shoring and hand digging costs
Confirmation and characterization sampling													
Sampling	9	ea	$ -	$ -	$ -	$ -	$ 1,000.00	$ 9,765	$ -	$ -	$ 1,085.00	$ 9,765	Means 33, 02, 06 assume 9 samples per excav; 5 confirmation + 4 characterization
Filling/soil covering													
Borrow, fill and compact	84	cy	$ 1.68	$ 243	$ 2.63	$ 240	$ 7.15	$ 652	$ -	$ -	$ 13.51	$ 1,135	Means 17, 03, 04, 23
Grading													
Rough grade	25	sy	$ 0.29	$ 12	$ 0.51	$ 14	$ -	$ -	$ -	$ -	$ 1.04	$ 26	Means 17, 03, 01, 02
Fine grade	25	sy	$ 0.20	$ 9	$ 0.21	$ 6	$ -	$ -	$ -	$ -	$ 0.60	$ 15	Means 17, 03, 01, 06
Storm Water Control											Storm Water Control Subtotal =	$ 376	
2 -foot high (and 2-ft wide) berm around open excav	15	cy		$ -		$ -		$ -	$ 6.12	$ 114	$ 7.60	$ 114	Means 2004 Environmental Remediation - Unit Price; Pg 4-31; 17 03 9911
Silt fences (vinyl, 3 ft high with 7.5 ft posts)	100	ft		$ -		$ -		$ -	$ 2.11	$ 262	$ 2.62	$ 262	Means 2004 Environmental Remediation - Unit Price; Pg 5-19; 18 05 0206
Waste Hauling and Disposal											Waste Hauling and Disposal Subtotal =	$ 25,561	
Haul (20 ton dump less than 200 mi.)	100.8	cy		$ -		$ -	$ 94.12	$ 10,294		$ -	$ 102.12	$ 10,294	Means 33, 19, 02, 09
Dump charge	100.8	cy		$ -		$ -	$ 119.36	$ 13,054		$ -	$ 129.50	$ 13,054	Means 33, 19, 03, 24
Truck decontamination	100.8	cy		$ -		$ -	$ 20.23	$ 2,213		$ -	$ 21.95	$ 2,213	Means 33, 19, 03, 11
Total Excavation Capital Costs IR09B030											**Total Excavation Capital Costs IR09B030 Subtotal =**	**$ 39,860**	
Excavation Costs Site ID IR09B091													
Site Preparation											Site Preparation Subtotal =	$ 875	
Clearing bituminous driveway	25	sy	$ 15.39	$ 661	$ 7.89	$ 214	$ -	$ -	$ -	$ -	35	$ 875	Means 2004 17, 02; assume site preparation only includes clearing existing asphalt if necessary; current cover is asphalt based on 2004 aerial photograph.
Excavation											Excavation Subtotal =	$ 10,384	
Standard soil excavation													
Excavation	14	cy	$ 1.35	$ 32	$ 1.71	$ 26	$ -	$ -	$ -	$ -	$ 4.14	$ 58	Means 17, 03, 02, 77
Building buffer soil excavation													
Excavation and building shoring	1	cy	$ 34.93	$ 60	$ 4.14	$ 4	$ 10.76	$ 12	$ -	$ -	$ 76.00	$ 76	Means 17, 03 includes excavation and shoring costs
Utility buffer soil excavation													
Excavation and utility shoring	3	cy	$ 34.05	$ 176	$ 2.47	$ 8	$ 5.22	$ 17	$ -	$ -	$ 67.00	$ 201	Means 17, 03 includes excavation, shoring and hand digging costs
Confirmation and characterization sampling													
Sampling	9	ea	$ -	$ -	$ -	$ -	$ 1,000.00	$ 9,765	$ -	$ -	$ 1,085.00	$ 9,765	Means 33, 02, 06 assume 9 samples per excav; 5 confirmation + 4 characterization
Filling/soil cover													
Borrow, fill and compact	18	cy	$ 1.68	$ 52	$ 2.63	$ 51	$ 7.15	$ 140	$ -	$ -	$ 13.50	$ 243	Means 17, 03, 04, 23
Grading													
Rough grade	25	sy	$ 0.29	$ 12	$ 0.51	$ 14	$ -	$ -	$ -	$ -	$ 1.04	$ 26	Means 17, 03, 01, 02
Fine grade	25	sy	$ 0.20	$ 9	$ 0.21	$ 6	$ -	$ -	$ -	$ -	$ 0.60	$ 15	Means 17, 03, 01, 06
Storm Water Control											Storm Water Control Subtotal =	$ 376	
2 -foot high (and 2-ft wide) berm around open excav	15	cy		$ -		$ -		$ -	$ 6.12	$ 114	$ 7.60	$ 114	Means 2004 Environmental Remediation - Unit Price; Pg 4-31; 17 03 9911
Silt fences (vinyl, 3 ft high with 7.5 ft posts)	100	ft		$ -		$ -		$ -	$ 2.11	$ 262	$ 2.62	$ 262	Means 2004 Environmental Remediation - Unit Price; Pg 5-19; 18 05 0206
Waste Hauling and Disposal											Waste Hauling and Disposal Subtotal =	$ 17,473	
Haul (20 ton dump less than 200 mi.)	21.6	cy		$ -		$ -	$ 94.12	$ 2,206		$ -	$ 102.13	$ 2,206	Means 33, 19, 02, 09
Dump charge	100.8	cy		$ -		$ -	$ 119.36	$ 13,054		$ -	$ 129.50	$ 13,054	Means 33, 19, 03, 24
Truck decontamination	100.8	cy		$ -		$ -	$ 20.23	$ 2,213		$ -	$ 21.95	$ 2,213	Means 33, 19, 03, 11
Total Excavation Capital Costs IR09B091											**Total Excavation Capital Costs IR09B091 Subtotal =**	**$ 29,108**	

TABLE F-3A: CAPITAL AND LABOR COST ESTIMATE, ALTERNATIVE S-3 (CONTINUED)

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Alternative S-3: Excavation, Disposal and Institutional Controls

Location Factors

Labor:	100.0%	(San Francisco - Means Sectio	133.8%
Equipment:	100.0%	(San Francisco - Means Sectio	112.6%
Material:	100.0%	(San Francisco - Means Sectio	112.6%
Assembly:	124.0%		
Professional Labor Multiplier:	1.6	(Racer)	
Labor Overhead & Profit Multiplier.:	1.719	(includes 10% to account for PPE [modified Level D])	
Material and Equipment Profit:	9%	(RACER)	
Project Duration:	2.0 Months or 44 working days		

Description	Quantity	Unit	Unloaded Labor Unit Cost	Total Labor (including O&P)	Unloaded Equipment Unit Cost	Total Equipment (including profit)	Unloaded Material Unit Cost	Total Material (including profit)	Unloaded Assembly Unit Cost	Total Assembly Cost (including profit)	Total Unit Cost (including O&P)	Total Cost (including O&P)	Comments
Excavation Costs Site ID IR35SS15													
Excavation											Excavation Subtotal =	$ 11,980	
Standard soil excavation													
Excavation	73	cy	$ 1.35	$ 169	$ 1.71	$ 135	$ -	$ -	$ -	$ -	$ 4.16	$ 304	Means 17, 03, 02, 77
Utility buffer soil excavation													
Excavation and utility shoring	11	cy	$ 34.05	$ 644	$ 2.47	$ 29	$ 5.22	$ 62	$ -	$ -	$ 66.82	$ 735	Means 17, 03 includes excavation, shoring and hand digging costs
Confirmation and characterization sampling													
Sampling	9	ea	$ -	$ -	$ -	$ -	$ 1,000.00	$ 9,765	$ -	$ -	$ 1,085.00	$ 9,765	Means 33, 02, 06 assume 9 samples per excav; 5 confirmation + 4 characterization
Filling/soil cover													
Borrow, fill and compact	84	cy	$ 1.68	$ 243	$ 2.63	$ 240	$ 7.15	$ 652	$ -	$ -	$ 13.51	$ 1,135	Means 17, 03, 04, 23
Grading													
Rough grade	25	sy	$ 0.29	$ 12	$ 0.51	$ 14	$ -	$ -	$ -	$ -	$ 1.04	$ 26	Means 17, 03, 01, 02
Fine grade	25	sy	$ 0.20	$ 9	$ 0.21	$ 6	$ -	$ -	$ -	$ -	$ 0.60	$ 15	Means 17, 03, 01, 06
Storm Water Control											Storm Water Control Subtotal =	$ 376	
2-foot high (and 2-ft wide) berm around open excavation	15	cy		$ -		$ -		$ -	$ 6.12	$ 114	$ 7.60	$ 114	Means 2004 Environmental Remediation - Unit Price; Pg 4-31; 17 03 9911
Silt fences (vinyl, 3 ft high with 7.5 ft posts)	100	ft		$ -		$ -		$ -	$ 2.11	$ 262	$ 2.62	$ 262	Means 2004 Environmental Remediation - Unit Price; Pg 5-19; 18 05 0206
Waste Hauling and Disposal											Waste Hauling and Disposal Subtotal =	$ 25,561	
Haul (20 ton dump less than 200 mi.)	100.8	cy		$ -		$ -	$ 94.12	$ 10,294		$ -	$ 102.12	$ 10,294	Means 33, 19, 02, 09
Dump charge	100.8	cy		$ -		$ -	$ 119.36	$ 13,054		$ -	$ 129.50	$ 13,054	Means 33, 19, 03, 24
Truck decontamination	100.8	cy		$ -		$ -	$ 20.23	$ 2,213		$ -	$ 21.95	$ 2,213	Means 33, 19, 03, 11
Total Excavation Capital Costs IR35SS15											**Total Excavation Capital Costs IR35SS15 Subtotal =**	**$ 37,917**	
Excavation Costs Site ID IR35SS14													
Excavation											Excavation Subtotal =	$ 11,292	
Standard soil excavation													
Excavation	84	cy	$ 1.35	$ 195	$ 1.71	$ 156	$ -	$ -	$ -	$ -	$ 4.18	$ 351	Means 17, 03, 02, 77
Confirmation and characterization sampling													
Sampling	9	ea	$ -	$ -	$ -	$ -	$ 1,000.00	$ 9,765	$ -	$ -	$ 1,085.00	$ 9,765	Means 33, 02, 06 assume 9 samples per excav; 5 confirmation + 4 characterization
Filling/soil cover													
Borrow, fill and compact	84	cy	$ 1.68	$ 243	$ 2.63	$ 240	$ 7.15	$ 652	$ -	$ -	$ 13.51	$ 1,135	Means 17, 03, 04, 23
Grading													
Rough grade	25	sy	$ 0.29	$ 12	$ 0.51	$ 14	$ -	$ -	$ -	$ -	$ 1.04	$ 26	Means 17, 03, 01, 02
Fine grade	25	sy	$ 0.20	$ 9	$ 0.21	$ 6	$ -	$ -	$ -	$ -	$ 0.60	$ 15	Means 17, 03, 01, 06
Storm Water Control											Storm Water Control Subtotal =	$ 376	
2-foot high (and 2-ft wide) berm around open excav	15	cy		$ -		$ -		$ -	$ 6.12	$ 114	$ 7.60	$ 114	Means 2004 Environmental Remediation - Unit Price; Pg 4-31; 17 03 9911
Silt fences (vinyl, 3 ft high with 7.5 ft posts)	100	ft		$ -		$ -		$ -	$ 2.11	$ 262	$ 2.62	$ 262	Means 2004 Environmental Remediation - Unit Price; Pg 5-19; 18 05 0206
Waste Hauling and Disposal											Waste Hauling and Disposal Subtotal =	$ 25,561	
Haul (20 ton dump less than 200 mi.)	100.8	cy		$ -		$ -	$ 94.12	$ 10,294		$ -	$ 102.12	$ 10,294	Means 33, 19, 02, 09
Dump charge	100.8	cy		$ -		$ -	$ 119.36	$ 13,054		$ -	$ 129.50	$ 13,054	Means 33, 19, 03, 24
Truck decontamination	100.8	cy		$ -		$ -	$ 20.23	$ 2,213		$ -	$ 21.95	$ 2,213	Means 33, 19, 03, 11
Total Excavation Capital Costs IR35SS14											**Total Excavation Capital Costs IR35SS14 Subtotal =**	**$ 37,229**	

TABLE F-3A: CAPITAL AND LABOR COST ESTIMATE, ALTERNATIVE S-3 (CONTINUED)

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Alternative S-3: Excavation, Disposal and Institutional Controls

Location Factors

Labor:	100.0%	(San Francisco - Means Sectio	133.8%
Equipment:	100.0%	(San Francisco - Means Sectio	112.6%
Material:	100.0%	(San Francisco - Means Sectio	112.6%
Assembly:	124.0%		
Professional Labor Multiplier:	1.6	(Racer)	
Labor Overhead & Profit Multiplier.:	1.719	(includes 10% to account for PPE [modified Level D])	
Material and Equipment Profit:	9%	(RACER)	
Project Duration:	2.0 Months or 44 working days		

Description	Quantity	Unit	Unloaded Labor Unit Cost	Total Labor (including O&P)	Unloaded Equipment Unit Cost	Total Equipment (including profit)	Unloaded Material Unit Cost	Total Material (including profit)	Unloaded Assembly Unit Cost	Total Assembly Cost (including profit)	Total Unit Cost (including O&P)	Total Cost (including O&P)	Comments
Excavation Costs Site ID PA55TA10													
Site Preparation											Site Preparation Subtotal =	$ 875	
Clearing bituminous driveway	25	sy	$ 15.39	$ 661	$ 7.89	$ 214	$ -	$ -	$ -	$ -	35	$ 875	Means 2004 17, 02; assume site preparation only includes clearing existing asphalt if necessary; current cover is asphalt based on 2004 aerial photograph.
Excavation											Excavation Subtotal =	$ 11,292	
Standard soil excavation													
Excavation	84	cy	$ 1.35	$ 195	$ 1.71	$ 156	$ -	$ -	$ -	$ -	$ 4.18	$ 351	Means 17, 03, 02, 77
Confirmation and characterization sampling													
Sampling	9	ea	$ -	$ -	$ -	$ -	$ 1,000.00	$ 9,765	$ -	$ -	$ 1,085.00	$ 9,765	Means 33, 02, 06 assume 9 samples per excav; 5 confirmation + 4 characterization
Filling/soil cover													
Borrow, fill and compact	84	cy	$ 1.68	$ 243	$ 2.63	$ 240	$ 7.15	$ 652	$ -	$ -	$ 13.51	$ 1,135	Means 17, 03, 04, 23
Grading													
Rough grade	25	sy	$ 0.29	$ 12	$ 0.51	$ 14	$ -	$ -	$ -	$ -	$ 1.04	$ 26	Means 17, 03, 01, 02
Fine grade	25	sy	$ 0.20	$ 9	$ 0.21	$ 6	$ -	$ -	$ -	$ -	$ 0.60	$ 15	Means 17, 03, 01, 06
Storm Water Control											Storm Water Control Subtotal =	$ 376	
2 -foot high (and 2-ft wide) berm around open excavation	15	cy		$ -		$ -		$ -	$ 6.12	$ 114	$ 7.60	$ 114	Means 2004 Environmental Remediation - Unit Price; Pg 4-31; 17 03 9911
Silt fences (vinyl, 3 ft high with 7.5 ft posts)	100	ft		$ -		$ -		$ -	$ 2.11	$ 262	$ 2.62	$ 262	Means 2004 Environmental Remediation - Unit Price; Pg 5-19; 18 05 0206
Waste Hauling and Disposal											Waste Hauling and Disposal Subtotal =	$ 25,561	
Haul (20 ton dump less than 200 mi.)	100.8	cy		$ -		$ -	$ 94.12	$ 10,294		$ -	$ 102.12	$ 10,294	Means 33, 19, 02, 09
Dump charge	100.8	cy		$ -		$ -	$ 119.36	$ 13,054		$ -	$ 129.50	$ 13,054	Means 33, 19, 03, 24
Truck decontamination	100.8	cy		$ -		$ -	$ 20.23	$ 2,213		$ -	$ 21.95	$ 2,213	Means 33, 19, 03, 11
Total Excavation Capital Costs PA55TA10											**Total Excavation Capital Costs PA55TA10 Subtotal =**	**$ 38,104**	
Excavation Costs Site ID PA55TA04													
Excavation											Excavation Subtotal =	$ 11,292	
Standard soil excavation													
Excavation	84	cy	$ 1.35	$ 195	$ 1.71	$ 156	$ -	$ -	$ -	$ -	$ 4.18	$ 351	Means 17, 03, 02, 77
Confirmation and characterization sampling													
Sampling	9	ea	$ -	$ -	$ -	$ -	$ 1,000.00	$ 9,765	$ -	$ -	$ 1,085.00	$ 9,765	Means 33, 02, 06 assume 9 samples per excav; 5 confirmation + 4 characterization
Filling/soil cover													
Borrow, fill and compact	84	cy	$ 1.68	$ 243	$ 2.63	$ 240	$ 7.15	$ 652	$ -	$ -	$ 13.51	$ 1,135	Means 17, 03, 04, 23
Grading													
Rough grade	25	sy	$ 0.29	$ 12	$ 0.51	$ 14	$ -	$ -	$ -	$ -	$ 1.04	$ 26	Means 17, 03, 01, 02
Fine grade	25	sy	$ 0.20	$ 9	$ 0.21	$ 6	$ -	$ -	$ -	$ -	$ 0.60	$ 15	Means 17, 03, 01, 06
Storm Water Control											Storm Water Control Subtotal =	$ 376	
2 -foot high (and 2-ft wide) berm around open excav	15	cy		$ -		$ -		$ -	$ 6.12	$ 114	$ 7.60	$ 114	Means 2004 Environmental Remediation - Unit Price; Pg 4-31; 17 03 9911
Silt fences (vinyl, 3 ft high with 7.5 ft posts)	100	ft		$ -		$ -		$ -	$ 2.11	$ 262	$ 2.62	$ 262	Means 2004 Environmental Remediation - Unit Price; Pg 5-19; 18 05 0206
Waste Hauling and Disposal											Waste Hauling and Disposal Subtotal =	$ 25,561	
Haul (20 ton dump less than 200 mi.)	100.8	cy		$ -		$ -	$ 94.12	$ 10,294		$ -	$ 102.12	$ 10,294	Means 33, 19, 02, 09
Dump charge	100.8	cy		$ -		$ -	$ 119.36	$ 13,054		$ -	$ 129.50	$ 13,054	Means 33, 19, 03, 24
Truck decontamination	100.8	cy		$ -		$ -	$ 20.23	$ 2,213		$ -	$ 21.95	$ 2,213	Means 33, 19, 03, 11
Total Excavation Capital Costs PA55TA04											**Total Excavation Capital Costs PA55TA04 Subtotal =**	**$ 37,229**	

TABLE F-3A: CAPITAL AND LABOR COST ESTIMATE, ALTERNATIVE S-3 (CONTINUED)

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Alternative S-3: Excavation, Disposal and Institutional Controls

Location Factors

Labor:	100.0%	(San Francisco - Means Sectio	133.8%
Equipment:	100.0%	(San Francisco - Means Sectio	112.6%
Material:	100.0%	(San Francisco - Means Sectio	112.6%
Assembly:	124.0%		
Professional Labor Multiplier:	1.6	(Racer)	
Labor Overhead & Profit Multiplier.:	1.719	(includes 10% to account for PPE [modified Level D])	
Material and Equipment Profit:	9%	(RACER)	
Project Duration:	2.0 Months or 44 working days		

Description	Quantity	Unit	Unloaded Labor Unit Cost	Total Labor (including O&P)	Unloaded Equipment Unit Cost	Total Equipment (including profit)	Unloaded Material Unit Cost	Total Material (including profit)	Unloaded Assembly Unit Cost	Total Assembly Cost (including profit)	Total Unit Cost (including O&P)	Total Cost (including O&P)	Comments
Excavation Costs Site ID PA53SS03													
Excavation											Excavation Subtotal =	$ 13,511	
Standard soil excavation													
Excavation	32	cy	$ 1.35	$ 74	$ 1.71	$ 59	$ -	$ -	$ -	$ -	$ 4.16	$ 133	Means 17, 03, 02, 77
Building buffer soil excavation													
Excavation and building shoring	35	cy	34.93	$ 2,102	$ 4.14	$ 157	$ 10.76	$ 409	$ -	$ -	$ 76.23	$ 2,668	Means 17, 03 includes excavation and shoring costs
Confirmation and characterization sampling													
Sampling	9	ea	$ -	$ -	$ -	$ -	$ 1,000.00	$ 9,765	$ -	$ -	$ 1,085.00	$ 9,765	Means 33, 02, 06 assume 9 samples per excav; 5 confirmation + 4 characterization
Filling/soil cover													
Borrow, fill and compact	67	cy	$ 1.68	$ 193	$ 2.63	$ 191	$ 7.15	$ 520	$ -	$ -	$ 13.49	$ 904	Means 17, 03, 04, 23
Grading													
Rough grade	25	sy	$ 0.29	$ 12	$ 0.51	$ 14	$ -	$ -	$ -	$ -	$ 1.04	$ 26	Means 17, 03, 01, 02
Fine grade	25	sy	$ 0.20	$ 9	$ 0.21	$ 6	$ -	$ -	$ -	$ -	$ 0.60	$ 15	Means 17, 03, 01, 06
Storm Water Control											Storm Water Control Subtotal =	$ 376	
2-foot high (and 2-ft wide) berm around open excavation	15	cy		$ -		$ -		$ -	$ 6.12	$ 114	$ 7.60	$ 114	Means 2004 Environmental Remediation - Unit Price; Pg 4-31; 17 03 9911
Silt fences (vinyl, 3 ft high with 7.5 ft posts)	100	ft		$ -		$ -		$ -	$ 2.11	$ 262	$ 2.62	$ 262	Means 2004 Environmental Remediation - Unit Price; Pg 5-19; 18 05 0206
Waste Hauling and Disposal											Waste Hauling and Disposal Subtotal =	$ 20,387	
Haul (20 ton dump less than 200 mi.)	80	cy		$ -		$ -	$ 94.12	$ 8,210		$ -	$ 102.11	$ 8,210	Means 33, 19, 02, 09
Dump charge	80	cy		$ -		$ -	$ 119.36	$ 10,412		$ -	$ 129.50	$ 10,412	Means 33, 19, 03, 24
Truck decontamination	80	cy		$ -		$ -	$ 20.23	$ 1,765		$ -	$ 21.95	$ 1,765	Means 33, 19, 03, 11
Total Excavation Capital Costs PA53SS03											**Total Excavation Capital Costs PA53SS03 Subtotal =**	**$ 34,274**	
Excavation Costs Site ID SPD31													
Excavation											Excavation Subtotal =	$ 13,048	
Standard soil excavation													
Excavation	56	cy	$ 1.35	$ 130	$ 1.71	$ 104	$ -	$ -	$ -	$ -	$ 4.18	$ 234	Means 17, 03, 02, 77
Utility buffer soil excavation													
Excavation and utility shoring	28	cy	$ 34.05	$ 1,639	$ 2.47	$ 75	$ 5.22	$ 159	$ -	$ -	$ 66.89	$ 1,873	Means 17, 03 includes excavation, shoring and hand digging costs
Confirmation and characterization sampling													
Sampling	9	ea	$ -	$ -	$ -	$ -	$ 1,000.00	$ 9,765	$ -	$ -	$ 1,085.00	$ 9,765	Means 33, 02, 06 assume 9 samples per excav; 5 confirmation + 4 characterization
Filling/soil cap													
Borrow, fill and compact	84	cy	$ 1.68	$ 243	$ 2.63	$ 240	$ 7.15	$ 652	$ -	$ -	$ 13.51	$ 1,135	Means 17, 03, 04, 23
Grading													
Rough grade	25	sy	$ 0.29	$ 12	$ 0.51	$ 14	$ -	$ -	$ -	$ -	$ 1.04	$ 26	Means 17, 03, 01, 02
Fine grade	25	sy	$ 0.20	$ 9	$ 0.21	$ 6	$ -	$ -	$ -	$ -	$ 0.60	$ 15	Means 17, 03, 01, 06
Storm Water Control											Storm Water Control Subtotal =	$ 376	
2-foot high (and 2-ft wide) berm around open excavation	15	cy		$ -		$ -		$ -	$ 6.12	$ 114	$ 7.60	$ 114	Means 2004 Environmental Remediation - Unit Price; Pg 4-31; 17 03 9911
Silt fences (vinyl, 3 ft high with 7.5 ft posts)	100	ft		$ -		$ -		$ -	$ 2.11	$ 262	$ 2.62	$ 262	Means 2004 Environmental Remediation - Unit Price; Pg 5-19; 18 05 0206
Waste Hauling and Disposal											Waste Hauling and Disposal Subtotal =	$ 25,561	
Haul (20 ton dump less than 200 mi.)	100.8	cy		$ -		$ -	$ 94.12	$ 10,294		$ -	$ 102.12	$ 10,294	Means 33, 19, 02, 09
Dump charge	100.8	cy		$ -		$ -	$ 119.36	$ 13,054		$ -	$ 129.50	$ 13,054	Means 33, 19, 03, 24
Truck decontamination	100.8	cy		$ -		$ -	$ 20.23	$ 2,213		$ -	$ 21.95	$ 2,213	Means 33, 19, 03, 11
Total Excavation Capital Costs SPD31											**Total Excavation Capital Costs SPD31 Subtotal =**	**$ 38,985**	

TABLE F-3A: CAPITAL AND LABOR COST ESTIMATE, ALTERNATIVE S-3 (CONTINUED)

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Alternative S-3: Excavation, Disposal and Institutional Controls

Location Factors

Labor:	100.0%	(San Francisco - Means Sectio	133.8%
Equipment:	100.0%	(San Francisco - Means Sectio	112.6%
Material:	100.0%	(San Francisco - Means Sectio	112.6%
Assembly:	124.0%		
Professional Labor Multiplier:	1.6	(Racer)	
Labor Overhead & Profit Multiplier.:	1.719	(includes 10% to account for PPE [modified Level D])	
Material and Equipment Profit:	9%	(RACER)	
Project Duration:	2.0 Months or 44 working days		

Description	Quantity	Unit	Unloaded Labor Unit Cost	Total Labor (including O&P)	Unloaded Equipment Unit Cost	Total Equipment (including profit)	Unloaded Material Unit Cost	Total Material (including profit)	Unloaded Assembly Unit Cost	Total Assembly Cost (including profit)	Total Unit Cost (including O&P)	Total Cost (including O&P)	Comments
Excavation Costs Site ID SPD23													
Excavation											Excavation Subtotal =	$ 11,292	
Standard soil excavation													
Excavation	84	cy	$ 1.35	$ 195	$ 1.71	$ 156	$ -	$ -	$ -	$ -	$ 4.18	$ 351	Means 17, 03, 02, 77
Confirmation and characterization sampling													
Sampling	9	ea	$ -	$ -	$ -	$ -	$ 1,000.00	$ 9,765	$ -	$ -	$ 1,085.00	$ 9,765	Means 33, 02, 06 assume 9 samples per excav; 5 confirmation + 4 characterization
Filling/soil cover													
Borrow, fill and compact	84	cy	$ 1.68	$ 243	$ 2.63	$ 240	$ 7.15	$ 652	$ -	$ -	$ 13.51	$ 1,135	Means 17, 03, 04, 23
Grading													
Rough grade	25	sy	$ 0.29	$ 12	$ 0.51	$ 14	$ -	$ -	$ -	$ -	$ 1.04	$ 26	Means 17, 03, 01, 02
Fine grade	25	sy	$ 0.20	$ 9	$ 0.21	$ 6	$ -	$ -	$ -	$ -	$ 0.60	$ 15	Means 17, 03, 01, 06
Storm Water Control											Storm Water Control Subtotal =	$ 376	
2-foot high (and 2-ft wide) berm around open excav	15	cy		$ -		$ -		$ -	$ 6.12	$ 114	$ 7.60	$ 114	Means 2004 Environmental Remediation - Unit Price; Pg 4-31; 17 03 9911
Silt fences (vinyl, 3 ft high with 7.5 ft posts)	100	ft		$ -		$ -		$ -	$ 2.11	$ 262	$ 2.62	$ 262	Means 2004 Environmental Remediation - Unit Price; Pg 5-19; 18 05 0206
Waste Hauling and Disposal											Waste Hauling and Disposal Subtotal =	$ 25,561	
Haul (20 ton dump less than 200 mi.)	100.8	cy		$ -		$ -	$ 94.12	$ 10,294		$ -	$ 102.12	$ 10,294	Means 33, 19, 02, 09
Dump charge	100.8	cy		$ -		$ -	$ 119.36	$ 13,054		$ -	$ 129.50	$ 13,054	Means 33, 19, 03, 24
Truck decontamination	100.8	cy		$ -		$ -	$ 20.23	$ 2,213		$ -	$ 21.95	$ 2,213	Means 33, 19, 03, 11
Total Excavation Capital Costs SPD23											**Total Excavation Capital Costs SPD23 Subtotal =**	**$ 37,229**	
Stockpile Disposal													
Excavation											Excavation Subtotal =	$ 34,356	
Standard soil excavation													
Excavation	560	cy	$ 1.35	$ 1,300	$ 1.71	$ 1,039	$ -	$ -	$ -	$ -	$ 4.18	$ 2,339	Means 17, 03, 02, 77
Stockpile characterization sampling													
Sampling	28	ea	$ -	$ -	$ -	$ -	$ 1,000.00	$ 30,380	$ -	$ -	$ 1,085.00	$ 30,380	Means 33, 02, 06 assume 1 sample per 20 cy
Grading													
Rough grade	1008	sy	$ 0.29	$ 502	$ 0.51	$ 558	$ -	$ -	$ -	$ -	$ 1.05	$ 1,060	Means 17, 03, 01, 02 Assume 5' high pyramid
Fine grade	1008	sy	$ 0.20	$ 347	$ 0.21	$ 230	$ -	$ -	$ -	$ -	$ 0.57	$ 577	Means 17, 03, 01, 06
Waste Hauling and Disposal											Waste Hauling and Disposal Subtotal =	$ 170,403	
Haul (20 ton dump less than 200 mi.)	672	cy		$ -		$ -	$ 94.12	$ 68,625		$ -	$ 102.12	$ 68,625	Means 33, 19, 02, 09
Dump charge	672	cy		$ -		$ -	$ 119.36	$ 87,028		$ -	$ 129.51	$ 87,028	Means 33, 19, 03, 24
Truck decontamination	672	cy		$ -		$ -	$ 20.23	$ 14,750		$ -	$ 21.95	$ 14,750	Means 33, 19, 03, 11
Total Stockpile Disposal											**Total Stockpile Disposal Subtotal =**	**$ 204,759**	
Total Excavation Capital Costs											**Total Excavation Capital Costs Subtotal =**	**$ 534,694**	
Construction Cost Summary													
Total Construction Capital Costs											**Total Construction Capital Costs Subtotal =**	**$ 724,287**	
Design Cost											**Design Cost Subtotal =**	**$ 86,914**	*Calculated as overall cost - not per individual excavation. Unit cost numbers same as previous.
Assume 12% of construction cost												$ 86,914	

TABLE F-3A: CAPITAL AND LABOR COST ESTIMATE, ALTERNATIVE S-3 (CONTINUED)

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Alternative S-3: Excavation, Disposal and Institutional Controls

Location Factors

Labor:	100.0%	(San Francisco - Means Sectio	133.8%
Equipment:	100.0%	(San Francisco - Means Sectio	112.6%
Material:	100.0%	(San Francisco - Means Sectio	112.6%
Assembly:	124.0%		
Professional Labor Multiplier:	1.6	(Racer)	
Labor Overhead & Profit Multiplier.:	1.719	(includes 10% to account for PPE [modified Level D])	
Material and Equipment Profit:	9%	(RACER)	
Project Duration:	2.0 Months or 44 working days		

Description	Quantity	Unit	Unloaded Labor Unit Cost	Total Labor (including O&P)	Unloaded Equipment Unit Cost	Total Equipment (including profit)	Unloaded Material Unit Cost	Total Material (including profit)	Unloaded Assembly Unit Cost	Total Assembly Cost (including profit)	Total Unit Cost (including O&P)	Total Cost (including O&P)	Comments
Institutional Controls													
Engineering Controls													
Fencing and Signage Capital Costs											Fencing and Signage Capital Costs Subtotal =	$ 263,730	
Blk 29 signs (24" x 24" reflectorized)	6	ea	$ 75.00	$ 450	$ -	$ -	$ 30.66	$ 184	$ -	$ -	$ 105.66	$ 634	One sign per industrial risk grid block side excluding non-risk outparcels within risk boundaries;
Blk 30A signs (24" x 24" reflectorized)	10	ea	$ 75.00	$ 750	$ -	$ -	$ 30.66	$ 307	$ -	$ -	$ 105.66	$ 1,057	One sign per industrial risk grid block side excluding non-risk outparcels within risk boundaries;
Blk 30B signs (24" x 24" reflectorized)	5	ea	$ 75.00	$ 375	$ -	$ -	$ 30.66	$ 153	$ -	$ -	$ 105.66	$ 528	One sign per industrial risk grid block side excluding non-risk outparcels within risk boundaries;
Blk 37 signs (24" x 24" reflectorized)	14	ea	$ 75.00	$ 1,050	$ -	$ -	$ 30.66	$ 429	$ -	$ -	$ 105.66	$ 1,479	One sign per industrial risk grid block side excluding non-risk outparcels within risk boundaries;
Blk 38 signs (24" x 24" reflectorized)	9	ea	$ 75.00	$ 675	$ -	$ -	$ 30.66	$ 276	$ -	$ -	$ 105.66	$ 951	One sign per industrial risk grid block side excluding non-risk outparcels within risk boundaries;
Blk 39 signs (24" x 24" reflectorized)	12	ea	$ 75.00	$ 900	$ -	$ -	$ 30.66	$ 368	$ -	$ -	$ 105.66	$ 1,268	One sign per industrial risk grid block side excluding non-risk outparcels within risk boundaries;
Blk 42 signs (24" x 24" reflectorized)	14	ea	$ 75.00	$ 1,050	$ -	$ -	$ 30.66	$ 429	$ -	$ -	$ 105.66	$ 1,479	One sign per industrial risk grid block side excluding non-risk outparcels within risk boundaries;
DOS 1 signs (24" x 24" reflectorized)	7	ea	$ 75.00	$ 525	$ -	$ -	$ 30.66	$ 215	$ -	$ -	$ 105.66	$ 740	One sign per industrial risk grid block side excluding non-risk outparcels within risk boundaries;
DMI 1 signs (24" x 24" reflectorized)	60	ea	$ 75.00	$ 4,500	$ -	$ -	$ 30.66	$ 1,840	$ -	$ -	$ 105.66	$ 6,340	One sign per industrial risk grid block side excluding non-risk outparcels within risk boundaries;
Fence (6' tall, industrial fence) around Block-39, 42 and DMI-1	10,000	ft	$ 2.75	$ 27,500	$ 0.56	$ 6,076	$ 20.00	$ 200,000	$ -	$ -	$ 23.36	$ 233,576	Fence installed only where buildings or asphalt caps are not present; Means Heavy Construction 02820 130 0500
Fenced Area Vegetation											Fenced Area Vegetation Subtotal =	$ 7,839	
Hydroseeding (20% of fenced area)	214	csy	$ 2.59	$ 554	$ 2.25	$ 522	$ 9.37	$ 2,005	$ -	$ -	$ 14.40	$ 3,081	Means 18, 05, 04, 01
Hydro fertilizer	214	csy	$ 1.03	$ 220	$ 0.75	$ 174	$ 2.18	$ 467	$ -	$ -	$ 4.02	$ 861	Means 18, 05, 04, 08
Water - 10 times	214	csy	$ 8.89	$ 1,902	$ 7.69	$ 1,786	$ 0.98	$ 210	$ -	$ -	$ 18.21	$ 3,898	Means 18, 05, 04, 08
Total Engineering Controls Capital Costs											**Total Engineering Controls Capital Costs Subtotal =**	**$ 271,570**	

Legal controls

Description	Quantity	Unit	Loaded Labor Unit Cost	Total Labor	Loaded Labor Unit Cost	Total Labor	Loaded Labor Unit Cost	Total Labor	Loaded Labor Unit Cost	Total Labor	Loaded Labor Unit Cost	Total Labor	Labor	ODCs	Subtask	Comments
Institutional Control Implementation and Certification											Institutional Control Implementation and Certification Subtotal =	$ 52,525				
LUC RD scoping meeting	40	hours	$100.00	$ 4,000.00	0	$ -	0	$ -	0	$ -	$100.00	$ 4,000.00	$ 4,000	$ 125	$ 4,125	ODCs for subsistence.
Prepare draft LUC RD	120	hours	$100.00	$12,000.00	0	$ -	0	$ -	0	$ -	$100.00	$ 12,000.00	$ 12,000	$ -	$ 12,000	
Submit draft LUC RD	40	hours	$100.00	$ 4,000.00	0	$ -	0	$ -	0	$ -	$100.00	$ 4,000.00	$ 4,000	$ 100	$ 4,100	ODCs for printing.
BCT review period	24	hours	$100.00	$ 2,400.00	0	$ -	0	$ -	0	$ -	$100.00	$ 2,400.00	$ 2,400	$ -	$ 2,400	
BCT comments due	32	hours	$100.00	$ 3,200.00	0	$ -	0	$ -	0	$ -	$100.00	$ 3,200.00	$ 3,200	$ -	$ 3,200	
RTC meeting and BCT concurrence	24	hours	$100.00	$ 2,400.00	0	$ -	0	$ -	0	$ -	$100.00	$ 2,400.00	$ 2,400	$ 500	$ 2,900	ODCs for printing.
Prepare draft final LUC RD	80	hours	$100.00	$ 8,000.00	0	$ -	0	$ -	0	$ -	$100.00	$ 8,000.00	$ 8,000	$ -	$ 8,000	
Submit draft final LUC RD	16	hours	$100.00	$ 1,600.00	0	$ -	0	$ -	0	$ -	$100.00	$ 1,600.00	$ 1,600	$ 100	$ 1,700	ODCs for printing.
BCT review and concurrence period	56	hours	$100.00	$ 5,600.00	0	$ -	0	$ -	0	$ -	$100.00	$ 5,600.00	$ 5,600	$ -	$ 5,600	
BCT concurrence letters due	32	hours	$100.00	$ 3,200.00	0	$ -	0	$ -	0	$ -	$100.00	$ 3,200.00	$ 3,200	$ -	$ 3,200	
Prepare final LUC RD with RTC	42	hours	$100.00	$ 4,200.00	0	$ -	0	$ -	0	$ -	$100.00	$ 4,200.00	$ 4,200	$ -	$ 4,200	
Submit final LUC RD with RTC	10	hours	$100.00	$ 1,000.00	0	$ -	0	$ -	0	$ -	$100.00	$ 1,000.00	$ 1,000	$ 100	$ 1,100	ODCs for printing.
Covenant to Restrict Use of Property											Covenant to Restrict Use of Property Subtotal =	$ 11,000				
Prepare draft covenant	84	hours	$100.00	$ 8,400.00	0	$ -	0	$ -	0	$ -	$100.00	$ 8,400.00	$ 8,400	$ 100	$ 8,500	ODCs for printing.
File covenant	24	hours	$100.00	$ 2,400.00	0	$ -	0	$ -	0	$ -	$100.00	$ 2,400.00	$ 2,400	$ 100	$ 2,500	ODCs for travel fees.
Total Legal Controls Capital Costs											**Total Legal Controls Capital Costs Subtotal =**	**$ 63,525**				
Total Institutional Control Capital Costs											**Total Institutional Control Capital Costs Subtotal =**	**$ 335,095**				

TABLE F-3A: CAPITAL AND LABOR COST ESTIMATE, ALTERNATIVE S-3 (CONTINUED)

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Alternative S-3: Excavation, Disposal and Institutional Controls

Location Factors

Labor:	100.0%	(San Francisco - Means Sectio	133.8%
Equipment:	100.0%	(San Francisco - Means Sectio	112.6%
Material:	100.0%	(San Francisco - Means Sectio	112.6%
Assembly:	124.0%		
Professional Labor Multiplier:	1.6	(Racer)	
Labor Overhead & Profit Multiplier.:	1.719	(includes 10% to account for PPE [modified Level D])	
Material and Equipment Profit:	9%	(RACER)	

Project Duration: 2.0 Months or 44 working days

Description	Quantity	Unit	Unloaded Labor Unit Cost	Total Labor (including O&P)	Unloaded Equipment Unit Cost	Total Equipment (including profit)	Unloaded Material Unit Cost	Total Material (including profit)	Unloaded Assembly Unit Cost	Total Assembly Cost (including profit)	Total Unit Cost (including O&P)	Total Cost (including O&P)	Comments

Annual Discount Rate	3.1%	2005 Costs	2007 Costs
Project Capital & Labor Cost =		$ 1,146,296	$ 1,218,468
Present Value of 30 Years of Periodic Costs = (Five-Year Reviews)		$ 269,387	$ 286,348
SubTotal =		$ 1,415,684	$ 1,504,816
20% Contingency =		$ 283,137	$ 300,963
Total Project Cost =		$ 1,698,820	$ 1,805,780

Notes:

"	Inch
%	Percent
BCT	Base Realignment and Closure Cleanup Team
cy	Cubic yard
ea	Each
FOST	Finding of suitability to transfer
ft	Foot
hr	Hour
LUC RD	Land Use Control Remedial Design
Means	Means, RS. 2004. "Environmental Remediation Cost Data – Unit Price, 10th Annual Edition, Environmental Cost Handling Options and Solutions," RS Means Company, Inc, Kingston, MA. October.
mi	Mile
mo	Month
N/A	Not applicable
O&P	Overhead and Profit
ODC	Other direct cost
Pg	Page
PPE	Personal protective equipment
RACER	Remedial Action Cost Engineering and Requirements System
RTC	Response to comment
sy	Square yard

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
36	Present-Worth Cost: $1,952,000	Table 6	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Appendix F, Table F-4A. SulTech. November 30, 2007.

TABLE F-4A: CAPITAL AND LABOR COST ESTIMATE, ALTERNATIVE S-4

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Alternative S-4: Covers and Institutional Controls

Location Factors

Labor:	100.0%	(San Fancisco - Means Section 1)	133.8%
Equipment:	100.0%	(San Fancisco - Means Section 1)	112.6%
Material:	100.0%	(San Fancisco - Means Section 1)	112.6%
Assembly:	124.0%	(From Previous)	
Professional Labor Multiplier:	1.6	(RACER)	
Labor Overhead & Profit Multiplier:	1.719	(From previous - includes 10% to account for PPE [modified Level D])	
Material and Equipment Profit:	9%	(RACER)	

Project Duration: 6.0 Months or 133 working days

Description		Quantity	Unit	Unloaded Labor Unit Cost	Total Labor (including O&P)	Unloaded Equipment Unit Cost	Total Equipment (including Profit)	Unloaded Material Unit Cost	Total Material (including profit)	Unloaded Assembly Unit Cost	Total Assembly Cost (including profit)	Total Unit Cost (including O&P)	Total Cost (including O&P)	Comments
Site Wide Costs														
Distributive Costs												Distributive Costs Subtotal =	$ 421,557	
1 Project Manager	50% on project; location factor N/A	532	hr	$ 50.00	$ 42,560	$ -	$ -	$ 200.00 /day	$ 13,300	$ -	$ -	$ 105.00	$ 55,860	
1 Superintendent	100% on project; location factor N/A	1064	hr	$ 42.00	$ 71,501	$ -	$ -	$ 200.00 /day	$ 26,600	$ -	$ -	$ 92.20	$ 98,101	
1 Engineer	100% on project; location factor N/A	1064	hr	$ 35.00	$ 59,584	$ -	$ -	$ 200.00 /day	$ 26,600	$ -	$ -	$ 81.00	$ 86,184	
1 Heatlh & Safety Officer	100% on project; location factor N/A	1064	hr	$ 25.00	$ 42,560	$ -	$ -	$ 200.00 /day	$ 26,600	$ -	$ -	$ 65.00	$ 69,160	
1 Quality Control Officer	100% on project; location factor N/A	1064	hr	$ 25.00	$ 42,560	$ -	$ -	$ 200.00 /day	$ 26,600	$ -	$ -	$ 65.00	$ 69,160	
1 Procurement Spec.	50% on project; location factor N/A	532	hr	$ 35.00	$ 29,792	$ -	$ -	$ 200.00 /day	$ 13,300	$ -	$ -	$ 81.00	$ 43,092	
Temporary Facilities												Temporary Facilities Subtotal =	$ 29,663	*Assume that we will not be setting up buildings/work areas/etc. Numers same as previous.
Portable Toilets (2)		6	mo	$ -	$ -	$ -	$ -	$ 1,006.40	$ 6,552	$ -	$ -	$ 1,092.00	$ 6,552	Means 2004 Heavy Construction. Pg. 24. 01590 400 6410
Rental Trucks (5) (for supervisory staff)		6	mo	$ -	$ -	$ -	$ -	$ 3,550.00	$ 23,111	$ -	$ -	$ 3,851.83	$ 23,111	Assuming rental from Enterprize
Mobiliation												Mobiliation Subtotal =	$ 2,734	*Assume that these will be used overall (not calced for every excavation).
Crawler mounted backhoes		5	ea	$ 53.00	$ 456	$ 168.00	$ 911	$ -	$ -	$ -	$ -	$ 273.40	$ 1,367	Means 2004 Heavy Construction. Pg. 139. 03110 420 1000
Graders		5	ea	$ 53.00	$ 456	$ 168.00	$ 911	$ -	$ -	$ -	$ -	$ 273.40	$ 1,367	Means 2004 Heavy Construction. Pg. 139. 03110 420 1000
Demobilization												Demobilization Subtotal =	$ 2,734	*Assume that these will be used overall (not calced for every excavation).
Crawler mounted backhoes		5	ea	$ 53.00	$ 456	$ 168.00	$ 911	$ -	$ -	$ -	$ -	$ 273.40	$ 1,367	From previous
Graders		5	ea	$ 53.00	$ 456	$ 168.00	$ 911	$ -	$ -	$ -	$ -	$ 273.40	$ 1,367	From previous
Oversight												Oversight Subtotal =	$ 64,016	
Engineer	100% on project; location factor N/A	1064	hr	$ 35.00	$ 64,016	$ -	$ -	$ -	$ -	$ -	$ -	$ 60.17	$ 64,016	*Calcualted as overall cost - not per individual excavation. Unit cost numbers same as previous.
Total Site Wide Capital Costs												**Total Site Wide Capital Costs Subtotal =**	**$ 520,704**	
Cover Costs														
Covering Block BLK-A														
Area														
Area Requiring Paving		10,690	sy											
Area Requiring Sealcoat		10,690	sy											
Asphalt sealcoat (to existing paved areas)												Asphalt sealcoat (to existing paved areas) Subtotal =	$ 21,419	
Sealcoat Area		10,690	sy	$ 0.73	$ 13,415	$ 0.40	$ 4,640	$ 0.29	$ 3,364	$ -	$ -	$ 2.00	$ 21,419	Means 2, 250, 1960
Capping/Covering												Capping/Covering Subtotal =	$ 37,572	
Asphalt cap - bituminous (0.33 ft. Thick)		1,176	cy	$ 10.35	$ 20,922	$ 0.50	$ 638	$ 12.55	$ 16,012	$ -	$ -	$ 31.95	$ 37,572	Means 18, 03, 03, 06
Total Covering Capital Costs BLK-A												**Total Covering Capital Costs BLK-A Subtotal =**	**$ 58,991**	
Covering Block BLK-29														
Area														
Area Requiring Paving		12,330	sy											
Area Requiring Sealcoat		12,330	sy											
Asphalt sealcoat (to existing paved areas)												Asphalt sealcoat (to existing paved areas) Subtotal =	$ 24,703	
Sealcoat Area		12,330	sy	$ 0.73	$ 15,472	$ 0.40	$ 5,351	$ 0.29	$ 3,880	$ -	$ -	$ 2.00	$ 24,703	Means 2, 250, 1960
Capping/Covering												Capping/Covering Subtotal =	$ 43,335	
Asphalt cap - bituminous (0.33 ft. Thick)		1,356	cy	$ 10.35	$ 24,131	$ 0.50	$ 736	$ 12.55	$ 18,468	$ -	$ -	$ 31.95	$ 43,335	Means 18, 03, 03, 06
Total Covering Capital Costs BLK-29												**Total Covering Capital Costs BLK-29 Subtotal =**	**$ 68,038**	
Covering Block BLK-30A														
Area														
Area Requiring Paving		8,204	sy											
Area Requiring Sealcoat		8,204	sy											
Asphalt sealcoat (to existing paved areas)												Asphalt sealcoat (to existing paved areas) Subtotal =	$ 16,438	
Sealcoat Area		8,204	sy	$ 0.73	$ 10,295	$ 0.40	$ 3,561	$ 0.29	$ 2,582	$ -	$ -	$ 2.00	$ 16,438	Means 2, 250, 1960
Capping/Covering												Capping/Covering Subtotal =	$ 28,836	
Asphalt cover - bituminous (0.33 ft. Thick)		902	cy	$ 10.35	$ 16,057	$ 0.50	$ 490	$ 12.55	$ 12,289	$ -	$ -	$ 31.95	$ 28,836	Means 18, 03, 03, 06
Total Covering Capital Costs BLK-30A												**Total Covering Capital Costs BLK-30A Subtotal =**	**$ 45,274**	
Covering Block BLK-30B														
Area														
Area Requiring Paving		1,919	sy											
Area Requiring Sealcoat		1,919	sy											
Asphalt sealcoat (to existing paved areas)												Asphalt sealcoat (to existing paved areas) Subtotal =	$ 3,845	
Sealcoat Area		1,919	sy	$ 0.73	$ 2,408	$ 0.40	$ 833	$ 0.29	$ 604	$ -	$ -	$ 2.00	$ 3,845	Means 2, 250, 1960
Capping/Covering												Capping/Covering Subtotal =	$ 6,743	
Asphalt cover - bituminous (0.33 ft. Thick)		211	cy	$ 10.35	$ 3,755	$ 0.50	$ 114	$ 12.55	$ 2,874	$ -	$ -	$ 31.95	$ 6,743	Means 18, 03, 03, 06
Total Covering Capital Costs BLK-30B												**Total Covering Capital Costs BLK-30B Subtotal =**	**$ 10,588**	

TABLE F-4A: CAPITAL AND LABOR COST ESTIMATE, ALTERNATIVE S-4 (CONTINUED)

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Alternative S-4: Covers and Institutional Controls

Location Factors

Labor:	100.0%	(San Fancisco - Means Section 1)	133.8%
Equipment:	100.0%	(San Fancisco - Means Section 1)	112.6%
Material:	100.0%	(San Fancisco - Means Section 1)	112.6%
Assembly:	124.0%	(From Previous)	
Professional Labor Multiplier:	1.6	(RACER)	
Labor Overhead & Profit Multiplier:	1.719	(From previous - includes 10% to account for PPE [modified Level D])	
Material and Equipment Profit:	9%	(RACER)	

Project Duration: 6.0 Months or 133 working days

Description	Quantity	Unit	Unloaded Labor Unit Cost	Total Labor (including O&P)	Unloaded Equipment Unit Cost	Total Equipment (including Profit)	Unloaded Material Unit Cost	Total Material (including profit)	Unloaded Assembly Unit Cost	Total Assembly Cost (including profit)	Total Unit Cost (including O&P)	Total Cost (including O&P)	Comments
Covering Block BLK-37													
Area													
Area Requiring Paving	3,756	sy											
Area Requiring Sealcoat	3,756	sy											
Asphalt sealcoat (to existing paved areas)											Asphalt sealcoat (to existing paved areas) Subtotal =	$ 7,526	
Sealcoat Area	3,756	sy	$ 0.73	$ 4,714	$ 0.40	$ 1,630	$ 0.29	$ 1,182	$ -	$ -	$ 2.00	$ 7,526	Means 2, 250, 1960
Capping/Covering											Capping/Covering Subtotal =	$ 13,202	
Asphalt cover - bituminous (0.33 ft. Thick)	413	cy	$ 10.35	$ 7,352	$ 0.50	$ 224	$ 12.55	$ 5,626	$ -	$ -	$ 31.95	$ 13,202	Means 18, 03, 03, 06
Total Covering Capital Costs BLK-37											**Total Covering Capital Costs BLK-37 Subtotal =**	**$ 20,728**	
Covering Block BLK-38													
Area													
Area Requiring Paving	6,102	sy											
Area Requiring Sealcoat	6,102	sy											
Asphalt sealcoat (to existing paved areas)											Asphalt sealcoat (to existing paved areas) Subtotal =	$ 12,226	
Sealcoat Area	6,102	sy	$ 0.73	$ 7,658	$ 0.40	$ 2,648	$ 0.29	$ 1,920	$ -	$ -	$ 2.00	$ 12,226	Means 2, 250, 1960
Capping/Covering											Capping/Covering Subtotal =	$ 21,447	
Asphalt cap - bituminous (0.33 ft. Thick)	671	cy	$ 10.35	$ 11,943	$ 0.50	$ 364	$ 12.55	$ 9,140	$ -	$ -	$ 31.95	$ 21,447	Means 18, 03, 03, 06
Total Covering Capital Costs BLK-38											**Total Covering Capital Costs BLK-38 Subtotal =**	**$ 33,673**	
Covering Block BLK-39													
Area													
Area Requiring Vegetative Cover	20,805	sy											
Area Requiring Sealcoat	0	sy											
Asphalt sealcoat (to existing paved areas)											Asphalt sealcoat (to existing paved areas) Subtotal =	$ -	
Sealcoat Area	0	sy	$ 0.73	$ -	$ 0.40	$ -	$ 0.29	$ -	$ -	$ -	#DIV/0!	$ -	Means 2, 250, 1960
Capping/Covering											Capping/Covering Subtotal =	$ 187,232	
Soil cover - Borrow, fill and compact (2 ft. thick)	13,870	cy	$ 1.68	$ 40,055	$ 2.63	$ 39,578	$ 7.15	$ 107,599	$ -	$ -	$ 13.50	$ 187,232	Means 17, 03, 04, 23
Seeding (soil cover only)											Seeding (soil cover only) Subtotal =	$ 9,714	
Hydroseeding	208.05	csy	$ 2.59	$ 926	$ 2.25	$ 508	$ 9.37	$ 2,115	$ -	$ -	$ 17.06	$ 3,549	Means 18, 05, 04, 01
Hydro fertilizer	208.05	csy	$ 1.03	$ 368	$ 0.75	$ 169	$ 2.18	$ 492	$ -	$ -	$ 4.95	$ 1,029	Means 18, 05, 04, 08
Water - 10 times	208.05	csy	$ 8.89	$ 3,179	$ 7.69	$ 1,736	$ 0.98	$ 221	$ -	$ -	$ 24.69	$ 5,136	Means 18, 05, 04, 08
Total Covering Capital Costs BLK-39											**Total Covering Capital Costs BLK-39 Subtotal =**	**$ 196,946**	
Covering Block BLK-42													
Area													
Area Requiring Paving	8033	sy											
Capping/Covering											Capping/Covering Subtotal =	$ 28,234	
Asphalt cover - bituminous (0.33 ft. Thick)	884	cy	$ 10.35	$ 15,722	$ 0.50	$ 479	$ 12.55	$ 12,033	$ -	$ -	$ 31.95	$ 28,234	Means 18, 03, 03, 06
Total Covering Capital Costs BLK-42											**Total Covering Capital Costs BLK-42 Subtotal =**	**$ 28,234**	
Covering Block DMI-1													
Area													
Area Requiring Paving	105,320	sy											
Area Requiring Sealcoat	105,320	sy											
Asphalt sealcoat (to existing paved areas)											Asphalt sealcoat (to existing paved areas) Subtotal =	$ 211,011	
Sealcoat Area	105,320	sy	$ 0.73	$ 132,163	$ 0.40	$ 45,709	$ 0.29	$ 33,139	$ -	$ -	$ 2.00	$ 211,011	Means 2, 250, 1960
Capping/Covering											Capping/Covering Subtotal =	$ 370,158	
Asphalt cover - bituminous (0.33 ft. Thick)	11,585	cy	$ 10.35	$ 206,120	$ 0.50	$ 6,285	$ 12.55	$ 157,753	$ -	$ -	$ 31.95	$ 370,158	Means 18, 03, 03, 06
Total Covering Capital Costs DMI-1											**Total Covering Capital Costs DMI-1 Subtotal =**	**$ 581,169**	
Covering Block DOS-1													
Area													
Area Requiring Vegetative Cover	18,641	sy											
Capping/Covering											Capping/Covering Subtotal =	$ 167,764	
Soil cap - Borrow, fill and compact (2 ft. thick)	12,428	cy	$ 1.68	$ 35,890	$ 2.63	$ 35,463	$ 7.15	$ 96,411	$ -	$ -	$ 13.50	$ 167,764	Means 17, 03, 04, 23
Seeding (soil cap only)											Seeding (soil cap only) Subtotal =	$ 8,705	
Hydroseeding	186.41	csy	$ 2.59	$ 830	$ 2.25	$ 455	$ 9.37	$ 1,895	$ -	$ -	$ 17.06	$ 3,180	Means 18, 05, 04, 01
Hydro fertilizer	186.41	csy	$ 1.03	$ 330	$ 0.75	$ 152	$ 2.18	$ 441	$ -	$ -	$ 4.95	$ 923	Means 18, 05, 04, 08
Water - 10 times	186.41	csy	$ 8.89	$ 2,849	$ 7.69	$ 1,555	$ 0.98	$ 198	$ -	$ -	$ 24.69	$ 4,602	Means 18, 05, 04, 08
Total Covering Capital Costs DOS-1											**Total Covering Capital Costs DOS-1 Subtotal =**	**$ 176,469**	
Total Covering Capital Costs											**Total Covering Capital Costs Subtotal =**	**$ 1,220,110**	

TABLE F-4A: CAPITAL AND LABOR COST ESTIMATE, ALTERNATIVE S-4 (CONTINUED)

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Alternative S-4: Covers and Institutional Controls

Location Factors

Labor:	100.0%	(San Fancisco - Means Section 1)	133.8%
Equipment:	100.0%	(San Fancisco - Means Section 1)	112.6%
Material:	100.0%	(San Fancisco - Means Section 1)	112.6%
Assembly:	124.0%	(From Previous)	
Professional Labor Multiplier:	1.6	(RACER)	
Labor Overhead & Profit Multiplier:	1.719	(From previous - includes 10% to account for PPE [modified Level D])	
Material and Equipment Profit:	9%	(RACER)	

Project Duration: 6.0 Months or 133 working days

Description	Quantity	Unit	Unloaded Labor Unit Cost	Total Labor (Including O&P)	Unloaded Equipment Unit Cost	Total Equipment (Including Profit)	Unloaded Material Unit Cost	Total Material (Including profit)	Unloaded Assembly Unit Cost	Total Assembly Cost (including profit)	Total Unit Cost (Including O&P)	Total Cost (Including O&P)	Comments
Stockpile Disposal													
Excavation											Excavation Subtotal =	$ 34,356	
Standard soil excavation													
Excavation	560	cy	$ 1.35	$ 1,300	$ 1.71	$ 1,039	$ -	$ -	$ -	$ -	$ 4.18	$ 2,339	Means 17, 03, 02, 77
Confirmation sampling													
Sampling	28	ea	$ -	$ -	$ -	$ -	$ 1,000.00	$ 30,380	$ -	$ -	$ 1,085.00	$ 30,380	Means 33, 02, 06 assume 2 samples per side and 1 sample at bottom
Grading													
Rough grade	1008	sy	$ 0.29	$ 502	$ 0.51	$ 558	$ -	$ -	$ -	$ -	$ 1.05	$ 1,060	Means 17, 03, 01, 02 Assume 5' high pyramid
Fine grade	1008	sy	$ 0.20	$ 347	$ 0.21	$ 230	$ -	$ -	$ -	$ -	$ 0.57	$ 577	Means 17, 03, 01, 06
Waste Hauling and Disposal											Waste Hauling and Disposal Subtotal =	$ 170,403	
Haul (20 ton dump less than 200 mi.)	672	cy		$ -		$ -	$ 94.12	$ 68,625		$ -	$ 102.12	$ 68,625	Means 33, 19, 02, 09
Dump charge	672	cy		$ -		$ -	$ 119.36	$ 87,028		$ -	$ 129.51	$ 87,028	Means 33, 19, 03, 24
Truck decontamination	672	cy		$ -		$ -	$ 20.23	$ 14,750		$ -	$ 21.95	$ 14,750	Means 33, 19, 03, 11
Total Stockpile Disposal											**Total Stockpile Disposal Subtotal =**	**$ 204,759**	
Construction Cost Summary													
Total Construction Capital Costs											**Total Construction Capital Costs Subtotal =**	**$ 1,945,573**	
Design Cost											**Design Cost Subtotal =**	**$ 233,469**	*Calcualted as overall cost - not per individual excavation; 12% of Total Construction Cap Cost
Assume 12% of construction cost												$ 233,469	

Institutional Controls

Description	Hour	Unloaded Cost	Hour	Unloaded Cost	Hour	Unloaded Cost	Hour	Unloaded Cost	Hour	Unloaded Cost	Hour	Unloaded Cost				
Institutional Control Implementation and Certification													Institutional Control Implementation and Certification Subtotal =		$ 52,525	
LUC RD scoping meeting	40	hours	$100.00	$ 4,000.00	0	$ -	0	$ -	0	$ -	$100.00	$ 4,000.00	$ 4,000	$ 125	$ 4,125	Tetra Tech 2002.
Prepare draft LUC RD	120	hours	$100.00	$ 12,000.00	0	$ -	0	$ -	0	$ -	$100.00	$ 12,000.00	$12,000	$ -	$ 12,000	Tetra Tech 2002
Submit draft LUC RD	40	hours	$100.00	$ 4,000.00	0	$ -	0	$ -	0	$ -	$100.00	$ 4,000.00	$ 4,000	$ 100	$ 4,100	Tetra Tech 2002
BCT review period	24	hours	$100.00	$ 2,400.00	0	$ -	0	$ -	0	$ -	$100.00	$ 2,400.00	$ 2,400	$ -	$ 2,400	Tetra Tech 2002
BCT comments due	32	hours	$100.00	$ 3,200.00	0	$ -	0	$ -	0	$ -	$100.00	$ 3,200.00	$ 3,200	$ -	$ 3,200	Tetra Tech 2002
RTC meeting and BCT concurrence	24	hours	$100.00	$ 2,400.00	0	$ -	0	$ -	0	$ -	$100.00	$ 2,400.00	$ 2,400	$ 500	$ 2,900	Tetra Tech 2002.
Prepare draft final LUC RD	80	hours	$100.00	$ 8,000.00	0	$ -	0	$ -	0	$ -	$100.00	$ 8,000.00	$ 8,000	$ -	$ 8,000	Tetra Tech 2002
Submit draft final LUC RD	16	hours	$100.00	$ 1,600.00	0	$ -	0	$ -	0	$ -	$100.00	$ 1,600.00	$ 1,600	$ 100	$ 1,700	Tetra Tech 2002.
BCT review and concurrence period	56	hours	$100.00	$ 5,600.00	0	$ -	0	$ -	0	$ -	$100.00	$ 5,600.00	$ 5,600	$ -	$ 5,600	Tetra Tech 2002
BCT concurrence letters due	32	hours	$100.00	$ 3,200.00	0	$ -	0	$ -	0	$ -	$100.00	$ 3,200.00	$ 3,200	$ -	$ 3,200	Tetra Tech 2002
Prepare final LUC RD with RTC	42	hours	$100.00	$ 4,200.00	0	$ -	0	$ -	0	$ -	$100.00	$ 4,200.00	$ 4,200	$ -	$ 4,200	Tetra Tech 2002
Submit final LUC RD with RTC	10	hours	$100.00	$ 1,000.00	0	$ -	0	$ -	0	$ -	$100.00	$ 1,000.00	$ 1,000	$ 100	$ 1,100	ODCs for printing.
Covenant to Resrict Use of Property													Covenant to Resrict Use of Property Subtotal =		$ 11,000	
Prepare draft covenant	84	hours	$100.00	$ 8,400.00	0	$ -	0	$ -	0	$ -	$100.00	$ 8,400.00	$ 8,400	$ 100	$ 8,500	Tetra Tech 2002.
File covenant	24	hours	$100.00	$ 2,400.00	0	$ -	0	$ -	0	$ -	$100.00	$ 2,400.00	$ 2,400	$ 100	$ 2,500	ODCs for travel fees.

TABLE F-4A: CAPITAL AND LABOR COST ESTIMATE, ALTERNATIVE S-4 (CONTINUED)

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Alternative S-4: Covers and Institutional Controls

Location Factors

Labor:	100.0%	(San Fancisco - Means Section 1)	133.8%
Equipment:	100.0%	(San Fancisco - Means Section 1)	112.6%
Material:	100.0%	(San Fancisco - Means Section 1)	112.6%
Assembly:	124.0%	(From Previous)	
Professional Labor Multiplier:	1.6	(RACER)	
Labor Overhead & Profit Multiplier:	1.719	(From previous - includes 10% to account for PPE [modified Level D])	
Material and Equipment Profit:	9%	(RACER)	

Project Duration: 6.0 Months or
133 working days

Description	Quantity	Unit	Unloaded Labor Unit Cost	Total Labor (including O&P)	Unloaded Equipment Unit Cost	Total Equipment (including Profit)	Unloaded Material Unit Cost	Total Material (including profit)	Unloaded Assembly Unit Cost	Total Assembly Cost (including profit)	Total Unit Cost (including O&P)	Total Cost (including O&P)	Comments
Total Legal Controls Capital Costs													
Total Institutional Control Capital Costs													

Total Legal Controls Capital Costs Subtotal =	$ 63,525		
Total Institutional Control Capital Costs Subtotal =	$ 63,525		
Annual Discount Rate	3.1%	**2005 Costs**	**2007 Costs**
Project Capital & Labor Cost =		$ 2,242,567	$ 2,383,761
Present Value of 30 Years of Periodic Costs =		$ 1,313,886	$ 1,396,610
(Five-Year Reviews and Asphalt Maintenance)			
SubTotal =		$ 3,556,453	$ 3,780,371
20% Contingency =		$ 711,291	$ 756,074
Total Project Cost =		$ 4,267,743	$ 4,536,445

Notes:

"	Inch
BCT	Base Realignment and Closure Cleanup Team
CSY	100 Square Yards
cy	cubic yard
ea	each
FOST	Finding of suitability to transfer
ft	Foot
hr	Hour
LUC RD	Land Use Control Remedial Design
Means	Means, RS. 2004. "Environmental Remediation Cost Data – Unit Price, 10th Annual Edition, Environmental Cost Handling Options and Solutions," RS Means Company, Inc, Kingston, MA. October.
mo	Month
N/A	Not applicable
O&P	Overhead and profit
ODC	Other Direct Costs
Pg	Page
PPE	Personal protective equipment
RACER	Remedial Action Cost Engineering and Requirements System
RTC	Response to comment
sy	Square yard

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
37	Present-Worth Cost: $2,555,000	Table 6	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Appendix F, Table F-5A. SulTech. November 30, 2007.

TABLE F-5A: CAPITAL AND LABOR COST ESTIMATE, ALTERNATIVE S-5

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Alternative S-5: Excavation, Covers, Disposal, and Institutional Controls

Location Factors

Labor:	100.0%	(San Francisco - Means Section 1)	133.8%
Equipment:	100.0%	(San Francisco - Means Section 1)	112.6%
Material:	100.0%	(San Francisco - Means Section 1)	112.6%
Assembly:	124.0%		122.0% Level D
Professional Labor Multiplier:	1.6	(RACER)	
Labor Overhead & Profit Multiplier.:	1.719	(Includes 10% to account for PPE [modified Level D])	
Material and Equipment Profit:	9%	(RACER)	

Project Duration: 6.0 Months or 133 working days

Description	Quantitity	Unit	Unloaded Labor Unit Cost	Total Labor (including O&P)	Unloaded Equipment Unit Cost	Total Equipment (including profit)	Unloaded Material Unit Cost	Total Material (including Profit)	Unloaded Assembly Unit Cost	Total Assembly Cost (including profit)	Total Unit Cost (including O&P)	Total Cost (including O&P)	Comments
Site Wide Costs													
Distributive Costs											Distributive Costs Subtotal =	$ 421,557	
1 Project Manager 50% on project; location factor N/A	532	hr	$ 50.00	$ 42,560	$ -	$ -	$ 200.00 /day	$ 13,300	$ -	$ -	$ 105.00	$ 55,860	
1 Superintendent 100% on project; location factor N/A	1064	hr	$ 42.00	$ 71,501	$ -	$ -	$ 200.00 /day	$ 26,600	$ -	$ -	$ 92.20	$ 98,101	
1 Engineer 100% on project; location factor N/A	1064	hr	$ 35.00	$ 59,584	$ -	$ -	$ 200.00 /day	$ 26,600	$ -	$ -	$ 81.00	$ 86,184	
1 Health & Safety Office 100% on project; location factor N/A	1064	hr	$ 25.00	$ 42,560	$ -	$ -	$ 200.00 /day	$ 26,600	$ -	$ -	$ 65.00	$ 69,160	
1 Quality Control Office 100% on project; location factor N/A	1064	hr	$ 25.00	$ 42,560	$ -	$ -	$ 200.00 /day	$ 26,600	$ -	$ -	$ 65.00	$ 69,160	
1 Procurement Spec. 50% on project; location factor N/A	532	hr	$ 35.00	$ 29,792	$ -	$ -	$ 200.00 /day	$ 13,300	$ -	$ -	$ 81.00	$ 43,092	
Temporary Facilities											Temporary Facilities Subtotal =	$ 29,663	*Assume that we will not be setting up buildings/work areas/etc. Numbers same as previous.
Portable Toilets (2)	6	mo	$ -	$ -	$ -	$ -	$ 1,006.40	$ 6,552	$ -	$ -	$ 1,092.00	$ 6,552	Means 2004 Heavy Construction. Pg. 24. 01590 400 6410
Rental Trucks (5) (for supervisory staff)	6	mo	$ -	$ -	$ -	$ -	$ 3,550.00	$ 23,111	$ -	$ -	$ 3,851.83	$ 23,111	Assuming rental from Enterprise
Mobilization											Mobilization Subtotal =	$ 14,390	*Assume that these will be used overall (not calculated for every excavation).
Crawler mounted backhoes	5	ea	$ 53.00	$ 456	$ 168.00	$ 911	$ -	$ -	$ -	$ -	$ 273.40	$ 1,367	Means 2004 Heavy Construction. Pg. 139. 03110 420 1000
Graders	5	ea	$ 53.00	$ 456	$ 168.00	$ 911	$ -	$ -	$ -	$ -	$ 273.40	$ 1,367	Means 2004 Heavy Construction. Pg. 139. 03110 420 1000
20 ton dump truck	100	ea	$ -	$ -	$ -	$ -	$ -	$ -	$ 50.00	$ 6,200	$ 62.00	$ 6,200	Assumed $1 per mile for 50 miles; location factor and O&P N/A
100,000 gallon Modular Storage Tank Mobilization	1	ea	$ -	$ -	$ -	$ -	$ -	$ -	$ 4,400	$ 5,456	$ 5,456.00	$ 5,456	Reed Margulis, ModuTank Inc., (800) 245-6964; location factor and O&P N/A
Demobilization											Demobilization Subtotal =	$ 14,390	*Assume that these will be used overall (not calculated for every excavation).
Crawler mounted backhoes	5	ea	$ 53.00	$ 456	$ 168.00	$ 911	$ -	$ -	$ -	$ -	$ 273.40	$ 1,367	
Graders	5	ea	$ 53.00	$ 456	$ 168.00	$ 911	$ -	$ -	$ -	$ -	$ 273.40	$ 1,367	
20 ton dump truck	100	ea	$ -	$ -	$ -	$ -	$ -	$ -	$ 50.00	$ 6,200	$ 62.00	$ 6,200	
100,000 gallon Modular Storage Tank Mobilization	1	ea	$ -	$ -	$ -	$ -	$ -	$ -	$ 4,400.00	$ 5,456	$ 5,456.00	$ 5,456	
Oversight											Oversight Subtotal =	$ 64,016	
Engineer 100% on project; location factor N/A	1064	hr	$ 35.00	$ 64,016	$ -	$ -	$ -	$ -	$ -	$ -	$ 60.17	$ 64,016	*Calculated as overall cost - not per individual excavation. Unit cost numbers same as previous.
Total Site Wide Capital Costs											**Total Site Wide Capital Costs Subtotal =**	**$ 544,016**	
IR09 Vats Area Chromium-VI Investigation Costs													
Sampling and Analysis											Sampling and Analysis Subtotal =	$ 12,977	
CPT Rig													
Mob/demob	1	ea	$ -	$ -	$ 2,568.00	$ 2,786	$ -	$ -	$ -	$ -	$ 2,786.00	$ 2,786	ECHOS 2006, 33 02 0640
Soil sampling													
Sampling with CPT rig	1	day		$ -		$ -	$ 3,548.00	$ 3,850	$ -	$ -	$ 3,850.00	$ 3,850	ECHOS 2006, 33 02 0639; assuming 5 samples per day at 20-30 ft bgs
Field analysis of soil samples													
XRF analyzer rental	1	week	$ -	$ -	$ 800.00	$ 868		$ -	$ -	$ -	$ 868.00	$ 868	Professional judgement; assuming one week rental to cover shipping time
Lab analysis of soil samples													
Metals, EPA 200.7 (QC samples)	2	ea	$ -	$ -	$ -	$ -		$ -	$ 543	$ 1,347	$ 673.50	$ 1,347	ECHOS 2006, 33 02 0612; assuming 2 XRF samples will be analyzed in lab for QC
Oversight, sample analysis and reporting													
Professional labor (incl. field and office; local staff)	24	man-hr	$ 100.0	$ 4,126	$ -	$ -		$ -	$ -	$ -	$ 171.92	$ 4,126	Professional judgement; assuming 2 persons in field for 1 day + I day office labor
Total IR09 Chromium-VI Investigation Cost											**Total IR09 Chromium-VI Investigation Cost Subtotal =**	**$ 12,977**	
Excavation Costs													
Excavation Costs Site ID IR09B030													
Site Preparation											Site Preparation Subtotal =	$ 875	
Clearing bituminous driveway	25	sy	$ 15.39	$ 661	$ 7.89	$ 214	$ -	$ -	$ -	$ -	35	$ 875	Means 2004 17, 02; assume site preparation only includes clearing existing asphalt if necessary; current
Excavation											Excavation Subtotal =	$ 13,048	cover is asphalt based on 2004 aerial photograph.
Standard soil excavation													
Excavation	56	cy	$ 1.35	$ 130	$ 1.71	$ 104	$ -	$ -	$ -	$ -	$ 4.18	$ 234	Means 17, 03, 02, 77
Utility buffer soil excavation													
Excavation and utility shoring	28	cy	$ 34.05	$ 1,639	$ 2.47	$ 75	$ 5.22	$ 159	$ -	$ -	$ 66.89	$ 1,873	Means 17, 03 includes excavation, shoring and hand digging costs
Confirmation and characterization sampling													
Sampling	9	ea	$ -	$ -	$ -	$ -	$ 1,000.00	$ 9,765	$ -	$ -	$ 1,085.00	$ 9,765	Means 33, 02, 06 assume 9 samples per excav; 5 confirmation + 4 characterization
Filling/soil cover													
Borrow, fill and compact	84	cy	$ 1.68	$ 243	$ 2.63	$ 240	$ 7.15	$ 652	$ -	$ -	$ 13.51	$ 1,135	Means 17, 03, 04, 23
Grading													
Rough grade	25	sy	$ 0.29	$ 12	$ 0.51	$ 14	$ -	$ -	$ -	$ -	$ 1.04	$ 26	Means 17, 03, 01, 02
Fine grade	25	sy	$ 0.20	$ 9	$ 0.21	$ 6	$ -	$ -	$ -	$ -	$ 0.60	$ 15	Means 17, 03, 01, 06

TABLE F-5A: CAPITAL AND LABOR COST ESTIMATE, ALTERNATIVE S-5 (CONTINUED)

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Alternative S-5: Excavation, Covers, Disposal, and Institutional Controls

Location Factors

Labor:	100.0%	(San Francisco - Means Section 1)	133.8%
Equipment:	100.0%	(San Francisco - Means Section 1)	112.6%
Material:	100.0%	(San Francisco - Means Section 1)	112.6%
Assembly:	124.0%		122.0% Level D
Professional Labor Multiplier:	1.6	(RACER)	
Labor Overhead & Profit Multiplier.:	1.719	(Includes 10% to account for PPE [modified Level D])	
Material and Equipment Profit:	9%	(RACER)	

Project Duration: 6.0 Months or 133 working days

Description	Quantitity	Unit	Unloaded Labor Unit Cost	Total Labor (including O&P)	Unloaded Equipment Unit Cost	Total Equipment (including profit)	Unloaded Material Unit Cost	Total Material (including Profit)	Unloaded Assembly Unit Cost	Total Assembly Cost (including profit)	Total Unit Cost (including O&P)	Total Cost (including O&P)	Comments
Storm Water Control											Storm Water Control Subtotal =	$ 376	
2-foot high (and 2-ft wide) berm around open excav	15	cy	$ -	$ -	$ -	$ -	$ -	$ -	$ 6.12	$ 114	$ 7.60	$ 114	Means 2004 Environmental Remediation - Unit Price; Pg 4-31; 17 03 9911
2-foot high (and 2-ft wide) berm around open excav	100	ft	$ -	$ -	$ -	$ -	$ -	$ -	$ 2.11	$ 262	$ 2.62	$ 262	Means 2004 Environmental Remediation - Unit Price; Pg 5-19; 18 05 0206
Waste Hauling and Disposal											Waste Hauling and Disposal Subtotal =	$ 25,561	
Haul (20 ton dump less than 200 mi.)	100.8	cy	$ -	$ -	$ -	$ -	$ 94.12	$ 10,294	$ -	$ -	$ 102.12	$ 10,294	Means 33, 19, 02, 09
Dump charge	100.8	cy	$ -	$ -	$ -	$ -	$ 119.36	$ 13,054	$ -	$ -	$ 129.50	$ 13,054	Means 33, 19, 03, 24
Truck decontamination	100.8	cy	$ -	$ -	$ -	$ -	$ 20.23	$ 2,213	$ -	$ -	$ 21.95	$ 2,213	Means 33, 19, 03, 11
Total Excavation Capital Costs IR09B030											**Total Excavation Capital Costs IR09B030 Subtotal =**	**$ 39,860**	
Excavation Costs Site ID IR09B091													
Site Preparation											Site Preparation Subtotal =	$ 875	
Clearing bituminous driveway	25	sy	$ 15.39	$ 661	$ 7.89	$ 214	$ -	$ -	$ -	$ -	35	$ 875	Means 2004 17, 02; assume site preparation only includes clearing existing asphalt if necessary; current cover is asphalt based on 2004 aerial photograph.
Excavation											Excavation Subtotal =	$ 10,384	
Standard soil excavation													
Excavation	14	cy	$ 1.35	$ 32	$ 1.71	$ 26	$ -	$ -	$ -	$ -	$ 4.14	$ 58	Means 17, 03, 02, 77
Building buffer soil excavation													
Excavation and building shoring	1	cy	34.93	$ 60	$ 4.14	$ 4	$ 10.76	$ 12	$ -	$ -	$ 76.00	$ 76	Means 17, 03 includes excavation and shoring costs
Utility buffer soil excavation													
Excavation and utility shoring	3	cy	$ 34.05	$ 176	$ 2.47	$ 8	$ 5.22	$ 17	$ -	$ -	$ 67.00	$ 201	Means 17, 03 includes excavation, shoring and hand digging costs
Confirmation and characterization sampling													
Sampling	9	ea	$ -	$ -	$ -	$ -	$ 1,000.00	$ 9,765	$ -	$ -	$ 1,085.00	$ 9,765	Means 33, 02, 06 assume 9 samples per excav; 5 confirmation + 4 characterization
Filling/soil cover													
Borrow, fill and compact	18	cy	$ 1.68	$ 52	$ 2.63	$ 51	$ 7.15	$ 140	$ -	$ -	$ 13.50	$ 243	Means 17, 03, 04, 23
Grading													
Rough grade	25	sy	$ 0.29	$ 12	$ 0.51	$ 14	$ -	$ -	$ -	$ -	$ 1.04	$ 26	Means 17, 03, 01, 02
Fine grade	25	sy	$ 0.20	$ 9	$ 0.21	$ 6	$ -	$ -	$ -	$ -	$ 0.60	$ 15	Means 17, 03, 01, 06
Storm Water Control											Storm Water Control Subtotal =	$ 376	
2-foot high (and 2-ft wide) berm around open excavation	15	cy	$ -	$ -	$ -	$ -	$ -	$ -	$ 6.12	$ 114	$ 7.60	$ 114	Means 2004 Environmental Remediation - Unit Price; Pg 4-31; 17 03 9911
Silt fences (vinyl, 3 ft high with 7.5 ft posts)	100	ft	$ -	$ -	$ -	$ -	$ -	$ -	$ 2.11	$ 262	$ 2.62	$ 262	Means 2004 Environmental Remediation - Unit Price; Pg 5-19; 18 05 0206
Waste Hauling and Disposal											Waste Hauling and Disposal Subtotal =	$ 5,477	
Haul (20 ton dump less than 200 mi.)	21.6	cy	$ -	$ -	$ -	$ -	$ 94.12	$ 2,206	$ -	$ -	$ 102.13	$ 2,206	Means 33, 19, 02, 09
Dump charge	21.6	cy	$ -	$ -	$ -	$ -	$ 119.36	$ 2,797	$ -	$ -	$ 129.49	$ 2,797	Means 33, 19, 03, 24
Truck decontamination	21.6	cy	$ -	$ -	$ -	$ -	$ 20.23	$ 474	$ -	$ -	$ 21.94	$ 474	Means 33, 19, 03, 11
Total Excavation Capital Costs IR09B091											**Total Excavation Capital Costs IR09B091 Subtotal =**	**$ 17,112**	
Excavation Costs Site ID IR35SS15													
Excavation											Excavation Subtotal =	$ 11,980	
Standard soil excavation													
Excavation	73	cy	$ 1.35	$ 169	$ 1.71	$ 135	$ -	$ -	$ -	$ -	$ 4.16	$ 304	Means 17, 03, 02, 77
Utility buffer soil excavation													
Excavation and utility shoring	11	cy	$ 34.05	$ 644	$ 2.47	$ 29	$ 5.22	$ 62	$ -	$ -	$ 66.82	$ 735	Means 17, 03 includes excavation, shoring and hand digging costs
Confirmation and characterization sampling													
Sampling	9	ea	$ -	$ -	$ -	$ -	$ 1,000.00	$ 9,765	$ -	$ -	$ 1,085.00	$ 9,765	Means 33, 02, 06 assume 9 samples per excav; 5 confirmation + 4 characterization
Filling/soil cover													
Borrow, fill and compact	84	cy	$ 1.68	$ 243	$ 2.63	$ 240	$ 7.15	$ 652	$ -	$ -	$ 13.51	$ 1,135	Means 17, 03, 04, 23
Grading													
Rough grade	25	sy	$ 0.29	$ 12	$ 0.51	$ 14	$ -	$ -	$ -	$ -	$ 1.04	$ 26	Means 17, 03, 01, 02
Fine grade	25	sy	$ 0.20	$ 9	$ 0.21	$ 6	$ -	$ -	$ -	$ -	$ 0.60	$ 15	Means 17, 03, 01, 06
Storm Water Control											Storm Water Control Subtotal =	$ 376	
2-foot high (and 2-ft wide) berm around open excavation	15	cy	$ -	$ -	$ -	$ -	$ -	$ -	$ 6.12	$ 114	$ 7.60	$ 114	Means 2004 Environmental Remediation - Unit Price; Pg 4-31; 17 03 9911
Silt fences (vinyl, 3 ft high with 7.5 ft posts)	100	ft	$ -	$ -	$ -	$ -	$ -	$ -	$ 2.11	$ 262	$ 2.62	$ 262	Means 2004 Environmental Remediation - Unit Price; Pg 5-19; 18 05 0206
Waste Hauling and Disposal											Waste Hauling and Disposal Subtotal =	$ 25,561	
Haul (20 ton dump less than 200 mi.)	100.8	cy	$ -	$ -	$ -	$ -	$ 94.12	$ 10,294	$ -	$ -	$ 102.12	$ 10,294	Means 33, 19, 02, 09
Dump charge	100.8	cy	$ -	$ -	$ -	$ -	$ 119.36	$ 13,054	$ -	$ -	$ 129.50	$ 13,054	Means 33, 19, 03, 24
Truck decontamination	100.8	cy	$ -	$ -	$ -	$ -	$ 20.23	$ 2,213	$ -	$ -	$ 21.95	$ 2,213	Means 33, 19, 03, 11
Total Excavation Capital Costs IR35SS15											**Total Excavation Capital Costs IR35SS15 Subtotal =**	**$ 37,917**	

TABLE F-5A: CAPITAL AND LABOR COST ESTIMATE, ALTERNATIVE S-5 (CONTINUED)

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Alternative S-5: Excavation, Covers, Disposal, and Institutional Controls

Location Factors

Labor:	100.0%	(San Francisco - Means Section 1)	133.8%
Equipment:	100.0%	(San Francisco - Means Section 1)	112.6%
Material:	100.0%	(San Francisco - Means Section 1)	112.6%
Assembly:	124.0%		122.0% Level D
Professional Labor Multiplier:	1.6	(RACER)	
Labor Overhead & Profit Multiplier.:	1.719	(Includes 10% to account for PPE [modified Level D])	
Material and Equipment Profit:	9%	(RACER)	

Project Duration: 6.0 Months or 133 working days

Description	Quantitity	Unit	Unloaded Labor Unit Cost	Total Labor (including O&P)	Unloaded Equipment Unit Cost	Total Equipment (including profit)	Unloaded Material Unit Cost	Total Material (including Profit)	Unloaded Assembly Unit Cost	Total Assembly Cost (including profit)	Total Unit Cost (including O&P)	Total Cost (including O&P)	Comments
Excavation Costs Site ID IR35SS14													
Excavation											Excavation Subtotal =	$ 11,292	
Standard soil excavation													
Excavation	84	cy	$ 1.35	$ 195	$ 1.71	$ 156	$ -	$ -	$ -	$ -	$ 4.18	$ 351	Means 17, 03, 02, 77
Confirmation and characterization sampling													
Sampling	9	ea	$ -	$ -	$ -	$ -	$ 1,000.00	$ 9,765	$ -	$ -	$ 1,085.00	$ 9,765	Means 33, 02, 06 assume 9 samples per excav; 5 confirmation + 4 characterization
Filling/soil cap													
Borrow, fill and compact	84	cy	$ 1.68	$ 243	$ 2.63	$ 240	$ 7.15	$ 652	$ -	$ -	$ 13.51	$ 1,135	Means 17, 03, 04, 23
Grading													
Rough grade	25	sy	$ 0.29	$ 12	$ 0.51	$ 14	$ -	$ -	$ -	$ -	$ 1.04	$ 26	Means 17, 03, 01, 02
Fine grade	25	sy	$ 0.20	$ 9	$ 0.21	$ 6	$ -	$ -	$ -	$ -	$ 0.60	$ 15	Means 17, 03, 01, 06
Storm Water Control											Storm Water Control Subtotal =	$ 376	
2 -foot high (and 2-ft wide) berm around open excav	15	cy	$ -	$ -	$ -	$ -	$ -	$ -	$ 6.12	$ 114	$ 7.60	$ 114	Means 2004 Environmental Remediation - Unit Price; Pg 4-31; 17 03 9911
Silt fences (vinyl, 3 ft high with 7.5 ft posts)	100	ft	$ -	$ -	$ -	$ -	$ -	$ -	$ 2.11	$ 262	$ 2.62	$ 262	Means 2004 Environmental Remediation - Unit Price; Pg 5-19; 18 05 0206
Waste Hauling and Disposal											Waste Hauling and Disposal Subtotal =	$ 25,561	
Haul (20 ton dump less than 200 mi.)	100.8	cy	$ -	$ -	$ -	$ -	$ 94.12	$ 10,294	$ -	$ -	$ 102.12	$ 10,294	Means 33, 19, 02, 09
Dump charge	100.8	cy	$ -	$ -	$ -	$ -	$ 119.36	$ 13,054	$ -	$ -	$ 129.50	$ 13,054	Means 33, 19, 03, 24
Truck decontamination	100.8	cy	$ -	$ -	$ -	$ -	$ 20.23	$ 2,213	$ -	$ -	$ 21.95	$ 2,213	Means 33, 19, 03, 11
Total Excavation Capital Costs IR35SS14											**Total Excavation Capital Costs IR35SS14 Subtotal =**	**$ 37,229**	
Excavation Costs Site ID PA55TA10													
Site Preparation											Site Preparation Subtotal =	$ 875	
Clearing bituminous driveway	25	sy	$ 15.39	$ 661	$ 7.89	$ 214	$ -	$ -	$ -	$ -	35	$ 875	Means 2004 17, 02; assume site preparation only includes clearing existing asphalt if necessary; current
Excavation											Excavation Subtotal =	$ 11,292	cover is asphalt based on 2004 aerial photograph.
Standard soil excavation													
Excavation	84	cy	$ 1.35	$ 195	$ 1.71	$ 156	$ -	$ -	$ -	$ -	$ 4.18	$ 351	Means 17, 03, 02, 77
Confirmation and characterization sampling													
Sampling	9	ea	$ -	$ -	$ -	$ -	$ 1,000.00	$ 9,765	$ -	$ -	$ 1,085.00	$ 9,765	Means 33, 02, 06 assume 9 samples per excav; 5 confirmation + 4 characterization
Filling/soil cover													
Borrow, fill and compact	84	cy	$ 1.68	$ 243	$ 2.63	$ 240	$ 7.15	$ 652	$ -	$ -	$ 13.51	$ 1,135	Means 17, 03, 04, 23
Grading													
Rough grade	25	sy	$ 0.29	$ 12	$ 0.51	$ 14	$ -	$ -	$ -	$ -	$ 1.04	$ 26	Means 17, 03, 01, 02
Fine grade	25	sy	$ 0.20	$ 9	$ 0.21	$ 6	$ -	$ -	$ -	$ -	$ 0.60	$ 15	Means 17, 03, 01, 06
Storm Water Control											Storm Water Control Subtotal =	$ 376	
2-foot high (and 2-ft wide) berm around open excav ation	15	cy	$ -	$ -	$ -	$ -	$ -	$ -	$ 6.12	$ 114	$ 7.60	$ 114	Means 2004 Environmental Remediation - Unit Price; Pg 4-31; 17 03 9911
Silt fences (vinyl, 3 ft high with 7.5 ft posts)	100	ft	$ -	$ -	$ -	$ -	$ -	$ -	$ 2.11	$ 262	$ 2.62	$ 262	Means 2004 Environmental Remediation - Unit Price; Pg 5-19; 18 05 0206
Waste Hauling and Disposal											Waste Hauling and Disposal Subtotal =	$ 25,561	
Haul (20 ton dump less than 200 mi.)	100.8	cy	$ -	$ -	$ -	$ -	$ 94.12	$ 10,294	$ -	$ -	$ 102.12	$ 10,294	Means 33, 19, 02, 09
Dump charge	100.8	cy	$ -	$ -	$ -	$ -	$ 119.36	$ 13,054	$ -	$ -	$ 129.50	$ 13,054	Means 33, 19, 03, 24
Truck decontamination	100.8	cy	$ -	$ -	$ -	$ -	$ 20.23	$ 2,213	$ -	$ -	$ 21.95	$ 2,213	Means 33, 19, 03, 11
Total Excavation Capital Costs PA55TA10											**Total Excavation Capital Costs PA55TA10 Subtotal =**	**$ 38,104**	
Excavation Costs Site ID PA55TA04													
Excavation											Excavation Subtotal =	$ 11,292	
Standard soil excavation													
Excavation	84	cy	$ 1.35	$ 195	$ 1.71	$ 156	$ -	$ -	$ -	$ -	$ 4.18	$ 351	Means 17, 03, 02, 77
Confirmation and characterization sampling													
Sampling	9	ea	$ -	$ -	$ -	$ -	$ 1,000.00	$ 9,765	$ -	$ -	$ 1,085.00	$ 9,765	Means 33, 02, 06 assume 9 samples per excav; 5 confirmation + 4 characterization
Filling/soil cover													
Borrow, fill and compact	84	cy	$ 1.68	$ 243	$ 2.63	$ 240	$ 7.15	$ 652	$ -	$ -	$ 13.51	$ 1,135	Means 17, 03, 04, 23
Grading													
Rough grade	25	sy	$ 0.29	$ 12	$ 0.51	$ 14	$ -	$ -	$ -	$ -	$ 1.04	$ 26	Means 17, 03, 01, 02
Fine grade	25	sy	$ 0.20	$ 9	$ 0.21	$ 6	$ -	$ -	$ -	$ -	$ 0.60	$ 15	Means 17, 03, 01, 06
Storm Water Control											Storm Water Control Subtotal =	$ 376	
2-foot high (and 2-ft wide) berm around open excavation	15	cy	$ -	$ -	$ -	$ -	$ -	$ -	$ 6.12	$ 114	$ 7.60	$ 114	Means 2004 Environmental Remediation - Unit Price; Pg 4-31; 17 03 9911
Silt fences (vinyl, 3 ft high with 7.5 ft posts)	100	ft	$ -	$ -	$ -	$ -	$ -	$ -	$ 2.11	$ 262	$ 2.62	$ 262	Means 2004 Environmental Remediation - Unit Price; Pg 5-19; 18 05 0206

TABLE F-5A: CAPITAL AND LABOR COST ESTIMATE, ALTERNATIVE S-5 (CONTINUED)

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Alternative S-5: Excavation, Covers, Disposal, and Institutional Controls

Location Factors

Labor:	100.0%	(San Francisco - Means Section 1)	133.8%
Equipment:	100.0%	(San Francisco - Means Section 1)	112.6%
Material:	100.0%	(San Francisco - Means Section 1)	112.6%
Assembly:	124.0%		122.0% Level D
Professional Labor Multiplier:	1.6	(RACER)	
Labor Overhead & Profit Multiplier.:	1.719	(Includes 10% to account for PPE [modified Level D])	
Material and Equipment Profit:	9%	(RACER)	

Project Duration: 6.0 Months or 133 working days

Description	Quantitity	Unit	Unloaded Labor Unit Cost	Total Labor (including O&P)	Unloaded Equipment Unit Cost	Total Equipment (including profit)	Unloaded Material Unit Cost	Total Material (including Profit)	Unloaded Assembly Unit Cost	Total Assembly Cost (including profit)	Total Unit Cost (including O&P)	Total Cost (including O&P)	Comments
Waste Hauling and Disposal										Waste Hauling and Disposal Subtotal =		$ 25,561	
Haul (20 ton dump less than 200 mi.)	100.8	cy	$ -	$ -	$ -	$ -	$ 94.12	$ 10,294	$ -	$ -	$ 102.12	$ 10,294	Means 33, 19, 02, 09
Dump charge	100.8	cy	$ -	$ -	$ -	$ -	$ 119.36	$ 13,054	$ -	$ -	$ 129.50	$ 13,054	Means 33, 19, 03, 24
Truck decontamination	100.8	cy	$ -	$ -	$ -	$ -	$ 20.23	$ 2,213	$ -	$ -	$ 21.95	$ 2,213	Means 33, 19, 03, 11
Total Excavation Capital Costs PA55TA04								**Total Excavation Capital Costs PA55TA04 Subtotal =**				**$ 37,229**	
Excavation Costs Site ID PA53SS03													
Excavation										Excavation Subtotal =		$ 13,511	
Standard soil excavation													
Excavation	32	cy	$ 1.35	$ 74	$ 1.71	$ 59	$ -	$ -	$ -	$ -	$ 4.16	$ 133	Means 17, 03, 02, 77
Building buffer soil excavation													
Excavation and building shoring	35	cy	34.93	$ 2,102	$ 4.14	$ 157	$ 10.76	$ 409	$ -	$ -	$ 76.23	$ 2,668	Means 17, 03 includes excavation and shoring costs
Confirmation and characterization sampling													
Sampling	9	ea	$ -	$ -	$ -	$ -	$ 1,000.00	$ 9,765	$ -	$ -	$ 1,085.00	$ 9,765	Means 33, 02, 06 assume 9 samples per excav; 5 confirmation + 4 characterization
Filling/soil cover													
Borrow, fill and compact	67	cy	$ 1.68	$ 193	$ 2.63	$ 191	$ 7.15	$ 520	$ -	$ -	$ 13.49	$ 904	Means 17, 03, 04, 23
Grading													
Rough grade	25	sy	$ 0.29	$ 12	$ 0.51	$ 14	$ -	$ -	$ -	$ -	$ 1.04	$ 26	Means 17, 03, 01, 02
Fine grade	25	sy	$ 0.20	$ 9	$ 0.21	$ 6	$ -	$ -	$ -	$ -	$ 0.60	$ 15	Means 17, 03, 01, 06
Storm Water Control										Storm Water Control Subtotal =		$ 376	
2 -foot high (and 2-ft wide) berm around open excavation	15	cy	$ -	$ -	$ -	$ -		$ -	$ 6.12	$ 114	$ 7.60	$ 114	Means 2004 Environmental Remediation - Unit Price; Pg 4-31; 17 03 9911
Silt fences (vinyl, 3 ft high with 7.5 ft posts)	100	ft	$ -	$ -	$ -	$ -		$ -	$ 2.11	$ 262	$ 2.62	$ 262	Means 2004 Environmental Remediation - Unit Price; Pg 5-19; 18 05 0206
Waste Hauling and Disposal										Waste Hauling and Disposal Subtotal =		$ 20,387	
Haul (20 ton dump less than 200 mi.)	80.4	cy	$ -	$ -	$ -	$ -	$ 94.12	$ 8,210	$ -	$ -	$ 102.11	$ 8,210	Means 33, 19, 02, 09
Dump charge	80.4	cy	$ -	$ -	$ -	$ -	$ 119.36	$ 10,412	$ -	$ -	$ 129.50	$ 10,412	Means 33, 19, 03, 24
Truck decontamination	80.4	cy	$ -	$ -	$ -	$ -	$ 20.23	$ 1,765	$ -	$ -	$ 21.95	$ 1,765	Means 33, 19, 03, 11
Total Excavation Capital Costs PA53SS03								**Total Excavation Capital Costs PA53SS03 Subtotal =**				**$ 34,274**	
Excavation Costs Site ID SPD31													
Excavation										Excavation Subtotal =		$ 13,059	
Standard soil excavation													
Excavation	56	cy	$ 1.35	$ 130	$ 1.71	$ 104	$ -	$ -	$ -	$ -	$ 4.18	$ 234	Means 17, 03, 02, 77
Utility buffer soil excavation													
Excavation and utility shoring	28	cy	$ 34.05	$ 1,639	$ 2.47	$ 75	$ 5.22	$ 159	$ -	$ -	$ 66.89	$ 1,873	Means 17, 03 includes excavation, shoring and hand digging costs
Confirmation and characterization sampling													
Sampling	9	ea	$ -	$ -	$ -	$ -	$ 1,000.00	$ 9,765	$ -	$ -	$ 1,085.00	$ 9,765	Means 33, 02, 06 assume 9 samples per excav; 5 confirmation + 4 characterization
Filling/soil cover													
Borrow, fill and compact	84	cy	$ 1.68	$ 243	$ 2.63	$ 240	$ 7.15	$ 652	$ -	$ -	$ 13.51	$ 1,135	Means 17, 03, 04, 23
Grading													
Rough grade	25	sy	$ 0.29	$ 12	$ 0.51	$ 14	$ -	$ -	$ -	$ -	$ 1.04	$ 26	Means 17, 03, 01, 02
Fine grade	25	sy	$ 0.20	$ 9	$ 0.21	$ 6	$ -	$ -	$ -	$ -	$ 0.60	$ 15	Means 17, 03, 01, 06
Cover													
6" Topsoil	25	sy	$ 0.10	$ 4	$ 0.27	$ 7	$ -	$ -	$ -	$ -	$ 0.44	$ 11	Means 18, 05, 03, 02
Storm Water Control										Storm Water Control Subtotal =		$ 376	
2-foot high (and 2-ft wide) berm around open excavation	15	cy	$ -	$ -	$ -	$ -	$ -	$ -	$ 6.12	$ 114	$ 7.60	$ 114	Means 2004 Environmental Remediation - Unit Price; Pg 4-31; 17 03 9911
Silt fences (vinyl, 3 ft high with 7.5 ft posts)	100	ft	$ -	$ -	$ -	$ -	$ -	$ -	$ 2.11	$ 262	$ 2.62	$ 262	Means 2004 Environmental Remediation - Unit Price; Pg 5-19; 18 05 0206
Waste Hauling and Disposal										Waste Hauling and Disposal Subtotal =		$ 25,561	
Haul (20 ton dump less than 200 mi.)	101	cy	$ -	$ -	$ -	$ -	$ 94.12	$ 10,294	$ -	$ -	$ 102.12	$ 10,294	Means 33, 19, 02, 09
Dump charge	101	cy	$ -	$ -	$ -	$ -	$ 119.36	$ 13,054	$ -	$ -	$ 129.50	$ 13,054	Means 33, 19, 03, 24
Truck decontamination	101	cy	$ -	$ -	$ -	$ -	$ 20.23	$ 2,213	$ -	$ -	$ 21.95	$ 2,213	Means 33, 19, 03, 11
Total Excavation Capital Costs SPD31								**Total Excavation Capital Costs SPD31 Subtotal =**				**$ 38,996**	

TABLE F-5A: CAPITAL AND LABOR COST ESTIMATE, ALTERNATIVE S-5 (CONTINUED)

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Alternative S-5: Excavation, Covers, Disposal, and Institutional Controls

Location Factors

Labor:	100.0%	(San Francisco - Means Section 1)	133.8%
Equipment:	100.0%	(San Francisco - Means Section 1)	112.6%
Material:	100.0%	(San Francisco - Means Section 1)	112.6%
Assembly:	124.0%		122.0% Level D
Professional Labor Multiplier:	1.6	(RACER)	
Labor Overhead & Profit Multiplier.:	1.719	(Includes 10% to account for PPE [modified Level D])	
Material and Equipment Profit:	9%	(RACER)	

Project Duration: 6.0 Months or 133 working days

Description	Quantitity	Unit	Unloaded Labor Unit Cost	Total Labor (including O&P)	Unloaded Equipment Unit Cost	Total Equipment (including profit)	Unloaded Material Unit Cost	Total Material (including Profit)	Unloaded Assembly Unit Cost	Total Assembly Cost (including profit)	Total Unit Cost (including O&P)	Total Cost (including O&P)	Comments
Excavation Costs Site ID SPD23													
Excavation											Excavation Subtotal =	$ 11,292	
Standard soil excavation													
Excavation	84	cy	$ 1.35	$ 195	$ 1.71	$ 156	$ -	$ -	$ -	$ -	$ 4.18	$ 351	Means 17, 03, 02, 77
Confirmation and characterization sampling													
Sampling	9	ea	$ -	$ -	$ -	$ -	$ 1,000.00	$ 9,765	$ -	$ -	$ 1,085.00	$ 9,765	Means 33, 02, 06 assume 9 samples per excav; 5 confirmation + 4 characterization
Filling/soil cover													
Borrow, fill and compact	84	cy	$ 1.68	$ 243	$ 2.63	$ 240	$ 7.15	$ 652	$ -	$ -	$ 13.51	$ 1,135	Means 17, 03, 04, 23
Grading													
Rough grade	25	sy	$ 0.29	$ 12	$ 0.51	$ 14	$ -	$ -	$ -	$ -	$ 1.04	$ 26	Means 17, 03, 01, 02
Fine grade	25	sy	$ 0.20	$ 9	$ 0.21	$ 6	$ -	$ -	$ -	$ -	$ 0.60	$ 15	Means 17, 03, 01, 06
Storm Water Control											Storm Water Control Subtotal =	$ 376	
2-foot high (and 2-ft wide) berm around open excavation	15	cy		$ -		$ -		$ -	$ 6.12	$ 114	$ 7.60	$ 114	Means 2004 Environmental Remediation - Unit Price; Pg 4-31; 17 03 9911
Silt fences (vinyl, 3 ft high with 7.5 ft posts)	100	ft		$ -		$ -		$ -	$ 2.11	$ 262	$ 2.62	$ 262	Means 2004 Environmental Remediation - Unit Price; Pg 5-19; 18 05 0206
Waste Hauling and Disposal											Waste Hauling and Disposal Subtotal =	$ 25,561	
Haul (20 ton dump less than 200 mi.)	100.8	cy		$ -		$ -	$ 94.12	$ 10,294		$ -	$ 102.12	$ 10,294	Means 33, 19, 02, 09
Dump charge	100.8	cy		$ -		$ -	$ 119.36	$ 13,054		$ -	$ 129.50	$ 13,054	Means 33, 19, 03, 24
Truck decontamination	100.8	cy		$ -		$ -	$ 20.23	$ 2,213		$ -	$ 21.95	$ 2,213	Means 33, 19, 03, 11
Total Excavation Capital Costs SPD23											**Total Excavation Capital Costs SPD23 Subtotal =**	**$ 37,229**	
Stockpile Disposal													
Excavation											Excavation Subtotal =	$ 46,484	
Standard soil excavation													
Excavation	560	cy	$ 1.35	$ -	$ 1.71	$ 958	$ -	$ -	$ -	$ -	$ 1.71	$ 958	Means 17, 03, 02, 77
Stockpile characterization sampling													
Sampling	28	ea	$ -	$ -	$ -	$ -	$ 1,000.00	$ 44,800	$ -	$ -	$ 1,600.00	$ 44,800	Means 33, 02, 06 assume 1 sample per 20 cy
Grading													
Rough grade	1008	sy	$ 0.29	$ -	$ 0.51	$ 514	$ -	$ -	$ -	$ -	$ 0.51	$ 514	Means 17, 03, 01, 02 Assume 5' high pyramid
Fine grade	1008	sy	$ 0.20	$ -	$ 0.21	$ 212	$ -	$ -	$ -	$ -	$ 0.21	$ 212	Means 17, 03, 01, 06
Waste Hauling and Disposal											Waste Hauling and Disposal Subtotal =	$ 251,285	
Haul (20 ton dump less than 200 mi.)	672	cy		$ -		$ -	$ 94.12	$ 101,198		$ -	$ 150.59	$ 101,198	Means 33, 19, 02, 09
Dump charge	672	cy		$ -		$ -	$ 119.36	$ 128,336		$ -	$ 190.98	$ 128,336	Means 33, 19, 03, 24
Truck decontamination	672	cy		$ -		$ -	$ 20.23	$ 21,751		$ -	$ 32.37	$ 21,751	Means 33, 19, 03, 11
Total Stockpile Disposal											**Total Stockpile Disposal Subtotal =**	**$ 297,769**	
Total Excavation Capital Costs											**Total Excavation Capital Costs Subtotal =**	**$ 615,719**	
Cover Costs													
Covering Block BLK-A													
Area													
Area Requiring Paving	10,690	sy											
Area Requiring Sealcoat	10,690	sy											
Asphalt sealcoat (to existing paved areas)											Asphalt sealcoat (to existing paved areas) Subtotal =	$ 21,419	
Sealcoat Area	10,690	sy	$ 0.73	$ 13,415	$ 0.40	$ 4,640	$ 0.29	$ 3,364	$ -	$ -	$ 2.00	$ 21,419	Means 2, 250, 1960
Capping/Covering											Capping/Covering Subtotal =	$ 37,572	
Asphalt cap - bituminous (0.33 ft. Thick)	1,176	cy	$ 10.35	$ 20,922	$ 0.50	$ 638	$ 12.55	$ 16,012	$ -	$ -	$ 31.95	$ 37,572	Means 18, 03, 03, 06
Total Covering Capital Costs BLK-A											**Total Covering Capital Costs BLK-A Subtotal =**	**$ 58,991**	
Covering Block BLK-29													
Area													
Area Requiring Paving	12,330	sy											
Area Requiring Sealcoat	12,330	sy											
Asphalt sealcoat (to existing paved areas)											Asphalt sealcoat (to existing paved areas) Subtotal =	$ 24,703	
Sealcoat Area	12,330	sy	$ 0.73	$ 15,472	$ 0.40	$ 5,351	$ 0.29	$ 3,880	$ -	$ -	$ 2.00	$ 24,703	Means 2, 250, 1960
Capping/Covering											Capping/Covering Subtotal =	$ 43,335	
Asphalt cap - bituminous (0.33 ft. Thick)	1,356	cy	$ 10.35	$ 24,131	$ 0.50	$ 736	$ 12.55	$ 18,468	$ -	$ -	$ 31.95	$ 43,335	Means 18, 03, 03, 06
Total Covering Capital Costs BLK-29											**Total Covering Capital Costs BLK-29 Subtotal =**	**$ 68,038**	

TABLE F-5A: CAPITAL AND LABOR COST ESTIMATE, ALTERNATIVE S-5 (CONTINUED)

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Alternative S-5: Excavation, Covers, Disposal, and Institutional Controls

Location Factors

Labor:	100.0%	(San Francisco - Means Section 1)	133.8%
Equipment:	100.0%	(San Francisco - Means Section 1)	112.6%
Material:	100.0%	(San Francisco - Means Section 1)	112.6%
Assembly:	124.0%		122.0% Level D
Professional Labor Multiplier:	1.6	(RACER)	
Labor Overhead & Profit Multiplier.:	1.719	(Includes 10% to account for PPE [modified Level D])	
Material and Equipment Profit:	9%	(RACER)	

Project Duration: 6.0 Months or 133 working days

Description	Quantitity	Unit	Unloaded Labor Unit Cost	Total Labor (including O&P)	Unloaded Equipment Unit Cost	Total Equipment (including profit)	Unloaded Material Unit Cost	Total Material (including Profit)	Unloaded Assembly Unit Cost	Total Assembly Cost (including profit)	Total Unit Cost (including O&P)	Total Cost (including O&P)	Comments
Covering Block BLK-30A													
Area													
Area Requiring Paving	8,204	sy											
Area Requiring Sealcoat	8,204	sy											
Asphalt sealcoat (to existing paved areas)											Asphalt sealcoat (to existing paved areas) Subtotal =	$ 16,438	
Sealcoat Area	8,204	sy	$ 0.73	$ 10,295	$ 0.40	$ 3,561	$ 0.29	$ 2,582	$ -	$ -	$ 2.00	$ 16,438	Means 2, 250, 1960
Capping/Covering											Capping/Covering Subtotal =	$ 28,836	
Asphalt cover - bituminous (0.33 ft. Thick)	902	cy	$ 10.35	$ 16,057	$ 0.50	$ 490	$ 12.55	$ 12,289	$ -	$ -	$ 31.95	$ 28,836	Means 18, 03, 03, 06
Total Covering Capital Costs BLK-30A											**Total Covering Capital Costs BLK-30A Subtotal =**	**$ 45,274**	
Covering Block BLK-30B													
Area													
Area Requiring Paving	1,919	sy											
Area Requiring Sealcoat	1,919	sy											
Asphalt sealcoat (to existing paved areas)											Asphalt sealcoat (to existing paved areas) Subtotal =	$ 3,845	
Sealcoat Area	1,919	sy	$ 0.73	$ 2,408	$ 0.40	$ 833	$ 0.29	$ 604	$ -	$ -	$ 2.00	$ 3,845	Means 2, 250, 1960
Capping/Covering											Capping/Covering Subtotal =	$ 6,743	
Asphalt cover - bituminous (0.33 ft. Thick)	211	cy	$ 10.35	$ 3,755	$ 0.50	$ 114	$ 12.55	$ 2,874	$ -	$ -	$ 31.95	$ 6,743	Means 18, 03, 03, 06
Total Covering Capital Costs BLK-30B											**Total Covering Capital Costs BLK-30B Subtotal =**	**$ 10,588**	
Covering Block BLK-37													
Area													
Area Requiring Paving	3,756	sy											
Area Requiring Sealcoat	3,756	sy											
Asphalt sealcoat (to existing paved areas)											Asphalt sealcoat (to existing paved areas) Subtotal =	$ 7,526	
Sealcoat Area	3,756	sy	$ 0.73	$ 4,714	$ 0.40	$ 1,630	$ 0.29	$ 1,182	$ -	$ -	$ 2.00	$ 7,526	Means 2, 250, 1960
Capping/Covering											Capping/Covering Subtotal =	$ 13,202	
Asphalt cap - bituminous (0.33 ft. Thick)	413	cy	$ 10.35	$ 7,352	$ 0.50	$ 224	$ 12.55	$ 5,626	$ -	$ -	$ 31.95	$ 13,202	Means 18, 03, 03, 06
Total Covering Capital Costs BLK-37											**Total Covering Capital Costs BLK-37 Subtotal =**	**$ 20,728**	
Covering Block BLK-38													
Area													
Area Requiring Paving	6,102	sy											
Area Requiring Sealcoat	6,102	sy											
Asphalt sealcoat (to existing paved areas)											Asphalt sealcoat (to existing paved areas) Subtotal =	$ 12,226	
Sealcoat Area	6,102	sy	$ 0.73	$ 7,658	$ 0.40	$ 2,648	$ 0.29	$ 1,920	$ -	$ -	$ 2.00	$ 12,226	Means 2, 250, 1960
Capping/Covering											Capping/Covering Subtotal =	$ 21,447	
Asphalt cap - bituminous (0.33 ft. Thick)	671	cy	$ 10.35	$ 11,943	$ 0.50	$ 364	$ 12.55	$ 9,140	$ -	$ -	$ 31.95	$ 21,447	Means 18, 03, 03, 06
Total Covering Capital Costs BLK-38											**Total Covering Capital Costs BLK-38 Subtotal =**	**$ 33,673**	
Covering Block BLK-39													
Area													
Area Requiring Vegetative Cover	20,805	sy											
Capping/Covering											Capping/Covering Subtotal =	$ 187,232	
Soil cover - Borrow, fill and compact (2 ft. thick)	13,870	cy	$ 1.68	$ 40,055	$ 2.63	$ 39,578	$ 7.15	$ 107,599	$ -	$ -	$ 13.50	$ 187,232	Means 17, 03, 04, 23
Seeding (soil cover only)											Seeding (soil cover only) Subtotal =	$ 9,714	
Hydroseeding	208.0482	csy	$ 2.59	$ 926	$ 2.25	$ 508	$ 9.37	$ 2,115	$ -	$ -	$ 17.06	$ 3,549	Means 18, 05, 04, 01
Hydro fertilizer	208.0482	csy	$ 1.03	$ 368	$ 0.75	$ 169	$ 2.18	$ 492	$ -	$ -	$ 4.95	$ 1,029	Means 18, 05, 04, 08
Water - 10 times	208.0482	csy	$ 8.89	$ 3,179	$ 7.69	$ 1,736	$ 0.98	$ 221	$ -	$ -	$ 24.69	$ 5,136	Means 18, 05, 04, 08
Total Covering Capital Costs BLK-39											**Total Covering Capital Costs BLK-39 Subtotal =**	**$ 196,946**	
Covering Block BLK-42													
Area													
Area Requiring Paving	8,033	sy											
Capping/Covering											Capping/Covering Subtotal =	$ 28,234	
Asphalt cover - bituminous (0.33 ft. Thick)	884	cy	$ 10.35	$ 15,722	$ 0.50	$ 479	$ 12.55	$ 12,033	$ -	$ -	$ 31.95	$ 28,234	Means 18, 03, 03, 06
Total Covering Capital Costs BLK-42											**Total Covering Capital Costs BLK-42 Subtotal =**	**$ 28,234**	

TABLE F-5A: CAPITAL AND LABOR COST ESTIMATE, ALTERNATIVE S-5 (CONTINUED)

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Alternative S-5: Excavation, Covers, Disposal, and Institutional Controls

Location Factors

Labor:	100.0%	(San Francisco - Means Section 1)	133.8%
Equipment:	100.0%	(San Francisco - Means Section 1)	112.6%
Material:	100.0%	(San Francisco - Means Section 1)	112.6%
Assembly:	124.0%		122.0% Level D
Professional Labor Multiplier:	1.6	(RACER)	
Labor Overhead & Profit Multiplier.:	1.719	(Includes 10% to account for PPE [modified Level D])	
Material and Equipment Profit:	9%	(RACER)	

Project Duration: 6.0 Months or 133 working days

Description	Quantitity	Unit	Unloaded Labor Unit Cost	Total Labor (including O&P)	Unloaded Equipment Unit Cost	Total Equipment (including profit)	Unloaded Material Unit Cost	Total Material (including Profit)	Unloaded Assembly Unit Cost	Total Assembly Cost (including profit)	Total Unit Cost (including O&P)	Total Cost (including O&P)	Comments
Covering Block DMI-1													
Area													
Area Requiring Paving	105,320	sy											
Area Requiring Sealcoat	105,320	sy											
Asphalt sealcoat (to existing paved areas)											Asphalt sealcoat (to existing paved areas) Subtotal =	$ 211,011	
Sealcoat Area	105,320	sy	$ 0.73	$ 132,163	$ 0.40	$ 45,709	$ 0.29	$ 33,139	$ -	$ -	$ 2.00	$ 211,011	Means 2, 250, 1960
Capping/Covering											Capping/Covering Subtotal =	$ 370,158	
Asphalt cover - bituminous (0.33 ft. Thick)	11,585	cy	$ 10.35	$ 206,120	$ 0.50	$ 6,285	$ 12.55	$ 157,753	$ -	$ -	$ 31.95	$ 370,158	Means 18, 03, 03, 06
Total Covering Capital Costs DMI-1											**Total Covering Capital Costs DMI-1 Subtotal =**	**$ 581,169**	
Covering Block DOS-1													
Area													
Area Requiring Vegetative Cover	18,641	sy											
Capping/Covering											Capping/Covering Subtotal =	$ 167,764	
Soil cover - Borrow, fill and compact (2 ft. thick)	12,428	cy	$ 1.68	$ 35,890	$ 2.63	$ 35,463	$ 7.15	$ 96,411	$ -	$ -	$ 13.50	$ 167,764	Means 17, 03, 04, 23
Seeding (soil cover only)											Seeding (soil cover only) Subtotal =	$ 8,705	
Hydroseeding	186.41494	csy	$ 2.59	$ 830	$ 2.25	$ 455	$ 9.37	$ 1,895	$ -	$ -	$ 17.06	$ 3,180	Means 18, 05, 04, 01
Hydro fertilizer	186.41494	csy	$ 1.03	$ 330	$ 0.75	$ 152	$ 2.18	$ 441	$ -	$ -	$ 4.95	$ 923	Means 18, 05, 04, 08
Water - 10 times	186.41494	csy	$ 8.89	$ 2,849	$ 7.69	$ 1,555	$ 0.98	$ 198	$ -	$ -	$ 24.69	$ 4,602	Means 18, 05, 04, 08
Total Covering Capital Costs DOS-1											**Total Covering Capital Costs DOS-1 Subtotal =**	**$ 176,469**	
Total Covering Capital Costs											**Total Covering Capital Costs Subtotal =**	**$ 1,220,110**	
Stockpile Disposal													
Excavation											Excavation Subtotal =	$ 34,356	
Standard soil excavation													
Excavation	560	cy	$ 1.35	$ 1,300	$ 1.71	$ 1,039	$ -	$ -	$ -	$ -	$ 4.18	$ 2,339	Means 17, 03, 02, 77
Stockpile characterization sampling													
Sampling	28	ea	$ -	$ -	$ -	$ -	$ 1,000.00	$ 30,380	$ -	$ -	$ 1,085.00	$ 30,380	Means 33, 02, 06 assume 1 sample per 20 cy
Grading													
Rough grade	1008	sy	$ 0.29	$ 502	$ 0.51	$ 558	$ -	$ -	$ -	$ -	$ 1.05	$ 1,060	Means 17, 03, 01, 02 Assume 5' high pyramid
Fine grade	1008	sy	$ 0.20	$ 347	$ 0.21	$ 230	$ -	$ -	$ -	$ -	$ 0.57	$ 577	Means 17, 03, 01, 06
Waste Hauling and Disposal											Waste Hauling and Disposal Subtotal =	$ 170,403	
Haul (20 ton dump less than 200 mi.)	672	cy		$ -		$ -	$ 94.12	$ 68,625		$ -	$ 102.12	$ 68,625	Means 33, 19, 02, 09
Dump charge	672	cy		$ -		$ -	$ 119.36	$ 87,028		$ -	$ 129.51	$ 87,028	Means 33, 19, 03, 24
Truck decontamination	672	cy		$ -		$ -	$ 20.23	$ 14,750		$ -	$ 21.95	$ 14,750	Means 33, 19, 03, 11
Total Stockpile Disposal											**Total Stockpile Disposal Subtotal =**	**$ 204,759**	
Construction Cost Summary													
Total Construction Capital Costs											**Total Construction Capital Costs Subtotal =**	**$ 2,597,581**	
Design Cost											**Design Cost Subtotal =**	**$ 311,710**	
Assume 12% of construction cost												$ 311,710	

TABLE F-5A: CAPITAL AND LABOR COST ESTIMATE, ALTERNATIVE S-5 (CONTINUED)

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Alternative S-5: Excavation, Covers, Disposal, and Institutional Controls

Location Factors

Labor:	100.0%	(San Francisco - Means Section 1)	133.8%
Equipment:	100.0%	(San Francisco - Means Section 1)	112.6%
Material:	100.0%	(San Francisco - Means Section 1)	112.6%
Assembly:	124.0%		122.0% Level D
Professional Labor Multiplier:	1.6	(RACER)	
Labor Overhead & Profit Multiplier.:	1.719	(Includes 10% to account for PPE [modified Level D])	
Material and Equipment Profit:	9%	(RACER)	

Project Duration: 6.0 Months or 133 working days

Description	Quantitity	Unit	Unloaded Labor Unit Cost	Total Labor (including O&P)	Unloaded Equipment Unit Cost	Total Equipment (including profit)	Unloaded Material Unit Cost	Total Material (including Profit)	Unloaded Assembly Unit Cost	Total Assembly Cost (including profit)	Total Unit Cost (including O&P)	Total Cost (including O&P)	Comments
Institutional Controls													
Legal Controls													
	P4		**P3**		**P2**		**P1**		**Lawyer**		**Clerk**		
Description	**Hour**	**Unloaded Cost**	**Hour**	**Unloaded Cost**	**Hour**	**Unloaded Cost**	**Hour**	**Unloaded Cost**	**Hour**	**Unloaded Cost**	**Hour**	**Unloaded Cost**	
Professional Unit Costs	**$ 125.00**		**$ 100.00**		**$ 60.00**		**$ 50.00**		**$ 198.00**		**$ 83.00**		

Description	P4 Hour	P4 Unloaded Cost	P3 Hour	P3 Unloaded Cost	P2 Hour	P2 Unloaded Cost	P1 Hour	P1 Unloaded Cost	Lawyer Hour	Lawyer Unloaded Cost	Clerk Hour	Clerk Unloaded Cost	unit	Labor Cost	ODCs	Subtask Cost	Comments
Institutional Control Implementation and Certification												Institutional Control Implementation and Certification Subtotal =				$ 47,090	
LUC RD scoping meeting	10	$ 1,250.00	16	$ 1,600.00	12	$ 720.00	0	$ -	0	$ -	0	$ -	hr	$ 3,570	$ 100	$ 3,670	ODCs for subsistence.
Prepare draft LUC RD	16	$ 2,000.00	32	$ 3,200.00	32	$1,920.00	24	$ 1,200.00	0	$ -	0	$ -	hr	$ 8,320	$ -	$ 8,320	
Submit draft LUC RD	8	$ 1,000.00	20	$ 2,000.00	8	$ 480.00	0	$ -	0	$ -	0	$ -	hr	$ 3,480	$ 100	$ 3,580	ODCs for printing.
BCT review period	8	$ 1,000.00	16	$ 1,600.00	8	$ 480.00	0	$ -	0	$ -	0	$ -	hr	$ 3,080	$ -	$ 3,080	
BCT comments due	8	$ 1,000.00	16	$ 1,600.00	8	$ 480.00	0	$ -	0	$ -	0	$ -	hr	$ 3,080	$ -	$ 3,080	
RTC meeting and BCT concurrence	8	$ 1,000.00	8	$ 800.00	8	$ 480.00	0	$ -	0	$ -	0	$ -	hr	$ 2,280	$ 500	$ 2,780	ODCs for subsistence.
Prepare draft final LUC RD	12	$ 1,500.00	20	$ 2,000.00	24	$1,440.00	24	$ 1,200.00	0	$ -	0	$ -	hr	$ 6,140	$ -	$ 6,140	
Submit draft final LUC RD	8	$ 1,000.00	8	$ 800.00	6	$ 360.00	0	$ -	0	$ -	0	$ -	hr	$ 2,160	$ 100	$ 2,260	ODCs for printing.
BCT review and concurrence period	12	$ 1,500.00	16	$ 1,600.00	34	$2,040.00	0	$ -	0	$ -	0	$ -	hr	$ 5,140	$ -	$ 5,140	
BCT concurrence letters due	12	$ 1,500.00	12	$ 1,200.00	6	$ 360.00	0	$ -	0	$ -	0	$ -	hr	$ 3,060	$ -	$ 3,060	
Prepare final LUC RD with RTC	12	$ 1,500.00	12	$ 1,200.00	6	$ 360.00	8	$ 400.00	0	$ -	0	$ -	hr	$ 3,460	$ -	$ 3,460	
Submit final LUC RD with RTC	12	$ 1,500.00	8	$ 800.00	2	$ 120.00	0	$ -	0	$ -	0	$ -	hr	$ 2,420	$ 100	$ 2,520	ODCs for printing.
Covenant to Restrict Use of Property												Covenant to Restrict Use of Property Subtotal =				$ 15,510	
Prepare draft covenant	16	$ 2,000.00	20	$ 2,000.00	0	$ -	0	$ -	40	$ 7,920.00	10	$ 830.00	hr	$ 12,750	$ 1,000	$ 13,750	ODCs for subsistence.
File covenant	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -	20	$ 1,660.00	hr	$ 1,660	$ 100	$ 1,760	ODCs for travel fees.
Total Legal Controls Capital Costs												**Total Legal Controls Capital Costs Subtotal =**				**$ 62,600**	
Total Institutional Controls Capital Costs												**Total Institutional Controls Capital Costs Subtotal =**				**$ 62,600**	

		2005 Costs	2007 Costs
Annual Discount Rate	**3.1%**		
Total Project Capital Cost =		**$ 2,971,891**	**$ 3,159,004**
Present Value of 30 Years of Periodic Costs = (Five-Year Reviews and Asphalt Maintenance)		**$ 1,340,926**	**$ 1,425,352**
SubTotal =		**$ 4,312,816**	**$ 4,584,356**
20% Contingency =		**$ 862,563**	**$ 916,871**
Total Project Cost =		**$ 5,175,380**	**$ 5,501,227**

Notes:

	Inch	mo	Month
"	Inch	N/A	Not applicable
BCT	Base Realignment and Closure Cleanup Team	O&M	Operations and maintenance
cy	Cubic Yard	O&P	Overhead and profit
ea	each	ODC	Other direct cost
FOST	Finding of suitability to transfer	Pg	Page
ft	Foot	PPE	Personal protective equipment
hr	Hour	RACER	Remedial Action Cost Engineering and Requirements System
ID	Identification	RTC	Response to Comments
IR	Installation restoration	sy	Square yard
LUC RD	Land Use Control Remedial Design		
Means	Means, RS. 2004. "Environmental Remediation Cost Data – Unit Price, 10th Annual Edition, Environmental Cost Handling Options and Solutions," RS Means Company, Inc, Kingston, MA. October.		
mi.	Mile		

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
38	Present-Worth Cost: $3,520,000	Table 6	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Appendix F, Table F-7A. SulTech. November 30, 2007.

TABLE F-7A: CAPITAL AND LABOR COST ESTIMATE, ALTERNATIVE GW-2

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Alternative GW-2: Long-Term Groundwater Monitoring and Institutional Controls

Site: Parcel D
Location: Hunters Point Shipyard, San Francisco, California
Phase: Feasibility Study
Base Year: 2005

DESCRIPTION	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Notes
Project Management and Other Costs							
Install Groundwater Monitoring Wells							1 well to be installed
Organic Vapor Analyzer Rental, per Day	1.00	DAY	$128.99	$0.00	$0.00	$129	
Decontaminate Rig, Augers, Screen (Rental Equipment)	1.00	DAY	$18.79	$648.54	$0.00	$667	
Field Technician	16.00	HR	$0.00	$47.87	$0.00	$766	
2" PVC, Schedule 40, Well Casing	10.00	LF	$1.27	$4.66	$7.33	$133	
2" PVC, Schedule 40, Well Screen	10.00	LF	$2.93	$6.02	$9.46	$184	
2" PVC, Well Plug	1.00	EA	$6.17	$7.00	$11.00	$24	
Hollow Stem Auger, 8" Diameter Borehole, Depth <= 100 feet	21.00	LF	$0.00	$12.79	$20.11	$691	
DOT steel drums, 55 gallon, open, 17C	2.00	EA	$92.27	$0.00	$0.00	$185	
2" Screen, Filter Pack	12.00	LF	$3.29	$3.96	$6.23	$162	
2" Well, Portland Cement Grout	7.00	LF	$1.23	$0.00	$0.00	$9	
2" Well, Bentonite Seal	1.00	EA	$9.78	$15.74	$24.75	$50	
Mobilize/DeMobilize Drilling Rig & Crew	1.00	LS	$0.00	$1,661.90	$996.44	$2,658	
Surface Pad, Concrete, 2' x 2' x 4"	3.00	EA	$40.84	$21.86	$1.81	$194	
SUBTOTALa						**$5,851**	
Residual Waste Management							Waste Characterization & Drum Drill Cuttings
RCRA Characterization	100%		$1,000.00	$0.00	$0.00	$1,000	
Secondary containment and storage, storage systems, loading hazardous waste for shipment, load drums on disposal truck	2.00	EA	$0.00	$5.80	$1.16	$14	
Subcontracted shipping of hazardous waste, transport drums of solid hazardous waste, 80 55 gal. drums	45.00	MI	$1.87	$0.00	$0.00	$84	
Commercial RCRA landfills, additional landfill disposal costs, waste stream evaluation, 50% rebate on first	1.00	EA	$501.36	$0.00	$0.00	$501	
Commercial RCRA landfills, drummed waste disposal, solid, non-hazardous, 55 gal drums	2.00	EA	$13.50	$0.00	$0.00	$27	
SUBTOTAL						**$1,626**	
Institutional Controls							
Institutional Control Remedial Design						$39,625	
Environmental Restrictions in Deed						$31,470	
Register and File Deed						$133	
Contingency		20%				$14,246	
Navy Oversight		20%				$14,246	
SUBTOTAL						**$99,719**	
Project Reports							
Remedial Design Work Plan						$30,000	Based on similar projects by Tetra Tech
Health and Safety Plan						$40,000	
Waste Management Plan						$15,000	
Design Quality Control Plan						$20,000	
SUBTOTAL						**$105,000**	
SUBTOTAL OF CAPITAL COSTS						**$212,197**	

TABLE F-7A: CAPITAL AND LABOR COST ESTIMATE, ALTERNATIVE GW-2 (CONTINUED)

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Alternative GW-2: Long-Term Groundwater Monitoring and Institutional Controls				
Site:	Parcel D			
Location:	Hunters Point Shipyard, San Francisco, California			
Phase:	Feasibility Study			
Base Year:	2005			
Professional Labor				
Design	5.00%		$10,610	Oversight entire program
Project Management Labor Cost	5.00%		$10,610	
Planning Documents Labor Cost	4.00%		$8,488	
Construction Oversight Labor Cost	3.25%		$6,896	
Reporting Labor Cost	0.75%		$1,591	
As-Built Drawings Labor Cost	0.75%		$1,591	
Public Notice Labor Cost	0.25%		$530	
Site Closure Activities Labor Cost	2.50%		$5,305	
Permitting Labor Cost	2.00%		$4,244	
SUBTOTAL			**$49,866**	
		Annual Inflation 3.10%	**2005 Costs**	**2007 Costs**
		Project Capital & Labor Cost =	**$262,063**	**$278,563**
		Present Value of 30 Years of Periodic Costs =	**$2,495,947**	**$2,653,095**
		SubTotal =	**$2,758,010**	**$2,931,657**
		20% Contingency =	**$551,602**	**$586,331**
		Total cost for Project Management and Other Costs =	**$3,309,612**	**$3,517,989**
		TOTAL PROJECT COSTS =	**$3,309,612**	**$3,517,989**

Notes: RACER 2005 outputs are in 2005 unmarked up dollars. Modifiers for San Francisco California were used: Material 1.000, Labor 1.000, and equipment 1.000.
RACER 2005 estimate for outyear annual sampling provided as a lump sum value are in 2005 unmarked up dollars.
Metals and VOCs treatment dose costs obtained from Regenesis, April 22, 2005

'	foot
"	Inch
<	greater than
CADD	Computer-aided design and drafting
DOT	Department of Transportation
EA	Each
ft	Feet
gal	Gallon
lbs	Pounds
OD	Outside diameter
PVC	Polyvinyl chloride
RACER	Remedial Action Cost Engineering and Requirements System
RCRA	Resource Conservation Recovery Act
VOC	Volatile organic compound
ZVI	Zero-valent iron

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
39	Present-Worth Cost: $2,450,000/$5,350,000	Table 6	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Appendix F, Tables F-8A and F-9A. SulTech. November 30, 2007.

TABLE F-8A: CAPITAL AND LABOR COST ESTIMATE, ALTERNATIVE GW-3A

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Alternative GW-3A: In-Situ VOC Plume Treatment with Slow-Release Compound Reduced Groundwater Monitoring, and Institutional Controls

Site: Parcel D
Location: Hunters Point Shipyard, San Francisco, California
Phase: Feasibility Study
Base Year: 2005

DESCRIPTION	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Notes
VOC Plume Remediation							
Full Scale Pilot Study							
Applied to GW						$35,000	
SUBTOTAL						**$35,000**	
Full Scale Treatment							
Geoprobe drilling	27	days	$2,500.00			$67,500	10 wells per day
Wells	270	wells	23.0'	inj. Interval	6210'		Total injection length
Substrate mass	6210'		3.9	lbs /ft	24219		Total lbs of substrate
Substrate injection	24219	lbs	$5.25	$0.00	$0.00	$127,150	
SUBTOTAL						**$194,650**	
Professional Labor							
Design		5.00%				$9,732	Oversight entire program
Project Management Labor Cost		5.00%				$9,732	
Planning Documents Labor Cost		4.00%				$7,786	
Construction Oversight Labor Cost		3.25%				$6,326	
Reporting Labor Cost		0.75%				$1,460	
As-Built Drawings Labor Cost		0.75%				$1,460	
Public Notice Labor Cost		0.25%				$487	
Site Closure Activities Labor Cost		2.50%				$4,866	
Permitting Labor Cost		2.00%				$3,893	
SUBTOTAL						**$45,743**	
				Annual Inflation	3.10%	**2005 Costs**	**2007 Costs**
					Project Capital & Labor Cost =	**$275,392**	**$292,731**
					Present Value of 30 Years of Periodic Costs =	**$184,842**	**$196,480**
					SubTotal =	**$460,235**	**$489,211**
					20% Contingency =	**$92,047**	**$97,842**
					Total cost for VOC Plume Remediation =	**$552,282**	**$587,054**

TABLE F-8A: CAPITAL AND LABOR COST ESTIMATE, ALTERNATIVE GW-3A (CONTINUED)

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Alternative GW-3A: In-Situ VOC Plume Treatment with Slow-Release Compound Reduced Groundwater Monitoring, and Institutional Controls

Site: Parcel D
Location: Hunters Point Shipyard, San Francisco, California
Phase: Feasibility Study
Base Year: 2005

DESCRIPTION	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Notes
Project Management and Other Costs							
Install Groundwater Monitoring Wells							1 well to be installed
Organic Vapor Analyzer Rental, per Day	1.00	DAY	$128.99	$0.00	$0.00	$129	
Decontaminate Rig, Augers, Screen (Rental Equipment)	1.00	DAY	$18.79	$648.54	$0.00	$667	
Field Technician	16.00	HR	$0.00	$47.87	$0.00	$766	
2" PVC, Schedule 40, Well Casing	10.00	LF	$1.27	$4.66	$7.33	$133	
2" PVC, Schedule 40, Well Screen	10.00	LF	$2.93	$6.02	$9.46	$184	
2" PVC, Well Plug	1.00	EA	$6.17	$7.00	$11.00	$24	
Hollow Stem Auger, 8" Diameter Borehole, Depth <= 100 feet	21.00	LF	$0.00	$12.79	$20.11	$691	
DOT steel drums, 55 gallon, open, 17C	2.00	EA	$92.27	$0.00	$0.00	$185	
2" Screen, Filter Pack	12.00	LF	$3.29	$3.96	$6.23	$162	
2" Well, Portland Cement Grout	7.00	LF	$1.23	$0.00	$0.00	$9	
2" Well, Bentonite Seal	1.00	EA	$9.78	$15.74	$24.75	$50	
Mobilize/DeMobilize Drilling Rig & Crew	1.00	LS	$0.00	$1,661.90	$996.44	$2,658	
Surface Pad, Concrete, 2' x 2' x 4"	3.00	EA	$40.84	$21.86	$1.81	$194	
SUBTOTALa						**$5,851**	
Residual Waste Management							Waste Characterization & Drum Drill Cuttings
RCRA Characterization	100%		$1,000.00	$0.00	$0.00	$1,000	
Secondary containment and storage, storage systems, loading hazardous waste for shipment, load drums on disposal truck	2.00	EA	$0.00	$5.80	$1.16	$14	
Subcontracted shipping of hazardous waste, transport drums of solid hazardous waste, 80 55 gal. drums	45.00	MI	$1.87	$0.00	$0.00	$84	
Commercial RCRA landfills, additional landfill disposal costs, waste stream evaluation, 50% rebate on first	1.00	EA	$501.36	$0.00	$0.00	$501	
Commercial RCRA landfills, drummed waste disposal, solid, non-hazardous, 55 gal drums	2.00	EA	$13.50	$0.00	$0.00	$27	
SUBTOTAL						**$1,626**	
Institutional Controls							
Institutional Control Remedial Design						$39,625	
Environmental Restrictions in Deed						$31,470	
Register and File Deed						$133	
Contingency		20%				$14,246	
Navy Oversight		20%				$14,246	
SUBTOTAL						**$99,719**	
Project Reports							
Remedial Design Work Plan						$120,000	Based on similar projects by Tetra Tech
Health and Safety Plan						$40,000	
Waste Management Plan						$15,000	
Design Quality Control Plan						$20,000	
SUBTOTAL						**$195,000**	
SUBTOTAL OF CAPITAL COSTS						**$302,197**	

TABLE F-8A: CAPITAL AND LABOR COST ESTIMATE, ALTERNATIVE GW-3A (CONTINUED)

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Alternative GW-3A: In-Situ VOC Plume Treatment with Slow-Release Compound Reduced Groundwater Monitoring, and Institutional Controls

Site: Parcel D
Location: Hunters Point Shipyard, San Francisco, California
Phase: Feasibility Study
Base Year: 2005

DESCRIPTION	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Notes
Professional Labor							
Design		5.00%				$15,110	Oversight entire program
Project Management Labor Cost		5.00%				$15,110	
Planning Documents Labor Cost		4.00%				$12,088	
Construction Oversight Labor Cost		3.25%				$9,821	
Reporting Labor Cost		0.75%				$2,266	
As-Built Drawings Labor Cost		0.75%				$2,266	
Public Notice Labor Cost		0.25%				$755	
Site Closure Activities Labor Cost		2.50%				$7,555	
Permitting Labor Cost		2.00%				$6,044	
SUBTOTAL						**$71,016**	
			Annual Inflation		3.10%	**2005 Costs**	**2007 Costs**
					Project Capital & Labor Cost =	**$373,213**	**$396,711**
					Present Value of 30 Years of Periodic Costs =	**$873,500**	**$928,496**
					SubTotal =	**$1,246,713**	**$1,325,207**
					20% Contingency =	**$249,343**	**$265,041**
					Total cost for Project Management and Other Costs =	**$1,496,056**	**$1,590,249**

Project Cost Summary

	2005 Costs	2007 Costs
Total cost for VOC Plume Remediation =	**$552,282**	**$587,054**
Total cost for Metals Plume Monitoring =	**$210,526**	**$223,781**
Metals Plume Monitoring Contingency (20%) =	**$42,105**	**$44,756**
Total cost for Project Management and Other Costs =	**$1,496,056**	**$1,590,249**
TOTAL PROJECT COSTS =	**$2,300,968**	**$2,445,840**

Notes: RACER 2005 outputs are in 2005 unmarked up dollars. Modifiers for this site were: Material 1.000, Labor 1.000, and equipment 1.000.
RACER 2005 estimate for outyear annual sampling provided as a lump sum value are in 2005 unmarked up dollars.
Metals and VOCs treatment dose costs obtained from Regenesis, April 22, 2005

'	foot
"	Inch
<	greater than
CADD	Computer-aided design and drafting
DOT	Department of Transportation
EA	Each
ft	Feet
gal	Gallon
lbs	Pounds
OD	Outside diameter
PVC	Polyvinyl chloride
RACER	Remedial Action Cost Engineering and Requirements System
RCRA	Resource Conservation Recovery Act
VOC	Volatile organic compound
ZVI	Zero-valent iron

TABLE F-9A: CAPITAL AND LABOR COST ESTIMATE, ALTERNATIVE GW-3B

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Alternative GW-3B: In-Situ VOC Plume Treatment with Zero-Valent Iron, Reduced Groundwater Monitoring, and Institutional Controls

Site: Parcel D
Location: Hunters Point Shipyard, San Francisco, California
Phase: Feasibility Study
Base Year: 2005

DESCRIPTION	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Notes
VOC Plume Remediation							
Full Scale Pilot Study							
Applied to GW						$35,000	
SUBTOTAL						**$35,000**	
Full Scale Treatment							
Geoprobe Borings	27	days	$2,500.00			$67,500	10 wells per day
Wells	270	wells	23.0'	injection depth	6210'		Total Injection depth
Zero valent Iron	6210'		125.0	lbs /ft	776250		Total lbs of substrate
Applied to GW	776250	LBSf	$2.54	$0.00	$0.00	$1,971,675	
SUBTOTAL						**$2,039,175**	
Professional Labor							
Design		5.00%				$101,959	Oversight entire program
Project Management Labor Cost		5.00%				$101,959	
Planning Documents Labor Cost		4.00%				$81,567	
Construction Oversight Labor Cost		3.25%				$66,273	
Reporting Labor Cost		0.75%				$15,294	
As-Built Drawings Labor Cost		0.75%				$15,294	
Public Notice Labor Cost		0.25%				$5,098	
Site Closure Activities Labor Cost		2.50%				$50,979	
Permitting Labor Cost		2.00%				$40,784	
SUBTOTAL						**$479,206**	
				Annual Inflation	3.10%	**2005 Costs**	**2007 Costs**
					Project Capital & Labor Cost =	**$2,553,381**	**$2,714,145**
					Present Value of 30 Years of Periodic Costs =	**$184,842**	**$196,480**
					SubTotal =	**$2,738,223**	**$2,910,625**
					20% Contingency =	**$547,645**	**$582,125**
					Total cost for VOC Plume Remediation =	**$3,285,868**	**$3,492,749**

TABLE F-9A: CAPITAL AND LABOR COST ESTIMATE, ALTERNATIVE GW-3B (CONTINUED)

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Alternative GW-3B: In-Situ VOC Plume Treatment with Zero-Valent Iron, Reduced Groundwater Monitoring, and Institutional Controls

Site: Parcel D
Location: Hunters Point Shipyard, San Francisco, California
Phase: Feasibility Study
Base Year: 2005

DESCRIPTION	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Notes
Project Management and Other Costs							
Install Groundwater Monitoring Wells							1 well to be installed
Organic Vapor Analyzer Rental, per Day	1.00	DAY	$128.99	$0.00	$0.00	$129	
Decontaminate Rig, Augers, Screen (Rental Equipment)	1.00	DAY	$18.79	$648.54	$0.00	$667	
Field Technician	16.00	HR	$0.00	$47.87	$0.00	$766	
2" PVC, Schedule 40, Well Casing	10.00	LF	$1.27	$4.66	$7.33	$133	
2" PVC, Schedule 40, Well Screen	10.00	LF	$2.93	$6.02	$9.46	$184	
2" PVC, Well Plug	1.00	EA	$6.17	$7.00	$11.00	$24	
Hollow Stem Auger, 8" Diameter Borehole, Depth <= 100 feet	21.00	LF	$0.00	$12.79	$20.11	$691	
DOT steel drums, 55 gallon, open, 17C	2.00	EA	$92.27	$0.00	$0.00	$185	
2" Screen, Filter Pack	12.00	LF	$3.29	$3.96	$6.23	$162	
2" Well, Portland Cement Grout	7.00	LF	$1.23	$0.00	$0.00	$9	
2" Well, Bentonite Seal	1.00	EA	$9.78	$15.74	$24.75	$50	
Mobilize/DeMobilize Drilling Rig & Crew	1.00	LS	$0.00	$1,661.90	$996.44	$2,658	
Surface Pad, Concrete, 2' x 2' x 4"	3.00	EA	$40.84	$21.86	$1.81	$194	
SUBTOTALa						**$5,851**	
Residual Waste Management							Waste Characterization & Drum Drill Cuttings
RCRA Characterization	100%		$1,000.00	$0.00	$0.00	$1,000	
Secondary containment and storage, storage systems, loading hazardous waste for shipment, load drums on disposal truck	2.00	EA	$0.00	$5.80	$1.16	$14	
Subcontracted shipping of hazardous waste, transport drums of solid hazardous waste, 80 55 gal. drums	45.00	MI	$1.87	$0.00	$0.00	$84	
Commercial RCRA landfills, additional landfill disposal costs, waste stream evaluation, 50% rebate on first	1.00	EA	$501.36	$0.00	$0.00	$501	
Commercial RCRA landfills, drummed waste disposal, solid, non-hazardous, 55 gal drums	2.00	EA	$13.50	$0.00	$0.00	$27	
SUBTOTAL						**$1,626**	
Institutional Controls							
Institutional Control Remedial Design						$39,625	
Environmental Restrictions in Deed						$31,470	
Register and File Deed						$133	
Contingency		20%				$14,246	
Navy Oversight		20%				$14,246	
SUBTOTAL						**$99,719**	
Project Reports							
Remedial Design Work Plan						$120,000	Based on similar projects by Tetra Tech
Health and Safety Plan						$40,000	
Waste Management Plan						$15,000	
Design Quality Control Plan						$20,000	
SUBTOTAL						**$195,000**	
SUBTOTAL OF CAPITAL COSTS						**$302,197**	

TABLE F-9A: CAPITAL AND LABOR COST ESTIMATE, ALTERNATIVE GW-3B (CONTINUED)

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Alternative GW-3B: In-Situ VOC Plume Treatment with Zero-Valent Iron, Reduced Groundwater Monitoring, and Institutional Controls

Site: Parcel D
Location: Hunters Point Shipyard, San Francisco, California
Phase: Feasibility Study
Base Year: 2005

DESCRIPTION	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Notes
Professional Labor							
Design		5.00%				$15,110	Oversight entire program
Project Management Labor Cost		5.00%				$15,110	
Planning Documents Labor Cost		4.00%				$12,088	
Construction Oversight Labor Cost		3.25%				$9,821	
Reporting Labor Cost		0.75%				$2,266	
As-Built Drawings Labor Cost		0.75%				$2,266	
Public Notice Labor Cost		0.25%				$755	
Site Closure Activities Labor Cost		2.50%				$7,555	
Permitting Labor Cost		2.00%				$6,044	
SUBTOTAL						**$71,016**	
			Annual Inflation		3.10%	**2005 Costs**	**2007 Costs**
					Project Capital & Labor Cost =	**$373,213**	**$396,711**
					Present Value of 30 Years of Periodic Costs =	**$873,500**	**$928,496**
					SubTotal =	**$1,246,713**	**$1,325,207**
					20% Contingency =	**$249,343**	**$265,041**
					Total cost for Project Management and Other Costs =	**$1,496,056**	**$1,590,249**

Project Capital Cost Summary

	2005 Costs	2007 Costs
Total cost for VOC Plume Remediation =	**$3,285,868**	**$3,492,749**
Total cost for Metals Plume Monitoring =	**$210,526**	**$223,781**
Metals Plume Monitoring Contingency (20%) =	**$42,105**	**$44,756**
Total cost for Project Management and Other Costs =	**$1,496,056**	**$1,590,249**
TOTAL PROJECT COSTS =	**$5,034,555**	**$5,351,535**

Notes: RACER 2005 outputs are in 2005 unmarked up dollars. Modifiers for this site were: Material 1.000, Labor 1.000, and equipment 1.000.
RACER 2005 estimate for outyear annual sampling provided as a lump sum value are in 2005 unmarked up dollars.
Metals and VOCs treatment dose costs obtained from Regenesis, April 22, 2005

'	foot
"	Inch
<	greater than
CADD	Computer-aided design and drafting
DOT	Department of Transportation
EA	Each
ft	Feet
gal	Gallon
lbs	Pounds
OD	Outside diameter
PVC	Polyvinyl chloride
RACER	Remedial Action Cost Engineering and Requirements System
RCRA	Resource Conservation Recovery Act
VOC	Volatile organic compound
ZVI	Zero-valent iron

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
40	Present-Worth Cost: $2,870,000/$9,200,000	Table 6	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Appendix F, Tables F-10A and F-11A. SulTech. November 30, 2007.

TABLE F-10A: CAPITAL AND LABOR COST ESTIMATE, ALTERNATIVE GW-4A

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Alternative GW-4A: In-Situ VOC and Metals Plume Treatment with Slow-Release Compound Reduced Groundwater Monitoring, and Institutional Controls

Site: Parcel D
Location: Hunters Point Shipyard, San Francisco, California
Phase: Feasibility Study
Base Year: 2005

DESCRIPTION	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Notes
Metals Plume Remediation							
Full Scale Pilot Study							
Applied to GW						$35,000	
SUBTOTAL						**$35,000**	
Full Scale Treatment							
Geoprobe Borings	32.00	days	$2,500.00			$80,000	One boring per 10 wells
Wells	320	wells	23.0'	injection depth	7360'		Total Injection depth
Substrate	7360'		2.8	lbs /ft	20608		Total lbs of substrate
Applied to GW	20608	lbs	$7.75	$0.00	$0.00	$159,712	Total cost of substrate
SUBTOAL						**$239,712**	
Professional Labor							Oversight entire program
Design		5.00%				$11,986	
Project Management Labor Cost		5.00%				$11,986	
Planning Documents Labor Cost		4.00%				$9,588	
Construction Oversight Labor Cost		3.25%				$7,791	
Reporting Labor Cost		0.75%				$1,798	
As-Built Drawings Labor Cost		0.75%				$1,798	
Public Notice Labor Cost		0.25%				$599	
Site Closure Activities Labor Cost		2.50%				$5,993	
Permitting Labor Cost		2.00%				$4,794	
SUBTOTAL						**$56,332**	
				Annual Inflation	3.10%	**2005 Costs**	**2007 Costs**
					Project Capital & Labor Cost =	**$331,044**	**$351,887**
					Present Value of 30 Years of Periodic Costs =	**$210,526**	**$223,781**
					SubTotal =	**$541,570**	**$575,668**
					20% Contingency =	**$108,314**	**$115,134**
					Total cost for Metals Plume Remediation =	**$649,885**	**$690,802**
VOC Plume Remediation							
Full Scale Pilot Study							
Applied to GW						$35,000	
SUBTOTAL						**$35,000**	
Full Scale Treatment							
Geoprobe Borings	27	days	$2,500.00			$67,500	10 wells per day
Wells	270	wells	23.0'	injection depth	6210'		Total Injection depth
Substrate	6210'		3.9	lbs /ft	24219		Total lbs of substrate
Applied to GW	24219	LBSf	$5.25	$0.00	$0.00	$127,150	
SUBTOTAL						**$194,650**	
Professional Labor							
Design		5.00%				$9,732	Oversight entire program
Project Management Labor Cost		5.00%				$9,732	
Planning Documents Labor Cost		4.00%				$7,786	
Construction Oversight Labor Cost		3.25%				$6,326	
Reporting Labor Cost		0.75%				$1,460	
As-Built Drawings Labor Cost		0.75%				$1,460	
Public Notice Labor Cost		0.25%				$487	
Site Closure Activities Labor Cost		2.50%				$4,866	
Permitting Labor Cost		2.00%				$3,893	
SUBTOTAL						**$45,743**	
				Annual Inflation	3.10%	**2005 Costs**	**2007 Costs**
					Project Capital & Labor Cost =	**$275,392**	**$292,731**
					Present Value of 30 Years of Periodic Costs =	**$184,842**	**$196,480**
					SubTotal =	**$460,235**	**$489,211**
					20% Contingency =	**$92,047**	**$97,842**
					Total cost for VOC Plume Remediation =	**$552,282**	**$587,054**

TABLE F-10A: CAPITAL AND LABOR COST ESTIMATE, ALTERNATIVE GW-4A (CONTINUED)

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Alternative GW-4A: In-Situ VOC and Metals Plume Treatment with Slow-Release Compound Reduced Groundwater Monitoring, and Institutional Controls

Site: Parcel D
Location: Hunters Point Shipyard, San Francisco, California
Phase: Feasibility Study
Base Year: 2005

DESCRIPTION	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Notes
Project Management and Other Costs							
Install Groundwater Monitoring Wells							1 well to be installed
Organic Vapor Analyzer Rental, per Day	1.00	DAY	$128.99	$0.00	$0.00	$129	
Decontaminate Rig, Augers, Screen (Rental Equipment)	1.00	DAY	$18.79	$648.54	$0.00	$667	
Field Technician	16.00	HR	$0.00	$47.87	$0.00	$766	
2" PVC, Schedule 40, Well Casing	10.00	LF	$1.27	$4.66	$7.33	$133	
2" PVC, Schedule 40, Well Screen	10.00	LF	$2.93	$6.02	$9.46	$184	
2" PVC, Well Plug	1.00	EA	$6.17	$7.00	$11.00	$24	
Hollow Stem Auger, 8" Diameter Borehole, Depth <= 100 feet	21.00	LF	$0.00	$12.79	$20.11	$691	
DOT steel drums, 55 gallon, open, 17C	2.00	EA	$92.27	$0.00	$0.00	$185	
2" Screen, Filter Pack	12.00	LF	$3.29	$3.96	$6.23	$162	
2" Well, Portland Cement Grout	7.00	LF	$1.23	$0.00	$0.00	$9	
2" Well, Bentonite Seal	1.00	EA	$9.78	$15.74	$24.75	$50	
Mobilize/DeMobilize Drilling Rig & Crew	1.00	LS	$0.00	$1,661.90	$996.44	$2,658	
Surface Pad, Concrete, 2' x 2' x 4"	3.00	EA	$40.84	$21.86	$1.81	$194	
SUBTOTALa						**$5,851**	
Residual Waste Management							Waste Characterization & Drum Drill Cuttings
RCRA Characterization	100%		$1,000.00	$0.00	$0.00	$1,000	
Secondary containment and storage, storage systems, loading hazardous waste for shipment, load drums on disposal truck	2.00	EA	$0.00	$5.80	$1.16	$14	
Subcontracted shipping of hazardous waste, transport drums of solid hazardous waste, 80 55 gal. drums	45.00	MI	$1.87	$0.00	$0.00	$84	
Commercial RCRA landfills, additional landfill disposal costs, waste stream evaluation, 50% rebate on first	1.00	EA	$501.36	$0.00	$0.00	$501	
Commercial RCRA landfills, drummed waste disposal, solid, non-hazardous, 55 gal drums	2.00	EA	$13.50	$0.00	$0.00	$27	
SUBTOTAL						**$1,626**	
Land Use Controls							
Land Use Control Remedial Design						$39,625	
Environmental Restrictions in Deed						$31,470	
Register and File Deed						$133	
Contingency		20%				$14,246	
Navy Oversight		20%				$14,246	
SUBTOTAL						**$99,719**	
Project Reports							
Remedial Design Work Plan						$120,000	Based on similar projects by Tetra Tech
Health and Safety Plan						$40,000	
Waste Management Plan						$15,000	
Design Quality Control Plan						$20,000	
SUBTOTAL						**$195,000**	
SUBTOTAL OF CAPITAL COSTS						**$302,197**	

TABLE F-10A: CAPITAL AND LABOR COST ESTIMATE, ALTERNATIVE GW-4A (CONTINUED)

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Alternative GW-4A: In-Situ VOC and Metals Plume Treatment with Slow-Release Compound Reduced Groundwater Monitoring, and Institutional Controls

Site: Parcel D
Location: Hunters Point Shipyard, San Francisco, California
Phase: Feasibility Study
Base Year: 2005

DESCRIPTION	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Notes
Professional Labor							
Design		5.00%				$15,110	Oversight entire program
Project Management Labor Cost		5.00%				$15,110	
Planning Documents Labor Cost		4.00%				$12,088	
Construction Oversight Labor Cost		3.25%				$9,821	
Reporting Labor Cost		0.75%				$2,266	
As-Built Drawings Labor Cost		0.75%				$2,266	
Public Notice Labor Cost		0.25%				$755	
Site Closure Activities Labor Cost		2.50%				$7,555	
Permitting Labor Cost		2.00%				$6,044	
SUBTOTAL						**$71,016**	
				Annual Inflation	3.10%	**2005 Costs**	**2007 Costs**
					Project Capital & Labor Cost =	**$373,213**	**$396,711**
					Present Value of 30 Years of Periodic Costs =	**$873,500**	**$928,496**
					SubTotal =	**$1,246,713**	**$1,325,207**
					20% Contingency =	**$249,343**	**$265,041**
					Total cost for Project Management and Other Costs =	**$1,496,056**	**$1,590,249**

Project Capital Cost Summary

	2005 Costs	2007 Costs
Total cost for Metals Plume Remediation =	**$649,885**	**$690,802**
Total cost for VOC Plume Remediation =	**$552,282**	**$587,054**
Total cost for Project Management and Other Costs =	**$1,496,056**	**$1,590,249**
TOTAL PROJECT COSTS =	**$2,698,222**	**$2,868,104**

Notes: RACER 2005 outputs are in 2005 unmarked up dollars. Modifiers for this site were: Material 1.000, Labor 1.000, and equipment 1.000.
RACER 2005 estimate for outyear annual sampling provided as a lump sum value are in 2005 unmarked up dollars.
Metals and VOCs treatment dose costs obtained from Regenesis, April 22, 2005

'	foot
"	Inch
<	greater than
CADD	Computer-aided design and drafting
DOT	Department of Transportation
EA	Each
ft	Feet
gal	Gallon
lbs	Pounds
OD	Outside diameter
PVC	Polyvinyl chloride
RACER	Remedial Action Cost Engineering and Requirements System
RCRA	Resource Conservation Recovery Act
VOC	Volatile organic compound
ZVI	Zero-valent iron

TABLE F-11A: CAPITAL AND LABOR COST ESTIMATE, ALTERNATIVE GW-4B

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Alternative GW-4B: In-Situ VOC and Metals Plume Treatment with Zero-Valent Iron Reduced Groundwater Monitoring, and Institutional Controls

Site: Parcel D
Location: Hunters Point Shipyard, San Francisco, California
Phase: Feasibility Study
Base Year: 2005

DESCRIPTION	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Notes
Metals Plume Remediation							
Full Scale Pilot Study							
Applied to GW						$35,000	
SUBTOTAL						**$35,000**	
Full Scale Treatment							
Geoprobe Borings	32.00	days	$2,500.00			$80,000	One boring per 10 wells
Wells	320	wells	23.0'	injection depth	7360'		Total Injection depth
Substrate	7360'		125.0	lbs /ft	920000		Total lbs of substrate
Applied to GW	920000	lbs	$2.54	$0.00	$0.00	$2,336,800	Total cost of substrate
CAPITAL COSTS						**$2,416,800**	
Professional Labor							Oversight entire program
Design		5.00%				$120,840	
Project Management Labor Cost		5.00%				$120,840	
Planning Documents Labor Cost		4.00%				$96,672	
Construction Oversight Labor Cost		3.25%				$78,546	
Reporting Labor Cost		0.75%				$18,126	
As-Built Drawings Labor Cost		0.75%				$18,126	
Public Notice Labor Cost		0.25%				$6,042	
Site Closure Activities Labor Cost		2.50%				$60,420	
Permitting Labor Cost		2.00%				$48,336	
SUBTOTAL						**$567,948**	
				Annual Inflation	3.10%	**2005 Costs**	**2007 Costs**
					Project Capital & Labor Cost =	**$3,019,748**	**$3,209,874**
					Present Value of 30 Years of Periodic Costs =	**$210,526**	**$223,781**
					SubTotal =	**$3,230,274**	**$3,433,655**
					20% Contingency =	**$646,055**	**$686,731**
					Total cost for Metals Plume Remediation =	**$3,876,329**	**$4,120,387**
VOC Plume Remediation							
Full Scale Pilot Study							
Applied to GW						$35,000	
SUBTOTAL						**$35,000**	
Full Scale Treatment							
Geoprobe Borings	27	days	$2,500.00			$67,500	10 wells per day
Wells	270	wells	23.0'	injection depth	6210'		Total Injection depth
Substrate	6210'		125.0	lbs /ft	776250		Total lbs of substrate
Applied to GW	776250	LBSf	$2.54	$0.00	$0.00	$1,971,675	
SUBTOTAL						**$2,039,175**	
Professional Labor							
Design		5.00%				$101,959	Oversight entire program
Project Management Labor Cost		5.00%				$101,959	
Planning Documents Labor Cost		4.00%				$81,567	
Construction Oversight Labor Cost		3.25%				$66,273	
Reporting Labor Cost		0.75%				$15,294	
As-Built Drawings Labor Cost		0.75%				$15,294	
Public Notice Labor Cost		0.25%				$5,098	
Site Closure Activities Labor Cost		2.50%				$50,979	
Permitting Labor Cost		2.00%				$40,784	
SUBTOTAL						**$479,206**	
				Annual Inflation	3.10%	**2005 Costs**	**2007 Costs**
					Project Capital & Labor Cost =	**$2,553,381**	**$2,714,145**
					Present Value of 30 Years of Periodic Costs =	**$184,842**	**$196,480**
					SubTotal =	**$2,738,223**	**$2,910,625**
					20% Contingency =	**$547,645**	**$582,125**
					Total cost for VOC Plume Remediation =	**$3,285,868**	**$3,492,749**

TABLE F-11A: CAPITAL AND LABOR COST ESTIMATE, ALTERNATIVE GW-4B (CONTINUED)

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Alternative GW-4B: In-Situ VOC and Metals Plume Treatment with Zero-Valent Iron Reduced Groundwater Monitoring, and Institutional Controls

Site: Parcel D
Location: Hunters Point Shipyard, San Francisco, California
Phase: Feasibility Study
Base Year: 2005

DESCRIPTION	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Notes
Project Management and Other Costs							
Install Groundwater Monitoring Wells							1 well to be installed
Organic Vapor Analyzer Rental, per Day	1.00	DAY	$128.99	$0.00	$0.00	$129	
Decontaminate Rig, Augers, Screen (Rental Equipment)	1.00	DAY	$18.79	$648.54	$0.00	$667	
Field Technician	16.00	HR	$0.00	$47.87	$0.00	$766	
2" PVC, Schedule 40, Well Casing	10.00	LF	$1.27	$4.66	$7.33	$133	
2" PVC, Schedule 40, Well Screen	10.00	LF	$2.93	$6.02	$9.46	$184	
2" PVC, Well Plug	1.00	EA	$6.17	$7.00	$11.00	$24	
Hollow Stem Auger, 8" Diameter Borehole, Depth <= 100 feet	21.00	LF	$0.00	$12.79	$20.11	$691	
DOT steel drums, 55 gallon, open, 17C	2.00	EA	$92.27	$0.00	$0.00	$185	
2" Screen, Filter Pack	12.00	LF	$3.29	$3.96	$6.23	$162	
2" Well, Portland Cement Grout	7.00	LF	$1.23	$0.00	$0.00	$9	
2" Well, Bentonite Seal	1.00	EA	$9.78	$15.74	$24.75	$50	
Mobilize/DeMobilize Drilling Rig & Crew	1.00	LS	$0.00	$1,661.90	$996.44	$2,658	
Surface Pad, Concrete, 2' x 2' x 4"	3.00	EA	$40.84	$21.86	$1.81	$194	
SUBTOTALa						**$5,851**	
Residual Waste Management							Waste Characterization & Drum Drill Cuttings
RCRA Characterization	100%		$1,000.00	$0.00	$0.00	$1,000	
Secondary containment and storage, storage systems, loading hazardous waste for shipment, load drums on disposal truck	2.00	EA	$0.00	$5.80	$1.16	$14	
Subcontracted shipping of hazardous waste, transport drums of solid hazardous waste, 80 55 gal. drums	45.00	MI	$1.87	$0.00	$0.00	$84	
Commercial RCRA landfills, additional landfill disposal costs, waste stream evaluation, 50% rebate on first	1.00	EA	$501.36	$0.00	$0.00	$501	
Commercial RCRA landfills, drummed waste disposal, solid, non-hazardous, 55 gal drums	2.00	EA	$13.50	$0.00	$0.00	$27	
SUBTOTAL						**$1,626**	
Institutional Controls							
Institutional Control Remedial Design						$39,625	
Environmental Restrictions in Deed						$31,470	
Register and File Deed						$133	
Contingency		20%				$14,246	
Navy Oversight		20%				$14,246	
SUBTOTAL						**$99,719**	
Project Reports							
Remedial Design Work Plan						$120,000	Based on similar projects by Tetra Tech
Health and Safety Plan						$40,000	
Waste Management Plan						$15,000	
Design Quality Control Plan						$20,000	
SUBTOTAL						**$195,000**	
SUBTOTAL OF CAPITAL COSTS						**$302,197**	

TABLE F-11A: CAPITAL AND LABOR COST ESTIMATE, ALTERNATIVE GW-4B (CONTINUED)

Revised Feasibility Study Report for Parcel D, Hunters Point Shipyard, San Francisco, California

Alternative GW-4B: In-Situ VOC and Metals Plume Treatment with Zero-Valent Iron
Reduced Groundwater Monitoring, and Institutional Controls

Site: Parcel D
Location: Hunters Point Shipyard, San Francisco, California
Phase: Feasibility Study
Base Year: 2005

DESCRIPTION	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Notes
Professional Labor							
Design		5.00%				$15,110	Oversight entire program
Project Management Labor Cost		5.00%				$15,110	
Planning Documents Labor Cost		4.00%				$12,088	
Construction Oversight Labor Cost		3.25%				$9,821	
Reporting Labor Cost		0.75%				$2,266	
As-Built Drawings Labor Cost		0.75%				$2,266	
Public Notice Labor Cost		0.25%				$755	
Site Closure Activities Labor Cost		2.50%				$7,555	
Permitting Labor Cost		2.00%				$6,044	
SUBTOTAL						**$71,016**	
				Annual Inflation	3.10%	**2005 Costs**	**2007 Costs**
					Project Capital & Labor Cost =	**$373,213**	**$396,711**
					Present Value of 30 Years of Periodic Costs =	**$873,500**	**$928,496**
					SubTotal =	**$1,246,713**	**$1,325,207**
					20% Contingency =	**$249,343**	**$265,041**
					Total cost for Project Management and Other Costs =	**$1,496,056**	**$1,590,249**

Project Capital Cost Summary		
	2005 Costs	**2007 Costs**
Total cost for Metals Plume Remediation =	**$3,876,329**	**$4,120,387**
Total cost for VOC Plume Remediation =	**$3,285,868**	**$3,492,749**
Total cost for Project Management and Other Costs =	**$1,496,056**	**$1,590,249**
TOTAL PROJECT COSTS =	**$8,658,252**	**$9,203,385**

Notes: RACER 2005 outputs are in 2005 unmarked up dollars. Modifiers for site were: Material 1.000, Labor 1.000, and equipment 1.000.
RACER 2005 estimate for annual sampling provided as a lump sum value are in 2005 unmarked up dollars.
Metals and VOCs treatment dose costs obtained from Regenesis, April 22, 2005

'	foot
"	Inch
<	greater than
CADD	Computer-aided design and drafting
DOT	Department of Transportation
EA	Each
ft	Feet
gal	Gallon
lbs	Pounds
OD	Outside diameter
PVC	Polyvinyl chloride
RACER	Remedial Action Cost Engineering and Requirements System
RCRA	Resource Conservation Recovery Act
VOC	Volatile organic compound
ZVI	Zero-valent iron

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
41	Present-Worth Cost: $15,200,000	Table 6	Final Radiological Addendum to the Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Appendix B, Section 6.9, Page B.6-6. Tetra Tech EC Inc. April 11, 2008.

2. Each building (274, 351, 351A, 364, 365, 366/351B (considered two separate buildings), 401, and 411) is assumed to generate one disposal bin of material (e.g., flooring, ventilation piping, etc.) from dismantlement activities. Building 408 is assumed to generate 8 bins of waste due to firebrick removal and dismantlement activities and Building 364 is expected to generate 3 waste bins of material. Using a disposal cost of $11,880 per bin with the total cost $213,840.
3. Each former building site (313, 313A, 317, 322, 364, 365, 383 area, 408) survey unit is assumed to have two elevated areas resulting in the generation of 10 cubic feet (ft^3) of radiologically-impacted soil from each survey unit. The total volume of radiologically-impacted soil is estimated to be 240 ft^3 (8.89 cy). The cost of disposal is assumed to be $11,880 per bin, and based on 14 cy of soil per bin the total disposal cost is estimated to be $11,880.
4. The Gun Mole Pier and NRDL Site on Mahan Street will be divided into 1,000 square meter (m^2) survey units. The surface area of the two sites is approximately 76,473 m^2 (823,175 square feet) resulting in 77 survey units. The cost of performing the survey in each survey unit is assumed to be $6,500. This cost is based on the San Francisco "49ers" Parcel D proposal summary and results in an estimated cost of $500,500. Each survey unit is assumed to have two elevated areas resulting in the generation of 150 ft^3 of radiologically-impacted soil from each survey unit. The total volume of radiologically-impacted soil is estimated to be 11,550 ft^3 (428 cy). The cost of disposal is assumed to be $11,880 per bin, and based on 14 cy of soil per bin the total disposal cost is estimated to be $368,280.
5. Removal of the Parcel D sewer and storm drain systems is estimated to result in 60,000 cy of material to be excavated at an estimated cost of $330 per cy of material excavated. This results in a total excavation cost of $19,800,000.
6. It is assumed that 5 percent of the material excavated during the Parcel D sewer and storm drain system removal will be radiologically-impacted resulting in approximately 3,000 cy of material. The cost of disposal is assumed to be $11,880 per bin, and based on 14 cy of soil per bin the total disposal cost is estimated to be $2,554,200. Note this does not include cost associated with disposal of Comprehensive Environmental Response, Compensation, and Liability Act-impacted materials.

The table below provides a breakdown of the estimated cost for Alternative R-2.

Impacted Parcel D Building and former building site Surveys/Release	$ 1,969,500
Radiological soil screening and waste disposal for building and building sites	$ 213,840
Gun Mole Pier and NRDL Site Surveys and Remediation	**$** 868,780
Parcel D sewer and storm drain removal and disposal	**$** 22,354,200
20% Contingency	**$** 5,081,264
***Total Estimated Cost for Alternative R-2**	**$ 30,487,584***

Notes:

* Total estimated cost has been rounded to the nearest thousand. The expected accuracy is within the range of -30% to +50%.

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
42	Institutional Controls	Section 2.9.2	Final Revised Feasibility Study for Parcel D, Hunters Point Shipyard, San Francisco, California. Section 4.0, pages 4-17 and 4-20. SulTech. November 30, 2007.

Parcel D at concentrations above remediation goals. For the relatively small volumes associated with the remaining COCs (lead and PAHs), treatment is not as cost-effective or as implementable as excavation.

Those process options retained during the initial screening were evaluated for effectiveness, implementability and cost and are discussed in this section. Table 4-3 summarizes the results for this evaluation.

No Action

The NCP requires that the no-action alternative be carried through the detailed analysis of alternatives. Under the no-action response, no remedial action is taken. Soil would be left as is without implementing any institutional controls, containment, removal, treatment, or other mitigating actions. Because soil at Parcel D poses a risk to human health and the environment under the anticipated future land use scenario, the no-action response would not be an effective alternative that meets the requirements of CERCLA. Because no action is taken, no cost is associated with this option. The no action option will be retained for further evaluation as a remedial alternative for comparison purposes only, as required under the NCP.

Institutional Controls in General

Institutional controls are legal and administrative mechanisms used to implement land use and access restrictions that are used to limit the exposure of future landowner(s) and/or user(s) of the property to hazardous substances present on the property, and to ensure the integrity of the remedial action. Institutional controls are required on a property where the selected remedial cleanup levels result in contamination remaining at the property above levels that allow for unlimited use and unrestricted exposure. Institutional controls would likely remain in place unless the remedial action taken would allow for unrestricted use of the property. Implementation of institutional controls includes requirements for monitoring and inspections, and reporting to ensure compliance with land use or activity restrictions.

Legal mechanisms include proprietary controls such as restrictive covenants, negative easements, equitable servitudes, and deed notices. Administrative mechanisms include notices, adopted local land use plans and ordinances, construction permitting, or other existing land use management systems that are intended to ensure compliance with land use or activity restrictions.

The Navy has determined that it will rely upon proprietary controls in the form of environmental restrictive covenants, as provided in the "Memorandum of Agreement Between the United States Department of the Navy and the California Department of Toxic Substances Control" and attached covenant models (Navy and DTSC 2000) (hereinafter referred to as the "Navy/DTSC MOA"). Appendix J contains the Navy/DTSC MOA.

More specifically, land use and activity restrictions will be incorporated into two separate legal instruments as provided in the Navy/DTSC MOA:

1 Restrictive covenants included in one or more Quitclaim Deeds from the Navy to the property recipient.

2 Restrictive covenants included in one or more "Covenant to Restrict Use of Property" entered into by the Navy and DTSC as provided in the Navy/DTSC MOA and consistent with the substantive provisions of Cal. Code Regs. tit. 22 § 67391.1.

The "Covenant(s) to Restrict Use of Property" will incorporate the land use restrictions into environmental restrictive covenants that run with the land and that are enforceable by DTSC against future transferees. The Quitclaim Deed(s) will include the identical land use and activity restrictions in environmental restrictive covenants that run with the land and that will be enforceable by the Navy against future transferees.

The activity restrictions in the "Covenant(s) to Restrict Use of Property" and Deeds shall be implemented through the Parcel D Risk Management Plan ("Parcel D RMP") to be prepared by the City of San Francisco and approved by the Navy and FFA Signatories. The Parcel D RMP shall be discussed in the Parcel D ROD and shall be attached to and incorporated by reference into the Covenant(s) to Restrict Use of Property and Deeds as an enforceable part thereof. It shall specify soil and groundwater management procedures for compliance with the remedy selected in the Parcel D ROD. The Parcel D RMP shall identify the roles of local, state, and federal government in administering the Parcel D RMP and shall include, but not be limited to, procedures for any necessary sampling and analysis requirements, worker health and safety requirements, and any necessary site-specific construction and/or use approvals that may be required.

In addition to being set forth in the Covenant and Deed(s) as described above, restrictions applied to specified portions of the property will be described in findings of suitability for transfer and findings of suitability for early transfer.

Access

The Deed and Covenant shall provide that the Navy and FFA Signatories and their authorized agents, employees, contractors and subcontractors shall have the right to enter upon HPS Parcel D to conduct investigations, tests, or surveys; inspect field activities; or construct, operate, and maintain any response or remedial action as required or necessary under the cleanup program, including but not limited to monitoring wells, pumping wells, treatment facilities, and cap/containment systems.

Implementation

The Navy shall address/describe institutional control implementation and maintenance actions including periodic inspections and reporting requirements in the preliminary and final RD reports to be developed and submitted to the FFA Signatories for review pursuant to the FFA. (See "Navy Principles and Procedures for Specifying, Monitoring and Enforcement of Land Use

Controls and Other Post-ROD Actions" attached to January 16, 2004 Department of Defense (DoD) memorandum titled "Comprehensive Environmental Response, Compensation and Liability Act [CERCLA] Record of Decision [ROD] and Post-ROD Policy.") The preliminary and final RD reports are primary documents as provided in Section 7.3 of the FFA.

Activity Restrictions that Apply Throughout Parcel D

The following sections describe the institutional control objectives to be achieved through activity restrictions throughout Parcel D in order to ensure that any necessary measures to protect human health and the environment and the integrity of the remedy have been undertaken.

Restricted Activities

The following restricted activities throughout HPS Parcel D must be conducted in accordance with the "Covenant(s) to Restrict Use of Property," Quitclaim Deed(s), the Parcel D RMP, and, if required, any other work plan or document approved in accordance with these referenced documents:

- "Land disturbing activity" which includes but is not limited to: (1) excavation of soil, (2) construction of roads, utilities, facilities, structures, and appurtenances of any kind, (3) demolition or removal of "hardscape" (for example, concrete roadways, parking lots, foundations, and sidewalks), (4) any activity that involves movement of soil to the surface from below the surface of the land, and (5) any other activity that causes or facilitates the movement of known contaminated groundwater.
- Alteration, disturbance, or removal of any component of a response or cleanup action (including but not limited to pump-and-treat facilities, revetment walls and shoreline protection, and soil cap/containment systems); groundwater extraction, injection, and monitoring wells and associated piping and equipment; or associated utilities.
- Extraction of groundwater and installation of new groundwater wells.
- Removal of or damage to security features (for example, locks on monitoring wells, survey monuments, fencing, signs, or monitoring equipment and associated pipelines and appurtenances).

Prohibited Activities

The following activities are prohibited throughout HPS Parcel D:

- Growing vegetables or fruits in native soil for human consumption.
- Use of groundwater.

Activity Restrictions Relating to VOC Vapors at Specific Locations within Parcel D

Any proposed construction of enclosed structures must be approved in accordance with the "Covenant to Restrict Use of the Property," Quitclaim Deed, and Parcel D RMP prior to the conduct of such activity within the area requiring institutional controls (ARIC) for VOC vapors in order to ensure that the risks of potential exposures to VOC vapors are reduced to acceptable levels that are adequately protective of human health. Initially, the ARIC will include all of Parcel D. This can be achieved through engineering controls or other design alternatives that meet the specifications set forth in the ROD, RD reports, land use control (LUC) RD report, and Parcel D RMP. The ARIC may be modified by the FFA Signatories as the soil contamination areas and groundwater contaminant plumes that are producing unacceptable vapor inhalation risks are reduced over time or in response to further soil, vapor, and groundwater sampling and analysis for VOCs that establishes that areas now included in the ARIC do not pose an unacceptable potential exposure risk to VOC vapors.

Additional Land Use Restrictions for Areas Designated Open Space, Educational/Cultural, and Maritime/Industrial

The following restricted land uses for property areas designated for open space, educational/cultural, and maritime/industrial land uses in the "Hunters Point Shipyard Redevelopment Plan" dated July 14, 1997 must be reviewed and approved by the FFA Signatories in accordance with the "Covenants to Restrict Use of the Property," Quitclaim Deed(s), and Parcel D RMP prior to use of the property for any of the restricted uses:

- A residence, including any mobile home or factory built housing, constructed or installed for use as residential human habitation,
- A hospital for humans,
- A school for persons under 21 years of age, or
- A daycare facility for children.

Removal

Removal is an effective process option for all contaminant groups associated with soil at Parcel D and involves removing and transporting contaminated material off site to a permitted treatment and disposal facility. To meet land disposal restrictions, some pretreatment such as stabilization may be required or preferred so that the most economical disposal option can be applied. Important considerations with the removal and disposal process option include excavation volume, fugitive emissions, hauling distance, and type of treatment/disposal facility for final deposition. Excavations will be to a maximum depth of 10 feet for industrial and residential land use and to a maximum depth of two feet for recreational land use. The excavation cleanup criteria would be specific to the reuse type and analyte-specific remediation goals specified in Section 4.1.1.1.

ATTACHMENT 4
ADMINISTRATIVE RECORD

(Administrative Record provided on CD only)

DRAFT ADMINISTRATIVE RECORD FILE INDEX - UPDATE (SORTED BY RECORD DATE/RECORD NUMBER)

Parcel D, G, and UC-1 Index

UIC No. / Rec. No. Doc. Control No. Record Type Contr./Guid. No. Approx. # Pages	Prc. Date Record Date CTO No. EPA Cat. #	Author Affil. Author Recipient Affil. Recipient	Subject	Classification	Sites	Location SWDIV Box No(s) CD No.	FRC Accession No. FRC Warehouse FRC Box No(s)	
N00217 / 002566 SER 1811WW/L3023 CORRESPONDENCE NONE 17	11-18-1999 **10-16-1992** NONE 00.0	NAVFAC - EFA WEST MIGUEL, M. TAKATA, K.	SUBMISSION OF PROPOSED SCHEDULES, PARCELS A, B, C, D, E AND ASSUMPTIONS; INTERIM ACTION SCHEDULES FOR OPERABLE UNIT (OU) II AND GROUP V SITES	ADMIN RECORD	GROUP V OU 0002 PARCEL A PARCEL B PARCEL C PARCEL D PARCEL E	FRC - PERRIS IMAGED HPNT_003	181-07-0027 30093199	BOX 0040
N00217 / 002582 EFAW SER 1811WW/L3107 CORRESPONDENCE NONE 21	11-18-1999 **12-04-1992** NONE 00.0	NAVFAC - EFA WEST G. KATZ U.S. EPA - SAN FRANCISCO K. TAKATA	POINT BY POINT RESPONSE TO AGENCIES' COMMENTS, REVISED SCHEDULING ASSUMPTIONS, REVISED SCHEDULES FOR PARCELS A, B, C, D, E	ADMIN RECORD	PARCEL A PARCEL B PARCEL C PARCEL D PARCEL E	FRC - PERRIS IMAGED HPNT_014	181-07-0027 30093199	BOX 0040
N00217 / 000127 NONE CORRESPONDENCE N62474-88-D-5086 74	08-30-2000 **11-30-1993** 00276	PRC ENVIRONMENTAL MANAGEMENT NAVFAC - SOUTHWEST DIVISION	REMEDIAL INVESTIGATION (RI)/FEASIBILITY STUDY (FS) FIELD WORK AND ANALYSIS WORK PLAN	ADMIN RECORD INFO REPOSITORY	PARCEL B PARCEL C PARCEL D PARCEL E	FRC - PERRIS IMAGED HPNT_001	181-07-0027 30093199	BOX 0002
N00217 / 002938 NONE CORRESPONDENCE NONE 4	11-18-1999 **01-03-1994** NONE 00.0	U.S. EPA	COMMENTS ON SITE INSPECTION (SI) DATA PRESENTATION PARCEL D VOLUMES II AND III	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_004	181-07-0027 30093199	BOX 0047

UIC No. / Rec. No. Doc. Control No. Record Type Contr./Guid. No. Approx. # Pages	Prc. Date Record Date CTO No. EPA Cat. #	Author Affil. Author Recipient Affil. Recipient	Subject	Classification	Sites	Location SWDIV Box No(s) CD No.	FRC Accession No. FRC Warehouse FRC Box No(s)	
N00217 / 002942 NONE CORRESPONDENCE NONE 2	11-18-1999 **01-31-1994** NONE 00.0	U.S. EPA	COMMENTS ON SITE INSPECTION (SI) DATA PRESENTATIONS FOR PARCELS D AND E, VOLUME I	ADMIN RECORD	PARCEL D PARCEL E	FRC - PERRIS IMAGED HPNT_004	181-07-0027 30093199	BOX 0047
N00217 / 002943 NONE CORRESPONDENCE NONE 10	11-18-1999 **02-01-1994** NONE 00.0	HARDING LAWSON ASSOCIATES	SUBMISSION OF MEETING MINUTES FOR PARCEL D VOLUMES I AND II/III DATA PRESENTATION MEETINGS AND SUMMARY RI WORK PLAN (WP)	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_004	181-07-0027 30093199	BOX 0047
N00217 / 002918 NONE REPORT NONE 224	11-18-1999 **02-22-1994** NONE 00.0	HARDING LAWSON ASSOCIATES	DRAFT PARCEL D SITE INSPECTION (SI) REPORT VOLUME I: TEXT, TABLES, PLATES	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_003	181-07-0027 30093199	BOX 0046
N00217 / 002919 NONE REPORT NONE 599	11-18-1999 **02-22-1994** NONE 00.0	HARDING LAWSON ASSOCIATES	DRAFT PARCEL D SITE INSPECTION (SI) REPORT VOLUME II: APPENDICES A THRU F	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_003	181-07-0027 30093199	BOX 0046
N00217 / 002920 NONE REPORT NONE 382	11-18-1999 **02-22-1994** NONE 00.0	HARDING LAWSON ASSOCIATES	DRAFT PARCEL D SITE INSPECTION (SI) REPORT VOLUME III: APPENDICES G THRU J	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_003	181-07-0027 30093199	BOX 0047
N00217 / 002957 NONE CORRESPONDENCE NONE 14	11-18-1999 **03-24-1994** NONE 00.0	U.S. EPA	COMMENTS ON DRAFT PARCEL D SITE INSPECTION REPORT (SI)	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_004	181-07-0027 30093199	BOX 0047

UIC No. / Rec. No. Doc. Control No. Record Type Contr./Guid. No. Approx. # Pages	Prc. Date Record Date CTO No. EPA Cat. #	Author Affil. Author Recipient Affil. Recipient	Subject	Classification	Sites	Location SWDIV Box No(s) CD No.	FRC Accession No. FRC Warehouse FRC Box No(s)	
N00217 / 003096 NONE CORRESPONDENCE NONE 2	11-18-1999 **04-08-1994** NONE 00.0	CRWQCB - OAKLAND B. SMITH DTSC - BERKELEY C. SHABAHARI	COMMENTS ON DRAFT PARCEL D SITE INSPECTION REPORT (SI)	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_008	181-07-0027 30093199	BOX 0052
N00217 / 002963 NONE CORRESPONDENCE NONE 5	11-18-1999 **04-15-1994** NONE 00.0	DTSC	COMMENTS ON PARCEL D SITE INSPECTION REPORT (SI)	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_004	181-07-0027 30093199	BOX 0048
N00217 / 002975 NONE CORRESPONDENCE NONE 3	11-18-1999 **04-15-1994** NONE 00.0	NAVY	SUBMISSION OF SITE ASSESSMENT REPORT, POTENTIALLY CONTAMINATED SITES, PARCELS B, C, D AND E	ADMIN RECORD	PARCEL B PARCEL C PARCEL D PARCEL E	FRC - PERRIS IMAGED HPNT_004	181-07-0027 30093199	BOX 0048
N00217 / 003027 NONE REPORT NONE 282	11-18-1999 **04-15-1994** NONE 00.0	PRC ENVIRONMENTAL MANAGEMENT	FINAL SITE ASSESSMENT REPORT, POTENTIALLY CONTAMINATED SITES, PARCELS B, C, D, AND E	ADMIN RECORD	PARCEL B PARCEL C PARCEL D PARCEL E	FRC - PERRIS IMAGED HPNT_004	181-07-0027 30093199	BOX 0050
N00217 / 002994 NONE CORRESPONDENCE NONE 3	11-18-1999 **05-27-1994** NONE 00.0	NAVY	SUBMISSION OF DRAFT FINAL PARCEL D SITE INSPECTION REPORT (SI) (VOLUME I-III OF III) (SEE AR #2995 -VOLUME I, 2996 - VOLUME II AND 2997 - VOLUME III)	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_004	181-07-0027 30093199	BOX 0049
N00217 / 002995 NONE REPORT NONE 265	11-18-1999 **05-30-1994** NONE 00.0	HARDING LAWSON ASSOCIATES	DRAFT FINAL PARCEL D SITE INSPECTION REPORT (SI), VOLUME I: TEXT, TABLES, AND PLATES (SEE AR #2996 - VOLUME II AND 2997 - VOLUME III)	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_004	181-07-0027 30093199	BOX 0049

UIC No. / Rec. No. Doc. Control No. Record Type Contr./Guid. No. Approx. # Pages	Prc. Date Record Date CTO No. EPA Cat. #	Author Affil. Author Recipient Affil. Recipient	Subject	Classification	Sites	Location SWDIV Box No(s) CD No.	FRC Accession No. FRC Warehouse FRC Box No(s)	
N00217 / 002996 NONE REPORT NONE 600	11-18-1999 **05-30-1994** NONE 00.0	HARDING LAWSON ASSOCIATES	DRAFT FINAL PARCEL D SITE INSPECTION REPORT (SI), VOLUME II: APPENDICES A-F (SEE AR #2995 - VOLUME I AND 2997 - VOLUME III)	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_004	181-07-0027 30093199	BOX 0049
N00217 / 002997 NONE REPORT NONE 436	11-18-1999 **05-30-1994** NONE 00.0	HARDING LAWSON ASSOCIATES	DRAFT FINAL PARCEL D SITE INSPECTION REPORT (SI), VOLUME III: APPENDICES G-M (SEE AR #2995 - VOLUME I AND 2996 - VOLUME II)	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_004	181-07-0027 30093199	BOX 0049
N00217 / 003000 NONE CORRESPONDENCE NONE 17	11-18-1999 **06-03-1994** NONE 00.0	ARC D. MEYERS NAVFAC - EFA WEST W. RADZEVICH	COMMENTS ON SITE INVESTIGATION (SI) REPORTS FOR PARCELS C, D, AND E (SITE INVESTIGATION REPORTS FOR PARCELS C, D, AND E WERE NOT SUBMITTED TO THE ADMINISTRATIVE RECORD)	ADMIN RECORD	PARCEL C PARCEL D PARCEL E	FRC - PERRIS IMAGED HPNT_008	181-07-0027 30093199	BOX 0049
N00217 / 003029 NONE CORRESPONDENCE NONE 3	11-18-1999 **06-24-1994** NONE 00.0	U.S. EPA - SAN FRANCISCO A. MANGELSDORF NAVFAC - EFA WEST R. POWELL	COMMENTS ON THE FINAL SITE ASSESSMENT REPORT, POTENTIALLY CONTAMINATED SITES PARCELS B, C, D, AND E	ADMIN RECORD	PARCEL B PARCEL C PARCEL D PARCEL E	FRC - PERRIS IMAGED HPNT_008	181-07-0027 30093199	BOX 0051
N00217 / 003007 NONE CORRESPONDENCE NONE 2	11-18-1999 **06-28-1994** NONE 00.0	U.S. EPA - SAN FRANCISCO A. MANGELSDORF NAVFAC - EFA WEST W. RADZEVICH	CONFIRMATION OF EXTENSION FOR REVIEW AND COMMENT ON DRAFT FINAL PARCEL D SITE INSPECTION REPORT (SI)	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_008	181-07-0027 30093199	BOX 0050
N00217 / 003030 NONE CORRESPONDENCE NONE 2	11-18-1999 **07-05-1994** NONE 00.0	DTSC - BERKELEY C. SHABAHARI NAVFAC - EFA WEST R. POWELL	COMMENTS ON THE FINAL SITE ASSESSMENT REPORT, POTENTIALLY CONTAMINATED SITES PARCELS B, C, D, AND E	ADMIN RECORD	PARCEL B PARCEL C PARCEL D PARCEL E	FRC - PERRIS IMAGED HPNT_008	181-07-0027 30093199	BOX 0051

UIC No. / Rec. No. Doc. Control No. Record Type Contr./Guid. No. Approx. # Pages	Prc. Date Record Date CTO No. EPA Cat. #	Author Affil. Author Recipient Affil. Recipient	Subject	Classification	Sites	Location SWDIV Box No(s) CD No.	FRC Accession No. FRC Warehouse FRC Box No(s)	
N00217 / 003031 NONE CORRESPONDENCE NONE 2	11-18-1999 **07-11-1994** NONE 00.0	DTSC - BERKELEY C. SHABAHARI NAVFAC - EFA WEST R. POWELL	ADDITIONAL COMMENTS ON THE DRAFT FINAL PARCEL D SITE INSPECTION REPORT (SI)	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_008	181-07-0027 30093199	BOX 0051
N00217 / 003014 NONE CORRESPONDENCE NONE 25	11-18-1999 **07-14-1994** NONE 00.0	U.S. EPA - SAN FRANCISCO A. MANGELSDORF NAVFAC - EFA WEST W. RADZEVICH	COMMENTS ON THE PARCEL D DRAFT FINAL SITE INSPECTION REPORT (SI)	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_008	181-07-0027 30093199	BOX 0050
N00217 / 003319 NONE CORRESPONDENCE NONE 11	11-18-1999 **07-22-1994** NONE 00.0	ARMS CONTROL RESEARCH CENTER D. MEYERS NAVFAC - EFA WEST W. RADZEVICH	COMMENTS ON THE DRAFT FINAL, PARCEL D SITE INSPECTION (SI)	ADMIN RECORD INFO REPOSITORY	PARCEL D	FRC - PERRIS IMAGED HPNT_016	181-07-0027 30093199	BOX 0056
N00217 / 003039 EFAW SER 09ER1WR/L4360 CORRESPONDENCE NONE 2	11-18-1999 **08-19-1994** NONE 00.0	NAVFAC - EFA WEST R. POWELL ARMS CONTROL RESEARCH CENTER D. MEYERS	RESPONSE TO COMMENTS DRAFT SITE INSPECTION (SI) REPORT, PARCEL C, D, AND E AND DRAFT FINAL SITE INSPECTION REPORT, PARCEL D	ADMIN RECORD	PARCEL C PARCEL D PARCEL E	FRC - PERRIS IMAGED HPNT_008	181-07-0027 30093199	BOX 0051
N00217 / 003059 EFAW SER 09ER1DS/L5054 CORRESPONDENCE NONE 8	11-18-1999 **11-21-1994** NONE 00.0	NAVFAC - EFA WEST R. POWELL VARIOUS AGENCIES	RESPONSE TO COMMENTS ON FINAL SITE ASSESSMENT REPORT, POTENTIALLY COMTAMINATED SITES PARCELS B, C, D, AND E	ADMIN RECORD	PARCEL B PARCEL C PARCEL D PARCEL E	FRC - PERRIS IMAGED HPNT_008	181-07-0027 30093199	BOX 0051

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N00217 / 003132 EFAW SER 1832.1WM/15201 CORRESPONDENCE NONE 3	11-18-1999 **08-07-1995** NONE 00.0	NAVFAC - EFA WEST R. POWELL VARIOUS AGENCIES	SUBMISSION OF DRAFT ADDENDUM TO THE FACILITY GROUNDWATER MONITORING PLAN FOR PARCELS B, D, AND E (W/OUT ENCLOSURE)	ADMIN RECORD	PARCEL B PARCEL D PARCEL E	FRC - PERRIS IMAGED HPNT_008	181-07-0027 30093199	BOX 0053
N00217 / 003234 NONE REPORT N62474-94-D-7609 383	11-18-1999 **04-05-1996** 00026 00.0	PRC ENVIRONMENTAL MANAGEMENT J. SICKLES NAVFAC - EFA WEST R. POWELL	FINAL FACILITY-WIDE GROUNDWATER MONITORING PLAN [INCLUDES PUBLIC SUMMARY]	ADMIN RECORD	BASEWIDE PARCEL B PARCEL C PARCEL D PARCEL E	FRC - PERRIS IMAGED HPNT_016	181-07-0027 30093199	BOX 0054
N00217 / 003268 HLA PROJ NO. 11400 1004 REPORT N62474-88-D-5086 437	11-18-1999 **05-22-1996** 00244 00.0	HARDING LAWSON ASSOCIATES J. FENTON NAVFAC - EFA WEST R. POWELL	DRAFT OPERABLE UNIT II (OU2) ANNUAL GROUNDWATER MONITORING REPORT [INCLUDES PUBLIC SUMMARY]	ADMIN RECORD	006 008 009 010 PARCEL B PARCEL D	FRC - PERRIS IMAGED HPNT_016	181-07-0027 30093199	BOX 0055
N00217 / 003294 NONE REPORT N62474-88-D-5086 54	11-18-1999 **06-05-1996** 00142 00.0	PRC ENVIRONMENTAL MANAGEMENT J. SICKLES NAVFAC - EFA WEST R. POWELL	TECHNICAL MEMORANDUM (TM), REVIEW OF POLYCHLORINATED BIPHENYL (PCB) OCCURRENCES IN SOIL AND GROUNDWATER - 31 MAY 1996 (HARDING LAWSON ASSOCIATES)	ADMIN RECORD	PARCEL B PARCEL C PARCEL D PARCEL E	FRC - PERRIS IMAGED HPNT_025	181-07-0027 30093199	BOX 0056
N00217 / 003293 EFAW SER 1832/L6282 CORRESPONDENCE N62474-88-D-5086 3	11-18-1999 **06-26-1996** 00142 00.0	NAVFAC - EFA WEST R. POWELL VARIOUS AGENCIES	SUBMISSION OF TECHNICAL MEMORANDUM (TM), REVIEW OF POLYCHLORINATED BIPHENYL (PCB) OCCURRENCES IN SOIL AND GROUNDWATER (SEE AR #3294 - TECHNICAL MEMORANDUM)	ADMIN RECORD	PARCEL B PARCEL C PARCEL D PARCEL E	FRC - PERRIS IMAGED HPNT_025	181-07-0027 30093199	BOX 0056

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N00217 / 003295 NONE CORRESPONDENCE N62474-94-D-7609 2	11-18-1999 **06-28-1996** 00005 00.0	NAVFAC - EFA WEST POWELL, R. US EPA - SAN FRANCISCO COOK, A.	SUBMISSION OF DRAFT REPORT, PARCEL D REMEDIAL INVESTIGATION (RI), VOLUMES 1 THROUGH 25 - 28 JUNE 1996	ADMIN RECORD INFO REPOSITORY	PARCEL D	SOUTHWEST DIVISION - BLDG. 1 BX-011	
N00217 / 003296 NONE REPORT N62474-94-D-7609 750	11-18-1999 **06-28-1996** 00005 00.0	PRC ENVIRONMENTAL MANAGEMENT SICKLES, J. NAVFAC - EFA WEST RADZEVICH, W.	DRAFT REPORT, PARCEL D REMEDIAL INVESTIGATION (RI), VOLUME I - TEXT	REMOVED	PARCEL D	BECHTEL NATIONAL PW - 45359685	
N00217 / 003297 NONE REPORT N62474-94-D-7609 750	11-18-1999 **06-28-1996** 00005 00.0	PRC ENVIRONMENTAL MANAGEMENT SICKLES, J. NAVFAC - EFA WEST RADZEVICH, W.	DRAFT REPORT, PARCEL D REMEDIAL INVESTIGATION (RI), VOLUME II - TEXT	REMOVED	PARCEL D	BECHTEL NATIONAL PW - 45359685	
N00217 / 003298 REPORT N62474-94-D-7609 750	11-18-1999 **06-28-1996** 00005 00.0	PRC ENVIRONMENTAL MANAGEMENT J. SICKLES NAVFAC - EFA WEST W. RADZEVICH	DRAFT REPORT, PARCEL D REMEDIAL INVESTIGATION (RI), VOLUME III - TABLES	REMOVED	PARCEL D	BECHTEL NATIONAL PW - 45359685	
N00217 / 003299 NONE REPORT N62474-94-D-7609 750	11-18-1999 **06-28-1996** 00005 00.0	PRC ENVIRONMENTAL MANAGEMENT SICKLES, J. NAVFAC - EFA WEST RADZEVICH, W.	DRAFT REPORT, PARCEL D REMEDIAL INVESTIGATION (RI), VOLUME IV - TABLES	REMOVED	PARCEL D	BECHTEL NATIONAL PW - 45359685	

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N00217 / 003300 NONE REPORT N62474-94-D-7609 750	11-18-1999 **06-28-1996** 00005 00.0	PRC ENVIRONMENTAL MANAGEMENT SICKLES, J. NAVFAC - EFA WEST RADZEVICH, W.	DRAFT REPORT, PARCEL D REMEDIAL INVESTIGATION (RI), VOLUME V - TABLES	REMOVED	PARCEL D	BECHTEL NATIONAL PW - 45359685	
N00217 / 003301 NONE REPORT N62474-94-D-7609 750	11-18-1999 **06-28-1996** 00005 00.0	PRC ENVIRONMENTAL MANAGEMENT SICKLES, J. NAVFAC - EFA WEST RADZEVICH, W.	DRAFT REPORT, PARCEL D REMEDIAL INVESTIGATION (RI), VOLUME VI - FIGURES	REMOVED	PARCEL D	BECHTEL NATIONAL PW - 45359685	
N00217 / 003302 NONE REPORT N62474-94-D-7609 750	11-18-1999 **06-28-1996** 00005 00.0	PRC ENVIRONMENTAL MANAGEMENT SICKLES, J. NAVFAC - EFA WEST RADZEVICH, W.	DRAFT REPORT, PARCEL D REMEDIAL INVESTIGATION (RI), VOLUME VII - FIGURES	REMOVED	PARCEL D	BECHTEL NATIONAL PW - 45359685	
N00217 / 003303 NONE REPORT N62474-94-D-7609 750	11-18-1999 **06-28-1996** 00005 00.0	PRC ENVIRONMENTAL MANAGEMENT SICKLES, J. NAVFAC - EFA WEST RADZEVICH, W.	DRAFT REPORT, PARCEL D REMEDIAL INVESTIGATION (RI), VOLUME VIII - FIGURES	REMOVED	PARCEL D	BECHTEL NATIONAL PW - 45359685	
N00217 / 003304 NONE REPORT N62474-94-D-7609 750	11-18-1999 **06-28-1996** 00005 00.0	PRC ENVIRONMENTAL MANAGEMENT SICKLES, J. NAVFAC - EFA WEST RADZEVICH, W.	DRAFT REPORT, PARCEL D REMEDIAL INVESTIGATION (RI), VOLUME VIIIA - FIGURES	REMOVED	PARCEL D	BECHTEL NATIONAL PW - 45359685	

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N00217 / 003305 NONE REPORT N62474-94-D-7609 750	11-18-1999 **06-28-1996** 00005 00.0	PRC ENVIRONMENTAL MANAGEMENT SICKLES, J. NAVFAC - EFA WEST RADZEVICH, W.	DRAFT REPORT, PARCEL D REMEDIAL INVESTIGATION (RI), VOLUME VIIIB - FIGURES	REMOVED	PARCEL D	BECHTEL NATIONAL PW - 45359685	
N00217 / 003306 NONE REPORT N62474-94-D-7609 750	11-18-1999 **06-28-1996** 00005 00.0	PRC ENVIRONMENTAL MANAGEMENT SICKLES, J. NAVFAC - EFA WEST RADZEVICH, W.	DRAFT REPORT, PARCEL D REMEDIAL INVESTIGATION (RI), VOLUME VIIIC - FIGURES	REMOVED	PARCEL D	BECHTEL NATIONAL PW - 45359685	
N00217 / 003307 NONE REPORT N62474-94-D-7609 750	11-18-1999 **06-28-1996** 00005 00.0	PRC ENVIRONMENTAL MANAGEMENT SICKLES, J. NAVFAC - EFA WEST RADZEVICH, W.	DRAFT REPORT, PARCEL D REMEDIAL INVESTIGATION (RI), VOLUME VIIID - FIGURES	REMOVED	PARCEL D	BECHTEL NATIONAL PW - 45359685	
N00217 / 003308 NONE REPORT N62474-94-D-7609 750	11-18-1999 **06-28-1996** 00005 00.0	PRC ENVIRONMENTAL MANAGEMENT SICKLES, J. NAVFAC - EFA WEST RADZEVICH, W.	DRAFT REPORT, PARCEL D REMEDIAL INVESTIGATION (RI), VOLUME VIIIE - FIGURES	REMOVED	PARCEL D	BECHTEL NATIONAL PW - 45359685	
N00217 / 003309 NONE REPORT N62474-94-D-7609 750	11-18-1999 **06-28-1996** 00005 00.0	PRC ENVIRONMENTAL MANAGEMENT SICKLES, J. NAVFAC - EFA WEST RADZEVICH, W.	DRAFT REPORT, PARCEL D REMEDIAL INVESTIGATION (RI), VOLUME IX - APPENDICES A - I	REMOVED	PARCEL D	BECHTEL NATIONAL PW - 45359685	

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N00217 / 003310 NONE REPORT N62474-94-D-7609 750	11-18-1999 **06-28-1996** 00005 00.0	PRC ENVIRONMENTAL MANAGEMENT SICKLES, J. NAVFAC - EFA WEST RADZEVICH, W.	DRAFT REPORT, PARCEL D REMEDIAL INVESTIGATION (RI), VOLUME X - APPENDICES J - L	REMOVED	PARCEL D	BECHTEL NATIONAL PW - 45359685	
N00217 / 003311 NONE REPORT N62474-94-D-7609 750	11-18-1999 **06-28-1996** 00005 00.0	PRC ENVIRONMENTAL MANAGEMENT SICKLES, J. NAVFAC - EFA WEST RADZEVICH, W.	DRAFT REPORT, PARCEL D REMEDIAL INVESTIGATION (RI), VOLUME XI - APPENDIX M	REMOVED	PARCEL D	BECHTEL NATIONAL PW - 45359685	
N00217 / 003312 NONE REPORT N62474-94-D-7609 750	11-18-1999 **06-28-1996** 00005 00.0	PRC ENVIRONMENTAL MANAGEMENT SICKLES, J. NAVFAC - EFA WEST RADZEVICH, W.	DRAFT REPORT, PARCEL D REMEDIAL INVESTIGATION (RI), VOLUME XII - APPENDIX M	REMOVED	PARCEL D	BECHTEL NATIONAL PW - 45359685	
N00217 / 003313 NONE REPORT N62474-94-D-7609 750	11-18-1999 **06-28-1996** 00005 00.0	PRC ENVIRONMENTAL MANAGEMENT SICKLES, J. NAVFAC - EFA WEST RADZEVICH, W.	DRAFT REPORT, PARCEL D REMEDIAL INVESTIGATION (RI), VOLUME X III - APPENDIX M	REMOVED	PARCEL D	BECHTEL NATIONAL PW - 45359685	
N00217 / 003314 NONE REPORT N62474-94-D-7609 750	11-18-1999 **06-28-1996** 00005 00.0	PRC ENVIRONMENTAL MANAGEMENT SICKLES, J. NAVFAC - EFA WEST RADZEVICH, W.	DRAFT REPORT, PARCEL D REMEDIAL INVESTIGATION (RI), VOLUME XIV - APPENDIX N	REMOVED	PARCEL D	BECHTEL NATIONAL PW - 45359685	

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N00217 / 003315 NONE REPORT N62474-94-D-7609 750	11-18-1999 **06-28-1996** 00005 00.0	PRC ENVIRONMENTAL MANAGEMENT SICKLES, J. NAVFAC - EFA WEST RADZEVICH, W.	DRAFT REPORT, PARCEL D REMEDIAL INVESTIGATION (RI), VOLUME XV - APPENDIX N	REMOVED	PARCEL D	BECHTEL NATIONAL PW - 45359685		
N00217 / 003316 NONE REPORT N62474-94-D-7609 750	11-18-1999 **06-28-1996** 00005 00.0	PRC ENVIRONMENTAL MANAGEMENT SICKLES, J. NAVFAC - EFA WEST RADZEVICH, W.	DRAFT REPORT, PARCEL D REMEDIAL INVESTIGATION (RI), VOLUME XVI - APPENDIX N	REMOVED	PARCEL D	BECHTEL NATIONAL PW - 45359685		
N00217 / 003317 NONE REPORT N62474-94-D-7609 750	11-18-1999 **06-28-1996** 00005 00.0	PRC ENVIRONMENTAL MANAGEMENT SICKLES, J. NAVFAC - EFA WEST RADZEVICH, W.	DRAFT REPORT, PARCEL D REMEDIAL INVESTIGATION (RI), VOLUME XVII - APPENDIX N	REMOVED	PARCEL D	BECHTEL NATIONAL PW - 45359685		
N00217 / 003318 NONE REPORT N62474-94-D-7609 750	11-18-1999 **06-28-1996** 00005 00.0	PRC ENVIRONMENTAL MANAGEMENT SICKLES, J. NAVFAC - EFA WEST RADZEVICH, W.	DRAFT REPORT, PARCEL D REMEDIAL INVESTIGATION (RI), VOLUME XVIII - APPENDIX N	REMOVED	PARCEL D	BECHTEL NATIONAL PW - 45359685		
N00217 / 003339 EFAW SER 1832.2/L6308 CORRESPONDENC E NONE 6	11-18-1999 **07-19-1996** NONE 00.0	NAVFAC - EFA WEST R. POWELL VARIOUS AGENCIES	SUBMISSION OF PUBLIC SUMMARY AND RESTORATION ADVISORY BOARD (RAB) IMPACT SUMMARY FOR PARCEL D REMEDIAL INVESTIGATION (RI) DRAFT REPORT (W/ ENCLOSURE)	ADMIN RECORD INFO REPOSITORY	PARCEL D	FRC - PERRIS IMAGED HPNT_028	181-07-0027 30093199	BOX 0056

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N00217 / 003348 EFAW SER 1832.2/L6317 CORRESPONDENCE N62474-88-D-5086 3	11-18-1999 **07-31-1996** 00245 00.0	NAVFAC - EFA WEST R. POWELL VARIOUS AGENCIES	SUBMISSION OF THE DRAFT CONSTRUCTION SUMMARY REPORT FOR THE PICKLING AND PLATE YARD REMOVAL ACTION (RM), VOLUMES I-II OF II (W/OUT ENCLOSURE)	ADMIN RECORD	009 PARCEL D	FRC - PERRIS IMAGED HPNT_025	181-07-0027 30093199	BOX 0056
N00217 / 003349 NONE REPORT N62474-88-D-5086 500	11-18-1999 **07-31-1996** 00245 00.0	HARDING LAWSON ASSOCIATES N. SAMHOURI NAVFAC - EFA WEST R. POWELL	DRAFT CONSTRUCTION SUMMARY REPORT FOR THE PICKLING AND PLATE YARD REMOVAL ACTION (RM), VOLUME I - TEXT, TABLES, AND PLATES (VOLUMES I-II OF II) (SEE AR #3350 - VOLUME II)	ADMIN RECORD	009 PARCEL D	SOUTHWEST DIVISION - BLDG. 110 BX-002		
N00217 / 003350 NONE REPORT N62474-88-D-5086 500	11-18-1999 **07-31-1996** 00245 00.0	HARDING LAWSON ASSOCIATES N. SAMHOURI NAVFAC - EFA WEST R. POWELL	DRAFT CONSTRUCTION SUMMARY REPORT FOR THE PICKLING AND PLATE YARD REMOVAL ACTION (RM), VOLUME II - APPENDICES (VOLUMES I-II OF II) (SEE AR #3349 - VOLUME I)	ADMIN RECORD	009 PARCEL D	SOUTHWEST DIVISION - BLDG. 110 BX-002		
N00217 / 003360 EFAW SER 1832/L6353 CORRESPONDENCE NONE 39	11-18-1999 **08-30-1996** NONE 00.0	NAVFAC - EFA WEST R. POWELL DTSC - BERKELEY C. SHABAHARI	REQUEST FOR IDENTIFICATION OF STATE APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARAR) FOR PARCEL D FEASIBILITY STUDY (FS)	INFO REPOSITORY	PARCEL D	FRC - PERRIS IMAGED HPNT_008	181-07-0027 30093199	BOX 0056
N00217 / 003367 EFAW SER 1832.2/L6376 CORRESPONDENCE NONE 1	11-18-1999 **09-18-1996** NONE 00.0	NAVFAC - EFA WEST R. POWELL VARIOUS AGENCIES	REVISED DATE FOR SUBMISSION OF THE DRAFT FINAL PARCEL D REMEDIAL INVESTIGATION (RI) REPORT TO 25 OCTOBER 1996	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_008	181-07-0027 30093199	BOX 0057

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N00217 / 003369 SER 1832.2/L6380 CORRESPONDENCE NONE 2	11-18-1999 **09-26-1996** NONE 00.0	NAVFAC - EFA WEST R. POWELL VARIOUS AGENCIES	SUBMISSION OF DRAFT PARCEL D FEASIBILITY STUDY (FS), VOLUMES I AND II - 26 SEPTEMBER 1996 [W/OUT ENCLOSURE] (SEE AR #585 - REVISED DRAFT FS, #3370 - DRAFT FS - VOLUME I, AND #3371 - DRAFT FS - VOLUME II)	ADMIN RECORD	PARCEL D	SOUTHWEST DIVISION - BLDG. 1 BX-012		
N00217 / 003370 EFAW SER 1832.2/L6380 REPORT N62474-94-D-7609 277	11-18-1999 **09-26-1996** 00005 00.0	LEVINE-FRICKE M. KNOX NAVFAC - EFA WEST	DRAFT REPORT, PARCEL D FEASIBILITY STUDY (FS), VOLUME I OF II, TEXT (SEE AR #3371 - VOLUME II AND AR #585 - REVISED DRAFT FS)	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_029	181-07-0027 30093199	BOX 0057
N00217 / 003371 EFAW SER 1832.2/L6380 REPORT N62474-94-D-7609 263	11-18-1999 **09-26-1996** 00005 00.0	LEVINE-FRICKE M. KNOX NAVFAC - EFA WEST	DRAFT REPORT, PARCEL D FEASIBILITY STUDY (FS), VOLUME II OF II, APPENDICES (SEE AR #3370 - VOLUME I AND #585 - REVISED DRAFT FS)	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_029	181-07-0027 30093199	BOX 0057
N00217 / 003384 NONE CORRESPONDENCE NONE 131	11-18-1999 **10-04-1996** NONE 00.0	DTSC - BERKELEY C. SHABAHARI NAVFAC - EFA WEST R. POWELL	IDENTIFICATION OF STATE APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARS) FOR THE PARCEL D FEASIBILITY STUDY (FS)	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_008	181-07-0027 30093199	BOX 0057
N00217 / 003413 EFAW SER 1832.2/L7019 CORRESPONDENCE N62474-94-D-7609 2	11-18-1999 **10-25-1996** 00005 00.0	NAVFAC - EFA WEST R. POWELL VARIOUS AGENCIES	SUBMISSION OF DRAFT FINAL REPORT, PARCEL D REMEDIAL INVESTIGATION (RI), VOLUMES I THROUGH XXIV (W/OUT ENCLOSURES) (SEE AR #3414 THROUGH 3437 - DRAFT FINAL PARCEL D REMEDIAL INVESTIGATION, VOLUMES I THROUGH XXIV)	ADMIN RECORD INFO REPOSITORY	PARCEL D	FRC - PERRIS IMAGED HPNT_017	181-07-0027 30093199	BOX 0058

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N00217 / 003414 NONE REPORT N62474-94-D-7609 812	11-18-1999 **10-25-1996** 00005 00.0	PRC ENVIRONMENTAL MANAGEMENT J. SICKLES NAVFAC - EFA WEST W. RADZEVICH	DRAFT FINAL PARCEL D REMEDIAL INVESTIGATION (RI) REPORT, VOLUME I OF XXIV - TEXT (SEE AR #3415 THROUGH 3437 - VOLUMES II THROUGH XXIV)	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_017	181-07-0027 30093199	BOX 0058
N00217 / 003415 NONE REPORT N62474-94-D-7609 768	11-18-1999 **10-25-1996** 00005 00.0	PRC ENVIRONMENTAL MANAGEMENT J. SICKLES NAVFAC - EFA WEST W. RADZEVICH	DRAFT FINAL PARCEL D REMEDIAL INVESTIGATION (RI) REPORT, VOLUME II OF XXIV - TEXT (SEE AR #3414 - VOLUME I AND 3416 THROUGH 3437 - VOLUMES III THROUGH XXIV)	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_017	181-07-0027 30093199	BOX 0058
N00217 / 003416 NONE REPORT N62474-94-D-7609 684	11-18-1999 **10-25-1996** 00005 00.0	PRC ENVIRONMENTAL MANAGEMENT J. SICKLES NAVFAC - EFA WEST W. RADZEVICH	DRAFT FINAL PARCEL D REMEDIAL INVESTIGATION (RI) REPORT, VOLUME III OF XXIV - TABLES (SEE AR #3414 THROUGH 3415 - VOLUMES I THROUGH II AND 3417 THROUGH 3437 - VOLUMES IV THROUGH XXIV)	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_017	181-07-0027 30093199	BOX 0058
N00217 / 003417 NONE REPORT N62474-94-D-7609 875	11-18-1999 **10-25-1996** 00005 00.0	PRC ENVIRONMENTAL MANAGEMENT J. SICKLES NAVFAC - EFA WEST W. RADZEVICH	DRAFT FINAL PARCEL D REMEDIAL INVESTIGATION (RI) REPORT, VOLUME IV OF XXIV - TABLES (SEE AR #3414 THROUGH 3416 - VOLUMES I THROUGH III AND 3418 THROUGH 3437 - VOLUMES V THROUGH XXIV)	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_017	181-07-0027 30093199	BOX 0058
N00217 / 003418 NONE REPORT N62474-94-D-7609 659	11-18-1999 **10-25-1996** 00005 00.0	PRC ENVIRONMENTAL MANAGEMENT J. SICKLES NAVFAC - EFA WEST W. RADZEVICH	DRAFT FINAL PARCEL D REMEDIAL INVESTIGATION (RI) REPORT, VOLUME V OF XXIV - TABLES (SEE AR #3414 THROUGH 3417 - VOLUMES I THROUGH IV AND 3419 THROUGH 3437 - VOLUMES VI THROUGH XXIV)	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_017	181-07-0027 30093199	BOX 0058

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N00217 / 003419 NONE REPORT N62474-94-D-7609 38	11-18-1999 **10-25-1996** 00005 00.0	PRC ENVIRONMENTAL MANAGEMENT J. SICKLES NAVFAC - EFA WEST W. RADZEVICH	DRAFT FINAL PARCEL D REMEDIAL INVESTIGATION (RI) REPORT, VOLUME VI OF XXIV - FIGURES 1.3-1 TO 3.8-8 (SEE AR #3414 THROUGH 3418 - VOLUMES I THROUGH V AND 3420 THROUGH 3437 - VOLUMES VII THROUGH XXIV)	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_017	181-07-0027 30093199	BOX 0059
N00217 / 003420 NONE REPORT N62474-94-D-7609 29	11-18-1999 **10-25-1996** 00005 00.0	PRC ENVIRONMENTAL MANAGEMENT J. SICKLES NAVFAC - EFA WEST W. RADZEVICH	DRAFT FINAL PARCEL D REMEDIAL INVESTIGATION (RI) REPORT, VOLUME VII OF XXIV - FIGURES 4.0-1 TO 4.1-20 (SEE AR #3414 THROUGH 3419 - VOLUMES I THROUGH VI AND 3421 THROUGH 3437 - VOLUMES VIII THROUGH XXIV)	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_017	181-07-0027 30093199	BOX 0059
N00217 / 003421 NONE REPORT N62474-94-D-7609 25	11-18-1999 **10-25-1996** 00005 00.0	PRC ENVIRONMENTAL MANAGEMENT J. SICKLES NAVFAC - EFA WEST W. RADZEVICH	DRAFT FINAL PARCEL D REMEDIAL INVESTIGATION (RI) REPORT, VOLUME VIII OF XXIV - FIGURES 4.1-21 TO 4.1-40 (SEE AR #3414 THROUGH 3420 - VOLUMES I THROUGH VII AND 3422 THROUGH 3437 - VOLUMES IX THROUGH XXIV)	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_017	181-07-0027 30093199	BOX 0059
N00217 / 003422 NONE REPORT N62474-94-D-7609 25	11-18-1999 **10-25-1996** 00005 00.0	PRC ENVIRONMENTAL MANAGEMENT J. SICKLES NAVFAC - EFA WEST W. RADZEVICH	DRAFT FINAL PARCEL D REMEDIAL INVESTIGATION (RI) REPORT, VOLUME IX OF XXIV - FIGURES 4.1-41 TO 4.1-60 (SEE AR #3414 THROUGH 3421 - VOLUMES I THROUGH VIII AND 3423 THROUGH 3437 - VOLUMES X THROUGH XXIV)	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_017	181-07-0027 30093199	BOX 0059
N00217 / 003423 NONE REPORT N62474-94-D-7609 42	11-18-1999 **10-25-1996** 00005 00.0	PRC ENVIRONMENTAL MANAGEMENT J. SICKLES NAVFAC - EFA WEST W. RADZEVICH	DRAFT FINAL PARCEL D REMEDIAL INVESTIGATION (RI) REPORT, VOLUME X OF XXIV - FIGURES 4.1-61 TO 4.1-94 (SEE AR #3414 THROUGH 3422 - VOLUMES I THROUGH IX AND 3424 THROUGH 3437 - VOLUMES XI THROUGH XXIV)	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_017	181-07-0027 30093199	BOX 0059

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N00217 / 003424 NONE REPORT N62474-94-D-7609 68	11-18-1999 **10-25-1996** 00005 00.0	PRC ENVIRONMENTAL MANAGEMENT J. SICKLES NAVFAC - EFA WEST W. RADZEVICH	DRAFT FINAL PARCEL D REMEDIAL INVESTIGATION (RI) REPORT, VOLUME XI OF XXIV - FIGURES 4.2-1 TO 4.12.5-1 (SEE AR #3414 THROUGH 3423 - VOLUMES I THROUGH X AND 3425 THROUGH 3437 - VOLUMES XII THROUGH XXIV)	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_017	181-07-0027 30093199	BOX 0059
N00217 / 003425 NONE REPORT N62474-94-D-7609 51	11-18-1999 **10-25-1996** 00005 00.0	PRC ENVIRONMENTAL MANAGEMENT J. SICKLES NAVFAC - EFA WEST W. RADZEVICH	DRAFT FINAL PARCEL D REMEDIAL INVESTIGATION (RI) REPORT, VOLUME XII OF XXIV - FIGURES 4.13-1 TO 4.20-2 (SEE AR #3414 THROUGH 3424 - VOLUMES I THROUGH XI AND 3426 THROUGH 3437 - VOLUMES XIII THROUGH XXIV)	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_017	181-07-0027 30093199	BOX 0060
N00217 / 003426 NONE REPORT N62474-94-D-7609 57	11-18-1999 **10-25-1996** 00005 00.0	PRC ENVIRONMENTAL MANAGEMENT J. SICKLES NAVFAC - EFA WEST W. RADZEVICH	DRAFT FINAL PARCEL D REMEDIAL INVESTIGATION (RI) REPORT, VOLUME XIII OF XXIV - FIGURES 4.21-1 TO 5.1-2 (SEE AR #3414 THROUGH 3425 - VOLUMES I THROUGH XII AND 3427 THROUGH 3437 - VOLUMES XIV THROUGH XXIV)	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_017	181-07-0027 30093199	BOX 0060
N00217 / 003427 SER 1832.2/L7019 REPORT N62474-94-D-7609 649	11-18-1999 **10-25-1996** 00005 00.0	PRC ENVIRONMENTAL MANAGEMENT J. SICKLES NAVFAC - EFA WEST W. RADZEVICH	DRAFT FINAL PARCEL D REMEDIAL INVESTIGATION (RI) REPORT, VOLUME XIV OF XXIV - APPENDICES A TO I (SEE AR #3414 THROUGH 3426 - VOLUMES I THROUGH XIII AND 3428 THROUGH 3437 - VOLUMES XV THROUGH XXIV)	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_017	181-07-0027 30093199	BOX 0060
N00217 / 003428 NONE REPORT N62474-94-D-7609 802	11-18-1999 **10-25-1996** 00005 00.0	PRC ENVIRONMENTAL MANAGEMENT J. SICKLES NAVFAC - EFA WEST W. RADZEVICH	DRAFT FINAL PARCEL D REMEDIAL INVESTIGATION (RI) REPORT, VOLUME XV OF XXIV - APPENDIX J (SEE AR #3414 THROUGH 3427 - VOLUMES I THROUGH XIV AND 3429 THROUGH 3437 - VOLUMES XVI THROUGH XXIV)	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_017	181-07-0027 30093199	BOX 0060

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N00217 / 003429 NONE REPORT N62474-94-D-7609 1305	11-18-1999 **10-25-1996** 00005 00.0	PRC ENVIRONMENTAL MANAGEMENT J. SICKLES NAVFAC - EFA WEST W. RADZEVICH	DRAFT FINAL PARCEL D REMEDIAL INVESTIGATION (RI) REPORT, VOLUME XVI OF XXIV - APPENDICES K TO M, DATA TABLES (SEE AR #3414 THROUGH 3428 - VOLUMES I THROUGH XV AND 3430 THROUGH 3437 - VOLUMES XVII THROUGH XXIV)	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_017	181-07-0027 30093199	BOX 0060
N00217 / 003430 NONE REPORT N62474-94-D-7609 1349	11-18-1999 **10-25-1996** 00005 00.0	PRC ENVIRONMENTAL MANAGEMENT J. SICKLES NAVFAC - EFA WEST W. RADZEVICH	DRAFT FINAL PARCEL D REMEDIAL INVESTIGATION (RI) REPORT, VOLUME XVII OF XXIV - APPENDIX M, DATA TABLES (SEE AR #3414 THROUGH 3429 - VOLUMES I THROUGH XVI AND 3431 THROUGH 3437 - VOLUMES XVIII THROUGH XXIV)	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_017	181-07-0027 30093199	BOX 0061
N00217 / 003431 NONE REPORT N62474-94-D-7609 944	11-18-1999 **10-25-1996** 00005 00.0	PRC ENVIRONMENTAL MANAGEMENT J. SICKLES NAVFAC - EFA WEST W. RADZEVICH	DRAFT FINAL PARCEL D REMEDIAL INVESTIGATION (RI) REPORT, VOLUME XVIII OF XXIV - APPENDIX M, DATA TABLES (SEE AR #3414 THROUGH 3430 - VOLUMES I THROUGH XVII AND 3432 THROUGH 3437 - VOLUMES XIX THROUGH XXIV)	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_017	181-07-0027 30093199	BOX 0061
N00217 / 003432 NONE REPORT N62474-94-D-7609 431	11-18-1999 **10-25-1996** 00005 00.0	PRC ENVIRONMENTAL MANAGEMENT J. SICKLES NAVFAC - EFA WEST W. RADZEVICH	DRAFT FINAL PARCEL D REMEDIAL INVESTIGATION (RI) REPORT, VOLUME XIX OF XXIV - APPENDIX N, RISK ASSESSMENT (SEE AR #3414 THROUGH 3431 - VOLUMES I THROUGH XVIII AND 3433 THROUGH 3437 - VOLUMES XX THROUGH XXIV)	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_017	181-07-0027 30093199	BOX 0061
N00217 / 003433 NONE REPORT N62474-94-D-7609 1367	11-18-1999 **10-25-1996** 00005 00.0	PRC ENVIRONMENTAL MANAGEMENT J. SICKLES NAVFAC - EFA WEST W. RADZEVICH	DRAFT FINAL PARCEL D REMEDIAL INVESTIGATION (RI) REPORT, VOLUME XX OF XXIV - APPENDIX N, RISK ASSESSMENT (SEE AR #3414 THROUGH 3432 - VOLUMES I THROUGH XIX AND 3434 THROUGH 3437 - VOLUMES XXI THROUGH XXIV)	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_017	181-07-0027 30093199	BOX 0061

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N00217 / 003434 NONE REPORT N62474-94-D-7609 1334	11-18-1999 **10-25-1996** 00005 00.0	PRC ENVIRONMENTAL MANAGEMENT J. SICKLES NAVFAC - EFA WEST W. RADZEVICH	DRAFT FINAL PARCEL D REMEDIAL INVESTIGATION (RI) REPORT, VOLUME XXI OF XXIV - APPENDIX N, RISK ASSESSMENT (SEE AR #3414 THROUGH 3433 - VOLUMES I THROUGH XX AND 3435 THROUGH 3437 - VOLUMES XXII THROUGH XXIV)	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_018	181-07-0027 30093199	BOX 0062
N00217 / 003435 NONE REPORT N62474-94-D-7609 1070	11-18-1999 **10-25-1996** 00005 00.0	PRC ENVIRONMENTAL MANAGEMENT J. SICKLES NAVFAC - EFA WEST W. RADZEVICH	DRAFT FINAL PARCEL D REMEDIAL INVESTIGATION (RI) REPORT, VOLUME XXII OF XXIV - APPENDIX N, RISK ASSESSMENT (SEE AR #3414 THROUGH 3434 - VOLUMES I THROUGH XXI AND 3436 THROUGH 3437 - VOLUMES XXIII THROUGH XXIV)	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_018	181-07-0027 30093199	BOX 0062
N00217 / 003436 NONE REPORT N62474-94-D-7609 579	11-18-1999 **10-25-1996** 00005 00.0	PRC ENVIRONMENTAL MANAGEMENT J. SICKLES NAVFAC - EFA WEST W. RADZEVICH	DRAFT FINAL PARCEL D REMEDIAL INVESTIGATION (RI) REPORT, VOLUME XXIII OF XXIV - APPENDIX N, RISK ASSESSMENT (SEE AR #3414 THROUGH 3435 - VOLUMES I THROUGH XXII AND 3437 - VOLUME XXIV)	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_018	181-07-0027 30093199	BOX 0062
N00217 / 003437 NONE REPORT N62474-94-D-7609 184	11-18-1999 **10-25-1996** 00005 00.0	PRC ENVIRONMENTAL MANAGEMENT J. SICKLES NAVFAC - EFA WEST W. RADZEVICH	DRAFT FINAL PARCEL D REMEDIAL INVESTIGATION (RI) REPORT, VOLUME XXIV OF XXIV - APPENDIX O AND P (SEE AR #3414 THROUGH 3436 - VOLUMES I THROUGH XXIII)	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_018	181-07-0027 30093199	BOX 0062
N00217 / 003409 NONE CORRESPONDENCE NONE 7	11-18-1999 **11-12-1996** NONE 00.0	DTSC C. SHABAHARI NAVFAC - EFA WEST R. POWELL	SUBMISSION OF PARCEL D APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARS) (W/ ENCLOSURES)	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_028	181-07-0027 30093199	BOX 0058

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N00217 / 003404 NONE CORRESPONDENCE NONE 4	11-18-1999 **11-21-1996** NONE 00.0	ARC ECOLOGY C. SHIRLEY NAVFAC - EFA WEST R. POWELL	COMMENTS ON THE DRAFT PARCEL D FEASIBILITY STUDY (FS) REPORT	ADMIN RECORD INFO REPOSITORY	PARCEL D	SOUTHWEST DIVISION - BLDG. 1 BX-011		
N00217 / 003438 EFAW SER 1832.2/L7052 CORRESPONDENCE NONE 2	11-18-1999 **12-12-1996** NONE 00.0	NAVFAC - EFA WEST R. POWELL U.S. EPA - SAN FRANCISCO C. TROMBADORE	PROPOSED MODIFICATION TO FEDERAL FACILITIES AGREEMENT (FFA) SCHEDULE FOR DELIVERY OF DRAFT PARCEL D PROPOSED PLAN	ADMIN RECORD INFO REPOSITORY	PARCEL D	FRC - PERRIS IMAGED HPNT_016	181-07-0027 30093199	BOX 0062
N00217 / 003454 EFAW SER 1832.1/L7077 CORRESPONDENCE NONE 2	11-18-1999 **01-16-1997** NONE 00.0	NAVFAC - EFA WEST R. POWELL U.S. EPA - SAN FRANCISCO C. TROMBADORE	PROPOSED MODIFICATIONS TO THE FEDERAL FACILITY AGREEMENT (FFA) SCHEDULES FOR PARCELS B AND D	ADMIN RECORD	PARCEL B PARCEL D	FRC - PERRIS IMAGED HPNT_025	181-07-0027 30093199	BOX 0062
N00217 / 003455 EFAW SER 1832.2/L7079 CORRESPONDENCE N62474-94-D-7609 3	11-18-1999 **01-24-1997** 00005 00.0	NAVFAC - EFA WEST R. POWELL VARIOUS AGENCIES	SUBMISSION OF (1) DRAFT FINAL PARCEL D FEASIBILITY STUDY (FS), VOLUMES 1 AND 2 - 24 JANUARY 1997, (2) ERRATA SHEET, PARCEL D, DRAFT FEASIBILITY STUDY - 24 JANUARY 1997 (W/OUT ENCLOSURES)	ADMIN RECORD INFO REPOSITORY	PARCEL D	FRC - PERRIS IMAGED HPNT_025	181-07-0027 30093199	BOX 0062
N00217 / 003456 NONE REPORT N62474-94-D-7609 620	11-18-1999 **01-24-1997** 00005 00.0	LEVINE-FRICKE RECON KNOX, M. NAVFAC - EFA WEST POWELL, R.	DRAFT FINAL FEASIBILITY STUDY (FS), VOLUME I OF II (INCLUDES ERRATA SHEET) [SEE AR #3457 - VOLUME II OF II, AR # 1132 - DRAFT FINAL REVISED FS, AND # 1160 - RADIOLOGICAL ADDENDUM, DRAFT FINAL REVISED FS]	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_001	181-07-0027 30093199	BOX 0062

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N00217 / 003457 NONE REPORT N62474-94-D-7609 381	11-18-1999 **01-24-1997** 00005 00.0	LEVINE-FRICKE RECON M. KNOX NAVFAC - EFA WEST R. POWELL	DRAFT FINAL PARCEL D FEASIBILITY STUDY (FS), VOLUME II OF II, APPENDICES (SEE AR #3456 - DRAFT FINAL PARCEL D FS, VOLUME I AND AR #585 - DRAFT PARCEL D REVISED FS)	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_001	181-07-0027 30093199 BOX 0063
N00217 / 003463 EFAW SER 1832.2/L7099 CORRESPONDENCE NONE 3	11-18-1999 **02-10-1997** NONE 00.0	NAVFAC - EFA WEST R. POWELL U.S. EPA - SAN FRANCISCO C. TROMBADORE	SUBMISSION OF RESPONSE TO COMMENTS ON THE DRAFT CONSTRUCTION SUMMARY REPORT, PICKLING AND PLATE YARD REMOVAL ACTION (RM) (SEE AR #3989 - RESPONSE TO COMMENTS)	ADMIN RECORD INFO REPOSITORY	009 PARCEL D	FRC - PERRIS IMAGED HPNT_025	181-07-0027 30093199 BOX 0063
N00217 / 003467 NONE CORRESPONDENCE NONE 2	11-18-1999 **02-25-1997** NONE 00.0	NAVFAC - EFA WEST POWELL, R. US EPA - SAN FRANCISCO TROMBADORE, C.	SUBMISSION OF THE RESPONSE TO COMMENTS ON THE PARCEL D REMEDIAL INVESTIGATION (RI) DRAFT REPORT FROM (1) DTSC DTD 12 AUGUST 1996, (2) RWQCB DTD 12 AUGUST 1996, AND (3) EPA DTD 03 DECEMBER 1996 DRAFT FINAL	ADMIN RECORD INFO REPOSITORY	PARCEL D	SOUTHWEST DIVISION - BLDG. 1 BX-011	
N00217 / 003468 NONE CORRESPONDENCE NONE 2	11-18-1999 **02-25-1997** NONE 00.0	NAVFAC - EFA WEST POWELL, R. US EPA - SAN FRANCISCO TROMBADORE, C.	RESPONSE TO COMMENTS ON THE PARCEL D REMEDIAL INVESTIGATION (RI) DRAFT REPORT FROM DTSC DATED 12 AUGUST 1996	ADMIN RECORD INFO REPOSITORY	PARCEL D	SOUTHWEST DIVISION - BLDG. 1 BX-011	
N00217 / 003469 NONE CORRESPONDENCE NONE 2	11-18-1999 **02-25-1997** NONE 00.0	NAVFAC - EFA WEST POWELL, R. US EPA - SAN FRANCISCO TROMBADORE, C.	RESPONSE TO COMMENTS ON THE PARCEL D REMEDIAL INVESTIGATION (RI) DRAFT REPORT FROM RWQCB DATED 12 AUGUST 1996	ADMIN RECORD INFO REPOSITORY	PARCEL D	SOUTHWEST DIVISION - BLDG. 1 BX-011	
N00217 / 003470 NONE CORRESPONDENCE NONE 103	11-18-1999 **02-25-1997** NONE 00.0	NAVFAC - EFA WEST POWELL, R. US EPA - SAN FRANCISCO TROMBADORE, C.	RESPONSE TO COMMENTS ON THE PARCEL D REMEDIAL INVESTIGATION (RI) DRAFT FINAL REPORT FROM USEPA DATED 03 DECEMBER 1996	INFO REPOSITORY	PARCEL D	FRC - PERRIS IMAGED HPNT_025	181-07-0027 30093199 BOX 0063

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N00217 / 003471 NONE CORRESPONDENCE NONE 2	11-18-1999 **02-26-1997** NONE 00.0	DTSC - BERKELEY C. SHABAHARI NAVFAC - EFA WEST R. POWELL	PARCEL D DRAFT FINAL FEASIBILITY STUDY (FS) REPORT, DEFER APPROVAL UNTIL TECH MEMO (TM) IS REVIEWED	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_025	181-07-0027 30093199	BOX 0063
N00217 / 003472 NONE CORRESPONDENCE NONE 1	11-18-1999 **02-28-1997** NONE 00.0	U.S. EPA - SAN FRANCISCO C. TROMBADORE NAVFAC - EFA WEST R. POWELL	PARCEL D FEASIBILITY STUDY (FS) DRAFT FINAL REPORT, DEFER APPROVAL UNTIL TECH MEMO (TM) IS REVIEWED	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_025	181-07-0027 30093199	BOX 0063
N00217 / 003480 NONE REPORT N62474-94-D-7609 19	11-18-1999 **05-05-1997** 00005 00.0	PRC ENVIRONMENTAL MANAGEMENT J. SICKLES NAVFAC - EFA WEST W. RADZEVICH	FINAL PROPOSED PLAN FOR PARCEL D	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_025	181-07-0027 30093199	BOX 0063
N00217 / 001334 NONE MINUTES NONE 5	06-23-2008 **08-16-1997** NONE	HUNTERS POINT CITIZENS' ADVISORY COMMITTEE PUBLIC INTEREST	NOTES FROM THE 16 AUGUST 1997 RETREAT OF THE CITIZENS' ADVISORY COMMITTEE	ADMIN RECORD	PARCEL B PARCEL D	SOUTHWEST DIVISION - BLDG. 1		
N00217 / 003527 EFAW SER 1832.2/L7251 CORRESPONDENCE NONE 5	11-18-1999 **08-29-1997** NONE 00.0	NAVFAC - EFA WEST R. POWELL VARIOUS AGENCIES	SUBMISSION OF RESPONSE TO COMMENTS ON THE DRAFT FINAL PARCEL D FEASIBILITY STUDY (FS) (W/ ENCLOSURE)	ADMIN RECORD INFO REPOSITORY	PARCEL D	FRC - PERRIS IMAGED HPNT_014	181-07-0027 30093199	BOX 0069

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N00217 / 003531 NONE CORRESPONDENCE NONE 2	11-18-1999 **09-03-1997** NONE 00.0	DTSC - BERKELEY KAO, C. NAVFAC - EFA WEST POWELL, R.	RESPONSE TO NAVY'S LETTER DATED 29 AUGUST 1997 REGARDING THE COMPLETION OF PARCEL D FEASIBILITY STUDY (FS)	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_014	181-07-0027 30093199	BOX 0069
N00217 / 000794 NONE REPORT N62474-94-D-7609 30	02-04-2004 **11-07-1997** 00174	TETRA TECH EM INC. S. TOBIAS NAVFAC - SOUTHWEST DIVISION	DRAFT BASEWIDE FINDING OF SUITABILITY TO LEASE (EXCLUDING PARCEL A)	ADMIN RECORD	PARCEL B PARCEL C PARCEL D PARCEL E PARCEL F	SOUTHWEST DIVISION - BLDG. 1		
N00217 / 000793 NONE REPORT N62474-94-D-7609 243	02-04-2004 **01-07-1998** 00174	TETRA TECH EM INC. S. TOBIAS NAVFAC - SOUTHWEST DIVISION J. TUAN	DRAFT FINAL BASEWIDE FINDING OF SUITABILITY TO LEASE (EXCLUDING PARCEL A)	ADMIN RECORD	PARCEL B PARCEL C PARCEL D PARCEL E PARCEL F	FRC - PERRIS IMAGED HPNT_018	181-07-0027 30093199	BOX 0030
N00217 / 003696 EFAW SER 6229WR/L8092 CORRESPONDENCE NONE 1	11-18-1999 **01-26-1998** NONE 00.0	NAVFAC - EFA WEST R. POWELL U.S. EPA - SAN FRANCISCO C. TROMBADORE	REVISED SCHEDULE FOR THE SUBMISSION OF THE PARCEL D DRAFT FINAL RECORD OF DECISION (ROD)	ADMIN RECORD INFO REPOSITORY	PARCEL D	FRC - PERRIS IMAGED HPNT_025	181-07-0027 30093199	BOX 0074
N00217 / 003722 EFAW SER 622WR/L8154 CORRESPONDENCE NONE 57	11-18-1999 **04-10-1998** NONE 00.0	NAVFAC - EFA WEST R. POWELL VARIOUS AGENCIES	RESPONSE TO COMMENTS ON THE DRAFT PARCEL D RECORD OF DECISION (ROD) - 10 APRIL 1998	ADMIN RECORD INFO REPOSITORY	PARCEL D	FRC - PERRIS IMAGED HPNT_025	181-07-0027 30093199	BOX 0075

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N00217 / 003743 NONE REPORT NONE 16	11-18-1999 **04-18-1998** NONE 00.0	NAVFAC - EFA WEST R. POWELL VARIOUS AGENCIES	SUBMISSION OF APRIL 1998 MONTHLY PROGRESS REPORT (MPR) AND SCHEDULES FOR PARCELS A THROUGH F AND BASEWIDE (W/ ENCLOSURE)	ADMIN RECORD	BASEWIDE PARCEL A PARCEL B PARCEL C PARCEL D PARCEL E PARCEL F	FRC - PERRIS IMAGED HPNT_025	181-07-0027 30093199	BOX 0076
N00217 / 003788 NONE CORRESPONDENCE NONE 4	11-18-1999 **05-07-1998** NONE 00.0	SFRA B. RHETT NAVFAC - EFA WEST E. HUNTER	COMMENTS ON THE RESPONSE TO COMMENTS ON THE DRAFT PARCEL D RECORD OF DECISION (ROD) (DRAFT RECORD OF DECISION WAS NOT SUBMITTED TO ADMINISTRATIVE RECORDS)	ADMIN RECORD INFO REPOSITORY	PARCEL D	FRC - PERRIS IMAGED HPNT_023	181-07-0027 30093199	BOX 0077
N00217 / 003789 NONE CORRESPONDENCE NONE 5	11-18-1999 **05-14-1998** NONE 00.0	U.S. EPA - SAN FRANCISCO C. TROMBADORE NAVFAC - EFA WEST R. POWELL	COMMENTS ON THE RESPONSE TO COMMENTS ON THE DRAFT RECORD OF DECISION (DRAFT RECORD OF DECISION WAS NOT SUBMITTED TO ADMINISTRATIVE RECORDS)	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_023	181-07-0027 30093199	BOX 0077
N00217 / 003790 NONE CORRESPONDENCE NONE 3	11-18-1999 **05-14-1998** NONE 00.0	U.S. EPA - SAN FRANCISCO C. TROMBADORE NAVFAC - EFA WEST R. POWELL	COMMENTS ON THE RESPONSE TO COMMENTS ON THE DRAFT CONSTRUCTION SUMMARY REPORT, PICKLING AND PLATE YARD (PPY) REMOVAL ACTION (RM)	ADMIN RECORD	009 PARCEL D	FRC - PERRIS IMAGED HPNT_023	181-07-0027 30093199	BOX 0077
N00217 / 000541 EFAW SER 622/L117-1 CORRESPONDENCE NONE 8	12-20-2001 **04-27-1999** NONE	NAVFAC - EFA WEST M. MCCLELLAND U.S. EPA - SAN FRANCISCO C. TROMBADORE	RESPONSE TO VARIOUS COMMENTS REGARDING NAVY'S REQUEST FOR SCHEDULE REVISIONS (WITH ENCLOSURES)	ADMIN RECORD	PARCEL B PARCEL C PARCEL D PARCEL E PARCEL F	FRC - PERRIS IMAGED HPNT_016	181-07-0027 30093199	BOX 0013

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N00217 / 003847 EFAW SER 6229/191673 CORRESPONDENCE N62474-94-D-7609 3	11-18-1999 **06-21-1999** 00005 00.0	NAVFAC - EFA WEST R. POWELL VARIOUS AGENCIES	SUBMISSION OF THE DRAFT PARCEL D RISK MANAGEMENT REVIEW PROCESS (W/O ENCLOSURE)(SEE AR #3848 FOR THE DRAFT PARCEL D RISK MANAGEMENT REVIEW PROCESS)	ADMIN RECORD INFO REPOSITORY	PARCEL D	FRC - PERRIS IMAGED HPNT_025	181-07-0027 30093199	BOX 0078
N00217 / 003848 NONE REPORT N62474-94-D-7609 692	11-18-1999 **06-21-1999** 00005 00.0	TETRA TECH S. WALD NAVFAC - EFA WEST W. RADZEVICH	DRAFT PARCEL D RISK MANAGEMENT REVIEW PROCESS	ADMIN RECORD INFO REPOSITORY	PARCEL D	FRC - PERRIS IMAGED HPNT_021	181-07-0027 30093199	BOX 0078
N00217 / 003853 SER 6229/19194-1 CORRESPONDENCE N62474-94-D-7609 3	11-18-1999 **07-15-1999** 00005 00.0	NAVFAC - EFA WEST R. POWELL VARIOUS AGENCIES	SUBMISSION OF THE DRAFT TECHNICAL MEMORANDUM (TM) GROUNDWATER CLASSIFICATION AND ANALYSIS OF THE A- AND B-AQUIFER INTERCONNECTIONS FOR PARCEL D - 15 JULY 1999 (W/OUT ENCLOSURE) [SEE AR #3854 - DRAFT TECHNICAL MEMORANDUM]	INFO REPOSITORY	PARCEL D	FRC - PERRIS IMAGED HPNT_028	181-07-0027 30093199	BOX 0078
N00217 / 003854 NONE REPORT N62474-94-D-7609 94	11-18-1999 **07-15-1999** 00005 00.0	TETRA TECH S. WALD NAVFAC - EFA WEST W. RADZEVICH	DRAFT TECHNICAL MEMORANDUM GROUNDWATER CLASSIFICATION AND ANALYSIS OF THE A- AND B-AQUIFER INTERCONNECTIONS FOR PARCEL D	ADMIN RECORD INFO REPOSITORY	PARCEL D	FRC - PERRIS IMAGED HPNT_025	181-07-0027 30093199	BOX 0078
N00217 / 003855 NONE CORRESPONDENCE NONE 1	11-18-1999 **07-23-1999** NONE 00.0	US EPA - SAN FRANCISCO TROMBADORE, C. NAVFAC - EFA WEST MCCLELLAND, M.	DRAFT RISK MANAGEMENT REVIEW PROCESS TECHNICAL MEMORANDUM (TM), PARCEL D; REQUEST FOR ADDITIONAL REVIEW TIME	INFO REPOSITORY	PARCEL D	SOUTHWEST DIVISION - BLDG. 1		
N00217 / 003892 NONE CORRESPONDENCE NONE 2	11-18-1999 **08-31-1999** NONE 00.0	U.S. EPA - SAN FRANCISCO C. TROMBADORE NAVFAC - EFA WEST M. MCCLELLAND	EXTENSION REQUEST FOR REVIEW AND COMMENTS OF THE RISK MANAGEMENT TECHNICAL MEMORANDUM, PARCEL D (RISK MANAGEMENT TECHNICAL MEMORANDUM, PARCEL D WAS NOT SUBMITTED TO ADMINISTRATIVE RECORDS)	ADMIN RECORD INFO REPOSITORY	PARCEL D	FRC - PERRIS IMAGED HPNT_025	181-07-0027 30093199	BOX 0079

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N00217 / 003893 NONE CORRESPONDENCE NONE 12	11-18-1999 **09-02-1999** NONE 00.0	U.S. EPA - SAN FRANCISCO C. TROMBADORE NAVFAC - EFA WEST M. MCCLELLAND	COMMENTS ON THE DRAFT TECHNICAL MEMORANDUM, GROUNDWATER CLASSIFICATION AND ANALYSIS OF THE A- AND B- AQUIFER INTERCONNECTIONS, PARCEL D	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_025	181-07-0027 30093199	BOX 0079
N00217 / 003894 NONE CORRESPONDENCE NONE 5	11-18-1999 **09-08-1999** NONE 00.0	CRWQCB D. LELAND NAVFAC - EFA WEST R. POWELL	COMMENTS ON THE DRAFT TECHNICAL MEMORANDUM, GROUNDWATER CLASSIFICATION AND ANALYSIS OF THE A- AND B- AQUIFER INTERCONNECTIONS, PARCEL D	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_025	181-07-0027 30093199	BOX 0079

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N00217 / 003919 EFAW SER 7229WR/L0015 REPORT N62474-94-D-7609 111	01-05-2000 **11-24-1999** 00128 01.1	NAVFAC - EFA WEST R. POWELL VARIOUS AGENCIES	DRAFT FINAL TECHNICAL MEMORANDUM, A-AQUIFER GROUNDWATER BENEFICIAL USE EVALUATION [INCLUDES PUBLIC SUMMARY AND EFAW TRANSMITTAL LETTER BY R. POWELL]	ADMIN RECORD INFO REPOSITORY	008 009 016 017 022 032 033N 033S 034 035 037 038 039 044 045 048 050 051 053 055 065 066 068 070 071 PARCEL D	FRC - PERRIS IMAGED HPNT_016	181-07-0027 30093199	BOX 0080
N00217 / 003921 SWDIV SER 06CH.AP/006 CORRESPONDENCE N62474-94-D-7609 26	01-20-2000 **01-03-2000** 00128 10.1	NAVFAC - SOUTHWEST DIVISION J. JOYCE VARIOUS AGENCIES	RESPONSE TO COMMENTS ON THE DRAFT TECHNICAL MEMORANDUM FOR THE GROUNDWATER CLASSIFICATION AND ANALYSIS OF THE A- AND B- AQUIFER INTERCONNECTIONS FOR PARCEL D	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_016	181-07-0027 30093199	BOX 0080

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N00217 / 000245 CTO-007/0178 MINUTES N68711-95-D-7526 69	11-08-2000 **02-24-2000** 00007	BECHTEL NATIONAL, INC. TAIT, R. NAVFAC - SOUTHWEST DIVISION SELBY, R.	24 FEBRUARY 2000 RESTORATION ADVISORY BOARD (RAB) MEETING HANDOUTS [INCLUDES AGENDA, RAB LISTING, MEETING MINUTES OF 10/21/99, 12/09/99, 01/18/00 AND 01/27/00 AND VARIOUS HANDOUTS] {PORTION OF MAILING LIST IS CONFIDENTIAL}	ADMIN RECORD INFO REPOSITORY SENSITIVE	PARCEL A PARCEL B PARCEL C PARCEL D PARCEL E PARCEL F	FRC - PERRIS IMAGED HPNT_001	181-07-0027 30093199	BOX 0005
N00217 / 003932 SWDIV SER 06CH.RM/278 CORRESPONDENCE NONE 8	04-14-2000 **04-12-2000** NONE	NAVFAC - EFA WEST R. MACH U.S. EPA - SAN FRANCISCO C. TROMBADORE	TRANSMITTAL OF 23 MARCH 2000 PARCEL D RISK MANAGEMENT REVIEW MEETING MINUTES (W/ ENCLOSURE)	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_016	181-07-0027 30093199	BOX 0080
N00217 / 000247 CTO-007/0178 MINUTES N68711-95-D-7526 72	11-08-2000 **04-27-2000** 00007	BECHTEL NATIONAL, INC. TAIT, R. NAVFAC - SOUTHWEST DIVISION SELBY, R.	27 APRIL 2000 RESTORATION ADVISORY BOARD (RAB) MEETING HANDOUTS - INCLUDES AGENDA, MEETING MINUTES OF 3/23/00 & BCT MEETING MINUTES OF 3/3/00, PARCEL UPDATES, OVERHEADS & DRAFT EXPLANATION OF SIGNIFICANT DIFFERENCES, PARCEL B - (4/10/00)]	ADMIN RECORD INFO REPOSITORY	PARCEL A PARCEL B PARCEL C PARCEL D PARCEL E PARCEL F SITE 00001	FRC - PERRIS IMAGED HPNT_001	181-07-0027 30093199	BOX 0005
N00217 / 003945 NONE CORRESPONDENCE NONE 2	06-06-2000 **05-05-2000** NONE	U.S. EPA - SAN FRANCISCO C. TROMBADORE NAVFAC - EFA WEST R. MACH	EPA'S REQUEST TO ASSIST IN CALCULATING REALISTIC COST TO COMPLETE ESTIMATE	ADMIN RECORD	PARCEL B PARCEL C PARCEL D PARCEL E PARCEL F	FRC - PERRIS IMAGED HPNT_016	181-07-0027 30093199	BOX 0081
N00217 / 003946 SWDIV SER 06CH.RM/361 CORRESPONDENCE NONE 11	06-06-2000 **05-12-2000** NONE	NAVFAC - EFA WEST R. MACH VARIOUS AGENCIES	SUBMISSION OF FINAL COST TO COMPLETE TECHNICAL ASSUMPTIONS MEETING MINUTES OF 25 APRIL 2000 (W/ ENCLOSURE)	ADMIN RECORD	PARCEL B PARCEL C PARCEL D	FRC - PERRIS IMAGED HPNT_016	181-07-0027 30093199	BOX 0081

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N00217 / 003947 SWDIV SER 06CH.RM/360 CORRESPONDENCE NONE 13	06-06-2000 **05-12-2000** NONE	NAVFAC - EFA WEST R. MACH VARIOUS AGENCIES	SUBMISSION OF 27 APRIL 2000 BASE REALIGNMENT AND CLOSURE (BRAC) CLEANUP TEAM (BCT) MEETING MINUTES (W/ ENCLOSURE)	ADMIN RECORD	PARCEL A PARCEL B PARCEL C PARCEL D PARCEL E	FRC - PERRIS IMAGED HPNT_016	181-07-0027 30093199	BOX 0081
N00217 / 000224 CTO-007/0097 MINUTES N68711-95-D-7526 19	10-27-2000 **05-25-2000** 00007	BECHTEL NATIONAL, INC. NAVFAC - SOUTHWEST DIVISION	RESTORATION ADVISORY BOARD (RAB) MEETING MINUTES OF 25 MAY 2000	ADMIN RECORD INFO REPOSITORY	PARCEL A PARCEL B PARCEL C PARCEL D PARCEL E	FRC - PERRIS IMAGED HPNT_001	181-07-0027 30093199	BOX 0004
N00217 / 000251 CTO-007/0178 MINUTES N68711-95-D-7526 20	11-08-2000 **05-25-2000** 00007	BECHTEL NATIONAL, INC. NAVFAC - SOUTHWEST DIVISION	25 MAY 2000 RESTORATION ADVISORY BOARD (RAB) MEETING HANDOUTS [INCLUDES AGENDA, 04/27/00 MEETING MINUTES & VARIOUS HANDOUTS]	ADMIN RECORD INFO REPOSITORY	PARCEL B PARCEL C PARCEL D PARCEL E	FRC - PERRIS IMAGED HPNT_001	181-07-0027 30093199	BOX 0005
N00217 / 000257 NONE MISC NONE 12	11-08-2000 **06-01-2000** NONE	NAVFAC - SOUTHWEST DIVISION NAVFAC - SOUTHWEST DIVISION	ENVIRONMENTAL CLEANUP NEWSLETTER: "WHAT IS HUNTERS POINT SHIPYARD?"	ADMIN RECORD INFO REPOSITORY	006 021 PARCEL A PARCEL B PARCEL C PARCEL D PARCEL E SITE 00001 SITE 00003	FRC - PERRIS IMAGED HPNT_001	181-07-0027 30093199	BOX 0005
N00217 / 003955 NONE REPORT N62474-94-D-7609 354	06-07-2000 **06-01-2000** 00005 & 00011	TETRA TECH EM INC. D. BIELSKIS VARIOUS AGENCIES	DRAFT FIELD SAMPLING PLAN FOR PHASE I GROUNDWATER DATA GAPS INVESTIGATION	ADMIN RECORD	PARCEL A PARCEL B PARCEL C PARCEL D PARCEL E PARCEL F	FRC - PERRIS IMAGED HPNT_021	181-07-0027 30093199	BOX 0081

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N00217 / 003956 NONE REPORT N62474-94-D-7609 126	06-07-2000 **06-01-2000** 00005 & 00011	TETRA TECH EM INC. D. BIELSKIS VARIOUS AGENCIES	DRAFT QUALITY ASSURANCE PROJECT PLAN FOR PHASE I GROUNDWATER DATA GAPS INVESTIGATION	ADMIN RECORD	PARCEL B PARCEL C PARCEL D PARCEL E	FRC - PERRIS IMAGED HPNT_022	181-07-0027 30093199	BOX 0081
N00217 / 003979 CRWQCB FILE NO. 2169.6032 (LBJ) CORRESPONDENCE NONE 3	07-14-2000 **06-16-2000** NONE	CRWQCB - SAN FRANCISCO B. JOB NAVFAC - EFA WEST R. MACH	COMMENTS ON DRAFT FIELD SAMPLING PLAN FOR PHASE I DATA GAPS INVESTIGATION	ADMIN RECORD	PARCEL C PARCEL D PARCEL E	FRC - PERRIS IMAGED HPNT_022	181-07-0027 30093199	BOX 0081
N00217 / 003978 NONE CORRESPONDENCE NONE 5	07-14-2000 **06-19-2000** NONE	U.S. EPA - SAN FRANCISCO C. TROMBADORE NAVFAC - EFA WEST R. MACH	REVIEW AND COMMENT ON THE DRAFT FIELD SAMPLING PLAN AND QUALITY ASSURANCE PROJECT PLAN FOR PHASE I GROUNDWATER DATA GAPS	ADMIN RECORD	PARCEL C PARCEL D	FRC - PERRIS IMAGED HPNT_022	181-07-0027 30093199	BOX 0081
N00217 / 003965 EFAW SER 06CH.RM/473 CORRESPONDENCE NONE 9	07-14-2000 **06-20-2000** NONE	NAVFAC - EFA WEST R. MACH VARIOUS AGENCIES	SUBMISSION OF FINAL COST TO COMPLETE ANALYSIS IN SUPPORT OF EARLY TRANSFER MEETING MINUTES OF 18 MAY 2000	ADMIN RECORD	PARCEL B PARCEL C PARCEL D	FRC - PERRIS IMAGED HPNT_022	181-07-0027 30093199	BOX 0081
N00217 / 003977 NONE CORRESPONDENCE NONE 7	07-14-2000 **06-20-2000** NONE	U.S. EPA - SAN FRANCISCO C. TROMBADORE NAVFAC - EFA WEST R. MACH	EPA REVIEW AND COMMENT ON THE DRAFT FIELD SAMPLING PLAN AND QUALITY ASURANE PROJECT PLAN FOR PHASE I GROUNDWATER DATA GAPS (WITH FOCUS ON PARCEL D GROUNDWATER SAMPLING EFFORT)	ADMIN RECORD	PARCEL C PARCEL D	FRC - PERRIS IMAGED HPNT_022	181-07-0027 30093199	BOX 0081

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N00217 / 003988 NONE REPORT N62474-94-D-7609 973	07-14-2000 **06-20-2000** 00128	TETRA TECH EM INC. S. WALD NAVFAC - SOUTHWEST DIVISION	DRAFT FINAL PARCEL D RISK MANAGEMENT REVIEW PROCESS - VOLUMES I AND II OF II	ADMIN RECORD	008 009 016 017 022 032 033N 033S 034 035 036 037 038 039 053 055 065 068 069 070 PARCEL D	FRC - PERRIS IMAGED HPNT_027	181-07-0027 30093199	BOX 0081
N00217 / 003990 EFAW SER 06CH.RM/459 CORRESPONDENCE NONE 4	07-14-2000 **06-20-2000** NONE	NAVFAC - EFA WEST R. MACH VARIOUS AGENCIES	TRANSMITTAL OF 1 & 2) DRAFT FINAL PARCEL D RISK MANAGEMENT REVIEW PROCESS, VOLUMES I-II OF II (SEE AR #3988) AND 3) FINAL CONSTRUCTION SUMMARY REPORT PICKLING AND PLATE YARD REMOVAL ACTION (SEE AR #3989)	ADMIN RECORD SENSITIVE	PARCEL D	FRC - PERRIS IMAGED HPNT_009	181-07-0027 30093199	BOX 0082

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N00217 / 003976 NONE CORRESPONDENCE NONE 11	07-14-2000 **06-23-2000** NONE	DTSC - BERKELEY C. KAO NAVFAC - EFA WEST R. MACH	REVIEW AND COMMENTS ON THE DRAFT QUALITY ASSSURANCE PROJECT PLAN AND DRAFT FIELD SAMPLING PLAN FOR PHASE I GROUNDWATER DATA GAPS INVESTIGATION	ADMIN RECORD	009 018 025 028 PARCEL B PARCEL C PARCEL D PARCEL E	FRC - PERRIS IMAGED HPNT_022	181-07-0027 30093199	BOX 0081
N00217 / 003986 NONE REPORT N62474-94-D-7609 119	07-14-2000 **06-26-2000** 00005	TETRA TECH EM INC. M. WANTA NAVFAC - SOUTHWEST DIVISION	DRAFT RADIOLOGICAL REMOVAL ACTION; ACTION MEMORANDUM	ADMIN RECORD	011 014 015 034 039 BLDG. 364 BLDG. 509 BLDG. 529 BLDG. 707 PARCEL D PARCEL E	FRC - PERRIS IMAGED HPNT_022	181-07-0027 30093199	BOX 0081
N00217 / 003972 EFAW SER 06CH.RM/478 CORRESPONDENCE NONE 11	07-14-2000 **06-30-2000** NONE	NAVFAC - EFA WEST R. MACH VARIOUS AGENCIES	TRANSMITTAL OF THE 08 JUNE 2000 FINAL BASE REALIGNMENT AND CLOSURE (BRAC) CLEANUP TEAM (BCT) MEETING MINUTES	ADMIN RECORD	PARCEL B PARCEL C PARCEL D PARCEL E	FRC - PERRIS IMAGED HPNT_022	181-07-0027 30093199	BOX 0081
N00217 / 003973 EFAW SER 06CH.RM/477 CORRESPONDENCE NONE 7	07-14-2000 **06-30-2000** NONE	NAVFAC - EFA WEST R. MACH VARIOUS AGENCIES	TRANSMITTAL OF 31 MAY 2000 FINAL PETROLEUM HYDROCARBON PROGRAM	ADMIN RECORD	BLDG. 439 PARCEL B PARCEL C PARCEL D PARCEL E	FRC - PERRIS IMAGED HPNT_022	181-07-0027 30093199	BOX 0081

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N00217 / 003991 NONE CORRESPONDENCE NONE 10	07-14-2000 **07-14-2000** NONE	NAVFAC - SOUTHWEST DIVISION	RESPONSE TO CALIFORNIA DTSC COMMENTS ON THE DRAFT SAMPLING AND ANALYSIS PLAN SITE INVESTIGATION	ADMIN RECORD	033 035 037 PARCEL D	FRC - PERRIS IMAGED HPNT_009	181-07-0027 30093199	BOX 0082
N00217 / 000040 NONE CORRESPONDENCE NONE 3	08-08-2000 **07-26-2000** NONE	ARC ECOLOGY C. SHIRLEY NAVFAC - SOUTHWEST DIVISION	COMMENTS ON THE PARCEL D RISK MANAGEMENT REVIEW PROCESS	ADMIN RECORD INFO REPOSITORY	PARCEL D	FRC - PERRIS IMAGED HPNT_001	181-07-0027 30093199	BOX 0001
N00217 / 000044 199624 CORRESPONDENCE NONE 11	08-08-2000 **07-26-2000** NONE	ENVIROMETRIX CORP. N. SHOPAY NAVFAC - EFA WEST R. MACH	QUALITATIVE REVIEW & COMMENTS BY SOUTHEAST ALLIANCE FOR ENVIRONMENTAL JUSTICE (SAEJ), RESIDENTS, COMMUNITY, & ENVIROMETRIX CORP. (EMC) ON THE DRAFT FINAL PARCEL D - RISK MANAGEMENT REVIEW PROCESS {SEE AR #40 & 3988 - REPORT & COMMENTS BY ARC ECOLOGY}	ADMIN RECORD INFO REPOSITORY	PARCEL D	FRC - PERRIS IMAGED HPNT_001	181-07-0027 30093199	BOX 0001
N00217 / 000234 CTO-007/0154 MINUTES N68711-95-D-7526 19	10-27-2000 **07-27-2000** 00007	BECHTEL NATIONAL, INC. NAVFAC - SOUTHWEST DIVISION	27 JULY 2000 RESTORATION ADVISORY BOARD MEETING MINUTES REPORTER'S TRANSCRIPT	ADMIN RECORD INFO REPOSITORY	PARCEL A PARCEL B PARCEL C PARCEL D PARCEL E	FRC - PERRIS IMAGED HPNT_002	181-07-0027 30093199	BOX 0004
N00217 / 000252 CTO-007/0178 MINUTES N68711-95-D-7526 30	11-08-2000 **07-27-2000** 00007	BECHTEL NATIONAL, INC. NAVFAC - SOUTHWEST DIVISION	27 JULY 2000 RESTORATION ADVISORY BOARD (RAB) MEETING HANDOUTS [INCLUDES AGENDA, 05/25/00 MEETING MINUTES AND VARIOUS HANDOUTS]	ADMIN RECORD INFO REPOSITORY	PARCEL B PARCEL C PARCEL D	FRC - PERRIS IMAGED HPNT_001	181-07-0027 30093199	BOX 0005

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N00217 / 000051 DS.0011.14744 CORRESPONDENCE N62474-94-D-7609 599	08-08-2000 **07-31-2000** 00011	TETRA TECH EM INC. D. BIELSKIS NAVFAC - SOUTHWEST DIVISION D. DEMARS	FINAL FIELD SAMPLING PLAN AND QUALITY ASSURANCE PROJECT PLAN - PHASE I GROUNDWATER DATA GAPS INVESTIGATION [INCLUDES SWDIV TRANSMITTAL LETTER BY R. MACH] {PORTION OF MAILING LIST IS SENSITIVE}	ADMIN RECORD INFO REPOSITORY SENSITIVE	006 021 022 PARCEL B PARCEL C PARCEL D PARCEL E SITE 00001	FRC - PERRIS IMAGED HPNT_002	181-07-0027 30093199	BOX 0001
N00217 / 000114 EFAW SER 06CH.RM/522 MINUTES NONE 15	08-29-2000 **08-15-2000** NONE	NAVFAC - EFA WEST MACH, R. VARIOUS AGENCIES	BRAC CLEANUP TEAM (BCT) MEETING MINUTES OF 13 JULY 2000 (W/ ENCLOSURE)	ADMIN RECORD INFO REPOSITORY	PARCEL B PARCEL C PARCEL D PARCEL E	FRC - PERRIS IMAGED HPNT_001	181-07-0027 30093199	BOX 0002
N00217 / 000123 DS.005.15135 & EFAW SER 06CH.RM/527 REPORT N62474-94-D-7609 134	08-29-2000 **08-17-2000** 00005	TETRA TECH EM INC. CHOW, D. NAVFAC - SOUTHWEST DIVISION MACH, R.	FINAL RADIOLOGICAL REMOVAL ACTION, ACTION MEMORANDUM (INCLUDES RESPONSE TO AGENCY COMMENTS ON THE DRAFT RADIOLOGICAL REMOVAL ACTION, ACTION MEMORANDUM AND CD COPY)	ADMIN RECORD INFO REPOSITORY	BLDG 00364 BLDG 00509 BLDG 00529 BLDG 00707 PARCEL B PARCEL D PARCEL E SITE 00011 SITE 00014 SITE 00015 SITE 00034 SITE 00039	FRC - PERRIS IMAGED HPNT_026	181-07-0027 30093199	BOX 0002
N00217 / 000159 NONE CORRESPONDENCE NONE 8	09-07-2000 **08-21-2000** NONE	DTSC - BERKELEY C. KAO NAVFAC - EFA WEST R. MACH	COMMENTS ON DRAFT ACTION MEMORANDUM FOR THE TIME CRITICAL REMOVAL ACTION (TCRA) FOR STEAM LINES, FUEL LINES, AND NON VOLATILE ORGANIC COMPOUNDS (VOC) SOIL SITES (W/ ENCLOSURE)	ADMIN RECORD INFO REPOSITORY	PARCEL C PARCEL D	FRC - PERRIS IMAGED HPNT_026	181-07-0027 30093199	BOX 0003

UIC No. / Rec. No. Doc. Control No. Record Type Contr./Guid. No. Approx. # Pages	Prc. Date Record Date CTO No. EPA Cat. #	Author Affil. Author Recipient Affil. Recipient	Subject	Classification	Sites	Location SWDIV Box No(s) CD No.	FRC Accession No. FRC Warehouse FRC Box No(s)	
N00217 / 000122 DS.0011.14913 CORRESPONDENCE N62474-94-D-7609 215	08-29-2000 **08-24-2000** 00011	TETRA TECH EM INC. R. REEVE NAVFAC - SOUTHWEST DIVISION	DRAFT SAMPLING AND ANALYSIS PLAN, PARCEL D SOIL SITE DELINEATION [INCLUDES TRANSMITTAL LETTER BY R. MACH] {CD COPY ENCLOSED}	ADMIN RECORD INFO REPOSITORY	008 009 037 053 055 065 PARCEL D	FRC - PERRIS IMAGED HPNT_001	181-07-0027 30093199	BOX 0002
N00217 / 000235 CTO-007/0158 MINUTES N68711-95-D-7526 31	10-27-2000 **08-24-2000** 00007	BECHTEL NATIONAL, INC. NAVFAC - SOUTHWEST DIVISION	24 AUGUST 2000 RESTORATION ADVISORY BOARD (RAB) MEETING MINUTES REPORTER'S TRANSCRIPT	ADMIN RECORD INFO REPOSITORY	BLDG. 411 PARCEL B PARCEL C PARCEL D PARCEL E	FRC - PERRIS IMAGED HPNT_002	181-07-0027 30093199	BOX 0004
N00217 / 000253 CTO-007/0178 MINUTES N68711-95-D-7526 33	11-08-2000 **08-24-2000** 00007	BECHTEL NATIONAL, INC. NAVFAC - SOUTHWEST DIVISION	24 AUGUST 2000 RESTORATION ADVISORY BOARD (RAB) MEETING HANDOUTS [INCLUDES AGENDA, 07/27/00 MEETING MINUTES , VARIOUS HANDOUTS AND TETRA TECH EMPLOYMENT APPLICATION]	ADMIN RECORD INFO REPOSITORY	PARCEL B PARCEL C PARCEL D	FRC - PERRIS IMAGED HPNT_001	181-07-0027 30093199	BOX 0005
N00217 / 000151 2169.6032 CORRESPONDENCE NONE 3	09-07-2000 **08-25-2000** NONE	CRWQCB - OAKLAND B. JOB NAVFAC - EFA WEST R. MACH	COMMENTS ON THE DRAFT ACTION MEMORANDUM, TIME CRITICAL REMOVAL ACTION FOR STEAM LINES, FUEL LINES, AND NON-VOC SOIL SITES	ADMIN RECORD INFO REPOSITORY	PARCEL C PARCEL D	FRC - PERRIS IMAGED HPNT_001	181-07-0027 30093199	BOX 0003
N00217 / 000269 NONE CORRESPONDENCE NONE 2	11-22-2000 **08-28-2000** NONE	SHEPPARD, MULLIN, RICHTER E. MCDANIEL NAVFAC - EFA WEST R. MACH	REVIEW AND COMMENTS OF THE DRAFT ACTION MEMORANDUM, TIME-CRITICAL REMOVAL ACTION FOR STEAM LINES, FUEL LINES, AND NON-VOLATILE ORGANIC COMPOUND SOIL SITES	ADMIN RECORD	PARCEL C PARCEL D	FRC - PERRIS IMAGED HPNT_002	181-07-0027 30093199	BOX 0005

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N00217 / 000270 NONE CORRESPONDENCE NONE 3	11-22-2000 **08-28-2000** NONE	SHEPPARD, MULLIN, RICHTER & HA E. MCDANIEL NAVFAC - EFA WEST R. MACH	REVIEW AND COMMENTS OF THE FIELD SAMPLING PLAN AND QUALITY ASSURANCE PROJECT PLAN, PHASE I GROUNDWATER DATA GAPS INVESTIGATION (WITH ENCLOSURE)	ADMIN RECORD	PARCEL C PARCEL D WELL IR 09MW38A WELL IR09MW36A WELL IR09MW37A WELL IR09MW39A WELL IR09MW45F WELL IR09P041A WELL IR09P140A WELL IR28MW313F WELL IR29MW56F WELL IR29MW58F WELL IR29MW85F WELL IR33MW116A WELL IR33MW63A WELL IR36MW16A WELL IR44MW08A WELL PA50MW12A	FRC - PERRIS IMAGED HPNT_002	181-07-0027 30093199	BOX 0005
N00217 / 000160 NONE CORRESPONDENCE NONE 2	09-07-2000 **08-30-2000** NONE	ARC ECOLOGY C. SHIRLEY NAVFAC - EFA WEST R. MACH	COMMENTS ON DRAFT ACTION MEMORANDUM, TIME CRITICAL REMOVAL ACTION FOR STEAM LINES, AND NON-VOC SOIL SITES	ADMIN RECORD INFO REPOSITORY	PARCEL C PARCEL D	FRC - PERRIS IMAGED HPNT_001	181-07-0027 30093199	BOX 0003

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N00217 / 000161 450-03200-190 CORRESPONDENCE NONE 4	09-07-2000 **08-30-2000** NONE	SF REDEVELOPMENT AGENCY B. RHETT NAVFAC - EFA WEST R. MACH	COMMENTS ON DRAFT ACTION MEMORANDUM, TIME CRITICAL REMOVAL ACTION FOR STEAM LINES, FUEL LINES, AND NON-VOC SOIL SITES (WITH ENCLOSURE)	ADMIN RECORD INFO REPOSITORY	PARCEL C PARCEL D	FRC - PERRIS IMAGED HPNT_001	181-07-0027 30093199	BOX 0003
N00217 / 000399 EFAW SER 06CH.RM/705 CORRESPONDENCE NONE 9	04-13-2001 **08-31-2000** NONE	NAVFAC - EFA WEST R. MACH VARIOUS AGENCIES	NAVY'S ENVIRONMENTAL RESTORATION JULY 2000 MONTHLY PROGRESS REPORT (MPR) (WITH ENCLOSURE) [PORTION OF MAILING LIST IS CONFIDENTIAL]	ADMIN RECORD SENSITIVE	PARCEL B PARCEL C PARCEL D PARCEL E PARCEL F	FRC - PERRIS IMAGED HPNT_005	181-07-0027 30093199	BOX 0008
N00217 / 000258 NONE MISC NONE 10	11-08-2000 **09-01-2000** NONE	NAVFAC - SOUTHWEST DIVISION NAVFAC - SOUTHWEST DIVISION	ENVIRONMENTAL CLEANUP NEWSLETTER: "PARCEL B CLEANUP MOVING FORWARD"	ADMIN RECORD INFO REPOSITORY	PARCEL A PARCEL B PARCEL C PARCEL D PARCEL E PARCEL F	FRC - PERRIS IMAGED HPNT_001	181-07-0027 30093199	BOX 0005
N00217 / 000168 DS.0011.14917 REPORT N62474-94-D-7609 67	09-26-2000 **09-13-2000** 00011	TETRA TECH EM INC. VARIOUS AGENCIES	FINAL TIME-CRITICAL REMOVAL ACTION FOR STEAM LINES, FUEL LINES AND NON-VOLATILE ORGANIC COMPOUND SOIL SITES {CD COPY ENCLOSED}	ADMIN RECORD INFO REPOSITORY	PARCEL C PARCEL D	FRC - PERRIS IMAGED HPNT_026	181-07-0027 30093199	BOX 0003
N00217 / 000193 NONE CORRESPONDENCE NONE 1	10-19-2000 **09-22-2000** NONE	SF REDEVELOPMENT AGENCY B. RHETT NAVFAC - EFA WEST R. MACH	CITY HAD INSUFFICIENT TIME TO THOROUGHLY REVIEW THE DOCUMENTS AND REQUESTS TO PROVIDE COMMENTS NO LATER THAN 04 OCTOBER 2000	ADMIN RECORD INFO REPOSITORY	PARCEL B PARCEL D	FRC - PERRIS IMAGED HPNT_001	181-07-0027 30093199	BOX 0004

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N00217 / 000188 NONE CORRESPONDENCE NONE 6	10-19-2000 **09-25-2000** NONE	U.S. EPA - SAN FRANCISCO C. TROMBADORE NAVFAC - EFA WEST R. MACH	REVIEW AND COMMENT ON DRAFT SAMPLING AND ANALYSIS PLAN, PARCEL D SOIL SITE DELINEATION	ADMIN RECORD INFO REPOSITORY	PARCEL D	FRC - PERRIS IMAGED HPNT_001	181-07-0027 30093199	BOX 0004
N00217 / 000192 NONE CORRESPONDENCE NONE 32	10-19-2000 **09-26-2000** NONE	DTSC - BERKELEY C. KAO NAVFAC - EFA WEST R. MACH	REVIEW AND COMMENTS ON THE DRAFT SAMPLING AND ANALYSIS PLAN, PARCEL D SOIL SITE DELINEATION	ADMIN RECORD INFO REPOSITORY	PARCEL D	FRC - PERRIS IMAGED HPNT_001	181-07-0027 30093199	BOX 0004
N00217 / 000196 NONE CORRESPONDENCE NONE 5	10-19-2000 **09-28-2000** NONE	U.S. EPA - SAN FRANCISCO C. TROMBADORE NAVFAC - EFA WEST R. MACH	REVIEW AND COMMENTS ON QUALITY ASSURANCE PROJECT PLAN, PARCEL D SOIL SITE DELINEATION (W/ ENCLOSURE)	ADMIN RECORD INFO REPOSITORY	PARCEL D	FRC - PERRIS IMAGED HPNT_001	181-07-0027 30093199	BOX 0004
N00217 / 000239 NONE CORRESPONDENCE NONE 2	10-27-2000 **10-18-2000** NONE	DTSC - BERKELEY C. KAO NAVFAC - EFA WEST R. MACH	REVIEW AND COMMENTS ON THE FINAL ACTION MEMORANDUM FOR TIME-CRITICAL REMOVAL ACTION AT PARCELS C AND D STEAM LINES, FUEL LINES, AND NON-VOLATILE ORGANIC COMPOUND SITES	ADMIN RECORD INFO REPOSITORY	PARCEL C PARCEL D	FRC - PERRIS IMAGED HPNT_002	181-07-0027 30093199	BOX 0004
N00217 / 000240 EFAW SER 06CH.RM/851 REPORT NONE 8	10-27-2000 **10-19-2000** NONE	NAVFAC - EFA WEST R. MACH VARIOUS AGENCIES	TECHNICAL JUSTIFICATION FOR THE PARCEL B THROUGH F INTERFACE, BEACH ARMORIZATION CONCEPTUAL DESIGN {PORTION OF MAILING LIST IS CONFIDENTIAL} (WITH ENCLOSURE)	ADMIN RECORD INFO REPOSITORY SENSITIVE	PARCEL B PARCEL C PARCEL D PARCEL E PARCEL F	FRC - PERRIS IMAGED HPNT_002	181-07-0027 30093199	BOX 0004
N00217 / 000256 CTO-007/0178 MINUTES N68711-95-D-7526 19	11-08-2000 **10-26-2000** 00007	BECHTEL NATIONAL, INC. NAVFAC - SOUTHWEST DIVISION	26 OCTOBER 2000 RESTORATION ADVISORY BOARD (RAB) MEETING HANDOUTS [INCLUDES AGENDA, MEETING MINUTES, VARIOUS HANDOUTS, SEPTEMBER 2000 MONTHLY PROGRESS REPORT AND FACT SHEET NO. 3]	ADMIN RECORD INFO REPOSITORY	PARCEL B PARCEL C PARCEL D PARCEL E PARCEL F	FRC - PERRIS IMAGED HPNT_001	181-07-0027 30093199	BOX 0005

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N00217 / 000289 NONE CORRESPONDENCE NONE 2	11-22-2000 **10-31-2000** NONE	U.S. EPA - SAN FRANCISCO C. TROMBADORE NAVFAC - EFA WEST R. MACH	REVIEW OF NAVY TECHNICAL JUSTIFCATION FOR THE PARCEL B THROUGH F INTERFACE, BEACH AMORIZATION CONCEPTUAL DESIGN {SEE AR #240 & 290 - TECHNICAL JUSTIFICATION & COMMENTS BY SFRA}	ADMIN RECORD	PARCEL B PARCEL C PARCEL D PARCEL E PARCEL F	FRC - PERRIS IMAGED HPNT_002	181-07-0027 30093199	BOX 0005
N00217 / 000297 NONE CORRESPONDENCE NONE 2	12-18-2000 **10-31-2000** NONE	CRWQCB - SAN FRANCISCO B. JOB NAVFAC - EFA WEST R. MACH	COMMENTS ON TECHNICAL JUSTIFICATION FOR THE PARCEL B THROUGH F INTERFACE BEACH ARMORIZATION CONCEPTUAL DESIGN (SEE AR #240 - DOCUMENT)	ADMIN RECORD	PARCEL B PARCEL C PARCEL D PARCEL E PARCEL F	FRC - PERRIS IMAGED HPNT_002	181-07-0027 30093199	BOX 0006
N00217 / 000290 450-04400-190 CORRESPONDENCE NONE 5	11-22-2000 **11-02-2000** NONE	S.F. REDEVELOPMENT AGENCY B. RHETT NAVFAC - EFA WEST R. MACH	COMMENTS ON THE NAVY TECHNICAL JUSTIFICATION FOR THE PARCEL B THROUGH F INTERFACE, BEACH ARMORIZATION CONCEPTUAL DESIGN [PORTION OF MAILING LIST IS CONFIDENTIAL] {SEE AR #240 - TECHNICAL JUSTIFICATION AND #289 - COMMENTS}	ADMIN RECORD SENSITIVE	PARCEL B PARCEL C PARCEL D PARCEL E PARCEL F	FRC - PERRIS IMAGED HPNT_002	181-07-0027 30093199	BOX 0005
N00217 / 000266 DS.0011.15530 & SWDIV SER 06CH.RM/857 CORRESPONDENCE N62474-94-D-7609 299	11-15-2000 **11-09-2000** 00011	TETRA TECH EM INC. A. TALAMANTEZ NAVFAC - SOUTHWEST DIVISION	FINAL SAMPLING AND ANALYSIS PLAN OVERVIEW, PARCEL D - SOIL SITE DELINEATION [INCLUDES TRANSMITTAL LETTER BY R. MACH] {CD COPY ENCLOSED}	ADMIN RECORD INFO REPOSITORY	008 009 037 053 055 065 PARCEL D	FRC - PERRIS IMAGED HPNT_001	181-07-0027 30093199	BOX 0005
N00217 / 000302 DS.0011.14441 AND SWDIV SER 06CH.RM/860 REPORT N62474-94-D-7609 33	12-18-2000 **11-17-2000** 00011	TETRA TECH EM INC. T. LI NAVFAC - SOUTHWEST DIVISION	GROUNDWATER BENEFICIAL USE EVALUATION, PARCELS C, D AND E [INCLUDES TRANSMITTAL LETTER FROM R. MACH (SWDIV), PORTION OF MAILING LIST IS CONFIDENTIAL] (SEE AR #325, 326 & 342 - COMMENTS & #359 - RESPONSE TO COMMENTS)	ADMIN RECORD SENSITIVE	PARCEL C PARCEL D PARCEL E	FRC - PERRIS IMAGED HPNT_001	181-07-0027 30093199	BOX 0006

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N00217 / 000323 NONE CORRESPONDENCE NONE 2	12-26-2000 **11-17-2000** NONE	DTSC - BERKELEY C. KAO NAVFAC - EFA WEST R. MACH	COMMENTS ON FINAL SAMPLING AND ANALYSIS PLAN, PARCEL D SOIL SITE DELINEATION (SEE AR #266 - DOCUMENT)	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_002	181-07-0027 30093199	BOX 0006
N00217 / 000325 NONE CORRESPONDENCE NONE 2	12-26-2000 **11-29-2000** NONE	CRWQCB - SAN FRANCISCO B. JOB NAVFAC - EFA WEST R. MACH	REVIEW AND COMMENTS ON GROUNDWATER BENEFICIAL USE EVALUATION, PARCELS C,D, AND E (SEE AR #302 - EVALUATION, #326 & 342 - COMMENTS & #359 - RESPONSE TO COMMENTS)	ADMIN RECORD	PARCEL C PARCEL D PARCEL E	FRC - PERRIS IMAGED HPNT_002	181-07-0027 30093199	BOX 0006
N00217 / 000313 DS.0011.15701 & SWDIV SER06CH.RM/964 REPORT N62474-94-D-7609 476	12-19-2000 **12-01-2000** 00011	TETRA TECH EM INC. T. LI NAVFAC - SOUTHWEST DIVISION D. DEMARS	TECHNICAL MEMORANDUM INFORMATION PACKAGE FOR THE PHASE I GROUNDWATER DATA GAPS INVESTIGATION {PORTION OF MAILING LIST IS CONFIDENTIAL;CD COPY ENCLOSED} (SEE AR #339 - REVISED INFORMATION PACKAGE)	ADMIN RECORD SENSITIVE	PARCEL C PARCEL D	FRC - PERRIS IMAGED HPNT_001	181-07-0027 30093199	BOX 0006
N00217 / 000326 NONE CORRESPONDENCE NONE 4	12-26-2000 **12-05-2000** NONE	U.S. EPA - SAN FRANCISCO S. LAUTH NAVFAC - EFA WEST R. MACH	REVIEW AND COMMENTS ON GROUNDWATER BENEFICIAL USE EVALUATION PARCELS C,D, AND E (SEE AR #302 - EVALUATION, #325 & 342 - COMMENTS & RESPONSE TO COMMENTS)	ADMIN RECORD	PARCEL C PARCEL D PARCEL E	FRC - PERRIS IMAGED HPNT_002	181-07-0027 30093199	BOX 0006
N00217 / 000358 CTO-007/0197 MINUTES N68711-95-D-7526 78	02-07-2001 **12-07-2000** 00007	BECHTEL NATIONAL, INC. NAVFAC - SOUTHWEST DIVISION	REPORTER'S TRANSCRIPT OF THE 07 DECEMBER 2000 RESTORATION ADVISORY BOARD (RAB) MEETING - INCLUDES RAB MEETING MINUTES OF 26 OCTOBER 2000, AGENDA, PUBLIC NOTICE, AND HANDOUTS	ADMIN RECORD	PARCEL B PARCEL C PARCEL D PARCEL E PARCEL F SITE 00003	FRC - PERRIS IMAGED HPNT_002	181-07-0027 30093199	BOX 0007

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N00217 / 000342 WBB-65622 CORRESPONDENCE NONE 3	01-22-2001 **12-18-2000** NONE	SHEPPARD, MULLIN, RICHTER & HA M. MCDANIEL NAVFAC - EFA WEST R. MACH	COMMENTS ON THE GROUNDWATER BENEFICIAL USE EVALUATION FOR PARCELS C, D, & E (WITH ENLCOSURE) {SEE AR #302 - EVALUATION, #325 - COMMENTS BY CRWQCB, & #326 - COMMENTS BY EPA & #359 - RESPONSE TO COMMENTS}	ADMIN RECORD	PARCEL C PARCEL D PARCEL E	FRC - PERRIS IMAGED HPNT_002	181-07-0027 30093199	BOX 0007
N00217 / 000360 SWDIV SER 06CH.RM/0089 & 0157 CORRESPONDENCE NONE 110	02-19-2001 **01-01-2001** NONE	NEW WORLD TECHNOLOGY NAVFAC - SOUTHWEST DIVISION	FINAL WORK PLAN FOR SOIL REMOVAL AND PACKAGING, RADIOLOGICAL TIME CRITICAL REMOVAL ACTION, REVISION 4 - INCLUDES RESPONSE TO COMMENTS ON THE DRAFT WORK PLAN, FINAL MARSSIM STATUS SURVEY PLAN & SWDIV TRANSMITTAL LETTER BY R. MACH	ADMIN RECORD INFO REPOSITORY	PARCEL D PARCEL E	SOUTHWEST DIVISION - BLDG. 1 PROBLEM FILE CABINET		
N00217 / 000332 DS.0011.15702; 15702-1 & SWDIV SER 06CH.RM/033&390 CORRESPONDENCE N62474-94-D-7609 249	01-11-2001 **01-08-2001** 00011	TETRA TECH EM INC. T. LI NAVFAC - SOUTHWEST DIVISION	FIELD SAMPLING PLAN AND QUALITY ASSURANCE PROJECT PLAN ADDENDUM FOR PHASE II GROUNDWATER DATA GAPS INVESTIGATION [INCLUDES SWDIV TRANSMITTAL LETTERS BY R. MACH] {CD COPY ENCLOSED}	ADMIN RECORD INFO REPOSITORY	006 021 022 PARCEL B PARCEL C PARCEL D PARCEL E SITE 00001	FRC - PERRIS IMAGED HPNT_002	181-07-0027 30093199	BOX 0006
N00217 / 000339 DS.0011.15701-1 & SWDIV SER 06CH.RM/032 & 0390 REPORT N62474-94-D-7609 560	01-22-2001 **01-08-2001** 00011	TETRA TECH EM INC. T. LI NAVFAC - SOUTHWEST DIVISION	TECHNICAL MEMORANDUM, REVISED INFORMATION PACKAGE FOR THE PHASE I GROUNDWATER DATA GAPS INVESTIGATION [INCLUDES SWDIV TRANSMITTAL LETTER BY R. MACH] (PORTION OF MAILING LIST IS CONFIDENTIAL) [CD COPY ENCLOSED] {SEE AR #313 - INFORMATION PACKAGE}	ADMIN RECORD SENSITIVE	PARCEL C PARCEL D	FRC - PERRIS IMAGED HPNT_001	181-07-0027 30093199	BOX 0007
N00217 / 000363 CTO-007/0203 & 0207 MISC N68711-95-D-7526 64	02-19-2001 **01-25-2001** 00007	BECHTEL NATIONAL, INC. NAVFAC - SOUTHWEST DIVISION	PUBLIC INFORMATION MATERIAL PACKAGE FOR THE 25 JANUARY 2001 RESTORATION ADVISORY BOARD (RAB) MEETING - INCLUDES REPORTER'S TRANSCRIPT OF 25 JANUARY 2001 MEETING	ADMIN RECORD INFO REPOSITORY SENSITIVE	PARCEL B PARCEL C PARCEL D PARCEL E PARCEL F	FRC - PERRIS IMAGED HPNT_002	181-07-0027 30093199	BOX 0007

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N00217 / 000384 NONE MISC NONE 35	04-03-2001 **02-07-2001** NONE	DTSC - BERKELEY C. PING KAO NAVFAC - EFA WEST R. MACH	DTSC REVIEW OF AND COMMENTS ON THE REVISED INFORMATION PACKAGE FOR THE PHASE I GROUNDWATER DATA GAP INVESTIGATION AND FIELD SAMPLING PLAN AND QUALITY ASSURANCE PROJECT PLAN ADDENDA FOR PHASE II GROUNDWATER DATA GAP INVESTIGATION	ADMIN RECORD	PARCEL C PARCEL D PARCEL E	FRC - PERRIS IMAGED HPNT_004	181-07-0027 30093199	BOX 0008
N00217 / 000359 TC.0011.10845 & SWDIV SER 06CH.RM/0156 CORRESPONDENCE N62474-94-D-7609 16	02-12-2001 **02-08-2001** 00011	NAVFAC - SOUTHWEST DIVISION VARIOUS AGENCIES	RESPONSE TO COMMENTS ON THE GROUNDWATER BENEFICIAL USE EVALUATION FOR PARCELS C, D, AND E [INCLUDES SWDIV TRANSMITTAL LETTER BY R.MACH]	ADMIN RECORD INFO REPOSITORY	PARCEL C PARCEL D PARCEL E	FRC - PERRIS IMAGED HPNT_002	181-07-0027 30093199	BOX 0007
N00217 / 000385 NONE CORRESPONDENCE NONE 8	04-03-2001 **02-13-2001** NONE	USEPA - SAN FRANCISCO C. TROMBADORE NAVFAC - EFA WEST R. MACH	EPA COMMENTS ON THE REVISED PHASE I DATA PACKAGE AND THE DRAFT PHASE II GROUNDWATER SAMPLING, FIELD SAMPLING AND QUALITY ASSURANCE PLANS (WITH ATTACHMENTS)	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_004	181-07-0027 30093199	BOX 0008
N00217 / 000364 CTO-007/0205 MISC N68711-95-D-7526 13	02-19-2001 **02-15-2001** 00007	BECHTEL NATIONAL, INC. NAVFAC - SOUTHWEST DIVISION	ENVIRONMENTAL CLEANUP NEWSLETTER: PARCEL E CAPPING AND FIRE UPDATE; OCTOBER THROUGH DECEMBER 2000	ADMIN RECORD INFO REPOSITORY	PARCEL B PARCEL C PARCEL D PARCEL E	FRC - PERRIS IMAGED HPNT_002	181-07-0027 30093199	BOX 0007
N00217 / 000362 CTO-007/0202 & 0213 MISC N68711-95-D-7526 61	02-19-2001 **02-22-2001** 00007	BECHTEL NATIONAL, INC. NAVFAC - SOUTHWEST DIVISION	PUBLIC INFORMATION MATERIAL PACKAGE FOR THE 22 FEBRUARY 2001 RESTORATION ADVISORY BOARD (RAB) MEETING - INCLUDES REPORTER'S TRANSCRIPT OF 22 FEBRUARY 2001 MEETING (MAILING LIST IS CONFIDENTIAL)	ADMIN RECORD SENSITIVE	PARCEL B PARCEL C PARCEL D PARCEL E PARCEL F	FRC - PERRIS IMAGED HPNT_002	181-07-0027 30093199	BOX 0007

UIC No. / Rec. No. Doc. Control No. Record Type Contr./Guid. No. Approx. # Pages	Prc. Date Record Date CTO No. EPA Cat. #	Author Affil. Author Recipient Affil. Recipient	Subject	Classification	Sites	Location SWDIV Box No(s) CD No.	FRC Accession No. FRC Warehouse FRC Box No(s)	
N00217 / 000389 NONE CORRESPONDENCE NONE 1	04-04-2001 **03-01-2001** NONE	U.S. EPA - SAN FRANCISCO C. TROMBADORE NAVFAC - EFA WEST R. MACH	EPA REVIEW AND COMMENT ON THE RESPONSE TO COMMENTS ON THE BENEFICIAL USE DETERMINATION, PARCEL D	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_004	181-07-0027 30093199	BOX 0008
N00217 / 000395 CTO-007/0217 MINUTES N68711-95-D-7526 87	04-12-2001 **03-22-2001** 00007	BECHTEL ENVIRONMENTAL, INC. NAVFAC - SOUTHWEST DIVISION	PUBLIC INFORMATION MATERIALS FOR THE RESTORATION ADVISORY BOARD MEETING FOR 22 MARCH 2001 - INCLUDES AGENDA, MEETING MINUTES FROM 2/22/01, REPORTER'S TRANSCRIPT FROM THE 3/22/01 MEETING, AND VARIOUS HANDOUTS	ADMIN RECORD INFO REPOSITORY	PARCEL D PARCEL E PARCEL F	FRC - PERRIS IMAGED HPNT_028	181-07-0027 30093199	BOX 0008
N00217 / 000430 DS.0011.14442 REPORT N62474-94-D-7609 44	05-04-2001 **04-12-2001** 00011	TETRA TECH EM INC. T. LI NAVFAC - SOUTHWEST DIVISION	FINAL GROUNDWATER BENEFICIAL USE DETERMINATION FOR A-AQUIFER {SEE AR #493 - REVISED FINAL GROUNDWATER BENEFICIAL USE}	ADMIN RECORD	PARCEL C PARCEL D PARCEL E	FRC - PERRIS IMAGED HPNT_025	181-07-0027 30093199	BOX 0009
N00217 / 000445 SWDIV SER 06CH.RM/0421 MINUTES NONE 8	06-19-2001 **04-18-2001** NONE	NAVFAC - EFA WEST MACH, R. VARIOUS AGENCIES	01 MARCH 2001 FINAL BASE REALIGNMENT AND CLOSURE (BRAC) CLEANUP TEAM (BCT) MEETING MINUTES ON THE PARCEL D REVISED FEASIBILITY STUDY	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_018	181-07-0027 30093199	BOX 0009
N00217 / 000437 CTO-007/0225 MINUTES N68711-95-D-7526 105	06-05-2001 **04-26-2001** 00007	BECHTEL ENVIRONMENTAL, INC. NAVFAC - SOUTHWEST DIVISION	PUBLIC INFORMATION MATERIALS FOR THE 26 APRIL 2001 RESTORATION ADVISORY BOARD MEETING - INCLUDES AGENDA, MEETING TRANSCRIPT FROM THE 4/26/01 MEETING, MINUTES FROM THE 3/22/01 MEETING, HANDOUTS, RAB APPLICATIONS & MAILING LIST	ADMIN RECORD INFO REPOSITORY SENSITIVE	PARCEL B PARCEL C PARCEL D PARCEL E PARCEL F	FRC - PERRIS IMAGED HPNT_018	181-07-0027 30093199	BOX 0009

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N00217 / 000456 450-01401-190 CORRESPONDENCE NONE 2	07-26-2001 **05-02-2001** NONE	SFRA, SAN FRANCISCO, CA A. CAPOBRES NAVFAC - EFA WEST R. MACH	REVIEW AND COMMENTS ON THE DRAFT PETROLEUM HYDROCARBON CORRECTIVE ACTION PLAN FOR PARCELS C, D, AND E {SEE AR #465 - COMMENTS BY CRWQCB}	ADMIN RECORD	PARCEL C PARCEL D PARCEL E	FRC - PERRIS IMAGED HPNT_002	181-07-0027 30093199	BOX 0010
N00217 / 000439 DS.0011.16327 & SWDIV SER 06CH.RM/0589 MISC N62474-94-D-7609 535	06-06-2001 **06-01-2001** 00011	TETRA TECH EM INC. T. LI NAVFAC - SOUTHWEST DIVISION	PARCEL D INFORMATION PACKAGE PHASE II GROUNDWATER DATA GAPS INVESTIGATION [INCLUDES SWDIV TRANSMITTAL LETTER BY R. MACH] {PORTION OF MAILING LIST IS CONFIDENTIAL; CD COPY ENCLOSED} (SEE AR #587 - REVISED INFORMATION PACKAGE)	ADMIN RECORD SENSITIVE	PARCEL D	FRC - PERRIS IMAGED HPNT_013	181-07-0027 30093199	BOX 0009
N00217 / 000465 2169.6032 CORRESPONDENCE NONE 3	07-26-2001 **06-14-2001** NONE	CRWQCB - OAKLAND B. JOB NAVFAC - EFA WEST R. MACH	REVIEW AND COMMENTS ON THE DRAFT PETROLEUM HYDROCARBON CORRECTIVE ACTION PLAN FOR PARCELS C, D, AND E {SEE AR #456 - COMMENTS BY SFRA}	ADMIN RECORD	PARCEL C PARCEL D PARCEL E	FRC - PERRIS IMAGED HPNT_002	181-07-0027 30093199	BOX 0010
N00217 / 000483 CTO-007/0234 MINUTES N68711-95-D-7526 114	07-26-2001 **06-28-2001** 00007	BECHTEL ENVIRONMENTAL, INC. NAVFAC - SOUTHWEST DIVISION	MEETING MATERIALS FOR THE RESTORATION ADVISORY BOARD MEETING HELD ON 28 JUNE 2001 - INCLUDES AGENDA, PUBLIC NOTICE, REPORTER'S TRANSCRIPT OF 6/28/01 & MEETING MINUTES OF 5/24/01, FACT SHEET DATED 6/19/01 FOR PARCEL B SANDBLAST GRIT & HANDOUTS	ADMIN RECORD SENSITIVE	007 PARCEL B PARCEL C PARCEL D PARCEL E PARCEL F	FRC - PERRIS IMAGED HPNT_002	181-07-0027 30093199	BOX 0010
N00217 / 000468 NONE CORRESPONDENCE NONE 5	07-26-2001 **07-02-2001** NONE	U.S. EPA - SAN FRANCISCO C. TROMBADORE NAVFAC - EFA WEST R. MACH	REVIEW AND COMMENTS ON THE PARCEL D INFORMATION PACKAGE, PHASE II GROUNDWATER DATA GAPS (WITH ATTACHMENT) (AR #439 - INFORMATION PACKAGE)	ADMIN RECORD	PARCEL D	SOUTHWEST DIVISION - BLDG. 1		

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N00217 / 000502 NONE CORRESPONDENCE NONE 29	08-14-2001 **07-19-2001** NONE	DTSC - BERKELEY C. KAO NAVFAC - SOUTHWEST DIVISION R. MACH	REVIEW AND COMMENTS ON THE PARCEL D INFORMATION PACKAGE, PHASE II GROUNDWATER DATA GAPS INVESTIGATION	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_022	181-07-0027 30093199	BOX 0012
N00217 / 000493 DS.0011.17266 & SWDIV SER 06CH.RM/0745 REPORT N62474-94-D-7609 42	08-13-2001 **08-10-2001** 00011	TETRA TECH EM INC. T. LI NAVFAC - SOUTHWEST DIVISION	REVISED FINAL GROUNDWATER BENEFICIAL USE DETERMINATION FOR A-AQUIFER FOR PARCELS C, D, AND E - INCLUDES SWDIV TRANSMITTAL LETTER BY R. MACH & PUBLIC SUMMARY [A PORTION OF THE MAILING LIST IS CONFIDENTIAL] {SEE AR #430 - FINAL GROUNDWATER BENEFICIAL USE}	ADMIN RECORD SENSITIVE	006 008 011 012 025 028 029 030 033 039 058 BLDG. 217 BLDG. 241 BLDG. 258 BLDG. 275 PARCEL C PARCEL D PARCEL E SITE 00002	FRC - PERRIS IMAGED HPNT_025	181-07-0027 30093199	BOX 0011
N00217 / 001444 NONE CORRESPONDENCE NONE 4	10-29-2008 **10-02-2001** NONE	SAN FRANCISCO REDEVELOPMENT AGENCY CAPOBRES, D. NAVFAC - SOUTHWEST MACH, R.	REVIEW AND COMMENTS ON THE REVISED DRAFT PETROLEUM HYDROCARBON SOIL AND GROUNDWATER SAMPLING PLAN	ADMIN RECORD	PARCEL C PARCEL D PARCEL E	SOUTHWEST DIVISION - BLDG. 1		

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N00217 / 000526 CTO-007/0263 MISC N68711-95-D-7526 13	11-28-2001 **10-30-2001** 00007	BECHTEL NATIONAL, INC. VARIOUS AGENCIES	JULY-SEPTEMBER 2001 ENVIRONMENTAL CLEANUP NEWSLETTER: "PARCEL D SOIL AND PIPELINE REMOVAL ACTION CLEANUP COMPLETED" {PORTION OF MAILING LIST IS CONFIDENTIAL}	ADMIN RECORD SENSITIVE	PARCEL D	FRC - PERRIS IMAGED HPNT_022	181-07-0027 30093199	BOX 0012
N00217 / 000549 NONE CORRESPONDENCE NONE 6	12-20-2001 **11-08-2001** NONE	U.S. EPA - SAN FRANCISCO C. TROMBADORE NAVFAC - EFA WEST R. MACH	REVIEW AND COMMENTS ON THE PARCEL D, TIME-CRITICAL REMOVAL ACTION CLOSEOUT REPORT	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_016	181-07-0027 30093199	BOX 0013
N00217 / 000531 CTO-007/0265 & 0270 MINUTES N68711-95-D-7526 107	11-29-2001 **11-29-2001** 00007	BECHTEL ENVIRONMENTAL, INC. NAVFAC - SOUTHWEST DIVISION	29 NOVEMBER 2001 PUBLIC INFORMATION MATERIAL PACKAGE FOR THE RESTORATION ADVISORY BOARD MEETING - INCLUDES AGENDA, PUBLIC NOTICE, MEETING MINUTES FROM MEETING HELD ON 10/24/01, REPORTERS TRANSCRIPT FROM 11/29/01 MEETING AND HANDOUTS	ADMIN RECORD SENSITIVE	DRY DOCK 4 PARCEL B PARCEL C PARCEL D PARCEL E	FRC - PERRIS IMAGED HPNT_019	181-07-0027 30093199	BOX 0013
N00217 / 000551 450-04301-190 CORRESPONDENCE NONE 3	01-04-2002 **11-30-2001** NONE	S.F. REDEVELOPMENT AGENCY A. CAPOBRES NAVFAC - EFA WEST R. MACH	COMMENTS ON THE PARCEL D TIME CRITICAL REMOVAL ACTION CLOSEOUT REPORT	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_002	181-07-0027 30093199	BOX 0013
N00217 / 000532 DS.0011.15700 & SWDIV SER 06CH.RM/1240 REPORT N62474-94-D-7609 1328	12-20-2001 **12-06-2001** 00011	TETRA TECH EM INC. W. BREEDLOVE NAVFAC - SOUTHWEST DIVISION	FINAL PARCEL D - TIME-CRITICAL REMOVAL ACTION CLOSEOUT REPORT (VOLUME I-II OF II) [INCLUDES PUBLIC SUMMARY AND SWDIV TRANSMITTAL LETTER BY R. MACH] {PORTION OF MAILING LIST IS CONFIDENTIAL; CD COPY ENCLOSED}	ADMIN RECORD SENSITIVE	PARCEL D	FRC - PERRIS IMAGED HPNT_018	181-07-0027 30093199	BOX 0013

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N00217 / 001449 NONE CORRESPONDENCE NONE 2	10-29-2008 **12-20-2001** NONE	CRWQCB - OAKLAND BESSETTE, M. NAVFAC - SOUTHWEST MACH, R.	REVIEW AND COMMENTS ON THE REVISED DRAFT PETROLEUM HYDROCARBON SOIL AND GROUNDWATER SAMPLING PLAN	ADMIN RECORD	PARCEL C PARCEL D PARCEL E	SOUTHWEST DIVISION - BLDG. 1		
N00217 / 000552 TC.0201.11016 & SWDIV SER 06CH.RM/1244 REPORT N62474-94-D-7609 241	01-04-2002 **12-21-2001** 00201	TETRA TECH EM INC. T. SHOFF NAVFAC - SOUTHWEST DIVISION	FINAL EVALUATION OF AMBIENT MANGANESE CONDITIONS {PORTION OF MAILING LIST IS CONFIDENTIAL; CD COPY ENCLOSED}	ADMIN RECORD INFO REPOSITORY SENSITIVE	PARCEL B PARCEL C PARCEL D	FRC - PERRIS IMAGED HPNT_002	181-07-0027 30093199	BOX 0013
N00217 / 000580 DS.0011.17267 & SWDIV SER 06CH.RM/0109 REPORT N62474-94-D-7609 336	04-05-2002 **02-05-2002** 00011	TETRA TECH EM INC. T. LI NAVFAC - SOUTHWEST DIVISION	FIELD SAMPLING PLAN AND QUALITY ASSURANCE PROJECT PLAN ADDENDUM FOR PHASE III GROUNDWATER DATA GAPS INVESTIGATION (ADDENDUM II) [INCLUDES PUBLIC SUMMARY AND SWDIV TRANSMITTAL LETTER BY R. MACH] {PORTION OF MAILING LIST IS CONFIDENTIAL; CD COPY ENCLOSED}	ADMIN RECORD SENSITIVE	006 021 022 PARCEL B PARCEL C PARCEL D PARCEL E SITE 00001	FRC - PERRIS IMAGED HPNT_002	181-07-0027 30093199	BOX 0014
N00217 / 000589 CTO-007/0285 & 0291 MINUTES N68711-95-D-7526 79	04-09-2002 **02-28-2002** 00007	BECHTEL ENVIRONMENTAL, INC. NAVFAC - SOUTHWEST DIVISION	PUBLIC INFORMATION MATERIAL PACKAGE FOR THE 28 FEBRUARY 2002 RESTORATION ADVISORY BOARD MEETING - INCLUDES AGENDA, PUBLIC NOTICE, MEETING MINUTES FROM 01/24/02 MEETING, REPORTERS TRANSCRIPT OF 02/28/02 MEETING, ATTENDANCE SHEET AND HANDOUTS	ADMIN RECORD SENSITIVE	010 PARCEL B PARCEL C PARCEL D PARCEL E PARCEL F	FRC - PERRIS IMAGED HPNT_005	181-07-0027 30093199	BOX 0015

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N00217 / 000583 CTO-007/0281 MISC N68711-95-D-7526 11	04-05-2002 **03-07-2002** 00007	BECHTEL ENVIRONMENTAL, INC. J. BAILEY NAVFAC - SOUTHWEST DIVISION	ENVIRONMENTAL CLEANUP NEWSLETTER: BAY AREA RAB MEMBERS PARTICIPATE AT WORKSHOP, OCTOBER-DECEMBER 2001 - INCLUDES E-MAIL AND MAILING LIST {PORTION OF MAILING LIST IS CONFIDENTIAL}	ADMIN RECORD SENSITIVE	010 026 PARCEL A PARCEL B PARCEL C PARCEL D PARCEL E PARCEL F	FRC - PERRIS IMAGED HPNT_002	181-07-0027 30093199	BOX 0015
N00217 / 000585 DS.0191.17655 & SWDIV SER 06CH.KF/0215 REPORT N62474-94-D-7609 740	04-05-2002 **03-08-2002** 00191	TETRA TECH EM INC. S. FISHER NAVFAC - SOUTHWEST DIVISION G. BROOKS	DRAFT PARCEL D REVISED FEASIBILITY STUDY [INCLUDES SWDIV TRANSMITTAL LETTER BY K. FORMAN AND PUBLIC SUMMARY] {PORTION OF MAILING LIST IS CONFIDENTIAL, CD COPY ENCLOSED}	ADMIN RECORD SENSITIVE	PARCEL D	FRC - PERRIS IMAGED HPNT_001	181-07-0027 30093199	BOX 0015
N00217 / 000587 DS.0011.17654 & SWDIV SER 06CH.KF/0228 REPORT N62474-94-D-7609 695	04-09-2002 **03-08-2002** 00011	NAVFAC - SOUTHWEST DIVISION T. LI NAVFAC - SOUTHWEST DIVISION	REVISED PARCEL D INFORMATION PACKAGE PHASE II GROUNDWATER DATA GAPS INVESTIGATION [INCLUDES SWDIV TRANSMITTAL LETTER BY K. FORMAN, PUBLIC SUMMARY] {CD COPY ENCLOSED} (SEE AR #439 - INFORMATION PACKAGE)	ADMIN RECORD	PARCEL D	FRC - PERRIS IMAGED HPNT_013	181-07-0027 30093199	BOX 0015
N00217 / 000590 DS.A003.10001 REPORT N68711-00-D-0005 141	04-09-2002 **03-21-2002** DO 0003	TETRA TECH EM INC. WANTA, M. NAVFAC - SOUTHWEST DIVISION DEMARS, D.	BASEWIDE HEALTH AND SAFETY PLAN {CD COPY ENCLOSED}	ADMIN RECORD	PARCEL A PARCEL B PARCEL C PARCEL D PARCEL E	FRC - PERRIS IMAGED HPNT_005	181-07-0027 30093199	BOX 0015
N00217 / 000594 DS.0191.17681 & DS.0191.17681-1 REPORT N62474-94-D-7609 664	04-10-2002 **03-29-2002** 00191	TETRA TECH EM INC. K. BRICKNELL NAVFAC - SOUTHWEST DIVISION	DRAFT HISTORICAL RADIOLOGICAL ASSESSMENT (HRA) - USE OF GENERAL RADIOLOGICAL MATERIALS 1939 - 2002, VOLUME II {SEE AR #128 - HISTORICAL RADIOLOGICAL ASSESSMENT (HRA) - NAVAL NUCLEAR PROPULSION PROGRAM 1966-1995 - VOLUME I DATED AUGUST 2000}	ADMIN RECORD SENSITIVE	PARCEL D SITE 00002	FRC - PERRIS IMAGED HPNT_027	181-07-0027 30093199	BOX 0015

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N00217 / 000595 FWSD-RAC-02-0687 & SWDIV SER 06CH.KF/0322 CORRESPONDENCE N68711-98-D-5713 294	04-10-2002 **04-03-2002** 00046	FOSTER WHEELER G. STARR NAVFAC - SOUTHWEST DIVISION	DRAFT WORK PLAN - INDUSTRIAL PROCESS EQUIPMENT SURVEY, SAMPLING, DECONTAMINATION, AND WASTE CONSOLIDATION PARCELS C, D, AND E, REV. 0 - INCLUDES SWDIV TRANSMITTAL LETTER BY K. FORMAN [PORTION OF MAILING LIST IS CONFIDENTIAL]	ADMIN RECORD SENSITIVE	PARCEL C PARCEL D PARCEL E	FRC - PERRIS IMAGED HPNT_010	181-07-0027 30093199	BOX 0016
N00217 / 004150 NONE CORRESPONDENCE NONE 13	06-21-2005 **04-16-2002** NONE	FOSTER WHEELER NAVFAC - EFA WEST	RESPONSE TO COMMENTS TO THE DRAFT HEALTH AND SAFETY PLAN INDUSTRIAL PROCESS EQUIPMENT SURVEY, SAMPLING, DECONTAMINATION, AND WASTE CONSOLIDATION	ADMIN RECORD	PARCEL C PARCEL D PARCEL E	SOUTHWEST DIVISION - BLDG. 1		
N00217 / 004089 FWSD-RAC-02-0834 REPORT N68711-98-D-5713 150	01-13-2005 **04-19-2002** 00046	FOSTER WHEELER R. MARGOTTO NAVFAC - SOUTHWEST DIVISION	FINAL HEALTH AND SAFETY PLAN FOR THE INDUSTRIAL PROCESS EQUIPMENT SURVEY, SAMPLING , DECONTAMINATION, AND WASTE CONSOLIDATION, REVISION 0	ADMIN RECORD	PARCEL C PARCEL D PARCEL E	SOUTHWEST DIVISION - BLDG. 1		
N00217 / 000615 CTO-007/0311 MISC N68711-95-D-7526 77	08-09-2002 **04-25-2002** 00007	BECHTEL ENVIRONMENTAL, INC. NAVFAC - SOUTHWEST DIVISION	PUBLIC INFORMATION MATERIALS FOR THE 25 APRIL 2002 RESTORATION ADVISORY BOARD MEETING WHICH INCLUDES: AGENDA, PUBLIC NOTICE, MINUTES FROM 28 MARCH 2002 MEETING, TRANSCRIPT OF MINUTES FROM 25 APRIL 2002 MEETING, MONTHLY PROGRESS REPORT, AND HANDOUTS	ADMIN RECORD INFO REPOSITORY	007 018 029 BLDG. 123 PARCEL A PARCEL B PARCEL C PARCEL D PARCEL E PARCEL F	FRC - PERRIS IMAGED HPNT_006	181-07-0027 30093199	BOX 0019

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N00217 / 000605 DS.A011.10011 CORRESPONDENCE N68711-00-D-0005 395	06-27-2002 **05-28-2002** DO 0011	TETRA TECH EM INC. WANTA, M. NAVFAC - SOUTHWEST DIVISION	REVISED FIELD SAMPLING PLAN AND QUALITY ASSURANCE PROJECT PLAN ADDENDA FOR THE PHASE III GROUNDWATER DATA GAPS INVESTIGATION (ADDENDUM II) {SEE AR #580 - ORIGINAL VERSION)	ADMIN RECORD	PARCEL C PARCEL D PARCEL E RU-C1 RU-C2 RU-C5 SITE 00003	FRC - PERRIS IMAGED HPNT_002	181-07-0027 30093199	BOX 0017
N00217 / 000609 TC.0011.11581 & SWDIV SER 06CH.KF/0554 MISC N62474-94-D-7609 9	06-27-2002 **05-29-2002** 00011	NAVFAC - SOUTHWEST DIVISION K. FORMAN VARIOUS AGENCIES	TRANSMITTAL OF COMPILED RESPONSE TO COMMENTS ON THE REVISED FINAL GROUNDWATER BENEFICIAL USE DETERMINATION FOR A-AQUIFER FOR PARCELS C, D, AND E {COMMENTS BY EPA} (W/ ENCLOSURE 3) [SEE AR #606 - ENCLOSURE 1 AND #607 - ENCLOSURE 2]	ADMIN RECORD SENSITIVE	006 011 012 028 029 030 033 039 058 BLDG. 217 BLDG. 241 BLDG. 258 BLDG. 275 PARCEL C PARCEL D PARCEL E SITE 00002	FRC - PERRIS IMAGED HPNT_005	181-07-0027 30093199	BOX 0017

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N00217 / 000620 CTO-007/0305 MISC N68711-95-D-7526 62	08-09-2002 **05-30-2002** 00007	BECHTEL ENVIRONMENTAL, INC. NAVFAC - SOUTHWEST DIVISION	PUBLIC INFORMATION MATERIALS FOR THE 30 MAY 2002 RESTORATION ADVISORY BOARD MEETING WHICH INCLUDES: AGENDA, PUBLIC NOTICE, MINUTES FROM 25 APRIL 2002 MEETING, TRANSCRIPT OF MINUTES FROM 30 MAY 2002 MEETING, MONTHLY PROGRESS REPORT, AND HANDOUTS	ADMIN RECORD INFO REPOSITORY	007 012 018 021 059 BLDG. 815 BLDG. 830 PARCEL A PARCEL B PARCEL C PARCEL D PARCEL E PARCEL F SITE 00001 SITE 00003	FRC - PERRIS IMAGED HPNT_006	181-07-0027 30093199	BOX 0019
N00217 / 000598 TC.0201.11606 & SWDIV SER 06CH.KF/0604 CORRESPONDENCE N62474-94-D-7609 54	06-27-2002 **06-11-2002** 00201	NAVFAC - SOUTHWEST DIVISION K. FORMAN U.S. EPA - SAN FRANCISCO C. TROMBADORE	COMPILED RESPONSE TO COMMENTS ON THE FINAL EVALUATION OF AMBIENT MANGANESE CONDITIONS - INCLUDES SWDIV TRANSMITTAL LETTER BY K. FORMAN [COMMENTS BY EPA, DTSC, & SAN FRANCISCO REDEVELOPMENT AGENCY] (SEE AR #552 - FINAL EVAUATION)	ADMIN RECORD SENSITIVE	PARCEL B PARCEL C PARCEL D	FRC - PERRIS IMAGED HPNT_005	181-07-0027 30093199	BOX 0017
N00217 / 000621 CTO-007/0312 MISC N68711-95-D-7526 82	08-09-2002 **06-27-2002** 00007	BECHTEL ENVIRONMENTAL, INC. NAVFAC - SOUTHWEST DIVISION	PUBLIC INFORMATION MATERIALS FOR THE 27 JUNE 2002 RESTORATION ADVISORY BOARD MEETING WHICH INCLUDES: AGENDA, PUBLIC NOTICE, MINUTES FROM 30 MAY 2002 MEETING, TRANSCRIPT OF MINUTES FROM 27 JUNE 2002 MEETING, MONTHLY PROGRESS REPORT, AND HANDOUTS	ADMIN RECORD INFO REPOSITORY	007 018 059 BLDG. 123 BLDG. 816 BLDG. 821 PARCEL A PARCEL B PARCEL C PARCEL D PARCEL E PARCEL F	FRC - PERRIS IMAGED HPNT_006	181-07-0027 30093199	BOX 0019

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N00217 / 000613 TC.0201.11547 & SWDIV SER 06CH.KF/0701 CORRESPONDENCE N62474-94-D-7609 137	07-20-2002 **07-12-2002** 00201	TETRA TECH EM INC. T. O'CONNOR NAVFAC - SOUTHWEST DIVISION	SAMPLING AND ANALYSIS PLAN (FIELD SAMPLING PLAN/QUALITY ASSURANCE PROJECT PLAN) FOR BASEWIDE GROUNDWATER SAMPLING FOR PETROLEUM HYDROCARBONS [INCLUDES PUBLIC SUMMARY AND SWDIV TRANSMITTAL LETTER BY K. FORMAN]	ADMIN RECORD SENSITIVE	PARCEL B PARCEL C PARCEL D PARCEL E	FRC - PERRIS IMAGED HPNT_005	181-07-0027 30093199	BOX 0018

UIC No. / Rec. No. Doc. Control No. Record Type Contr./Guid. No. Approx. # Pages	Prc. Date Record Date CTO No. EPA Cat. #	Author Affil. Author Recipient Affil. Recipient	Subject	Classification	Sites	Location SWDIV Box No(s) CD No.	FRC Accession No. FRC Warehouse FRC Box No(s)
N00217 / 000641 CTO-007/0317 & 0319 MISC N68711-95-D-7526 102	09-26-2002 **07-25-2002** 00007	BECHTEL ENVIRONMENTAL, INC. NAVFAC - SOUTHWEST DIVISION	PUBLIC INFORMATION MATERIAL PACKAGE FOR THE 25 JULY 2002 RESTORATION ADVISORY BOARD (RAB) MEETING - INCLUDES REPORTER'S TRANSCRIPT OF 25 JULY 2002 MEETING, AGENDA, MINUTES FROM 27 JUNE 2002 MEETING, MONTHLY PROGRESS REPORT, PRESENTATION MATERIALS, ETC.	ADMIN RECORD INFO REPOSITORY SENSITIVE	007 018 021 BLDG. 103 BLDG. 113 BLDG. 123 BLDG. 130 BLDG. 134 BLDG. 146 BLDG. 211 BLDG. 214 BLDG. 224 BLDG. 241 BLDG. 253 BLDG. 272 BLDG. 274 BLDG. 313 BLDG. 317 BLDG. 322 BLDG. 351 BLDG. 364 BLDG. 365 BLDG. 366 BLDG. 406 BLDG. 414 BLDG. 506 BLDG. 507 BLDG. 509 BLDG. 510 BLDG. 517 BLDG. 520 BLDG. 529 BLDG. 707 BLDG. 708 BLDG. 810	FRC - PERRIS IMAGED HPNT_013	181-07-0027 BOX 0020 30093199

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					BLDG. 815 BLDG. 816 BLDG. 820 BLDG. 821 BLDG. 830 BLDG. 831 PARCEL A PARCEL B PARCEL C PARCEL D PARCEL E SITE 00001 SITE 00002			
N00217 / 000631 FWSD-RACIII-02-1273 & SWDIV SER 06CH.KF/0820 CORRESPONDENCE N68711-98-D-5713 328	09-05-2002 **08-16-2002** 00046	FOSTER WHEELER G. STARR NAVFAC - SOUTHWEST DIVISION	FINAL WORK PLAN - INDUSTRIAL PROCESS EQUIPMENT SURVEY, SAMPLING, DECONTAMINATION, AND WASTE CONSOLIDATION PARCELS C, D, AND E, REVISION 0 - (SEE AR #702 - ADDENDUM TO THE SAP)	ADMIN RECORD SENSITIVE	PARCEL C PARCEL D PARCEL E	FRC - PERRIS IMAGED HPNT_010	181-07-0027 30093199	BOX 0019
N00217 / 000646 CTO-007/0326 MINUTES N68711-95-D-7526 98	11-12-2002 **08-22-2002** 00007	BECHTEL ENVIRONMENTAL, INC. NAVFAC - SOUTHWEST DIVISION	PUBLIC INFORMATION MATERIALS FROM THE 22 AUGUST 2002 PUBLIC MEETING/ RESTORATION ADVISORY BOARD MEETING INCLUDES: AGENDA & PUBLIC NOTICE, MINUTES FROM MEETING OF 25 JULY 2002, PRESENTATION MATERIALS, FACT SHEET, MINUTES FROM VARIOUS OTHER MEETINGS	ADMIN RECORD INFO REPOSITORY SENSITIVE	007 018 BLDG. 815 BLDG. 820 BLDG. 821 PARCEL A PARCEL C PARCEL D PARCEL E	FRC - PERRIS IMAGED HPNT_013	181-07-0027 30093199	BOX 0020

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N00217 / 000652 DS.A004.10117 CORRESPONDENCE N68711-00-D-0005 400	11-26-2002 **11-22-2002** DO 0004	TETRA TECH EM INC. VETROMILE, J. NAVFAC - SOUTHWEST DIVISION PAYNE, J.	REVISED DRAFT PETROLEUM HYDROCARBONS CORRECTIVE ACTION PLAN - PARCELS C, D, & E [INCLUDES SWDIV TRANSMITTAL LETTER FROM K. FORMAN WHICH CONTAINS SOME CONFIDENTIAL ADDRESSES]	ADMIN RECORD SENSITIVE	PARCEL C PARCEL D PARCEL E	SOUTHWEST DIVISION - BLDG. 1		
N00217 / 000657 CTO-007/0335 MISC N68711-95-D-7526 15	12-19-2002 **12-12-2002** 00007	BECHTEL ENVIRONMENTAL, INC. NAVFAC - SOUTHWEST DIVISION	ENVIRONMENTAL CLEANUP NEWSLETTER SUMMER/FALL EXPANDED ISSUE: "AMBIENT AIR AND SOIL GAS SURVEYS CONDUCTED AT PARCEL E LANDFILL - REMOVAL ACTION UNDERWAY", APRIL-SEPTEMBER 2002 {PORTION OF MAILING LIST IS CONFIDENTIAL}	ADMIN RECORD INFO REPOSITORY SENSITIVE	007 018 BLDG. 123 BLDG. 364 BLDG. 406 PARCEL A PARCEL B PARCEL C PARCEL D PARCEL E PARCEL F	FRC - PERRIS IMAGED HPNT_006	181-07-0027 30093199	BOX 0021
N00217 / 000674 TC.A013.10051 & SWDIV SER 06CH.KF/0360 CORRESPONDENCE N68711-00-D-0005 12	02-07-2003 **01-17-2003** DO 0013	NAVFAC - SOUTHWEST DIVISION FORMAN, K. VARIOUS AGENCIES	RESPONSE TO COMMENTS ON THE FINAL WORK PLAN AND SAMPLING AND ANALYSIS PLAN (FIELD SAMPLING PLAN/QUALITY ASSURANCE PROJECT PLAN) FOR THE FEROX INJECTION TECHNOLOGY DEMONSTRATION, PARCEL C, REMEDIAL UNIT 4	ADMIN RECORD INFO REPOSITORY SENSITIVE	PARCEL C PARCEL D REMEDIAL UNIT 4	FRC - PERRIS IMAGED HPNT_015	181-07-0027 30093199	BOX 0021
N00217 / 000695 DS.A011.10116 & SWDIV SER 06CH.KF/0603 REPORT N68711-00-D-0005 3213	04-23-2003 **03-31-2003** DO 0011	TETRA TECH EM INC. LANTZ, R. NAVFAC - SOUTHWEST DIVISION BROOKS, P.	FINAL PARCEL D INFORMATION PACKAGE FOR THE PHASE III GROUNDWATER DATA GAPS INVESTIGATION [INCLUDES PUBLIC SUMMARY AND SWDIV TRANSMITTAL LETTER BY K. FORMAN] {PORTION OF MAILING LIST IS CONFIDENTIAL; CD COPY ENCLOSED}	ADMIN RECORD SENSITIVE	022 PARCEL D	FRC - PERRIS IMAGED HPNT_013	181-07-0027 30093199	BOX 0023 BOX 0024

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N00217 / 000702 FWSD-RAC-1046 & SWDIV SER 06CH.KF/0593 CORRESPONDENCE N68711-98-D-5713 36	05-15-2003 **04-08-2003** 00046	FOSTER WHEELER M. SCHNEIDER NAVFAC - SOUTHWEST DIVISION	ADDENDUM TO THE SAMPLING AND ANALYSIS PLAN - INDUSTRIAL PROCESS EQUIPMENT SURVEY, SAMPLING, DECONTAMINATION, AND WASTE CONSOLIDATION PARCELS C, D, AND E, REVISION 0 [SEE AR #631 - SAP (APPENDIX A) OF FINAL WORK PLAN]	ADMIN RECORD SENSITIVE	PARCEL C PARCEL D PARCEL E	FRC - PERRIS IMAGED HPNT_010	181-07-0027 30093199	BOX 0024
N00217 / 000716 FWSD-RAC-03-1484 & SWDIV SER 06CH.KF/0829 REPORT N68711-98-D-5713 115	06-10-2003 **06-06-2003** 00046	FOSTER WHEELER G. STARR NAVFAC - SOUTHWEST DIVISION	DRAFT POST-CONSTRUCTION REPORT FOR THE INDUSTRIAL PROCESS EQUIPMENT SURVEY, SAMPLING, DECONTAMINATION, AND WASTE CONSOLIDATION FOR PARCEL D, REVISION 0 [INCLUDES SWDIV TRANSMITTAL LETTER BY K. FORMAN]	ADMIN RECORD SENSITIVE	PARCEL D	FRC - PERRIS IMAGED HPNT_014	181-07-0027 30093199	BOX 0026
N00217 / 000779 FWSD-RAC-04-0052 & SWDIV SER 06CH.KF/1421 REPORT N68711-98-D-5713 105	10-31-2003 **10-22-2003** 00046	FOSTER WHEELER G. STARR NAVFAC - SOUTHWEST DIVISION	FINAL POST-CONSTRUCTION REPORT FOR THE INDUSTRIAL PROCESS EQUIPMENT SURVEY, SAMPLING, DECONTAMINATION, AND WASTE CONSOLIDATION FOR PARCEL D, REVISION 0 [INCLUDES SWDIV TRANSMITTAL LETTER BY K. FORMAN]	ADMIN RECORD SENSITIVE	PARCEL D	FRC - PERRIS IMAGED HPNT_023	181-07-0027 30093199	BOX 0028
N00217 / 000782 FWSD-RAC-04-0052 & SWDIV SER 06CH.KF/1421 REPORT N68711-98-D-5713 100	11-14-2003 **10-22-2003** 00046	FOSTER WHEELER G. STARR NAVFAC - SOUTHWEST DIVISION	FINAL POST-CONSTRUCTION REPORT FOR THE INDUSTRIAL PROCESS EQUIPMENT SURVEY, SAMPLING, DECONTAMINATION, AND WASTE CONSOLIDATION FOR PARCEL D, REVISION 0 [INCLUDES SWDIV TRANSMITTAL LETTER BY K. FORMAN] {PORTION OF MAILING LIST IS CONFIDENTIAL}	ADMIN RECORD SENSITIVE	PARCEL D	SOUTHWEST DIVISION - BLDG. 1 TO BE DELETED		
N00217 / 003994 SWDIV SER 06CH.KF/0200 & DS.A057.10714 REPORT N68711-00-D-0005 39	02-26-2004 **02-24-2004** 00057	TETRA TECH EM INC. NAVFAC - SOUTHWEST DIVISION	DRAFT ACTION MEMORANDUM TIME-CRITICAL REMOVAL ACTION FOR THE PARCEL D SOIL EXCAVATION SITES DATED 24 FEBRUARY 2004 [INCLUDES SWDIV TRANSMITTAL LETTER BY K. FORMAN]{CD COPY ENCLOSED}	ADMIN RECORD INFO REPOSITORY SENSITIVE	PARCEL D	FRC - PERRIS IMAGED HPNT_025	181-07-0027 30093199	BOX 0082

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N00217 / 000804 DS.A057.10715 REPORT N68711-00-D-0005 834	03-11-2004 **02-27-2004** DO 0057	TETRA TECH EM INC. NAVFAC - SOUTHWEST DIVISION BROOKS, P.	DRAFT WORK PLAN FOR THE TIME-CRITICAL REMOVAL ACTION FOR PARCEL D EXCAVATION SITES [INCLUDES PUBLIC SUMMARY AND SWDIV TRANSMITTAL LETTER BY K. FORMAN] {PORTION OF MAILING LIST IS CONFIDENTIAL; CD COPY ENCLOSED}	ADMIN RECORD INFO REPOSITORY SENSITIVE	PARCEL D	FRC - PERRIS IMAGED HPNT_020	181-07-0027 30093199	BOX 0031
N00217 / 004000 04-1414 & SWDIV SER 06CH.KF/0320 REPORT N68711-98-D-5713 149	03-30-2004 **03-24-2004** 00070	TETRA TECH EM INC. G. STARR NAVFAC - SOUTHWEST DIVISION	DRAFT POST - CONSTRUCTION REPORT REVISION 0 DECONTAMINATE PROCESS EQUIPMENT, CONDUCT WASTE CONSOLIDATION AND PROVIDE ASBESTOS SERVICES IN PARCELS B,C, D	ADMIN RECORD INFO REPOSITORY SENSITIVE	PARCEL B PARCEL C PARCEL D PARCEL E	FRC - PERRIS IMAGED HPNT_023	181-07-0027 30093199	BOX 0083
N00217 / 000929 NONE CORRESPONDENCE NONE 7	06-06-2006 **04-07-2004** NONE	CRWQCB - OAKLAND J. PONTON BRAC PMO WEST K. FORMAN	COMMENTS ON THE DRAFT ACTION MEMORANDUM, TIME-CRITICAL REMOVAL ACTION AND ON THE DRAFT WORK PLAN, TIME-CRITICAL REMOVAL ACTION	ADMIN RECORD	PARCEL D	SOUTHWEST DIVISION - BLDG. 110		
N00217 / 000809 SWDIV SER 06CH.KF/0378 REPORT N68711-02-D-8310 323	04-30-2004 **04-09-2004** 00003	TPA-CKY JOINT VENTURE T. YU NAVFAC - SOUTHWEST DIVISION	DRAFT WORK PLAN FOR THE TOTAL PETROLEUM HYDROCARBON PROGRAM IMPLEMENTATION OF CORRECTIVE ACTION PLAN - SOIL REMOVAL, PARCELS B, C, D, AND E [INCLUDES SAMPLING AND ANALYSIS PLAN AND HEALTH AND SAFETY PLAN]	ADMIN RECORD INFO REPOSITORY SENSITIVE	PARCEL B PARCEL C PARCEL D PARCEL E	FRC - PERRIS IMAGED HPNT_020	181-07-0027 30093199	BOX 0031
N00217 / 004022 DS.A500.14176 & SWDIV SER 06CH.KF/0556 CORRESPONDENCE NONE 8	06-24-2004 **06-09-2004** DO 0002	NAVFAC - SOUTHWEST DIVISION K. FORMAN VARIOUS AGENCIES	REQUEST FOR IDENTIFICATION OF STATE APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARS) FOR THE DRAFT FEASIBILITY STUDY (FS) {CD COPY ENCLOSED}	ADMIN RECORD INFO REPOSITORY	PARCEL D	FRC - PERRIS IMAGED HPNT_025	181-07-0027 30093199	BOX 0083

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N00217 / 000932 NONE CORRESPONDENCE NONE 4	06-06-2006 **06-10-2004** NONE	CRWQCB - OAKLAND J. PONTON BRAC PMO WEST K. FORMAN	COMMENTS ON THE DRAFT WORK PLAN FOR TOTAL PETROLEUM HYDROCARBON PROGRAM - IMPLEMENTATION OR CORRECTIVE ACTION PLAN (CAP) SOIL REMOVAL	ADMIN RECORD	PARCEL B PARCEL C PARCEL D PARCEL E	SOUTHWEST DIVISION - BLDG. 110		
N00217 / 004095 SWDIV SER 06CH.KF/0698 REPORT N68711-02-D-8310 1000	02-02-2005 **06-23-2004** 00003	TPA-CKY JOINT VENTURE T. YU NAVFAC - SOUTHWEST DIVISION	DRAFT FINAL WORK PLAN TOTAL PETROLEUM HYDROCARBON PROGRAM CORRECTIVE ACTION IMPLEMENTATION PLAN - SOIL REMOVAL [INCLUDES RESPONSE TO COMMENTS ON THE DRAFT, SAMPLING AND ANALYSIS PLAN, HEALTH AND SAFETY PLAN AND TRANSPORTATION AND DISPOSAL PLAN]	ADMIN RECORD INFO REPOSITORY SENSITIVE	PARCEL B PARCEL C PARCEL D PARCEL E	SOUTHWEST DIVISION - BLDG. 110		
N00217 / 004071 DS.A057.14464 REPORT N68711-00-D-0005 56	10-29-2004 **10-28-2004** NONE	TETRA TECH EM INC. NAVFAC - SOUTHWEST DIVISION	FINAL ACTION MEMORANDUM TIME-CRITCAL REMOVAL ACTION FOR SOIL EXCAVATION SITES, PARCEL D [INCLUDES SWDIV TRANSMITTAL LETTER BY M. AVERY] {PORTION OF MAILING LIST IS CONFIDENTIAL; CD COPY ENCLOSED}	ADMIN RECORD INFO REPOSITORY SENSITIVE	PARCEL D	FRC - PERRIS IMAGED HPNT_024	181-07-0027 30093199	BOX 0087
N00217 / 004075 DS.A057.10761 & SWDIV SER 06CH.KF/0019 REPORT N68711-00-D-0005 832	11-18-2004 **11-01-2004** DO 0057	TETRA TECH EM INC. BABCOCK, S. NAVFAC - SOUTHWEST DIVISION	FINAL WORK PLAN, TIME-CRITICAL REMOVAL ACTION FOR PARCEL D EXCAVATION SITES [INCLUDES PUBLIC SUMMARY, RESPONSE TO COMMENTS ON THE DRAFT WORK PLAN AND SWDIV TRANSMITTAL LETTER BY M AVERY] {PORTION OF MAILING LIST IS CONFIDENTIAL; CD COPY ENCLOSED}	ADMIN RECORD INFO REPOSITORY SENSITIVE	PARCEL D	FRC - PERRIS IMAGED HPNT_024	181-07-0027 30093199	BOX 0087
N00217 / 004030 FWSD-RAC-05-0092 & SWDIV SER BPMOW.KSF/0075 REPORT N68711-98-D-5713 80	07-14-2004 **11-02-2004** 00070	TETRA TECH FW INC. G. SLATTERY NAVFAC - SOUTHWEST DIVISION	FINAL POST-CONSTRUCTION REPORT FOR THE DECONTAMINATE PROCESS EQUIPMENT, CONDUCT WASTE CONSOLIDATION AND PROVIDE ASBESTOS SERVICES, REVISION 0 [INCLUDES SWDIV TRANSMITTAL LETTER BY M. AVERY] {PORTION OF MAILING LIST IS CONFIDENTIAL; CD COPY IS ENCLOSED}	ADMIN RECORD INFO REPOSITORY SENSITIVE	PARCEL B PARCEL C PARCEL D PARCEL E	SOUTHWEST DIVISION - BLDG. 1		

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N00217 / 004078 FWSD-RAC-05-0092 & SWDIV SER BPMOW.KSF/0114 REPORT N68711-98-D-5713 10	11-24-2004 **11-02-2004** 00070	TETRA TECH FW, INC. NAVFAC - SOUTHWEST DIVISION	REVIEW OF THE DRAFT FINAL POST-CONSTRUCTION REPORT, REVISION 0, DECONTAMINATE PROCESS EQUIPMENT, CONDUCT WASTE CONSOLIDATION, AND PROVIDE ASBESTOS SERVICES DATED 11/09/04 [INCLUDES SWDIV TRANSMITTAL LETTER BY M. AVERY]	ADMIN RECORD INFO REPOSITORY	BLDG. 231 BLDG. 600 PARCEL B PARCEL C PARCEL D PARCEL E	FRC - PERRIS IMAGED HPNT_025	181-07-0027 BOX 0087 30093199
N00217 / 000868 BRAC SER BPMOW.KSF/0235 CORRESPONDENCE NONE 3	02-22-2006 **12-22-2004** NONE	BRAC K. FORMAN VARIOUS AGENCIES	TRANSMITTAL OF RESPONSE TO PUBLIC COMMENTS ON THE DRAFT ACTION MEMORANDUM AND ON THE WORK PLAN FOR THE TIME-CRITICAL REMOVAL ACTION AT PARCEL D, SOIL EXCAVATION SITES {CD COPY ENCLOSED} (PORTION OF THE MAILING LIST IS CONFIDENTIAL)	ADMIN RECORD INFO REPOSITORY SENSITIVE	PARCEL D	SOUTHWEST DIVISION - BLDG. 110	
N00217 / 004087 PROJ NO. 41330-2.09 & SWDIV SER BPMOW.GWC/0281 REPORT N68711-00-D-0004 600	01-13-2005 **01-07-2005** DO 0074	KLEINFELDER M. VALDOVINOS NAVFAC - SOUTHWEST DIVISION	DRAFT SECOND QUARTER (APRIL-JUNE) 2004 GROUNDWATER SAMPLING REPORT, REVISION 0 [INCLUDES SWDIV TRANSMITTAL LETTER BY K. FORMAN] {PORTION OF MAILING LIST IS CONFIDENTIAL, CD COPY ENCLOSED}	ADMIN RECORD INFO REPOSITORY SENSITIVE	PARCEL C PARCEL D PARCEL E	SOUTHWEST DIVISION - BLDG. 110 CHECKED OUT BY J. ARCEO, EXT 2-4062, ON 09/05/08, FOR QAQC	
N00217 / 004102 DS.A057.10716 & SWDIV SER BPMOW.KSF/0367 REPORT N68711-00-D-0005 50	02-16-2005 **02-03-2005** DO 0057	TETRA TECH EM INC. A. CHAKRABARTI BRAC - SAN DIEGO P. BROOKS	DRAFT CLOSEOUT REPORT TIME-CRITICAL REMOVAL ACTION FOR PARCEL D EXCAVATION SITES [INCLUDES PUBLIC SUMMARY AND SWDIV TRANSMITTAL LETTER BY K. FORMAN] {PORITON OF MAILING LIST IS CONFIDENTIAL, CD COPY ENCLOSED}	ADMIN RECORD INFO REPOSITORY SENSITIVE	PARCEL D	SOUTHWEST DIVISION - BLDG. 1	
N00217 / 000901 NONE REPORT N68711-00-D-0004 250	04-20-2006 **04-17-2005** DO 0074	KLEINFELDER BRAC PMO WEST	DRAFT APRIL TO JUNE 2005 SIXTH QUARTER GROUNDWATER SAMPLING REPORT (SEE AR #902 BRAC TRANSMITTAL LETTER BY K. FORMAN)	ADMIN RECORD INFO REPOSITORY	PARCEL C PARCEL D PARCEL E	SOUTHWEST DIVISION - BLDG. 110	

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N00217 / 004141 02-125-06-001 & SWDIV SER BPMOW.AK/00701 REPORT N68711-03-D-5104 100	06-01-2005 **05-13-2005** 00110	TETRA TECH EM INC. A. CHAKRABARTI NAVFAC - SOUTHWEST DIVISION P. BROOKS	FINAL CLOSEOUT REPORT FOR THE TIME-CRITICAL REMOVAL ACTION (TCRA) FOR THE EXCAVATION SITES {PORTION OF MAILING LIST IS CONFIDENTIAL, CD COPY ENCLOSED}	ADMIN RECORD INFO REPOSITORY SENSITIVE	PARCEL D	SOUTHWEST DIVISION - BLDG. 1	
N00217 / 004144 SWDIV SER BPMOW.GWC/0763 REPORT N68711-00-D-0004 700	06-03-2005 **05-20-2005** DO 0074	KLEINFELDER M. VALDOVINOS NAVFAC - SOUTHWEST DIVISION	DRAFT THIRD QUARTER (JULY - SEPTEMBER) 2004 GROUNDWATER SAMPLING REPORT {PORTION OF MAILING LIST IS CONFIDENTIAL}	ADMIN RECORD INFO REPOSITORY SENSITIVE	PARCEL C PARCEL D PARCEL E	SOUTHWEST DIVISION - BLDG. 110 CHECKED OUT BY J. ARCEO, EXT 2-4062, ON 09/05/08, FOR QAQC	
N00217 / 000821 SWDIVSER BPMOW.JEP/0955 & PROJ. NO JV-13 REPORT N68711-02-D-8310 250	07-20-2005 **06-01-2005** 00003	TPA - CKY JOINT VENTURE NAVFAC - SOUTHWEST DIVISION	DRAFT FINAL SITE CLOSURE REPORT FOR THE TOTAL PETROLEUM HYDROCARBON PROGRAM CORRECTIVE ACTION IMPLEMENTATION SOIL REMOVAL FOR PARCELS [PORTION OF MAILING LIST IS CONFIDENTIAL]	ADMIN RECORD INFO REPOSITORY SENSITIVE	PARCEL B PARCEL C PARCEL D PARCEL E	SOUTHWEST DIVISION - BLDG. 110	
N00217 / 004160 DS.B019.13894 CORRESPONDENCE N68711-03-D-5104 65	08-30-2005 **08-18-2005** 00019	SULTECH VARIOUS AGENCIES	RESPONSES TO REGULATORY AGENCY COMMENTS ON DRAFT REVISED FEASIBILTY STUDY (DOCUMENT NOT DATED)	ADMIN RECORD INFO REPOSITORY	PARCEL D	SOUTHWEST DIVISION - BLDG. 1	
N00217 / 004167 BRAC SER BPMOW.RNA/1229 REPORT N68711-00-D-0004 500	10-12-2005 **09-23-2005** DO 0074	KLEINFELDER C. JOHNSON NAVFAC - SOUTHWEST DIVISION	DRAFT FOURTH QUARTER (OCTOBER-DECEMBER) 2004 GROUNDWATER SAMPLING REPORT (INCLUDES BRAC TRANSMITTAL LETTER BY D. GILKEY, CD COPY ENCLOSED) [PORTION OF MAILING LIST IS CONFIDENTIAL]	ADMIN RECORD INFO REPOSITORY SENSITIVE	PARCEL C PARCEL D PARCEL E	SOUTHWEST DIVISION - BLDG. 110	

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N00217 / 004179 BRAC SER BPMOW.JEP/1242 REPORT N68711-02-D-8310 175	11-30-2005 **09-23-2005** 00003	TPA-CKY JOINT VENTURE BRAC	FINAL SITE CLOSE OUT REPORT, TOTAL PETROLEUM HYDROCARBON PROGRAM CORRECTIVE ACTION IMPLEMENTATION SOIL REMOVAL (INCLUDES RESPONSES TO AGENCY COMMENTS ON DRAFT FINAL REPORT AND BRAC TRANSMITTAL LETTER BY D. GILKEY)	ADMIN RECORD INFO REPOSITORY SENSITIVE	PARCEL B PARCEL C PARCEL D PARCEL E	SOUTHWEST DIVISION - BLDG. 1	
N00217 / 000830 BRAC SER BPMOW.RNA/0984 & BRAC SER BPMOW.RNA/1431 REPORT N68711-00-D-0004 700	08-01-2005 **12-01-2005** DO 0074	KLEINFELDER NAVFAC - SOUTHWEST DIVISION	FINAL SECOND QUARTER (APRIL - JUNE) 2004 GROUNDWATER SAMPLING REPORT (INCLUDES REPLACEMENT PAGES REVISING THE DATE OF 29 JULY 2005 TO 01 DECEMBER 2005) [INCLUDES BRAC TRANSMITTAL LETTERS BY D. GILKEY AND K. FORMAN] {CD COPY ENCLOSED}	ADMIN RECORD INFO REPOSITORY SENSITIVE	PARCEL C PARCEL D PARCEL E	SOUTHWEST DIVISION - BLDG. 110	
N00217 / 001457 BRAC SER BPMOW.MA/1431 CORRESPONDENCE NONE 3	11-06-2008 **12-01-2005** NONE	BRAC PMO WEST FORMAN, K. VARIOUS AGENCIES	TRANSMITTAL OF THE RESPONSES TO COMMENTS ON THE 1) FINAL APRIL - JUNE 2004, EIGHTEENTH QUARTERLY GROUNDWATER SAMPLING REPORT, 2) FINAL JULY - SEPTEMBER 2004, NINETEENTH QUARTERLY GROUNDWATER SAMPLING REPORT, (***SEE COMMENTS)	ADMIN RECORD SENSITIVE	PARCEL B PARCEL C PARCEL D PARCEL E	SOUTHWEST DIVISION - BLDG. 110	
N00217 / 001459 BRAC SER BPMOW.MA/1468 CORRESPONDENCE NONE 2	11-06-2008 **12-14-2005** NONE	BRAC PMO WEST FORMAN, K. VARIOUS AGENCIES	TRANSMITTAL OF THE FINAL FOURTH QUARTER (OCTOBER - DECEMBER) 2004 GROUNDWATER SAMPLING REPORT (W/OUT ENCLOSURE) [PORTION OF THE MAILING LIST IS SENSITIVE]	ADMIN RECORD SENSITIVE	PARCEL C PARCEL D PARCEL E	SOUTHWEST DIVISION - BLDG. 110	
N00217 / 004181 PROJECT NO. 41330-2.09 REPORT N68711-00-D-0004 500	12-16-2005 **12-14-2005** DO 0074	KLEINFELDER BRAC PMO WEST	FINAL FOURTH QUARTER (OCTOBER - DECEMBER) 2004 GROUNDWATER SAMPLING REPORT (CD COPY ENCLOSED)	ADMIN RECORD INFO REPOSITORY	PARCEL C PARCEL D PARCEL E	SOUTHWEST DIVISION - BLDG. 110	

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N00217 / 000873 NONE REPORT N68711-00-D-0004 200	03-23-2006 **03-22-2006** DO 0074	CDM BRAC PMO WEST	DRAFT JANUARY TO MARCH 2005 FIFTH QUARTERLY/FIRST ANNUAL GROUNDWATER SAMPLING REPORT, VOLUMES I AND II OF II [CD COPY ENCLOSED] (SEE AR #874 - BRAC TRANSMITTAL LETTER BY K. FORMAN)	ADMIN RECORD INFO REPOSITORY	PARCEL C PARCEL D PARCEL E	SOUTHWEST DIVISION - BLDG. 110	
N00217 / 000874 BRAC PMOW SER BPMOW.MA/0271 CORRESPONDENCE NONE 3	03-23-2006 **03-22-2006** NONE	BRAC PMO WEST K. FORMAN BCT MEMBERS	TRANSMITTAL OF DRAFT JANUARY TO MARCH 2005 FIFTH QUARTERLY/FIRST ANNUAL GROUNDWATER MONITORING REPORT (PORTION OF THE MAILING LIST IS CONFIDENTIAL) [SEE AR 3873 - DRAFT JANUARY TO MARCH 2005 FIFTH QUARTERLY/FIRST ANNUAL GROUNDWATER MONITORING REPORT]	ADMIN RECORD INFO REPOSITORY SENSITIVE	PARCEL C PARCEL D PARCEL E	SOUTHWEST DIVISION - BLDG. 110	
N00217 / 000947 BRAC PMO WEST SER BPMOW.GB/0297 CORRESPONDENCE NONE 3	06-26-2006 **03-31-2006** NONE	BRAC PMO WEST K. FORMAN VARIOUS AGENCIES	TRANSMITTAL OF ADDITIONAL RESPONSE TO COMMENTS AND REPLACEMENT PAGES FOR 1) FINAL Q18 (APRIL TO JUNE 2004) PARCEL B; 2) FINAL Q19 (JULY TO SEPT. 2004) PARCEL B; & 3) FINAL Q3 (JULY TO SEPT. 2004) PARCELS C, D & E GROUNDWATER MONITORING REPORTS	ADMIN RECORD INFO REPOSITORY	PARCEL B PARCEL C PARCEL D PARCEL E	SOUTHWEST DIVISION - BLDG. 110	
N00217 / 004161 BRAC SER BPMOW.RNA/1201 & BRAC SER BPMOW.RNA/1431 REPORT N68711-00-D-0004 600	09-12-2005 **03-31-2006** 00074	CDM C. JOHNSON NAVFAC - SOUTHWEST DIVISION	FINAL THIRD QUARTER (JULY - SEPTEMBER) 2004 GROUNDWATER SAMPLING REPORT (INCLUDES REPLACEMENT PAGES REVISING THE DATE OF 09 SEPTEMBER 2005 TO 01 DECEMBER 2005 TO 31 MARCH 2) [INCLUDES BRAC TRANSMITTAL LETTERS BY D. GILKEY AND K. FORMAN] {CD COPY ENCLOSED}	ADMIN RECORD INFO REPOSITORY	PARCEL C PARCEL D PARCEL E	SOUTHWEST DIVISION - BLDG. 110	
N00217 / 000909 NONE REPORT N62473-06-C-2001 250	05-02-2006 **04-01-2006** NONE	CE2-KLEINFELDER JOINT VENTURE BRAC PMO WEST	DRAFT OCTOBER TO DECEMBER 2005 QUARTERLY GROUNDWATER MONITORING REPORT (SEE AR #910 - BRAC TRANSMITTAL LETTER BY K. FORMAN)	ADMIN RECORD INFO REPOSITORY	PARCEL C PARCEL D PARCEL E	SOUTHWEST DIVISION - BLDG. 110	

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N00217 / 000902 BRAC SER BPMOW.MA/0356 CORRESPONDENCE NONE 3	04-20-2006 **04-17-2006** NONE	BRAC PMO WEST K. FORMAN BCT MEMBERS	TRANSMITTAL OF DRAFT APRIL TO JUNE 2005 SIXTH QUARTER GROUNDWATER MONITORING REPORT[PORTION OF THE MAILING LIST IS CONFIDENTIAL] (SEE AR #901 - DRAFT APRIL TO JUNE 2005 SIXTH QUARTER GROUNDWATER MONITORING REPORT)	ADMIN RECORD INFO REPOSITORY SENSITIVE	PARCEL C PARCEL D PARCEL E	SOUTHWEST DIVISION - BLDG. 1	
N00217 / 000904 BRAC SER BPMOW.MA/0357 CORRESPONDENCE NONE 3	04-20-2006 **04-19-2006** NONE	BRAC PMO WEST K. FORMAN BCT MEMBERS	TRANSMITTAL OF DRAFT JULY TO SEPTEMBER 2005 SEVENTH QUARTER GROUNDWATER MONITORING REPORT [PORTION OF THE MAILING LIST IS CONFIDENTIAL] (SEE AR # 903 - DRAFT JULY TO SEPTEMBER 2005 SEVENTH QUARTER GROUNDWATER MONITORING REPORT)	ADMIN RECORD INFO REPOSITORY SENSITIVE	PARCEL C PARCEL D PARCEL E	SOUTHWEST DIVISION - BLDG. 110	
N00217 / 000910 BRAC SER BPMOW.KF\0394 CORRESPONDENCE NONE 2	05-02-2006 **04-27-2006** NONE	BRAC PMO WEST K. FORMAN BCT MEMBERS	TRANSMITTAL OF DRAFT OCTOBER TO DECEMBER 2005 GROUNDWATER MONITORING REPORT (PORTION OF THE MAILING LIST IS CONFIDENTIAL) [SEE AR #909 - DRAFT OCTOBER TO DECEMBER 2005 GROUNDWATER MONITORING REPORT)	ADMIN RECORD INFO REPOSITORY SENSITIVE	PARCEL C PARCEL D PARCEL E	SOUTHWEST DIVISION - BLDG. 110	
N00217 / 000903 41330 2.10 REPORT N68711-00-D-0004 1500	04-20-2006 **05-01-2006** DO 0074	KLEINFELDER SRINIVASAN, L. BRAC PMO WEST	DRAFT JULY TO SEPTEMBER 2005 SEVENTH QUARTER GROUNDWATER MONITORING REPORT (INCLUDES REPLACEMENT REVISING THE DATE FROM 19 APRIL 2006 TO 01 MAY 2006) [REPLACEMENT PAGES ISSUE DON 01 MAY 2006 INCLUDE: COVER PAGE AND TABLE 1]	ADMIN RECORD INFO REPOSITORY	PARCEL C PARCEL D PARCEL E	SOUTHWEST DIVISION - BLDG. 110	
N00217 / 000917 BRAC SER BMPOW.PB/0413 CORRESPONDENCE NONE 2	05-31-2006 **05-08-2006** NONE	BRAC PMO WEST K. FORMAN VARIOUS AGENCIES	TRANSMITTAL OF REVISED FINAL FOURTH QUARTER (OCTOBER - DECEMBER) 2004 GROUNDWATER SAMPLING REPORT (SEE AR #916 - REVISED FINAL FOURTH QUARTER REPORT)	ADMIN RECORD INFO REPOSITORY	PARCEL C PARCEL D PARCEL E	SOUTHWEST DIVISION - BLDG. 110	

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N00217 / 000991 NONE REPORT N62473-06-C-2001 950	09-07-2006 **08-01-2006** NONE	CE2 - KLEINFELDER E. KILDUFF BRAC PMO WEST	QUARTERLY GROUNDWATER (GW) MONITORING REPORT, OCTOBER-DECEMBER 2005, REVISION 1 (SEE AR # 990 - BRAC PMO WEST TRANSMITTAL AND AR # 909 - DRAFT QUARTERLY GW MONITORING REPORT]	ADMIN RECORD INFO REPOSITORY	PARCEL C PARCEL D PARCEL E	SOUTHWEST DIVISION - BLDG. 110	
N00217 / 001000 NONE REPORT N62473-06-C-2001 3000	09-28-2006 **08-01-2006** NONE	CE2 - KLEINFELDER E. KILDUFF NAVFAC - SOUTHWEST	PARCELS C, D, & E, QUARTERLY GROUNDWATER MONITORING REPORT AND ANNUAL REPORT, JANUARY - MARCH 2006, REVISION 1 (FOLDER 1-3 OF 3) [SEE AR # 4232 - BRAC PMO WEST TRANSMITTAL LETTER BY K. FORMAN]	ADMIN RECORD INFO REPOSITORY	PARCEL C PARCEL D PARCEL E	SOUTHWEST DIVISION - BLDG. 110	
N00217 / 000990 BRAC SER BPMOW.MLW/0726 CORRESPONDENCE NONE 2	09-07-2006 **08-31-2006** NONE	BRAC PMO WEST K. FORMAN VARIOUS AGENCIES	TRANSMITTAL OF QUARTERLY GROUNDWATER (GW) MONITORING REPORT, OCTOBER-DECEMBER 2005, REVISION 1 (SEE AR # 991 - GW MONITORING REPORT)	ADMIN RECORD INFO REPOSITORY SENSITIVE	PARCEL C PARCEL D PARCEL E	SOUTHWEST DIVISION - BLDG. 1	
N00217 / 000999 BRAC SER BPMOW.MLW/0775 CORRESPONDENCE NONE 4	09-28-2006 **09-13-2006** NONE	BRAC PMO WEST K. FORMAN VARIOUS AGENCIES	TRANSMITTAL OF PARCELS C, D, & E, QUARTERLY GROUNDWATER MONITORING REPORT, JANUARY - MARCH 2006 AND ANNUAL REPORT, REVISION 0 (W/OUT ENCLOSURE) [SEE AR #1000 - GW MONITORING REPORT] {PORTION OF THE MAILING LIST IS SENSITIVE}	ADMIN RECORD INFO REPOSITORY SENSITIVE	PARCEL C PARCEL D PARCEL E	SOUTHWEST DIVISION - BLDG. 110	
N00217 / 000916 PROJECT NO. 41330-2.10 REPORT N68711-00-D-0004 400	05-31-2006 **09-29-2006** DO 0074	KLEINFELDER BRAC PMO WEST	REVISED FINAL FOURTH QUARTER (OCTOBER - DECEMBER) 2004 GROUNDWATER SAMPLING REPORT (INCLUDES REPLACEMENT PAGES REVISING THE DATE OF 28 APRIL 2006 TO 29 SEPTEMBER 2006 AND CD COPY) [***SEE COMMENTS]	ADMIN RECORD INFO REPOSITORY	PARCEL C PARCEL D PARCEL E	SOUTHWEST DIVISION - BLDG. 110	

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N00217 / 001458 BRAC SER BPMOW.MLW/0819 CORRESPONDENCE NONE 3	11-06-2008 **09-29-2006** NONE	BRAC PMO WEST FORMAN, K. VARIOUS AGENCIES	TRANSMITTAL OF REPLACEMENT PAGES REVISING THE DATE ON THE FINAL FOURTH QUARTER (OCTOBER-DECEMBER) 2004 GROUNDWATER SAMPLING REPORT (W/OUT ENCLOSURE) [PORTION OF THE MAILING LIST IS SENSITIVE]	ADMIN RECORD SENSITIVE	PARCEL C PARCEL D PARCEL E	SOUTHWEST DIVISION - BLDG. 110	
N00217 / 001056 NONE REPORT N62473-06-C-2001 1000	11-30-2006 **10-01-2006** NONE	CE2-KLEINFELDER E. KILDUFF BRAC PMO WEST	PARCELS C, D, & E QUARTERLY GROUNDWATER MONITORING REPORT, APRIL - JUNE 2006, REVISION 0 (FOLDERS 1 - 2 OF 2) [CD COPY ENCLOSED] {SEE AR #1055 - BRAC PMO WEST TRANSMITTAL LETTER BY K. FORMAN}	ADMIN RECORD INFO REPOSITORY	PARCEL C PARCEL D PARCEL E	SOUTHWEST DIVISION - BLDG. 1	
N00217 / 001010 BRAC SER BPMOW.MLW/0046 CORRESPONDENCE NONE 2	10-26-2006 **10-11-2006** NONE	BRAC PMO WEST K. FORMAN VARIOUS AGENCIES	TRANSMITTAL OF FINAL APRIL TO JUNE 2005, SIXTH QUARTER GROUNDWATER MONITORING REPORT, PARCELS C, D, AND E (W/OUT ENCLOSURE) [PORTION OF THE MAILING LIST IS SENSITIVE] {SEE AR #1011 - FINAL REPORT}	ADMIN RECORD INFO REPOSITORY SENSITIVE	PARCEL C PARCEL D PARCEL E	SOUTHWEST DIVISION - BLDG. 110	
N00217 / 001011 PROJECT NO. 41330-2.10 REPORT N68711-00-D-0004 600	10-26-2006 **10-11-2006** DO 0074	KLEINFELDER L. SRINIVASAN BRAC PMO WEST	FINAL APRIL TO JUNE 2005, SIXTH QUARTER GROUNDWATER MONITORING REPORT, PARCELS C, D, AND E, REVISION 0 (CD COPY ENCLOSED) [SEE AR #1010 - BRAC PMO WEST TRANSMITTAL LETTER BY K. FORMAN]	ADMIN RECORD INFO REPOSITORY	PARCEL C PARCEL D PARCEL E	SOUTHWEST DIVISION - BLDG. 110	
N00217 / 001012 BRAC SER BPMOW.MLV/0047 CORRESPONDENCE NONE 2	10-26-2006 **10-17-2006** NONE	BRAC PMO WEST K. FORMAN VARIOUS AGENCIES	TRANSMITTAL OF FINAL JULY TO SEPTEMBER 2005, SEVENTH QUARTER GROUNDWATER MONITORING REPORT, PARCELS C, D, AND E (W/OUT ENCLOSURE) [PORTION OF THE MAILING LIST IS SENSITIVE] {SEE AR #1013 - FINAL REPORT} (SEE COMMENTS)	ADMIN RECORD INFO REPOSITORY SENSITIVE	PARCEL C PARCEL D PARCEL E	SOUTHWEST DIVISION - BLDG. 110	

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N00217 / 001013 PROJECT NO. 41330-2.10 REPORT N68711-00-D-0004 600	10-26-2006 **10-17-2006** DO 0074	KLEINFELDER L. SRINIVASAN BRAC PMO WEST	FINAL JULY TO SEPTEMBER 2005, SEVENTH QUARTER, GROUNDWATER MONITORING REPORT, PARCELS C, D, AND E (CD COPY ENCLOSED) [SEE AR #1012 - BRAC PMO WEST TRANSMITTAL LETTER BY K. FORMAN] {SEE COMMENTS}	ADMIN RECORD INFO REPOSITORY	PARCEL C PARCEL D PARCEL E	SOUTHWEST DIVISION - BLDG. 110	
N00217 / 001065 BRAC SER BPMOW.MLW/0139 CORRESPONDENCE NONE 3	12-20-2006 **11-17-2006** NONE	BRAC PMO WEST K. FORMAN VARIOUS AGENCIES	TRANSMITTAL OF FINAL JANUARY TO MARCH 2005 FIFTH QUARTERLY/FIRST ANNUAL GROUNDWATER SAMPLING REPORT, VOLUMES I - II OF II (W/OUT ENCLOSURE) [SEE AR# 1066 - FINAL ANNUAL GROUNDWATER SAMPLING REPORT]	ADMIN RECORD INFO REPOSITORY	PARCEL C PARCEL D PARCEL E	SOUTHWEST DIVISION - BLDG. 110 CHECKED OUT BY J. ARCEO, EXT 2-4062, ON 10/09/08 FOR QAQC	
N00217 / 001066 NONE REPORT N68711-00-D-0004 6000	12-20-2006 **11-17-2006** DO 0074	KLEINFELDER NAVFAC - SOUTHWEST DIVISION	FINAL JANUARY TO MARCH 2005 FIFTH QUARTERLY/FIRST ANNUAL GROUNDWATER SAMPLING REPORT, VOLUMES I - II OF II, FOLDERS 1 - 6 OF 6 (CD COPY OF REPORT AND APPENDICES A THROUGH J ENCLOSED) [SEE AR# 1065 - BRAC TRANSMITTAL LETTER BY K. FORMAN]	ADMIN RECORD INFO REPOSITORY	PARCEL C PARCEL D PARCEL E	SOUTHWEST DIVISION - BLDG. 110	
N00217 / 001055 BRAC SER BPMOW.MLW/0125 CORRESPONDENCE NONE 2	11-30-2006 **11-21-2006** NONE	BRAC PMO WEST K. FORMAN VARIOUS AGENCIES	TRANSMITTAL OF PARCELS C, D, & E QUARTERLY GROUNDWATER MONITORING REPORT, APRIL - JUNE 2006, REVISION 0 (W/OUT ENCLOSURE) [PORTION OF THE MAILING LIST IS SENSITIVE] {SEE AR #1056 - GW MONITORING REPORT}	ADMIN RECORD INFO REPOSITORY SENSITIVE	PARCEL C PARCEL D PARCEL E	SOUTHWEST DIVISION - BLDG. 1	
N00217 / 004191 BRAC SER BPMOW.MLW/0312 CORRESPONDENCE NONE 2	03-21-2007 **01-31-2007** NONE	BRAC PMO WEST K. FORMAN VARIOUS AGENCIES	TRANSMITTAL OF PARCELS C, D, AND E QUARTERLY GROUNDWATER MONITORING REPORT, JULY-SEPTEMBER 2006, REVISION 0 (W/OUT ENCLOSURE) [SEE AR #4192 - PARCELS C, D, AND E QUARTERLY GROUNDWATER MONITORING REPORT]	ADMIN RECORD INFO REPOSITORY	PARCEL C PARCEL D PARCEL E	SOUTHWEST DIVISION - BLDG. 1	

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N00217 / 004232 BRAC PMOW SER BPMOW.MLW/0425 CORRESPONDENCE NONE 2	08-31-2007 **03-30-2007** NONE	BRAC PMO WEST K. ROWMAN VARIOUS AGENCIES	TRANSMITTAL OF REPLACEMENT PAGES CONVERTING REVISION 0 DATED 1 AUGUST 2006 TO REVISION 1, QUARTERLY GROUNDWATER MONITORING REPORT (JANUARY-MARCH 2006) {PORTION OF MAILING LIST IS SENSITIVE} (W/OUT ENCLOSURE) {SEE COMMENTS}	ADMIN RECORD INFO REPOSITORY	PARCEL C PARCEL D PARCEL E	SOUTHWEST DIVISION - BLDG. 1	
N00217 / 004221 TTPB-RAC3-07-0234 REPORT N44255-01-D-2000 (RAC 3) 3	05-10-2007 **04-20-2007** 00070	TETRA TECH EC, INC. NAVFAC - SOUTHWEST	FINAL PARCEL D BARGE SURVEY WORK INSTRUCTION	ADMIN RECORD INFO REPOSITORY	PARCEL D	SOUTHWEST DIVISION - BLDG. 1	
N00217 / 004192 NONE REPORT N62473-06-C-2001 5000	03-21-2007 **05-01-2007** NONE	CE2-KLEINFELDER JOINT VENTURE E. KILDUFF BRAC PMO WEST	PARCELS C, D, AND E QUARTERLY GROUNDWATER MONITORING REPORT, JULY-SEPTEMBER 2006, REVISION 1 (CD COPY ENCLOSED) [FOLDERS 1-2 OF 2] {SEE AR #1082 - BRAC PMO WEST TRANSMITTAL LETTER BY K. FORMAN}***SEE COMMENTS	ADMIN RECORD INFO REPOSITORY	PARCEL C PARCEL D PARCEL E	SOUTHWEST DIVISION - BLDG. 1	
N00217 / 001100 CEKA-3001-0000-0002 REPORT N62473-07-C-3001 2200	07-12-2007 **06-01-2007** NONE	CE2 KLEINFELDER - PLEASANTON B. RUCKER NAVFAC - SOUTHWEST DIVISION	QUARTERLY GROUNDWATER MONITORING REPORT (JANUARY - MARCH 2007) AND ANNUAL REPORT PARCELS C, D, E, AND E-2, REVISION 1 (CD COPY ENCLOSED) [SEE AR # 1231 - BRAC TRANSMITTAL LETTER]	ADMIN RECORD INFO REPOSITORY	PARCEL C PARCEL D PARCEL E PARCEL E-2	SOUTHWEST DIVISION - BLDG. 1	
N00217 / 001099 BRAC SER BPMOW.MLW/0663 CORRESPONDENCE NONE 2	07-12-2007 **06-03-2007** NONE	BRAC PMO WEST K. FORMAN VARIOUS AGENCIES	TRANSMITTAL OF QUARTERLY GROUNDWATER MONITORING REPORT (JANUARY - MARCH 2007) AND ANNUAL REPORT {PORTION OF MAILING LIST IS SENSITIVE} (W/OUT ENCLOSURE) [SEE AR # 1100 - QUARTERLY GROUNDWATER MONITORING REPORT (JANUARY - MARCH 2007) AND ANNUAL REPORT]	ADMIN RECORD INFO REPOSITORY SENSITIVE	PARCEL C PARCEL D PARCEL E PARCEL E-2	SOUTHWEST DIVISION - BLDG. 1	

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N00217 / 004231 ECSD-2000-0070-0001 REPORT N44255-01-D-2000 75	06-28-2007 **06-22-2007** 00070	TETRA TECH EC, INC. W. DOUGHERTY BRAC PMO WEST	FINAL DESIGN PLAN STORM DRAIN AND SANITARY SEWER REMOVAL (CD COPY ENCLOSED) [INCLUDES REPLACEMENT PAGES CONVERTING DRAFT DATED 22 JUNE 2007 TO FINAL] {SEE AR # 1116 - BRAC PMOW TRANSMITTAL LETTER BY K. FORMAN}	ADMIN RECORD INFO REPOSITORY	017 018 019 027 PARCEL D	SOUTHWEST DIVISION - BLDG. 1	
N00217 / 001131 BRAC SER BPMOW.MLW/0664 CORRESPONDENCE NONE 2	08-22-2007 **07-06-2007** NONE	BRAC PMO WEST K. FORMAN VARIOUS AGENCIES	TRANSMITTAL OF THE DRAFT FINAL REVISED FEASIBILITY STUDY (W/OUT ENCLOSURE) [SEE AR #1132 - DRAFT FINAL REVISED FEASIBILITY STUDY] {PORTION OF THE MAILING LIST IS SENSITIVE}	ADMIN RECORD INFO REPOSITORY SENSITIVE	PARCEL D	SOUTHWEST DIVISION - BLDG. 110	
N00217 / 001132 SULT.5104.0019.000 2 REPORT N68711-03-D-5104 200	08-22-2007 **07-06-2007** 00019	SULTECH KNIGHT, J. NAVFAC - SOUTHWEST	DRAFT FINAL REVISED FEASIBILITY STUDY (FS) [SEE AR# 1131 - BRAC PMO WEST TRANSMITTAL LETTER, # 3456 THROUGH 3457 - DRAFT FINAL FS, VOLUMES I THROUGH II OF II, AND # 1160 - RADIOLOGICAL ADDENDUM, DRAFT FINAL REVISED FS]	ADMIN RECORD INFO REPOSITORY	PARCEL D	SOUTHWEST DIVISION - BLDG. 110	
N00217 / 001435 BAI.5106.0016.0003 MINUTES N68711-03-D-5106 30	10-28-2008 **07-26-2007** 00016	BARAJAS & ASSOCIATES, INC. RAB MEMBERS	26 JULY 2007 RESTORATION ADVISORY BOARD (RAB) MINUTES (INCLUDES LIST OF ATTENDEES, VARIOUS HANDOUTS, TRANSCRIPT, AND CD COPY)	ADMIN RECORD INFO REPOSITORY	AREA 00017 AREA 00018 AREA 00019 AREA 00027 PARCEL A PARCEL B PARCEL D PARCEL F	SOUTHWEST DIVISION - BLDG. 1	
N00217 / 001089 NONE REPORT N62473-06-C-2001 1200	07-10-2007 **08-01-2007** NONE	CE2-KLEINFELDER KILDUFF, E. NAVFAC - SOUTHWEST DIVISION	QUARTERLY GROUNDWATER MONITORING REPORT (OCTOBER - DECEMBER 2006) REVISION 1 (INCLUDES REPLACEMENT PAGES CONVERTING THE QUARTERLY GROUNDWATER MONITORING REPORT (OCTOBER - DECEMBER 2006) DATED APRIL 2007 TO REVISION 1)	ADMIN RECORD INFO REPOSITORY	PARCEL C PARCEL D PARCEL E	SOUTHWEST DIVISION - BLDG. 110 CHECKED OUT BY C. CASAS, EXT 2-2240, ON 11/14/2008, FOR QAQC	

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N00217 / 001116 BRAC PMOW SER BPMOW.REP/0752 CORRESPONDENCE NONE 2	08-15-2007 **08-07-2007** NONE	BRAC PMO WEST K. FORMAN VARIOUS AGENCIES	TRANSMITTAL OF REPLACEMENT PAGES CONVERTING DRAFT DATED 22 JUNE 2007 TO FINAL DESIGN PLAN STORM DRAIN AND SANITARY SEWER REMOVAL PARCEL D (CD COPY ENCLOSED) {PORTION OF MAILING LIST IS SENSITIVE} (W/OUT ENCLOSURE) [SEE AR #1423 - FINAL DESIGN PLAN]	ADMIN RECORD INFO REPOSITORY SENSITIVE	AREA 017 AREA 018 AREA 019 AREA 027 PARCEL D	SOUTHWEST DIVISION - BLDG. 1	
N00217 / 001139 ALNC-2206-0001-0003 REPORT N62473-06-D-2206 800	09-04-2007 **08-21-2007** 00001	ALLIANCE COMPLIANCE GROUP D. PHOADES BRAC PMO WEST	FINAL WORK PLAN FOR THE PARCEL D GROUNDWATER TREATABILITY STUDY (CD COPY ENCLOSED) [SEE AR # 1138 - BRAC TRANSMITTAL LETTER BY K. FORMAN]	ADMIN RECORD INFO REPOSITORY	009 071 PARCEL D	SOUTHWEST DIVISION - BLDG. 1	
N00217 / 001138 BRAC PMOW SER BPMOW.MLW/0073 CORRESPONDENCE NONE 2	09-04-2007 **08-22-2007** NONE	BRAC PMO WEST K. FORMAN VARIOUS AGENCIES	TRANSMITTAL OF FINAL WORK PLAN FOR THE PARCEL D GROUNDWATER TREATABILITY STUDY (PORTION OF THE MAILING LIST IS SENSITIVE) [SEE AR # 1139 - FINAL WORK PLAN]	ADMIN RECORD INFO REPOSITORY SENSITIVE	009 071 PARCEL D	SOUTHWEST DIVISION - BLDG. 1	
N00217 / 001439 BAI.5106.0016.0009 MINUTES N68711-03-D-5106 30	10-28-2008 **09-27-2007** 00016	BARAJAS & ASSOCIATES, INC. RAB MEMBERS	27 SEPTEMBER 2007 RESTORATION ADVISORY BOARD (RAB) MINUTES (INCLUDES LIST OF ATTENDEES, VARIOUS HANDOUTS, TRANSCRIPT, AND CD COPY)	ADMIN RECORD INFO REPOSITORY	PARCEL A PARCEL D PARCEL D-2 PARCEL E-2	SOUTHWEST DIVISION - BLDG. 1	
N00217 / 001159 BRAC SER BPMOW.MW/0874 CORRESPONDENCE NONE 2	10-02-2007 **09-28-2007** NONE	BRAC PMO WEST FORMAN, K. VARIOUS AGENCIES	TRANSMITTAL OF THE RADIOLOGICAL ADDENDUM, DRAFT REVISED FEASIBILITY STUDY (FS) (W/OUT ENCLOSURE) [SEE AR # 1160 - RADIOLOGICAL ADDENDUM, DRAFT REVISED FS] {PORTION OF THE MAILING LIST IS SENSITIVE}	ADMIN RECORD INFO REPOSITORY SENSITIVE	PARCEL D	SOUTHWEST DIVISION - BLDG. 110	

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N00217 / 001160 ECSD-2201-0003-0003 REPORT N62473-06-D-2201 100	10-02-2007 **09-28-2007** 00003	TETRA TECH EM INC. STEPHAN, C. BRAC PMO WEST	RADIOLOGICAL ADDENDUM, DRAFT FINAL REVISED FEASIBILITY STUDY (FS) (CD COPY IS ENCLOSED) [SEE AR # 1159 - BRAC PMO WEST TRANSMITTAL LETTER, AND # 1132 - DRAFT FINAL REVISED FS]	ADMIN RECORD INFO REPOSITORY	PARCEL D	SOUTHWEST DIVISION - BLDG. 110	
N00217 / 001170 BRAC SER BPMOW.REP/0875 CORRESPONDENCE NONE 3	10-29-2007 **09-28-2007** NONE	BRAC PMO WEST K. FORMAN VARIOUS AGENCIES	TRANSMITTAL OF THE DRAFT SURVEY UNIT 38 PROJECT REPORT (W/OUT ENCLOSURE) [PORTION OF THE MAILING LIST IS SENSITIVE] {SEE AR # 1171 - DRAFT SURVEY UNIT 38 PROJECT REPORT}	ADMIN RECORD INFO REPOSITORY SENSITIVE	AREA 12 PARCEL D	SOUTHWEST DIVISION - BLDG. 1	
N00217 / 001178 BRAC SER.BPMOW.REP/0875 CORRESPONDENCE NONE 3	10-29-2007 **09-28-2007** NONE	BRAC PMO WEST K. FORMAN VARIOUS AGENCIES	TRANSMITTAL OF THE DRAFT SURVEY UNIT 35 PROJECT REPORT (W/OUT ENCLOSURE) [PORTION OF THE MAILING LIST IS SENSITIVE] {SEE AR # 1179 - DRAFT SURVEY UNIT 35 PROJECT REPORT}	ADMIN RECORD INFO REPOSITORY SENSITIVE	AREA 12 PARCEL D	SOUTHWEST DIVISION - BLDG. 1	
N00217 / 001179 ECSD-2201-0006-0004 REPORT N62473-06-D-2201 15	10-29-2007 **09-28-2007** 00006	TETRA TECH EM INC. B. DOUGHERTY VARIOUS AGENCIES	DRAFT SURVEY UNIT 35 PROJECT REPORT, SANITARY SEWER AND STORM DRAIN REMOVAL PROJECT (CD COPY IS ENCLOSED) [SEE AR # 1178 - BRAC TRANSMITTAL LETTER BY K. FORMAN	ADMIN RECORD INFO REPOSITORY	AREA 12 PARCEL B PARCEL D	SOUTHWEST DIVISION - BLDG. 1	
N00217 / 001191 BRAC SER BPMOW.MLW/0038 CORRESPONDENCE NONE 2	11-01-2007 **10-18-2007** NONE	BRAC PMO WEST FORMAN, K. VARIOUS AGENCIES	TRANSMITTAL OF REPLACEMENT PAGES CONVERTING THE QUARTERLY GROUNDWATER MONITORING REPORT (OCTOBER - DECEMBER 2006) TO REVISION 1 (PORTION OF MAILING LIST IS SENSITIVE)	ADMIN RECORD INFO REPOSITORY	PARCEL C PARCEL D PARCEL E	SOUTHWEST DIVISION - BLDG. 110 CHECKED OUT BY C. CASAS, EXT 2-2240, ON 11/14/2008, FOR QAQC	

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N00217 / 001440 BAI.5106.0016.0011 MINUTES N68711-03-D-5106 30	10-28-2008 **10-25-2007** 00016	BARAJAS & ASSOCIATES, INC. RAB MEMBERS	25 OCTOBER 2007 RESTORATION ADVISORY BOARD (RAB) MINUTES (INCLUDES LIST OF ATTENDEES, VARIOUS HANDOUTS, TRANSCRIPT, AND CD COPY)	ADMIN RECORD INFO REPOSITORY	BLDG 00813 PARCEL 00049 PARCEL A PARCEL B PARCEL D PARCEL D-2 PARCEL E-2	SOUTHWEST DIVISION - BLDG. 1	
N00217 / 001231 BRAC PMOW SER BPMOW.MLW/0096 CORRESPONDENC E NONE 2	11-29-2007 **11-15-2007** NONE	BRAC PMO WEST K. FORMAN VARIOUS AGENCIES	TRANSMITTAL OF REPLACEMENT PAGES CONVERTING QUARTERLY GROUNDWATER MONITORING REPORT (JANUARY - MARCH 2007) AND ANNUAL REPORT PARCELS C, D, E, AND E-2 DATED 1 JUNE 2007 TO REVISION 1 (PORTION OF THE MAILING LIST IS SENSITIVE)	ADMIN RECORD INFO REPOSITORY SENSITIVE	PARCEL C PARCEL D PARCEL E PARCEL E-2	SOUTHWEST DIVISION - BLDG. 1	
N00217 / 001257 BRAC SER BPMOW.MLW/0129 CORRESPONDENC E NONE 2	02-04-2008 **11-30-2007** NONE	BRAC PMO WEST FORMAN, K. VARIOUS AGENCIES	TRANSMITTAL OF THE FINAL REVISED FEASIBILITY STUDY, VOLUMES I AND II OF II (W/OUT ENCLOSURE) {PORTION OF THE MAILING LIST IS SENSITIVE} [SEE AR # 1258 - FINAL REVISED FEASIBILITY STUDY]	ADMIN RECORD INFO REPOSITORY SENSITIVE	PARCEL D	SOUTHWEST DIVISION - BLDG. 1	
N00217 / 001258 SULT.5104.0019.000 3 REPORT N68711-03-D-5104 25000	02-04-2008 **11-30-2007** 00019	SULTECH KNIGHT, J. BRAC PMO WEST	FINAL REVISED FEASIBILITY STUDY, VOLUMES I AND II OF II {INCLUDES ANALYTICAL DATA} (CD COPY ENCLOSED) [SEE AR # 1257 - BRAC PMO WEST TRANSMITTAL LETTER, AND # 1303 - RADIOLOGICAL ADDENDUM] {***SEE COMMENTS***}	ADMIN RECORD INFO REPOSITORY	PARCEL D	SOUTHWEST DIVISION - BLDG. 1	
N00217 / 001259 BRAC SER BPMOW.MLW/0210 CORRESPONDENC E NONE 3	02-05-2008 **01-18-2008** NONE	BRAC PMO WEST FORMAN, K. VARIOUS AGENCIES	TRANSMITTAL OF THE RADIOLOGICAL ADDENDUM, DRAFT FINAL REVISED FEASIBILITY STUDY (FS) (W/OUT ENCLOSURE) {PORTION OF MAILING LIST IS SENSITIVE} [SEE AR # 1262 - RADIOLOGICAL ADDENDUM, DRAFT FINAL REVISED FS]	ADMIN RECORD INFO REPOSITORY SENSITIVE	PARCEL D	SOUTHWEST DIVISION - BLDG. 1	

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N00217 / 001262 ECSD-2201-0006-0073 REPORT N62473-06-D-2201 2500	02-05-2008 **01-18-2008** 00006	TETRA TECH EC INC. STEPHAN, C. BRAC PMO WEST	RADIOLOGICAL ADDENDUM TO THE DRAFT FINAL REVISED FEASIBILITY STUDY (FS) (CD COPY ENCLOSED) {INCLUDES ANALYTICAL DATA} [SEE AR # 1259 - BRAC PMO WEST TRANSMITTAL LETTER, AND # 1132 - DRAFT FINAL REVISED FS]	ADMIN RECORD INFO REPOSITORY	PARCEL D	SOUTHWEST DIVISION - BLDG. 1	
N00217 / 001264 BAI.5106.0005.0006 REPORT N68711-03-D-5106 100	02-07-2008 **01-18-2008** 00005	BARAJAS & ASSOCIATES, INC. ONO, Y. BRAC PMO WEST	FINAL TECHNICAL MEMORANDUM: NONREPRESENTATIVE GROUNDWATER SAMPLES AND INFLUENCES ON RESULTS OF HUMAN HEALTH, RISK ASSESSMENTS (CD COPY ENCLOSED) [SEE AR # 1263 - BRAC PMO WEST TRANSMITTAL LETTER]	ADMIN RECORD INFO REPOSITORY	PARCEL B PARCEL C PARCEL D PARCEL E PARCEL E-2	SOUTHWEST DIVISION - BLDG. 1	
N00217 / 001302 BRAC SER BPMOW.DCJ/0384 CORRESPONDENCE NONE 2	04-17-2008 **04-11-2008** NONE	BRAC PMO WEST FORMAN, K. VARIOUS AGENCIES	TRANSMITTAL OF THE RADIOLOGICAL ADDENDUM, FINAL REVISED FEASIBILITY STUDY {PORTION OF THE MAILING LIST IS SENSITIVE} (W/OUT ENCLOSURE) [SEE AR # 1303 - RADIOLOGICAL ADDENDUM, FINAL REVISED FEASIBILITY STUDY]	ADMIN RECORD INFO REPOSITORY SENSITIVE	PARCEL D	SOUTHWEST DIVISION - BLDG. 1	
N00217 / 001303 ECSD-2201-0006-0078 REPORT N62473-06-D-2201 2500	04-17-2008 **04-11-2008** 00006	TETRA TECH EC, INC. DOUGHERTY, B. BRAC PMO WEST	RADIOLOGICAL ADDENDUM, FINAL REVISED FEASIBILITY STUDY (CD COPY ENCLOSED) [SEE AR # 1302 - BRAC PMO WEST TRANSMITTAL LETTER, AND # 1258 - FINAL REVISED FEASIBILITY STUDY]	ADMIN RECORD INFO REPOSITORY	PARCEL D	SOUTHWEST DIVISION - BLDG. 1	
N00217 / 001319 BRAC SER BPMOW.SAK/0433 CORRESPONDENCE NONE 3	05-21-2008 **05-05-2008** NONE	BRAC PMO WEST FORMAN, K. VARIOUS AGENCIES	TRANSMITTAL OF THE DRAFT PROPOSED PLAN {PORTION OF THE MAILING LIST IS SENSITIVE} (W/OUT ENCLOSURE) [SEE AR # 1320 - DRAFT PROPOSED PLAN]	ADMIN RECORD SENSITIVE	PARCEL D	SOUTHWEST DIVISION - BLDG. 1	

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N00217 / 001320 CHAD.3213.0030.0003 REPORT N62473-07-D-3213 35	05-21-2008 **05-05-2008** 00030	CHADUXTT BRAC PMO WEST	DRAFT PROPOSED PLAN (CD COPY ENCLOSED) [SEE AR # 1319 - BRAC PMO WEST TRANSMITTAL LETTER]	ADMIN RECORD	PARCEL D	SOUTHWEST DIVISION - BLDG. 1	
N00217 / 001333 JNS-7417-0004-0172 REPORT N68711-05-G-7417 250	06-23-2008 **06-18-2008** 00004	JONAS & ASSOCIATES MALAEB, S. BRAC PMO WEST URIZAR, L.	DRAFT SECOND FIVE-YEAR REVIEW OF REMEDIAL ACTIONS (CD COPY ENCLOSED) [PORTION OF MAILING LIST IS SENSITIVE] {SEE AR # 1332 - BRAC PMOW TRANSMITTAL LETTER}	POST DECISION FILE SENSITIVE	BLDG 00123 PARCEL A PARCEL B PARCEL C PARCEL D PARCEL E PARCEL E-2 PARCEL F SITE 00007 SITE 00018	SOUTHWEST DIVISION - BLDG. 1	
N00217 / 001423 BRAC SER BPMOW.SAK/0775 CORRESPONDENCE NONE 3	10-03-2008 **08-29-2008** NONE	BRAC PMO WEST FORMAN, K. VARIOUS AGENCIES	TRANSMITTAL OF THE DRAFT RECORD OF DECISION (ROD) [PORTION OF THE MAILING LIST IS SENSITIVE] {W/OUT ENCLOSURE} (SEE RECORD # 1424 - DRAFT ROD)	ADMIN RECORD INFO REPOSITORY SENSITIVE	PARCEL G	SOUTHWEST DIVISION - BLDG. 1	
N00217 / 001424 CHAD.3213.0030.0007 REPORT N62473-07-D-3213 900	10-03-2008 **08-29-2008** 00030	BRAC PMO WEST NAVFAC - SOUTHWEST	DRAFT RECORD OF DECISION (ROD) [CD COPY ENCLOSED] {SEE RECORD # 1423 - BRAC PMO WEST TRANSMITTAL LETTER}	SITE FILE (SF)	PARCEL G	SOUTHWEST DIVISION - BLDG. 1	
N00217 / 001428 CHAD.3213.0029.0002 REPORT N62473-07-D-3213 50	10-07-2008 **09-01-2008** 00029	CHADUXTT JV NAVFAC - SOUTHWEST	DRAFT PROPOSED PLAN (UNFORMATTED VERSION) [CD COPY ENCLOSED] {SEE RECORD # 1427 - BRAC PMO WEST TRANSMITTAL LETTER}	ADMIN RECORD	PARCEL C PARCEL UC-2	SOUTHWEST DIVISION - BLDG. 1	

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N00217 / 001467 JNS-7417-0004-0324 REPORT N68711-05-G-7417 325	11-14-2008 **11-11-2008** 00004	JONAS & ASSOCIATES, INC. MALAEB, S. BRAC PMO WEST	FINAL SECOND FIVE-YEAR REVIEW OF REMEDIAL ACTIONS (CD COPY ENCLOSED)	POST DECISION FILE	BLDG 00134 BLDG 00140 PARCEL A PARCEL B PARCEL C PARCEL D PARCEL E PARCEL E-2 PARCEL F SITE 00007 SITE 00010 SITE 00018 SITE 00026	SOUTHWEST DIVISION - BLDG. 1	

Total Estimated Record Page Count: 119,553

Total - Administrative Records: 331

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No Keywords
Sites=PARCEL D;PARCEL G;PARCEL UC-2
No Classification