

Hunters Point Naval Shipyard Parcel E-2



San Francisco, California

September 2011

NAVY ANNOUNCES PROPOSED PLAN

The U.S. Navy encourages the public to comment on its **Proposed Plan*** for cleanup of Parcel E-2 at Hunters Point Naval Shipyard (HPNS) in San Francisco, California. Parcel E-2 includes an unlined **solid waste** landfill along the shoreline in the southwest portion of the Shipyard (see Figure 1).

This Proposed Plan presents several remedial (cleanup) alternatives and identifies the Navy's **Preferred Alternative**. The Navy, in consultation with the U.S. Environmental Protection Agency (EPA), the California EPA Department of Toxic Substances Control (DTSC), and the San Francisco Bay Regional Water Quality Control Board (Water Board), will select a **remedial action** for the site in the **Record of Decision (ROD)** after reviewing and considering all information submitted during the public comment period. The Navy may modify the Preferred Alternative or select another remedial alternative presented in this Proposed Plan based on new information or public comments. Therefore, the public is encouraged to review and comment on all of the alternatives presented in this Proposed Plan. A final decision will not be made until all comments submitted during the review period are considered. See how to comment in the box below.

This Proposed Plan summarizes the remedial (cleanup) alternatives evaluated by the Navy and explains the basis for identifying the preferred alternative to address contamination at Parcel E-2 at HPNS (Figure 1). The Navy proposes the following actions to address hazardous substances in soil, shoreline sediment, **landfill gas**, and groundwater at Parcel E-2:

- Remove and dispose of contaminated soil in selected areas.
- Separate and dispose of materials and soil with **radiological contamination**.
- Install a **protective liner** and soil cover over all of Parcel E-2.
- Install a **below-ground barrier** to limit groundwater flow from the landfill to San Francisco Bay.
- Remove and treat landfill gas to prevent it from moving beyond the Parcel E-2 boundary.
- Build a shoreline **revetment**.
- Build new **wetlands**.
- Monitor and maintain the different parts of the preferred alternative (soil cover, shoreline revetment, wetlands, etc.) to ensure they are working properly.
- Use **institutional controls (IC)** to restrict specific land uses and activities on parcel E-2 (see page 21 for more details on ICs).

Public comments will be accepted from September 7 through October 24, 2011, and public comments can be submitted via mail, fax, or e-mail throughout the comment period. A public meeting will be held from 6:00 p.m. to 8:00 p.m. on September 20, 2011, at the Southeast Community Facility Commission Building in the Alex L. Pitcher, Jr. Room, located at 1800 Oakdale Avenue in San Francisco. Members of the public may submit written and oral comments on this Proposed Plan at the

public meeting. Written comments can be provided any time during the comment period but must be received no later than October 24, 2011. Please refer to page 20 for further information on how to provide comments.

How to Comment on the Proposed Plan for Parcel E-2

- Provide written comments no later than October 24, 2011, by one of the following methods:
 - E-mail: keith.s.forman@navy.mil
 - Fax: (619) 532-0995
 - Mail: See address on page 20
- Attend the public meeting and provide verbal or written comments:
September 20, 2011, from 6:00 p.m. to 8:00 p.m.
Southeast Community Facility Commission Building, Alex L. Pitcher, Jr. Room
1800 Oakdale Avenue in San Francisco

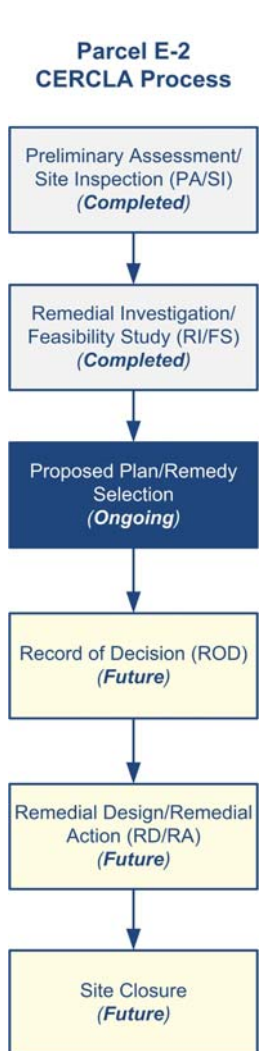


Figure 1. Location of HPNS.

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THE CERCLA PROCESS



The Navy is issuing this Proposed Plan as part of its public participation responsibilities under Section 117(a) of *Comprehensive Environmental Response Compensation and Liability Act (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 conclusions presented in the final *Remedial Investigation/Feasibility Study (RI/FS) Report* (May 5, 2011) and its *radiological addendum* (March 4, 2011). The flowchart to the left illustrates the status of Parcel E-2 in the CERCLA process. The Navy received public input during the development of the RI/FS Report and radiological addendum, and this input helped identify the remedial alternatives discussed in this Proposed Plan.

The Navy has conducted numerous *environmental investigations* at HPNS since the mid-1980s. These investigations have identified contamination that poses a potential risk to human health and the environment. The Navy conducted several *removal actions* from 1997 to 2011 to excavate contaminated soil, remove radiological contamination, control landfill gas, and to limit the flow of groundwater from under the landfill into the bay. These removal actions provided protection to the community for the short-term, but the Navy must

address the remaining contaminants with a remedial action for the entire parcel. The Navy's Preferred Alternative is presented in this Proposed Plan.

The ROD will present the selected remedial alternative, identify the remedial action objectives and *remediation goals*, and outline performance standards that must be met when cleanup is complete. After the ROD, the *remedial design* and remedial action are the next steps in the CERCLA process and involve planning and implementation of the selected remedial action. For large sites such as Parcel E-2, the remedial action is often implemented in phases over a period of several years.

The RI/FS Report, radiological addendum, and other documents that provide information about the conditions and Navy activities at Parcel E-2 are available for public review at the locations listed on page 19.

SITE BACKGROUND

HPNS is located in southeastern San Francisco on a peninsula that extends east into San Francisco Bay. This Proposed Plan applies to Parcel E-2, which includes 47.4 acres of shoreline and lowland coastal area along the southwest portion of HPNS (see Figure 2), and contains the four study areas used to organize data in the RI/FS Report (see Figure 3):

- The Parcel E-2 Landfill, located in the north-central part of Parcel E-2
- The Panhandle Area, located west and southwest of the Parcel E-2 Landfill
- The East Adjacent Area, located to the east of the Parcel E-2 Landfill
- The Shoreline Area, located at the edge of San Francisco Bay

A facility owned by the University of California, San Francisco (UCSF) is located north of Parcel E-2, and non-Navy off-base property is located to the west. Parcel E is located to the east, and the Navy is currently developing and evaluating remedial alternatives for this parcel. San Francisco Bay forms the southern edges of Parcel E-2.

Parcel E-2 is part of an area created in the 1940s, 1950s, and 1960s by filling in the edge of San Francisco Bay with various materials, including soil, crushed bedrock, dredged sediments, and waste. The photographs on the following page show the conditions at Parcel E-2 from the 1950s to 1970s.

The Parcel E-2 Landfill is a 22-acre area where the Navy disposed of various shipyard wastes from the mid-1950s to the late-1960s. These wastes include:

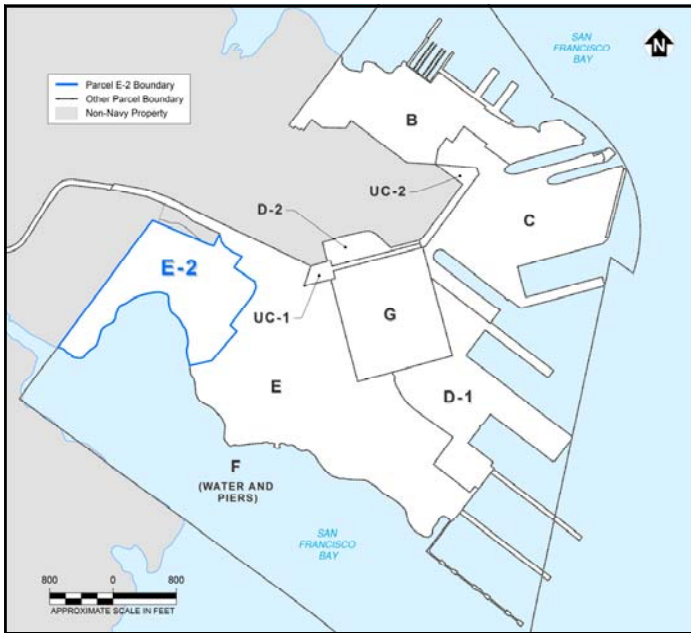


Figure 2. Location of Parcel E-2.

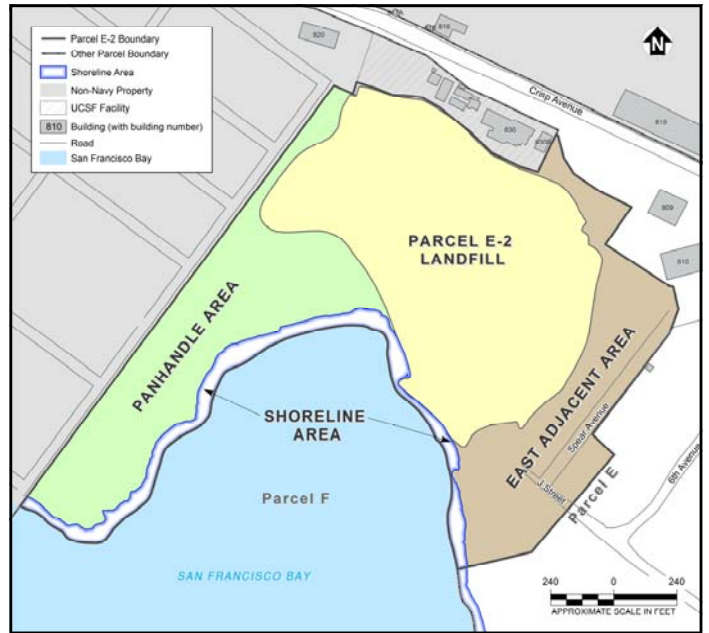


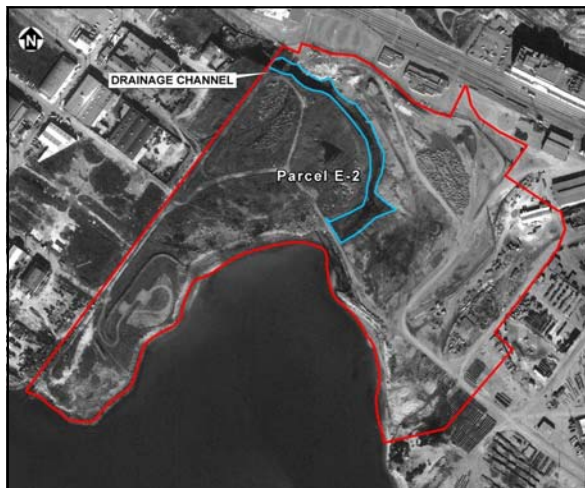
Figure 3. Parcel E-2 Areas.



1955 Aerial Photograph. Filling began from the west (non-Navy property).



1965 Aerial Photograph. Filling of the eastern edge of landfill began.



1969 Aerial Photograph. Filling at the landfill was nearly complete, with only a narrow drainage channel remaining.



1974 Aerial Photograph. Landfill covered with soil (between 2 and 5 feet thick).

- Construction debris (including wood, steel, concrete, and soil)
- Municipal-type trash (including paper, plastic, and metal)
- Industrial waste (including *sandblast waste*, paint sludge, solvents, and waste oils)

The Navy's investigations showed that the landfill waste consists of mostly construction debris and trash, with smaller amounts of industrial waste. The photograph below shows typical waste in the landfill, and Figure 4 (on page 5) presents a conceptual drawing of the landfill contents adjacent to the UCSF facility.



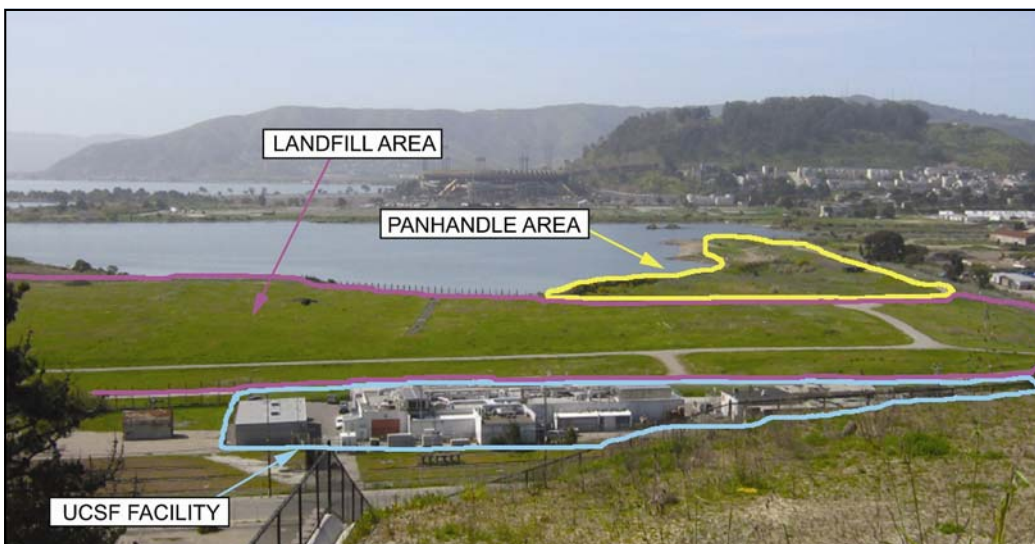
Typical Waste in Parcel E-2 Landfill.
Note continuous layer of construction debris and trash that begins several feet below the ground surface.

After the landfill closed in the early 1970s, the Navy covered it with 2 to 5 feet of soil. The placement of a soil cover was a standard practice at the time and was prior to the existence of any environmental regulations for landfills. The volume of the soil cover, landfill waste, and soil under the waste (which is likely contaminated) is estimated to be more than 1,000,000 cubic yards. This volume is equal to about one football field, with about 470 feet of soil on top. The landfill waste is estimated to extend as deep as 25 feet.

The East Adjacent Area was created by filling in the bay prior to the 1950s with soil and construction debris. Some industrial waste was disposed of in parts of the East Adjacent Area, including an area referred to as the *Polychlorinated Biphenyl [PCB] Hot Spot Area*.

The Panhandle Area was created by filling in the bay in the 1950s with soil and construction debris. The Navy disposed of *metal slag* in a part of the Panhandle Area referred to as the Metal Slag Area. Also, the Navy tested ship-shielding technologies using *radioactive chemicals* in another part of the Panhandle Area referred to as the Ship-Shielding Area. The Navy has excavated waste and contaminated soil in the PCB Hot Spot Area and the Metal Slag Area as part of removal actions described on the following page. The Navy has also started another removal action to identify and excavate radiological contamination from the Ship-Shielding Area.

The Shoreline Area is adjacent to San Francisco Bay and contains contaminated sediments. The contaminated sediments above mean sea level will be addressed by the selected remedial action for Parcel E-2. Contaminated sediments below mean sea level will be addressed by the selected remedial action for Parcel F, the Navy's property offshore of HPNS .



Current conditions at Parcel E-2, looking south from adjacent hillside.

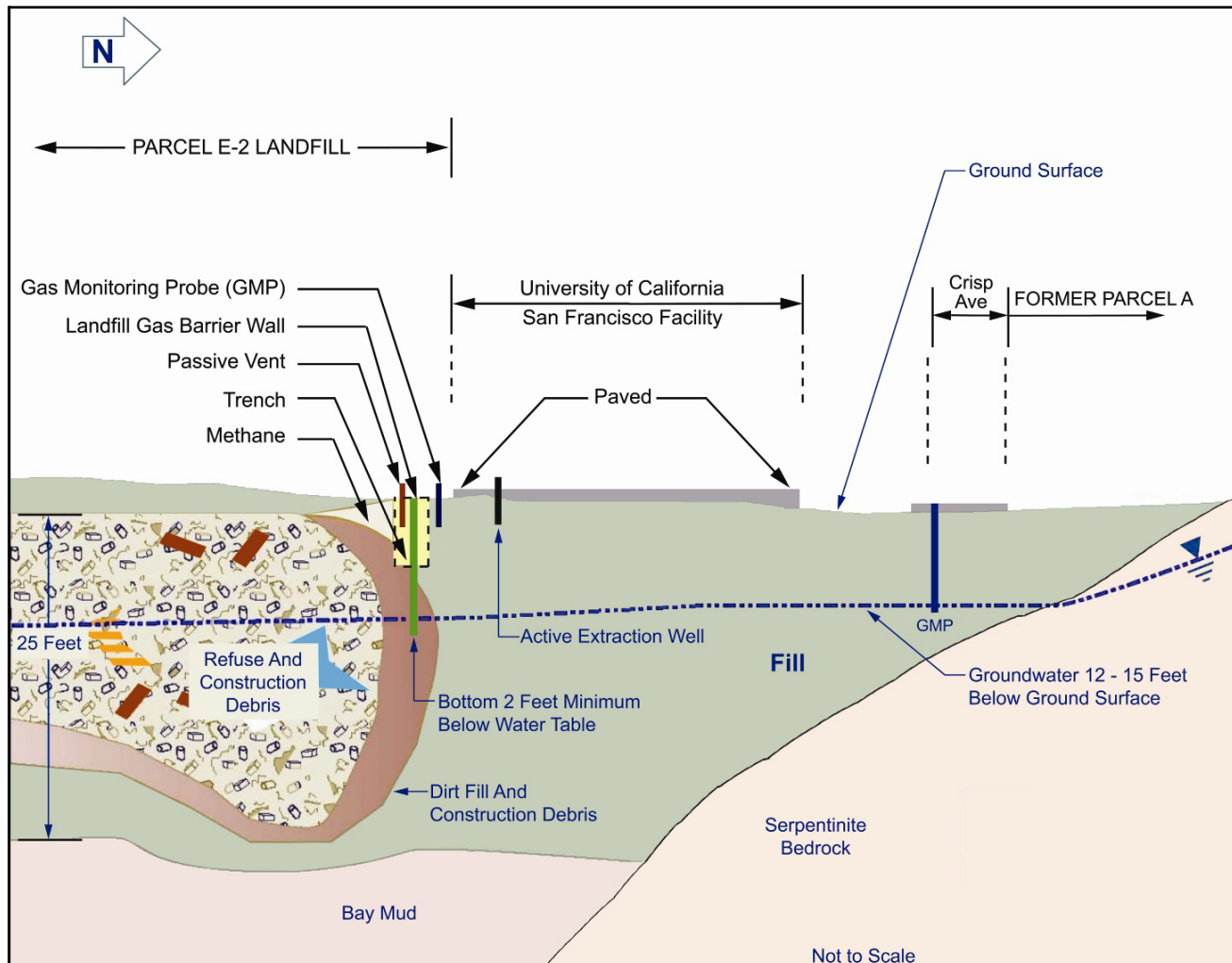


Figure 4. Conceptual Cross Section of Parcel E-2 Landfill near UCSF Facility.

Previous Investigations

Parcel E-2 was one of the first environmental investigation sites identified at HPNS during the Initial Assessment Study (1984), and the Navy has performed numerous environmental investigations at Parcel E-2 since then.

The Navy has collected extensive information during these investigations, as well as during ongoing environmental monitoring programs for groundwater and landfill gas, including:

- Over 2,000 soil samples and over 800 *groundwater samples* analyzed for various radioactive and nonradioactive chemicals to determine the types and concentrations of chemicals
- Over 30 trenches and over 200 *soil borings* to identify the types of waste disposed of at Parcel E-2
- Over 3,000 soil gas and outdoor air samples analyzed for *methane* and other *organic chemicals* to track emissions from the landfill

- Special investigations to address the unique site conditions at Parcel E-2 that included identifying buried waste using special *geophysical instruments*, evaluating *liquefaction potential*, identifying existing wetlands, and analyzing shoreline sediment for various chemicals

Figure 5 on page 6 shows the locations where samples were collected to analyze groundwater, soil, landfill gas, and radiation during the numerous site investigations. The RI/FS Report and radiological addendum summarize the results of the environmental investigations at Parcel E-2 and document how much is known about the site. The previous investigations provide sufficient information to evaluate site risks, develop remedial alternatives, and support the Navy's Preferred Alternative.

Past and Current Removal Actions

The Navy has also performed several removal actions at Parcel E-2 (Figure 6 on page 6) in order to minimize potential exposure to hazardous chemicals. Although these potential exposures did not pose an immediate risk to the public, the Navy decided to take early action because

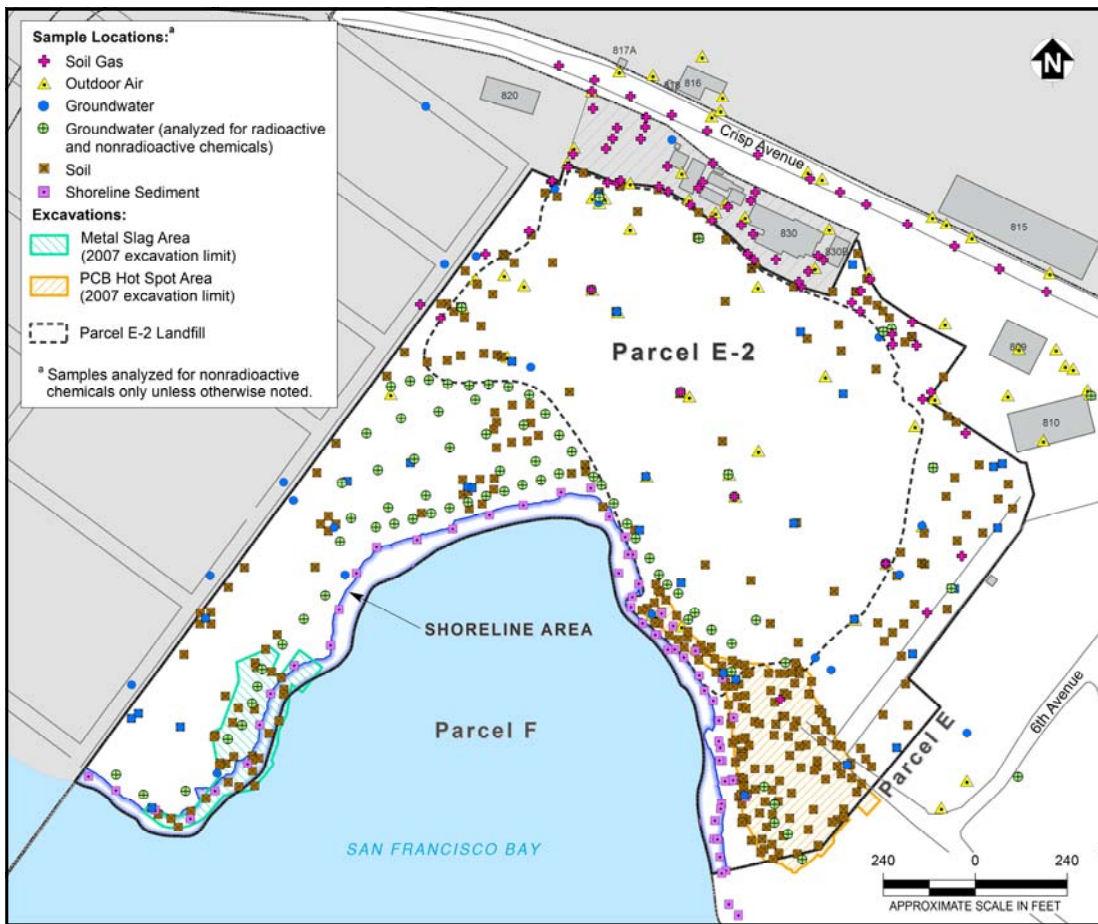


Figure 5. Sample Locations from Past Investigations.

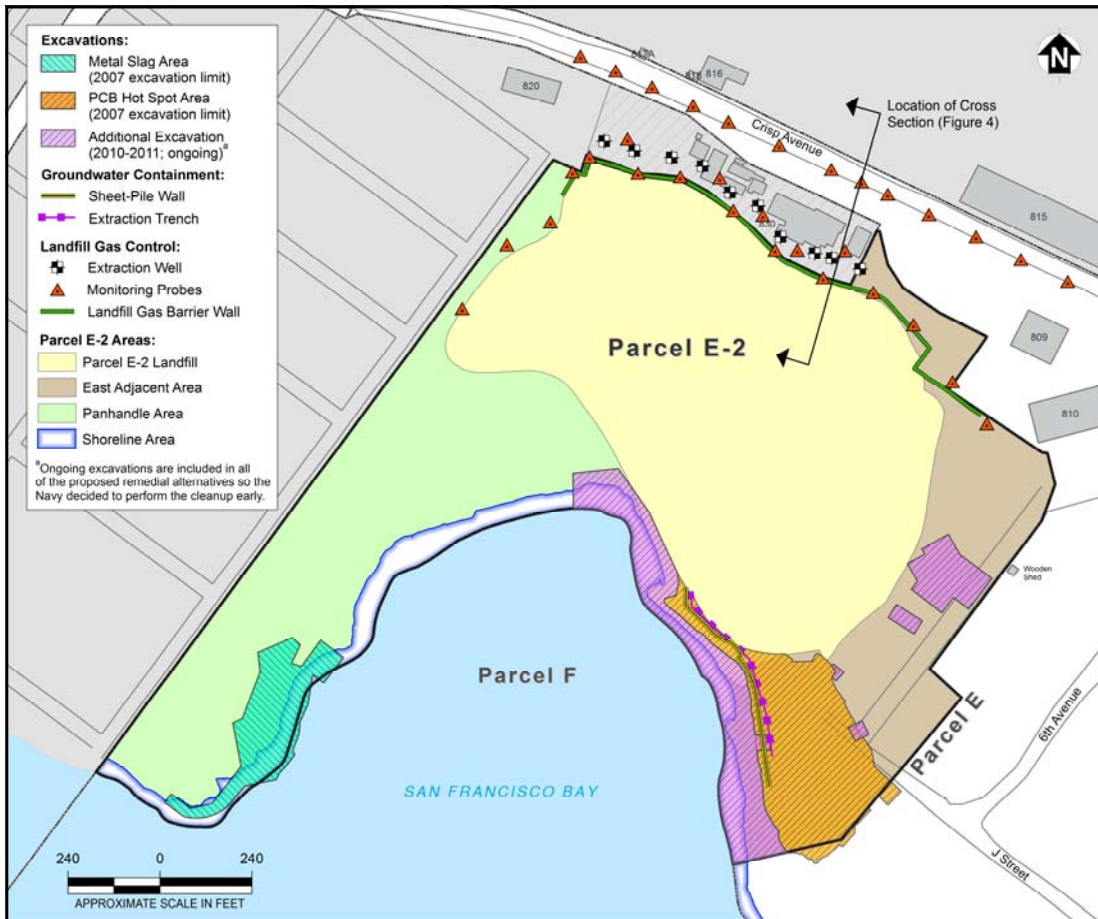


Figure 6. Previous Removal Actions.

these areas contained the most significant contamination at Parcel E-2.

- Groundwater Extraction System, 1997–1998: a vertical sheet-pile wall and groundwater extraction system were installed at the southeast portion of Parcel E-2 to control contaminated groundwater next to San Francisco Bay. The sheet-pile wall, which remains in place, consists of interlocking steel panels and limits the flow of groundwater to the bay. The extraction system, which was removed in 2005, consisted of horizontal and vertical pipes and groundwater pumps, and removed contaminated groundwater, which was transported off site for treatment. The Navy operated the extraction system until 2005, when it was removed so that the contaminant source (the PCB Hot Spot Area) could be excavated and disposed of off site. During the 6 years of operation, the extracted groundwater was tested for chemical contaminants and found to meet the City and County of San Francisco’s requirements for direct discharge to the sewer system.
- Landfill Cap Construction, 2000–2001: a protective liner and soil cover were installed over part of the landfill (about 14.5 acres) to stop the smoldering below ground following a brush fire. The fire started on August 16, 2000, and was extinguished at the surface within 6 hours, but small areas continued to smolder below ground for approximately 1 month. Because the protective liner and soil cover limit air from entering into the landfill, the effect was a smothering of any smoldering areas below ground. Additional information on construction of the protective liner and soil cover and air monitoring performed following the fire and during the cap construction is provided in the RI/FS Report.
- Landfill Gas Removal Action, 2002–2003: a landfill gas barrier wall, monitoring probes, and extraction wells were installed along the northern Parcel E-2 boundary to control gas from moving past the landfill boundary. The barrier wall, which consists of thick interlocking plastic panels, limits the landfill gas from moving past the wall and directs it into a collection trench (Figure 4 on page 5). The monitoring probes are used to verify that landfill gas is properly controlled. The extraction wells, which were used from 2002 to 2003 to remove landfill gas that had migrated under the UCSF facility, are currently used for monitoring purposes only. The Navy continues to operate this system to control landfill gas.

- Metal Slag Area Removal Action, 2005–2007: 8,200 cubic yards of contaminated soil and sediment, including 119 cubic yards of material with radioactive chemicals, were excavated from this area in the southwest portion of Parcel E-2 and disposed of off site.
- PCB Hot Spot Area Removal Action (Phase 1), 2005–2007: 44,500 cubic yards of contaminated soil, including 611 cubic yards of material with radioactive chemicals, was excavated from this area in the southeast portion of Parcel E-2 and disposed of off site.
- PCB Hot Spot Area Removal Action (Phase 2), 2010–2011: approximately 40,000 cubic yards of contaminated soil is currently being excavated from areas not addressed during the Phase 1 removal action. The excavated soil is being disposed of off site, and the work is expected to be completed in early 2012 .

The removal actions described above successfully removed significant amounts of contamination from certain Parcel E-2 areas; however, contamination remains elsewhere at Parcel E-2, which the Navy intends to address with the Preferred Alternative described in this Proposed Plan.

Potential Radioactive Wastes at Parcel E-2

The Navy prepared a *Historical Radiological Assessment* that identified areas where low-level radiological waste may have been disposed of at Parcel E-2. These areas are shown on Figure 7.

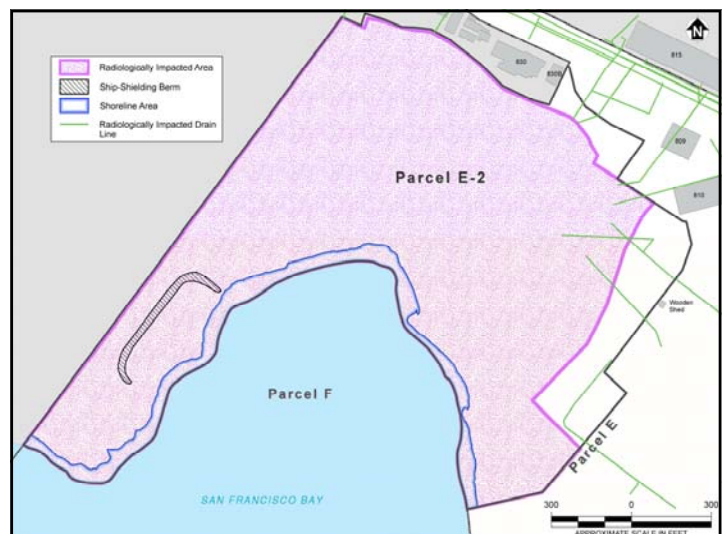


Figure 7. Radiologically Impacted Sites.

The following radiological waste disposal activities were documented at Parcel E-2:

- Disposal of dials, gauges, and deck markers painted with *radioactive paint* (to make the devices glow in the dark) at the Parcel E-2 Landfill, the Panhandle Area, and the East Adjacent Area
- Disposal of industrial debris and metal slag with dials, gauges, and deck markers painted with radioactive paint at the Metal Slag Area (removed during a previous removal action)
- Potential discharge of small amounts of low-level radioactive chemicals into drains at *Naval Radiological Defense Laboratory (NRDL)* buildings; former NRDL buildings were located outside of Parcel E-2 (in Parcel E) but their drain lines may have led to drain lines in the eastern part of Parcel E-2. The drain lines in Parcel E and any contamination in them are currently being excavated as part of an ongoing removal action being performed throughout HPNS.
- Materials used in radiological experiments by NRDL may have been disposed of at the Parcel E-2 Landfill, the Panhandle Area, and the East Adjacent Area. However, historic records presented in the Historical Radiological Assessment suggest that such material was strictly controlled, particularly after 1954 when the Atomic Energy Commission began regulating the use of radioactive chemicals at HPNS. This information suggests that the volume of NRDL waste potentially disposed of in the Parcel E-2 Landfill was relatively low because most of the landfill was filled after 1955.
- Sandblast waste from cleaning ships used during weapons testing in the South Pacific may have been disposed of at the Parcel E-2 Landfill, the Panhandle Area, and the East Adjacent Area. However, historic records presented in the Historical Radiological Assessment suggest that waste with the highest levels of radioactivity was controlled and not disposed of at Parcel E-2.

Because of the potential for sandblast waste to contain radiological contamination, the Navy has separated and tested any sandblast waste found during cleanup activities at HPNS. Sandblast waste found during past cleanup activities at Parcel E-2 (and other HPNS parcels) did not have elevated radioactivity above naturally occurring background levels. The Navy collected over 1,000 soil samples from Parcel E-2 and analyzed the samples for various radioactive chemicals. Radium-226,

which is commonly used in radioactive paint but also occurs naturally in the environment, was the most common radioactive chemical found in Parcel E-2 soil.

In addition, the Navy tested ship-shielding technologies using radioactive chemicals in another part of the Panhandle Area referred to as the Ship-Shielding Area, and the Navy started another removal action to identify and excavate radiological contamination from this area. The Navy also performed investigations to identify potential radioactive chemicals in groundwater at Parcel E-2. The investigations included analysis of samples from 68 wells located close to San Francisco Bay, and found that groundwater at Parcel E-2 does not contain radioactive chemicals at levels that could impact humans or wildlife in the bay.

Landfill Gas at Parcel E-2

Landfill gas consists mostly of methane and smaller amounts of other organic chemicals (referred to as nonmethane organic compounds or NMOCs) that are produced as waste decomposes. Municipal-type trash (such as paper and food waste) and wood debris generate methane gas when buried. Methane gas poses an explosive hazard if it migrates to the surface or under buildings at concentrations greater than 5 percent by volume.

The Navy's past investigations identified elevated concentrations of methane gas north of the Parcel E-2 Landfill (under the UCSF facility), but not in any other areas of Parcel E-2. Although these conditions did not pose an immediate risk to the public, the Navy performed the following activities in response to the elevated concentrations of methane gas under the UCSF facility:

- Removed and treated landfill gas that had migrated under the UCSF facility
- Built a gas control, extraction, and treatment system to prevent gas from moving past the landfill boundary

Figure 6 on page 6 shows the location where the Navy performed the removal action for landfill gas. Monitoring performed since January 2004 has shown that landfill gas is being properly controlled. Monitoring has also shown that concentrations of NMOCs are within safe limits. The Navy continues to conduct monthly monitoring for both methane and NMOCs.

SUMMARY OF SITE RISKS AT PARCEL E-2

“Risk” is the likelihood or probability that a hazardous chemical, when released to the environment, will cause effects (such as cancer or other illnesses) on exposed humans or wildlife. Figure 8 below shows the ways, such as breathing of contaminants from soil, that people and wildlife may be exposed to contamination (referred to as the *exposure pathway*).

The Navy evaluated the risk to humans and wildlife from exposure to contaminated soil, shoreline sediment, landfill gas, and groundwater. Table 1 (page 10) shows the list of exposure pathways and human and ecological *receptors* considered in the *risk assessments*. The risk calculations were based on site conditions prior to the cleanup, and all of the risks at the site will be minimized by the cleanup. The green-shaded features on Figure 8 show possible ways that the cleanup can prevent exposures of humans and wildlife to landfill gas and contaminated soil, shoreline sediment, and groundwater. The risk assessment results are summarized below.

Human Health Risk Assessment (HHRA). The Navy evaluated risk to human health at Parcel E-2 in the HHRA that were presented in the RI/FS Report for Parcel E-2 and its radiological addendum. The Navy considered the various ways that humans might be exposed to chemicals

(see Table 1 on page 10), the possible concentrations of chemicals that could be encountered during exposure, and the potential frequency and duration of exposure (referred to as “*exposure scenarios*”). These exposure scenarios depend on the future use of the land. The Navy evaluated risk using an exposure scenario for a recreational user (because Parcel E-2 will be used in the future for open space, including parks and restored wetlands) and for a construction worker.

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. Human health risk is classified as cancer risk (from exposure to carcinogens) or noncancer hazard (from exposure to noncarcinogens).

Cancer risk is the estimated probability that a person will develop cancer from exposure to site contaminants, and is generally expressed as an upper bound probability. For example, a 1 in 10,000 chance is a risk that for every 10,000 people, one additional cancer case may occur as a result of exposure to site contaminants. A 1 in 1,000,000 chance is a risk that for every 1,000,000 people, one additional cancer case may occur as a result of exposure to site contaminants. The Navy adopted a conservative approach at Parcel E-2 and evaluated action where potential risk exceeded 1 in 1,000,000, which meets the

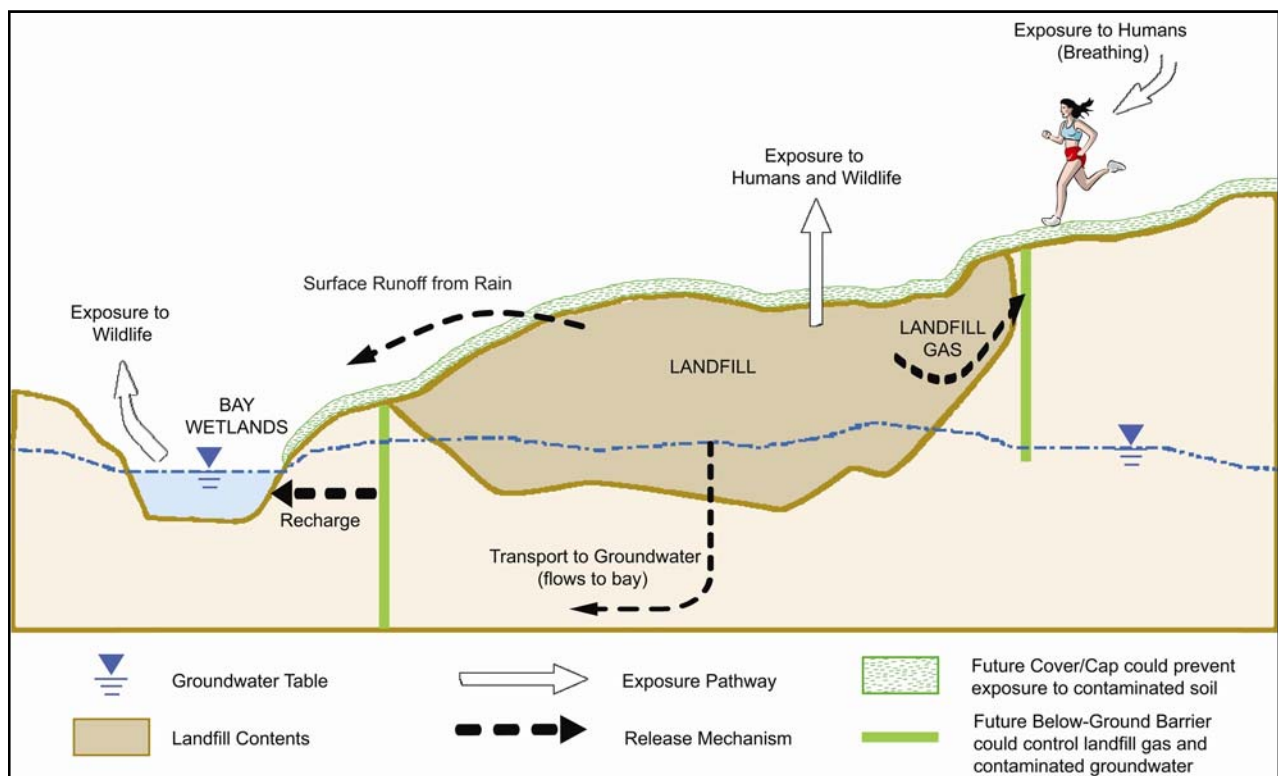


Figure 8. Ways that Humans and Wildlife Can Be Exposed to Contamination Without Some Form of Cleanup (such as removal or containment, shown in green).

Table 1: Exposure Pathways and Potential Receptors at Parcel E-2

| Soil, Sediment, and Landfill Gas | Groundwater | Radionuclides |
|--|---|---|
| <ul style="list-style-type: none"> ▪ Touching or eating contaminated soil or sediment: recreational users, construction workers, and wildlife on the land. ▪ Breathing of contaminants from soil or in landfill gas: recreational users and construction workers ▪ Human exposure to methane gas is not evaluated in the HHRA because it is not toxic. The Navy evaluated methane gas by comparing methane concentrations with the regulatory limit of 5 percent (the level above which an explosive hazard is present) | <ul style="list-style-type: none"> ▪ Touching or breathing vapors from contaminated shallow groundwater: construction workers ▪ Drinking or showering with contaminated deep groundwater: residents (but only if groundwater is used for domestic purposes, which is unlikely because of high natural salt levels) ▪ Touching or drinking contaminated groundwater that could migrate to San Francisco Bay: wildlife in the bay (but only if groundwater is released to the bay carrying chemicals at concentrations greater than regulatory limits) | <ul style="list-style-type: none"> ▪ Touching or eating contaminated soil, sediment, or other material: recreational users and construction workers ▪ Breathing of contaminants from soil, sediment, or other material: recreational users and construction workers ▪ Exposure to radioactivity coming from soil, sediment, or other material: recreational users and construction workers |

most conservative end of the risk management range established by EPA.

Noncancer hazard is the risk of health effects other than cancer, and is expressed as a number called the hazard index (HI). An HI of 1 or less is considered an acceptable exposure level for noncancer health hazards. The Navy evaluated action at Parcel E-2 areas with an HI greater than 1.

At Parcel E-2, the cancer risks from exposure to contaminated soil and groundwater are greater than 1 in 1,000,000 and noncancer HIs are greater than 1 (see Tables 2 and 3 on page 11). The estimated cancer risk from exposure to landfill gas is less than 1 in 1,000,000 (see Table 3 on page 11).

The Navy plans to perform remedial actions at areas with cancer risks greater than 1 in 1,000,000 and noncancer HIs greater than 1. The Navy and environmental regulators developed preliminary remediation goals (PRGs) for chemicals that pose a potential risk (Tables 4 and 5 on page 11, and Table 6 on page 12 identify PRGs for the most significant chemicals). Human exposure to chemical concentrations exceeding the PRGs poses an *unacceptable risk* that would be addressed by the remedial actions.

Screening-Level Ecological Risk Assessment. The Navy performed a screening-level ecological risk assessment to evaluate risks to wildlife (such as small mammals, birds, and marine life) and concluded that contaminated soil and shoreline sediment in Parcel E-2 pose a potential threat to wildlife. The Navy developed PRGs for chemicals that pose a potential risk (Table 4 on page 11 identifies PRGs for the most significant chemicals). Ecological exposure to chemical concentrations that pose an unacceptable risk would be addressed by the remedial actions.

The Navy also compared data for chemicals detected in groundwater with values the Water Board uses to protect aquatic wildlife in San Francisco Bay. The screening evaluation found that *metals* and organic chemicals in groundwater may pose a potential risk to aquatic wildlife if groundwater with these chemicals reaches the bay. The remedial action would control (through either containment or removal of the contaminant source) these chemical concentrations in groundwater and protect aquatic wildlife in the bay.

REMEDIAL ACTION OBJECTIVES

After the risk assessments were completed, the Navy developed remedial action objectives to assist in identifying and assessing remedial alternatives that would address risks at Parcel E-2. Remedial action objectives are established for soil, sediment, and groundwater at Parcel E-2. Each remedial action objective takes into account (1) the *chemicals of concern (COCs)*, (2) the ways people or wildlife could be affected, and (3) an associated acceptable chemical concentration or range of concentrations (known as PRGs). The remedial action objectives were developed in conjunction with the regulatory agencies and are consistent with the expected future uses of Parcel E-2.

Most of the remedial action objectives include PRGs. Exposure to chemical concentrations exceeding the PRGs poses an unacceptable risk that would be addressed by the remedial actions. PRGs for the most significant COCs are presented in Tables 4 and 5 on page 11 and Table 6 on page 12 and will be finalized in the ROD. The remedial action objectives are listed on page 12.

Table 2. Maximum Cancer Risks and Noncancer Hazards from Soil Before Cleanup^a

| Parcel E-2 Area | Exposure Scenario | Cancer Risk | | Noncancer Hazard Index |
|---------------------|-------------------|-------------|--------------|------------------------|
| | | Chemical | Radiological | |
| Parcel E-2 Landfill | Recreational | 2 in 10,000 | 2 in 10,000 | 20 |
| Panhandle Area | Recreational | 6 in 10,000 | 1 in 10,000 | 6 |
| East Adjacent Area | Recreational | 6 in 10,000 | 2 in 10,000 | 100 |

Notes:

a Listed risk value is the highest calculated value for Parcel E-2; risk is based on conditions before cleanup.

Table 3: Maximum Cancer Risks and Noncancer Hazards from Landfill Gas and Groundwater Before Cleanup^{a,b}

| Exposure Pathway | Exposure Scenario | Cancer Risk | Noncancer Hazard Index |
|------------------------------------|--------------------------|-----------------|------------------------|
| Breathing Vapors from Landfill Gas | Residential ^c | 6 in 10,000,000 | <1 |
| Breathing Vapors from Groundwater | Construction Worker | 1 in 10,000 | <1 |
| Drinking Groundwater | Residential ^d | 5 in 1,000 | 80 |

Notes:

a Listed risk value is the highest calculated value for Parcel E-2; risk is based on conditions before cleanup.

b No complete exposure pathways for planned open space reuse; other pathways evaluated to conservatively estimate risk.

c Evaluation used gas data collected north of the landfill for residential exposure scenario.

d Evaluation used shallow and deep groundwater data; groundwater is an unlikely source of drinking water because of high natural salt levels.

Table 4. Preliminary Remediation Goals for Select Chemicals in Soil and Sediment^{a,b}

| Exposure Scenario | Chemical of Concern | PRG (mg/kg) | Exposure Scenario | Chemical of Concern | PRG (mg/kg) |
|---------------------|---------------------|-------------|---------------------------|---------------------|-------------|
| Recreational | Heptachlor epoxide | 0.21 | Wildlife on the land | Copper | 470 |
| | Lead | 155 | | Lead | 197 |
| | Total PCBs | 0.74 | | Total PCBs | 37 |
| Construction Worker | Copper | 11,000 | Wildlife on the shoreline | Copper | 270 |
| | Heptachlor epoxide | 1 | | Lead | 218 |
| | Total PCBs | 2.1 | | Total PCBs | 0.18 |
| | Total TPH | 3,500 | | | |

Notes:

a The listed chemicals are those found in soil and sediment at concentrations that are much higher than (10 or 100 times) the levels considered safe for humans and wildlife. Areas with these high concentrations are referred to as hot spots, and several of these hot spots (identified on Figure 9) are currently being excavated as part of a removal action (see Figure 5).

b The source of the PRGs is presented in Sections 7 and 9 of the RI/FS Report.

mg/kg = milligrams per kilogram

PRGs = preliminary remediation goals

PCBs = polychlorinated biphenyls

TPH = total petroleum hydrocarbons

Table 5. Preliminary Remediation Goals for Select Chemicals in Groundwater^{a,b}

| Exposure Scenario | Chemical of Concern | PRG (µg/L) | Exposure Scenario | Chemical of Concern | PRG (µg/L) |
|---|---|-----------------|----------------------------------|---------------------|------------|
| Construction Worker Exposure to Shallow Groundwater | Benzo(a)pyrene | 0.05 | Domestic Use of Deep Groundwater | 4-Nitrophenol | 3.4 |
| | Benzo(b)fluoranthene | 0.45 | | Aroclor-1242 | 0.5 |
| | Dibenz(a,h)anthracene | 0.05 | | Aroclor-1260 | 0.5 |
| | Lead | 15 | | Arsenic | 10 |
| Wildlife in the Bay | Total TPH (goals vary based on distance from the bay) | 1,400 to 20,000 | Iron | 10,950 | |
| | | | Lead | 15 | |

Notes:

a The listed chemicals are those found in shallow and deep groundwater at concentrations that contribute most (greater than 80 percent) of the estimated risk for the individual exposure scenarios.

b The source of the PRGs is presented in Sections 7 and 9 of the RI/FS Report.

PRGs = preliminary remediation goals

TPH = total petroleum hydrocarbons

µg/L = micrograms per liter

Table 6. Preliminary Remediation Goals for Radioactive Chemicals

| Radioactive Chemical of Concern | Soil (pCi/g) | |
|---------------------------------|----------------|-----------------------|
| | Outdoor Worker | Resident ^a |
| Cesium-137 | 0.113 | 0.113 |
| Cobalt-60 | 0.0602 | 0.0361 |
| Radium-226 | 1.0 | 1.0 |
| Strontium-90 | 10.8 | 0.331 |

Notes: The source of the PRGs is presented in Sections 7 and 9 of the radiological addendum.

a Residential use is not planned for Parcel E-2, but residential goals were specified as an additional level of protection.

pCi/g = picocuries per gram

PRGs = preliminary remediation goals

- Prevent or minimize migration of deep groundwater that may contain chemicals at concentrations greater than PRGs beyond the Parcel E-2 boundary.
- Prevent or minimize migration of chemicals in shallow groundwater (that were identified in the groundwater screening-level ecological risk assessment) from migrating to the bay.

Remedial Action Objectives for Radiological Contamination

- Protect people from exposures¹ to radioactive chemicals at levels greater than the PRGs.

SUMMARY OF REMEDIAL ALTERNATIVES

The Navy developed a range of alternatives in the FS to address contamination at Parcel E-2. The remedial alternatives evaluated in the FS ranged from no action to complete removal of the Parcel E-2 Landfill. All of the alternatives, except for the no action alternative, address the remedial action objectives. The Navy evaluated several remedial alternatives involving partial removal along with containment because EPA guidance indicates that these types of actions are usually the most appropriate for large landfills (greater than 10 acres) such as Parcel E-2. The remedial alternatives, which are presented in Table 7 (page 14) and summarized below, present a variety of methods with different costs and approaches to meet the remedial action objectives.

Alternative 1 is no action; CERCLA requires an evaluation of a no action alternative to provide a baseline for comparison with other remedial alternatives. Under a no action alternative, no further cleanup is conducted.

Alternative 2 consists of removing all waste and contaminated soil from the 22-acre Parcel E-2 Landfill (up to 30 feet deep, which includes soil under the waste that may be contaminated) and all shallow soil and sediment from the Panhandle Area, East Adjacent Area, and Shoreline Area (ranging from 2.5 to 4 feet deep in most areas, with some locations extending as deep as 16 feet). Alternative 2 would involve excavating 1,166,000 cubic yards of waste, soil, and sediment from Parcel E-2. This volume is equal to about one football field, with about 550 feet of soil on top. The Navy estimates that it would take about 4 years to excavate the material, transport and dispose of the material off site at an appropriate landfill, and fill the excavation with clean soil. The Navy and the regulatory agencies would also implement ICs for

Remedial Action Objectives for Soil and Shoreline Sediment (and associated waste)

- Protect people from exposures¹ to vapors from soil or from eating and touching soil with chemical concentrations greater than the PRGs.
- Protect wildlife from exposures from eating and touching soil or sediment with chemical concentrations greater than PRGs.

Remedial Action Objectives for Landfill Gas

- Control methane concentrations to levels identified in State of California regulations to protect the public. These levels are 5 percent (by volume in air) or less at the Parcel E-2 boundary and 1.25 percent (by volume in air) or less in buildings near the landfill or any future structures placed on or near the landfill.
- Protect people from exposures¹ to NMOCs at concentrations greater than conservative levels that will protect the public, as determined by the Navy's risk assessment findings. These levels are 500 *parts per million by volume (ppmv)* at the Parcel E-2 boundary, and greater than 5 ppmv above background levels (the levels measured upwind of the site) in the breathing zone of on-site workers and visitors.

Remedial Action Objectives for Groundwater

- Protect people from drinking or showering in groundwater that may contain chemical concentrations greater than the PRGs.
- Protect construction workers from touching or breathing chemicals that may be in groundwater at concentrations greater than the PRGs.

¹ Exposure of construction workers during redevelopment, using appropriate construction health and safety practices, will not result in unacceptable health risks.

continued protection of human health and the environment and to ensure the integrity of the proposed actions (for example, to make sure that people are not exposed to any remaining contamination in deep soil at the Panhandle Area, East Adjacent Area, and Shoreline Area. An overview of ICs is provided on page 21.

Alternative 3 consists of removing contaminated soil from selected areas (referred to as “hot spots”) followed by covering the remaining soil, waste, and sediment with at least 2 feet of clean soil. Alternative 3 would involve excavating 17,300 cubic yards of waste, soil, and sediment from Parcel E-2 (up to 16 feet deep), with disposal off site at an approved landfill. The hot spots proposed for excavation are close to San Francisco Bay (Figure 9).

The goals for the excavations are 10 times the PRGs listed in Table 4 (page 11), and will remove the soil that poses the most significant risk to humans and wildlife prior to installing the soil cover. In addition, the entire parcel would be scanned for radioactivity to a depth of 1 foot, and radiological contamination near the ground surface would also be excavated and disposed of off site at an approved landfill.

Excavation would also be performed in the Panhandle Area to build new wetlands (both tidal and freshwater),

and the excavated material would be screened to remove radiological contamination before placing it elsewhere on Parcel E-2. This process is referred to as “*on-site consolidation,*” and is an effective way to address low levels of contamination prior to covering with clean soil. A minimum 2-feet-thick soil cover would be placed over all of Parcel E-2, and a protective liner would be placed under the soil cover in all areas except the new tidal wetlands (the soil cover in the wetlands would be 4-feet-thick) to minimize water seeping into the contaminated material.

Alternative 3 would include elements to control landfill gas and limit the flow of contaminated groundwater to San Francisco Bay. The Navy estimates that it would take about 2 years to excavate the material, transport and dispose of the material off site at an appropriate landfill, fill the excavation with clean soil, and install the protective liner and soil cover. Alternative 3 would also include monitoring and maintenance that would be performed as long as necessary to protect human health and the environment. The Navy and the regulatory agencies would also implement ICs for continued protection of human health and the environment and to ensure the integrity of the proposed actions. An overview of ICs is provided on page 21.

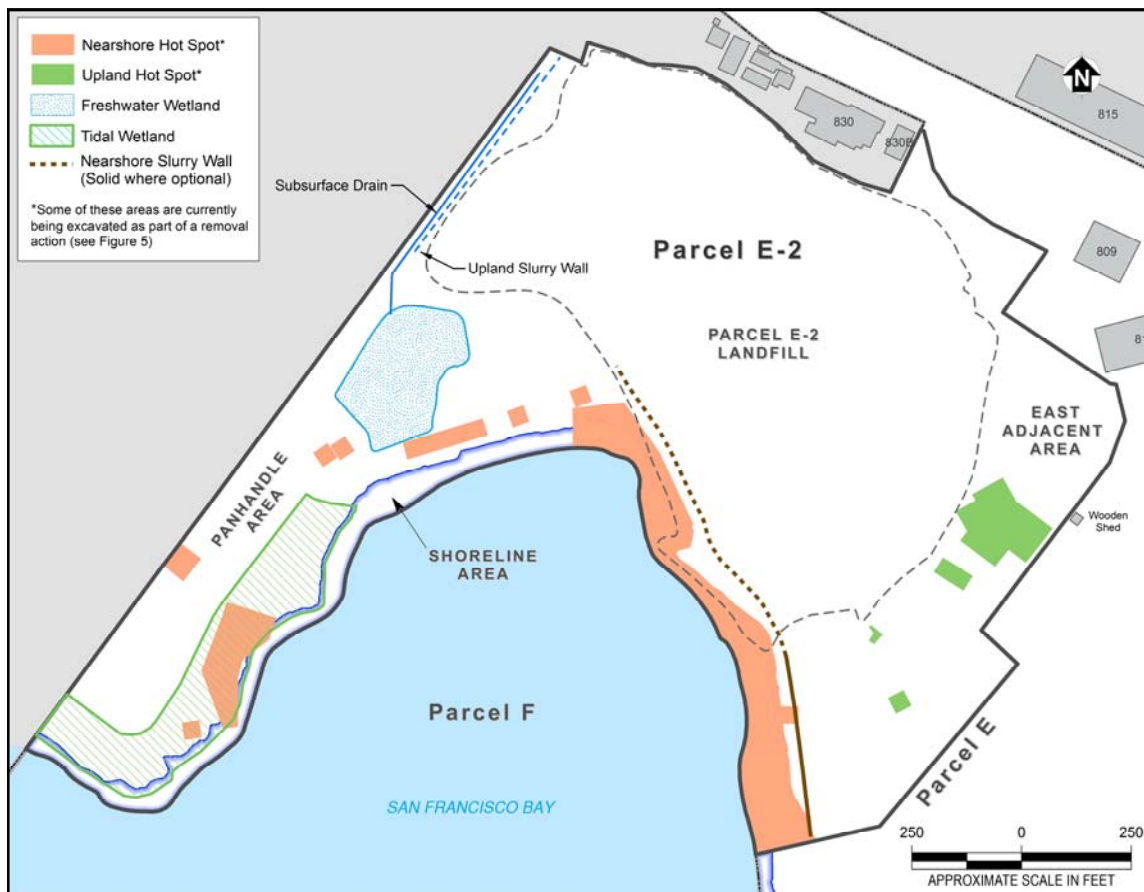


Figure 9. Alternative 5 Hotspot Excavations and Groundwater Containment Features.

Table 7. Remedial Alternatives for Solid Waste, Soil, Sediment, and Groundwater

| Remedial Alternative | Approx. Cost (\$M) | Components of Remedial Alternative |
|----------------------|--------------------|---|
| 1 | 0 | No Action: No actions or costs; this alternative is required by CERCLA as a baseline for comparison with the other alternatives. |
| 2 | 351.5 | <p>Excavation and Off-Site Disposal: Excavate all waste and contaminated soil in the Parcel E-2 Landfill and all shallow waste, soil, and sediment in the Panhandle Area, East Adjacent Area, and Shoreline Area. Dispose of excavated waste and contaminated soil and sediment at an off-site landfill.</p> <p>Wetlands Restoration in Panhandle Area and Shoreline Area: Build new tidal and freshwater wetlands with appropriate soil and vegetation. Maintain and monitor wetlands.</p> <p>Groundwater Monitoring: Implement long-term monitoring of groundwater to assess whether chemicals are migrating and to monitor changes in ambient conditions.</p> <p>ICs: Impose ICs to limit the use of land or restrict activities that take place within an area. The ICs for Parcel E-2 are listed on page 21.</p> <p>Additional Radiological Actions: Excavate potential radioactive contamination from (1) drain lines that extend into the East Adjacent Area but are located outside of the boundary of IR Site 01/21, and (2) ship-shielding berm in Panhandle Area. Dispose of excavated waste and soil at an off-site landfill. Perform final radiological surveys at all excavated areas prior to backfilling with clean, imported soil.</p> |
| 3 | 78.4 | <p>Excavation and Off-Site Disposal: Excavate all radioactive contamination near the ground surface and isolated areas with contaminated soil and waste in the Panhandle Area, East Adjacent Area, and Shoreline Area (Tiers 1 and 2 hot spots). Dispose of excavated waste and soil at an off-site landfill.</p> <p>Excavation and On-Site Consolidation: Excavate soil and debris from the parts of the Panhandle Area planned for new wetlands, and excavate sediment and debris from the Shoreline Area. Consolidate excavated soil, sediment, and debris at Parcel E-2.</p> <p>Containment: Install soil cover over all of Parcel E-2 and place a protective liner under the soil cover in all areas except the new tidal wetlands in the Panhandle Area. Build shoreline revetment at the edge of the soil cover. Perform active landfill gas extraction and treatment. Install below-ground barrier and drain at western boundary to divert groundwater flow into the landfill. Inspect and maintain soil cover, protective liner, groundwater barrier/drain, and gas control system.</p> <p>Wetlands Restoration in Panhandle Area: Build new tidal wetlands with appropriate soil and vegetation, but without a liner and shoreline revetment. Build new freshwater wetlands with appropriate soil and vegetation, and with a liner and shoreline revetment. Maintain and monitor wetlands.</p> <p>Monitoring: Implement long-term monitoring of landfill gas, stormwater, and groundwater to assess whether chemicals are migrating and to monitor changes in ambient conditions.</p> <p>ICs: Impose ICs to limit the use of land or restrict activities that take place within an area. The ICs for Parcel E-2 are listed on page 21.</p> <p>Additional Radiological Actions: Excavate potential radioactive contamination from (1) drain lines that extend into the East Adjacent Area but are located outside of the boundary of IR Site 01/21, and (2) ship-shielding berm in Panhandle Area. Dispose of excavated waste and soil at an off-site landfill. Perform final radiological surveys at all excavated areas prior to backfilling with clean, imported soil.</p> |
| 4 | 86.6 | <p><i>All of the same elements as Alternative 3, but would also include:</i></p> <p>Additional Excavation and Off-Site Disposal: Excavate additional areas with contaminated soil and waste in the Panhandle Area, East Adjacent Area, and Shoreline Area (Tiers 3, 4, and 5 hot spots). Dispose of excavated waste and soil at an off-site landfill.</p> <p>Groundwater Containment: Build below-ground barrier along shoreline to better limit the flow of contaminated groundwater to San Francisco Bay. Extend the below-ground barrier south into the PCB Hot Spot Area, if needed to protect the bay.</p> <p>Natural Clay Liner for Freshwater Wetlands: New freshwater wetlands would be built with a natural clay liner.</p> |
| 5 | 86.7 | <p><i>All the same elements as Alternative 4, but would also include:</i></p> <p>No Liner for Freshwater Wetlands: New freshwater wetlands would be built without a liner.</p> |

Alternatives 4 and 5 include the same elements as Alternative 3, but include more excavations and additional elements to contain groundwater. A total of 33,500 cubic yards of waste, soil, and sediment would be removed from Parcel E-2 (up to 16 feet deep) and disposed of off site at an approved landfill. This is an additional 16,200 cubic yards compared to Alternative 3. The additional hot spots proposed for excavation are farther from San Francisco Bay and are located 4 to 5 feet below ground. As a result, these hot spots do not pose as significant of a risk to humans and wildlife as the hot spots close to San Francisco Bay. The goals for the

additional excavations are 100 times the PRGs listed in Table 4 (page 11), and will further reduce site risks prior to installing the soil cover. Similar to Alternative 3, the entire parcel would be scanned for radioactivity to a depth of 1 foot, and radiological contamination near the ground surface would be excavated and disposed of off site at an approved landfill. Alternatives 4 and 5 would also involve building a below-ground barrier near San Francisco Bay to better limit the flow of contaminated groundwater to the bay.

Alternatives 4 and 5 are different from each other only in the way that the new freshwater wetlands would be built.

Alternative 4 includes a natural clay liner under the freshwater wetlands, while Alternative 5 uses soil that would allow surface water to percolate underground. The Navy estimates that it would take about 2 years to implement either of these alternatives. Alternatives 4 and 5 would also include monitoring and maintenance that would be performed as long as necessary to protect human health and the environment.

Alternatives 2, 3, 4, and 5 all include components to address radiological contamination at Parcel E-2, including removal and cleanup of radiologically contaminated drain lines in the East Adjacent Area and removal of radiological contamination at the ship-shielding berm in the Panhandle Area.

EVALUATION OF REMEDIAL ALTERNATIVES

The Navy evaluated the remedial alternatives using the criteria specified by federal regulations in the NCP. General descriptions of the nine criteria are presented in the illustration above right. Protection of human health and the environment and compliance with state and federal laws and regulations, called *applicable or relevant and appropriate requirements (ARARs)*, are threshold criteria that each alternative must meet to be eligible for selection.

Key ARARs are summarized in Attachment 1 of this Proposed Plan and a complete discussion of ARARs for all of the alternatives is presented in Appendix N of the RI/FS Report and Appendix C of the radiological addendum.

The following five balancing criteria are used to weigh major tradeoffs in the benefits and limitations among alternatives: (1) long-term effectiveness and permanence; (2) reduction of toxicity, mobility, or volume through treatment; (3) short-term effectiveness; (4) implementability; and (5) cost. Modifying criteria include state acceptance and community acceptance. State acceptance is based on comments on the RI/FS Report and Proposed Plan. Community acceptance is evaluated based on comments received from the public during the comment period for the Proposed Plan.

Table 8 on page 16 summarizes the comparison of the remedial alternatives for Parcel E-2. The Navy's evaluation relative to the threshold and balancing criteria is summarized below.

Criteria 1 and 2: Overall Protection of Human Health and the Environment and Compliance with ARARs. Alternatives 2, 3, 4, and 5 provide adequate protection of human health and the environment and comply with state and federal ARARs. Therefore,



Alternatives 2, 3, 4, and 5 satisfy the two threshold criteria specified in the NCP and are eligible for selection as the final remedial action. Alternative 1, the “no action” alternative, would not provide adequate protection of human health and the environment and is not eligible for selection as the final remedial action.

Criterion 3: Long-Term Effectiveness and Permanence. Alternatives 2, 3, 4, and 5 each would be effective in the long-term. Alternative 2 would be most effective in the long-term because waste, soil, and sediment posing an unacceptable risk would be excavated and moved to another landfill. Alternatives 3, 4, and 5 would each be effective in the long-term because the hotspot areas would be removed and the final soil cover, protective liner, and control systems (for landfill gas and groundwater) would protect people and wildlife from being exposed to remaining contamination. The final cover, liner, and control systems would be maintained as

Table 8. Comparative Analysis of Alternatives for Parcel E-2

| 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 | Approx. Cost (\$M) |
|--|--|-----------------------|--|--|--------------------------|------------------|--------------------|
| 1: No Action | No | NA | | | | | 0 |
| 2: Excavate and Dispose of Solid Waste, Soil, and Sediment (including monitoring, ICs, and unlined freshwater wetlands) | Yes | Yes | | | | | 351.5 |
| 3: Contain Solid Waste, Soil, and Sediment with Hotspot Removal (including monitoring, ICs, and lined freshwater wetlands) | Yes | Yes | | | | | 78.4 |
| 4: Contain Solid Waste, Soil, Sediment, and Groundwater with Hotspot Removal (including monitoring, ICs, and lined freshwater wetlands) | Yes | Yes | | | | | 86.6 |
| 5: Contain Solid Waste, Soil, Sediment, and Groundwater with Hotspot Removal (including monitoring, ICs, and unlined freshwater wetlands) | Yes | Yes | | | | | 86.7 |

Notes:

Text in **blue** indicates preferred alternative.

Symbol:



Fill symbol by quarters from open (not acceptable) to full (excellent).

long as contamination that could pose an unacceptable risk remains at the site. Alternatives 4 and 5 each include additional actions (additional excavation and installation of the below-ground barrier near San Francisco Bay) that would make them more effective in the long-term when compared with Alternative 3.

Criterion 4: Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment.

Alternatives 2, 3, 4, and 5 would perform equally in the way they reduce the toxicity, mobility, and volume of contaminants through treatment. These alternatives focus on removing and/or containing contaminants at Parcel E-2, and do not involve a significant amount of treatment.

Criteria 5, 6, and 7: Short-term Effectiveness, Implementability, and Cost.

The Navy’s evaluation identified major differences between Alternative 2 and Alternatives 3, 4, and 5 relative to short-term effectiveness, implementability, and cost. Alternative 2 presents many short-term risks, would be difficult to carry out, and would be very expensive. The Navy’s

evaluation of Alternative 2 was based on several factors, the most significant being the large volume of soil and waste (over 1,000,000 cubic yards) that would need to be removed and would require an excavation up to 30 feet deep adjacent to San Francisco Bay. Alternatives 3, 4, and 5 present fewer short-term risks, would be easier to carry out, and would be significantly more cost-effective when compared with Alternative 2. Alternatives 3, 4, and 5 vary slightly in their level of implementability and cost.

Criteria 8 and 9: State Acceptance and Community Acceptance.

The State of California (as represented by DTSC and Water Board) approved the RI/FS Report and agreed in principle with the Navy’s Preferred Alternative in order to proceed with this Proposed Plan. These two modifying criteria will be further evaluated based on comments received on the Proposed Plan.

Conclusion

Alternatives 2, 3, 4, and 5 would be effective remedial alternatives for Parcel E-2. Alternatives 3, 4, and 5 are significantly more feasible, cost-effective, and implementable remedial alternatives when compared with Alternative 2. Alternatives 4 and 5 offer improved long-term effectiveness but have a higher cost relative to Alternative 3.

EPA's *presumptive remedy guidance*, based on a national analysis of numerous other large landfills (greater than 10 acres) similar to Parcel E-2, supports these conclusions. The EPA concluded that moving waste from one location to another causes more hazards than leaving it in place, and that most landfills nationwide can be properly contained, monitored, and maintained to protect human health and the environment and comply with regulatory requirements.

SUMMARY OF THE PREFERRED ALTERNATIVE

The Navy, in consultation with EPA, DTSC, and the Water Board, selected Alternative 5 as the Preferred Alternative for addressing contamination at Parcel E-2. This is the Preferred Alternative because it will effectively reduce site risks by removing significant amounts of contaminants and safely containing the remaining material. The combination of removal and containment reduces risk sooner, is easier to implement and costs much less than Alternative 2, and provides additional risk reduction at a reasonable cost compared with Alternatives 3 and 4.

The Preferred Alternative consists of removing 33,500 cubic yards of waste, soil, and sediment from nearshore and upland hot spots (up to 16 feet deep) (Figure 9 on page 13), with disposal at an approved off-site landfill, and backfilling of the excavations with clean soil. Figure 9 also shows several nearshore and upland hot spots that are currently being excavated as part of a removal action. The nearshore and upland hot spots contain concentrations of certain chemicals that are much higher than the levels considered safe for humans and wildlife, and the removal of soil from these areas will reduce site risks prior to installing the soil cover. Radiological contamination near the ground surface would also be removed and disposed of at an approved off-site landfill.

Additional excavation would be performed in the Panhandle Area to build new wetlands, and this excavated material would be screened to remove radiological contamination before placing it elsewhere on Parcel E-2 (Figure 10 on page 18). The wetlands are not required to prevent exposure to contaminants, but are being created to offset the loss of wetlands at Parcel E-2 and other areas at HPNS. The Panhandle Area is the best location for to create wetlands at HPNS because of its location along the shore of the South Basin.

A minimum 2-foot-thick soil cover would be placed over all of Parcel E-2, and a protective liner (consisting of high-

density plastic) would be placed under the soil cover in all areas except the new wetlands. The liner will minimize water seeping into the contaminated material, control animals from burrowing under the cover, and serve as a visual marker for the bottom of the cover. A liner would not be used in the new wetlands, so that they function more naturally. In order to prevent exposure to contaminated material, the soil cover in the new wetlands would be 4-feet-thick and would include a visual marker at the bottom of the cover.

The Preferred Alternative would expand the existing landfill gas controls, which focus on the northern edge of the Parcel E-2 Landfill, by actively removing and treating gas from the entire Parcel E-2 Landfill (Figure 10 on page 18). The existing landfill gas controls have effectively prevented off-site migration of landfill gases from Parcel E-2, and the expanded system will provide improved performance.

Flow of contaminated groundwater into San Francisco Bay would be limited by installing a below-ground barrier and drain along the western boundary (Figure 9 on page 13). This barrier and drain would divert groundwater flow into the landfill to the new freshwater wetland. In addition, a below-ground barrier would be installed near the shoreline and groundwater quality would be monitored behind the barrier. The groundwater would be pumped and treated if necessary to keep contaminants from flowing into San Francisco Bay.

The Preferred Alternative would be protective because the excavation of hot spots, along with radiological contamination near the ground surface, will remove soil with contamination that poses the most significant risk to humans and wildlife, and placement of a high-density plastic liner under at least 2 feet of clean soil will prevent exposure to remaining contamination.

The Preferred Alternative would also include monitoring and maintenance that would be performed as long as necessary to protect human health and the environment. The Navy and the regulatory agencies would also implement ICs for continued protection of human health and the environment and to ensure the integrity of the final remedial action. An overview of ICs is provided on page 21.

Why is this the Preferred Alternative?

Based on the information currently available, the Navy believes that the Preferred Alternative provides the best balance among the alternatives with respect to long-term

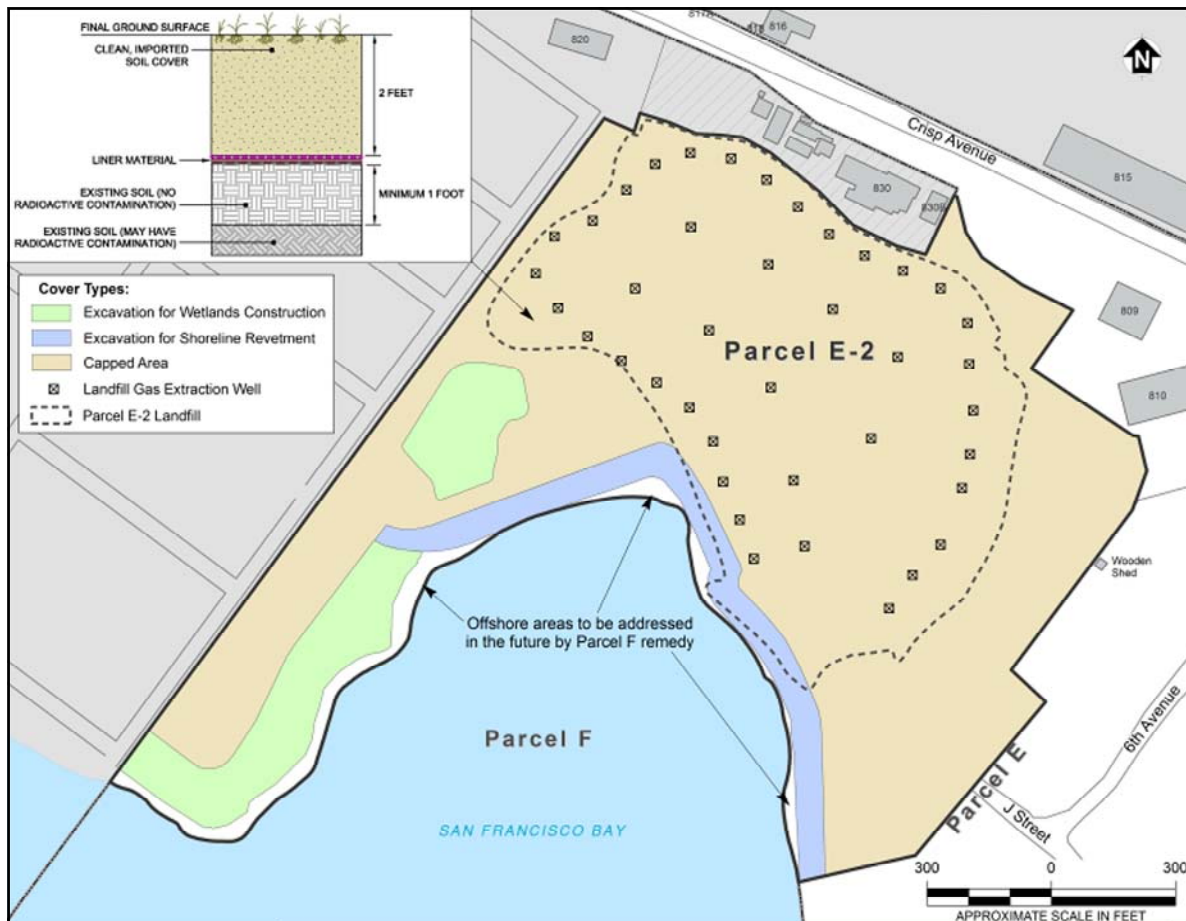


Figure 10. Alternative 5 Excavation and Cover Plan.

and short-term effectiveness, implementability, and cost. The Navy expects the preferred alternative will satisfy the following statutory requirements of CERCLA Section 121 (b):

1. Protect human health and the environment
2. Comply with ARARs (identified in Appendix N of the RI/FS report and Appendix C of the radiological addendum and summarized in Attachment 1)
3. Be cost effective
4. Use permanent solutions and alternative treatment technologies to the maximum extent practicable

The Navy finds that the Preferred Alternative would protect people and wildlife from being exposed to remaining contamination left in place, including radioactive chemicals, because significant sources of contamination will have been removed and the proposed cover, landfill gas controls, and groundwater controls will prevent contact with hazardous materials at levels that might pose an unacceptable risk. The Preferred Alternative will be designed to withstand sea level rise, erosion, and earthquakes and will meet the standards used at other landfills nationwide. The Preferred

Alternative would allow the property to be used in the future for open space.

The Navy's findings are consistent with EPA's recommendation that containment actions are typically the best alternative for large landfill sites instead of removal or treatment actions. EPA findings were summarized in their presumptive remedy guidance for CERCLA landfills. The Navy determined that the Parcel E-2 Landfill meets all of the criteria specified in EPA's presumptive remedy guidance. However, based on feedback from members of the local community, the Navy fully evaluated excavation of the landfill in the RI/FS to provide information to support the community's review of potential remedial alternatives for Parcel E-2.

If Alternative 5 is selected in the ROD, the Navy will design and build the final remedial action to address several additional issues that, based on previous feedback, are of special interest to community members. These additional issues are summarized below.

Liquefaction potential. The preferred alternative includes a preliminary plan, developed with input from various technical experts that would control soil

movement during the *maximum probable earthquake (MPE)*. Certain types of soil (sands and silts), if present over a large enough area and depth, can liquefy during an earthquake and cause the ground surface to move. The Navy studied the soil in and around the Parcel E-2 Landfill and found that most soil would not liquefy even during the MPE, and the soil layers that might liquefy would be controlled through proper design and construction of the final cover using methods that are well established for sites in the San Francisco Bay area. The Navy will further evaluate this very important part of the design, including consulting with other technical experts, to make sure that the final cover is built to withstand the MPE and comply with numerous other regulatory requirements for landfill covers.

Landfill gas treatment. Extracted landfill gas would be treated by either an enclosed flare or adsorbent material (such as a charcoal filter). An enclosed flare involves controlled burning of the gases captured from the landfill. An enclosed flare is the most common technology for treating landfill gas, and it limits the amount of methane (a “greenhouse” gas) that is released to the atmosphere. Adsorbent material is designed to capture the NMOCs but not methane. The Navy currently uses a charcoal filter to capture NMOCs from the landfill gas control system. The Navy will further evaluate the treatment options during the design and will consult with the regulatory agencies and the community to determine which treatment option will be used.

Shoreline protection and future open space reuse. Parcel E-2 is planned for open space that includes parks and restored wetlands. The covered upland area of Parcel E-2 would be accessible to pedestrians and may include part of the regional trail planned for the edge of San Francisco Bay. The new tidal wetlands would be combined with the planned wetland restoration at the non-Navy, California State Parks property immediately west of Parcel E-2 along Yosemite Slough. The shorelines adjacent to the upland area and the new tidal wetlands would require protection to make sure people and wildlife are not exposed to contaminated soil that is not excavated. The new tidal wetlands would have gradual slopes that can be protected by natural soil and vegetation. The upland area would have steeper slopes that require stronger protection. A rock revetment structure, consisting of large rocks placed on the shoreline slope, is proposed to prevent erosion and protect the edge of the covered upland area (Figure 10 on page 18). The top of the revetment would extend high enough to protect against flooding from a potential rise in sea level, but would not obstruct pedestrians’ views of the bay because trails would be placed at about the same

height as the top of the revetment. The bottom of the revetment would stop near the mean tide line, and the areas exposed during low tide would be natural sediment.

HOW TO FIND ADDITIONAL INFORMATION

The Navy provides information on the cleanup of Parcel E-2 to the public through public meetings, the Administrative Record file for the site, and notices published in the local newspapers.

The collection of reports and historic documents used by the Navy, in conjunction with the regulatory agencies, in selecting remedial alternatives is the Administrative Record. The Administrative Record includes documents such as the Final RI/FS Report and its radiological addendum for Parcel E-2. These two reports provide the most comprehensive, current understanding of Parcel E-2. The Administrative Record also contains other supporting documents and data for Parcel E-2. Administrative Record files are located at the following address:

Naval Facilities Engineering Command, Southwest
Attention: Diane Silva, Commands Records Manager
2965 Mole Road, Building 3519
San Diego, CA 92136
Phone: (619) 556-1280

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 E-2 and a complete index of all Navy HPNS documents at the information repositories listed on the following page.

Information Repositories

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

HPNS Office Trailer
690 Hudson Street
San Francisco, CA 94124

The Navy, EPA, DTSC, and the Water Board encourage the public to gain a more thorough understanding of Parcel E-2 and CERCLA work conducted at HPNS by visiting one of the information repositories, reviewing the relevant records contained in the Administrative Record file, and attending public meetings. The Navy schedules regular public meetings to discuss the cleanup program at HPNS. Please visit the Navy’s [website http://www.bracpmo.navy.mil/bracbases/california/hps/default.aspx](http://www.bracpmo.navy.mil/bracbases/california/hps/default.aspx) for more information on future public meetings.

PROVIDING COMMENTS ON THIS PROPOSED PLAN

There are two ways to provide comments during the public comment period (September 7 to October 24, 2011):

1. Tell us your comments in person at the public meeting
2. Provide written comments by mail, fax, or e-mail to the Navy no later than October 24, 2011 (see contact information below)

The public meeting will be held from 6:00 p.m. to 8:00 p.m. on September 20, 2011, at the Southeast Community Facility Commission Building in the Alex L. Pitcher, Jr. Room located at 1800 Oakdale Avenue in San Francisco.

Navy representatives will provide visual displays and information on the environmental investigations and the remedial alternatives at Parcel E-2. The Navy will also give a presentation on the Proposed Plan. The public 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
Fax: (619) 532-0995
E-mail: keith.s.forman@navy.mil

For More Information

If you have any questions or concerns about environmental activities at HPNS, 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
San Diego, CA 92108-4310
Telephone: (619) 532-0913
Cell Phone: (415) 308-1458
E-mail: keith.s.forman@navy.mil

U.S. EPA

Mr. Craig Cooper
Project Manager
U.S. EPA, Region 9
75 Hawthorne Street
San Francisco, CA 94105
Telephone: (415) 972-4148
E-mail: cooper.craig@epa.gov

DTSC

Mr. Ryan Miya
Project Manager
Department of Toxic Substances Control
700 Heinz Avenue, Suite 200
Berkeley, CA 94710
Telephone: (510) 540-3775
E-mail: RMiya@dtsc.ca.gov

Water Board

Mr. Ross Steenson
Project Manager
San Francisco Bay
Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, CA 94612
Telephone: (510) 622-2445
E-mail: RSteenson@waterboards.ca.gov

INFORMATION AVAILABLE ON THE INTERNET

For more information on the closure of HPNS and Parcel E-2 and future public meetings, go to the website at:

<http://www.bracpmo.navy.mil/bracbases/california/hps/default.aspx>

Overview of Proposed Institutional Controls

ICs described in this Proposed Plan include land use and activity restrictions, which would be established to limit human exposure to contaminants in soil, sediment, soil gas, and groundwater. ICs are a component of Remedial Alternatives 2, 3, 4, and 5 that are considered in the RI/FS Report. ICs would remain in place unless the remedial action taken would allow for unrestricted use of the property and unrestricted exposure. Land use and activity restrictions would be incorporated into and implemented through two separate legal instruments:

1. Restrictive covenants included in one or more "Covenant(s) to Restrict Use of Property" provided in the Navy and DTSC 2000 Memorandum of Agreement and consistent with the substantive provisions of California Code of Regulations Title 22, Section 67391.1.
2. Restrictive covenants included in one or more Quitclaim Deed(s) from the Navy to the property recipient.

Proposed Land Use Restrictions:

- Prohibit a residence, including any mobile home or factory built housing, constructed or installed for use as residential human habitation;
- Prohibit a hospital for humans;
- Prohibit a school for persons under 21 years of age;
- Prohibit a day care facility for children; and
- Restrict Parcel E-2 to open space and recreational uses, unless approval is received from the Federal Facility Agreement (FFA) signatories (and the California Department of Public Health [CDPH] for areas restricted for radioactive chemicals). For example, the City and County of San Francisco may request that industrial or residential land uses be allowed in a small area (about 0.42-acres) in the East Adjacent Area that is designated as part of a multi-use district.

The Land Use Control Remedial Design (LUC RD) report will identify specific requirements for obtaining written approval to deviate from these land use restrictions.

Proposed Activity Restrictions:

- Prohibit growing vegetables or fruits in native soil for human consumption;
- Prohibit use of and restrict access to groundwater²;
- Restrict any "land disturbing activity" including but not limited to those listed below that may impact the effectiveness of the remedial alternative:
 - * Excavation of soil;
 - * Construction of roads, utilities, facilities, structures, and appurtenances of any kind;
 - * Demolition or removal of "hardscape" (for example, concrete roadways, parking lots, foundations, and sidewalks);
 - * Any activity that involves movement of soil to the surface from below the surface of the land; and
 - * Any other activity that causes or facilitates the movement of known contaminated groundwater.
- Further restrict any "land disturbing activity" in areas restricted for radioactive chemicals by requiring that:
 - * Any proposed land-disturbing activity must be described in a work plan approved by the FFA signatories and CDPH;
 - * Following implementation of an approved land-disturbing activity, the integrity of the cover/liner must be restored and documented in a completion report approved by the FFA signatories and CDPH; and
 - * The LUC RD report, the Operation and Maintenance Plan (OMP), Parcel E-2 Risk Management Plan (RMP), or a project-specific work plan, if applicable, list the procedures for ensuring that the cover is not disturbed or breached.
- Restrict² alteration, disturbance, or removal of any component of a response or cleanup action (including but not limited to shoreline protection and soil cover/containment systems); groundwater extraction, injection, and monitoring wells and associated piping and equipment; or associated utilities;
- Restrict² extraction of groundwater and installation of new groundwater wells; and
- Restrict² 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).
- Restrict² construction of enclosed structures to ensure compliance with the substantive provisions of 27 CCR §§ 21190(a), (b), (d), (e), (f) and (g).

Access Provisions:

Access provisions would be required to ensure the Navy and the regulatory agencies have access to remedial equipment and other remedy components for the purpose of implementing the remedial action, performing maintenance activities, and conducting monitoring.

² Performing any of these restricted activities requires approval from FFA Signatories (and CDPH for areas restricted for radioactive chemicals) prior to conducting the activity.

GLOSSARY OF TECHNICAL TERMS

Applicable or relevant and appropriate requirements (ARARs): Federal, state, and local regulations and standards determined to be legally applicable or relevant and appropriate to removal or remedial actions at a CERCLA site. The NCP requires compliance with all state or federal ARARs at a Superfund site unless they are waived.

Below-ground barrier: A vertical structure built below the ground surface with material that does not allow groundwater or air to easily pass through it. These barriers include slurry walls, which are trenches excavated and filled with a clay mixture that limits the speed in which groundwater passes through the barrier.

Chemical of concern (COC): A metal, organic chemical, or radioactive chemical that is present in soil, sediment, soil gas, or groundwater at concentrations greater than those considered safe for humans or wildlife.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA): The federal law (also referred to as the “Superfund” 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.

Environmental investigation: Activities that involve reviewing historical information, performing site inspections, and collecting and analyzing samples of soil, sediment, soil gas, or groundwater for chemicals. Investigations are designed to identify potential chemical contamination that may pose a risk to humans or wildlife. Often referred to as the “Remedial Investigation” during the CERCLA cleanup process.

Exposure pathway: The route a chemical takes from its source (where it began) to its end point (where it ends), and how people or wildlife can come into contact with (or be exposed to) it. An exposure pathway has five parts: (1) a source of contamination; (2) an environmental medium (such as soil or groundwater) and transport mechanism (such as movement through groundwater); (3) a point of exposure (such as a well); (4) a route of exposure (such as eating, drinking, breathing, or touching), and (5) a receptor population (such as people or wildlife potentially or actually exposed). When all five parts are present, the exposure pathway is considered a complete exposure pathway.

Exposure scenario: A set of facts, assumptions, and inferences about how exposure takes place that aids the risk assessor in evaluating, estimating, or quantifying exposures.

Geophysical instruments: Specialized instruments that measure differences of physical properties below the ground surface. Density, magnetic fields, and electrical resistance are several of the most common properties measured using geophysical instruments. Geophysical instruments can be used to identify certain types of buried objects (such as metal debris) and differences in soil and rock types.

Groundwater samples: Water samples collected from below ground in probes or wells. Samples are analyzed for various chemicals to identify the types and concentrations of potential contaminants.

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 HPNS and the identification of radiologically impacted areas at HPNS.

Hot spots: Area with contaminated soil where concentrations of certain chemicals are much higher than (such as 10 or 100 times) the levels considered safe for humans and wildlife.

Institutional controls (ICs): Legal and administrative documents and processes to limit human exposure to contaminated waste, soil, or groundwater. These documents and processes may include deed restrictions, covenants, easements, laws, and regulations.

Landfill gas: Gas generated from decomposing waste in a landfill. Landfill gas consists mostly of methane, with lower levels of other organic chemicals.

Liquefaction potential: The susceptibility of soil to liquefy when subjected to sudden loading, such as intense ground shaking from an earthquake. High liquefaction potential and liquefaction hazards are associated with saturated, sandy and silty soil.

Maximum probable earthquake (MPE): The largest earthquake a fault is predicted capable of generating within a specified time period of concern (for example, 30 or 100 years). MPEs are most likely to occur within the time span of most development; therefore, they are commonly used in assessing seismic risk for construction.

Metal slag: Melted metal that is created by heating and solidifies when cooled.

GLOSSARY OF TECHNICAL TERMS

Metals: Inorganic chemicals (such as lead) that are present in the natural environment (such as rock formations), but can be extracted and used for various products (such as paint). Soil and groundwater can be contaminated if such products are spilled on the ground or buried for disposal.

Methane: A colorless, nontoxic, flammable gas created by natural processes, such as when buried food, paper, and wood wastes decompose.

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, which 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 HPNS from 1948 until 1969. The mission of NRDL was to study the effects of nuclear weapons and the different ways to clean ships used during weapons testing in the South Pacific.

On-site consolidation: Collecting and combining material (such as contaminated soil or landfill waste) into one local area without removing it from the site; typically done to reduce the area affected by contamination.

Organic chemicals: Chemicals or groups of chemicals containing carbon that are present in the natural environment but are usually changed to create various products (such as cleaning solvents or fuels). Soil and groundwater can be contaminated if such products are spilled on the ground or buried for disposal.

Parts per million by volume (ppmv): The volume ratio of a gas contaminant in air (relative to a fixed volume) that can be measured using field instruments. One percent by volume equals 10,000 ppmv.

Polychlorinated biphenyls (PCBs): A mixture of up to 209 individual chlorinated organic compounds. PCBs have been used as coolants and lubricants in electrical equipment. Their use is now banned.

Picocurie per gram (pCi/g): Unit used to describe concentrations (or activity levels) of radioactive chemicals in soil or sediment.

Preferred Alternative: The remedial alternative selected by the Navy, in conjunction with the regulatory agencies, that best satisfies the remedial action objective and remediation goal, based on the evaluation of alternatives presented in the RI/FS Report.

Presumptive remedy guidance: Guidance documents written by the EPA to assist in the decision-making process for certain types of sites, such as landfills. Presumptive remedies are preferred technologies for common categories of sites, based on EPA's experience and its scientific and engineering evaluation of alternative technologies. The objective of the initiative is to use the Superfund program's experience to streamline site characterization and speed up the selection of cleanup actions. EPA's presumptive remedy guidance for CERCLA landfills consists of the following documents: (1) "Presumptive Remedy for CERCLA Municipal Landfill Sites," EPA/540/F-93/035, September 1993; (2) "Presumptive Remedy: Policy and Procedures," EPA/540/F-93/047, September 1993; (3) "Feasibility Study Analysis for CERCLA Municipal Landfill Sites," EPA/540/R-94/081, August 1994; and (4) "Application of the CERCLA Municipal Landfill Presumptive Remedy to Military Landfills," EPA/540/F-96/020, December 1996.

Proposed Plan: A document used to facilitate public involvement in the remedy selection process. The document presents the lead agency's preliminary recommendations about how to best address contamination at the site, presents alternatives that were evaluated, and explains the reasons the lead agency recommends the Preferred Alternative.

Protective liner: A durable material (such as natural clay or thick plastic) that is placed under a soil cover to limit rain water from coming into contact with remaining contamination.

Radioactive chemicals: Chemicals containing elements that emit energy as radiation that are present in the natural environment but are usually changed for various purposes (such as being used to create paint that glows in the dark). Soil and groundwater can be contaminated if such chemicals are spilled on the ground or buried for disposal.

GLOSSARY OF TECHNICAL TERMS

Radioactive paint: Paint containing radioactive chemicals that was used on devices (such as deck markers for ships) to make them glow in the dark. Radium is the most common radioactive chemical used in radioactive paint at HPNS.

Radiological addendum: A document that presents additional information on the investigation results and remedial alternatives for radiologically impacted areas.

Radiological contamination: A radioactive substance on an area, building, or piece of equipment that, based on test results, contains radioactivity higher than the levels considered safe for humans.

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

Receptors: People or wildlife that may be exposed to contaminated soil, sediment, groundwater, or soil gas.

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: An environmental cleanup that is conducted based on a ROD and involves actions to contain, collect, or treat hazardous wastes to protect human health and the environment. Also referred to as a cleanup action or final remedy.

Remedial design (RD): The phase in the CERCLA cleanup process where the technical specifications for remedial action are identified. The RD contains the detailed information describing how the selected remedial action will be implemented, including enforcement of institutional controls (referred to as the Land Use Controls RD).

Remedial Investigation/Feasibility Study (RI/FS): The two major studies that must be completed before a decision can be made about how to clean up a site. The RI is designed to identify the nature and extent of contamination at a site and to estimate the risks presented by the contamination. The FS is a study to identify, screen, and compare remedial (cleanup) alternatives for a site.

Remediation goal: Concentration limit that provides a number for each chemical of concern to identify areas for potential cleanup, screen the types of appropriate technologies, and evaluate a remedial action's potential to achieve the remedial action objective.

Removal action: An early cleanup action that is implemented before a ROD and involves actions to contain, collect, or treat hazardous wastes to protect human health and the environment.

Revetment: A structure, usually consisting of large rocks, placed on a sloped shoreline in such a way as to absorb the energy of incoming waves and tidal currents.

Risk assessment: An assessment of the likelihood or probability that a hazardous chemical, when released to the environment, will have negative effects on exposed humans or wildlife.

Sandblast waste: Sand previously mixed with water and used under pressure to clean the outside surfaces of ships that are not in use. Following cleaning, the sand and water are collected, separated, and disposed of as waste. Contaminants present on the surfaces of the ships may be incorporated into the sand during ship cleaning and remain in the sandblast waste. Soil and groundwater can be contaminated if such material is spilled on the ground or buried for disposal.

Soil borings: Soil cores drilled below ground using special equipment. Used to collect soil samples and install probes and wells (for collection of soil gas or groundwater samples).

Solid Waste: Any discarded (abandoned or considered waste-like) materials. Solid wastes can be solid, liquid, semi-solid, or containerized gaseous material (for example, waste tires, scrap metal, domestic garbage, and construction and demolition debris).

Unacceptable risk: The risk level at which cleanup is necessary to avoid potential negative effects to humans or the environment. Risk levels are evaluated as both cancer and noncancer risk. For Parcel E-2, the Navy considers a cancer risk greater than 1 in 1,000,000 to be unacceptable. For noncancer risk, an HI greater than 1 is considered unacceptable.

Wetlands: An area of land whose soil is saturated with moisture either permanently or seasonally and may be covered partially or completely by shallow water. Wetlands are biologically diverse ecosystems that offer unique habitat to a large range of plant and wildlife.

ATTACHMENT 1

KEY 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 unless they are waived. The following list identifies some key ARARs for the Preferred Alternative described in this Proposed Plan. A complete list of potential chemical-, location-, and action-specific ARARs identified for the Preferred Alternative is provided in the RI/FS Report (Appendix N) and its radiological addendum (Appendix C).

Key Potential Chemical-Specific ARARs:

- Provisions of California Code of Regulations (CCR) Titles 22, 23, and 27, as specified in Appendix N of the RI/FS Report, which define RCRA and non-RCRA hazardous and solid waste and designated waste.
- Uranium Mill Tailings Radiation Control Act requirements at Code of Federal Regulations (CFR) Title 40 Section (§) 192, as specified in Appendix C of the radiological addendum.
- Nuclear Regulatory Commission Standards for Protection of Radiation at Title 10 CFR (10 CFR) §§ 20 and 61, as specified in Appendix C of the radiological addendum.
- Federal and State of California maximum contaminant limits (MCLs) and the RCRA groundwater protection standard in Title 22 CCR § 66264.94 are potential ARARs for groundwater, as specified in Appendix N of the RI/FS report.
- Provisions of the California Water Code and water quality objectives (WQOs), waste discharge requirements, and promulgated policies of the Comprehensive Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan), as specified in Appendix N of the RI/FS Report.
- SWRCB, Resolution 88-63 (SWRCB, 1988), identifies exceptions to potential sources of drinking water. Evaluation by the Navy indicates that A-aquifer groundwater at HPNS is not a potential source of drinking water, and that B-aquifer groundwater has a moderate potential for use as a drinking water source.
- California Toxics Rule (CTR) requirements at 40 CFR § 131.38 for surface water and groundwater discharges from Parcel E-2 to San Francisco Bay, as specified in Appendix N of the RI/FS Report.
- Clean Air Act requirements for radionuclides at 40 CFR § 61, as specified in Appendix C of the radiological addendum.

Key Potential Location-Specific ARARs:

- San Francisco Bay Plan requirements at Title 14 CCR, as specified in Appendix N of the RI/FS Report.
- Clean Water Act of 1977 requirements at Title 33 United States Code § 1344, as specified in Appendix N of the RI/FS Report.

Key Potential Action-Specific ARARs:

- Containment, closure and post-closure requirements for the proposed soil cover and protective liner at Title 22 CCR § 66264 and Title 27 CCR, as specified in Appendix N of the RI/FS Report.
- Shoreline construction requirements for the proposed revetment and tidal wetlands at Title 40 CFR § 230, as specified in Appendix N of the RI/FS Report.
- Landfill gas monitoring requirements at Title 27 CCR, as specified in Appendix N of the RI/FS Report.
- Groundwater and surface water monitoring requirements at Title 22 CCR §§ 66262 and 66264, as specified in Appendix N of the RI/FS Report.
- Requirements for institutional controls at California Civil Code § 1471, California Health and Safety Code, and Title 22 CCR § 67391.1, as specified in Appendix N of the RI/FS Report. The U.S. Environmental Protection Agency considers subsections (a), (b), (d), and (e) of 22 CCR § 67391.1 to be ARARs. DTSC's position is that all of the state statutes and regulations referenced in this section are ARARs. The Navy recognizes that the substantive provisions of 22 CCR § 67391.1 are state ARARs as stated in Section N4.2.6 of Appendix N to the RI/FS Report.

Attn: Lawrence McGuire
135 Main Street, Suite 1600
San Francisco, CA 94105

Proposed Plan for Parcel E-2
Hunters Point Naval Shipyard
San Francisco, California

Request Public Comment on Parcel E-2 Landfill
Comment Period from September 7, 2011, to October 24, 2011
See Inside How to Comment

Keith Forman, BRAC Environmental Coordinator
Program Management Office West
1455 Frazee Road, Suite 900
San Diego, CA 92108-4310