

# Hunters Point Shipyard Parcel D



San Francisco, California

July 2008

## U.S. NAVY ANNOUNCES PROPOSED PLAN

The U.S. Navy encourages the public to comment on its *Proposed Plan*\* for cleanup of Parcel D at Hunters Point Shipyard in San Francisco, California (see Figure 1). This Proposed Plan presents a proposal for a remedial action to be selected in a *Record of Decision (ROD)*. This Proposed Plan includes all of Parcel D (see Figure 2); however, for remedy selection, Parcel D will be divided into four new parcels: Parcels D-1, D-2, G, and UC-1 (see Figure 3). Three RODs are planned: one combined ROD for Parcels D-1 and UC-1 and one each for Parcel D-2 and Parcel G. The *U.S. Environmental Protection Agency, Region 9 (EPA)*, the *California Environmental Protection Agency's Department of Toxic Substances Control (DTSC)*, and the *San Francisco Bay Regional Water Quality Control Board (Water Board)* worked with the Navy in evaluating alternatives and in selecting the *preferred alternatives*.

This Proposed Plan summarizes the alternatives evaluated under the *Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)* and explains the basis for choosing the preferred remedial (cleanup) alternatives for soil, structures and *groundwater* contamination in Parcel D at Hunters Point Shipyard. The Navy proposes the following actions to address contamination in soil, groundwater, and structures at Parcel D:

- Removing soil in selected areas where concentrations of organic chemicals and metals are higher than the concentrations considered safe for human health.
- Installing soil covers to prevent contact with naturally occurring metals that were not excavated.
- Conducting radiological surveys and decontaminating buildings, former building sites, sewer lines, and other areas potentially affected by radiological sources.
- Screening, separating, and disposing of radioactive sources and radiologically contaminated building materials and soil at disposal facilities that meet federal and state requirements.
- Transporting excavated contaminated soil off site to an appropriate landfill.
- Treating groundwater at *Installation Restoration (IR)*-09, IR-33, and IR-71 by injecting chemicals or biological nutrients to break down the contaminants.
- Implementing a groundwater monitoring program to verify that remediation efforts meet *remediation goals* as defined in the ROD(s).
- Using *engineering controls (EC)* and *institutional controls (IC)* to limit exposure to contaminated soil and ICs to limit exposure to contaminated groundwater by restricting specified land uses and activities on the parcel (see page 17 for a list of the ICs).

This Proposed Plan summarizes the regulatory process that governs the cleanup; describes the site history, environmental investigations, risk assessments, and remedial alternatives for Parcel D; and indicates how the Navy selected the preferred alternative for cleaning up soil and groundwater at the parcel. The Navy will consider public comments on this Proposed Plan when the three RODs are prepared for the four new parcels (described below) within Parcel D. The Navy invites you to provide comments on this Proposed Plan. See page 16 for information on how to comment. 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.



Figure 1- Site Location Map

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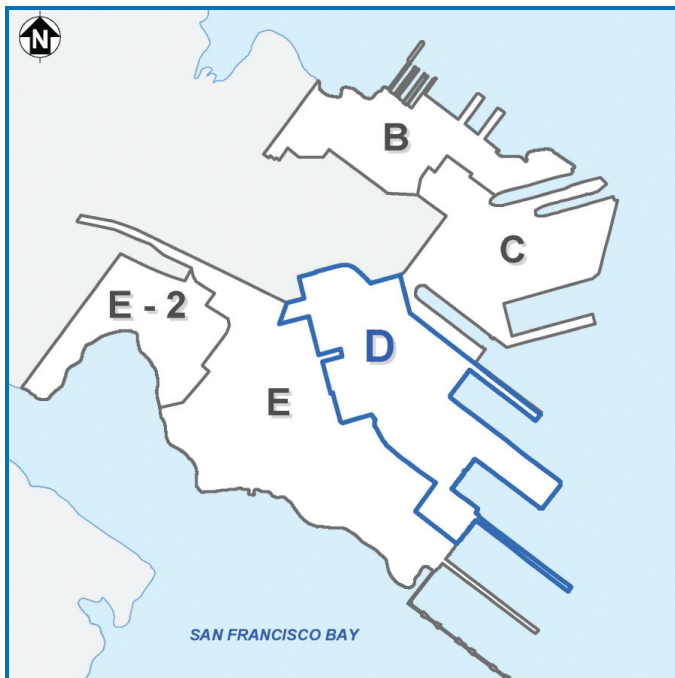


Figure 2- Parcel Location Map

## THE FUTURE OF PARCEL D

The Navy plans to divide Parcel D into four new parcels, supported by three RODs. This division supports the early transfer of portions of Parcel D to the City and County of San Francisco. The original redevelopment plan developed by the San Francisco Redevelopment Agency divided Parcel D into reuse areas. Specific streets were used within each reuse area to divide the parcel into redevelopment blocks (see Figure 4). The expected long-term uses in the redevelopment plan included educational/cultural, mixed uses, open space,

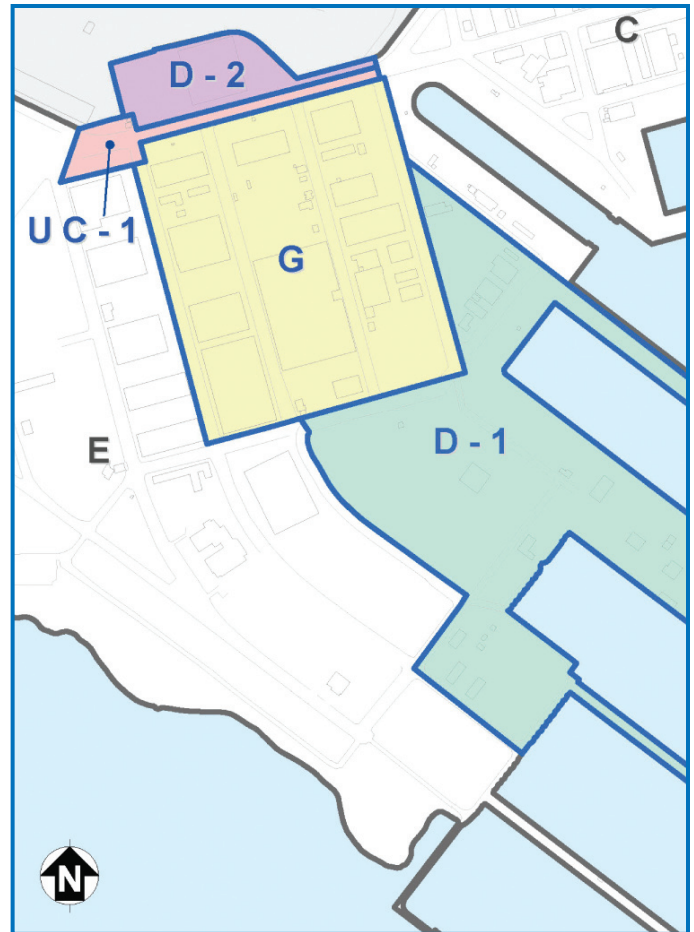


Figure 3- New Parcel Designations

industrial, and maritime/industrial reuse. This Proposed Plan applies to any potential sub-parcels that are within the original boundary of Parcel D. Although separate RODs would be developed for these sub-parcels, no new proposed plan will be issued.

The four new parcels envisioned in the current redevelopment strategy are described below.

**Parcel D-1:** This area is proposed for reuse under the redevelopment plan for as maritime or industrial use.

**Parcel D-2:** This area is proposed for research and development reuse. This area was brought into Parcel D from the former Parcel A to allow further evaluation for possible radiological contamination in one building (Building 813). The Navy surveyed Building 813 for radiological impacts and concluded that no radiological material was present at or above risk levels at or in the building. The *California Department of Public Health (CDPH)* approved the Final Status Survey Report for Building 813 on April 1, 2008.

**Parcel G:** This area is proposed for commercial reuse. Long term uses include educational/cultural use, mixed use, open space, and industrial reuse.

**Parcel UC-1:** This area along Spear Avenue is proposed for commercial use as an access street and utility corridor, as part of the ongoing site redevelopment.

# THE CERCLA PROCESS

Since the mid-1980s, numerous investigations have been conducted at Hunters Point Shipyard under the Navy's *IR* Program, which is a comprehensive environmental investigation and cleanup program that identifies, investigates, and remediates chemical and radiological contamination that resulted from past activities (see below). The IR Program complies with CERCLA, the California Hazardous Substances Account Act, and all other federal and state laws that govern environmental cleanups.

In accordance with CERCLA, the Navy is issuing this Proposed Plan as part of its public participation responsibilities under Section 117(a) of CERCLA and Section 300.430(f)(2) of the *National Oil and Hazardous Substances Pollution Contingency Plan (NCP)*. This Proposed Plan has been prepared to highlight key information and associated conclusions that are presented in the Revised *Feasibility Study (FS) Report* (November 30, 2007) for Parcel D. The flow chart below illustrates the CERCLA process and indicates the status of Parcel D.

The *Remedial Investigation (RI)* and the FS for Parcel D were both completed in 1997. After the initial

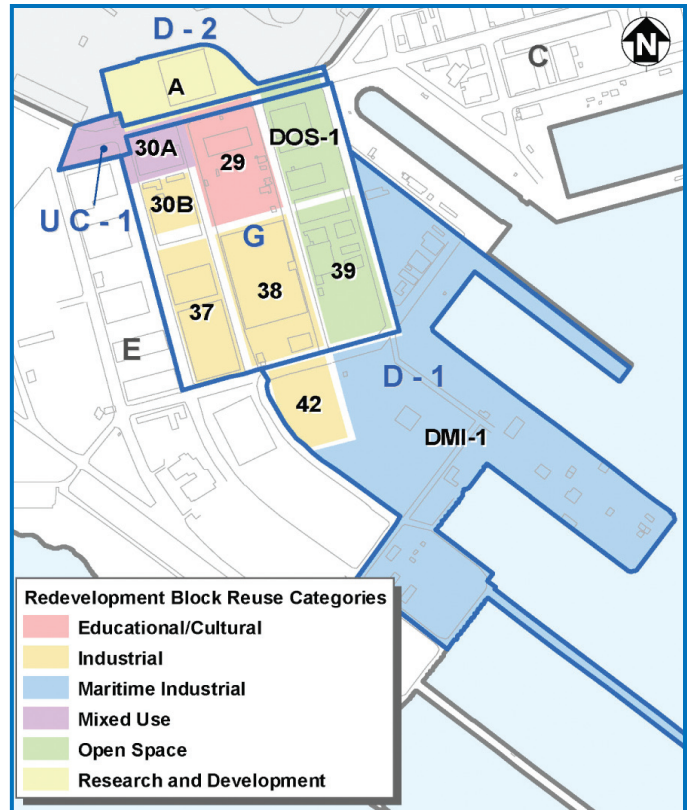
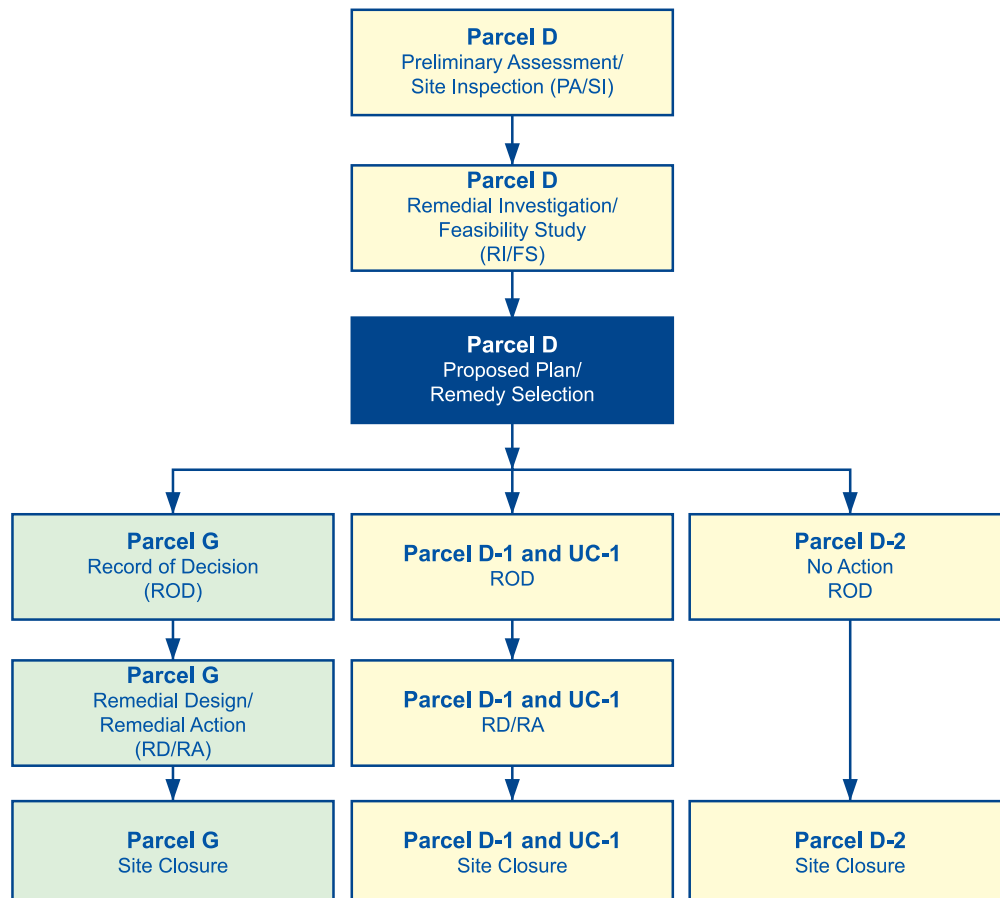


Figure 4- Reuse Areas

## Parcel D CERCLA Process



FS was completed, the *Base Realignment and Closure Cleanup Team (BCT)* decided to reevaluate all the areas in Parcel D and issue a revised *human health risk assessment (HHRA)* and a revised feasibility study in 2007 before a ROD would be completed. The revised FS considered new information associated with several cleanup actions completed within Parcel D and at other adjacent parcels at Hunters Point Shipyard. New information considered and incorporated into the revised FS includes (1) the widespread presence of metals in soil across Parcel D, (2) updates to toxicity criteria used in the 1997 HHRA, and (3) the findings from removal actions conducted to address chemicals identified by a *Risk Management Review* process and radiological contaminants that were identified by a *Historical Radiological Assessment (HRA)*. The Navy finalized the Revised FS Report in November 2007, and a radiological addendum to the FS was completed in April 2008. The FS Report and radiological addendum summarize the most recent information available on Parcel D and provide the basis for the RODs for each of the four designated parcels. These RODs will present the remedial alternatives selected, identify the remediation goals, and outline performance standards that the selected remedy must meet.

The Proposed Plan summarizes information detailed in the FS Report, radiological addendum, and in other documents contained in the *Administrative Record* file for this site. The Navy encourages the public to review these documents to gain an understanding of the environmental assessments and investigations that have been conducted. Documents are available for public review at the locations listed on page 16.

A public comment period will be held from July 23 through August 22, 2008, and public comments can be submitted via mail, facsimile, or e mail throughout the comment period. A public meeting will be held from 6:30 p.m. to 8:00 p.m. on July 30, 2008, at the Southeast Community Facility Commission Building in the Alex L. Pitcher, Jr., Room located at 1800 Oakdale Avenue, San Francisco. Members of the public may submit written and oral comments on this Proposed Plan at the public meeting. Comments must be provided no later than August 22, 2008.

The Navy may modify the preferred alternative or select another cleanup remedy based on feedback from the regulatory agencies and the community or on new information. Therefore, the community is strongly encouraged to review and comment. A final decision will not be made until all comments that are submitted during the review period are considered.

## PARCEL D HISTORY

Hunters Point Shipyard is located in southeastern San Francisco on a peninsula that extends east into San Francisco Bay (see Figure 1). This Proposed Plan applies

to Parcel D, which includes about 98 acres in the central portion of the shipyard (see Figure 2).

Parcel D 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 the *Naval Radiological Defense Laboratory (NRDL)*.

Parcel D consists of level lowlands constructed from fill created from local crushed bedrock. The fill supported new buildings and, in some areas, filled the margin of San Francisco Bay. About 85 percent of the parcel is paved or covered by structures. Subsurface materials consist of fill, native sediments (such as sand and Bay Mud), and bedrock. Groundwater beneath Parcel D includes the shallow *A-aquifer* and the deeper *B-aquifer*; groundwater is not currently used for any purpose at Parcel D. 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 because (1) there is a limited volume and storage capacity, (2) the existence of ICs 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, and (3) the current and historical uses of the *B-aquifer* (which has never been used as a water supply in the area).

## OVERVIEW OF THE REMEDIAL INVESTIGATION AND FEASIBILITY STUDY ACTIVITIES AT PARCEL D

Investigations began in 1990 with a *Preliminary Assessment (PA)*, which involved record searches, interviews, and limited field investigations. The PA report concluded that portions of Parcel D warranted further investigation because of the potential for contamination of soil and groundwater from past site activities. After a further *Site Inspection* in 1994, the Navy performed the RI (1996), which included collection of soil and groundwater data and hydrogeologic characterization of Parcel D. The RI was followed by the original FS (1997) and a Risk Management Review (1999). In 2002, a data gaps investigation was completed to provide additional understanding of the groundwater conditions underlying the parcel. This was followed by a Revised FS (2007) and this Proposed Plan.

While these investigations were under way, the Navy conducted removal actions in areas that were known to be contaminated. Completed actions included removal and cleanup of underground storage tanks (1994) and aboveground storage tanks (2001), removal of sandblast grit (1996), cleanup and removal of equipment at the former Pickling and Plate Yard at IR-09 (1996) (see Figure 5), removal of more than 2,500 cubic yards of

soil from 10 soil excavation areas, removal or closure of fuel and steam lines (2001), and quarterly monitoring of groundwater since 2004. These activities have resulted in an increased site-wide understanding of soil and groundwater throughout Parcel D.

Although a number of removal actions have been completed, some chemical contamination remains at Parcel D. 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 *polycyclic aromatic hydrocarbons (PAH)* and lead in soil. 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 material may have contained elevated concentrations of select metals. Therefore, the Navy has worked with the regulatory agencies to identify remedial alternatives that address metals in soil, regardless of their source.

The Navy identified the former Pickling and Plate Yard as the source of the elevated concentrations of chromium VI and possibly nickel in groundwater. Use of solvents during industrial operations also released *volatile organic compounds (VOC)* into groundwater. The Navy is currently planning a treatability study to address the chemicals in groundwater. During the study, iron

particles will be injected into groundwater to create conditions where VOCs are destroyed and metals are immobilized in groundwater.

The Navy also identified *radiologically impacted areas*, buildings, equipment, and infrastructure at Parcel D (see Figure 6) associated with the former use of general radioactive materials, decontamination of ships, and NRDL research. Once a site is identified as radiologically impacted, the Navy is committed to investigating the site to determine if contamination is present. For example, the sewers and storm drains were identified as impacted because radioactive materials could have gone down drains in laboratories. Similarly, the Navy is investigating buildings that may have used or stored radioactive materials to make sure that the buildings are safe. The Navy continues to investigate and clean up radiological contamination throughout the shipyard as part of an ongoing *time-critical removal action (TCRA)*.

At Parcel D, the Navy is currently removing radiologically impacted storm drain and sanitary sewer lines and surveying radiologically impacted sites. The radiological sewer line and storm drain removal action is expected to remove 10 linear miles of sewer and storm drain lines. ROD remedial actions will complete the removal actions for any radiologically impacted areas that are not addressed under the TCRA, such that all remedial goals are achieved.

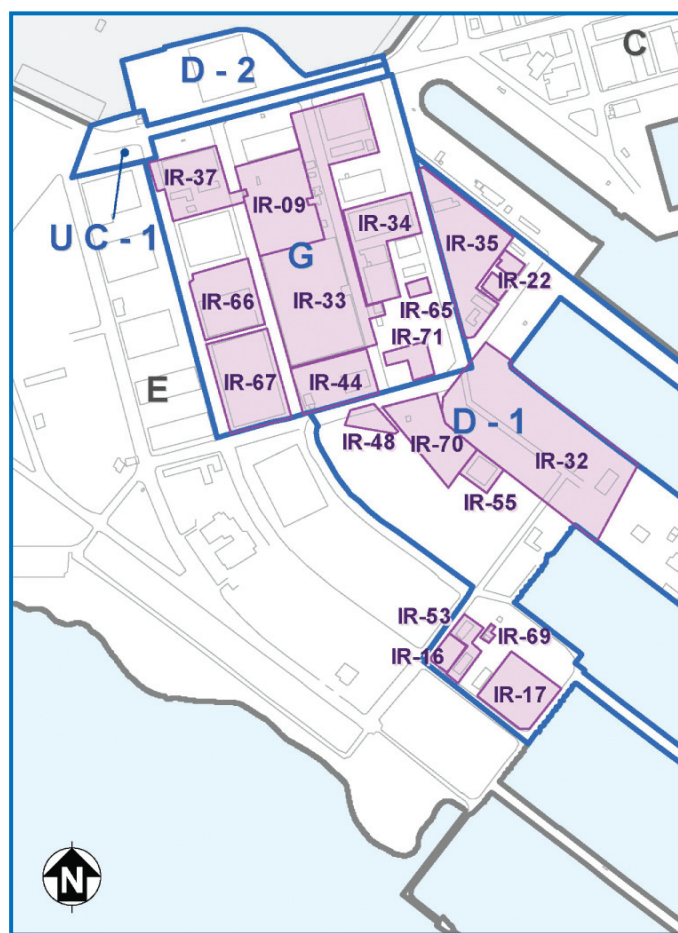


Figure 5- IR Sites

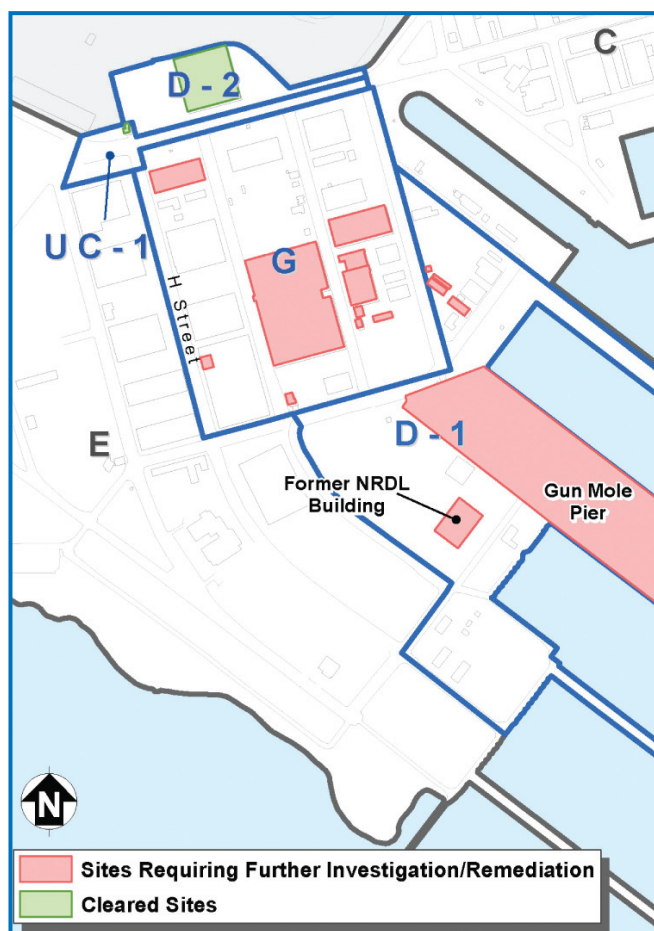


Figure 6- Radiologically Impacted Areas

## WHAT ARE THE RISKS AT PARCEL D?

“Risk” is the potential that a hazardous chemical, when released to the environment, will cause adverse effects on exposed humans or wildlife. The Navy evaluated risk to human health in risk assessments that were presented in the Parcel D FS Report and its radiological addendum as summarized below. 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. Therefore, ecological risk associated with exposure to soil was not evaluated further. However, a screening evaluation of groundwater was conducted to evaluate potential risks to aquatic wildlife in San Francisco Bay. These evaluations are summarized below.

**Human Health Risk Assessment.** The Navy considered the various ways that humans might be exposed to chemicals, the possible concentrations of chemicals that could be encountered during exposure, and the potential frequency and duration of exposure. These exposure scenarios depend on the future use of the land.

The redevelopment plan from the San Francisco Redevelopment Agency outlines the proposed reuses for Parcel D-1, D-2, G, and UC-1, and divides the parcels into reuse areas (see Figure 4). The expected long-term uses include research and development, mixed use, educational/cultural, open space, maritime industrial,

and industrial. The Navy evaluated these reuses using residential (research and development and mixed use), industrial (educational/cultural, maritime industrial and industrial), and recreational (open space) exposure scenarios.

Risk calculations were based on conservative assumptions to protect human health. “Conservative” means the assumption will tend to overestimate risk, resulting in remediation goals that are more protective of human health. The residential scenario is considered the most conservative. Human health risk is classified as cancer risk (from exposure to carcinogens) or noncancer hazard (from exposure to noncarcinogens).

The radiological risk calculations were based on estimated values of radiological contamination. Actual calculated risk will be based on field measurements following receipt of final status survey results for each impacted site. After cleanup actions are completed, the sites will be again evaluated to make sure that the residual excess lifetime cancer risk is acceptable.

Cancer risk is generally expressed as a probability. For example, a cancer risk probability of 5 in 100,000 ( $5 \times 10^{-5}$ ) based on the risk assumptions indicate that, out of 100,000 people exposed, five cancer cases may occur. According to EPA, an action is generally warranted for sites where the cumulative site risk for future and current land use is greater than  $10^{-4}$ , and action may be considered for risks in the  $10^{-4}$  to  $10^{-6}$  range. However,

Table 1. Cancer Risks and Noncancer Hazards from Soil

Proposed New Parcel	Redevelopment Block	Exposure Scenario	Cancer Risk <sup>a</sup>		Noncancer HI
			Chemical	Radiological <sup>b</sup>	
G	30B	Industrial	$2 \times 10^{-7}$	NA	< 1
	37	Industrial	$4 \times 10^{-8}$	NA	< 1
	38	Industrial	$4 \times 10^{-5}$	$2 \times 10^{-4}$	< 1
	29	Industrial	$3 \times 10^{-5}$	NA	< 1
	DOS-1	Recreational	$4 \times 10^{-6}$	NA	< 1
	39	Recreational	$1 \times 10^{-4}$	$4 \times 10^{-5}$	< 1
	30A	Residential	$2 \times 10^{-7}$	$1 \times 10^{-6}$	6
D-1	DMI-1	Industrial	$6 \times 10^{-5}$	$9 \times 10^{-5}$	< 1
	42	Industrial	$1 \times 10^{-6}$	NA	< 1
D-2	A	Residential	---	$3 \times 10^{-7}$	---
UC-1	Utility corridor <sup>c</sup>	Industrial	$3 \times 10^{-5}$	$3 \times 10^{-6}$	< 1

Notes:

1. Risks presented in the table reflect site risk before the remedies are implemented.

<sup>a</sup> Listed risk value is maximum in each redevelopment block.

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

<sup>c</sup> Utility corridor risk values are the maximum for the industrial scenario.

-- Not applicable; soil samples were not collected because no historical activities with risk concerns occurred in this block.

HI Hazard index

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

**Table 2. Cancer Risks and Noncancer Hazards from Groundwater**

Proposed New Parcel	Redevelopment Block	Exposure Scenario	Exposure Area <sup>a</sup>	Maximum Cancer Risk	Noncancer Risk (HI)
G	29, 30A, 30B, 37, 38, 39, and DOS-1	Industrial	IR-33 Plume, IR-09, IR-71 Plumes	10 <sup>-4</sup>	9
D-1	DMI-1 and 42	Industrial	IR-33 Plume	10 <sup>-4</sup>	9
D-2	A	b	b	b	b
UC-1	Portions of 29 and 30A	b	b	b	b

Notes:

- 1. Risks presented in the table reflect site risk before the remedies are implemented.
- a. Maximum of the identified risk from all plumes.
- b. Not applicable; groundwater samples were not collected because no historical activities with groundwater risk concerns occurred in this block.

the Navy adopted a conservative approach at Parcel D and evaluated action for risks greater than 10<sup>-6</sup>.

Noncancer risk is expressed as a number called the *hazard index (HI)* and is estimated by comparing chemical exposure levels with reference values established by the regulatory agencies. An HI of 1 or less is considered an acceptable exposure level for noncancer health hazards. An HI greater than 1 is often used by risk managers to evaluate whether noncancer health hazards are significant enough to warrant further cleanup.

The HHRA calculations for soil and groundwater are based on reasonable maximum exposure 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 D are likely to be lower.

Based on the revised Parcel D FS Report, the risk assessment for soil indicated chemical cancer risks greater than 10<sup>-6</sup> at redevelopment blocks DMI-1, 29, 30A, 38, and 39 (see Table 1). Radiological risks for soil and building structures are greater than 10<sup>-6</sup> at redevelopment blocks DMI-1, 30A, 38, and 39. Noncancer HI were less than 1 for all blocks evaluated for industrial risk. Block 30A, evaluated against the more stringent residential scenario, showed a noncancer hazard above 1 (see Table 1). Potential risks are primarily based on exposure to arsenic, lead, manganese, PAHs, and radionuclides. The risk assessment for groundwater estimated cancer risks greater than 10<sup>-6</sup> or noncancer hazards greater than 1 in distinct areas within all nine redevelopment blocks 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. As previously discussed, areas with cancer risks greater than 10<sup>-6</sup> and noncancer hazards greater than 1 are reevaluated

by risk managers to identify whether there is a need for further cleanup.

**Screening Evaluation of Groundwater to Protect Surface Water.** The Navy completed a screening evaluation of surface water quality to assess potential exposure by aquatic wildlife to groundwater as it interacts with the surface water of San Francisco Bay. The screening evaluation of surface water quality found that two metals in groundwater (chromium VI and nickel) may pose a potential risk to aquatic wildlife. However, the current areas where chromium VI and nickel are present are approximately 1,100 and 1,500 feet to the nearest discharge point on the bay. Groundwater monitoring data indicated metals migrate at a much slower rate than groundwater flows. There are no concerns of imminent discharge of metals to the bay.

## REMEDIAL ACTION OBJECTIVES

**Remedial action objectives (RAO)** are established to assist in identifying and assessing remedial alternatives to address risks associated with the site. RAOs are goals for protecting human health and the environment that are established for each medium of concern (such as soil and groundwater). Each RAO should specify (1) the chemicals of concern (COC), (2) the exposure routes and receptors, and (3) an acceptable contaminant concentration or range of concentrations for each exposure pathway and medium (known as “remediation goals”). Remediation goals provide a quantitative means of (1) identifying areas for potential remedial action, (2) screening appropriate types of technologies, and (3) assessing a remedial action’s potential to achieve the RAO. 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 D are based on the San Francisco Redevelopment Agency’s reuse plan. These RAOs will also be appropriate if the reuse plan changes. These RAOs were developed in conjunction with the regulatory agencies.

Most of the RAOs include remediation goals. A remediation goal is a chemical concentration that corresponds to a human health risk of  $10^{-6}$  or a noncancer HI greater than 1 for the exposure pathway listed in the RAO. Preliminary remediation goals for COCs are presented in Tables 3, 4, and 5 and will be finalized in each ROD. The RAOs are listed below.

**Soil.** The RAOs for soil include:

1. Prevent exposure to organic and inorganic chemicals in soil at concentrations above remediation goals (see Table 3 on the right) developed in the HHRA for the following exposure pathways:
  - (a) Ingestion of, outdoor inhalation of, and dermal exposure to soil
  - (b) Ingestion of homegrown produce by residents in research and development and mixed-use reuse areas
2. Prevent exposure to VOCs in soil gas at concentrations that would pose unacceptable risk via indoor inhalation of vapors. The remediation goal for soil gas will correspond to a cancer risk of  $10^{-6}$ ; the numerical goal for each VOC will be established during the *remedial design (RD)*.

**Groundwater.** RAOs for groundwater were selected based on the various exposure scenarios that indicated potential risk to humans and aquatic wildlife from groundwater. The RAOs for groundwater include:

1. Prevent exposure to VOCs in the A-aquifer groundwater at concentrations above remediation goals (see Table 4) 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 (see Table 4) 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* ( $\mu\text{g/L}$ ), and nickel above 96.5  $\mu\text{g/L}$  in surface water of San Francisco Bay.

Remediation goals for soil and groundwater were selected by chemical, based on a comparison of (1) the concentration calculated in the risk assessment that would correspond to a cancer risk of  $10^{-6}$  or a noncancer HI of 1, (2) the laboratory *practical quantitation limit (PQL)*, and (3) for metals only, the ambient level at Hunters Point Shipyard (called the *Hunters Point*

Exposure Scenario	Chemical of Concern	RG (mg/kg)
Residential	Manganese	1,431
	Arsenic	11.1
Recreational	Benzo(a)pyrene	0.33
	Arsenic	11.1
Industrial	Benzo(a)pyrene	0.33
	Benzo(b)fluoranthene	1.76
	Lead	800
Construction Worker	Arsenic	11.1
	Benzo(a)pyrene	0.65
	Lead	800
	Manganese	6,889

Notes:  
 mg/kg Milligram per kilogram  
 RG Remediation goal

Exposure Scenario	Chemical of Concern	RG ( $\mu\text{g/L}$ )
Residential – Vapor Intrusion	Chloroform	1.0
	Methylene Chloride	27
	Trichloroethene	2.9
Industrial – Vapor Intrusion	Benzene	0.63
	Carbon Tetrachloride	0.50
	Chloroform	1.2
	Naphthalene	6.0
	Tetrachloroethene	1.0
	Trichloroethene	4.8
	Xylene (total)	337
Construction Worker – Trench Exposure	Arsenic	40
	Benzene	17
	Naphthalene	17
	Tetrachloroethene	18
	Xylene (total)	861

Notes:  
 1. Soil gas remediation goals, once established, will be used to determine the vapor intrusion risk and the soil gas goals would replace the groundwater PRGs as the indicator for areas requiring vapor controls and for identifying areas that have achieved cleanup objectives and are below risk levels of concern.

$\mu\text{g/L}$  Microgram per liter  
 RG Remediation goal



ambient level [HPAL] for soil and the *Hunters Point groundwater ambient level [HGAL]* for groundwater). The highest of the three values was selected as the remediation goal for each chemical. If a legal requirement (see the discussion of *applicable or relevant and appropriate requirements [ARAR]* later) was applied to a chemical, the value was selected; otherwise, the same comparison as listed above was made.

**Radiologically Impacted Soil and Structures.** RAOs for radiologically impacted sites include:

1. Prevent ingestion of, dermal contact with, or inhalation of radionuclides of concern in concentrations that exceed remediation goals (see Table 5).
2. Ensure that the increased lifetime cancer risk does not exceed  $10^{-6}$  for future use scenarios.

## SUMMARY OF REMEDIAL ALTERNATIVES EVALUATED

The remedial alternatives evaluated in the FS ranged from no action to extensive remediation to address soil, groundwater, and radiologically impacted areas.

**Remedial Alternatives for Soil.** Remedial technologies were screened for their potential to achieve the RAOs at Parcel D. Technologies were retained and assembled into the remedial alternatives presented in Table 6.

Alternative S-1 is no action; no further cleanup would be performed. Alternative S-2 relies on ICs and maintained landscaping to prevent exposure and involves little active remediation. Alternative S-3 also uses ICs as the primary component, but adds limited excavation and off-site disposal to address Navy releases of lead and organic compounds (Figure 7). Alternative S-4 uses covers and ICs as protection from exposure. Alternative

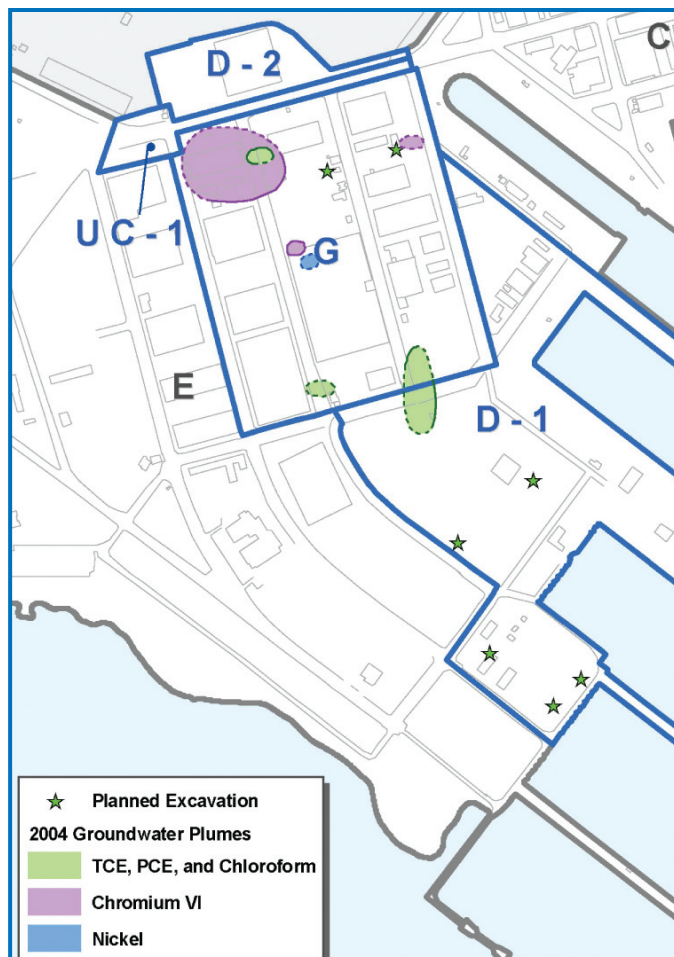


Figure 7- Soil Remediation and Groundwater Plumes

S-5 combines the excavation and disposal components from Alternative S-3, the cover components from Alternative S-4, and ICs. ICs are an integral component of every remedial alternative, and page 17 provides an overview of ICs common to all the alternatives except for Alternative S-1. The Navy and DTSC implement ICs

Table 5. Preliminary Remediation Goals for Radionuclides

Radionuclide	Surfaces (dpm/100 cm <sup>2</sup> )		Soil (pCi/g)	
	Equipment Waste (dpm/100 cm <sup>2</sup> )	Structures (dpm/100 cm <sup>2</sup> )	Construction Worker	Resident
Cesium-137	5,000	5,000	0.113	0.113
Cobalt-60	5,000	5,000	0.0602	0.0361
Plutonium-239	100	100	14.0	2.59
Radium-226	100	100	1.0	1.0
Strontium-90	1,000	1,000	10.8	0.331
Thorium-232	1,000	36.5	19.0	1.69
Hydrogen-3	5,000	5,000	4.23	2.28
Uranium-235	5,000	488	0.398	0.195

Notes:  
 cm<sup>2</sup> Square centimeter  
 dpm Disintegration per minute  
 pCi/g Picocurie per gram  
 RG Remediation goal

**Table 6. Remedial Alternatives for Soil**

Remedial Alternative	Cost	Components of Remedial Alternative
S-1	\$0	<b>No Action:</b> No actions or costs; this alternative is required by CERCLA as a baseline for comparison with the other alternatives.
S-2	\$0.8 Million	<b>ICs:</b> Impose ICs to limit the use of land or activities that take place within an area. See page 17 for a list of the ICs. <b>Maintained Landscaping:</b> Maintain landscaping for bare or disturbed areas that have not been restored with a cover to prevent potential exposure to asbestos that may be present in surface soil and transported by wind erosion.
S-3	\$1.8 Million	<b>Excavation and Off-Site Disposal:</b> Excavate eight areas where lead or polycyclic aromatic hydrocarbons exceed remediation goals and dispose of excavated soil at an off-site landfill. <b>Maintained Landscaping:</b> Maintain landscaping for bare or disturbed areas that have not been restored with a cover to prevent potential exposure to asbestos that may be present in surface soil and transported by wind erosion. <b>ICs:</b> Impose ICs to limit the use of land or activities that take place within an area. See page 17 for a list of the ICs.
S-4	\$4.5 Million	<b>Covers:</b> Implement physical barriers to cut off exposure pathways to soil across all of Parcels D-1, G and UC-1. Covers will be a durable material 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. Covers are not necessary for Parcel D-2. <b>ICs:</b> Impose ICs to limit the use of land or activities that take place within an area. See page 17 for a list of the ICs.
S-5	\$5.5 Million	<b>Excavation and Off-Site Disposal:</b> Excavate eight areas where lead or polycyclic aromatic hydrocarbons exceed remediation goals and dispose of excavated soil at an off-site landfill. <b>Covers:</b> Implement physical barriers to cut off exposure pathways to soil across all of Parcels D-1, G, and UC-1. Covers will be a durable material 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. Covers are not necessary for Parcel D-2. <b>ICs:</b> Impose ICs to limit the use of land or activities that take place within an area. See page 17 for a list of the ICs.

through legal instruments known as quitclaim deeds and covenants to restrict use of property.

**Remedial Alternatives for Groundwater.** Remedial technologies were screened for their potential to achieve the RAOs at Parcel D. Technologies were retained and assembled into the remedial alternatives presented in Table 7.

Alternative GW-1 is no action; no further cleanup would be performed. Alternative GW-2 involves groundwater monitoring to assess whether contaminants migrate over time. ICs are also an integral part of Alternative GW-2. Alternatives GW-3A and -3B propose active *in situ* treatment of VOCs (only) in groundwater using biological compounds (GW-3A) or *zero-valent iron* (GW-3B) and monitoring groundwater for metals and VOCs. Alternatives GW-4A and GW-4B are similar, proposing treatment of VOCs and metals, also using biological compounds (GW-4A) or zero-valent iron (GW-4B). All alternatives except Alternative GW-1 include ICs to prevent exposure to groundwater. ICs are an integral

component of every remedial alternative, and page 18 provides an overview of ICs common to all the remedial alternatives except Alternative GW-1.

**Remedial Alternatives for Radiologically Impacted Soil and Structures.** Remedial technologies were screened for their potential to achieve the RAOs at Parcel D. Technologies were retained and assembled into the remedial alternatives presented in Table 8.

Alternative R-1 is no action; no further cleanup would be performed. Alternative R-2 includes (1) surveying radiologically impacted areas that may include structures and former building sites; (2) decontaminating (and demolishing if necessary) buildings; (3) excavating storm drain and sanitary sewer lines and soils in impacted areas; and (4) screening, separating, and disposing of radioactive sources and contaminated excavated soil at an off-site low-level radioactive waste facility.

**Table 7. Remedial Alternatives for Groundwater**

Remedial Alternative	Cost	Components of Remedial Alternative
GW-1	0	<b>No Action:</b> No actions or costs; this alternative is required by CERCLA as a baseline for comparison with the other alternatives.
GW-2	\$3.5 Million	<b>Monitoring:</b> Implement long-term monitoring (for about 30 years) of groundwater to assess whether chemicals are migrating and to monitor changes in ambient conditions. <b>ICs:</b> Impose ICs to limit the use of land or activities that take place within an area. See page 18 for a list of ICs for groundwater.
GW-3A	\$2.5 Million	<b>In Situ Treatment for VOCs:</b> Inject an organic compound to stimulate biological activity to create conditions where VOCs are destroyed in groundwater. <b>Monitoring:</b> Implement long-term monitoring (for about 30 years) of groundwater to assess whether chemicals are migrating and to evaluate the effects of treatment. <b>ICs:</b> Impose ICs to limit the use of land or activities that take place within an area. See page 18 for a list of ICs for groundwater.
GW-3B	\$5.4 Million	<b>In Situ Treatment for VOCs:</b> Inject ZVI to create conditions where VOCs are destroyed in groundwater. <b>Monitoring:</b> Implement long-term monitoring (for about 30 years) of groundwater to assess whether chemicals are migrating and to evaluate the effects of treatment. <b>ICs:</b> Impose ICs to limit the use of land or activities that take place within an area. See page 18 for a list of ICs for groundwater.
GW-4A	\$2.9 Million	<b>In Situ Treatment for VOCs and Metals:</b> Inject an organic compound to stimulate biological activity to create conditions where VOCs are destroyed and metals are immobilized in groundwater. <b>Monitoring:</b> Implement long-term monitoring (for about 30 years) of groundwater to assess whether chemicals are migrating and to evaluate the effects of treatment. <b>ICs:</b> Impose ICs to limit the use of land or activities that take place within an area. See page 18 for a list of ICs for groundwater.
GW-4B	\$9.2 Million	<b>In Situ Treatment for VOCs and Metals:</b> Inject ZVI to create conditions where VOCs are destroyed and metals are immobilized in groundwater. <b>Monitoring:</b> Implement long-term monitoring (for about 30 years) of groundwater to assess whether chemicals are migrating and to evaluate the effects of treatment. <b>ICs:</b> Impose ICs to limit the use of land or activities that take place within an area. See page 18 for a list of ICs for groundwater.

**Table 8. Remedial Alternatives for Radiologically Impacted Structures and Soil**

Remedial Alternative	Cost	Components of Remedial Alternative
R-1	0	<b>No Action:</b> No actions or costs; this alternative is required by CERCLA as a baseline for comparison with the other alternatives.
R-2	\$ 30 Million	<b>Survey:</b> Survey structures, former building sites, and radiologically impacted areas. <b>Decontamination and Off-Site Disposal:</b> Decontaminate buildings, excavate storm drain and sanitary sewer lines, excavate at outdoor and radiologically impacted areas, and dispose of excavated material at off-site facilities. <b>Release:</b> Conduct surveys to ensure that remediation goals are met for radiologically impacted sites scheduled for unrestricted release.

# HOW DO THE REMEDIAL ALTERNATIVES COMPARE?

The preferred alternative was selected based on an evaluation of the remedial alternatives using seven of the nine criteria specified in the NCP (see below). The final two criteria, state and community acceptance, are not considered in the initial evaluation of the remedial alternatives in the FS, but rather, are an integral part of the proposed plan process. General descriptions of the nine criteria are presented in the illustration below. Protection of human health and the environment and compliance with ARARs are threshold criteria that each alternative must meet to be eligible for selection. Balancing criteria include (1) long-term effectiveness and permanence (2) reduction of toxicity, mobility, or volume through treatment, (3) short-term effectiveness, (4) implementability, and (5) cost. Balancing criteria are used to weigh tradeoffs of benefits and limitations between alternatives. Modifying criteria include state acceptance and community acceptance. State acceptance is based on comments on the FS and Proposed Plan.

Community acceptance is evaluated based on comments received from the public during the public comment period for the Proposed Plan. Tables 9, 10, and 11 summarize the comparison of the remedial alternatives for soil, groundwater, and radiologically impacted soil and structures. The Navy's preferred alternatives are described in the next section.

## PREFERRED ALTERNATIVES

Based on information currently available for each of the four parcels, the Navy believes that the preferred alternatives for soil, groundwater, and radiologically impacted soil and structures meet the threshold criteria and provide the best balance of tradeoffs among the other alternatives with respect to the balancing and modifying criteria. The Navy expects the preferred alternatives to satisfy the following statutory requirements of CERCLA Section 121(b):

1. Protect human health and the environment
2. Comply with ARARs
3. Are cost effective
4. Use permanent solutions and alternative treatment technologies to the maximum extent practicable

The Navy identified preferred alternatives for soil, groundwater, and radiologically impacted soil and structures based on the comparison of remedial alternatives. State acceptance is established before the Proposed Plan becomes final. Community acceptance will be evaluated after the public comment period for the Proposed Plan. Community input will be summarized in a responsiveness summary that will be part of the ROD.

Each preferred alternative is summarized below.

**Soil (Alternative S-5).** This alternative would achieve RAOs by removing soil in selected areas where chemicals exceed remediation goals and disposing of excavated soil at an off-site facility. Eight areas are planned for excavation, with a total of approximately 700 cubic yards of soil estimated to be removed. Across all of Parcel D, except Parcel D-2, durable covers would be applied as physical barriers to cut off potential exposure to metals in soil. Parcel D-2 has been demonstrated to meet the RAOs; therefore, a No Action ROD is proposed for this parcel. Existing asphalt and concrete surfaces (repaired as necessary to be durable) and buildings would act as covers. New covers would be installed consistent with the redevelopment plan (for example, soil covers for open space areas or asphalt for mixed use or industrial areas). The cover design, including details on how the cover would be finished at the seawalls, will be provided in the RD. Covers would be maintained to contain the soil at the seawall. The RD will include plans for inspection and maintenance to ensure the covers remain intact. ICs will be implemented to maintain the integrity of the covers, including where the covers meet

**1 Overall Protection of Human Health and the Environment**  
How the risks are eliminated, reduced, or controlled through treatment, engineering, or institutional controls.

**2 Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)**  
Federal and state environmental statutes met or grounds for waiver provided.

**3 Long-term Effectiveness**  
Maintain reliable protection of human health and the environment over time, once cleanup goals are met.

**4 Reduction of Toxicity, Mobility, or Volume (TMV) through Treatment**  
Ability of a remedy to reduce the toxicity, mobility, and volume of the hazardous contaminants present at the site.

**5 Short-term Effectiveness**  
Protection of human health and the environment during construction and implementation period.

**6 Implementability**  
Technical and administrative feasibility of a remedy, including the availability of materials and services needed to carry it out.

**7 Cost**  
Estimated capital, operation, and maintenance costs of each alternative.

**8 State Acceptance**  
State concurs with, opposes, or has no comment on the preferred alternative.

**9 Community Acceptance**  
Community concerns addressed; community preferences considered

Nine Criteria

Table 9. Comparative Analysis of Alternatives for Soil

Remedial Alternative	Overall Protection of Human Health and Environment	Compliance with ARARs	Long-Term Effectiveness and Permanence	Reduction of Toxicity, Mobility, or Volume via Treatment	Short-Term Effectiveness	Implementability	Cost (\$M)	Overall
S-1: No Action	No	Not Applicable					0	
S-2: ICs, Maintained Landscaping	Yes	Yes					0.8	
S-3: Excavation, Off-Site Disposal, Maintained Landscaping, ICs	Yes	Yes					1.8	
S-4: Covers, ICs	Yes	Yes					4.5	
<b>***S-5: Excavation, Off-Site Disposal, Covers, ICs</b>	<b>Yes</b>	<b>Yes</b>					5.5	

Notes:  
Text in **blue** and asterisk indicates preferred alternative.

Symbol:



Fill symbol by quarters from open (poor) to full (excellent).  
(\$M) = Cost in millions of dollars

Table 10. Comparative Analysis of Alternatives for Groundwater

Remedial Alternative	Overall Protection of Human Health and Environment	Compliance with ARARs	Long-Term Effectiveness and Permanence	Reduction of Toxicity, Mobility, or Volume via Treatment	Short-Term Effectiveness	Implementability	Cost (\$M)	Overall
GW-1: No Action	No	Not Applicable					0	
GW-2: Groundwater Monitoring, ICs	Yes	Yes					3.5	
GW-3A: In Situ Biological Treatment for VOCs, Groundwater Monitoring, ICs	Yes	Yes					2.5	
GW-3B: In Situ Zero-Valent Iron Treatment for VOCs, Groundwater, ICs	Yes	Yes					5.4	
<b>***GW-4A: In Situ Biological Treatment for VOCs and Metals, Groundwater Monitoring, ICs</b>	<b>Yes</b>	<b>Yes</b>					2.9	
<b>***GW-4B: In Situ Zero-Valent Iron Treatment for VOCs and Metals, Groundwater Monitoring, ICs</b>	<b>Yes</b>	<b>Yes</b>					9.2	

Notes:  
Text in **blue** and asterisk indicates preferred alternative.

Symbol:



Fill symbol by quarters from open (poor) to full (excellent).  
(\$M) = Cost in millions of dollars

Table 11. Comparative Analysis of Alternatives for Radiologically Impacted Soil and Structures

Remedial Alternative	Overall Protection of Human Health and Environment	Compliance with ARARs	Long-Term Effectiveness and Permanence	Reduction of Toxicity, Mobility, or Volume via Treatment	Short-Term Effectiveness	Implementability	Cost (\$M)	Overall
R-1: No Action	No	Not Applicable					0	
<b>***R-2: Survey, Decontamination of Buildings, Removal of Storm Drains and Sewer Lines, and Excavation of Soil</b>	<b>Yes</b>	<b>Yes</b>					30	

Notes:  
Text in **blue** and asterisk indicates preferred alternative.

Symbol:



Fill symbol by quarters from open (poor) to full (excellent).  
(\$M) = Cost in millions of dollars

the seawall. Excavated soil from radiologically impacted sites would be screened and radioactive sources and contaminated soil removed and disposed of at an off-site low-level radioactive waste facility. Following the remedial actions to achieve the remediation goals set forth in Table 4, soil gas surveys will be conducted. The survey results would be used to establish risk-based numeric remediation goals for VOCs in soil gas based upon cumulative risk at  $10^{-6}$  risk, assess the need for use of a vacuum system to remove VOC vapors, set remediation goals and to determine areas where the initial VOC ICs described on page 18 shall be retained and areas where they shall be released.

After these activities, the Navy and regulatory agencies will implement ICs for the continued protection of public health and the environment and to ensure the integrity of the containment remedies (for example, soil covers). ICs are specified in legally binding quitclaim deeds and covenants to restrict use of property. See page 18 for a list of the ICs.

A *risk management plan (RMP)* will be prepared by the City and County of San Francisco and approved by the Navy and the *federal facility agreement (FFA)* signatories (EPA, DTSC, and the Water Board) for each Parcel. The RMPs will specify soil and groundwater management procedures for implementation of the ICs during redevelopment and future operation and maintenance of the remedies for soil and groundwater. The RMPs will identify the roles of local, state, and federal government in administering the RMPs and will 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 or use approvals that may be required.

#### Why is this a preferred alternative?

- Provides best long-term effectiveness by permanently removing the largest volume of contamination (by excavation), thus providing the greatest reduction in on-site risk.
- Prevents exposure to remaining metals (by covers). Excavating remaining metals is not practical because the metals occur at many locations at Parcel D at concentrations similar to native rock. Covers provide the best option to make sure people are not exposed to metals.
- Contains the most comprehensive set of remediation components and involves the least reliance on ICs to prevent exposure.

#### Groundwater (Alternatives GW-4A and GW-4B).

These alternatives would achieve RAOs by actively treating VOCs in groundwater using an injected *biological substrate* (GW-4A) or zero-valent iron (GW-4B) to destroy the VOCs and immobilize metals in the groundwater *plumes* at IR-09, IR-33, and IR-71 (see

Figure 7). Groundwater would be monitored where concentrations of VOCs or metals were found to exceed cleanup goals until remediation is complete. The Navy's monitoring plan will be flexible to allow modifications as data are collected. ICs would be implemented to restrict groundwater use.

#### Why are these preferred alternatives?

- Provides long-term protection by reducing concentrations of VOCs and metals and their associated risk.
- Reduces the toxicity, mobility, and volume of VOCs, chromium VI, and nickel by implementing an expedient and aggressive treatment strategy.
- Includes the options of using either biological substrates or zero-valent iron for active treatment. Biological substrate can flow with groundwater and remediate a larger volume. Zero-valent iron remains in place longer than biological substrate after injection.

#### Radiologically Impacted Soil and Structures

(**Alternative R-2**). This alternative would achieve RAOs by 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 would be performed and buildings would be dismantled if necessary. Radiologically impacted storm drains and sanitary sewer lines throughout Parcel D would be removed and radiologically contaminated pipe and soils would be disposed of off site as low-level radioactive waste. Contaminated soils at outdoor impacted sites at the Gun Mole Pier and the former NRDL site on Mahan Street will be removed and disposed of off site. The survey and removals would occur before any covers were installed as part of Alternative S-5. Buildings, former building sites, and excavated areas would be surveyed after cleanup is completed to ensure that no residual radioactivity is present at levels above the remediation goals.

Some components of this alternative are in progress as a TCRA (storm drain and sanitary sewer removals and building surveys). Although the TCRA may not be completed before the ROD is signed, the Navy anticipates that the TCRA will meet the RAOs described in this Proposed Plan.

#### Why is this a preferred alternative?

- Provides the best long-term effectiveness by removing contaminants from radiologically impacted buildings and former building sites with documented radiological impacts, and by removing potential radiologically impacted sanitary and storm sewers.



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San Diego, CA 92108-4310



## APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARAR)

CERCLA requires that remedial actions meet federal or state (if more stringent) environmental standards, requirements, criteria, or limitations that are determined to be ARARs. Attachment 1 on pages 22 through 25 summarizes the ARARs that will be met by the preferred alternatives. This attachment lists the new parcels for which each ARAR applies.

## HOW WILL THE ALTERNATIVES APPLY TO PARCEL D?

Here is how the alternatives will be implemented if the overall Parcel D is divided into four new parcels:

**Parcel D-1:** Alternative S-5 requires covers, ICs, and excavation in Parcel D-1. Alternatives GW 4A and GW-4B require cleanup of groundwater as it extends southward in a plume from IR-71 (see Figure 7). Alternative R-2 will require 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.

**Parcel D-2:** This area was part of former Parcel A (the property directly north of Parcel D; see Figure 2); the ROD for Parcel A specified No Further Action. The Navy surveyed Building 813 for radiological impacts. CDPH approved the Final Status Survey Report for Building 813 on April 1, 2008. This report demonstrates that no radiological material at or above risk levels exists at or in the building. Therefore, a No Action ROD will be prepared for this area. No covers or ICs will be required. No groundwater cleanup is needed for Parcel D-2 under Alternatives GW-4A or GW-4B.

**Parcel G:** Alternative S-5 requires covers, ICs, and excavation in Parcel G. Alternatives GW 4A and GW-4B require cleanup of groundwater at IR-09, IR-33, and IR-71 (see Figure 7). Alternative R-2 will require 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.

**Parcel UC-1:** Alternative S-5 requires covers, and ICs in this area. No groundwater cleanup is needed or planned for this area under Alternatives GW-4A or GW-4B (see Figure 7).

## HOW DO YOU PROVIDE INPUT TO THE NAVY?

The Navy provides information on the cleanup of Parcel D to the public through public meetings, the administrative record file for the site, and notices published in the local newspapers.

The Navy, EPA, DTSC, and the Water Board encourage the public to gain a more thorough understanding of Parcel D and CERCLA activities conducted at Hunters Point Shipyard by visiting one of the information repositories, reviewing the relevant records contained in the administrative record file, and attending public meetings. *Restoration Advisory Board (RAB)* meetings are held on the fourth Thursday of every month and are open to the public. For more information on the RAB meetings, please visit the Navy's web site: <<http://www.bracpmo.navy.mil/bracbases/california/hps/default.asp>>.

### Administrative Record

The collection of reports and historical documents used by the Navy, in conjunction with the regulatory agencies, in selecting cleanup or environmental alternatives is the administrative record. The administrative record includes documents such as the Final RI Report, Final FS Report, and its radiological addendum (these three reports provide the most comprehensive understanding of Parcel D), as well as other supporting documents and data for Parcel D. Administrative record files are located at the following address:

**Naval Facilities Engineering Command, Southwest  
Attention: Diane Silva, FISC Building 1, 3rd Floor  
1220 Pacific Highway  
San Diego, CA 92132-5190  
Phone: (619) 532-3676**

Community members interested in the full technical details beyond the scope of this Proposed Plan can also find key supporting documents that pertain to Parcel D and a complete index of all Navy Hunters Point Shipyard documents at the following information repositories:

### Information Repositories

**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) 715-4100**

## Providing Comments on this Proposed Plan

There are two ways to provide comments during the public comment period (July 23, 2008, to August 22, 2008):

- Offer oral comments during the public meeting
- Provide written comments by mail, facsimile, or e-mail to the Navy no later than August 22, 2008 (see contact information below)

The public meeting will be held from 6:30 p.m. to 8:00 p.m. on July 30, 2008, at the Southeast Community Facility Commission Building in the Alex L. Pitcher, Jr., Room located at 1800 Oakdale Avenue, San Francisco. Navy representatives will provide visual displays and information on the environmental investigations and the remedial alternatives at Parcel D. The Navy will also give a presentation on the Proposed Plan. You will have an opportunity to ask questions and formally comment on the remedial alternatives summarized in this Proposed Plan.

### Please send all written comments to:

Mr. Keith Forman  
BRAC Environmental Coordinator  
BRAC Program Management Office West  
1455 Frazee Road, Suite 900  
San Diego, CA 92108-4310  
Telephone: (619) 532-0913  
Cell Phone: (415) 308-1458  
Facsimile: (619) 532-0995  
E-mail: keith.s.forman@navy.mil

## For More Information

If you have any questions or concerns about environmental activities at Hunters Point Shipyard, feel free to contact any of the following project representatives:

**Navy**  
Mr. Keith Forman  
BRAC Environmental Coordinator  
BRAC Program Management Office West  
1455 Frazee Road, Suite 900  
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E-mail: keith.s.forman@navy.mil

**EPA**  
Mr. Mark Ripperda  
Project Manager  
U.S. Environmental Protection Agency, Region 9  
75 Hawthorne Street  
San Francisco, CA 94105  
Telephone: (415) 972-3028  
E-mail: Ripperda.Mark@epa.gov

## DTSC

Mr. Thomas Lanphar  
Project Manager  
Department of Toxic Substances Control  
700 Heinz Avenue, Suite 200  
Berkeley, CA 94710  
Telephone: (510) 540-3776  
E-mail: TLanphar@dtsc.ca.gov

## Water Board

Mr. Erich Simon  
Project Manager  
San Francisco Bay  
Regional Water Quality Control Board  
1515 Clay Street, Suite 1400  
Oakland, CA 94612  
Telephone: (510) 622-2355  
E-mail: ersimon@waterboards.ca.gov

For more information on the closure of Hunters Point Shipyard, the IR Program, and Parcel D, check out the website at: <<http://www.bracpmo.navy.mil/bracbases/califorcnia/hps/default.aspx>>.

Public meeting will be held from 6:30 p.m. to 8:00 p.m. on July 30, 2008, at the Southeast Community Facility Commission Building in the Alex L. Pitcher, Jr., Room located at 1800 Oakdale Avenue, San Francisco

## Overview of Institutional Controls for Parcels D-1, G, and UC-1

Institutional Controls (IC) 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 clean-up levels result in contamination remaining at the property above levels that allow for unlimited use and unrestricted exposure. ICs will remain in place unless the remedial action taken will allow for unlimited use of the property and unrestricted exposure. Implementation of institutional controls 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 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”).

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.) title. 22 section (§) 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 implemented through the Risk Management Plans (RMP) for Parcels D-1, G, and UC-1 to be prepared by the City of San Francisco and approved by the Navy and FFA Signatories. The RMPs shall be attached to and incorporated by reference into the Covenant(s) to Restrict Use of Property and Deed(s) as an enforceable part thereof. It shall specify soil and groundwater management procedures for compliance with the remedy selected in the RODs for Parcels D-1, G, and UC-1. Each RMP shall identify the roles of local, state, and federal government in administering the 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.

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 Parcels D-1, G, and UC-1 at HPS.

Although the Navy may later transfer the procedural responsibilities for enforcement of land use restrictions to another party by contract, property transfer agreement, or through other means, the Navy shall retain ultimate responsibility for the integrity of the remedy.

### 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 Parcels D-1, G, and UC-1 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

## Overview of Institutional Controls for Parcels D-1, G, and UC-1 (Continued)

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 Parcels D-1, G, and UC-1

The following sections describe the institutional control objectives to be achieved through activity restrictions throughout Parcels D-1, G, and UC-1 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 Parcels D-1, G, and UC-1 must be conducted in accordance with the “Covenant(s) to Restrict Use of Property”, Quitclaim Deed(s), the Parcels D-1, G, and UC-1 RMP, and if required, any other workplan or document approved in accordance with these referenced documents:

- 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, 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 Parcels D-1, G, and UC-1:

- 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 Parcels D-1 and 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), and the RMP for each parcel prior to the conduct of such activity within the area requiring institutional controls (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 Parcels D-1 and G. This can be achieved through engineering controls or other design alternatives that meet the specifications set forth in the RODs, remedial design reports, land use control remedial design (LUC RD) report, and the RMP for each parcel. The ARIC may be modified 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 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 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), and the RMP for each parcel prior to use of the property for any of the 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.

## Glossary of Technical Terms

**Administrative Record:** The reports and historical documents used in selection of cleanup or environmental management activities.

**Applicable or Relevant and Appropriate Requirements (ARAR):** Federal, state, and local regulations and standards determined legally applicable or relevant and appropriate to remedial actions at a CERCLA site.

**Aquifer:** A zone of rock or soil below the earth's surface through which groundwater moves in sufficient quantity to serve as a source of water.

**Below ground surface (bgs):** Collection depth of a sample or depth of an excavation.

**Biological substrate:** A chemical that acts as a source of food for microorganisms.

**Base Realignment and Closure Cleanup Team (BCT):** Base Realignment and Closure Cleanup Team, consisting of representatives from the Navy, EPA, DTSC, and the Water Board.

**California Environmental Protection Agency:** State agency established to protect human health and the environment.

**California Department of Public Health (CDPH):** A state organization dedicated to optimizing the health and well-being of the people in California. This agency has the responsibility to address cleanup at radiological sites in California.

**Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA):** The federal law establishing a program to identify hazardous waste sites and procedures for cleaning up sites to protect human health and the environment, and to evaluate damages to natural resources.

**Curie:** A unit of measure of the amount of radioactivity equal to  $3.7 \times 10^{10}$  disintegrations per minute (dpm). A picoCurie is one-trillionth of a Curie.

**Department of Toxic Substances Control (DTSC):** Part of the California Environmental Protection Agency, whose mission is to protect California and Californians from exposures to hazardous wastes.

**Engineering Controls (EC):** Barriers, such as fencing, warning signs, or any other physical structures designed to limit exposure to contaminated waste, soil, or groundwater.

**Feasibility Study (FS):** A study to identify, screen, and compare cleanup (remedial) alternatives for a site.

**Federal Facility Agreement (FFA):** A written agreement among the Navy, U.S. EPA, and California Environmental Protection Agency (Cal/EPA) (including DTSC and the Water Board) for environmental remediation. The FFA outlines the roles and responsibilities of each party, and sets timetables for cleanup actions.

**Groundwater:** Water in the subsurface that fills pores in soil or openings in rocks.

**Hazard Index (HI):** A calculated value used to represent a potential noncancer health risk. An HI value of 1 or less is considered an acceptable exposure level.

**Historical Radiological Assessment (HRA).** A document that summarizes the review completed by the Navy to evaluate potential radiological contamination from the use of general radioactive materials at HPS and the identification of radiologically impacted areas at HPS.

**Human Health Risk Assessment (HHRA):** An analysis of the potential human health effects caused by exposure to hazardous substances at a site.

**Hunters Point Ambient Level (HPAL):** Concentrations of metals detected in soils at Hunters Point Shipyard that are statistically representative of ambient concentrations.

**Hunters Point Groundwater Ambient Level (HGAL):** Concentrations of metals detected in groundwater at Hunters Point Shipyard that are statistically representative of ambient concentrations.

**In situ:** Identifies an action or process as occurring within a given medium, such as soil or groundwater.

## Glossary of Technical Terms (Continued)

**Installation Restoration (IR):** Department of Defense's comprehensive program to investigate and clean up environmental contamination at military facilities in full compliance with CERCLA.

**Institutional Controls (IC):** Non-engineered mechanisms established to limit human exposure to contaminated waste, soil, or groundwater. These mechanisms may include deed restrictions, covenants, easements, laws, and regulations.

**Microgram per liter ( $\mu\text{g/L}$ ):** Unit used to describe concentrations of chemicals in groundwater that is nearly equal to one part per billion. This unit is equivalent to about 50 drops in an Olympic-size swimming pool.

**Milligram per kilogram (mg/kg):** Unit used to describe concentrations of chemicals in soil or sediment that is nearly equal to one part per million. A part per million is equivalent to about 4 drops in 55 gallons or 15 grains of sand in a 90 pound bag.

**National Oil and Hazardous Substances Pollution Contingency Plan (NCP):** The NCP is the basis for government responses to oil and hazardous substance spills, releases, and sites where these materials have been released.

**Naval Radiological Defense Laboratory (NRDL):** A Navy command based at HPS from 1948 until 1969. The mission of NRDL was the study of nuclear weapons effects and the development of countermeasures to the atomic weapon and decontamination methods for ships.

**Picocurie:** One-trillionth ( $10^{-12}$ ) of a *curie*.

**Plume:** A zone of contaminated groundwater.

**Polycyclic aromatic hydrocarbon (PAH):** A group of more than 100 different chemicals commonly present in coal and petroleum products; these chemicals are formed during burning of organic substances.

**Practical quantitation limit (PQL):** The lowest concentration of a chemical that a laboratory can reliably measure.

**Preliminary Assessment (PA):** Initial site evaluation including record searches, interviews, and limited field investigations.

**Preferred Alternative:** The remedial alternative selected by the Navy, in conjunction with the regulatory agencies, that best satisfies the RAO and remediation goal, based on the evaluation of alternatives presented in the Parcel D FS.

**Proposed Plan:** A document that summarizes remedial alternatives, presents the recommended cleanup action, explains the recommendation, and solicits comments from the community.

**Radiologically Impacted Area:** An area, building, or piece of equipment that, under professional interpretation, has the distinct possibility of having residual radioactive material associated with it.

**Record of Decision (ROD):** A decision document that identifies the remedial alternative chosen for implementation at a CERCLA site. The ROD is based on information from the RI, FS, and other reports, and on public comments and community concerns.

**Remedial Action:** A general term used to describe technologies or actions implemented to contain, collect, or treat hazardous wastes to protect human health and the environment.

**Remedial Action Objective (RAO):** A set of statements that each contains a remediation goal for the protection of one or more receptors from one or more chemicals in a specific medium (such as soil, groundwater, or air) at a site.

**Remedial Design (RD):** The phase in the Superfund site cleanup process where the technical specifications for cleanup remedies and technologies are identified. The RD contains the detailed information describing how the selected remedy will be implemented.

**Remedial Investigation (RI):** The first of two major studies that must be completed before a decision can be made about how to clean up a site. (The FS is the second study.) The RI is designed to delineate the nature and extent of contamination at a site and to estimate the risks presented by the contamination.

**Remediation Goal:** Chemical concentration limit that provides a quantitative means of identifying areas for potential remedial action, screening the types of appropriate technologies, and assessing a remedial action's potential to achieve the RAO.

## Glossary of Technical Terms (Continued)

**Restoration Advisory Board (RAB):** An advisory body designated to act as a focal point for exchanging information and concerns between the Navy and the local community regarding environmental cleanup. The RAB consists primarily of community members, but also includes representatives from the Navy, EPA, DTSC, the Water Board, and the City of San Francisco.

**Risk Management Plan (RMP):** A document prepared by the City and County of San Francisco and approved by the Navy and the FFA signatories that will specify soil and groundwater management procedures for implementation of institutional controls. The RMP will identify the roles of local, state, and federal government in administering the RMP and will 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 or use approvals that may be required.

**Risk Management Review:** A process where the Navy, EPA, DTSC, the Water Board, and the City of San Francisco reviewed all the available data at a site to determine locations where action should be taken. Action could be additional investigation or cleanup.

**San Francisco Bay Regional Water Quality Control Board (Water Board):** Local division of the state agency established to protect water resources.

**Site Inspection:** An investigation to identify the substances present at a site in environmental media, and to evaluate whether they have been released to the environment and whether targets are contaminated.

**Time-Critical Removal Action (TCRA):** A removal action that requires a maximum 6-month planning phase. The removal action may contribute to the implementation phase of a CERCLA site cleanup.

**U.S. Environmental Protection Agency (EPA):** Federal agency established to protect human health and the environment.

**Volatile Organic Compound (VOC):** An organic (carbon containing) compound that evaporates readily at room temperature. VOCs are found in industrial solvents commonly used in dry cleaning, metal plating, and machinery degreasing operations.

**Zero-Valent Iron:** Fine iron particles that can be injected into groundwater. VOCs in the groundwater react with the iron particles, and break down into nontoxic compounds.

# ATTACHMENT 1

## APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

CERCLA requires that remedial actions meet federal or state (if more stringent) environmental standards, requirements, criteria, or limitations that are determined to be ARARs. The following summarizes the chemical-, location-, and action-specific ARARs for the preferred alternatives described in this Proposed Plan. Refer to the Parcel D FS (Appendix D) and its radiological addendum (Appendix C), for more specific information on potential ARARs.

<b>Potential federal chemical-specific ARARs</b>		
The substantive provisions of the following requirements were identified as potential federal chemical-specific ARARs:		
Medium	Requirement	Future Parcels Affected
Soil	Determination of RCRA hazardous waste at Cal. Code Regs. tit. 22, §§ 66261.21, 66261.22(a)(1), 66261.23, 66261.24(a)(1), and 66261.100	Applies to excavations at Parcel G, and Parcel D-1. No excavations are planned for the other parcels.
	Uranium Mill Tailings Radiation Control Act at 40 CFR § 192.12(a)	Applies to Parcel D-1, Parcel G, and Parcel D-2. Also applies to structures. No cleanup for radiological contamination is planned for the other parcels.
	Nuclear Regulatory Commission Standards for Protection of Radiation at 10 CFR § 20.1301 and 20.1402	Applies to Parcel D-1, Parcel G, and Parcel D-2. Also applies to structures. No cleanup for radiological contamination is planned for Parcel UC-1.
	RCRA groundwater protection standards at Cal. Code Regs. tit. 22, § 66264.94(a)(1), (a)(3), (c), (d), and (e)	Applies to Parcel G and Parcel D-1. No groundwater cleanup or monitoring is planned for the other parcels.
	Determination of RCRA hazardous waste at Cal. Code Regs. tit. 22, § 66261.21, 66261.22(a)(1), 66261.23, 66261.24(a)(1), and 66261.100	Applies to Parcel G and Parcel D-1. No groundwater cleanup or monitoring is planned for the other parcels.
Surface Water	Clean Water Act, California Toxics Rule at 40 CFR § 131.38	Applies to Parcel G and Parcel D-1. No groundwater cleanup or monitoring is planned for the other parcels.
Air	Clean Air Act requirements for radionuclides at 40 CFR § 61.92 and 61.102	Applies to Parcel D-1, Parcel G, and Parcel D-2. No cleanup for radiological contamination is planned for Parcel UC-1.
<b>Potential state chemical-specific ARARs</b>		
The substantive provisions of the following requirements were identified as potential state chemical-specific ARARs:		
Medium	Requirement	Future Parcels Affected
Soil	Non-RCRA hazardous waste determinations at Cal. Code Regs. tit. 22 § 66261.22(a)(3) and (4), 66261.24(a)(2) to (a)(8), 66261.101, 66261.3(a)(2)(C) or 66261.3(a)(2)(F)	Applies to excavations at Parcel G and Parcel D-1. No excavations are planned for the other parcels.
	Definitions of designated, nonhazardous waste and inert waste at Cal. Code Regs. tit. 27 § 20210, 20220, and 20230	Applies to excavations at Parcel G and Parcel D-1. No excavations are planned for the other parcels.



**Potential state chemical-specific ARARs**

The substantive provisions of the following requirements were identified as potential state chemical-specific ARARs:

Medium	Requirement	Future Parcels Affected
Groundwater	Substantive provisions of Chapters 2 and 3 (except the MUN designation for the A-aquifer) of the Basin Plan promulgated pursuant to the Porter-Cologne Water Quality Control Act.	Applies to Parcel G and Parcel D-1. No groundwater cleanup or monitoring is planned for the other parcels.
	California Water Code §§ 13240, 13241, 13243, 13263(a), 13269, and 13360 as enabling legislation as implemented through the beneficial uses, WQOs, waste discharge requirements, and promulgated policies in the Basin Plan	Applies to Parcel G and Parcel D-1. No groundwater cleanup or monitoring is planned for the other parcels.
	SWRCB Resolution No. 88-63 establishing criteria to identify potential sources of drinking water	Applies to Parcel G and Parcel D-1. No groundwater cleanup or monitoring is planned for the other parcels.
	The Water Board identified the substantive provisions of the “Statement of Policy with Respect to Maintaining High Quality of Waters in California” SWRCB Res. 68-16) and “Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under California Water Code Section 13304” (SWRCB Res. 92-49) as state ARARs for Parcel D groundwater remedial action. The SWRCB interprets Res. 68-16 as prohibiting further migration of the volatile organic compound plumes in Parcel D; however, the U.S. Environmental Protection Agency and the Navy do not agree that SWRCB Res. 68-16 applies to further migration. Furthermore, the Navy’s position is that SWRCB Res. 68-16 and 92-49 do not constitute chemical-specific ARARs (numerical values or methodologies that result in the establishment of a cleanup level at the site) since they are state requirements and are not more stringent than federal provisions of Cal. Code Regs. tit. 22 § 66424.94, determined to be ARARs for Parcel D groundwater remedial action. The Water Board and DTSC do not agree with the Navy’s determination that SWRCB Res. 92-49 and 68-16 are not ARARs for Parcel D remedial action; however, the Water Board and DTSC agree that the proposed remedial action would comply with SWRCB Res. 92-49 and 68-16.	Does not apply.
	Non-RCRA hazardous waste determinations at Cal. Code Regs. tit. 22 § 66261.22(a)(3) and (4), 66261.24(a)(2) to (a)(8), 66261.101, 66261.3(a)(2)(C) or 66261.3(a)(2)(F)	Applies to Parcel G and Parcel D-1. No groundwater cleanup or monitoring is planned for the other parcels.
	Definitions of designated, nonhazardous, and inert waste at Cal. Code Regs. tit. 27 § 20210, 20220, and 20230	Applies to Parcel G and Parcel D-1. No groundwater cleanup or monitoring is planned for the other parcels.

**Potential state chemical-specific ARARs**

The substantive provisions of the following requirements were identified as potential state chemical-specific ARARs:

Medium	Requirement	Future Parcels Affected
Surface Water	Basin Plan, Table 3-3, for marine waters with salinities equal to or greater than 10 parts per thousand, 95 percent of the time	Applies to Parcel G and Parcel D-1. No groundwater cleanup or monitoring is planned for the other parcels.

**Potential federal location-specific ARARs**

The substantive provisions of the following requirements were identified as potential federal location-specific ARARs:

Location	Requirement	Future Parcels Affected
Coastal Zone	Coastal Zone Management Act at 16 U.S.C. § 1456(c)(1)(a) and 15 CFR Part 930	Applies specifically to Parcel D-1. The other parcels are not within the coastal zone.
Historic Properties	National Historic Preservation Act at 16 U.S.C. § 470-470x-6, 36 CFR Part 800, and 40 CFR § 6.301(b)	Applies only to Parcel D-1, where the bridge crane is located. There are no other historic properties on any of the other parcels.

**Potential state location-specific ARARs**

The substantive provisions of the following requirements were identified as potential state location-specific ARARs:

Location	Requirement	Future Parcels Affected
Coastal Zone	San Francisco Bay Plan at Cal. Code Regs. tit. 14 §§ 10110 through 11990 and enabling legislation in the McAteer-Petris Act (California Government Code §§ 66600 through 66661)	Applies only to Parcel D-1. The other parcels are not within the coastal zone.

**Potential federal action-specific ARARs**

The substantive provisions of the following requirements were identified as potential federal action-specific ARARs:

Action	Requirement	Future Parcels Affected
Excavation	RCRA on-site waste generation at Cal. Code Regs. tit. 22 § 66262.10(a), 66262.11, and 66264.13(a) and (b)	Applies to excavations at Parcel G and Parcel D-1. No excavations are planned for the other parcels.
	RCRA waste pile requirements at Cal. Code Regs. tit. 22 § 66246.553(b), (d), (e), and (f) and 40 CFR § 264.554(d)(1)(i-ii), (d)(2), (e), (f), (h), (i), (j), and (k)	Applies to excavations at Parcel G and Parcel D-1. No excavations are planned for the other parcels.
	Clean Water Act storm water discharge requirements at 40 CFR § 12.44(k)(2) and discharge of dredged material and filling of wetlands at 33 U.S.C. § 1344; 33 CFR § 320.4 and 323; 40 CFR § 230.10, 230.11, 230.20 through 230.25, 230.31, 230.32, 230.41, 230.42, and 230.53	Applies to excavations at Parcel G and Parcel D-1. No excavations are planned for the other parcels.
	Clean air provisions of the Bay Area Air Quality Management District, Regulation 6, Rule 6-1-302, Regulation 2-2-301, and Regulation 8-47	Applies to excavations at Parcel G and Parcel D-1. No excavations are planned for the other parcels.
Covers	RCRA cover requirements at Cal. Code Regs. tit. 22 § 66264.310(a)(5), (b)(1), (b)(4), and (b)(5)	Applies to Parcels G, D-1, and UC-1.

**Potential federal action-specific ARARs**

The substantive provisions of the following requirements were identified as potential federal action-specific ARARs:

Action	Requirement	Future Parcels Affected
Groundwater Monitoring	RCRA monitoring requirements: <ul style="list-style-type: none"> <li>Monitoring duration requirements under Cal. Code Regs. tit. 22, § 66264.90(c)</li> <li>Detection monitoring program at Cal. Code Regs. tit. 22, § 66264.91(a)(1)COC requirements at Cal. Code Regs. tit. 22 § 66264.93</li> <li>General groundwater monitoring requirements Cal. Code Regs. tit. 22 § 66264.97(b)(1)(A), (b)(1)(B) (b)(1)(D)(1) and (b)(1)(D)(2)</li> <li>Monitoring well construction requirements at Cal. Code Regs. tit. 22 § 66264.97(b)(4), (5), (6), and (7)</li> <li>General monitoring system requirements at Cal. Code Regs. tit. 22 § 66264.9 (e)(6), (e)(12)(A)(3), (e)(12)(B), (e)(13), and (e)(15)</li> <li>Detection monitoring requirements at Cal. Code Regs. tit. 22, § 66264.98(e)(1)-(e)(5), (i), (j), (k)(1)-(k)(3), (k)(4)(A), (k)(4)(D), (k)(5), (k)(7)(C) and (k)(7)(D), (n)(1), (n)(2)(B), and (n)(2)(C)</li> <li>Evaluation monitoring requirements at Cal. Code Regs. tit. 22, § 66264.99(b), (e)(1)-(e)(6), (f)(3), and (g)</li> <li>Corrective action monitoring requirements at Cal. Code Regs. tit. 22, § 66264.100(d), (g)(1)</li> <li>Post-closure requirements at under Cal. Code Regs. tit. 22, § 66264.117(b)(2)(A)</li> </ul>	Applies to Parcel G and Parcel D-1. No groundwater cleanup or monitoring is planned for the other parcels.
In Situ Treatment	Safe Drinking Water Act underground injection requirements at 40 CFR § 144.12(a), excluding reporting requirements in § 144.12(b) and 144.12(c)(1)	Applies to Parcel G and Parcel D-1. No groundwater cleanup planned for the other parcels.

**Potential state action-specific ARARs**

The substantive provisions of the following requirements were identified as potential state action-specific ARARs:

Action	Requirement	Future Parcels Affected
Institutional Controls	Requirements for institutional controls at California Civil Code § 1471; Cal. Code Regs. tit. 22 § 67391.1; California Health and Safety Code § 25202.5, 25222.1, 25232(b)(1)(A)-(E), 25233(c), 25234, and 25355.5(a)(1)(C)	Applies to Parcels G, D-1, and UC-1.
Covers	Cover requirements at Cal. Code Regs. tit. 27 § 20080(b), 20090(d), 20950(d), 21090(b)(1), (c)(4), (e)(1) and (e)(3), 21140, 21145(a), and 21150	Applies to Parcels G, D-1, and UC-1.
Excavation	Construction activity requirements in asbestos-containing rock or soil at Cal. Code Regs. tit. 17 § 93105	Applies to Parcels G, D-1, and UC-1.
Excavation	Waste characterization requirements at Cal. Code Regs. tit. 27 § 20200(c), 20210, 20220(b), (c), and (d)	Applies to excavations at Parcel G and Parcel D-1. No excavations are planned for the other parcels.

**Notes:**

§	Section	SWRCB	State Water Resources Control Board
§§	Sections	tit.	Title
ARAR	Applicable or Relevant and Appropriate Requirement	U.S.C.	United States Code
Basin Plan	San Francisco Bay Basin Water Quality Control Plan	Water Board	San Francisco Regional Water Quality Control Board
Cal. Code Regs.	California Code of Regulations		
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act	WQO	Water quality objective
CFR	Code of Federal Regulations		
DTSC	Department of Toxic Substances Control		
FS	Feasibility Study		
MUN	Municipal		
RCRA	Resource Conservation and Recovery Act		

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**BRAC  
PMO**

**Proposed Plan for Parcel D**  
**Hunters Point Shipyard**  
**San Francisco, California**