

Appendix N. Applicable or Relevant and Appropriate Requirements

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Acronyms and Abbreviations

§	Section
§§	Sections
33 CFR	Title 33 of the <i>Code of Federal Regulations</i>
40 CFR	Title 40 of the <i>Code of Federal Regulations</i>
50 CFR	Title 50 of the <i>Code of Federal Regulations</i>
ARAR	applicable or relevant and appropriate requirement
BAAQMD	Bay Area Air Quality Management District
Basin Plan	Comprehensive Water Quality Control Plan for the San Francisco Bay Basin
Bay	San Francisco Bay
Bay Plan	San Francisco Bay Plan
BCDC	San Francisco Bay Conservation and Development Commission
bgs	below ground surface
Cal. Code Regs.	<i>California Code of Regulations</i>
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	chemical of concern
CTR	California Toxics Rule
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
DTSC	State of California Department of Toxic Substances Control
ELCR	excess lifetime cancer risk
EP	extraction procedure
EPA	U.S. Environmental Protection Agency
ER-M	effects range median
ESA	Endangered Species Act
Fed. Reg.	<i>Federal Register</i>
FS	feasibility study
GMPs	gas monitoring probe
gpd	gallons per day
HDPE	high density polyethylene
HGAL	Hunters Point groundwater ambient levels
HHRA	human health risk assessment
HPS	Hunters Point Shipyard
IDW	investigation-derived waste

Acronyms and Abbreviations (continued)

LDR	land disposal restriction
MCL	maximum contaminant level
MCLG	maximum contaminant level goal
mg/kg	milligram per kilogram
mg/L	milligram per liter
MOU	memorandum of understanding
Navy	U.S. Department of the Navy
NAWQC	National Ambient Water Quality Criteria
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NMOC	nonmethane organic compound
NPDES	National Pollutant Discharge Elimination System
NRWQC	National Recommended Water Quality Criteria
PCB	polychlorinated biphenyls
POC	point of compliance
ppmv	parts per million by volume
ppt	parts per thousand
RAO	remedial action objective
RCRA	Resource Conservation and Recovery Act
RI	remedial investigation
ROD	record of decision
RWQCB	San Francisco Bay Regional Water Quality Control Board
SDWA	Safe Drinking Water Act
SLERA	screening-level ecological risk assessment
SSF	site-specific factor
STLC	soluble threshold limit concentration
SWDMP	storm water discharge management plan
SWRCB	State of California Water Resources Control Board
TBC	to be considered
TCLP	toxicity characteristic leaching procedure
TDS	total dissolved solids
tit.	Title
TPH	total petroleum hydrocarbons
TSCA	Toxic Substances Control Act
TTLC	total threshold limit concentration

Acronyms and Abbreviations (continued)

USACE	U.S. Army Corps of Engineers
USC	<i>United States Code</i>
USFWS	U.S. Fish and Wildlife Service
WBZ	water bearing zone
WET	waste extraction test
WQO	water quality objectives

Section N1. Introduction

This appendix identifies and evaluates potential federal and State of California applicable or relevant and appropriate requirements (ARAR) from the universe of regulations, requirements, and guidance and sets forth the U.S. Department of Navy (Navy) determinations regarding potential ARARs for each response action alternative retained for detailed analysis in this remedial investigation (RI) / feasibility study (FS) report for Parcel E-2 at Hunters Point Shipyard (HPS), San Francisco, California.

This document addresses potential ARARs for Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) hazardous substances with the exception of radionuclides. Potential ARARs for radiological contamination will be addressed in a radiological addendum to the RI/FS. Both chemical and radiological contaminants will then be addressed together in the proposed plan and the record of decision (ROD).

Specifically, [Sections N2.0](#), [N3.0](#), and [N4.0](#) discuss chemical-, location-, and action-specific ARARs, respectively, that are potentially applicable to the Parcel E-2 FS response action alternatives listed below.

- **Alternative 1, No Action:** For this alternative, no remedial action will be taken. Solid waste, soil, sediment, and groundwater will be left in place without implementing any response actions (including monitoring, institutional controls, containment, removal, treatment, or other mitigating actions). The no action response is retained throughout the FS process as required by the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) to provide a baseline for comparison to and evaluation of other alternatives.
- **Alternative 2, Excavate and Dispose of Solid Waste, Soil, and Sediment (including monitoring and institutional controls):** This alternative would involve excavation and off-site disposal of solid waste, debris, and soil in the Landfill Area. Isolated solid waste locations and soil in the Panhandle Area and East Adjacent Area, as well as sediment within the Shoreline Area, would also be excavated and disposed of off site. Groundwater monitoring is also included in this alternative as a method for monitoring chemicals present in groundwater while allowing the aquifer to naturally recover. Additionally, groundwater monitoring will be used to confirm site conditions and ensure that over time the potential exposure pathways remain incomplete. This alternative would also include institutional controls (including covenants to restrict use of property) that will be implemented parcel-wide to prevent exposure to potential unacceptable risk posed by chemicals of concern (COCs) in soil and groundwater.
- **Alternative 3, Contain Solid Waste, Soil, and Sediment (including monitoring and institutional controls):** This alternative would involve containing solid waste and soil in the Landfill Area as well as soil and sediment in the adjacent areas. The portions of the Landfill Area not already covered by the existing multilayer cap would then be capped with a similarly

designed multilayer cap. The isolated solid waste locations and soil in the adjacent areas would also be capped in place with an engineered alternative cap. The intertidal sediment and debris within the Shoreline Area would be contained with a revetment wall. In addition, this alternative would include installation, operation, and maintenance of an active landfill gas control system. Monitoring of landfill gas, storm water, and groundwater are also included in this alternative. This alternative would also include institutional controls (including covenants to restrict use of property) that will be implemented parcel-wide to prevent exposure to potential unacceptable risk posed by COCs in soil and groundwater.

This ARAR evaluation includes an initial determination of whether the potential ARARs actually qualify as ARARs and a comparison for stringency between the federal and state regulations to identify controlling ARARs. The identification of ARARs is an iterative process. The Navy will make a final determination of ARARs in the ROD after public review, as part of the process for selecting the response action.

[Section N1.0](#) summarizes requirements from CERCLA and the NCP; the methodology used to identify and evaluate potential federal and state ARARs for Parcel E-2; general issues identified during the identification and evaluation of ARARs; and waste characterization.

N1.1. SUMMARY OF CERCLA AND NCP REQUIREMENTS

Section 121(d) of CERCLA (Title 42 of the *United States Code* [USC] Section [§] 9621[d]), as amended, states that remedial actions on CERCLA sites must attain (or the decision document must justify the waiver of) any federal or more stringent state environmental standards, requirements, criteria, or limitations that are determined to be legally applicable or relevant and appropriate.

Applicable requirements are those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that specifically address the situation at a CERCLA site. The requirement is applicable if the jurisdictional prerequisites of the standard show a direct correspondence when objectively compared to the conditions at the site. An applicable federal requirement is an ARAR. An applicable state requirement is an ARAR only if it is more stringent than federal ARARs.

If the requirement is not legally applicable, then the requirement is evaluated to determine whether it is relevant and appropriate. Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that, while not applicable, address problems or situations similar to the circumstances of the proposed response action and are well suited to the conditions of the site (U.S. Environmental Protection Agency [EPA], 1988a). A requirement must be determined to be both relevant and appropriate in order to be considered an ARAR.

The criteria for determining relevance and appropriateness are listed in Title 40 of the *Code of Federal Regulations* (40 CFR) § 300.400(g)(2) and include the following:

- The purpose of the requirement and the purpose of the CERCLA action.
- The medium regulated or affected by the requirement and the medium contaminated or affected at the CERCLA site.
- The substances regulated by the requirement and the substances found at the CERCLA site.
- The actions or activities regulated by the requirement and the response action contemplated at the CERCLA site.
- Any variances, waivers, or exemptions of the requirement and their availability for the circumstances at the CERCLA site.
- The type of place regulated and the type of place affected by the release or CERCLA action.
- The type and size of structure or facility regulated and the type and size of structure or facility affected by the release or contemplated by the CERCLA action.
- Any consideration of use or potential use of affected resources in the requirement and the use or potential use of the affected resources at the CERCLA site.

According to CERCLA ARARs guidance ([EPA, 1988a](#)), a requirement may be “applicable” or “relevant and appropriate,” but not both. Identification of ARARs must be done on a site-specific basis and involve a two-part analysis: first, a determination whether a given requirement is applicable; then, if it is not applicable, a determination whether it is nevertheless both relevant and appropriate. It is important to explain that some regulations may be applicable or, if not applicable, may still be relevant and appropriate. When the analysis determines that a requirement is both relevant and appropriate, such a requirement must be complied with to the same degree as if it were applicable ([EPA, 1988a](#)).

Tables included in this appendix present each potential ARAR with an initial determination of ARAR status (applicable or relevant and appropriate). For the determination of relevance and appropriateness, the pertinent criteria were examined to determine whether the requirements addressed problems or situations sufficiently similar to the circumstances of the release or response action contemplated, and whether the requirement was well suited to the site. A negative determination of relevance and appropriateness indicates that the requirement did not meet the pertinent criteria. Negative determinations are discussed in the text only for specific cases.

To qualify as a state ARAR under CERCLA and the NCP, a state requirement must be:

- A state law or regulation
- An environmental or facility siting law or regulation
- Promulgated (of general applicability and legally enforceable)
- Substantive (not procedural or administrative)
- More stringent than federal requirements
- Identified in a timely manner
- Consistently applied

To constitute an ARAR, a requirement must be substantive; therefore, only the substantive provisions of requirements identified as ARARs in this analysis are considered to be ARARs. Permits are considered to be procedural or administrative requirements. Provisions of generally relevant federal and state statutes and regulations that were determined to be procedural or non-environmental, including permit requirements, are not considered to be ARARs. CERCLA Section 121(e)(1), 42 USC § 9621(e)(1), states, “No Federal, State, or local permit shall be required for the portion of any removal or remedial action conducted entirely on-site, where such remedial action is selected and carried out in compliance with this section.” The term *on-site* is defined for purposes of this ARARs discussion as “the areal extent of contamination and all suitable areas in very close proximity to the contamination necessary for implementation of the response action” (40 CFR § 300.5).

Non-promulgated advisories or guidance issued by federal or state governments are not legally binding and do not have the status of ARARs. Such requirements may, however, be useful, and are “to be considered” (TBC). TBC (40 CFR § 300.400[g][3]) requirements complement ARARs but do not override them. They are useful for guiding decisions regarding cleanup levels or methodologies when regulatory standards are not available.

Pursuant to EPA guidance (EPA, 1988a), ARARs are generally divided into three categories: chemical-specific, location-specific, and action-specific requirements. This classification was developed to aid in the identification of ARARs; some ARARs do not fall precisely into one group or another. ARARs are identified on a site basis for remedial actions where CERCLA authority is the basis for cleanup.

As the lead federal agency at HPS, the Navy has primary responsibility for identifying federal ARARs at Parcel E-2. Pursuant to the definition of the term “on-site” in 40 CFR § 300.5, the on-site area is Parcel E-2.

Identification of potential state ARARs was initiated through Navy requests to the State of California Department of Toxic Substances Control (DTSC), San Francisco Bay Regional Water Quality Control Board (RWQCB), and San Francisco Bay Conservation and Development Commission (BCDC). In two sets of consolidated responses received in December 2004, potential state ARARs were specified by the DTSC, RWQCB, BCDC, the California Integrated Waste Management Board (CIWMB), California Department of Fish and Game, California Air Resources Board, and the Bay Area Air Quality Management District (BAAQMD). The solicitation of potential state ARARs is described in more detail in [Section N1.2.3](#). The methodology, other general issues, and waste characterization are discussed below.

N1.2. METHODOLOGY DESCRIPTION

The process of identifying and evaluating potential federal and state ARARs is described in this subsection.

General

As the lead federal agency, the Navy has primary responsibility for identification of potential ARARs for Parcel E-2. In preparing this ARARs analysis, the Navy undertook the following measures consistent with CERCLA and the NCP:

- Identified federal ARARs for each response action alternative addressed in the FS, taking into account site-specific information for Parcel E-2
- Reviewed potential state ARARs identified by the state to determine whether they satisfy CERCLA and NCP criteria that must be met in order to constitute state ARARs
- Evaluated and compared federal ARARs and their state counterparts to determine whether state ARARs are more stringent than the federal ARARs or are in addition to the federally required actions
- Reached a conclusion as to which federal and state ARARs are the most stringent and/or “controlling” ARARs for each alternative

[Section 9.0](#) of this RI/FS report discusses the remedial action objectives (RAO) for: 1) solid waste, soil, and sediment; 2) groundwater; 3) surface water, and 4) landfill gas. The Parcel E-2 RAOs are as follows:

Solid Waste, Soil, and Sediment RAOs

1. Prevent human exposure to organic and inorganic compounds greater than the remediation goals (specified in RI/FS [Section 9](#)) for the following exposure pathways:
 - Ingestion of, outdoor inhalation of, and dermal exposure to solid waste, soil, or sediment from 0 to 2 feet below ground surface (bgs) by recreational users throughout Parcel E-2
 - Soil ingestion, outdoor air inhalation, and dermal exposure to solid waste, soil, or sediment from 0 to 10 feet bgs by construction workers throughout Parcel E-2
2. Prevent ecological exposure to organic and inorganic compounds in solid waste or soil greater than the protective soil concentrations (identified in the onshore screening-level ecological risk assessment [SLERA] in [Appendix L](#)) from 0 to 3 feet bgs by terrestrial receptors throughout Parcel E-2.
3. Prevent ecological exposure to organic and inorganic compounds in intertidal sediment greater than the effects range-median (ER-M) values (identified in the shoreline SLERA in [Appendix G](#)) from 0 to 2.5 feet bgs by aquatic receptors throughout the Shoreline Area.

Groundwater RAOs

1. Prevent direct exposure to groundwater that may contain COCs greater than the remediation goals (developed in RI/FS [Subsection 7.1](#)) through the domestic use pathway.
2. Prevent or minimize migration of B-aquifer groundwater that may contain COCs greater than the remediation goals (developed in RI/FS [Subsection 7.1](#)) beyond the compliance boundary.
3. Prevent direct exposure to groundwater that may contain COCs greater than the remediation goals from existing and future groundwater monitoring wells.

4. Prevent or minimize dermal exposure to and vapor inhalation from A-aquifer groundwater containing COCs greater than remediation goals (developed in RI/FS [Subsection 7.1](#)) by construction workers.
5. Prevent or minimize migration of A-aquifer groundwater to the San Francisco Bay (the Bay) that would result in surface water concentrations of COCs (listed in RI/FS [Table 8-1](#)) greater than aquatic water quality criteria.
6. Prevent or minimize migration of A-aquifer groundwater containing total petroleum hydrocarbon (TPH) concentrations greater than the remediation goal (where commingled with CERCLA substances) into San Francisco Bay. Monitor potential groundwater migration in areas with total TPH soil concentrations greater than the source criterion of 3,500 milligrams per kilogram (applicable to soil from 0 to 10 feet bgs),

Surface Water RAOs

1. Prevent or minimize migration of surface water runoff from Parcel E-2 to the Bay that may contain COCs above aquatic water quality criteria (listed in current Parcel E-2 Storm Water Discharge Management Plan [SWDMP]).

Landfill Gas RAOs

1. Control landfill gas methane concentrations to 5 percent volume in air or less at the points of compliance.
2. Control landfill gas methane concentrations to 1.25 percent volume in air or less in on-site structures (“on-site” for this FS is defined as any area within the points of compliance for landfill gas).
3. Prevent exposure to non-methane organic compounds (NMOCs) at concentrations greater than 500 parts per million by volume (ppmv) at the points of compliance.
4. Prevent exposure to NMOCs at concentrations greater than 5 ppmv above background levels in the breathing zone of on-site workers and visitors.

At Parcel E-2, the Navy evaluated removal and containment of materials posing unacceptable risk. The Navy also evaluated monitoring and institutional controls as a means of preventing unacceptable exposures. The alternatives developed and evaluated in the FS report are designed to accomplish the above RAOs. The following sections discuss the identification and evaluation of federal and state ARARs for Parcel E-2.

N1.2.1. Identifying and Evaluating Federal ARARs

The Navy is responsible for identifying federal ARARs as the lead federal agency under CERCLA and the NCP. The final determination of federal ARARs will be made when the Navy issues the ROD for Parcel E-2. The federal government implements a number of federal environmental statutes that are the source of potential federal ARARs, either in the form of the statutes or regulations promulgated there under. Examples include the Resource Conservation and Recovery Act (RCRA), the Clean Water Act (CWA), the Safe Drinking Water Act (SDWA), the Toxic Substances Control Act (TSCA), and their

implementing regulations, to name a few. See NCP preamble at 55 *Federal Register* (Fed. Reg.) 8764–8765 (1990) for a more complete listing.

The proposed response actions and alternatives were reviewed against all potential federal ARARs, including, but not limited to, those set forth at 55 Fed. Reg. 8764–8765 (1990) in order to determine if they are applicable or relevant and appropriate utilizing the CERCLA and NCP criteria and procedures for ARARs identification by lead federal agencies.

N1.2.2. Identifying and Evaluating State ARARs

EPA guidance ([EPA, 1988b](#)) recommends that the lead federal agency consult with the state when identifying state ARARs for remedial actions. In essence, the CERCLA/NCP requirements at 40 CFR § 300.515 for remedial actions provide that the lead federal agency request that the state identify chemical- and location-specific state ARARs upon completion of site characterization. The requirements also provide that the lead federal agency request identification of all categories of state ARARs (chemical-, location-, and action-specific) upon completion of identification of remedial alternatives for detailed analysis. The state must respond within 30 days of receipt of the lead federal agency requests. The following chronology documents the Navy's efforts to date to identify and evaluate state ARARs.

- The Navy requested state ARARs for Parcel E-2, from all appropriate state agencies, in a letter dated November 2, 2004.
- The Navy received responses from the RWQCB on December 2, 2004. These responses from the RWQCB included the San Francisco Bay Plan, developed by BCDC under the authority of the McAteer-Petris Act (California Government Code Sections 66600 through 66682).
- The Navy received a consolidated set of responses from DTSC on December 17, 2004. These responses specified ARARs from the DTSC, CIWMB, California Department of Fish and Game, California Air Resources Board, and the BAAQMD.

The Navy has evaluated requirements identified by the state agencies and identified the ones that qualify as potential state ARARs for Parcel E-2. Key correspondence between the Navy and the state agencies relating to this effort is included in the Administrative Record for HPS Parcel E-2.

N1.3. OTHER GENERAL ISSUES

General issues identified during the evaluation of ARARs for Parcel E-2 are discussed in the following subsections.

N1.3.1. Containment Issues

Alternative 3 considers the installation of a cap over the Landfill Area, Panhandle Area, and East Adjacent Area. The containment of the Landfill Area is being evaluated in accordance with EPA guidance documents titled “Presumptive Remedy for CERCLA Municipal Landfill Sites” ([EPA, 1993](#)) and “Application of the CERCLA Municipal Landfill Presumptive Remedy to Military Landfills” ([EPA, 1996b](#)) ([Appendix H](#) to the RI/FS report). The guidance and the NCP explain that at municipal landfills,

waste treatment may be impracticable because of the size and heterogeneity of the contents. Waste in CERCLA landfills is usually present in large volumes and is a mixture of municipal waste co-disposed of with industrial or hazardous wastes. Because treatment is usually impracticable, EPA considers containment to be the appropriate response action for the source areas of municipal landfill sites. EPA's guidance states that characterization of a landfill's contents is not necessary or appropriate for selecting a response action for a municipal landfill.

EPA has determined that containment should be applied to all appropriate military landfills as outlined in the guidance titled "Application of the CERCLA Municipal Landfill Presumptive Remedy to Military Landfills" (EPA, 1996b) (Appendix H to the RI/FS report). Based on the evaluation presented in RI/FS Section 4, the Navy has determined that the Parcel E-2 Landfill is suitable for evaluation using the presumptive remedy. However, the areas adjacent to the Parcel E-2 Landfill (the Panhandle Area and East Adjacent Area) are not as easily categorized for application of the presumptive remedy and require consideration more typical of a standard RI/FS (i.e., quantitative risk assessments and evaluation of remedial alternatives other than containment). In addition, some members of the local community have expressed a strong desire for the Navy to thoroughly evaluate excavation of the landfill. In order to provide the necessary information to support the community's review of potential remedial alternatives for Parcel E-2, the Navy has agreed to evaluate excavation of the landfill as part of the RI/FS. Therefore, this FS evaluates a containment alternative (Alternative 3), a removal alternative (Alternative 2), and the no-action alternative (Alternative 1).

N1.3.2. General Approach to Federal RCRA Requirements

RCRA is a federal statute passed in 1976 to meet four goals: protection of human health and the environment; reduction of waste; conservation of energy and natural resources; and elimination of the generation of hazardous waste as expeditiously as possible. The Hazardous and Solid Waste Amendments of 1984 significantly expanded the scope of RCRA by adding new corrective action requirements, land disposal restrictions, and technical requirements. RCRA, as amended, contains several provisions that are potential ARARs for CERCLA sites.

Substantive RCRA requirements are applicable to response actions on CERCLA sites if the waste is a RCRA hazardous waste, and either:

- The waste was initially treated, stored, or disposed after the effective date of the particular RCRA requirement; or
- The activity at the CERCLA site constitutes treatment, storage, or disposal, as defined by RCRA (EPA, 1988a).

The preamble to the NCP indicates that state regulations that are components of a federally authorized or delegated state program are generally considered federal requirements and potential federal ARARs for the purposes of ARARs analysis (55 Fed. Reg. 8666, 8742 [1990]). The State of California received approval for its base RCRA hazardous waste management program on July 23, 1992 (57 Fed. Reg. 32726

[1992]). The State of California “Environmental Health Standards for the Management of Hazardous Waste,” set forth in *California Code of Regulations* (Cal. Code Regs.) Title (tit.) 22, Division 4.5, were approved by EPA as a component of the federally authorized State of California RCRA program. On September 26, 2001, California received final authorization of its revised State Hazardous Waste Management Program by the EPA (66 Fed. Reg. 49118 [2001]).

The regulations of Cal. Code Regs. tit. 22, Division 4.5, are therefore a source of potential federal ARARs for CERCLA response actions. The exception is when a state regulation is “broader in scope” than the corresponding federal RCRA regulations. In that case, such regulations are not considered part of the federally authorized program or potential federal ARARs. Instead, they are purely state law requirements and potential state ARARs.

The EPA July 23, 1992, notice approving the State of California RCRA program (57 Fed. Reg. 32726 [1992]) specifically indicated that the state regulations addressed certain non-RCRA, state-regulated hazardous wastes that fell outside the scope of federal RCRA requirements. The Cal. Code Regs. tit. 22, Division 4.5, requirements would be potential state ARARs for such non-RCRA, state-regulated wastes.

A key threshold question for the ARARs analysis is whether or not the contaminants at Parcel E2 constitute federal hazardous waste as defined under RCRA and the state’s authorized program or qualify as non-RCRA, state-regulated hazardous wastes. Waste characterization is discussed below in [Section N1.4](#).

N1.4. WASTE CHARACTERIZATION

Selection of ARARs involves the characterization of wastes as described below. This section discusses RCRA hazardous waste determination; California-regulated, non-RCRA hazardous waste determination; and other California waste classifications that are potential ARARs for the alternatives involving excavation.

N1.4.1. RCRA Hazardous Waste Determination

Federal RCRA hazardous waste determination is necessary to determine whether a waste is subject to RCRA requirements at Cal. Code Regs. tit. 22, Division 4.5 and other state requirements at Cal. Code Regs. tit. 23, Division 3, Chapter 15. The first step in the RCRA hazardous waste characterization process is to evaluate contaminated media at the site(s) and determine whether the contaminant constitutes a “listed” RCRA waste. The preamble to the NCP states that “... it is often necessary to know the origin of the waste to determine whether it is a listed waste and that, if such documentation is lacking, the lead agency may assume it is not a listed waste” (55 Fed. Reg. 8666, 8758 [1990]).

This approach is confirmed in EPA guidance for CERCLA compliance with other laws ([EPA, 1988a](#)) as follows:

“To determine whether a waste is a listed waste under RCRA, it is often necessary to know the source. However, at many Superfund sites, no information exists on the source

of wastes. The lead agency should use available site information, manifests, storage records, and vouchers in an effort to ascertain the nature of these contaminants. When this documentation is not available, the lead agency may assume that the wastes are not listed RCRA hazardous wastes, unless further analysis or information becomes available that allows the lead agency to determine that the wastes are listed RCRA hazardous wastes.”

RCRA hazardous wastes that have been assigned EPA hazardous waste numbers (or codes) are listed in Cal. Code Regs. tit. 22, Sections (§§) 66261.30–66261.33. The lists include hazardous waste codes beginning with the letters “F,” “K,” “P,” and “U.”

Knowledge of the exact source of a waste is required for source-specific listed wastes (“K” waste codes). Some knowledge of the nature or source of the waste is required even for listed wastes from nonspecific sources, such as spent solvents (“F” waste codes) or commercial chemical products (“P” and “U” waste codes). These listed RCRA hazardous wastes are restricted to commercially pure chemicals used in particular processes such as degreasing.

“P” and “U” wastes cover only unused and unmixed commercial chemical products, particularly spilled or off-specification products (EPA, 1991). Not every waste containing a “P”- or “U”-listed chemical is a hazardous waste. To determine whether a CERCLA investigation-derived waste contains a “P” or “U” waste, there must be direct evidence of product use. In particular, all the following criteria must be met. The chemicals must be:

- Discarded (as described in 40 CFR § 261.2[a][2]),
- Either an off-specification commercial product or a commercially sold grade,
- Not used (soil contaminated with spilled unused wastes is a “P” or “U” waste), and
- The sole active ingredient in a formulation.

The second step in the RCRA hazardous waste characterization process is to evaluate potential hazardous characteristics of the waste. The evaluation of characteristic waste is described in EPA guidance as follows (EPA, 1988a):

“Under certain circumstances, although no historical information exists about the waste, it may be possible to identify the waste as RCRA characteristic waste. This is important in the event that (1) remedial alternatives under consideration at the site involve on-site treatment, storage, or disposal, in which case RCRA may be triggered as discussed in this section; or (2) a remedial alternative involves off-site shipment. Since the generator (in this case, the agency or responsible party conducting the Superfund action) is responsible for determining whether the wastes exhibit any of these characteristics (defined in 40 CFR §§ 261.21 through 261.24), testing may be required. The lead agency must use best professional judgment to determine, on a site-specific basis, if testing for hazardous characteristics is necessary.”

In determining whether to test for the toxicity characteristic using the extraction procedures (EP) toxicity test, it may be possible to assume that certain low concentrations of waste are not toxic. For example, if the total waste concentration in soil is 20 times or less the EP toxicity concentration, the waste cannot be characteristic hazardous waste. In such a case, RCRA requirements would not be applicable. In other instances, where it appears that the substances may be characteristic hazardous waste (ignitable, corrosive, reactive, or EP toxic), testing should be performed.”

Hazardous waste characteristics as defined in 40 CFR §§ 261.21 through 261.24 are commonly referred to as ignitability, corrosivity, reactivity, and toxicity. California environmental health standards for the management of hazardous waste set forth in Cal. Code Regs. tit. 22, Division 4.5, were approved by EPA as a component of the federally authorized California RCRA program; therefore, the characterization of RCRA waste is based on the state requirements.

The characteristics of ignitability, corrosivity, reactivity, and toxicity are defined in Cal. Code Regs. tit. 22, §§ 66261.21 through 66261.24. According to Cal. Code Regs. tit. 22, § 66261.24(a)(1)(A), “A waste that exhibits the characteristic of toxicity pursuant to Subsection (a)(1) of this section has the EPA Hazardous Waste Number specified in Table I of this section which corresponds to the toxic contaminant causing it to be hazardous.” Table I assigns hazardous waste codes beginning with the letter “D” to wastes that exhibit the characteristic of toxicity; D waste codes are limited to “characteristic” hazardous wastes.

According to Cal. Code Regs. tit. 22, § 66261.10, waste characteristics can be measured by an available standardized test method or be reasonably classified by generators of waste based on their knowledge of the waste provided that the waste has already been reliably tested or if there is documentation of chemicals used.

The requirements at Cal. Code Regs. tit. 22, § 66261.24, list the toxic contaminant concentrations that determine the characteristic of toxicity. The concentration limits are in milligrams per liter (mg/L). These units are directly comparable to total concentrations in waste groundwater and surface water. For waste soils, these concentrations apply to the extract or leachate produced by the toxicity characteristic leaching procedure (TCLP).

A waste is considered hazardous if the contaminants in the wastewater or in the soil TCLP extract equal or exceed the TCLP limits. TCLP testing is required only if total contaminant concentrations in soil equal or exceed 20 times the TCLP limits because TCLP uses a 20-to-1 dilution for the extract (EPA, 1988a).

N1.4.2. California-Regulated, Non-RCRA Hazardous Waste

A waste determined not to be a RCRA hazardous waste may still be considered a state-regulated, non-RCRA hazardous waste. The state is broader in scope in its RCRA program in determining hazardous waste. Cal. Code Regs. tit. 22, § 66261.24(a)(2), lists the total threshold limit concentrations (TTLC) and soluble threshold limit concentrations (STLC) for non-RCRA hazardous wastes. The state applies its own

leaching procedure, the waste extraction test (WET), which uses a different acid reagent and has a different dilution factor (10-fold). There are other state requirements that may be broader in scope than federal ARARs for identifying non-RCRA wastes regulated by the state. These may be potential ARARs for wastes not covered under federal ARARs. See additional subsections of Cal. Code Regs. tit. 22, § 66261.24. A waste is considered hazardous if its total concentrations exceed the TTLCs or if the extract concentrations from the WET exceed the STLCs.

A WET is required when the total concentrations exceed the STLC but are less than the TTLCs (Cal. Code Regs. tit. 22, Division 4.5, Chapter 11, Appendix II [b]).

N1.4.3. Other California Waste Classifications

For waste discharged after July 18, 1997, solid waste classifications at Cal. Code Regs. tit. 27, §§ 20210, 20220, and 20230 are used to determine applicability of waste management requirements. These classifications are summarized below.

A “designated waste” under Cal. Code Regs. tit. 27, § 20210, is defined at California Water Code, § 13173. Under California Water Code, § 13173, designated waste is hazardous waste that has been granted a variance from hazardous waste management requirements or non-hazardous waste that consists of or contains pollutants that, under ambient environmental conditions at a waste management unit, could be released in concentrations exceeding applicable water quality objectives or that could reasonably be expected to affect beneficial uses of the waters of the state.

A non-hazardous solid waste under Cal. Code Regs. tit. 27, § 20220, consists of all putrescible and non-putrescible solid, semisolid, and liquid wastes, including garbage, trash, refuse, paper, rubbish, ashes, industrial wastes, demolition and construction wastes, abandoned vehicles and parts thereof, discarded home and industrial appliances, manure, vegetable or animal solid and semisolid wastes, and other discarded waste (whether of solid or semisolid consistency), provided that such wastes do not contain wastes that must be managed as hazardous wastes or wastes that contain soluble pollutants in concentrations that exceed applicable water quality objectives or could cause degradation of waters of the state.

Under Cal. Code Regs. tit. 27, § 20230, inert waste is that subset of solid waste that does not contain hazardous waste or soluble pollutants at concentrations in excess of applicable water quality objectives and does not contain significant quantities of decomposable waste.

Section N2. Chemical-Specific ARARs

Chemical-specific ARARs are generally health- or risk-based numerical values or methodologies applied to site-specific conditions that result in the establishment of a cleanup level. Many potential ARARs associated with particular response alternatives (such as closure or discharge) can be characterized as action-specific but include numerical values or methodologies to establish them so they fit in both categories (chemical- and action-specific). To simplify the comparison of numerical values, most action-specific requirements that include numerical values are included in this chemical-specific section and, if repeated in the action-specific section, the discussion refers back to this section.

This section presents chemical-specific ARAR determinations for groundwater, soil, and air. [Tables N-1](#) and [N-2](#) summarize potential federal and state chemical-specific ARARs, respectively.

N2.1. GROUNDWATER ARARS

The hydrostratigraphy of Parcel E-2 consists of a four distinct units, including three water-bearing units and one aquitard. The shallowest water-bearing unit is referred to as the A-aquifer. The A-aquifer is separated from the deeper water-bearing unit, referred to as the B-aquifer, by the Bay Mud aquitard in most locations across Parcel E-2. Flow in the third water-bearing unit, the bedrock water-bearing zone (WBZ), generally occurs in localized, discontinuous fractures located below the upper weathered portions of bedrock. As discussed in Subsection 2.2.1 of the RI/FS, the presence of laterally continuous layers of silt and clay within the B-aquifer sediments serve to hydraulically isolate the uppermost portions of the B-aquifer (that are interconnected with the A-aquifer) from the lower portions of the B-aquifer. Groundwater monitoring has been limited to the uppermost B-aquifer, and no monitoring has been required in the lower portions of the B-aquifer or the bedrock water-bearing zone (see Subsection 2.2.1 of the RI/FS). The A-aquifer and uppermost B-aquifer present at HPS are potentially affected by contamination from Parcel E-2.

N2.1.1. Federal ARARs

Federal Groundwater Classification

One of the significant issues in identifying ARARs for groundwater under the SDWA and RCRA is whether groundwater at the site can be classified as a source of drinking water. EPA's groundwater policy is set forth in the preamble to the NCP (55 Fed. Reg. 8666, 8752–8756 [1990]). This policy uses the groundwater classification system set forth in the draft EPA "Guidelines for Groundwater Classification Under the EPA Groundwater Protection Strategy" (EPA, 1986). Under this policy,

groundwater is classified in one of three categories (Class I, II, or III) based on ecological importance, replaceability, and vulnerability considerations. Irreplaceable groundwater that currently is used by a substantial population or groundwater that supports a vital habitat is considered to be Class I. Class II consists of groundwater that currently is being used or that might be used as a source of drinking water in the future. Groundwater that cannot be used for drinking water because of insufficient quality (such as high salinity or widespread, naturally occurring contamination) or quantity is considered to be Class III. EPA guidelines define Class III groundwater as groundwater with total dissolved solids (TDS) concentrations over 10,000 milligrams per liter (mg/L) and a yield of less than 150 gallons per day (gpd). Class III groundwater also can be classified based on economic or technological treatability tests as well as quality or quantity (both criteria need not be met).

Transmissivities measured at Parcel E-2 indicate that the A-aquifer and uppermost B-aquifer could yield a minimum of 150 gpd (see Table 2-1 from RI/FS). Based on data collected from three sampling events performed in 2001 and 2002, the average TDS concentration in the A-aquifer is 5,592 mg/L and the average TDS concentration in the uppermost B-aquifer is 2,742 mg/L.

The Navy further evaluated the suitability of the A- and B-aquifers as potential drinking water sources based on site-specific factors (SSF) in conjunction with the Base Realignment and Closure Cleanup Team (Appendix I). The site-specific factors are (1) aquifer thickness; (2) depth to groundwater; (3) measured TDS concentrations; (3) actual groundwater yield; (4) proximity to saltwater and the potential for saltwater intrusion; (5) existence of institutional controls on well construction or aquifer use; (6) information on current and historic use of the aquifer at HPS or in the community surrounding HPS; (7) depth to groundwater; and (8) the cost of cleanup to federal drinking water standards. A ninth SSF, quality of the underlying water-bearing units, was evaluated for the A-aquifer; however, this SSF was not evaluated for the B-aquifer because of a lack of data. The evaluation is summarized below, and is discussed in detail in [Appendix I](#).

A-Aquifer Drinking Water Source Evaluation

Aquifer thickness. The saturated thickness of the unconsolidated materials that form the A-aquifer is averages approximately 10 feet in the potentially potable area (see [Appendix I](#)). Assuming an average porosity of 25 percent, this translates to approximately 95 acre-feet of available water in the A-aquifer for all of Parcel E-2, a relatively small groundwater resource. Continuous pumping of any A-aquifer well at Parcel E-2 will likely induce saltwater intrusion by nearby high-TDS waters (see [Appendix I](#)), which would further degrade the groundwater resource.

Depth to groundwater. The maximum depth to groundwater is 15 feet bgs, and most groundwater is encountered at less than 10 feet bgs. Because the depth to groundwater is so shallow at Parcel E-2, it is unlikely that a domestic well could be installed in the A-aquifer with the required 20-foot minimum well seal.

Measured TDS concentrations. The statistical evaluation of TDS data indicated that the average TDS concentration in the A-aquifer at Parcel E-2 (for three recent sampling events performed in 2001 and 2002) is 5,592 mg/L, which is moderately high for use as a source of drinking water.

Groundwater yield. There are no direct data on the actual yield of the A-aquifer. However, based on the reported transmissivities and hydraulic conductivities (see RI/FS Table 2-1) for the A-aquifer at Parcel E-2 calculated from pumping tests performed during the RI, A-aquifer wells may be capable of sustaining the minimum required well yield of 150 gpd, per the federal classification criterion.

Proximity to saltwater and potential for saltwater intrusion. For the purposes of the evaluation, saltwater areas were defined as areas where TDS concentrations exceed 10,000 mg/L. Areas with TDS concentrations exceeding 10,000 mg/L are located throughout the Parcel E-2 shoreline and an isolated area in the southeast portion of Parcel E-2. Based on this distribution of maximum TDS concentrations, the majority of Parcel E-2 is located within 150 to 250 feet of a saltwater area.

Historic and current uses of the aquifer. Groundwater in the A-aquifer has never been and is not currently being used as a drinking water source. San Francisco currently obtains its municipal water supply from the Hetch Hetchy watershed in the Sierra Nevada and plans to continue using the Hetch Hetchy watershed as a drinking water source in the reasonably foreseeable future.

Existence of institutional controls on well construction and aquifer use. Because high quality water is easily obtainable through the existing water distribution system, the City of San Francisco prohibits installation of domestic wells within city boundaries. In addition, the A-aquifer groundwater within the landfill waste can be considered leachate, and Cal. Code Regs. tit. 27, §§ 21160(a) and (c) prohibits uncontrolled human contact with landfill leachate. As a result, installation of domestic wells would be prohibited in the majority of Parcel E-2.

Cost of cleanup to federal drinking water standards. As part of the RI process at various HPS parcels, Hunters Point groundwater ambient levels (HGALs) were estimated for naturally occurring metals. The HGALs for antimony, arsenic, and thallium exceeded their respective federal drinking water standards (i.e., primary maximum contaminant levels [MCLs]). While the Navy has not calculated the cost to reduce concentrations of these naturally occurring metals to below MCLs in groundwater, the cost would likely be prohibitive, and it may be technically impracticable to do so. In addition, the presence of the landfill at Parcel E-2 has introduced a variety of organic contaminants, most notably benzene, into the A-aquifer at concentrations exceeding MCLs. The cost to remove the landfill and other sources of groundwater contamination in the Panhandle Area and East Adjacent Area would be very high, as documented in the RI/FS (Section 14).

Quality of underlying water-bearing units. Although the B-aquifer, based on the available TDS data, would qualify as a potential drinking water source per the federal classification criteria, it is not a current source of drinking water. Groundwater within the uppermost B-aquifer contains dissolved metals concentrations that exceed drinking water standards, most notably antimony and arsenic, but ambient

levels have not been established for the B-aquifer, and thus it is unknown how much of the metal contamination is from naturally occurring sources. In addition, benzene is present in the uppermost B-aquifer at concentrations greater than the MCL. The presence of benzene in the uppermost B-aquifer is attributed to landfill waste in the northwest portion of Parcel E-2 that is in direct contact with B-aquifer sediments. Also, uppermost B-aquifer groundwater at Parcel E-2 typically exceeds the secondary MCLs for chloride, iron, manganese, and sulfate. Based on this information, the B-aquifer would be considered a poor quality drinking water source.

Based on EPA's groundwater classification criteria and the evaluation of these site-specific factors, groundwater in the A-aquifer is not considered suitable for use as a potential drinking water source ([Appendix I](#)).

B-Aquifer Drinking Water Source Evaluation

Aquifer thickness. Using the interpretation presented on Figure 2-9 of the RI/FS, there are two transmissive layers in the B-aquifer that extend across the majority of Parcel E-2 (the third, deepest layer is interpreted to be present across a small portion of Parcel E-2). Assuming an average thickness of 35 feet (for both transmissive layers) across the 47.4-acre Parcel E-2, and assuming an average porosity of 25 percent, the size of the potentially potable B-aquifer groundwater resource is estimated at 830 acre-feet, which is an order of magnitude larger than the storage capacity estimated for the A-aquifer.

Depth to groundwater. Because the B-aquifer is overlain by the artificial fill and Bay Mud (with an average overall thickness of over 30 feet) across most of Parcel E-2, adequate depth is available to meet annular seal requirements within all but the uppermost portions of the B-aquifer.

Groundwater yield. There are no direct data on the actual yield of the B-aquifer. However, based on the reported transmissivities and hydraulic conductivities ([see RI/FS Table 2-1](#)) for the uppermost B-aquifer at Parcel E-2 calculated from pumping tests performed during the RI, B-aquifer wells may be capable of sustaining the minimum required well yield of 150 gpd, per the federal classification criterion.

Proximity to saltwater and potential for saltwater intrusion. Based on the distribution of maximum TDS concentrations in the uppermost B-aquifer, the majority of Parcel E-2 is located greater than 250 feet from a saltwater area.

Historical and current uses of the aquifer. Groundwater in the B-aquifer has never been and is not currently being used as a drinking water source.

Existence of institutional controls on well construction and aquifer use. Because high quality water is easily obtainable through the existing water distribution system, the City of San Francisco prohibits installation of domestic wells within city boundaries. In addition, the hydraulic connection between the A-aquifer and uppermost B-aquifer could lead to the migration of, and potential human exposure to, A-aquifer groundwater (which can be considered landfill leachate) if a domestic well is installed in the

uppermost B-aquifer. This potential exposure would be prohibited by Cal. Code Regs. tit. 27, §§ 21160(a) and (c).

Cost of cleanup to federal drinking water standards. The hydraulic connection between the A-aquifer and uppermost B-aquifer has introduced organic contaminants, most notably benzene, into the uppermost B-aquifer at concentrations exceeding primary MCLs. The cost to remove the landfill and other sources of groundwater contamination in the Panhandle Area and East Adjacent Area would be very high, as documented in the RI/FS (Section 14). Groundwater in the uppermost B-aquifer contains dissolved metals concentrations that exceed drinking water standards, most notably antimony and arsenic, but ambient levels have not been established for the B-aquifer, and thus it is unknown how much of the metal contamination is from naturally occurring sources. In addition, groundwater in the uppermost B-aquifer typically exceeds the secondary MCLs for chloride, iron, manganese, and sulfate. While the Navy has not calculated the cost to reduce concentrations of these naturally occurring constituents to below MCLs in groundwater, the cost would likely be prohibitive, and it may be technically impracticable to do so.

Based on EPA's groundwater classification criteria and the evaluation of these site-specific factors, groundwater in the B-aquifer is considered to have a moderate potential for use as a drinking water source ([Appendix I](#)). This determination was made independent of the potential remedial alternatives being considered for Parcel E-2. In order to make an ARAR determination, the remedial alternatives for Parcel E-2 must be considered in conjunction with the drinking water source evaluation. For remedial alternatives that leave waste in place, the potential for B-aquifer groundwater at Parcel E-2 to be used as a drinking water source would be low. This conclusion is made primarily considering the hydraulic connection between the A-aquifer and uppermost B-aquifer and the high cost to mitigate this migration pathway. For remedial alternatives that involve complete excavation of the Parcel E-2 Landfill (where the A-aquifer is hydraulically connected with the B-aquifer), the potential for B-aquifer at Parcel E-2 to be used as a drinking water source would be moderate. This conclusion is consistent with the site-specific factor evaluation presented above. The potential federal ARARs resulting from the drinking water source evaluation are specified in detail below (see paragraphs under the headings titled "Safe Drinking Water Act," "RCRA Groundwater Protection Standards," and "Point of Compliance").

Bedrock Water-Bearing Zone Drinking Water Source Evaluation

Groundwater monitoring has not been required in the Parcel E-2 bedrock WBZ because the bedrock is relatively deep (greater than 55 feet bgs in the northern portion of Parcel E-2 to greater than 200 feet bgs in the southeast portion of Parcel E-2). Therefore, no direct data is available to assess the water quality or yield of the bedrock WBZ underlying Parcel E-2 relative to federal and state criteria.

As discussed in [Subsection 2.2.6.4 of the RI/FS](#), the RI at former Parcel A demonstrated that wells installed in the bedrock WBZ were not capable of yielding sustainable quantities of water (less than 200 gpd to a single well) ([PRC Environmental Management, 1995](#)). Based on this information, the Navy recommended that groundwater within the bedrock WBZ be designated as a non-drinking water source

(Naval Facilities Engineering Command Engineering Field Activity West, 1995). The RWQCB concurred with the Navy's evaluation and recommendation in a letter dated May 10, 1995 (RWQCB, 1995).

Safe Drinking Water Act

Federal MCLs and maximum contaminant level goals (MCLGs) developed by the EPA under the SDWA are potential relevant and appropriate requirements for aquifers with Class I and Class II characteristics. Based on the drinking water source evaluation summarized above, federal MCLs and MCLGs are potential federal ARARs for the following scenarios:

- Complete "clean closure" of Parcel E-2 involving excavation of the Parcel E-2 Landfill and adjacent areas (consisting of the Panhandle Area, East Adjacent Area, and Shoreline Area). Under this scenario, federal MCLs and MCLGs are potential federal ARARs for groundwater in the B-aquifer throughout Parcel E-2. Also under this scenario, MCLs and MCLGs may be potential relevant and appropriate ARARs at the small northwest portion of the A-aquifer where the Bay Mud confining unit or aquitard does not separate the A-aquifer from the uppermost B-aquifer.
- Containment of in place waste within the Parcel E-2 Landfill and adjacent areas. Under this scenario, federal MCLs and MCLGs are potential federal ARARs for groundwater in portions of the B-aquifer downgradient of the point of compliance (POC) (see discussion under "Point of Compliance" heading). Under this scenario, federal MCLs and MCLGs are not potential relevant and appropriate ARARs for groundwater in the A-aquifer because the A-aquifer is not a current or potential source of drinking water as concluded above.

The POC for MCLGs and MCLs under the SDWA is at the tap; therefore, the MCLs and MCLGs are not "applicable" ARARs for Navy sites; however, MCLs and MCLGs are generally considered relevant and appropriate as remediation goals for current or potential drinking water sources and thus are commonly identified as potential ARARs for groundwater response actions under CERCLA. The POC for the scenario involving containment of in place waste is discussed below (under "Point of Compliance" heading).

MCLs for HPS Parcel E-2 are found at 40 CFR § 141.61. Although MCLs are developed using cost and technical considerations, EPA considers them to be protective of human health as well. No contaminant concentrations in the B-aquifer exceed the federal MCLs.

EPA has also developed MCLGs to serve as guidance for establishing MCLs. MCLGs for organic contaminants are promulgated at Title 40 CFR § 141.50. MCLGs for inorganic contaminants are promulgated at Title 40 CFR § 141.51. An MCLG is set at a level where no adverse health effects may arise, with a margin of safety. An MCL is required to be set as close as possible to its corresponding MCLG, taking into consideration the best technology, treatment techniques, and other factors, including cost. For non-carcinogens, MCLs generally are set equal to MCLGs. MCLGs for carcinogens are set at zero.

Secondary maximum contaminant levels are non-enforceable federal contaminant levels intended as guidelines for the states. Because they are non-enforceable, federal secondary maximum contaminant levels are not ARARs.

RCRA Groundwater Protection Standards

Groundwater concentration limits for RCRA-regulated units are promulgated at Cal. Code Regs. tit. 22, § 66264.94. For corrective action programs, Cal. Code Regs. tit. 22, § 66264.94(c) states that the concentrations of compounds must not exceed the background level of that constituent in groundwater or, if achieving background is shown to be technologically or economically infeasible, some concentration limit greater than background that is set as part of the corrective action program. Cal. Code Regs. tit. 22, § 66264.94(e) states that in no event shall a concentration limit greater than background exceed other applicable statutes or regulations (such as an MCL), or the lowest concentration demonstrated to be technologically and economically achievable. Consistent with the drinking water source evaluation summarized above, the A-aquifer is not a potential source of drinking water and, therefore, MCLs are not applicable regulations and are not potential ARARs for the A-aquifer (with the exception noted below under the “clean closure” scenario). The lowest concentration determined to be technologically and economically achievable is a potential ARAR for the A-aquifer. In general, economic feasibility is an objective balancing of the incremental benefit of attaining further reductions in the concentrations of chemicals of concern with the incremental cost of achieving those reductions. Therefore, the lowest feasible concentration limits are based on the site risk. The lowest concentration limit greater than background that is technologically and economically achievable for the A-aquifer is based on unacceptable risk from the vapor intrusion pathway.

The requirements at Cal. Code Regs. tit. 22, § 66264.94 are not applicable to groundwater in the A-aquifer because there is no RCRA-regulated unit at HPS Parcel E-2. However, because the wastes at the site are similar or identical to RCRA hazardous wastes, substantive provisions of Cal. Code Regs. tit. 22, § 66264.94(a)(1), (a)(3), (c), (d), and (e) are “relevant and appropriate” and, therefore, potential federal ARARs for groundwater at HPS Parcel E-2 under the following scenarios:

- Complete “clean closure” of Parcel E-2 involving excavation of the Parcel E-2 Landfill and adjacent areas. Under this scenario, concentration limits based on unacceptable risk from the vapor intrusion pathway are potential federal ARARs for groundwater in the A-aquifer throughout Parcel E-2, with the exception of the small northwest portion of the A-aquifer where the Bay Mud confining unit or aquitard does not separate the A-aquifer from the uppermost B-aquifer. In this area, federal MCLs and MCLGs are potential relevant and appropriate ARARs under the “clean closure” scenario.
- Containment of in place waste within the Parcel E-2 Landfill and adjacent areas. Under this scenario, concentration limits based on unacceptable risk from the vapor intrusion pathway are potential federal ARARs for groundwater in portions of the A-aquifer downgradient of the POC.

The POC for the scenario involving containment of in place waste is discussed below.

Point of Compliance

The origins of EPA policy regarding the POC regulatory mechanism can be traced to early EPA RCRA regulations for groundwater monitoring and corrective action at RCRA regulated units set forth in 40 CFR Part 264, Subpart F (40 CFR § 264.95 and 47 Fed. Reg. §§ 32273, 3229 [26 July 1982]). The cited preamble to these regulations clearly state that groundwater cleanup standard and corrective action requirements apply at and beyond the POC at the downgradient edge of regulated units.

EPA followed the RCRA regulatory model and adopted the POC when it established its CERCLA groundwater cleanup policy in the 1990 NCP. EPA's CERCLA policy, set forth in the NCP preamble states that "EPA believes that remediation levels should generally be attained throughout the contaminated plume or at and beyond the edge of the waste management area, when waste is left in place" (55 Fed. Reg. §§ 8666, 8753 [08 March 1990]). The NCP preamble on the same page discusses groundwater cleanup levels and states that "Such restoration may be achieved by attaining MCLs or non-zero MCLGs in the ground water itself, excluding the area underneath any waste left in place."

The policy reflected in the NCP preamble language quoted above was issued to accommodate both scenarios, where: 1) complete "clean closure" is selected as a remedial action using the nine NCP remedy selection criteria and cleanup throughout the contaminant plume is an appropriate cleanup goal; and 2) the remedy selected under those criteria support leaving some waste in place and containing it in conjunction with a POC either for cost reasons or technical feasibility limitations on complete treatment.

In accordance with the NCP preamble, there may be certain circumstances where a plume of groundwater contamination is caused by releases from several distinct sources that are in close geographical proximity. In such cases, the most cost-effective groundwater cleanup strategy may be to address the problem as a whole rather than on a source-by-source basis, and to draw a common POC that encompasses all the sources of release (55 Fed. Reg. 8753, 08 March 1990).

Consistent with EPA's policy as set forth in the NCP preamble, State of California regulations contain the following POC provisions:

- Cal. Code Regs. tit. 22, § 66264.95 indicates that the POC at which the protection standards apply is a vertical surface located at the hydraulically downgradient limit of the waste management area that extends through the uppermost aquifer underlying the regulated unit.
- Cal. Code Regs. tit. 23, § 2550.5 and Cal. Code Regs. tit. 27, § 20405(a) both specify that the POC is a vertical surface located at the hydraulically downgradient limit of the waste management unit that extends through the uppermost aquifer underlying the unit.

The POC provisions at Cal. Code Regs. tit. 22, § 66264.95 are potential relevant and appropriate ARARs for the scenario involving containment of in place waste at HPS Parcel E-2.

Waste has been identified throughout the Parcel E-2 Landfill and the adjacent areas (see Section 4 of the RI/FS), and this waste is the primary source of contamination to groundwater (see Section 6 of the RI/FS). Based on these findings, HPS Parcel E-2 is considered a contiguous waste management unit.

Consistent with the circumstances stated in the NCP preamble, the site conditions warrant defining a common POC downgradient of the contaminant sources. It is the Navy's position that the designation of the POC at the downgradient edge of Parcel E-2 (see [Figure N-1](#)) would be appropriate and is supported by CERCLA, the NCP, and the site-specific conditions at HPS Parcel E-2. The Navy believes that contamination upgradient of the POC would be adequately contained by the remedial action to ensure compliance with the RAOs and adequately protect human health and the environment.

N2.1.2.State ARARs

Primary and Secondary State MCLs

Primary and secondary state MCLs are set forth in Cal. Code Regs. tit. 22, as listed below.

- § 64431 (Maximum Contaminant Levels – Inorganic Chemicals)
- § 64444 (Maximum Contaminant Levels – Organic Chemicals)
- § 64449 (a) (Secondary Maximum Contaminant Levels – Consumer Acceptance Limits)

The RWQCB has concurred in the Navy's determination that groundwater in the A-aquifer is not a potential source of drinking water ([RWQCB, 2003](#)). Therefore, drinking water standards, such as primary and secondary state MCLs are not potential ARARs for the A-aquifer. The Navy considers groundwater in the B-aquifer to have moderate potential as a drinking water source, and therefore the substantive provisions of the standards in Cal. Code Regs. tit. 22 §§ 64431, 64444, and 64449(a) constitute potential relevant and appropriate state ARARs for the following scenarios:

- Complete “clean closure” of Parcel E-2 involving excavation of the Parcel E-2 Landfill and adjacent areas. Under this scenario, primary and secondary state MCLs are potential state ARARs for groundwater in the B-aquifer throughout Parcel E-2. Also under this scenario, primary and secondary state MCLs may be potential relevant and appropriate ARARs at the small northwest portion of the A-aquifer where the Bay Mud confining unit or aquitard does not separate the A-aquifer from the uppermost B-aquifer.
- Containment of in place waste within the Parcel E-2 Landfill and adjacent areas. Under this scenario, primary and secondary state MCLs are potential state ARARs for groundwater in portions of the B-aquifer downgradient of the POC (see discussion under “Point of Compliance” heading in Subsection N2.1.1). Under this scenario, primary and secondary state MCLs are not potential relevant and appropriate ARARs for groundwater in the A-aquifer because the A-aquifer is not a current or potential source of drinking water as concluded above.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act became Division 7 of the California Water Code in 1969. The Porter-Cologne Water Quality Control Act requires each regional board to formulate and adopt basin plans for all areas within the region (*California Water Code* § 13240). It also requires each regional board to establish water quality objectives that will protect the beneficial uses of the water basin

(*California Water Code* § 13241) and to prescribe waste discharge requirements that would implement the basin plan for any discharge of waste to the waters of the state (*California Water Code* § 13263[a]).

Other sections of the Porter-Cologne Water Quality Control Act include *California Water Code* § 13243, which allows regional boards to specify conditions or areas where waste discharge is not permitted. *California Water Code* § 13269 provides the regional boards authority for waivers for reports or compliance with requirements as long as it is not against the public interest.

The Navy accepts the substantive provisions of *California Water Code* §§ 13240, 13241, 13243, 13263(a), 13269, and 13360 of the Porter-Cologne Water Quality Control Act as enabling legislation as implemented through the beneficial uses, water quality objectives, waste discharge requirements, and promulgated policies of the basin plan for the San Francisco Bay Region as potential state ARARs. Although on-site CERCLA response actions are exempt from permit requirements under Section 121(e) of CERCLA, the Navy considers the substantive requirements of the General Permit to be a TBC and a means of assuring compliance with potential ARARs such as MCLs, the Comprehensive Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan), and State of California Water Resources Control Board (SWRCB) Res. 68-16.

California Water Code § 13304 sets forth enforcement authority and an enforcement process (orders issued by the state) and is procedural in nature. It therefore does not constitute an ARAR because it does not establish or contain substantive environmental “standards, requirements, criteria, or limitations” (CERCLA § 121 [Title 42 USC § 9621]) and is not in itself a directive in intent. Through its enforcement authority and procedures, substantive state environmental standards set forth in other statutes, regulations, plans, and orders are enforced. In addition, *California Water Code* § 13304 is no more stringent than the substantive requirements of the potential state ARARs identified above or potential federal ARARs for groundwater.

Comprehensive Water Quality Control Plan for the San Francisco Bay Basin (referred to as the “Basin Plan”)

The Navy accepts the substantive provisions for groundwater in Chapters 2 and 3 of the Basin Plan, including beneficial use, water quality objectives (WQOs), and waste discharge requirements as potential state ARARs.

The RWQCB prepared and implemented the Basin Plan to protect and enhance the quality of the waters in the San Francisco Bay region. The Basin Plan establishes location-specific beneficial uses and water quality objectives for the surface water and groundwater of the region and is the basis of the RWQCB’s regulatory programs. The Basin Plan includes both numerical and narrative water quality objectives for specific groundwater subbasins. The water quality objectives are intended to protect the beneficial uses of the waters of the region and to prevent nuisance.

Beneficial use and reuse of water are key aspects of the Basin Plan for the San Francisco Bay Region. HPS Parcel E-2 groundwater has the following existing and potential beneficial use designations (RWQCB, 2006):

- Municipal and domestic supply
- Industrial process supply
- Industrial service supply
- Agricultural supply

There is no existing or potential beneficial use designation of freshwater replenishment to surface water for the groundwater at HPS Parcel E-2. According to the Basin Plan, site-by-site determinations of the freshwater replenishment beneficial use will be made. Freshwater replenishment has been determined to be a beneficial use of the groundwater at HPS Parcel E-2.

The Navy has determined that despite the municipal and domestic supply designation, the only beneficial use of the groundwater in the A-aquifer is freshwater replenishment of the Bay. The RWQCB has concurred in the Navy's determination that groundwater in the A-aquifer is not a potential source of drinking water (RWQCB, 2003). The Navy considers groundwater in the B-aquifer to have moderate potential as a drinking water source. The potential state ARARs resulting from this determination are specified under the heading titled "Primary and Secondary State MCLs."

SWRCB Resolution 88-63, Adoption of Policy, "Sources of Drinking Water"

SWRCB Resolution 88-63 establishes criteria to help the RWQCB identify potential sources of drinking water. According to this resolution, all groundwater in California is considered suitable or potentially suitable for domestic or municipal freshwater supply except in cases where any one of the water quality and production criteria summarized below cannot be met.

- TDS exceeds 3,000 mg/L (or electrical conductivity is greater than 5,000 micromhos per centimeter) and the RWQCB does not reasonably expect the groundwater to be a public supply system.
- Groundwater is contaminated, either by natural processes or by human activity unrelated to a specific pollution incident, and cannot reasonably be treated for domestic use either by best management practices or best economically available treatment practices.
- The groundwater does not provide sufficient water to supply a single well capable of producing an average sustained yield of 200 gallons per day.

SWRCB Resolution 88-63 was incorporated into and became part of the Basin Plan in 1989. The Navy has concluded that, according to the criteria contained in SWRCB Resolution 88-63, groundwater in the A-aquifer is not a potential drinking water source and groundwater in the B-aquifer has a moderate potential for use as a drinking water source. The RWQCB has concurred in the Navy's conclusion that groundwater in the A-aquifer is not a potential source of drinking water (RWQCB, 2003). The potential

state ARARs resulting from the drinking water determination are specified under the heading titled “Primary and Secondary State MCLs.”

SWRCB Resolutions No. 92-49 and 68-16

SWRCB Resolution 92-49 (as amended on April 21, 1994, and October 2, 1996) is titled Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under California Water Code Section 13304. This resolution contains policies and procedures for the regional boards that apply to all investigations and cleanup and abatement activities for all types of discharges subject to California Water Code Section 13304.

SWRCB Resolution 68-16, Statement of Policy with Respect to Maintaining High Quality of Waters in California, establishes the policy that high-quality waters of the state “shall be maintained to the maximum extent possible” consistent with the “maximum benefit to the people of the state.” It provides that whenever the existing quality of water is better than the required applicable water quality policies, such existing high-quality water will be maintained until it has been demonstrated to the state that any change will be consistent with maximum benefit to the people of the state, will not unreasonably affect present and anticipated beneficial use of such water, and will not result in water quality less than that prescribed in the policies. It also states that any activity that produces or may produce a waste or increased volume or concentration of waste and that discharges or proposes to discharge to existing high-quality waters will be required to meet waste discharge requirements that will result in the best practicable treatment or control of the discharge necessary to assure that a) pollution or a nuisance will not occur and b) the highest water quality consistent with maximum benefit to the people of the state will be maintained.

Cleanup to below ambient water quality conditions is not required by the SWRCB under the Porter-Cologne Act. SWRCB Resolution 92-49 II.F.1 provides that regional boards may require cleanup and abatement to “conform to the provisions of the Resolution No. 68-16 of the State Water Board, and the Water Quality Control Plans of the State and the Water Boards, provided that under no circumstances shall these provisions be interpreted to require cleanup and abatement, which achieves water quality conditions that are better than background conditions.”

The Navy’s and State of California’s positions regarding the applicability of SWRCB Resolutions 68-16 and 92-49 to Parcel E-2 groundwater are summarized below.

Navy’s Position Regarding SWRCB Resolutions 92-49 and 68-16

The Navy recognizes that the key substantive requirements of Cal. Code Regs. tit. 22, § 66264.94 (and the identical requirements of Cal. Code Regs. tit. 23, § 2550.4 and Section III.G of SWRCB Resolution 92-49), require cleanup to ambient levels of constituents unless such restoration proves to be technologically or economically infeasible and an alternative cleanup level of constituents will not pose a substantial present or potential hazard to human health or the environment. In addition, the Navy recognizes that these provisions are more stringent than corresponding provisions of 40 CFR § 264.94

and, although they are federally enforceable via the RCRA program authorization, they are also independently based on state law to the extent that they are more stringent than the federal regulations.

The Navy has also determined that SWRCB Resolution 68-16 is not a chemical-specific ARAR for determining response action goals; however, SWRCB Resolution 68-16 is an action-specific ARAR for regulating discharged treated groundwater back into the aquifer. The Navy has determined that further migration of already-contaminated groundwater is not a discharge governed by the language in Resolution 68-16. More specifically, the language of SWRCB Resolution 68-16 indicates that it is prospective in intent, applying to new discharges in order to maintain existing high-quality waters. It is not intended to apply to restoration of waters that are already degraded.

The Navy's position is that SWRCB Resolutions 68-16 and 92-49 and Cal. Code Regs. tit. 23, § 2550.4, do not constitute chemical-specific ARARs for this Parcel E-2 response action because they are state requirements and are not more stringent than federal ARAR provisions of Cal. Code Regs. tit. 22, § 66264.94. The NCP set forth in 40 CFR § 300.400(g)(4) provides that only state standards more stringent than federal standards may be ARARs (see also CERCLA Section 121(d)(2)(A)(ii) [42 USC § 9621(d)(2)(A)(ii)]).

The substantive technical standard in the equivalent state requirements (Cal. Code Regs. tit. 23, Division 3, Chapter 15, and SWRCB Resolutions 92-49 and 68-16) is identical to the substantive technical standard in Cal. Code Regs. tit. 22, § 66264.94. This section of Cal. Code Regs. tit. 22 will likely be applied in a manner consistent with equivalent provisions of other regulations, including SWRCB Resolutions 92-49 and 68-16.

State of California's Position Regarding SWRCB Resolutions 92-49 and 68-16

The state does not agree with the Navy's determination that SWRCB Resolutions 92-49 and 68-16 and certain provisions of Cal. Code Regs. tit. 23, div. 3, Chapter 15 are not ARARs for this response action. SWRCB has interpreted the term "discharges" in the *California Water Code* to include the movement of waste from soils to groundwater and from contaminated to uncontaminated water (SWRCB, 1994). However, the state agrees that the proposed action would comply with SWRCB Resolutions 92-49 and 68-16, and compliance with the Cal. Code Regs. tit. 22 provisions should result in compliance with the Cal. Code Regs. tit. 23 provisions. The state does not intend to dispute the record of decision, but reserves its rights if implementation of the Cal. Code Regs. tit. 22 provisions is not as stringent as state implementation of Cal. Code Regs. tit. 23 provisions. Because Cal. Code Regs. tit. 22 regulation is part of the state's authorized hazardous waste control program, it is also the state's position that Cal. Code Regs. tit. 22, § 66264.94 is a state ARAR and not a federal ARAR (United States v. State of Colorado, 990 F.2d 1565 [1993]).

Whereas the Navy and the State of California have not agreed on whether SWRCB Resolutions 92-49 and 68-16 and Cal. Code Regs. tit. 23, § 2550.4 are ARARs for this response action, this RI/FS report documents each of the parties' positions on the resolutions but does not attempt to resolve the issue.

N2.2. SURFACE WATER ARARs

The Navy evaluated federal and state surface water criteria as potential ARARs for surface water bodies at HPS Parcel E-2 which, as discussed in Section 2 of the RI/FS, consist of freshwater wetlands in the Panhandle Area and intertidal wetlands in the Shoreline Area. In addition, A-aquifer groundwater discharges to the Bay. For the A-aquifer, the Navy has determined that the state standards promulgated in Table 3-3 of the Basin Plan and the federal standards promulgated in the California Toxics Rule (CTR) are potential ARARs for HPS Parcel E-2 to be met at the interface of A-aquifer groundwater and the Bay. CERCLA § 121(d)(2)(A) states that every remedial action shall require a level or standard of control which at least attains water quality criteria established under Section 304 or 303 of the CWA, where such criteria are relevant and appropriate under the circumstances of the release or threatened release. Under CWA § 304, the EPA has published the National Ambient Water Quality Criteria (NAWQC) and the National Recommended Water Quality Criteria (NRWQC). Under CWA § 303, the EPA has promulgated the water quality standards referred to as the National Toxics Rule and the CTR. In addition, the RWQCB promulgated WQOs for toxic pollutants in surface water with salinities greater than 5 parts per thousand (ppt) in Table 3-3 of the Basin Plan. All of these standards apply to surface water; none of them apply to groundwater. Therefore, these potential surface water ARARs would be applied to the interface of A-aquifer groundwater with the Bay. These potential surface water ARARs would also be applied to surface water bodies at HPS Parcel E-2 (e.g., freshwater wetlands).

For the B-aquifer, the Navy has identified federal and state MCLs as potential ARARs, as discussed above in Subsections N2.1.1 and N2.1.2. These ARARs also would be protective of the discharge of B-aquifer groundwater to permeable zones underlying the Bay; therefore, CWA §§ 304 and 303 surface water criteria are not identified as potential ARARs for the interface of the B-aquifer groundwater and the Bay.

N2.2.1. Federal ARARs

National Ambient Water Quality Criteria

Section 304(a)(1) of the CWA (33 USC § 1314[a][1]) directs U.S. EPA to publish and periodically update the NAWQC. These standards are intended to protect human health and aquatic life from contamination in surface water. The NAWQC are updated in the *Federal Register*. The latest list of the NAWQC through June 2000 was published in the *Federal Register* on December 10, 1998, with amendments in 64 Fed. Reg. 19781 (1999). These criteria are to reflect the latest scientific knowledge on the identifiable effects of pollutants on public health and welfare, aquatic life, and recreation. These criteria serve as guidance to states in adopting water quality standards under Section 303(c) (33 USC § 1313[c]) of the CWA that protect aquatic life from acute and chronic effects.

In 2006, the EPA revised the criteria for 150 priority and non-priority pollutants in the NRWQC (EPA, 2006). The revised criteria are also for the protection of aquatic life and human health.

Although the NAWQC and NRWQC are non-enforceable guidelines and are not legally applicable requirements, they may be potentially relevant and appropriate surface water ARARs under certain circumstances (EPA, 1990). These circumstances generally are when a state has not promulgated a state surface water quality standard and when the protection of aquatic life is a concern or human exposure from consumption of contaminated fish is a concern (EPA 1990). The Navy has determined that the NAWQC and the NRWQC are not potential ARARs for surface water bodies or the interface of A-aquifer groundwater with the Bay because there are other standards better suited to HPS Parcel E-2 including state standards in Table 3-3 of the Basin Plan and the federal standards developed for the State of California codified in CTR, as discussed below.

In addition, the Navy has determined that the NAWQC and NRWQC are not potential ARARs for the in-situ groundwater at HPS Parcel E-2. The EPA has stated the federal water quality criteria should only be used to set groundwater cleanup standards when the groundwater is a current or potential source of drinking water and other cleanup standards for drinking water (such as MCLs and nonzero MCLGs) are not available (EPA, 1990). Groundwater in the A-aquifer is not a current or potential drinking water source, and MCLs are available and have been identified as potential ARARs for the B-aquifer.

Water Quality Standards

EPA promulgated a rule on May 18, 2000, to fill a gap in California water quality standards that was created in 1994 when a state court overturned the state's water quality control plans that contained water quality criteria for priority toxic pollutants. The rule is commonly called the CTR. The rule is codified at 40 CFR § 131.38. These federal criteria are legally applicable in the state of California for inland surface waters and enclosed bays and estuaries for all purposes and programs under the CWA. The water quality standards at 40 CFR § 131.38 are potential applicable federal ARARs for inland surface water and discharges of groundwater to surface water. The Navy has identified the CTR as potential ARARs for surface water bodies and the interface of A-aquifer groundwater and the Bay, because these standards are better suited to HPS Parcel E-2 than national standards. The CTR standards will be applied to surface water bodies and the interface of the A-aquifer and the Bay for those chemicals that do not have standards promulgated in Table 3-3 of the Basin Plan. In addition, some inorganic chemicals have ambient concentrations established that are referred to as HGALs. CERCLA and the State of California do not require clean up to below background conditions. The Navy will compare the CTR standards to these established HGALs, and if the HGAL is greater than the CTR standard, the Navy will meet the HGAL at the interface of the A-aquifer groundwater and the Bay.

On December 22, 1992, EPA promulgated federal water quality standards under the authority of the federal CWA Section 303(c)(2)(B), 33 USC Chapter 26, § 1313(c)(2)(B), in order to establish water-quality standards required by the CWA where the State of California and other states had failed to do so (57 Fed. Reg. 60848 [1992]). These standards have been amended over the years in the *Federal Register* including amendments of the National Toxics Rule (60 Fed. Reg. 22228 [1995]). These water quality standards, as amended, are codified at 40 CFR § 131.36. The Navy has determined that these are not

potential ARARs for the interface of A-aquifer groundwater and surface water because there are better suited standards promulgated in Table 3-3 of the Basin Plan and the CTR.

Additional and revised water quality standards for salinity for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary were codified at 40 CFR § 131.37. The Navy has determined that these are not potential ARARs for HPS Parcel E-2 because they apply salinity criteria at locations in Suisun Bay and the Sacramento-San Joaquin Delta Estuary, which are located more than 30 miles northeast of HPS. .

N2.2.2.State ARARs

Comprehensive Water Quality Control Plan for the San Francisco Bay Basin (referred to as the “Basin Plan”)

In Chapter 3, Table 3-3, of the Basin Plan, the RWQCB established WQOs for chemicals in surface water with salinities equal to or greater than 10 ppt, many of them based on the CTR. These WQOs apply to all marine waters within the region, except for the South Bay below Dumbarton Bridge. These WQOs apply to the Bay, which meets the salinity threshold. These WQOs were identified by the RWQCB as potential state ARARs. The Navy has identified Table 3-3 of the Basin Plan as a potential ARAR for the Bay because it is a state promulgation for the specific pollutants and the water bodies (the wetlands and Bay) at HPS Parcel E-2. The Navy will meet the WQOs promulgated in Table 3-3 of the Basin Plan in the Bay, at a point past the interface of the A-aquifer (or surface water bodies) and the Bay unless that standard is lower than an established HGAL. If the WQOs promulgated in Table 3-3 of the Basin Plan are lower than an established HGAL, then, because CERCLA and the State of California do not require cleanup to below background conditions, the Navy will meet the HGAL. For chemicals that do not have a WQO promulgated in Table 3-3 of the Basin Plan, the Navy will comply with the standards promulgated in the CTR, as discussed above in Section N2.2.1.

N2.3. SOIL ARARS

The San Francisco Redevelopment Agency has designated most of HPS Parcel E-2 for open space reuse ([San Francisco Redevelopment Agency, 1997](#)). Other planned reuses of areas within Parcel E-2 include industrial and research and development ([San Francisco Redevelopment Agency, 1997](#)). As discussed in RI/FS [Subsection 1.8](#), land uses other than open space are incompatible with the landfill area, and restrictive covenants will address this incompatibility. The Navy is evaluating remedial alternatives for the soil, sediment, and waste to meet the remediation goals consistent with the recreational exposure scenario, which is associated with open space reuse.

The only potential chemical-specific ARARs for the soil, sediment, and waste pertain to characterizing any waste generated in implementing various alternatives for off-site disposal, such as excavation and off-site disposal of soil. Because characterization of the contents of landfills is not typically required, no other chemical-specific ARARs apply to soil, sediment, or waste at Parcel E-2 other than the RCRA hazardous waste classification requirements.

The key threshold question for soil ARARs is whether or not the wastes and soil exceeding screening criteria at Parcel E-2 would be classified as hazardous waste. The soil and waste may be classified as a federal hazardous waste as defined by RCRA and the state-authorized program, or as non-RCRA, state regulated hazardous waste. If the soil and waste are determined to be hazardous waste, the appropriate requirements apply.

The potential federal and state chemical-specific ARARs are discussed below.

N2.3.1.Federal ARARs

RCRA Requirements

The federal RCRA requirements at 40 CFR Part 261 do not apply in California because the state RCRA program is authorized. The authorized state RCRA requirements are therefore considered potential federal ARARs. The applicability of RCRA requirements depends on whether the waste is a RCRA hazardous waste; whether the waste was initially treated, stored, or disposed after the effective date of the particular RCRA requirement; and whether the activity at the site constitutes treatment, storage, or disposal as defined by RCRA. However, RCRA requirements may be relevant and appropriate even if they are not applicable. Examples include activities that are similar to the definition of RCRA treatment, storage, or disposal for waste that is similar to RCRA hazardous waste.

The determination of whether a waste is an RCRA hazardous waste can be made by comparing the site waste to the definition of RCRA hazardous waste. The RCRA requirements at Cal. Code Regs. tit. 22, §§ 66261.21, 66261.22(a)(1), 66261.23, 66261.24(a)(1), and 66261.100, are potential ARARs because they define RCRA hazardous waste. A waste can meet the definition of hazardous waste if it has the toxicity characteristic of hazardous waste. This determination is made by using the TCLP. The maximum concentrations allowable for the TCLP listed in Section 66261.24(a)(1)(B) are potential federal ARARs for determining whether the site has hazardous waste. If the site waste has concentrations exceeding these values, it is determined to be a characteristic RCRA hazardous waste.

RCRA land disposal restrictions (LDRs) at Cal. Code Regs. tit. 22, § 66268.1(f), prohibit the placement of hazardous waste on land unless (1) it is treated in accordance with the treatment standards of Cal. Code Regs. tit. 22, § 66268.40, and the underlying hazardous constituents meet the Universal Treatment Standards at Cal. Code Regs. tit. 22, § 66268.48; (2) it is treated to meet the alternative soil treatment standards of Cal. Code Regs. tit. 22, § 66268.49; or (3) a treatability variance is obtained under Cal. Code Regs. tit. 22, § 66268.44. The on-site response actions considered under Alternatives 2 and 3 do not trigger RCRA LDRs, as discussed in Sections N4.2.1 and N4.3.2, respectively.

N2.3.2.State ARARs

RCRA Requirements

State RCRA requirements included within the EPA-authorized RCRA program for California are considered potential federal ARARs and are discussed above. When state regulations are either broader

in scope or more stringent than their federal counterparts, they are considered potential state ARARs. State requirements such as the non-RCRA, state-regulated hazardous waste requirements may be potential state ARARs because they are not within the scope of the federal ARARs (57 Fed. Reg. 60848). Cal. Code Regs. tit. 22 division 4.5 requirements that are part of the state-approved RCRA program would be potential state ARARs for non-RCRA, state-regulated hazardous wastes.

The site waste characteristics need to be compared with the definition of non-RCRA, state-regulated hazardous waste. The requirements for non-RCRA, state-regulated waste are defined at Cal. Code Regs. tit. 22, § 66261.24(a)(2). Section 66261.24(a)(2) lists the TTLCs and STLCs. The site waste may be compared with these thresholds to determine whether waste meets the definition of non-RCRA, state-regulated hazardous waste.

Title 27 California Code of Regulations, Division 2, Subdivision 1 (for solid waste)

The former requirements at Cal. Code Regs. tit. 23, div. 3, Chapter 15 were repealed and recodified at Cal. Code Regs. tit. 27, div. 2, Subdivision 1, and became effective July 18, 1997. The following sections of Cal. Code Regs. tit. 27, div. 2, Subdivision 1 define waste characteristics for discharge of waste to land. These requirements may be applicable for soil left in place that was discharged after the effective date of the requirements. They are not potentially applicable to discharges before that date, but may be relevant and appropriate.

Cal. Code Regs. tit. 27, §§ 20210 and 20220 are state definitions for designated waste and nonhazardous waste, respectively. These may be ARARs for waste that meets the definitions. These waste classifications determine state classification and siting requirements for discharging waste to land.

Title 27 California Code of Regulations, Division 2, Subdivision 1 (for subsurface gas)

Previous investigations at Parcel E-2 indicate that methane was present at concentrations exceeding the levels permitted by Cal. Code Regs. tit. 27, § 20921(a). In August 2002, the Navy installed a methane gas barrier and vent extraction and treatment system as part a time-critical removal action. The system is currently operating on a portion of Parcel E-2. Alternative 3 involves closing the existing gas control system and installing an active gas collection system. The Parcel E-2 ARARs therefore include Cal. Code Regs. tit. 27, § 20921 (a) requirements, which are summarized below.

- The concentration of methane gas must not exceed 1.25 percent by volume in air within on-site structures.
- The concentration of methane gas migrating from the landfill must not exceed 5 percent by volume in the air at the facility property boundary (or alternative boundary).
- Trace gases must be controlled to prevent adverse acute and chronic exposure to toxic or carcinogenic compounds.

For NMOCs, the Navy has established an action level for NMOC concentrations at the fence line gas monitoring probes (GMP) of 500 ppmv. This value is based on the analytical results collected from GMPs for landfill gases during the time-critical removal action and from field data collected at the GMPs.

Calculations of excess lifetime cancer risk (ELCR) for GMPs along Crisp Avenue based on these analytical results ranged from 6.4×10^{-7} to 2.0×10^{-8} for a residential exposure scenario. ELCR calculations for the GMPs on the University of California, San Francisco, compound ranged from 4.0×10^{-7} to 8.8×10^{-9} for an industrial exposure scenario. These risk ranges are an order of magnitude below the NCP point of departure of 1×10^{-6} . Field measurements for NMOCs collected during the same timeframe range from 0 to 51 ppmv. Because a 10-fold increase in the ELCR would require a 10-fold increase in the NMOC measurements, 500 ppmv was determined to be an appropriate field screening level for NMOCs detected in GMPs. If NMOC concentrations exceed 500 ppmv in a fence-line GMP, a sample will be collected and analyzed for volatile organic compounds, and modeling will be conducted to determine if a health threat exists. This action level is not an ARAR because it is not promulgated.

Section N3. Location-Specific ARARs

This section discusses potential location-specific ARARs based on various attributes of Parcel E-2's location (such as whether it is in a flood plain). Additional surveys will be performed in connection with the response action design and response action to confirm location-specific ARARs where inadequate siting information currently exists, or in the event of changes to planned facility locations. The location-specific ARARs applicable to Parcel E-2 are the coastal resources, wetlands protection and flood plains management, and biological resources ARARs discussed below. [Tables N-3](#) and [N-4](#) summarize potential federal and state location-specific ARARs, respectively.

N3.1. COASTAL RESOURCES ARARs

Portions of HPS Parcel E-2 are in the coastal zone. There are potential federal and state location-specific ARARs for the coastal zone.

N3.1.1. Federal ARARs

Coastal Zone Management Act

The CZMA (16 USC §§ 1451 through 1464) specifically excludes federal lands from the coastal zone (16 USC § 1453[I]); therefore, the CZMA is not potentially applicable to Parcel E-2. The CZMA will be evaluated as a potentially relevant and appropriate requirement. CZMA Section 1456(c)(1)(A) requires each federal agency activity within or outside the coastal zone that affects any land or water use or natural resource to conduct its activities in a manner that is consistent to the maximum extent practicable with enforceable policies or approved state management policies. A state coastal zone management program is developed under state law guided by the CZMA and its accompanying implementing regulations in Title 15 of the *Code of Federal Regulations* Section 930. A state program sets forth objectives, policies, and standards to guide public and private uses of lands and water in the coastal zone.

The Navy has identified the substantive provisions of the Coastal Zone Management Act as a potential ARAR because some alternatives evaluated in this FS report contemplate activity within the coastal zone. These alternatives will be completed in a manner consistent with the San Francisco Bay Plan (Bay Plan), an approved state coastal zone management program.

N3.1.2.State ARARs

McAteer-Petris Act and the San Francisco Bay Plan

The BCDC administers the CZMA within the Bay. California's approved coastal management program includes the Bay Plan developed by BCDC. The BCDC was formed under the authority of the McAteer-Petris Act, California Government Code Sections 66600 through 66682, which authorizes the BCDC to regulate activities within the Bay and the shoreline (100 feet landward from the shoreline) in conformity with the policies of the Bay Plan. The McAteer-Petris Act and the Bay Plan were developed primarily to halt uncontrolled development and filling of the Bay. Their broad goals include reducing Bay fill and disposal of dredged material in the Bay, maintaining marshes and mudflats to the fullest extent possible to conserve wildlife and abate pollution, and protecting the beneficial uses of the Bay. The federal CZMA, which requires compliance with approved state coastal zone management program, is a potential ARAR. Therefore, the substantive provisions of the McAteer-Petris Act and the Bay Plan are potential ARARs for Parcel E-2.

N3.2. WETLANDS PROTECTION AND FLOOD PLAINS MANAGEMENT ARARs

This section discusses the federal location-specific ARARs for wetlands protection and flood plain management. The Parcel E-2 Landfill is adjacent to wetland areas. Installation of the landfill cap may necessitate the removal of intertidal wetlands. If any wetlands are destroyed or impaired, the Navy will mitigate and restore the wetlands in accordance with the substantive requirements of Executive Order 11990, which is codified at 40 CFR § 6.302(a) and CWA §404.

The following sections detail the federal ARARs for wetlands protection under Executive Order No. 11990 and the CWA. There are no state location-specific ARARs for wetlands protection and flood plain management for Parcel E-2. The landfill cap will comply with the McAteer-Petris Act and the Bay Plan described in [Section N3.1](#).

N3.2.1.Protection of Wetlands, Executive Order Number 11990

Executive Order No. 11990 requires that federal agencies minimize the destruction, loss, or degradation of wetlands; preserve and enhance the natural and beneficial value of wetlands; and avoid support of new construction in wetlands if a practicable alternative exists.

Executive orders themselves are not ARARs, but they constitute TBC guidance that should be followed in any response action. Executive Order No. 11990 is codified at 40 CFR § 6.302(a). The substantive provisions of 40 CFR § 6.302(a) are potential ARARs because the response action may impact wetlands.

N3.2.2.Clean Water Act (33 USC Section 1344)

Parcel E-2 contains small wetland areas within its boundaries and Alternatives 2 and 3 would potentially require filling of the wetlands; therefore, the Navy has also identified CWA § 404, as promulgated in 40 CFR § 230.10 and 230.11, and 33 CFR § 320, as a potential federal action-specific ARAR for alternatives

that would affect the wetland or the shoreline. The discussion of this potential ARAR is included in Section N4.2.3 of this appendix.

N3.3. BIOLOGICAL RESOURCES ARARS

This section discusses the federal and state location-specific ARARs for biological resources.

N3.3.1. Federal ARARs

Endangered Species Act of 1973

The Endangered Species Act (ESA) of 1973 (16 USC §§ 1531 through 1543) provides a means for conserving various species of fish, wildlife, and plants that are threatened with extinction. The ESA defines an endangered species and provides for the designation of critical habitats. Federal agencies may not jeopardize the continued existence of any listed species or cause the destruction or adverse modification of critical habitat. Under Section 7(a) of the ESA, federal agencies must carry out conservation programs for listed species. The Endangered Species Committee may grant an exemption for agency action if reasonable mitigation and enhancement measures such as propagation, transplantation, and habitat acquisition and improvement are implemented (16 U.S.C. § 1536[h][1][B]). Consultation regulations at Title 50 of the *Code of Federal Regulations* (50 CFR) Section 402 are administrative in nature and are therefore not ARARs; however, they may be TBCs to comply with the substantive provisions of the ESA.

Although no threatened or endangered species are known to inhabit Parcel E-2 or its immediate vicinity, the federally endangered peregrine falcon (*Falco peregrinus*) has been observed at Parcel E ([Tetra Tech EM Inc., Levine-Fricke-Recon, and Uribe and Associates, 1997](#)). The ESA is therefore a potential ARAR.

Migratory Bird Treaty Act of 1972

The Migratory Bird Treaty Act (16 USC §§ 703 through 712) prohibits the pursuit, hunting, capturing, and killing or attempting to take, capture, or kill any migratory bird at any time, using any means or manner. This act also prohibits the possession, sale, export, and import of any migratory bird or any part of a migratory bird, as well as nests and eggs. A list of migratory birds that this requirement applies to is presented at 50 CFR § 10.13. It is the Navy's position that this act is not legally applicable to Navy actions; however, Executive Order No. 13186 (dated January 10, 2001) requires each federal agency taking actions that have or are likely to have a measurable effect on migratory bird populations to develop and implement, within 2 years, a memorandum of understanding (MOU) with the United States Fish and Wildlife Service (USFWS) to promote the conservation of such populations. The Department of Defense (DoD) recently signed (July 2006) a MOU with the United States Fish and Wildlife Service. The MOU will be evaluated when a remedial action is necessary. The MOU describes the responsibilities of the DoD with respect to conservation of migratory birds for all DoD activities, including "hazardous waste cleanup." DoD's specific responsibilities are spelled out in Section D.2.e. and f. of the MOU.

Because migratory birds have been observed at Parcel E-2, the Migratory Bird Treaty Act is a potential relevant and appropriate ARAR.

N3.3.2.State ARARs

California Endangered Species Act

The California Endangered Species Act is codified in the *California Fish and Game Code* §§ 2050–2116. It is the Navy’s position that the requisite federal sovereign immunity waiver does not exist to authorize applicability of the California Endangered Species Act. Nevertheless, §§ 2053 and 2080 of this act, which were identified by DTSC as potential ARARs, will be evaluated as potentially relevant and appropriate requirements for the Navy’s CERCLA response actions. The Navy has determined that *California Fish and Game Code* § 2053 is procedural and nonsubstantive; therefore, this section is not an ARAR. *California Fish and Game Code* § 2080 contains substantive provisions which prohibit the take of endangered species; these substantive provisions may be potential relevant and appropriate requirements if California endangered and special-status species are present within Parcel E-2 or its immediate vicinity.

Although no threatened or endangered species are known to inhabit Parcel E-2 or its immediate vicinity, California endangered and special-status species have been observed at Parcel E, including the endangered peregrine falcon (*Falco peregrinus*) as well as the special-status species of northern harrier (*Circus cyaneus*) and burrowing owl (*Athene cunicularia*) (Tetra Tech EM Inc., Levine-Fricke-Recon, and Uribe and Associates, 1997). Therefore, the substantive provisions of Cal. Fish & Game Code § 2080 are potentially relevant and appropriate requirements for the proposed response action. The response action will be designed to minimize potential effects on these endangered species.

California Fish and Game Code, Section 3005

California Fish and Game Code §§ 3005(a) prohibits the take birds or mammals with any net, pound, cage, trap, set line or wire, or poisonous substance. The procedural aspects of this section are not ARARs; however, the substantive provisions pertaining to the take are potentially relevant and appropriate for the Parcel E-2 response actions.

Section N4. Action-Specific ARARs

Potential action-specific ARARs are identified below for each alternative considered for remedial action at Parcel E-2. Tables N-5 and N-6 summarize potential federal and state action-specific ARARs, respectively.

N4.1. ALTERNATIVE 1: NO ACTION

There is no need to identify action-specific ARARs for the no-action alternative because ARARs apply only to “any removal or remedial action conducted entirely on-site” and “no action” is not a removal or remedial action (CERCLA Section 121(e), 42 USC § 9621[e]). Cleanup standards for selection of a CERCLA remedy, including the requirement to meet ARARs, are not triggered by the no-action alternative (EPA, 1988b); therefore, a discussion of compliance with ARARs is not appropriate for this alternative.

N4.2. ALTERNATIVE 2: EXCAVATE AND DISPOSE OF SOLID WASTE, SOIL, AND SEDIMENT

This alternative would involve excavation and off-site disposal of solid waste, debris, and soil in the Landfill Area. Isolated solid waste locations and soil in the Panhandle Area and East Adjacent Area, as well as sediment within the Shoreline Area, would also be excavated and disposed of off site. Groundwater monitoring is also included in this alternative as a method for monitoring chemicals present in groundwater while allowing for the aquifer to naturally recover. Additionally, groundwater monitoring will be used to confirm site conditions, and ensure that over time the potential exposure pathways remain incomplete. This alternative would also include institutional controls (consisting of access restrictions, land use restrictions, and covenants to restrict use of property) that will be implemented parcel-wide to prevent exposure to potential unacceptable risk posed by COCs in soil and groundwater.

N4.2.1. Excavation and Off-Site Disposal ARARs

Each set of federal and state ARARs is discussed below.

N4.2.1.1. Federal ARARs

Each potential federal ARAR for excavation and off-site disposal is discussed below

Resource Conservation and Recovery Act

According to Cal. Code Regs. tit. 22, §§ 66262.10(a) and 66262.11, a person who generates waste must determine if that waste is hazardous. Cal. Code Regs. tit. 22, §§ 66264.13(a) and (b) specifies the

requirement to analyze generated waste to determine if it is hazardous. These regulatory sections have been identified as potential action-specific ARARs.

Because this alternative may require that hazardous waste be temporarily stored on site prior to off-site disposal, the staging pile requirements of 40 CFR § 264.554 are potential ARARs. Regulations at 40 CFR § 264.554 allow relief from LDRs for temporary storage (less than 2 years) of remediation waste on contiguous property. Placing hazardous remediation wastes in a staging pile does not trigger LDRs or minimum technology requirements. In addition, physical operations such as mixing, sizing, or blending that are intended to prepare wastes for subsequent management or treatment are allowed to occur in staging piles regardless of whether they technically meet the RCRA definition of treatment. The substantive provisions of Section 264.554(a), (d), (g), (h), (i), (j) and (k) are potential ARARs for design, operating, and closure criteria for the staging pile.

For Alternative 2, contaminated water generated as part of the remediation would be temporarily stored in holding tanks and treated in an on-site treatment plant. The Navy has identified the temporary tank requirements for treatment or storage of hazardous remediation waste in Cal. Code Regs. tit. 22, § 66264.553(b), (d), (e), and (f) as potential federal action-specific ARARs under RCRA for the storage of the extracted groundwater. The extracted groundwater would then be treated according to the federal pre-treatment standards, which are identified as potential chemical-specific ARARs below, prior to discharge to the on-site sanitary sewer.

Federal Pre-Treatment Standards

For Alternative 2, contaminated water generated as part of the remediation would be treated in an on-site treatment plant designed to remove metals by ion exchange and organic compounds by carbon adsorption prior to discharge into the on-site sanitary sewer. If the on-site groundwater treated under Alternative 2 is discharged to a publicly-owned sanitary sewer system, the substantive provisions of the pre-treatment standards contained in 40 CFR § 403 are potential relevant and appropriate federal ARARs.

Clean Air Act

The requirement that source emissions not equal or exceed 20 percent opacity under BAAQMD Regulation 6-302 is a potential ARAR for Alternative 2.

Toxic Substances Control Act

TSCA regulates the storage and disposal of polychlorinated biphenyls (PCBs). These requirements have both action- and chemical-specific aspects. They address storage and disposal activities and PCBs only; therefore, they are discussed in this portion of Section N4. Under TSCA, EPA has promulgated 40 CFR § 761.61(a), (b) and (c) PCB remediation waste requirements that provide cleanup and disposal options for PCB remediation waste. The options include (1) self-implementing on-site cleanup and disposal, (2) performance-based disposal, and (3) risk-based disposal. The self-implementing cleanup provisions are not binding on cleanups conducted under other authorities, including actions conducted under Sections

104 or 106 of CERCLA; therefore, they are not applicable ARARs for actions at CERCLA sites. In the preamble of the final rule for 40 CFR 761, however, EPA indicates that it anticipates that the final rule “will be a potential ARAR at CERCLA sites where PCBs are present. EPA expects that CERCLA cleanups would typically comply with the substantive requirements of one of the three options, provided by Section 761.61, upon completion of the cleanups” (63 Fed. Reg. 35, 407, June 29, 1998). At CERCLA sites where PCB contamination is present, 40 CFR § 761.61(c) is therefore potentially relevant and appropriate.

At 40 CFR § 761.61(c), requirements for risk-based disposal are mostly procedural and require EPA approvals. The substantive provisions are at Section 761.61(c)(2), which requires that the risk-based sampling, cleanup, and disposal will not pose an unreasonable risk of injury to health or the environment.

At Parcel E-2, any soils containing PCBs will be disposed of in accordance with 40 CFR § 761.61(c).

N4.2.1.2. State ARARs

The Navy reviewed the requirements identified by the state and determined that the following are potential state ARARs for Alternative 2:

- The requirement to accurately characterize wastes under Cal. Code Regs. tit. 27, § 20200(c)
- The discharge requirements for designated waste to Class I or Class II waste management units at Cal. Code Regs. tit. 27, § 20210
- The discharge requirements for non-hazardous solid to classified units at Cal. Code Regs. tit. 27, §§ 20220(b), (c), and (d)

In addition, the Navy will use the substantive provisions of the state’s general permit, Order Number 99-08-DWQ, as TBCs for complying with the storm water discharge requirements under the potential federal CWA ARAR at 40 CFR §§ 122.44(k)(2) and (4). These requirements are discussed in Subsection N4.2.4.

N4.2.2. Construction and Grading ARARs

The Navy has identified the following new requirement as a potential state ARAR for Alternative 2 because the requirement is applicable and necessary to ensure that the remedy is protective of human health and the environment:

- Asbestos airborne toxic control measure for construction, grading, quarrying, and surface mining operations in naturally occurring asbestos, serpentine or ultramafic rock at Cal. Code Regs. tit. 17, § 93105

The Navy has concluded that this requirement is a potential ARAR because the Navy anticipates construction and grading in areas of E-2 that contain naturally occurring asbestos, serpentine, and ultramafic rock. This regulation sets forth requirements for road construction and maintenance, construction and grading operations. These requirements include limiting construction vehicle speed, applying water to prevent visible emissions and keeping the areas adequately wetted, properly maintaining storage piles, and properly washing down vehicles. This regulation also requires an approved

asbestos dust mitigation plan. Mitigation plans for asbestos dust must specify mitigation practices adequate to ensure that no equipment or operation emits visible dust that crosses the property line and must include one or more provisions to address each of the following topics: track-out prevention and control measures; measures for keeping active storage piles adequately wetted or covered with tarpaulins; control for disturbed surface areas and storage piles that will remain inactive for more than 7 days; control for traffic on on-site unpaved roads, parking lots, and staging areas; control for earthmoving; control for off-site transport; post-construction stabilization of disturbed areas; air monitoring for asbestos, if required by the Air Pollution Control Officer; and frequency of reporting to the air quality district.

The requirement to complete an asbestos dust mitigation plan is procedural and therefore is not an ARAR; however, the Navy will comply with the substantive requirements of Cal. Code Regs. tit. 17, § 93105.

The Navy has identified the substantive provisions of Cal. Code Regs. tit. 27, § 20090(d) as a potential relevant and appropriate ARAR for Alternative 2. Under Cal. Code Regs. tit. 27, § 20090(d), actions taken by or at the direction of public agencies to clean up or abate conditions of pollution or nuisance resulting from unintentional or unauthorized releases of waste or pollutants to the environment are exempt from the requirements identified in Cal. Code Regs. tit. 27, div. 2, subdiv. 1, provided that wastes, pollutants, or contaminated materials removed from the immediate place of release shall be discharged according to the SWRCB-promulgated sections of div. 2, subdiv. 1, ch. 3, subch. 2 and further provided that remedial actions intended to contain such wastes at the place of release shall implement applicable SWRCB-promulgated provisions of Division 2 to the extent feasible.

There are no federal ARARs specific to the construction and grading; however, potential federal and state ARARs pertaining to excavation activities at Parcel E-2 are presented in [Subsection N4.2.1](#).

N4.2.3. Shoreline Construction ARARs

The following text presents federal ARARs specific to shoreline construction activities. There are no state ARARs specific to the shoreline construction; however, potential federal and state ARARs pertaining to the construction of containment systems within the shoreline area (and elsewhere at Parcel E-2) are presented in [Subsection N4.3.1](#).

Construction along the shoreline would require dredging sediment from the shoreline of the bay. This dredged material would be temporarily stored on site awaiting permanent off-site disposal. The Navy has identified the temporary tank requirements for treatment or storage of hazardous remediation waste in Cal. Code Regs. tit. 22, § 66264.553(b), (d), (e), and (f) as potential federal action-specific ARARs under RCRA for the storage of the dredged material. Complying with these potential RCRA ARARs would also be protective for any PCB contamination in the dredged sediment. The sediment would then be characterized for appropriate off-site disposal according to the potential chemical-specific ARARs for waste generated in implementing the alternatives discussed in [Section N2.0](#).

Construction along the shoreline would result in filling in a wetland, approximately 2.38 acres in size, and minor filling in of the bay. The discharge of fill material into the waters of the United States is regulated

under CWA § 404, therefore, the Navy has identified CWA § 404 as a potential federal action-specific ARAR. CWA Section 404 governs the discharge of dredged and fill material into waters of the United States, including adjacent wetlands. Wetlands are areas that are inundated by water frequently enough to support vegetation typically adapted for life in saturated soil conditions. Wetlands include swamps, marshes, bogs, sloughs, potholes, wet meadows, river overflows, mudflats, natural ponds and similar areas. Both the EPA and the U.S. Army Corps of Engineers (USACE) have jurisdiction over wetlands. EPA's Section 404 guidelines are promulgated in 40 CFR § 230, and the USACE's guidelines are promulgated in Title 33 of the *Code of Federal Regulations* (33 CFR) Section 320.

Construction along the shoreline will not result in the discharge of dredged material into the wetland or the bay. Pursuant to 33 CFR § 323.2(d)(2), earth moving in waters of the United States does not constitute discharge of dredged material if project-specific evidence shows that the activity results only in incidental fallback. 33 CFR § 323.2(d) defines incidental fallback as the redeposit of small volumes of dredged material that is incidental to excavation in waters of the United States when the material falls back to substantially the same place as the initial removal. Dredging the sediment around the bay at Parcel E-2 is necessary for construction along the shoreline; however, the Navy would remove the sediment from the shoreline area and only incidental fallback of the dredged material would result.

Construction along the shoreline, and within the Panhandle Area, will result in the discharge of fill material into the wetland and the bay. Pursuant to 33 CFR § 323.2(e), fill material is defined as any material placed in waters of the United States where the material has the effect of replacing any portion of a water of the United States with dry land. Construction along the shoreline would result in either the partial or complete filling in of wetland areas, the loss of which will be replaced by the Navy. The substantive provisions of 40 CFR § 230.10 and 230.11 and 33 CFR Part 323 are potential ARARs for discharging the fill material into the wetland. The Navy will discharge fill material into the wetlands at Parcel E-2 in a manner consistent with the Nationwide General Permit 38 (Cleanup of Hazardous and Toxic Waste) available under the USACE Nationwide Permit program at 33 CFR § 330. Nationwide Permit 38 is contained in 67 Fed. Reg. 2020, Appendix B. The Navy is not required to first obtain authorization from the USACE, either through an individual permit or by filing a notice of intent to discharge under a general permit because permits are not required under CERCLA § 121(e). The Navy will comply with the substantive provisions of the Nationwide Permit 38, including general conditions contained in 67 Fed. Reg. 2020, Appendix C as a means of compliance with CWA § 404 and its implementing regulations (33 USC § 1344, 40 CFR § 230.10 and 230.11, and 33 CFR § 320). Wetland mitigation options are evaluated in [Appendix O](#) of the RI/FS.

N4.2.4. Storm Water Discharge ARARs

Storm water discharge requirements for construction that will disturb 1 or more acres are specified in 40 CFR §§ 122.44(k)(2) and (4). The Navy has identified these requirements as potential ARARs because excavation activities proposed under Alternative 2 would disturb more than 1 acre. This regulation requires the use of best management practices to control or abate the discharge of pollutants when

authorized under CWA § 402(p) to control storm water discharges. Under the CWA and its implementing regulations, individual NPDES permits, or coverage under promulgated storm water general permits, are required for construction that disturbs at least 1 acre. The State of California has promulgated a storm water general permit as Order Number 99-08-DWQ. Under CERCLA § 121(e)(1), no federal, state, or local permit is required for any remedial action conducted entirely on site, where it is selected and carried out in compliance with CERCLA § 121. The Navy is therefore not required to obtain an individual storm water permit or submit a notice of intent to discharge under the state's general permit. The Navy will, however, use the substantive requirements of the state's general permit for storm water discharges as TBCs for complying with the requirement to apply best management practices for storm water discharges promulgated at 40 CFR § 122.44(k)(2) and (4).

Storm water discharges at the Parcel E-2 landfill are currently being managed in accordance with the substantive requirements of SWRCB Order 97-03, which is the state of California General Permit for Discharge of Stormwater Associated with Industrial Activities. The substantive permit requirements include the use of best management practices to prevent non-storm water discharges and to monitor storm water discharges. The Navy will use the substantive requirements of SWRCB Order 97-03 as TBCs during the pre-closure period at the Parcel E-2 landfill, and will continue to manage storm water discharges in accordance with the current SWDMP.

N4.2.5. Groundwater Monitoring ARARs

Groundwater monitoring is included in this alternative as a method for monitoring chemicals present in groundwater while allowing for the aquifer to naturally recover. For Alternative 2, groundwater monitoring will be conducted in accordance with Cal. Code Regs. tit. 22, § 66264.100(d), which requires implementation of a corrective action monitoring program that demonstrates the effectiveness of the corrective action. For Alternative 3, groundwater monitoring will be conducted in accordance with Cal. Code Regs. tit. 22, § 66264.310(b)(3), which requires that the groundwater system be maintained and monitored after closure in accordance with the applicable requirements of Cal. Code Regs. tit. 22, Division 4.5, Chapter 14, Article 6. In addition, the Navy has identified the following potential federal and state ARARs for the long-term monitoring of groundwater at Parcel E-2:

N4.2.5.1. Federal ARARs

- Chemical of concern requirements identified in Cal. Code Regs. tit. 22, § 66264.93
- The point of compliance requirement at Cal. Code Regs. tit. 22, § 66264.95
- The requirement to establish a sufficient number of monitoring points at Cal. Code Regs. tit. 22, § 66264.97(b)(1)(A), (b)(1)(D)(1) and (2)
- Monitoring well construction requirements at Cal. Code Regs. tit. 22, § 66264.97(b)(4), (5), (6), and (7)
- Sample collection requirements at Cal. Code Regs. tit. 22, § 66264.97(e)(6), (e)(12)(A), (e)(12)(B), (e)(13), and (e)(15)

The Navy would generate investigation-derived waste (IDW) in implementing this alternative. The Navy has identified the following potential federal ARARs for characterization of the IDW:

- The requirement to determine if generated waste is hazardous waste at Cal. Code Regs. tit. 22, §§ 66262.10(a) and 66262.11
- The requirement to analyze generated waste to determine if it is hazardous at Cal. Code Regs. tit. 22, § 66264.13(a) and (b)

These waste characterization requirements were also discussed in Subsection N4.2.1.

N4.2.5.2. State ARARs

The Navy has reviewed the regulations and requirements identified by the state in its response to the Navy's request for ARARs. The analysis resulted in the following potential state ARARs for disposal of any IDW generated in the implementation of this alternative:

- The requirement to accurately characterize wastes under Cal. Code Regs. tit. 27, § 20200(c)
- The discharge requirements for designated waste to Class I or Class II waste management units at Cal. Code Regs. tit. 27, § 20210
- The discharge requirements for non-hazardous solid to classified units at Cal. Code Regs. tit. 27, §§ 20220(b), (c), and (d)

These waste characterization requirements were also discussed in Subsection N4.2.1.

N4.2.6. Institutional Control ARARs

Institutional controls will be implemented as part of Alternative 2. Institutional Controls are legal and administrative mechanisms used to implement land use and access restrictions that are used to limit the exposure of future landowner(s) and/or user(s) of the property to hazardous substances and to maintain the integrity of the remedial action until remediation is complete and remediation goals have been achieved. Monitoring and inspections are conducted to assure that the land-use restrictions are being followed.

Legal mechanisms include proprietary controls such as restrictive covenants, negative easements, equitable servitudes, and deed notices. Administrative mechanisms include notices, adopted local land use plans and ordinances, construction permitting, or other existing land use management systems that may be used to ensure compliance with use 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 (2000) (hereinafter referred to as "Navy/DTSC MOA"). More specifically, land use restrictions will be incorporated into and implemented through 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; and 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 tit. 22 Cal. Code Regs. Section 67391.1.

The “Covenant 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 restrictions in environmental restrictive covenants that run with the land and that will be enforceable by the Navy against future transferees. Land use restrictions will be applied to the property and included in findings of suitability to transfer (FOSTs), findings of suitability for early transfer (FOSETs), “Covenant to Restrict Use of Property” between the Navy and DTSC, and any Quitclaim Deeds conveying real property containing HPS Parcel E-2.

Restrictive covenants will be recorded to limit land uses within the adjacent areas to open space, to prohibit the use of A-aquifer groundwater, to protect groundwater monitoring equipment, require compliance with a soil and groundwater management plan, and to preserve access to the sites and associated monitoring equipment for the Navy and the FFA signatories. Additional institutional controls may include establishment of an easement (to perform remediation activities on non-Navy property). There are no federal ARARs for institutional controls.

State statutes that have been accepted by the Navy as ARARs for implementing institutional controls and entering into an Environmental Restriction Covenant and Agreement with DTSC include substantive provisions of the Cal. Civ. Code § 1471 and Cal. Health & Safety Code §§ 25202.5, 25222.1, 25232(b)(1)(A)-(E), 25233(c), 25234, and 25355.5. DTSC promulgated a regulation on 19 April 2003 regarding “Requirements for Land Use Covenants” at Cal. Code Regs. tit. 22, § 67391.1. The substantive provisions of this regulation have been determined to be “relevant and appropriate” state ARARs by the DON.

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

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

Cal. Health and Safety Code § 25233(c) sets forth “relevant and appropriate” substantive criteria for granting variances from restrictions on prohibited uses set forth in Cal. Health and Safety Code §

25232(b)(1)(A)-(E) based upon specified environmental and health criteria. Cal. Health and Safety Code § 25234 sets forth the following “relevant and appropriate” substantive criteria for the removal of a land-use restriction on the grounds that “... the waste no longer creates a significant existing or potential hazard to present or future public health or safety.”

Cal. Health & Safety Code §§ 25222.1 and 25355.5(a)(1)(C) provide the authority for the state to enter into voluntary agreements to establish land-use covenants with the owner of property. The substantive requirements of the following Cal. Health & Safety Code § 25222.1 provisions are “relevant and appropriate”: (1) the general narrative standard: “restricting specified uses of the property, . . .” and (2) “. . . the agreement is irrevocable, and shall be recorded by the owner, . . . as a hazardous waste easement, covenant, restriction or servitude, or any combination thereof, as appropriate, upon the present and future uses of the land.” The substantive requirements of the following Cal. Health & Safety Code § 25355.5(a)(1)(C) provisions are “relevant and appropriate”: “. . . execution and recording of a written instrument that imposes an easement, covenant, restriction, or servitude, or combination thereof, as appropriate, upon the present and future uses of the land.”

The Navy will comply with the substantive requirements of Cal. Health & Safety Code §§ 25222.1 and 25355.5(a)(1)(C) by incorporating the CERCLA use restrictions into the Navy’s deed of conveyance in the form of restrictive covenants under the authority of Cal. Civ. Code § 1471 and into the environmental restriction covenant and agreement. The substantive provisions of Cal. Health & Safety Code §§ 25222.1 and 25355.5(a)(1)(C) may be interpreted in a manner that is consistent with the substantive provisions of Cal. Civ. Code § 1471. The covenants shall be recorded with the deed and run with the land.

In addition to being implemented through the Environmental Restriction Covenant and Agreement between the DON and DTSC, the appropriate and relevant portions of Cal. Health & Safety Code §§ 25202.5, 25222.1, 25232(b)(1)(A)-(E), 25233(c), 25234, and 25355.5(a)(1)(C) and Cal. Civ. Code § 1471 shall also be implemented through the deed between the Navy and the transferee.

U.S. EPA agrees that the substantive portions of the state statutes and regulations referenced in this section are ARARs. U.S. EPA specifically considers sections (a), (b), (d), and (e) of Cal. Code Regs., tit. 22 § 67391.1, to be ARARs for this FS. DTSC’s position is that all of the state statutes and regulations referenced in this section are ARARs.

N4.3. ALTERNATIVE 3: CONTAIN SOLID WASTE, SOIL, AND SEDIMENT

This alternative would involve containing solid waste and soil in the Landfill Area as well as soil and sediment in the adjacent areas. The portions of the Landfill Area not already covered by the existing multilayer cap would then be capped with a similarly designed multilayer cap. The isolated solid waste locations and soil in the adjacent areas would also be capped in place with an engineered alternative cap. The intertidal sediment and debris within the Shoreline Area would be contained with a revetment wall. In addition, this alternative would include installation, operation, and maintenance of an active landfill gas control system. Monitoring of landfill gas, storm water, and groundwater are also included in this

alternative. This alternative would also include institutional controls that will be implemented parcel-wide to prevent exposure to potential unacceptable risk posed by COCs in soil and groundwater.

The principal threat to human health from soil and waste at Parcel E-2 is posed by the ingestion, dermal contact, and inhalation pathways. Under Alternative 3, a cap would be constructed over the adjacent areas in accordance with ARARs that allow for an engineered alternative cover. The cap would consist of a 1-foot-thick vegetative layer, a geomembrane layer, and a 2-foot-thick foundation layer. Specified substantive provisions of the regulations at Cal. Code Regs. tit. 22 and Cal. Code Regs. tit. 27 are potential ARARs for general landfill capping, as summarized in [Section N4.3.1](#).

The potential action-specific ARARs for the containment alternative include the following components in common with Alternative 2: 1) shoreline construction; 2) storm water discharge; 3) groundwater monitoring; and 4) institutional controls. These potential ARARs were discussed in [Section N4.2](#). Additional institutional controls, beyond those specified for Alternative 2, will include a restrictive covenant and deed restrictions to limit construction over the landfill cap, to limit land uses in all areas to open space, and to require maintenance of the cover systems.

N4.3.1. Containment ARARs

Landfill closure and post-closure requirements are contained in Cal. Code Regs. tit. 22, 40 CFR Part 258, Cal. Code Regs. tit. 23, and Cal. Code Regs. tit. 27. Because the Parcel E-2 landfill ceased operation (between 1974 and 1975) prior to the effective date of any of these sets of similar but not identical regulations, they are not “applicable” ARARs. Therefore, the Navy reviewed these regulations to determine whether any were potentially relevant to the proposed remedial alternatives and then whether they were appropriate relative to the site-specific conditions. The criteria used in determining whether these regulations were “relevant and appropriate” were specified in [Section N1.1](#).

Because these regulations contain overlapping requirements, Table N-7 compares Cal. Code Regs. tit. 22, 40 CFR Part 258, Cal. Code Regs. tit. 23, and Cal. Code Regs. tit. 27 and identifies the most stringent, or controlling, potential ARARs. When federal and state regulations are considered to be equally stringent, federal regulations are selected as controlling ARARs. The potential ARARs identified in Table N-7 as “controlling” were evaluated to determine whether the requirements were “relevant and appropriate” for the containment actions contemplated under Alternative 3. Some of the controlling ARARs for containment actions were determined not to be relevant and appropriate using the criteria specified in [Section N1.1](#). One of these criteria considers potential variances, waivers, or exemptions of the requirement and their availability for the circumstances at the CERCLA site. As a result of this evaluation, several requirements at Cal. Code Regs. tit. 27 were determined to not be relevant and appropriate because the site-specific conditions at HPS Parcel E-2 met the variance requirements specified at Cal. Code Regs. tit. 27 §§ 20080 (b) and (c). This determination is discussed in [Subsection N4.3.1.2](#).

The potential action-specific ARARs for the containment actions contemplated under Alternative 3 are identified in Tables N-5 and N-6, and are summarized below.

N4.3.1.1. Federal ARARs

- **Compaction:** Cal. Code Regs. tit. 22, § 66264.228(e)(1). This section requires that, if waste is to remain in a unit, the unit shall be compacted before any portion of the final cover is installed.
- **Post-closure Water Entry:** Cal. Code Regs. tit. 22, § 66264.310(a)(1). This section requires that the final cover be designed to prevent the downward entry of water into the closed landfill throughout a period of at least 100 years.
- **Cover Seismic Requirements:** Cal. Code Regs. tit. 22, § 66264.310(a)(5). This section requires that the final cover be designed to accommodate lateral and vertical shear forces generated by the maximum credible earthquake so that the integrity of the cover is maintained.
- **Post-closure Care:** Cal. Code Regs. tit. 22, § 66264.310(b)(1). This section requires that the integrity and effectiveness of the final cover be maintained throughout the post-closure period.
- **Benchmark Maintenance:** Cal. Code Regs. tit. 22, § 66264.310(b)(5). This section requires that surveyed benchmarks be protected and maintained throughout the post-closure period.

N4.3.1.2. State ARARs

- **Engineered Alternative:** Cal. Code Regs. tit. 27, §§ 20080(b) and (c). Under these sections, alternatives to construction or prescriptive standards contained in SWRCB-promulgated regulations under Cal. Code Regs. tit. 27 (which include § 21090) may be considered. Under Cal. Code Regs. tit. 27, § 20080(b), alternatives shall only be approved where the discharger demonstrates that: 1) the construction or prescriptive standard is not feasible as provided in § 20080(c); and 2) there is a specific engineered alternative that: a) is consistent with the performance goal addressed by the particular construction or prescriptive standard, and b) affords equivalent protection against water quality impairment. In order to establish that construction or prescriptive standard is not feasible under Cal. Code Regs. tit. 27, § 20080(c), the discharger shall demonstrate that compliance with the prescriptive standard either: 1) is unreasonably and unnecessarily burdensome and will cost substantially more than alternatives which meet the criteria in § 20080(b); or 2) is impractical and will not promote attainment of applicable performance standards. The requirements at Cal. Code Regs. tit. 27 § 20324(g)(1), § 21090(a)(2), and § 21090(b)(1) were determined to not be feasible and a specific engineered alternative was identified that is consistent with the performance goal and affords equivalent protection against water quality impairment. This determination is discussed in detail below.
- **Capping permeability:** Cal. Code Regs. tit. 27, §§ 20320 (c) and (d). These sections requires hydraulic conductivities be evaluated primarily through laboratory methods and be confirmed by appropriate field testing. Earthen materials used in containment structures must consist of a clay mixture and other suitable fine-grained soils that have specific characteristics and that, in combination, can be compacted to attain the required hydraulic conductivity when installed. Cal. Code Regs. tit. 27, § 20324(g)(1) also specifies requirements for capping permeability; however, this section is not an ARAR because the requirements were determined to not be feasible and a specific engineered alternative was identified that is consistent with the performance goal and

affords equivalent protection against water quality impairment. This determination is discussed in detail below.

- Erosion Control: Cal. Code Regs. tit. 27, §§ 20365(c) and (d) and 21090(c)(4). These sections require that diversion and drainage facilities be designed, constructed, and maintained to accommodate the anticipated volume of site precipitation and peak flows. In addition, erosion and related damage of the final cover due to drainage must be prevented throughout the post-closure maintenance period.
- Post-closure care period: Cal. Code Regs. tit. 27, §§ 20950(a). This section requires that the post-closure maintenance period shall extend as long as the wastes pose a threat to water quality
- Foundation layer: Cal. Code Regs. tit. 27, § 21090(a)(1). This section requires that closed landfills be provided with not less than 2 feet of appropriate materials as a foundation layer for the final cover. These materials may be soil, contaminated soil, incinerator ash, or other waste materials, provided that such materials have appropriate engineering properties to be used for a foundation layer. The foundation layer shall be compacted to the maximum density obtainable at optimum moisture content using methods that are in accordance with accepted civil engineering practice. A lesser thickness may be allowed for units if the differential settlement of waste and ultimate land use will not affect the structural integrity of the final cover.
- Low hydraulic conductivity layer: Cal Code Regs. tit. 27, § 21090(a)(2) is not an ARAR because the requirements were determined to not be feasible and a specific engineered alternative was identified that is consistent with the performance goal and affords equivalent protection against water quality impairment. This determination is discussed in detail below.
- Erosion-resistant layer: Cal. Code Regs. tit. 27, § 21090(a)(3). This section requires that closed landfills be provided with an uppermost cover layer, which should directly overlay the low-hydraulic-conductivity layer, consisting of either a vegetative layer consisting of not less than 1 foot of soil capable of sustaining native or other suitable plant growth or a mechanically erosion-resistant layer.
- Emergency Response: Cal. Code Regs. tit. 27, § 21130. The substantive provisions of this section requires that: 1) occurrences that may exceed the site design and endanger public health or the environment be identified; 2) specific procedures that minimize these hazards to protect public health and safety be established; and 3) hazard mitigation procedures also address vandalism, fires, explosions, earthquakes, floods, the collapse or failure of artificial or natural dikes, levees, or dams, surface drainage problems, and other waste releases. These substantive requirements will be addressed in the post-closure maintenance plan and the final closure plan.
- Site Security: Cal. Code Regs. tit. 27, §§ 21135(f) and (g). This section requires that all points of site access must be restricted, except at permitted entry points, and all monitoring, control and recovery systems must be protected from unauthorized access. Once closure activities are complete, site access by the public may be allowed in accordance with the approved post-closure maintenance plan.
- Structure Removal: Cal. Code Regs. tit. 27, § 21137. This section requires that the operator dismantle and remove site structures at the time of closure to protect public health and safety in accordance with the implementation schedule of the approved final closure plan.
- Final Cover: Cal. Code Regs. tit. 27, §§ 21140(a) and (b) require that the final cover must function with minimum maintenance and provide waste containment to protect public health and

safety by controlling at a minimum, vectors, fire, odor, litter, and landfill gas migration. The final cover must also be compatible with post-closure land use.

- Final Grading: Cal. Code Regs. tit. 27, § 21142(a). This section requires that final grades must be designed and maintained to reduce impacts to health and safety and take into consideration any post-closure land use. Cal. Code Regs. tit. 27, § 21090(b)(1) also specifies requirements for final grading; however, this section is not an ARAR because the requirements were determined to not be feasible and a specific engineered alternative was identified that is consistent with the performance goal and affords equivalent protection against water quality impairment. This determination is discussed in detail below.
- Slope Stability: Cal. Code Regs. tit. 27, § 21145(a) requires the operator to ensure the integrity of final slopes under both static and dynamic conditions to protect public health & safety and prevent damage to post-closure land-uses, roads, structures, utilities, gas monitoring and control systems, leachate collection and control systems to prevent public contact with leachate, and prevent exposure of waste. These requirements do not conflict with the seismic requirements in Cal. Code Regs. tit. 22, § 66264.310(a)(5).
- Drainage and Erosion Control: Cal. Code Regs. tit. 27, § 21150(a). The drainage and erosion control system shall be designed and maintained to ensure integrity of post-closure land uses, roads, and structures; to prevent public contact with waste and leachate; to ensure integrity of gas monitoring and control systems; to prevent safety hazards; and to prevent exposure of waste.
- Post-closure Maintenance: Cal. Code Regs. tit. 27, § 21180(a). This section requires post-closure maintenance and monitoring of the landfill for no less than 30 years following closure.
- Post-closure Land Use: Cal. Code Regs. tit. 27, §§ 21190(a), (b), (c), (d), (e), (f) and (g). These sections require that postclosure land uses be designed and maintained to protect health and safety; prevent contact with waste, landfill gas, and leachate; and prevent gas explosions. In addition, approval is required if proposed postclosure land uses involve structures within 1,000 feet of the disposal area, structures on top of waste, modification of the low permeability layer, or irrigation over waste. Additional requirements apply to potential on-site construction.

The content requirements for the post-closure maintenance plan and the final closure plan are specified in Cal. Code Regs. tit. 27, §§ 21800(c) and 21830, respectively. These reporting requirements are not substantive and are therefore not ARARs; however, these requirements will be used by the Navy as TBCs in developing the post-closure maintenance plan and the final closure plan.

The low hydraulic conductivity layer requirements at Cal Code Regs. tit. 27, § 21090(a)(2), as well as the capping permeability requirements at Cal. Code Regs. tit. 27, § 20324(g)(1), were determined to not be feasible because they were considered impractical and would not promote attainment of applicable performance standards. The requirement for a one-foot, low hydraulic conductivity soil layer was considered impractical because it would not form an effective, continuous barrier across Parcel E-2. Specifically, the increased thickness of the soil layer (relative to the geosynthetic interim cap) would create surface drainage problems that would in turn result in performance problems. The soil layer would not promote attainment of the applicable performance standards because, in order to meet the low hydraulic conductivity requirements, the clay material must be compacted to a high degree over a solid

foundation, and such compaction standards would not likely be met in low-lying areas near the groundwater table (such as the Panhandle Area). An evaluation of two engineered alternatives is provided in [Subsection 11.5.1](#) and [Appendix P](#) of the RI/FS. Based on this evaluation, the engineered alternatives are readily implementable and will exceed the applicable performance standards.

The final grading requirements at Cal Code Regs. tit. 27, § 21090(b)(1) were determined to not be feasible because they were considered impractical and would not promote attainment of applicable performance standards. Specifically, the prohibition on surface water ponding at § 21090(b)(1) is not practical and would not promote attainment of applicable performance standards considering the location-specific ARARs requiring wetlands mitigation, and the extremely limited number of locations, either elsewhere at HPS or in the San Francisco Bay Area, where wetlands restoration is practical. Rather, HPS Parcel E-2 has been identified by the City and County of San Francisco, along with other areas adjoining the South Basin (Yosemite Slough and Candlestick Point), as a prime location for their planned wetlands restoration activities. An evaluation of two engineered alternatives is provided in [Subsection 11.5.1](#) and [Appendix P](#) of the RI/FS. Based on this evaluation, the engineered alternatives are readily implementable and will exceed the applicable performance standards.

N4.3.2. Construction and Grading ARARs

The construction and grading to be performed under Alternative 3 will involve re-locating soil and waste material to achieve final design grades. Such grading is needed to ensure proper drainage and to facilitate wetlands restoration prior to capping Parcel E-2. The Navy evaluated potential ARARs for the construction and grading activities contemplated under Alternative 3.

In the NCP preamble, EPA defined “land disposal” under a CERCLA action as “placement into a land disposal unit under section 3004(k) of RCRA.” Further, EPA “equated an area of contamination (AOC), consisting of continuous contamination of varying amounts and types at a CERCLA site, to a single RCRA land disposal unit, and stated that movement within the unit does not constitute placement” (55 Fed. Reg. §§ 8666, 8758 [08 March 1990]). EPA’s AOC policy was further discussed, consistent with the NCP preamble, in a 1996 memorandum (EPA, 1996a). Consistent with the findings of the RI (presented in Section 8 of this RI/FS), the heterogeneous distribution of soil contamination and solid waste support the definition of Parcel E-2 as a single AOC. Therefore, the re-location of soil and waste material within Parcel E-2 does not constitute placement, and RCRA LDRs are not triggered.

Consistent with the grading under Alternative 2 (Section N4.2.2), the Navy has identified the following new requirement as a potential state ARAR for Alternative 3 because the requirement is applicable and necessary to ensure that the remedy is protective of human health and the environment:

- Cal. Code Regs. tit. 17, § 93105: asbestos airborne toxic control measure for construction, grading, quarrying, and surface mining operations in naturally occurring asbestos, serpentine or ultramafic rock.

- Cal. Code Regs. tit. 27, § 20090(d): actions taken by or at the direction of public agencies to clean up or abate conditions of pollution or nuisance resulting from unintentional or unauthorized releases of waste or pollutants to the environment are exempt from the Title 27 requirements identified in Cal. Code Regs. tit 27, div. 2, subdiv. 1, provided that wastes, pollutants, or contaminated materials removed from the immediate place of release shall be discharged according to the SWRCB-promulgated sections of div. 2, subdiv. 1, ch. 3, subch. 2 and further provided that remedial actions intended to contain such wastes at the place of release shall implement applicable SWRCB-promulgated provisions of Division 2 to the extent feasible.

N4.3.3.Landfill Gas Monitoring and Control ARARs

The potential ARARs for landfill gas monitoring and control are summarized in the following sections.

N4.3.3.1. Federal ARARs

- Gas Emissions: BAAQMD Regulation 8, Rule 2. This rule requires that a person shall not discharge into the atmosphere from any miscellaneous operation an emission containing more than 6.8 kilograms (15 pounds) per day and containing a concentration of more than 300 parts per million of total carbon on a dry basis.

BAAQMD Regulation 8, Rule 34 was identified by DTSC as a potential ARAR. This rule limits the emission of non-methane organic compounds and methane from the waste decomposition process. This rule also specifies the following exemption criteria which are pertinent to Parcel E-2: 1) the landfill is a closed landfill or an inactive landfill with no design capacity available for future waste deposition; 2) the landfill last received solid waste at least thirty years ago; and 3) the solid waste disposal site has an in-place tonnage of less than 1,000,000 tons. Because the Parcel E-2 Landfill meets these exemption criteria, the substantive provisions of BAAQMD Regulation 8, Rule 34 are not ARARs.

N4.3.3.2. State ARARs

According to Cal. Code Regs. tit. 27, § 20921, landfill gases generated at a disposal site must be controlled in accordance with the requirements summarized below.

- The concentration of methane gas must not exceed 1.25 percent by volume in air within on-site structures.
- The concentration of methane gas migrating from the landfill must not exceed 5 percent volume in air at the facility property boundary or an alternative boundary approved in accordance with Cal. Code Regs. tit. 27, § 20925.

Landfill gas was detected at levels exceeding the lower explosive limit at the University of California, San Francisco, compound adjacent to the northern portion of the landfill. In August 2002, the Navy installed a landfill gas control system as a time-critical removal action to address methane gas emissions. The landfill gas control system is designed to reduce the concentrations of methane gas in the surface to levels below the lower explosive limit (5 percent by volume in air) at the university compound and to

prevent future methane migration north of the Landfill. The regulations below are landfill gas control ARARs that will be followed to monitor landfill gas at Parcel E-2.

- **Landfill Gas Monitoring:** Cal. Code Regs. tit. 27, § 20923. This section states that to ensure that the conditions of Section 20921 are met, the operator must implement a gas monitoring program at the disposal site in accordance with specified requirements including (1) design by a registered civil engineer or a certified engineering geologist; and (2) design to account for the local soil, rock, and hydrogeological conditions; locations of buildings and structures relative to the waste disposal area; adjacent land use and inhabitable structures within 1,000 feet of the disposal site property boundary; manmade pathways, such as underground construction; and the nature and age of waste and its potential to generate landfill gas.
- **Perimeter Monitoring:** Cal. Code Regs. tit. 27, § 20925. This section requires that perimeter monitoring wells be installed around the waste. The perimeter wells must be (1) located at or near the disposal site property boundary or at an alternative boundary; (2) not more than 1,000 feet apart; (3) drilled by a licensed drilling contractor or, where in-house drilling capability exists, by a drilling crew under the supervision of the design engineer or engineering geologist; and (4) logged during drilling by a geologist or geotechnical engineer.
- **Structure Monitoring:** Cal. Code Regs. tit. 27, § 20931. This section requires that the monitoring network design include provisions for monitoring on-site structures such as buildings, subsurface vaults, utilities, and any other areas where potential gas buildup would be of concern.
- **Monitored Parameters:** Cal. Code Regs. tit. 27, § 20932. This section requires that all monitoring probes and on-site structures be sampled for methane during the monitoring period.
- **Monitoring Frequency:** Cal. Code Regs. tit. 27, § 20933. This section requires quarterly monitoring at a minimum. More frequent monitoring may also be required at locations where monitoring results indicate that landfill gas migration is occurring or is accumulating in structures.
- **Methane Control:** Cal. Code Regs. tit. 27, § 20937. This section requires that when gas monitoring results indicate methane concentrations exceeding the compliance levels required by Section 20921(a), the operator must (1) take all immediate steps necessary to protect public health and safety, and the environment; (2) notify the enforcement agency in writing within 5 working days of learning that compliance levels have been exceeded and indicate planned or implemented actions to resolve the problem; (3) verify the accuracy of results; (4) within 10 working days, submit to the enforcement agency a letter that describes the nature and extent of the problem, and any immediate corrective actions that need to be taken to protect public health and safety and the environment; and (5) construct a gas control system to prevent methane accumulation in on-site structures, reduce methane concentrations at monitored property boundaries to below compliance levels, reduce trace gas concentrations, and provide for the collection and treatment and/or disposal of landfill gas condensate produced at the surface. When the results of monitoring in on-site structures indicate levels exceeding those specified in Section 20923(a), appropriate action must be taken to mitigate the effects of landfill gas accumulation in on-site structures.

N4.3.4. Surface Water Monitoring ARARs

Surface water monitoring will be conducted in accordance with Cal. Code Regs. tit. 22, § 66264.97(c)(1), which requires that a monitoring system be established to monitor each surface water body that could be affected by a release from a regulated unit. A detection monitoring program will be established in accordance with Cal. Code Regs. tit. 22, § 66264.97(c)(2)(B).

N4.3.5. Leachate Collection and Control ARARs

During the post-closure maintenance period, leachate collection and control must be conducted in a manner that prevents public contact and controls vectors, nuisance, and odors in accordance with Cal. Code Regs. tit. 27, § 21160(a) and (c) discussed in Subsection N4.3.1.2. Because the waste within the Parcel E-2 is present below the shallow groundwater table, no discharge of landfill leachate occurs at the site aside from the discharge of A-aquifer groundwater into the Bay. Groundwater monitoring ARARs are discussed in [Section N4.2.5](#). If needed based on results of groundwater monitoring, leachate collection and removal will be performed until no longer detected as required by Cal. Code Regs. tit. 22, § 66264.310(b)(2).

Section N5. References

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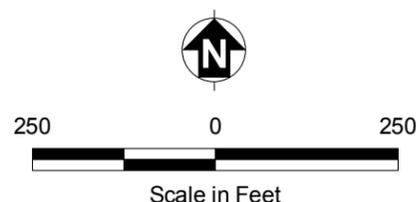
Figures



- A-Aquifer Flow Direction (June 2004)
- B-Aquifer Flow Direction (February 2002)
- Groundwater Point of Compliance (A- and B-Aquifers)
- Parcel Boundary
- Landfill Area
- East Adjacent Area
- Panhandle Area
- Shoreline Area
- Non-Navy Property
- UCSF Compound
- Building
- Road
- Gravel Road

Notes:

1. Point of compliance is the vertical surface located at the hydraulically downgradient limit of Parcel E-2 that extends through the B-aquifer.
2. In areas where the point of compliance is located in an area with tidal mixing (e.g. A-aquifer areas at Parcel E-2 shoreline), the point of monitoring will be adjusted to ensure that groundwater quality is accurately monitored.



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U.S. Department of the Navy, BRAC PMO West, San Diego, California

FIGURE N-1
GROUNDWATER
POINT OF COMPLIANCE

Remedial Investigation/Feasibility Study for Parcel E-2

Tables

**Table N-1 Potential Federal Chemical-Specific ARARs ^a
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Requirement	Prerequisite	Citation ^b	Preliminary ARAR Determination	Comments
Groundwater				
U.S Environmental Protection Agency				
Classifies groundwater based on ecological importance, replaceability, and vulnerability considerations.	Groundwater	EPA Guidelines for Groundwater Classification under the EPA Groundwater Protection Strategy ^d	To Be Considered	The Navy has reviewed the classification criteria for the A-aquifer at HPS Parcel E-2 and determined that groundwater classification Class II and III apply to the A-aquifer Groundwater based on EPA guidelines. However, based on site specific factors provided by EPA Region IX, A-aquifer groundwater at HPS Parcel E-2 is not considered a potential domestic use source.
Safe Drinking Water Act (42 U.S.C., Chapter 6A, § 300[f] through 300[jj]-26)^c				
National Primary drinking water standards are health-based standards for public water systems (MCLs).	Public water system	40 CFR §§ 141.11 (excluding § 141.11[d][3]), 141.13, 141.15, 141.16, 141.61(a) and (c), and 141.62(b)	Relevant and appropriate	The Navy has identified MCLs as potential ARARs for the following scenarios: 1) complete "clean closure" involving excavation of the Parcel E-2 Landfill and adjacent areas, for which MCLs are potential federal ARARs for groundwater in the B-aquifer throughout Parcel E-2; and 2) containment of in place waste within the Parcel E-2 Landfill and adjacent areas, for which MCLs are potential federal ARARs for groundwater in portions of the B-aquifer downgradient of the point of compliance.

**Table N-1 Potential Federal Chemical-Specific ARARs ^a (Continued)
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Requirement	Prerequisite	Citation ^b	Preliminary ARAR Determination	Comments
Groundwater (continued)				
Resource Conservation and Recovery Act (42 U.S.C., Chapter 82, §§ 6901 through 6991[i])^c				
Groundwater protection standards: Owners/operators of RCRA treatment, storage, or disposal facilities must comply with conditions in this section that are designed to ensure that hazardous constituents entering the groundwater from a regulated unit do not exceed the concentration limits for contaminants of concern set forth under Cal. Code Regs. tit. 22, § 66264.94 in the uppermost aquifer underlying the waste management area of concern at the POC.	A regulated unit that receives or has received hazardous waste before July 26, 1982, or regulated units that ceased receiving hazardous waste prior to July 26, 1982 where constituents in or derived from the waste may pose a threat to human health or the environment.	Cal. Code Regs, tit. 22, § 66264.94 (a)(1), (a)(3), (c), (d), (e)	Relevant and appropriate	The lowest concentration determined to be technologically and economically achievable is a potential ARAR for the A-aquifer. The lowest concentration limit greater than background that is technologically and economically achievable for the A-aquifer is based on unacceptable risk from the vapor intrusion pathway. These potential ARARs pertain to the following scenarios: 1) complete "clean closure" involving excavation of the Parcel E-2 Landfill and adjacent areas, for which concentration limits based on unacceptable risk from the vapor intrusion pathway are potential federal ARARs for groundwater in the A-aquifer throughout Parcel E-2 (with the exception of the small northwest portion of the A-aquifer where the Bay Mud confining unit or aquitard does not separate the A-aquifer from the uppermost B-aquifer); and 2) containment of in place waste within the Parcel E-2 Landfill and adjacent areas, for which concentration limits based on unacceptable risk from the vapor intrusion pathway are potential federal ARARs for groundwater in portions of the A-aquifer downgradient of the point of compliance.

**Table N-1 Potential Federal Chemical-Specific ARARs ^a (Continued)
 Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Requirement	Prerequisite	Citation ^b	Preliminary ARAR Determination	Comments
Surface Water				
Clean Water Act of 1977, as Amended (33 U.S.C., ch. 26, §§ 1313–1314) ^c				
Surface water quality standards	Discharges to waters of the United States	40 CFR § 131.38	Applicable	These standards, known as the CTR, are applicable surface water ARARs. The Navy has identified the CTR as potential ARARs for HPS Parcel E-2 because groundwater and surface water bodies discharge to the Bay. The Navy will meet these ARARs for contaminants that do not have a promulgated standard in Table 3-3 of the Basin Plan at the interface of the A-aquifer and the Bay. These ARARs will also be applied to surface water bodies at HPS Parcel E-2. The Navy has identified MCLs as potential ARARs for the B-aquifer, which will be protective of the discharge of B-aquifer groundwater to the Bay. Therefore, these are not potential ARARs for the interface of the B-aquifer and the Bay.

**Table N-1 Potential Federal Chemical-Specific ARARs ^a (Continued)
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Requirement	Prerequisite	Citation ^b	Preliminary ARAR Determination	Comments
Waste, Soil, and Sediment				
Resource Conservation and Recovery Act (42 U.S.C., Chapter 82, §§ 6901 through 6991[i])^c				
This requirement defines RCRA hazardous waste. Solid wastes are characterized as toxic based on the TCLP results if the wastes exceed the TCLP maximum concentrations.	Waste	Cal. Code Regs, tit. 22, §§ 66261.21, 66261.22(a)(1), 66261.23, 66261.24(a)(1), and 66261.100	Applicable	These regulations are applicable to activities that generate waste. Some of the alternatives evaluated in this feasibility study include excavation and off-site disposal of soil, sediment, and solid waste. The Navy will determine if the excavated soil, sediment, and solid waste meets the definition of non-RCRA hazardous waste when it is generated.

Notes:

- a Many potential action-specific ARARs contain chemical-specific limitations and are addressed in Tables K-5 and K-6
 - b Only the substantive provisions of the requirements cited in this table are potential ARARs
 - c Statutes and policies and their citations are provided as headings to identify general categories of potential ARARs for the convenience of the reader; listing the statutes and policies does not indicate that the Navy accepts the entire statutes or policies as potential ARARs; specific potential ARARs are addressed in the table below each general heading; only pertinent substantive requirements of the specific citations are considered potential ARARs
 - d EPA. 1986. "Guidelines for Groundwater Classification Under the EPA Groundwater Protection Strategy, Final Draft." November.
 - § Section
 - §§ Sections
-
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|--------|--|-------------------------|--|
| 40 CFR | Title 40 of the Code of Federal Regulations | Cal. Code Regs, tit. 22 | Title 22 of the California Code of Regulations |
| ARAR | Applicable or relevant and appropriate requirement | CTR | California Toxics Rule |
| EPA | U.S. Environmental Protection Agency | HPS | Hunters Point Shipyard |
| MCL | Maximum contaminant level | POC | Point of compliance |
| RCRA | Resource Conservation and Recovery Act | TCLP | Toxicity characteristic leaching procedure |
| tit | title | U.S.C. | United States Code |

**Table N-2 Potential State Chemical-Specific ARARs ^a
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

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

**Table N-2 Potential State Chemical-Specific ARARs ^a (Continued)
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Requirement	Prerequisite	Citation ^b	Preliminary ARAR Determination	Comments
Groundwater (continued)				
Department of Toxic Substances Control ^c / State and Regional Water Quality Control Boards ^c				
State MCL list.	Source of drinking water	Cal. Code Regs. tit. 22, §§ 64431 and 64444	Relevant and appropriate	State MCLs are potential ARARs for the following scenarios: 1) complete "clean closure" involving excavation of the Parcel E-2 Landfill and adjacent areas, for which MCLs are potential state ARARs for groundwater in the B-aquifer throughout Parcel E-2; and 2) containment of in place waste within the Parcel E-2 Landfill and adjacent areas, for which MCLs are potential state ARARs for groundwater in portions of the B-aquifer downgradient of the point of compliance.
State secondary MCL list.	Source of drinking water	Cal. Code Regs. tit. 22, § 64449(a)	Relevant and appropriate	State secondary MCLs are potential ARARs for the following scenarios: 1) complete "clean closure" involving excavation of the Parcel E-2 Landfill and adjacent areas, for which MCLs are potential state ARARs for groundwater in the B-aquifer throughout Parcel E-2; and 2) containment of in place waste within the Parcel E-2 Landfill and adjacent areas, for which MCLs are potential state ARARs for groundwater in portions of the B-aquifer downgradient of the point of compliance.
Describes requirements for RWQCB oversight of investigation and cleanup and abatement activities resulting from discharges of hazardous substances. RWQCB may decide on cleanup and abatement goals and objectives for the protection of water quality and beneficial uses of water within each region. Establishes criteria for "containment zones" where cleanup to established water-quality goals is not economically or technically practicable.	Discharge of hazardous substance into waters of the state	Policies and procedures for investigation and cleanup and abatement of discharges under Cal. Water Code § 13304, SWRCB Res. 92-49	Not an ARAR	Not an ARAR because it is not more stringent than the federal Cal. Code Regs. tit. 22 monitoring requirements (Cal. Code Regs. tit. 22, § 66264.94[a][1] and [3],[c], [d], and [e])

**Table N-2 Potential State Chemical-Specific ARARs ^a (Continued)
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Requirement	Prerequisite	Citation ^b	Preliminary ARAR Determination	Comments
Groundwater (continued)				
State and Regional Water Quality Control Boards ^c				
Establishes the policy that high-quality waters of the state "shall be maintained to the maximum extent possible" consistent with the "maximum benefit to the people of the State." It provides that whenever the existing quality of water is better than that required by applicable water quality policies, such existing high-quality water will be maintained until it has been demonstrated to the state that any change will be consistent with maximum benefit to the people of the state, will not unreasonably affect present and anticipated beneficial use of such water, and will not result in water quality less than that prescribed in the policies. It also states that any activity that produces or may produce a waste or increased volume or concentration of waste and that discharges or proposes to discharge to existing high-quality waters will be required to meet waste-discharge requirements that will result in the best practicable treatment or control of the discharge.	High quality waters of the state	Statement of Policy With Respect to Maintaining High Quality of Waters in California, SWRCB Res. 68-16	Not an ARAR	Not an ARAR for groundwater because it is not more stringent than the federal Cal. Code Regs. tit. 22 monitoring requirements (Cal. Code Regs. tit. 22, § 66264.94[a][1] and [3],[c], [d], and [e]). SWRCB Res. 68-16 is also not a potential ARAR for the groundwater alternatives evaluated because none contemplate a direct discharge of groundwater.

**Table N-2 Potential State Chemical-Specific ARARs ^a (Continued)
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Requirement	Prerequisite	Citation ^b	Preliminary ARAR Determination	Comments
Groundwater (continued)				
State and Regional Water Quality Control Boards ^c				
Provides guidance on selecting numerical values to implement narrative water quality objectives contained in the Basin Plan	Waters of the state	Staff Report of the Central Valley RWQCB "A Compilation of Water Quality Goals"	Not an ARAR	Not an ARAR because it is not a promulgated requirement
Provides guidance on selecting numerical values to implement narrative water quality objective contained in the Basin Plan	Waters of the state	Technical Document prepared by the San Francisco RWQCB Staff: "Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater" (Interim Final – July 2003) (updated September 4, 2003)	Not an ARAR	Not an ARAR because it is not a promulgated requirement
Concentration limits must be established for groundwater, surface water, and the unsaturated zone. Must be based on background, equal to background, or for corrective actions, may be greater than background, not exceed the lower of the applicable water quality objective or the concentration technologically or economically achievable. Specific factors must be considered in setting cleanup standards above background levels.	Regulated waste disposal unit	Cal. Code Regs. tit. 27, Section 20400; Cal. Code Regs. tit. 23, Section 2550.4	Not an ARAR	Not ARARs because they are not more stringent than the federal Cal. Code Regs. tit. 22 monitoring requirements (Cal. Code Regs. tit. 22, § 66264.94[a][1] and [3],[c], [d], and [e])

**Table N-2 Potential State Chemical-Specific ARARs ^a (Continued)
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Requirement	Prerequisite	Citation ^b	Preliminary ARAR Determination	Comments
Surface Water				
State Water Resources Control Board ^c				
Surface water quality standards	Marine water with salinities equal to or greater than 10 parts per thousand	Basin Plan Table 3-3	Applicable	These standards are applicable to the Bay. The Navy has identified Table 3-3 as potential ARARs for HPS Parcel E-2 because groundwater discharges to the Bay. The Navy will meet these ARARs in the Bay, at a point past the interface of the A-aquifer (or surface water bodies) and the Bay. The Navy has identified MCLs as potential ARARs for the B-aquifer, which will be protective of any discharge of B-aquifer groundwater to the permeable zones underlying the Bay. Therefore, these are not potential ARARs for the interface of the B-aquifer and the permeable zones underlying the Bay.
Waste, Soil, Sediment and Subsurface Air				
Department of Toxic Substances Control ^c / State Water Resources Control Board ^c / California Integrated Waste Management Board				
Definition of non-RCRA hazardous waste.	Waste	Cal. Code Regs, tit. 22, §§ 66261.22(a)(3) and (a)(4), 66261.24(a)(2)-(a)(8), 66261.101, 66261.3(a)(2)(C) and (a)(2)(F)	Applicable	These regulations are potentially applicable to activities that generate waste. Some of the alternatives evaluated in this feasibility study include excavation and off-site disposal of waste, soil, and sediment. The Navy will determine if the excavated waste, soil, or sediment meets the definition of non-RCRA hazardous waste when it is generated.
Definition of designated waste and nonhazardous waste.	Waste	Cal. Code Regs, tit. 27, §§ 20210 and 20220	Applicable	These regulations are potentially applicable to activities that generate waste. One of the alternatives evaluated in this feasibility study includes excavation and off-site disposal of waste, soil, and sediment. The Navy will determine if the excavated waste, soil, or sediment meets these definitions when it is generated.

**Table N-2 Potential State Chemical-Specific ARARs ^a (Continued)
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Requirement	Prerequisite	Citation ^b	Preliminary ARAR Determination	Comments
Waste, Soil, Sediment and Subsurface Air (continued)				
Department of Toxic Substances Control ^c / State Water Resources Control Board ^c / California Integrated Waste Management Board				
This requirement controls release of methane.	Release of methane from landfill	Cal. Code Regs, tit. 27, § 20921(a)	Applicable	Provides that methane must not exceed 1.25 percent by volume in air within on-site structures, and concentrations of methane migrating from the Parcel E-2 landfill must not exceed 5 percent by volume in air at the property boundary (or an alternative boundary in accordance with Cal. Code Regs, tit. 27, § 20925.
Provides guidance on how to classify wastes according to Cal. Code Regs. tit. 27, Div. 2, Subdivision 1 and Title 23 Div. 3. Chapter 15, Article 10	Waste	Staff Report of the RWQCB Central Valley Region: The Designated Level Methodology for Waste Classification and Cleanup Level Determination	Not an ARAR	Not an ARAR because it is not a promulgated requirement.

Notes:

- a Many potential action-specific ARARs contain chemical-specific limitations and are addressed in Table 4-3
- b Only the substantive provisions of the requirements cited in this table are potential ARARs
- c Statutes and policies and their citations are provided as headings to identify general categories of potential ARARs for the convenience of the reader; listing the statutes and policies does not indicate that the Navy accepts the entire statutes or policies as potential ARARs; specific potential ARARs are addressed in the table below each general heading; only pertinent substantive requirements of the specific citations are considered potential ARARs
- § Section
- §§ Sections

Cal. Code Regs, tit. 22 Title 22 of the *California Code of Regulations*
 ARAR Applicable or relevant and appropriate requirement
 HPS Hunters Point Shipyard
 ppm parts per million
 RWQCB Regional Water Quality Control Board

Cal. Code Regs, tit. 27 Cal. Code Regs. tit. 27 of the *California Code of Regulations*
 gpd gallons per day
 MCL Maximum contaminant level
 RCRA Resource Conservation and Recovery Act
 SWRCB State Water Resources Control Board



**Table N-3 Potential Federal Location-Specific ARARs
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Location	Requirement	Prerequisite	Citation ^a	Preliminary ARAR Determination	Comments
Endangered Species Act of 1973 (16 U.S.C. §§ 1531 through 1543) ^b					
Habitat upon which endangered species or threatened species depend	Federal agencies may not jeopardize the continued existence of any listed species or cause the destruction or adverse modification of critical habitat. The Endangered Species Committee may grant an exemption for agency action if reasonable mitigation and enhancement measures, such as propagation, transplantation, and habitat acquisition and improvement, are implemented.	Determination of effect on endangered or threatened species or its habitat; critical habitat upon which endangered species or threatened species depend	16 U.S.C. § 1536(a), (h)(1)(B)	Applicable	Potentially applicable if endangered species are found at Parcel E-2
Migratory Bird Treaty Act of 1972 (16 U.S.C. §§ 1531 through 1543) ^b					
Migratory bird area	Protects almost all species of native migratory birds in the United States from unregulated "take," which can include poisoning at hazardous waste sites.	Presence of migratory birds	16 U.S.C. § 703	Relevant and appropriate	This section is a potentially relevant and appropriate because migratory birds have been observed at Parcel E-2
Coastal Zone Management Act (16 U.S.C. §§ 1451 through 1464) ^b					
Within coastal zone	Conduct activities in a manner consistent with approved state management programs	Activities affecting the coastal zone, including lands there under and adjacent shore land	16 U.S.C. § 1456(c) 15 CFR § 930	Applicable	Remedial alternatives will comply with the CZMA and San Francisco Bay Plan.

**Table N-3 Potential Federal Location-Specific ARARs (Continued)
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Location	Requirement	Prerequisite	Citation ^a	Preliminary ARAR Determination	Comments
Executive Order 11990, Protection of Wetlands ^b					
Wetland	Avoid, to the extent possible, the adverse impacts associated with the destruction or loss of wetlands and avoid support of new construction in wetlands if practicable alternatives exist.	Wetland meeting definition of Section 7.	40 C.F.R. § 6.302(a) and 40 C.F.R. pt. 6, app. A, § 6(a)(1), (3), and (5) (at the end of § 6.1007)	Applicable	Potentially applicable to construction activities that result in the destruction, loss, or degradation of wetlands
Clean Water Act of 1977, as Amended, § 404 (33 U.S.C. § 1344) ^b					
Wetland	Action to prohibit discharge of dredged or fill material into wetland without permit	Wetland as defined by Executive Order 11990, Section 7	33 U.S.C. § 1344	Applicable	Substantive provisions are potentially applicable if discharge of dredged or fill material is planned as part of the response action.
Wetland	Reassures that all wetland creation, uplands, disposal or dredging projects complete certain notifications and listings.		USACE, Public Notice 92-7: Interim Testing Procedures for Evaluating Dredged Material Disposed on in San Francisco Bay	Not an ARAR	Not an ARAR because it is procedural in nature, and is not a promulgated requirement.

**Table N-3 Potential Federal Location-Specific ARARs (Continued)
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Location	Requirement	Prerequisite	Citation ^a	Preliminary ARAR Determination	Comments
Clean Water Act of 1977, as Amended, § 404 (33 U.S.C. § 1344) ^b					
Wetland	State Water Quality Certification: Wetland destruction and alteration would require a 404 permit and this certification assures that the proposed activities will comply with state water quality standards.		Clean Water Act § 401, 33 U.S.C. § 1341	Not an ARAR	Not an ARAR because the procedural requirements for a Section 404 permit and Section 401 certification do not apply to an on-site CERCLA response action.

Notes:

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

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

§ Section

§§ Sections

15 CFR Title 15 of the *Code of Federal Regulations*

40 CFR Title 40 of the *Code of Federal Regulations*

ARAR Applicable or relevant and appropriate requirement

CZMA Coastal Zone Management Act

U.S.C. United States Code

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**Table N-4 Potential State Location-Specific ARARs
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Location	Requirement	Prerequisite	Citation ^a	Preliminary ARAR Determination	Comments
McAteer-Petris Act (California Government Code §§ 66600 through 66661) ^b					
Within the San Francisco Bay coastal zone	Reduce fill and disposal of dredged material in San Francisco Bay, maintain marshes and mudflats to the fullest extent possible to conserve wildlife, abate pollution, and protect the beneficial uses of the San Francisco Bay.	Activities affecting the San Francisco Bay and 100 feet landward of the shoreline.	San Francisco Bay Plan (Bay Plan) at Cal. Code Regs, tit. 14, §§ 10110 through 11990	Relevant and appropriate	The Bay Plan, developed under the authority of the McAteer-Petris Act, is an approved state coastal zone management program. Any remedial actions take by the Navy that will affect San Francisco Bay or that will occur within 100 feet landward of the shoreline will be consistent with the goals of the Bay Plan.
California Endangered Species Act (California Fish & Game Code §§ 2050–2116, 3005 (a) ^b					
Endangered species habitat	No person shall import, export, take, possess, or sell any endangered or threatened species or part or product thereof.	Threatened or endangered species determination on or before 01 January 1985 or a candidate species with proper notification.	California Fish & Game Code § 2080	Relevant and appropriate	Potentially relevant and appropriate if endangered species are found at Parcel E-2
Actions impacting birds or mammals	Prohibits the taking of birds and mammals, including the taking by poison.	Birds and mammals.	California Fish & Game Code § 3005(a)	Relevant and appropriate	Procedural aspects are not ARARs; certain substantive provisions pertaining to take of birds or mammals with a poisonous substance are potentially applicable. The selected remedy will prevent “take” of birds and mammals by containing contaminants and severing the pathway of exposure to contaminated soil.

**Table N-4 Potential State Location-Specific ARARs (Continued)
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Location	Requirement	Prerequisite	Citation ^a	Preliminary ARAR Determination	Comments
California Endangered Species Act (California Fish & Game Code §§ 2050–2116, 3005 (a) ^b					
Endangered species habitat	Specifies that projects within the state shall not jeopardize the existence of any endangered or threatened species.	Threatened or endangered species determination on or before 01 January 1985 or a candidate species with proper notification.	California Fish & Game Code § 2053	Not an ARAR	Not an ARAR because it is procedural and nonsubstantive.
California Department of Fish and Game ^b					
Endangered species habitat	No person shall import or take, possess, or sell, except as incident to the possession or sale of the real property on which the plant is growing, any native plant, or any part or product thereof, that the commission determines to be an endangered native plant or rare native plant.	"Native plant" means a plant growing in a wild uncultivated state which is normally found native to the plantlife of the state. A species, subspecies, or variety is endangered when its prospects of survival and reproduction are in immediate jeopardy from one or more cause. A species, subspecies, or variety is rare when, although not presently threatened with extinction, it is in such small numbers throughout its range that it may become endangered if its present environment worsens.	California Fish & Game Code §§ 1900 and 1908	Not an ARAR	Not an ARAR because no endangered or rare plant species have been identified at Parcel E-2.

Notes:

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

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

§ Section

§§ Sections

Cal. Code Regs, tit. 14 Title 14 of the *California Code of Regulations*

ARAR Applicable or relevant and appropriate requirement



**Table N-5 Potential Federal Action-Specific ARARs
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Containment					
Resource Conservation and Recovery Act (Title 42 U.S.C., Chapter 82, §§ 6901-6991[i])^a					
Compaction	If waste is to remain in a unit, the unit shall be compacted before any portion of the final cover is installed.	Landfill closure	Cal. Code Regs. tit. 22, § 66264.228(e)(1)	Relevant and appropriate (for Alternative 3)	Potentially relevant and appropriate
Post-closure water entry	The final cover will be designed to prevent the downward entry of water into the closed landfill throughout a period of at least 100 years.	Landfill closure	Cal. Code Regs. tit. 22, § 66264.310(a)(1)	Relevant and appropriate (for Alternative 3)	Potentially relevant and appropriate
Cover seismic requirements	The final cover shall accommodate lateral and vertical shear forces generated by the maximum credible earthquake so that the integrity of the cover is maintained.	Landfill closure	Cal. Code Regs. tit. 22, § 66264.310(a)(5)	Relevant and appropriate (for Alternative 3)	Potentially relevant and appropriate
Post-closure care	Maintain the integrity and effectiveness of the final cover, including making repairs to the cap as necessary to correct the effects of settling, subsidence, erosion, or other events throughout the post-closure period.	Landfill closure	Cal. Code Regs. tit. 22, § 66264.310(b)(1)	Relevant and appropriate (for Alternative 3)	Potentially relevant and appropriate
Benchmark maintenance	Protect and maintain surveyed benchmarks throughout the post-closure period.	Landfill closure	Cal. Code Regs. tit. 22, § 66264.310(b)(5)	Relevant and appropriate (for Alternative 3)	Potentially relevant and appropriate
Monitoring and Inspection of Landfill Cover Systems	This section describes the requirements for inspections during construction or installation of cover systems. Cover systems shall be inspected for uniformity, damage and imperfections.	Construction and operation of landfills	Cal. Code Regs., tit 22, § 66264.303	Not an ARAR	Requirements pertain to construction of new landfills and operational landfills, and not permanent closure contemplated under Alternative 3.

**Table N-5 Potential Federal Action-Specific ARARs (Continued)
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Shoreline Construction					
Clean Water Act, as Amended, Section 404 (33 U.S.C. § 1344)^a					
Perform dredging and construction of shoreline revetment	Action to prohibit discharge of dredged or fill material into waters of the United States without permit	Waters of the United States	33 U.S.C. § 1344 40 CFR § 230.10 and 230.11 33 CFR part 323	Applicable	Alternatives 2 and 3 contemplate dredging and construction of shoreline revetment that will result in the discharge of fill material into a wetland, which will be mitigated by the Navy, and to the bay. The Navy is not required to obtain a permit to discharge the fill; however, the Navy will comply with the permit requirements contained in 40 CFR § 230.10 and 230.11 and 33 CFR part 323.
Resource Conservation and Recovery Act (Title 42 U.S.C., Chapter 82, §§ 6901-6991[i])^a					
Temporary units	Alternative requirements that are protective of human health or the environment may replace design, operating, or closure standards for temporary tanks and container storage areas.	Temporary units may be used and are not subject to RCRA LDRs.	Cal. Code Regs. tit. 22, §§ 66264.553 (b), (d), (e), and (f)	Applicable (for Alternative 2)	The substantive portions are potentially applicable for temporary storage of dredged sediments on site following excavation.

**Table N-5 Potential Federal Action-Specific ARARs (Continued)
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Landfill Gas Treatment					
Clean Air Act (42 U.S.C. § 7401 et seq.)^a					
Landfill gas emissions	Requires that a person shall not discharge into the atmosphere from any miscellaneous operation an emission containing more than 6.8 kilograms (15 pounds) per day and containing a concentration of more than 300 parts per million of total carbon on a dry basis.	Landfill gas emissions	BAAQMD Regulation 8, Rule 2	Applicable (for Alternative 3)	Potentially applicable for discharges from landfill gas collection and treatment systems.
Landfill gas collection and emission control	Specifies landfill gas collection and emission control system requirements including construction standards, administrative requirements, monitoring and record keeping requirements and operation procedures	Landfill Gas Collection Systems	BAAQMD Regulation 8, Rule 34	Not an ARAR	The substantive provisions are not ARARs because the Parcel E-2 Landfill meets the exemption criteria: 1) the landfill is a closed landfill or an inactive landfill with no design capacity available for future waste deposition; 2) the landfill last received solid waste at least thirty years ago; and 3) the solid waste disposal site has an in-place tonnage of less than 1,000,000 tons.

**Table N-5 Potential Federal Action-Specific ARARs (Continued)
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Storm Water Discharge / Surface Water Monitoring					
Resource Conservation and Recovery Act (Title 42 U.S.C., Chapter 82, §§ 6901-6991[i])^a					
Surface water monitoring	Owner or operator shall establish a surface water monitoring system for each regulated unit and include a sufficient number of monitoring points installed at appropriate locations and depths to yield samples that provide the best assurance of the earliest possible detection of a release from a regulated unit.	RCRA hazardous waste management unit	Cal. Code Regs. tit. 22, § 66264.97(c)(1) and (c)(2)(B)	Relevant and appropriate (for Alternative 3)	These requirements are applicable to RCRA hazardous waste facilities; however, the Navy has determined that they are potentially relevant and appropriate to the monitoring component of the containment action.
Clean Water Act, as Amended (33 U.S.C., ch. 26, §§ 1251-1387)^a					
Closure of waste management unit	Construction that disturbs at least 1 acre must use best management practices to control storm water discharges.	Construction activities at least 1 acre in size.	Clean Water Act §402 40 CFR § 122.44(k)(2) and (4) (SWRCB Order 99-08-DWQ was adopted pursuant to this section)	Applicable (for Alternatives 2 and 3)	Alternatives 2 and 3 will disturb more than 1 acre. The Navy will use the requirements of state general storm water discharge permit, Order 99-08-DWQ, as TBCs for complying with the storm water discharge requirements under the Clean Water Act.
Groundwater Monitoring					
Resource Conservation and Recovery Act (Title 42 U.S.C., Chapter 82, §§ 6901-6991[i])^a					
Monitor groundwater	After final closure, maintain and monitor the groundwater system and comply with all other applicable requirements of Article 6, Chapter 14.	RCRA hazardous waste management unit	Cal. Code Regs. tit. 22, § 66264.310(b) (3)	Relevant and appropriate (for Alternative 3)	Potentially relevant and appropriate for groundwater monitoring associated with landfill closure

**Table N-5 Potential Federal Action-Specific ARARs (Continued)
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Groundwater Monitoring (Continued)					
Resource Conservation and Recovery Act (Title 42 U.S.C., Chapter 82, §§ 6901-6991[i])^a					
Monitor groundwater	Contaminants of concern are the waste constituents, reaction products, and hazardous constituents that are reasonably expected to be in or derived from the waste contained in the regulated unit.	RCRA hazardous waste management unit	Cal. Code Regs. tit. 22, § 66264.93	Relevant and appropriate (for Alternatives 2 and 3)	These requirements are applicable to RCRA hazardous waste facilities; however, the Navy has determined that they are potentially relevant and appropriate to the monitoring component of the groundwater response action.
	The point of compliance is a vertical surface, located at the hydraulically downgradient limit of the waste management area that extends through the uppermost aquifer underlying the regulated unit.	RCRA hazardous waste management unit	Cal. Code Regs. tit. 22, § 66264.95	Relevant and appropriate (for Alternatives 2 and 3)	The Navy believes that contamination upgradient of the POC would be adequately contained by the remedial action to ensure compliance with the RAOs and adequately protect human health and the environment.
	Owner or operator shall establish a groundwater monitoring system for each regulated unit and include a sufficient number of monitoring points installed at appropriate locations and depths to yield groundwater samples from the uppermost aquifer that represent the quality of groundwater passing the point of compliance.	RCRA hazardous waste management unit	Cal. Code Regs. tit. 22, § 66264.97(b)(1)(A), (b)(1)(D)(1) and (b)(1)(D)(2)	Relevant and appropriate (for Alternatives 2 and 3)	These requirements are applicable to RCRA hazardous waste facilities; however, the Navy has determined that they are potentially relevant and appropriate to the monitoring component of the groundwater response action.

**Table N-5 Potential Federal Action-Specific ARARs ^a (Continued)
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Groundwater Monitoring (Continued)					
Resource Conservation and Recovery Act (Title 42 U.S.C., Chapter 82, §§ 6901-6991[i]) ^a					
Monitor groundwater	Requirements for monitoring well construction and sampling intervals	RCRA hazardous waste management unit	Cal. Code Regs. tit. 22, § 66264.97(b)(4), (5), (6), and (7)	Relevant and appropriate (for Alternatives 2 and 3)	These requirements are applicable to RCRA hazardous waste facilities; however, the Navy has determined that they are potentially relevant and appropriate to the monitoring component of the groundwater response action.
	Requirements for collecting samples.	RCRA hazardous waste management unit	Cal. Code Regs. tit. 22, § 66264.97(e)(6), (e)(12)(A), (e)(12)(B), (e)(13), and (e)(15)	Relevant and appropriate (for Alternatives 2 and 3)	These requirements are applicable to RCRA hazardous waste facilities; however, the Navy has determined that they are potentially relevant and appropriate to the monitoring component of the groundwater response action.
	In conjunction with corrective action measures, the owner or operator shall establish and implement a water quality monitoring program to demonstrate the effectiveness of the corrective action program. The program shall be effective in determining compliance and in determining the success of the corrective action measures.	RCRA hazardous waste management unit	Cal. Code Regs. tit. 22, § 66264.100(d)	Relevant and appropriate (for Alternative 2)	Potentially relevant and appropriate for groundwater monitoring associated with excavation alternative.

**Table N-5 Potential Federal Action-Specific ARARs (Continued)
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Groundwater Monitoring / Excavation and Off-Site Disposal					
Resource Conservation and Recovery Act (Title 42 U.S.C., Chapter 82, §§ 6901-6991[i])^a					
On-site generation of waste	Person who generates waste shall determine if the waste is a RCRA hazardous waste.	Generator of waste	Cal. Code Regs. tit. 22, §§ 66262.10 (a), 66262.11	Applicable (for Alternatives 2 and 3)	These regulations are potentially applicable to any operation that generates waste. The monitoring and excavation alternatives contemplates the generation of waste to be disposed of off site. The Navy will decide whether the waste is RCRA hazardous waste when it is generated.
	Requirements for analyzing waste for determining whether waste is hazardous.	Generator of waste	Cal. Code Regs. tit. 22, § 66264.13 (a) and (b)	Applicable (for Alternatives 2 and 3)	These regulations are potentially applicable to any operation that generates waste. The monitoring and excavation alternatives includes activities that generate waste to be disposed of off site. The Navy will decide whether the waste is RCRA hazardous waste when it is generated.
Excavation and Off-Site Disposal					
Resource Conservation and Recovery Act (Title 42 U.S.C., Chapter 82, §§ 6901-6991[i])^a					
Stockpiling soil for off-site disposal	Allows generators to accumulate solid remediation waste in an EPA-designated pile for storage only up to 2 years during remedial operations without triggering land disposal restrictions.	RCRA hazardous waste temporarily stored in piles	40 CFR, § 264.554(a), (d), (g), (h), (i), (j), and (k)	Relevant and appropriate (for Alternative 2)	The Navy will temporarily stockpile soil in staging piles for off-site disposal. The Navy does not anticipate that all soil will be RCRA hazardous waste; however, the Navy has determined that these requirements are potentially relevant and appropriate for all stockpiled soil.

**Table N-5 Potential Federal Action-Specific ARARs (Continued)
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Excavation and Disposal (Continued)					
Resource Conservation and Recovery Act (Title 42 U.S.C., Chapter 82, §§ 6901-6991[i])^a					
Temporary units	Alternative requirements that are protective of human health or the environment may replace design, operating, or closure standards for temporary tanks and container storage areas.	Temporary units may be used and are not subject to RCRA LDRs.	Cal. Code Regs. tit. 22, §§ 66264.553 (b), (d), (e), and (f)	Applicable (for Alternative 2)	The substantive portions are potentially applicable for treatment of groundwater on site during excavation.
Clean Water Act (General Pre-Treatment Regulations)^a					
Discharge of treated groundwater to publicly-owned treatment works	Identifies prohibited discharges, categorical standards, and monitoring requirements.	Pollutants from non-domestic sources that are discharged indirectly into publicly-owned treatment works	40 CFR § 403	Relevant and appropriate (for Alternative 2)	If the on-site groundwater treated under Alternative 2 is discharged to a publicly-owned sanitary sewer system, the substantive provisions of the pre-treatment standards are potential relevant and appropriate federal ARARs.
Clean Air Act (42 U.S.C. § 7401 et seq.)^a					
Excavation	Sets forth opacity limitations	Excavation	BAAQMD Regulation 6, Rule 302	Applicable (for Alternative 2)	Potentially applicable for excavation activities

**Table N-5 Potential Federal Action-Specific ARARs (Continued)
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Excavation and Disposal (Continued)					
Toxic Substances Control Act (15 U.S.C., Chapter 53, §§ 2601 through 2692) ^a					
Disposal of PCBs	This act regulates the storage and disposal of PCB remediation waste. There are three options: (1) self-implementing on-site cleanup and disposal, (2) performance-based disposal using existing approved disposal technologies, and (3) risk-based disposal. This act is applicable to soils, debris, sludge, or dredged materials contaminated with PCBs at concentrations greater than 50 ppm.	Soils, debris, sludge, or dredged materials contaminated with PCBs at concentrations greater than 50 parts per million.	40 CFR § 761.61 (c)	Relevant and appropriate (for Alternative 2)	For Alternative 2, the Navy will use a risk-based cleanup approach to any PCB contamination in soil or sediment.
Leachate Collection and Control					
Resource Conservation and Recovery Act (Title 42 U.S.C., Chapter 82, §§ 6901-6991[i]) ^a					
Leachate control	Continue to operate leachate collection and removal system until leachate is no longer detected (this regulation does not require the installation of a leachate collection system)	RCRA hazardous waste management unit	Cal. Code Regs. tit. 22, § 66264.310(b)(2)	Relevant and appropriate (for Alternative 3)	Potentially relevant and appropriate for leachate control (if required based on groundwater monitoring results).

**Table N-5 Potential Federal Action-Specific ARARs (Continued)
 Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Notes:

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

§ Section
 §§ Sections

Cal. Code Regs. tit.22 Title 22 of the *California Code of Regulations*
 40 CFR Title 40 of the *Code of Federal Regulations*
 49 CFR Title 49 of the *Code of Federal Regulations*

ARAR Applicable or relevant and appropriate requirement
 BAAQMD Bay Area Air Quality Management District
 CCR California Code of Regulations
 CFR Code of Federal Regulations
 DOT U.S. Department of Transportation
 LDR Land disposal restriction
 Navy U.S. Department of the Navy
 PCB Polychlorinated biphenyl
 ppm Part per million
 RCRA Resource Conservation and Recovery Act
 U.S.C. United States Code



**Table N-6 Potential State Action-Specific ARARs
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Containment					
State Water Resources Control Board / California Integrated Waste Management Board ^a					
Engineered alternative	Alternatives to prescriptive standards may be considered provided the prescriptive standard is not feasible and there is a specific engineered alternative that is consistent with the performance goal and affords equivalent protection against water quality impairment.	Cal. Code Regs. tit. 27, requirements are only applicable for waste discharged after July 18, 1997 (the effective date of the consolidated regulations), unless otherwise noted.	Cal. Code Regs. tit. 27, §§ 20080(b) and (c)	Relevant and appropriate (for Alternative 3)	The prescriptive standards at Cal. Code Regs. tit. 27 §§ 21090(a)(2) and § 21090(b)(1) were determined, based on an evaluation of site-specific conditions, to be impractical and to not promote attainment of applicable performance standards. Specific engineered alternatives were identified, evaluated, and determined to be consistent with the performance goals and to afford equivalent protection against water quality impairment.
Capping permeability	Hydraulic conductivities will be evaluated primarily through laboratory methods and will be confirmed by appropriate field testing. Earthen materials used in containment structures will consist of a clay mixture and other suitable fine-grained soils that have specific characteristics and that, in combination, can be compacted to attain the required hydraulic conductivity when installed.	Cal. Code Regs. tit. 27, requirements are only applicable for waste discharged after July 18, 1997 (the effective date of the consolidated regulations), unless otherwise noted.	Cal. Code Regs. tit. 27, § 20320 (c) and (d)	Relevant and appropriate (for Alternative 3)	Potentially relevant and appropriate for the testing required for the engineered alternative (geomembrane).

**Table N-6 Potential State Action-Specific ARARs (Continued)
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Containment (Continued)					
State Water Resources Control Board / California Integrated Waste Management Board ^a					
Capping permeability (continued)	Before installing the compacted soil barrier layer component of a final cover system or the compacted soil of a liner system, the operator will accurately establish the correlation between the design hydraulic conductivity and the density at which that conductivity is achieved.	Cal. Code Regs. tit. 27, requirements are only applicable for waste discharged after July 18, 1997 (the effective date of the consolidated regulations), unless otherwise noted.	Cal. Code Regs. tit. 27, § 20324 (g)(1)	Not an ARAR	Not an ARAR because the requirements were determined to not be feasible and a specific engineered alternative was identified that is consistent with the performance goal and affords equivalent protection against water quality impairment, consistent with the variance requirements specified at Cal. Code Regs. tit. 27, §§ 20080(b) and (c).
Erosion control	Diversion and drainage facilities will be designed, constructed, and maintained to accommodate the anticipated volume of precipitation and peak flows. In addition, erosion and related damage of the final cover due to drainage must be prevented throughout the postclosure maintenance period.	Cal. Code Regs. tit. 27, requirements are only applicable for waste discharged after July 18, 1997 (the effective date of the consolidated regulations), unless otherwise noted.	Cal. Code Regs. tit. 27, §§ 20365(c) and (d) and 21090(c)(4)	Relevant and appropriate (for Alternative 3)	Potentially relevant and appropriate; a cover will be designed to prevent erosion, slope failure, washout, and overtopping.

**Table N-6 Potential State Action-Specific ARARs (Continued)
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Containment (Continued)					
State Water Resources Control Board / California Integrated Waste Management Board ^a					
Post-closure care	<p>§ 20950(a): The postclosure maintenance period shall extend as long as the wastes pose a threat to water quality.</p> <p>§ 21180(a): The landfill shall be maintained and monitored for a period of not less than 30 years after completion of closure of the entire solid waste landfill.</p>	Cal. Code Regs. tit. 27, requirements are only applicable for waste discharged after July 18, 1997 (the effective date of the consolidated regulations), unless otherwise noted.	Cal. Code Regs. tit. 27, § 20950(a) and § 21180(a)	Relevant and appropriate (for Alternative 3)	Potentially relevant and appropriate
Foundation layer	Closed landfills shall be provided with not less than 2 feet of appropriate materials as a foundation layer for the final cover. These materials may be soil, contaminated soil, incinerator ash, or other waste materials, provided that such materials have appropriate engineering properties to be used for a foundation layer. The foundation layer shall be compacted to the maximum density obtainable at optimum moisture content using methods that are in accordance with accepted civil engineering practice. A lesser thickness may be allowed for units if the differential settlement of waste and ultimate land use will not affect the structural integrity of the final cover.	Cal. Code Regs. tit. 27, requirements are only applicable for waste discharged after July 18, 1997 (the effective date of the consolidated regulations), unless otherwise noted.	Cal. Code Regs. tit. 27, § 21090(a)(1)	Relevant and appropriate (for Alternative 3)	Potentially relevant and appropriate

**Table N-6 Potential State Action-Specific ARARs (Continued)
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Containment (Continued)					
State Water Resources Control Board / California Integrated Waste Management Board ^a					
Low-hydraulic conductivity layer	Closed landfills shall be provided with a low-hydraulic-conductivity (or low through-flow rate) layer, consisting of not less than 1 foot of soil containing no waste or leachate, that is placed on top of the foundation layer and compacted to attain a hydraulic conductivity of either 1×10^{-6} cm/sec (i.e., 1 foot per year) or less, or equal to the hydraulic conductivity of any bottom liner system or underlying natural geologic materials, whichever is less permeable, or another design that provides a correspondingly low through-flow rate throughout the postclosure maintenance period.	Cal. Code Regs. tit. 27, requirements are only applicable for waste discharged after July 18, 1997 (the effective date of the consolidated regulations), unless otherwise noted.	Cal. Code Regs. tit. 27, § 21090(a)(2)	Not an ARAR	Not an ARAR because the requirements were determined to not be feasible and a specific engineered alternative was identified that is consistent with the performance goal and affords equivalent protection against water quality impairment, consistent with the variance requirements specified at Cal. Code Regs. tit. 27, §§ 20080(b) and (c).
Erosion-resistant layer	The low-hydraulic-conductivity layer of § 21090(a)(2) shall be directly overlain by an erosion-resistant layer. Closed landfills shall be provided with an uppermost cover layer consisting of either a vegetative layer consisting of not less than 1 foot of soil capable of sustaining native or other suitable plant growth or a mechanically erosion-resistant layer.	Cal. Code Regs. tit. 27, requirements are only applicable for waste discharged after July 18, 1997 (the effective date of the consolidated regulations), unless otherwise noted.	Cal. Code Regs. tit. 27, § 21090(a)(3)	Relevant and appropriate (for Alternative 3)	Potentially relevant and appropriate

**Table N-6 Potential State Action-Specific ARARs (Continued)
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Containment (Continued)					
State Water Resources Control Board / California Integrated Waste Management Board ^a					
Emergency response	Potential emergency conditions that may exceed the design of the site and could endanger the public health or the environment must be anticipated.	Cal. Code Regs. tit. 27, requirements are only applicable for waste discharged after July 18, 1997 (the effective date of the consolidated regulations), unless otherwise noted.	Cal. Code Regs. tit. 27, § 21130	Relevant and appropriate (for Alternative 3)	The Navy will comply with the substantive portions of this requirement.
Site Security	Requires that all points of access be restricted except at permitted entry points and that the monitoring, control, and recovery systems be protected from unauthorized access	Cal. Code Regs. tit. 27, requirements are only applicable for waste discharged after July 18, 1997 (the effective date of the consolidated regulations), unless otherwise noted.	Cal. Code Regs. tit. 27, § 21135 (f) and (g)	Relevant and appropriate (for Alternative 3)	The Navy will comply with the substantive portions of this requirement.
Structure Removal	Requires that the operator dismantle and remove site structures at the time of closure to protect public health and safety in accordance with the closure plan	Cal. Code Regs. tit. 27, requirements are only applicable for waste discharged after July 18, 1997 (the effective date of the consolidated regulations), unless otherwise noted.	Cal. Code Regs. tit. 27, § 21137	Relevant and appropriate (for Alternative 3)	The Navy will comply with the substantive portions of this requirement.

**Table N-6 Potential State Action-Specific ARARs (Continued)
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Containment (Continued)					
State Water Resources Control Board / California Integrated Waste Management Board ^a					
Final cover	Contains general standards for the design of the final cover	Cal. Code Regs. tit. 27, requirements are only applicable for waste discharged after July 18, 1997 (the effective date of the consolidated regulations), unless otherwise noted.	Cal. Code Regs. tit. 27, §21140(a) and (b)	Relevant and appropriate (for Alternative 3)	The cap will be designed to function with minimal maintenance, control vectors, prevent exposure to landfill contents, and ensure the stability and integrity of the cover.
Final grading	Contains general standards for landfill grading	Cal. Code Regs. tit. 27, requirements are only applicable for waste discharged after July 18, 1997 (the effective date of the consolidated regulations), unless otherwise noted.	Cal. Code Regs. tit. 27, § 21142(a)	Relevant and appropriate (for Alternative 3)	The cap will be designed to function with minimal maintenance, control vectors, prevent exposure to landfill contents, and ensure the stability and integrity of the cover.
Slope stability	Contains general standards for slope stability	Cal. Code Regs. tit. 27, requirements are only applicable for waste discharged after July 18, 1997 (the effective date of the consolidated regulations), unless otherwise noted.	Cal. Code Regs. tit. 27, § 21145(a)	Relevant and appropriate (for Alternative 3)	The cap will be designed to function with minimal maintenance, control vectors, prevent exposure to landfill contents, and ensure the stability and integrity of the cover.

**Table N-6 Potential State Action-Specific ARARs (Continued)
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Containment (Continued)					
State Water Resources Control Board / California Integrated Waste Management Board ^a					
Erosion control	The drainage and erosion control system will be designed and maintained to (1) ensure integrity of post-closure land uses, roads, and structures; (2) prevent public contact with waste and leachate; (3) ensure the integrity of gas monitoring and control systems; (4) prevent safety hazards; and (5) prevent exposure of waste.	Cal. Code Regs. tit. 27, requirements are only applicable for waste discharged after July 18, 1997 (the effective date of the consolidated regulations), unless otherwise noted.	Cal. Code Regs. tit. 27, § 21150(a)	Relevant and appropriate (for Alternative 3)	Potentially relevant and appropriate
Final closure plan	Sets forth requirements for final closure plan contents	Cal. Code Regs. tit. 27, requirements are only applicable for waste discharged after July 18, 1997 (the effective date of the consolidated regulations), unless otherwise noted.	Cal. Code Regs. tit. 27, § 21800(c)	To be considered (for Alternative 3)	Requirements are procedural and not substantive; however, these requirements will be used as TBCs in developing the final closure plan.
	Provides the content requirements for post-closure maintenance plans for solid waste disposal sites	Cal. Code Regs. tit. 27, requirements are only applicable for waste discharged after July 18, 1997 (the effective date of the consolidated regulations), unless otherwise noted.	Cal. Code Regs. tit. 27, § 21830	To be considered (for Alternative 3)	Requirements are procedural and not substantive; however, these requirements will be used as TBCs in developing the postclosure maintenance plan.

**Table N-6 Potential State Action-Specific ARARs (Continued)
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Containment (Continued)					
State Water Resources Control Board / California Integrated Waste Management Board ^a					
Post-closure land use	Subsection (a) requires proposed post-closure land uses be designed and maintained to protect health and safety; prevent contact with waste, landfill gas, and leachate; and prevent gas explosions. Subsection (b) specifies that the site closure design shall show one or more proposed uses of the closed site or show development that is compatible with open space. Subsection (c) specifies that approval is required if proposed post-closure land uses involve structures within 1,000 feet of the disposal area, structures on top of waste, modification of the low permeability layer, or irrigation over waste. Subsections (d) through (g) sets forth conditions for construction of on-site structures.	Cal. Code Regs. tit. 27, requirements are only applicable for waste discharged after July 18, 1997 (the effective date of the consolidated regulations), unless otherwise noted.	Cal. Code Regs. tit. 27, §§ 21190(a), (b), (c), (d), (e), (f), and (g)	Relevant and appropriate (for Alternative 3)	The substantive portions of Subsections (a), (b), (c), (d), (e), (f), and (g) are potentially relevant and appropriate. Even though no waste was discharged after July 18, 1997, this section is potentially relevant and appropriate because it is a closure/post-closure requirement in Cal. Code Regs. tit. 27, Division 2, Subchapter 5, Article 2, which applies to "disposal sites that did not complete closure prior to November 18, 1990, in accordance with all applicable requirements" (Cal. Code Regs. tit. 27, § 21100).
Final grading	The final cover of closed landfills will be designed, graded, and maintained to prevent ponding and to prevent site erosion caused by high run-off velocities. Slopes should be at least 3 percent.	Cal. Code Regs. tit. 27, requirements are only applicable for waste discharged after July 18, 1997 (the effective date of the consolidated regulations), unless otherwise noted.	Cal. Code Regs. tit. 27, § 21090(b)(1)	Not an ARAR	Not an ARAR because the requirements were determined to not be feasible and a specific engineered alternative was identified that is consistent with the performance goal and affords equivalent protection against water quality impairment.

**Table N-6 Potential State Action-Specific ARARs (Continued)
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Containment (Continued)					
State Water Resources Control Board / California Integrated Waste Management Board ^a					
Closure of existing waste management units	Requires closure of existing waste management units according to Cal. Code Regs. tit. 27 and Title 23	Existing waste management unit	Cal. Code Regs. tit. 27, Section 20080(d), Cal. Code Regs. tit. 23 2510(d)	Not an ARAR	These regulations are not ARARs because the Parcel E-2 Landfill is not an existing waste management unit; the landfill ceased operation between 1974 and 1975.
Closure of surface impoundments	Requires surface impoundments to be closed by removing and treating all free liquid and either removing all remaining contamination or closing the surface impoundment as a landfill.	Existing surface impoundment	Cal. Code Regs. tit. 27, Section 21400, Cal. Code Regs. tit. 23, Section 2580	Not an ARAR	Not ARARs because no surface impoundments exist at Parcel E-2.
Closure certification	Provides the content requirements to obtain certification that the solid waste disposal sites has closure pursuant to state standards	Cal. Code Regs. tit. 27, requirements are only applicable for waste discharged after July 18, 1997 (the effective date of the consolidated regulations), unless otherwise noted.	Cal. Code Regs. tit. 27, § 21880	Not an ARAR	Not an ARAR because it is procedural and nonsubstantive.
Waste management unit operation	Requires that weight or volume of waste accepted be determined to an accuracy of plus or minus 10 percent	Existing waste management unit	Cal. Code Regs. tit. 27, § 20510(a)	Not an ARAR	Requirements specify operating criteria that do not apply to permanent closure contemplated under Alternative 3.

**Table N-6 Potential State Action-Specific ARARs (Continued)
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Containment (Continued)					
State Water Resources Control Board / California Integrated Waste Management Board ^a					
Waste management unit operation	Requires records be maintained for excavations that may affect the safe and proper operation of the site or cause damage to adjoining properties	Existing waste management unit	Cal. Code Regs. tit. 27, § 20510(b)	Not an ARAR	Requirements specify operating criteria that do not apply to permanent closure contemplated under Alternative 3.
	Requires the site to be designed to discourage unauthorized access by persons or vehicles by using a perimeter barrier or topographic constraints; areas within the site where open storage or ponding of hazardous materials occurs shall be separately fenced	Existing waste management unit	Cal. Code Regs. tit. 27, § 20530	Not an ARAR	Requirements specify operating criteria that do not apply to permanent closure contemplated under Alternative 3.
	Landfill road must minimize dust and tracking of materials onto public roads	Existing waste management unit	Cal. Code Regs. tit. 27, § 20540	Not an ARAR	Requirements specify operating criteria that do not apply to permanent closure contemplated under Alternative 3.
	Requires unloading of solid wastes be confined to as small an area as possible without resulting in traffic, personnel, or public safety hazards	Existing waste management unit	Cal. Code Regs. tit. 27, § 20630	Not an ARAR	Requirements specify operating criteria that do not apply to permanent closure contemplated under Alternative 3.
	Requires spreading and compacting of refuse in layers	Existing waste management unit	Cal. Code Regs. tit. 27, § 20640	Not an ARAR	Requirements specify operating criteria that do not apply to permanent closure contemplated under Alternative 3.

**Table N-6 Potential State Action-Specific ARARs (Continued)
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Containment (Continued)					
State Water Resources Control Board / California Integrated Waste Management Board ^a					
Waste management unit operation	Requires covered surfaces of the disposal area be graded to promote runoff and prevent ponding, accounting for future settlement	Existing waste management unit	Cal. Code Regs. tit. 27, § 20650	Not an ARAR	Requirements specify operating criteria that do not apply to permanent closure contemplated under Alternative 3.
	Requires stockpiled cover material and unsuitable native materials be placed so as not to cause problems or interference with site operations	Existing waste management unit	Cal. Code Regs. tit. 27, § 20660	Not an ARAR	Requirements specify operating criteria that do not apply to permanent closure contemplated under Alternative 3.
	Requires compacted earthen material of at least 12 inches on all surfaces of the fill where no additional solid waste will be deposited within 180 days	Existing waste management unit	Cal. Code Regs. tit. 27, § 20700	Not an ARAR	Requirements specify operating criteria that do not apply to permanent closure contemplated under Alternative 3.
	Prohibits scavenging under most circumstances (with specific exceptions)	Existing waste management unit	Cal. Code Regs. tit. 27, §§ 20710(a), (b), (c), and 20720	Not an ARAR	Requirements specify operating criteria that do not apply to permanent closure contemplated under Alternative 3.
	Permits volume reduction and energy recovery in planned and controlled manners	Existing waste management unit	Cal. Code Regs. tit. 27, § 20730	Not an ARAR	Requirements specify operating criteria that do not apply to permanent closure contemplated under Alternative 3.
	Requires that the site be operated and maintained so as not to create a public nuisance	Existing waste management unit	Cal. Code Regs. tit. 27, § 20760	Not an ARAR	Requirements specify operating criteria that do not apply to permanent closure contemplated under Alternative 3.

**Table N-6 Potential State Action-Specific ARARs (Continued)
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Containment (Continued)					
State Water Resources Control Board / California Integrated Waste Management Board ^a					
Waste management unit operation	Requires burning wastes be extinguished	Existing waste management unit	Cal. Code Regs. tit. 27, § 20780(b)	Not an ARAR	Requirements specify operating criteria that do not apply to permanent closure contemplated under Alternative 3.
	Requires operator to ensure that leachate is controlled to prevent contact with the public	Existing waste management unit	Cal. Code Regs. tit. 27, § 20790	Not an ARAR	Requirements specify operating criteria that do not apply to permanent closure contemplated under Alternative 3.
	Dust control - Requires adequate measures to minimize the creation of dust and prevent safety hazards resulting from obscured visibility	Existing waste management unit	Cal. Code Regs. tit. 27, § 20800	Not an ARAR	Requirements specify operating criteria that do not apply to permanent closure contemplated under Alternative 3.
	Requires adequate measures to control or prevent the propagation, harborage, or attraction of flies, rodents, or other vectors	Existing waste management unit	Cal. Code Regs. tit. 27, § 20810	Not an ARAR	Requirements specify operating criteria that do not apply to permanent closure contemplated under Alternative 3.
	Requires the drainage system be designed and maintained to ensure integrity of roads, structures, and gas monitoring and control systems; prevent safety hazards; and prevent exposure of waste	Existing waste management unit	Cal. Code Regs. tit. 27, § 20820	Not an ARAR	Requirements specify operating criteria that do not apply to permanent closure contemplated under Alternative 3.
	Requires litter and loose material be routinely collected and disposed of properly	Existing waste management unit	Cal. Code Regs. tit. 27, § 20830	Not an ARAR	Requirements specify operating criteria that do not apply to permanent closure contemplated under Alternative 3.

**Table N-6 Potential State Action-Specific ARARs (Continued)
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Containment (Continued)					
State Water Resources Control Board / California Integrated Waste Management Board ^a					
Waste Disposal	Report of Disposal Site Information: The planning and procedural requirements necessary to ensure that solid waste is handled and disposed in manners that protect public health and safety and the environment.	Existing waste management unit	Cal. Code Regs. tit. 27, § 21600	Not an ARAR	Nonsubstantive requirements that do not apply to permanent closure contemplated under Alternative 3.
Construction and Grading					
Air Resources Board ^a					
Construction or grading in soil containing asbestos, serpentine, or ultramafic rock	This regulation sets forth requirements for road construction and maintenance, and for construction and grading operations in soil containing naturally occurring asbestos, serpentine, or ultramafic rock.	Soil containing naturally occurring asbestos, serpentine, or ultramafic rock.	Cal. Code Regs. tit. 17, § 93105	Applicable (for Alternatives 2 and 2)	This regulation is potentially applicable for construction and grading activities if they will occur in areas containing asbestos, serpentine, or ultramafic rock.
Construction and grading	Requirements for construction that will change the natural flow of surface water, use material from streambeds, or result in disposal into designated waters.	Construction by a state/ local government or public utility that will change the natural flow of surface water, use material from streambeds, or result in disposal into designated waters.	Cal. Fish & Game Code Section 1601 and 1603	Not an ARAR	Not an ARAR because it is not a requirement of general applicability – it only applies to state and local government and utilities.

**Table N-6 Potential State Action-Specific ARARs (Continued)
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Construction and Grading (Continued)					
State Water Resources Control Board ^a					
Remediation activities	Actions taken by or at the direction of public agencies to clean up or abate conditions of pollution or nuisance resulting from unintentional or unauthorized releases of waste or pollutants to the environment are exempt from the Cal. Code Regs. tit. 27 requirements identified in Cal. Code Regs. tit 27, div. 2, subdiv. 1, provided that wastes, pollutants, or contaminated materials removed from the immediate place of release shall be discharged according to the SWRCB-promulgated sections of div. 2, subdiv. 1, ch. 3, subch. 2 and further provided that remedial actions intended to contain such wastes at the place of release shall implement applicable SWRCB-promulgated provisions of Division 2 to the extent feasible.	Action taken by or at the direction of a public agency to cleanup release of pollutant.	Cal. Code Regs, tit. 27 §20090(d)	Relevant and appropriate (for Alternatives 2 and 3)	The substantive provisions of this regulation are potentially relevant and appropriate.
Landfill Gas Monitoring and Control					
State Water Resources Control Board / California Integrated Waste Management Board ^a					
Landfill gas monitoring	Contains general standards for a landfill gas monitoring network	Cal. Code Regs. tit. 27, requirements are only applicable for waste discharged after July 18, 1997 (the effective date of the consolidated regulations).	Cal. Code Regs. tit. 27, § 20923	Relevant and appropriate (for Alternative 3)	Potentially relevant and appropriate to closure of the landfill

**Table N-6 Potential State Action-Specific ARARs (Continued)
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Landfill Gas Monitoring and Control (Continued)					
State Water Resources Control Board / California Integrated Waste Management Board ^a					
Landfill gas monitoring	Describes the location, spacing, depth, and construction requirements for a perimeter monitoring system	Cal. Code Regs. tit. 27, requirements are only applicable for waste discharged after July 18, 1997 (the effective date of the consolidated regulations), unless otherwise noted.	Cal. Code Regs. tit. 27, § 20925	Relevant and appropriate (for Alternative 3)	Potentially relevant and appropriate to closure of the landfill
	Provides requirements for monitoring structures	Cal. Code Regs. tit. 27, requirements are only applicable for waste discharged after July 18, 1997 (the effective date of the consolidated regulations), unless otherwise noted.	Cal. Code Regs. tit. 27, § 20931	Relevant and appropriate (for Alternative 3)	Potentially relevant and appropriate to closure of the landfill
	Requires that all monitoring probes and on-site structures be sampled for methane during the monitoring period	Cal. Code Regs. tit. 27, requirements are only applicable for waste discharged after July 18, 1997 (the effective date of the consolidated regulations), unless otherwise noted.	Cal. Code Regs. tit. 27, § 20932	Relevant and appropriate (for Alternative 3)	Potentially relevant and appropriate to closure of the landfill

**Table N-6 Potential State Action-Specific ARARs (Continued)
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Landfill Gas Monitoring and Control (Continued)					
State Water Resources Control Board / California Integrated Waste Management Board ^a					
Landfill gas monitoring	Establishes the frequency for landfill gas monitoring	Cal. Code Regs. tit. 27, requirements are only applicable for waste discharged after July 18, 1997 (the effective date of the consolidated regulations), unless otherwise noted.	Cal. Code Regs. tit. 27, § 20933	Relevant and appropriate (for Alternative 3)	Potentially relevant and appropriate to closure of the landfill
	Describes actions to be taken if the results of landfill gas monitoring indicate that concentrations of methane exceed levels set forth in § 20921(a)	Cal. Code Regs. tit. 27, requirements are only applicable for waste discharged after July 18, 1997 (the effective date of the consolidated regulations), unless otherwise noted.	Cal. Code Regs. tit. 27, § 20937	Relevant and appropriate (for Alternative 3)	Potentially relevant and appropriate to closure of the landfill
Landfill gas control	Following notification by the enforcement agency, the operator shall cause the site to be monitored for the presence and movement of landfill gas and take any necessary action to control such gases.	Cal. Code Regs. tit. 27, requirements are only applicable for waste discharged after July 18, 1997 (the effective date of the consolidated regulations), unless otherwise noted.	Cal. Code Regs. tit. 27, § 20919	Not an ARAR	Requirement is procedural and therefore not substantive. Landfill gas monitoring and control will be performed in accordance with substantive provisions of Cal. Code Regs. tit. 27, §§ 20923, 20925, 20931, 20932, 20933, and 20937.

**Table N-6 Potential State Action-Specific ARARs (Continued)
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Groundwater Monitoring / Excavation and Off-Site Disposal					
State Water Resources Control Board ^a					
Generating investigation-derived waste	Sampling and analysis of discharges shall be used for accurate characterization of wastes.	Waste	Cal. Code Regs. tit. 27, §20200(c)	Applicable (for Alternatives 2 and 3)	This regulation is potentially applicable to excavation of soil and generation of IDW. The Navy will characterize the soil or any IDW when it is generated.
Off-site disposal of soil and investigation derived waste	Requires that designated waste as defined at California Water Code §13173 be discharged to Class I or Class II waste management units.	Discharge of designated waste after July 18, 1997 (nonhazardous waste that could cause degradation of surface or ground waters) to land for treatment, storage, or disposal	Cal. Code Regs. tit. 27, §20210	Applicable (for Alternatives 2 and 3)	This regulation is potentially applicable to excavation of soil and generation of IDW. The Navy will characterize the soil or any IDW when it is generated.
	Requires that nonhazardous solid waste as defined at Cal. Code Regs. tit. 27, §20220(a) be discharged to a classified waste management unit.	Discharge of nonhazardous solid waste after July 18, 1997, to land for treatment, storage, or disposal	Cal. Code Regs. tit. 27, §20220(b), (c), and (d)	Applicable (for Alternatives 2 and 3)	This regulation is potentially applicable to excavation of soil and generation of IDW. The Navy will characterize the soil or any IDW when it is generated.
	Inert waste as defined at Cal. Code Regs. tit. 27, §20230(a) need not be discharged at a classified unit.	Applies to discharges of inert waste to land after July 18, 1997, for treatment, storage, or disposal	Cal. Code Regs. tit. 27, §20230(b)	Not an ARAR	There are no requirements prescribed at Cal. Code Regs. tit. 27, §20230.

**Table N-6 Potential State Action-Specific ARARs (Continued)
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Groundwater Monitoring					
State Water Resources Control Board ^a					
Groundwater Monitoring	Chapter 4 describes implementation plans and other control measures designed to ensure compliance with statewide plans and policies. Includes groundwater and surface water protection and management. Describes program goals, how water quality objectives are applied, and strategies for managing polluted sites.	Waters of the state	Chapter 4 of the Basin Plan	Not an ARAR	Not an ARAR because the section primarily imposes procedural requirements. In addition, substantive requirements pertaining to point source discharges are not applicable because no active groundwater response is contemplated at this time.
	Requires monitoring for compliance with remedial action objectives for three years from the date of achieving cleanup standards	Groundwater	Cal. Code Regs. tit. 27, Section 20410; Cal. Code Regs. tit. 23, Section 2550.6	Not an ARAR	These requirements are not more stringent than the federal Title 22 monitoring requirements.
	Requires general soil, surface water and groundwater monitoring	Groundwater	Cal. Code Regs. tit. 27, Section 20415; Cal. Code Regs. tit. 23, Section 2550.7	Not an ARAR	These requirements are not more stringent than the federal Title 22 monitoring requirements.
	Requires an assessment of the nature and extent of the release, including a determination of the spatial distribution and concentration of each constituent	Groundwater	Cal. Code Regs. tit. 27, Section 20425; Cal. Code Regs. tit. 23, Section 2550.9	Not an ARAR	These requirements are not more stringent than the federal Title 22 monitoring requirements.

**Table N-6 Potential State Action-Specific ARARs (Continued)
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Groundwater Monitoring					
State Water Resources Control Board ^a					
Groundwater Monitoring	Requires monitoring. If water quality is threatened, corrective action consistent with Title 27 and Title 23 is required.	Groundwater	Cal. Code Regs. tit. 27, Sections 20080(g) and Cal. Code Regs. tit. 23 Section 2510(g)	Not an ARAR	These requirements are not more stringent than the federal Title 22 monitoring requirements.
	Applicable where groundwater monitoring is required under 2510 or 2511. Applies to authorized waste management units as wells as unauthorized discharges from closed, abandoned or inactive units.	Groundwater	Cal. Code Regs. tit. 27, Sections 20385-20435, Cal. Code Regs. tit. 23, Section 2550	Not an ARAR	These requirements are not more stringent than the federal Title 22 monitoring requirements.
Excavation and Off-Site Disposal					
California Department of Toxic Substance Control ^a					
Excavation and Disposal	Requires that hazardous waste be discharged to Class I waste management units that meet certain design and monitoring standards.	California hazardous waste	Cal. Code Regs. tit. 23, Sections 2520 and 2521	Not an ARAR	This requirement is applicable for off-site disposal and ARARs only apply to on-site response actions
Excavation and off site disposal	This section provides definitions and requirements for on-site storage of non-RCRA hazardous waste soil prior to on-site treatment or off-site transportation and DTSC says it is applicable if non-RCRA hazardous waste soil is accumulated and stored on-site.	Remediation waste staging and on-site storage prior to transportation off-site.	Cal. Health & Safety Code Section 25123.3	Not an ARAR	This requirement is not more stringent than the federal requirement (40 CFR § 264.554)..

**Table N-6 Potential State Action-Specific ARARs (Continued)
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Institutional Controls					
California Civil Code ^a					
Land use controls	Provides conditions under which land-use restrictions will apply to successive owners of land.	Transfer of property from the federal government to a nonfederal agency	California Civil Code §1471(a)(3)	Relevant and appropriate (for Alternatives 2 and 3)	Substantive provisions are the following general narrative standard: "to do or refrain from doing some act on his or her own land . . . where (c) Each such act relates to the use of land and each such act is reasonably necessary to protect present or future human health or safety or the environment as a result of the presence of hazardous materials, as defined in Section 25260 of the California Health and Safety Code." This narrative standard would be implemented through incorporation of restrictive covenants in the deed and Environmental Restriction and Covenant Agreement at the time of transfer.
California Health and Safety Code ^a					
Land use controls	Allows DTSC to enter into an agreement with the owner of a hazardous waste facility to restrict present and future land uses. Prohibits certain uses of land containing hazardous waste without a specific variance.	Transfer of property from the federal government to a nonfederal agency Hazardous waste property.	California Health and Safety Code § 25202.5 Cal. Health & Safety Code § 25232(b)(1)(A)-(E)	Relevant and appropriate (for Alternatives 2 and 3) Relevant and appropriate (for Alternatives 2 and 3)	The substantive provisions of Cal. Health & Safety Code § 25202.5 are the general narrative standards to restrict "present and future uses of all or part of the land on which the . . . facility . . . is located . . ." Land-use restrictions will be used to prohibit the following activities at Parcel E-2: residential use of the sites, construction of hospitals for humans, schools for persons under 21 years of age, day care centers for children, or any permanently occupied human habitation on the sites.

**Table N-6 Potential State Action-Specific ARARs (Continued)
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Institutional Controls (Continued)					
California Health and Safety Code ^a					
Land use controls	Provides processes and criteria for obtaining written variances from a land-use restriction and for removal of the land use restrictions.	Transfer of property from the federal government to a nonfederal agency	California Health & Safety Code §§ 25233(c) and 25234	Relevant and appropriate (for Alternatives 2 and 3)	Cal. Health & Safety Code § 25233(c) sets forth "relevant and appropriate" substantive criteria for granting variances based upon specified environmental and health criteria. Cal. Health & Safety Code § 25234 sets forth the following "relevant and appropriate" substantive criteria for the removal of a land-use restriction on the grounds that "...the waste no longer creates a significant existing or potential hazard to present or future public health or safety."
	Provides a streamlined process to be used to enter into an agreement to restrict specific use of property in order to implement the substantive use restrictions of Cal. Health & Safety Code § 25232(b)(1) (A)-(E).	Transfer of property from federal government to a nonfederal agency	California Health & Safety Code §§ 25222.1 and 25355.5(a)(1)(C)	Relevant and appropriate (for Alternatives 2 and 3)	Generally, Cal. Health & Safety Code §§ 25222.1 and 25355.5(a)(1)(C) provide the authority for the DTSC to enter into voluntary agreements with land owners to restrict the use of property. The agreements run with the land restricting present and future uses of the land. The substantive requirements of the following Cal. Health & Safety Code § 25222.1 provisions are "relevant and appropriate": (1) the general narrative standard: "restricting specified uses of the property..." and (2) "...the agreement is irrevocable, and shall be recorded by the owner, ...as a hazardous waste easement, covenant, restriction or servitude, or any combination thereof, as appropriate, upon the present and future uses of the land." The substantive requirements of the following Cal. Health & Safety Code § 25355.5(a)(1)(C) provisions are "relevant and appropriate": "...execution and recording of a written instrument that imposes an easement, covenant, restriction, or servitude, or combination thereof , as appropriate, upon the present and future uses of the land."

**Table N-6 Potential State Action-Specific ARARs (Continued)
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Institutional Controls (Continued)					
Department of Toxic Substances Control ^a					
Land Use Covenants	A land use covenant imposing appropriate limitations on land use shall be executed and recorded when Facility closure, corrective action, remedial or removal action, or other response actions are undertaken and Hazardous materials, hazardous wastes or constituents, or hazardous substances will remain at the property at levels which are not suitable for unrestricted use of the land.	Transfer of property from federal government to a nonfederal agency	Cal. Code Regs. tit. 22, § 67391.1(a) and (e)(1)	Relevant and appropriate (for Alternatives 2 and 3)	Cal. Code Regs. tit. 22, § 67391.1 provides for a land-use covenant to be executed and recorded when remedial actions are taken and hazardous substances will remain at the property at concentrations that are unsuitable for unrestricted use of the land. The substantive provisions of this regulation have been determined to be potentially "relevant and appropriate" ARARs by the Navy.
California Regional Water Quality Control Board					
Institutional Controls	If the state board or the regional board finds that the property is not suitable for unrestricted use and that a land use restriction is necessary for the protection of public health, safety, or the environment, then the state board and the regional boards may not issue a closure letter, or make a determination that no further action is required, with respect to a site that is subject to a cleanup or abatement order pursuant to Section 13304 and that is not an underground storage tank site, unless a land use restriction is recorded or required to be recorded pursuant to Section 1471 of the Civil Code.	Hazardous waste property.	Cal. Water Code Section 13307.1(c)	Not an ARAR	Not an ARAR because the section imposes procedural requirements on the water boards and does not impose any requirement directly on the Navy.

**Table N-6 Potential State Action-Specific ARARs (Continued)
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Surface Water Monitoring					
State Water Resources Control Board ^a					
Closure of waste management unit	Prior to closure, inactive waste management units must comply with the substantive requirements for eliminating most nonstormwater discharges, developing and implementing a stormwater pollution prevention plan, and performing monitoring of stormwater discharges.	Storm water discharge	SWRCB Order 97-03-DWQ	Not an ARAR	Not an ARAR for the response actions contemplated. However, the Navy will use the substantive requirements of SWRCB Order 97-03 as TBCs during the pre-closure period at the Parcel E-2 landfill, and will continue to manage storm water discharges in accordance with the current SWDMP.
Leachate Collection and Control					
State Water Resources Control Board / California Integrated Waste Management Board ^a					
Leachate control	During the post-closure maintenance period, the owner/operator will ensure that leachate collection and control are performed in a manner that prevents public contact and controls vectors, nuisance, and odors. (This section does not require installation of a new leachate collection system.)	Cal. Code Regs. tit. 27, requirements are only applicable for waste discharged after July 18, 1997 (the effective date of the consolidated regulations), unless otherwise noted.	Cal. Code Regs. tit. 27, §§ 21160(a) and (c)	Relevant and appropriate (for Alternative 3)	Potentially relevant and appropriate for leachate control (if required based on monitoring results)

**Table N-6 Potential State Action-Specific ARARs (Continued)
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Leachate Collection and Control (continued)					
State Water Resources Control Board / California Integrated Waste Management Board ^a					
Groundwater corrective action	Requires implementation of corrective action measure that ensure that cleanup levels are achieved throughout the zone affected by the release by removing the waste constituents or treating them in place.	Contaminated groundwater	Cal. Code Regs. tit. 27, Section 20430; Cal. Code Regs. tit. 23, Section 2550.10	Not an ARAR	Not ARARs because they are not more stringent than the federal Title 22 requirements (Cal. Code Regs. tit. 22, § 66264.100). Relevant and appropriate in the event that detection and evaluation monitoring shows evidence that a new release has occurred.
Groundwater treatment system	Requires that a groundwater cleanup system that is required to obtain a discharge permit from the RWQCB and that discharges of treated groundwater to surface water or groundwater, shall treat the groundwater to standards approved by the RWQCB taking into account the beneficial uses of the receiving water	Contaminated groundwater	Cal. Water Code Section 13304.1(a)	Not an ARAR	Not an ARAR because no groundwater response that would discharge to surface water or groundwater is contemplated at this time.

**Table N-6 Potential State Action-Specific ARARs (Continued)
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Leachate Collection and Control (continued)					
California Regional Water Quality Control Board					
Groundwater treatment system	Urges the dischargers of extracted groundwater from groundwater cleanup projects to reclaim their effluents to the extent technologically and economically feasible, and if not feasible, urges discharge to POTWs. Where neither reclamation nor POTW discharge is feasible, discharge in accordance with NPDES requirements will be authorized by the Board.	Contaminated groundwater	Cal. Water Code Sections 13240, 13241, 13242, 13243 RWQCB Resolution 88-160	Not an ARAR	Not an ARAR because no groundwater response is contemplated at this time. Groundwater treatment contemplated under Alternative 2 is incidental to the soil and waste removal, and is planned to be discharged to the POTW.

**Table N-6 Potential State Action-Specific ARARs (Continued)
 Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Notes:

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

§ Section

§§ Sections

Cal. Code Regs. tit. 22 Title 22 of the *California Code of Regulations*

Cal. Code Regs. tit. 23 Title 23 of the *California Code of Regulations*

Cal. Code Regs. tit. 27 Cal. Code Regs. tit. 27 of the *California Code of Regulations*

ARAR Applicable or relevant and appropriate requirement

DTSC Department of Toxic Substances Control

Navy U.S. Department of the Navy

RCRA Resource Conservation and Recovery Act

SWRCB State Water Resources Control Board

**Table N-7 Comparison of Potential Closure and Postclosure Requirements for Landfill Sites^a
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Closure Activity	Potential Federal ARARs		Potential State ARARs		Controlling ARARs ^b
	Cal. Code Regs. tit. 22, RCRA	40 C.F.R. pt. 258, subpt. F	Cal. Code Regs. tit. 27	Cal. Code Regs. tit. 23	
Location	§ 66264.309(a): A map must be prepared showing the exact location and dimensions, including depth, of each cell with respect to permanently surveyed benchmarks with horizontal and vertical controls.	Not specified.	<p>§ 20950(d): Closed waste management units shall be provided with at least two permanent monuments (to be installed by a licensed land surveyor or a registered civil engineer) from which the location and elevation of wastes, containment structures, and monitoring facilities can be determined throughout the postclosure period.</p> <p>§ 21090(e)(1): An aerial photographic survey must be conducted to include closed portions of the unit and its immediate surrounding area, including the surveying monuments. This survey shall be used to produce a topographic map showing the as-closed topography and to allow early detection of any differential settlement.</p>	§ 2580(d): Closed waste management units shall be provided with at least two permanent monuments installed by a licensed land surveyor or a registered civil engineer, from which the location and elevation of wastes, containment structures, and monitoring facilities can be determined throughout the postclosure maintenance period.	Cal. Code Regs. tit. 27, § 20950(d) and 21090(e)(1)

**Table N-7 Comparison of Potential Closure and Postclosure Requirements for Landfill Sites^a (Continued)
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Closure Activity	Potential Federal ARARs		Potential State ARARs		Controlling ARARs ^b
	Cal. Code Regs. tit. 22, RCRA	40 C.F.R. pt. 258, subpt. F	Cal. Code Regs. tit. 27	Cal. Code Regs. tit. 23	
Security	§ 66264.117(c): Continue security requirements specified in §66264.14, which require 24-hour surveillance, a barrier surrounding entire facility, entry control, and placarding if hazardous waste remains exposed after final closure or if access by public or livestock may pose a threat to human health.	Not specified.	§ 21135(f) and (g): All points of access to the site must be restricted. All monitoring, control, and recovery systems shall be protected from unauthorized access. Once closure activities are complete, site access by the public may be allowed in accordance with the approved postclosure maintenance plan.	Not specified.	Cal. Code Regs. tit. 27, § 21135(f) and (g)
Final grading	§ 66264.228(e)(13): Permanent disposal areas shall be graded at closure so that, with allowance for settling and subsidence, the slope of the land surface above all portions of the cover shall be sufficient to prevent ponding of water.	Not specified.	§ 21090(b)(1): The final cover of closed landfills shall be designed, graded, and maintained to prevent ponding and to prevent site erosion due to high runoff velocities. Slopes should be at least 3 percent.	§ 2546(f): Cover materials shall be graded to divert precipitation from the waste management unit, to prevent ponding of surface water over wastes, and to resist erosion as a result of precipitation with the return frequency specified in Table 4.1 of this article.	Cal. Code Regs. tit. 27, § 21090(b)(1)

**Table N-7 Comparison of Potential Closure and Postclosure Requirements for Landfill Sites^a (Continued)
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Closure Activity	Potential Federal ARARs		Potential State ARARs		Controlling ARARs ^b
	Cal. Code Regs. tit. 22, RCRA	40 C.F.R. pt. 258, subpt. F	Cal. Code Regs. tit. 27	Cal. Code Regs. tit. 23	
Permeability	§ 66264.228(f): Before installing the compacted layer of the final cover, the owner or operator shall accurately establish the correlation between the desired permeability and the density at which that permeability is achieved.	Not specified.	<p>§ 20320(c) and (d): Hydraulic conductivities shall be determined primarily through laboratory methods and shall be confirmed by appropriate field testing. Earthen materials used in containment structure shall consist of a mixture of clay and other suitable fine-grained soils that have specified characteristics and that, in combination, can be compacted to attain the required hydraulic conductivity when installed.</p> <p>§ 20324(g)(1): Before installing the compacted soil barrier layer component of a final cover system or the compacted soil of a liner system, the operator shall accurately establish the correlation between the design hydraulic conductivity and the density at which that conductivity is achieved.</p>	<p>§ 2541(c): Permeabilities shall be determined primarily by appropriate field test methods in accordance with accepted civil engineering practice. The results of laboratory tests with both water and leachate and field tests with water shall be compared to evaluate how the field permeabilities will be affected by leachate. Appropriate compaction tests may be used in conjunction with laboratory permeability tests to determine field permeabilities as long as a reasonable number of field permeability tests are also conducted. One acceptable method for testing the compatibility of leachate and clay liners (including the permeability of the liner to leachate) is given in app. I.</p> <p>§ 2541(d): Earthen materials used in containment structures other than cutoff walls and grout curtains shall consist of a mixture of clay and other suitable fine-grained soils that have the following characteristics, and, in combination, can be compacted to attain the required permeability when installed. Liners made of such materials are referred to as "clay liners" in this chapter. (1) At least 30 percent of the material, by weight, shall pass a No. 200 U.S. Standard sieve.</p>	Cal. Code Regs. tit. 27, §§ 20320(c) and (d) and 20324(g)(1)

**Table N-7 Comparison of Potential Closure and Postclosure Requirements for Landfill Sites^a (Continued)
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Closure Activity	Potential Federal ARARs		Potential State ARARs		Controlling ARARs ^b
	Cal. Code Regs. tit. 22, RCRA	40 C.F.R. pt. 258, subpt. F	Cal. Code Regs. tit. 27	Cal. Code Regs. tit. 23	
Landfill gas	§ 66264.310(c): The owner or operator shall provide a control system designed to prevent migration of gas unless it is demonstrated that no gas or vapor will be emitted by waste and no gas will be emitted capable of disrupting cover or causing other property damage.	§ 258.61(a)(4): Maintain and operate the gas monitoring system in accordance with § 258.23, which requires monitoring to assure less than 25 percent lower explosive limit for methane in site facilities and less than the lower explosive limit for methane at the facility property boundary.	§ 20921(a)(1), (2), and (3): The operator shall ensure that landfill gases generated at a disposal site are controlled. Methane must not exceed 1.25 percent by volume in air within on-site structures, concentrations of methane gas migrating from the landfill must not exceed 5 percent by volume in air at the property boundary, and trace gases shall be controlled to prevent adverse acute and chronic exposure to toxic and/or carcinogenic compounds.	Not specified.	Cal. Code Regs. tit. 27, § 20921(a)(1), (2), and (3)
Landfill leachate	§ 66264.310(b)(2): Continue to operate leachate collection and removal system until leachate is no longer detected.	§ 258.61(a)(2): Maintain and operate the leachate collection system.	§ 21160(a) and (c): During the postclosure maintenance period, the owner/operator shall assure that leachate collection and control is done in a manner that prevents public contact and controls vectors, nuisance, and odors. § 21090(c)(2): Continue to operate the leachate collection and removal system as long as leachate is generated and detected.	Not specified.	Cal. Code Regs. tit. 22, § 66264.310(b)(2) and Cal. Code Regs. tit. 27, § 21160(a) and (c)

**Table N-7 Comparison of Potential Closure and Postclosure Requirements for Landfill Sites^a (Continued)
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Closure Activity	Potential Federal ARARs		Potential State ARARs		Controlling ARARs ^b
	Cal. Code Regs. tit. 22, RCRA	40 C.F.R. pt. 258, subpt. F	Cal. Code Regs. tit. 27	Cal. Code Regs. tit. 23	
Groundwater monitoring	§ 66264.310(b)(3): After final closure, maintain and monitor the groundwater system and comply with all other applicable requirements of art. 6, ch. 14.	§ 258.61(a)(3): Monitor the groundwater in accordance with requirements of Subpart E of this part and maintain as applicable.	§ 21090(c)(3): Maintain monitoring systems and monitor groundwater, surface water, and the unsaturated zone in accordance with applicable requirements of art. 1, subch. 3, ch. 3, subdiv. 1 (§ 20380 et seq.).	§ 2580(a): Classified waste management units shall be closed according to an approved closure and postclosure maintenance plan that provides for continued compliance with the applicable standards for the monitoring program requirements in art. 5 of this chapter, throughout the closure and postclosure maintenance period.	Cal. Code Regs. tit. 22, § 66264.310(b)(3)
Compaction	§ 66264.228(e)(1): If waste is to remain in a unit, the unit shall be compacted before any portion of the final cover is installed.	Not specified.	Not specified.	Not specified.	Cal. Code Regs. tit. 22, § 66264.228(e)(1)

**Table N-7 Comparison of Potential Closure and Postclosure Requirements for Landfill Sites^a (Continued)
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Closure Activity	Potential Federal ARARs		Potential State ARARs		Controlling ARARs ^b
	Cal. Code Regs. tit. 22, RCRA	40 C.F.R. pt. 258, subpt. F	Cal. Code Regs. tit. 27	Cal. Code Regs. tit. 23	
Cover seismic requirements	§ 66264.310(a)(5): The final cover shall accommodate lateral and vertical shear forces generated by the maximum credible earthquake so that the integrity of the cover is maintained.	Not specified.	§ 20370: Hazardous waste and designated waste management units shall be designed to withstand the maximum credible earthquake and nonhazardous waste management units must be designed to withstand the maximum probable earthquake without damage to the foundation or the structures that control leachate, surface drainage, erosion, or gas. §§ 21145(a) and 21750(f)(5): The owner shall assure the integrity of final slopes under both static and dynamic conditions. A stability analysis shall be performed to assure the integrity of the unit. The report must indicate a factor of safety for the critical slope of at least 1.5 under dynamic conditions.	§ 2547: Class I waste management units shall be designed to withstand the maximum credible earthquake without damage to the foundation or to the structures that control leachate, surface drainage, erosion, or gas.	Cal. Code Regs. tit. 22, § 66264.310(a)(5)
Postclosure care period	§ 66264.117(b)(1) and (2): Postclosure care shall begin after completion of closure and continue for approximately 30 years, based on protectiveness to human health and the environment.	§ 258.61(a) and (b): Postclosure care must be conducted for approximately 30 years, based on protection of human health and the environment.	§ 20950(a): The postclosure maintenance period shall extend as long as the wastes pose a threat to water quality. § 21180(a): The landfill shall be maintained and monitored for a period of not less than 30 years after completion of closure of the entire solid waste landfill.	§ 2580(a): The postclosure maintenance period shall extend as long as the wastes pose a threat to water quality.	Cal. Code Regs. tit. 27, §§ 20950(a) and 21180(a)

**Table N-7 Comparison of Potential Closure and Postclosure Requirements for Landfill Sites^a (Continued)
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Closure Activity	Potential Federal ARARs		Potential State ARARs		Controlling ARARs ^b
	Cal. Code Regs. tit. 22, RCRA	40 C.F.R. pt. 258, subpt. F	Cal. Code Regs. tit. 27	Cal. Code Regs. tit. 23	
Postclosure care	<p>§ 66264.310(a)(1): The final cover shall be designed to prevent the downward entry of water into the closed landfill throughout a period of at least 100 years.</p> <p>§ 66264.310(b)(1): Maintain the integrity and effectiveness of the final cover, including making repairs to the cap as necessary to correct the effects of settling, subsidence, erosion, or other events throughout the postclosure period.</p>	<p>§ 258.61(a)(1): Maintain the integrity and effectiveness of any final cover, including making repairs to the cover as necessary to correct the effects of settlement, subsidence, erosion, or other events, and preventing run-on and runoff from eroding or otherwise damaging the final cover during the postclosure care period.</p>	<p>§ 21090(c)(1): Maintain the structural integrity and effectiveness of all containment structures and maintain the final cover as necessary to correct the effects of settlement or other adverse factors.</p>	<p>§ 2580(a): Classified waste management units shall be closed according to an approved closure and postclosure maintenance plan which provides for continued compliance with the applicable standards for waste containment and precipitation and drainage controls in art. 4 of this chapter.</p>	<p>Cal. Code Regs. tit. 22, § 66264.310(a)(1) and (b)(1)</p>
Erosion control	<p>§ 66264.310(b)(4): Prevent run-on and runoff from eroding or otherwise damaging the final cover throughout the postclosure period.</p>	<p>Not specified.</p>	<p>§ 20365(c) and (d): Diversion and drainage facilities shall be designed, constructed, and maintained to accommodate the anticipated volume of precipitation and peak flows. Collection and holding facilities associated with precipitation and drainage control systems shall be emptied immediately or otherwise managed to maintain system design capacity.</p> <p>§ 21090(c)(4): Prevent erosion and related damage of the final cover due to drainage throughout the postclosure maintenance period.</p>	<p>§ 2546(a): Class I waste management units and containment structures shall be designed and constructed to limit, to the greatest extent possible, ponding, infiltration, inundation, erosion, slope failure, washout, and overtopping under the precipitation conditions specified in Table 4.1 of this article.</p>	<p>Cal. Code Regs. tit. 27, §§ 20365(c) and (d), 21090(c)(4), and 21150</p>

**Table N-7 Comparison of Potential Closure and Postclosure Requirements for Landfill Sites^a (Continued)
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Closure Activity	Potential Federal ARARs		Potential State ARARs		Controlling ARARs ^b
	Cal. Code Regs. tit. 22, RCRA	40 C.F.R. pt. 258, subpt. F	Cal. Code Regs. tit. 27	Cal. Code Regs. tit. 23	
Erosion control (continued)	See previous page	See previous page	§ 21150(a): The drainage and erosion control system shall be designed and maintained to assure integrity of postclosure land uses, roads, and structures; to prevent public contact with waste and leachate; to assure integrity of gas monitoring and control systems; to prevent safety hazards; and to prevent exposure of waste.	See previous page	See previous page
Benchmark maintenance	§ 66264.310(b)(5): Protect and maintain surveyed benchmarks throughout the postclosure period.	Not specified.	§ 21090(c)(5): Throughout the postclosure maintenance period, the discharger shall protect and maintain surveyed monuments (installed under § 20950(d)).	Not specified.	Cal. Code Regs. tit. 22, § 66264.310(b)(5)
Engineered alternatives to final cover standard	§ 66264.310(a)(7): At final closure of the landfill or upon closure of any cell, the owner or operator shall cover the landfill or cell with a final cover designed and constructed to conform to the provisions of subsections (e) through (r) of § 66264.228, except that a variance shall be granted from any requirement of subsections (e) through (r) that the owner or operator demonstrates is not necessary to protect public health, water quality, or other environmental quality.	§ 258.60(b)(1) and (2): An alternative final cover design may be approved that includes: (1) an infiltration layer that achieves a reduction in infiltration equivalent to the infiltration layer specified in paragraphs (a)(1) and (a)(2) of this section, and (2) an erosion layer that provides protection from wind and water erosion equivalent to the erosion layer specified in paragraph (a)(3) of this section.	§ 20080(b) and (c): Alternatives to prescriptive standards may be considered provided the prescriptive standard is not feasible and there is a specific engineered alternative that is consistent with the performance goal and affords equivalent protection against water quality impairment. § 21090(a): The RWQCB can allow any alternative final cover that it finds will continue to isolate the waste and irrigation waters at least as well as would a final cover built in accordance with applicable prescriptive standards.	§ 2510(b) and (c): Alternatives to prescriptive standards may be considered provided the prescriptive standard is not feasible and there is a specific engineered alternative that is consistent with the performance goal and affords equivalent protection against water quality impairment.	Cal. Code Regs. tit. 27, §§ 20080(b) and (c) and 21090(a)

**Table N-7 Comparison of Potential Closure and Postclosure Requirements for Landfill Sites^a (Continued)
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Closure Activity	Potential Federal ARARs		Potential State ARARs		Controlling ARARs ^b
	Cal. Code Regs. tit. 22, RCRA	40 C.F.R. pt. 258, subpt. F	Cal. Code Regs. tit. 27	Cal. Code Regs. tit. 23	
Foundation layer	§ 66264.228(e)(4): A foundation layer shall be provided for the compacted barrier layer of the final cover. If needed, the foundation layer shall contain herbicide sufficient to prevent vegetative growth, and shall be free of decomposable organic matter. The layer shall be compacted at a moisture content sufficient to achieve the density required to provide adequate support for the nonearthen membrane.	Not specified.	§ 21090(a)(1): Foundation Layer— Closed landfills shall be provided with not less than 2 feet of appropriate materials as a foundation layer for the final cover. These materials may be soil, contaminated soil, incinerator ash, or other waste materials, provided that such materials have appropriate engineering properties to be used for a foundation layer. The foundation layer shall be compacted to the maximum density obtainable at optimum moisture content using methods that are in accordance with accepted civil engineering practice. A lesser thickness may be allowed for units if the differential settlement of waste and ultimate land use will not affect the structural integrity of the final cover.	Not specified.	Cal. Code Regs. tit. 27, § 21090(a)(1)

**Table N-7 Comparison of Potential Closure and Postclosure Requirements for Landfill Sites^a (Continued)
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Closure Activity	Potential Federal ARARs		Potential State ARARs		Controlling ARARs ^b
	Cal. Code Regs. tit. 22, RCRA	40 C.F.R. pt. 258, subpt. F	Cal. Code Regs. tit. 27	Cal. Code Regs. tit. 23	
Low-Hydraulic-Conductivity layer	<p>§ 66264.228(5): A compacted barrier layer of clean earth shall be provided above the foundation layer, and shall be provided around the unit to a depth as low as the level at which the owner or operator has deposited waste, to prevent lateral migration of waste and gas and vapor from the waste. The layer of earth shall be wholly below the average depth of frost penetration, and shall be compacted at a moisture content sufficient to achieve a percent compaction that has been demonstrated, with the specific cover material to be used, to prevent the downward entry of water into the foundation layer for a period of at least 100 years.</p> <p>§ 66264.228(7): The owner or operator may use nonearthen materials for the barrier layer provided it is demonstrated to the satisfaction of the department that a barrier layer of alternative composition will equally impede movement of fluid and be as durable as a compacted earthen barrier.</p>	<p>§ 258.60(a): Owners or operators of all MSWLF units must install a final cover system that is designed to minimize infiltration and erosion. The final cover system must be designed and constructed to: (1) have a permeability less than or equal to the permeability of any bottom liner system or natural subsoils present, or a permeability no greater than 1×10^{-5} cm/sec, whichever is less, and (2) minimize infiltration through the closed MSWLF by the use of an infiltration layer that contains a minimum 18 inches of earthen material.</p>	<p>§ 21090(a)(2): Low-Hydraulic-Conductivity Layer—Closed landfills shall be provided with a low-hydraulic-conductivity (or low through-flow rate) layer, consisting of not less than 1 foot of soil containing no waste or leachate, that is placed on top of the foundation layer and compacted to attain a hydraulic conductivity of either 1×10^{-6} cm/sec (i.e., 1 foot per year) or less, or equal to the hydraulic conductivity of any bottom liner system or underlying natural geologic materials, whichever is less permeable, or another design that provides a correspondingly low through-flow rate throughout the postclosure maintenance period.</p>	Not specified.	Cal Code Regs. tit. 27, § 21090(a)(2)

**Table N-7 Comparison of Potential Closure and Postclosure Requirements for Landfill Sites^a (Continued)
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Closure Activity	Potential Federal ARARs		Potential State ARARs		Controlling ARARs ^b
	Cal. Code Regs. tit. 22, RCRA	40 C.F.R. pt. 258, subpt. F	Cal. Code Regs. tit. 27	Cal. Code Regs. tit. 23	
Erosion-resistant layer (vegetation and filter/drainage)	<p>§ 66264.228(10): The owner or operator shall provide a water drainage layer, blanket or channel above the compacted barrier layer of the final cover to provide a path for water to exit rapidly.</p> <p>§ 66264.228(11): The owner or operator shall provide a filter layer above the water drainage layer to prevent soils from clogging the drainage layer.</p> <p>§ 66264.228(e)(12): A layer of topsoil shall be provided thick enough to support vegetation for erosion control and deep enough to prevent root penetration into the filter layer.</p>	<p>§ 258.60(a)(3): Minimize erosion by use of an erosion layer that contains a minimum of 6 inches of earthen material that is capable of sustaining native plant growth.</p>	<p>§ 21090(a)(3): Erosion-Resistant Layer—The low-hydraulic-conductivity layer of § 21090(a)(2) shall be directly overlain by an erosion-resistant layer.</p> <p>§ 21090(a)(3): Closed landfills shall be provided with an uppermost cover layer consisting of either a vegetative layer consisting of not less than 1 foot of soil capable of sustaining native or other suitable plant growth or a mechanically erosion-resistant layer.</p>	<p>§ 2580(e): Vegetation for closed waste management units shall be selected to require minimum irrigation and maintenance and shall not impair the integrity of containment structures, including the final cover.</p>	<p>Cal. Code Regs. tit. 27, § 21090(a)(3)</p>

**Table N-7 Comparison of Potential Closure and Postclosure Requirements for Landfill Sites^a (Continued)
Hunters Point Shipyard Parcel E-2 Remedial Investigation/Feasibility Study**

Notes:

a landfill closure and postclosure requirements in potential federal ARARs Cal. Code Regs. tit. 22 and 40 C.F.R. § 258 and potential state ARARs Cal. Code Regs. tits. 27 and 23 are "relevant and appropriate" rather than "applicable" if the landfills ceased operation prior to the effective date of the regulations

b controlling – because 40 C.F.R. § 258, Cal. Code Regs. tits. 22, 27, and 23 contain overlapping requirements, this table was used to compare the four sets of regulations and to select the most stringent as the controlling ARAR; where regulations were judged to be equally stringent, the federal regulations were selected as the controlling ARARs

§ Section

§§ Sections

40 CFR pt. 258, subpt F Title 40 of the *Code of Federal Regulations*, Part 258, Subpart F

Cal. Code Regs. tit. 22 Title 22 of the *California Code of Regulations*

Cal. Code Regs. tit. 23 Title 23 of the *California Code of Regulations*

Cal. Code Regs. tit. 27 Cal. Code Regs. tit. 27 of the *California Code of Regulations*

ARAR – applicable or relevant and appropriate requirement

app. – appendix

art. – article

ch. – chapter

cm/sec – centimeters per second

MSWLF – municipal solid waste landfill

RCRA – Resource Conservation and Recovery Act

RWQCB – Regional Water Quality Control Board

subch. – subchapter

subdiv. – subdivision

subpt. – subpart

tit. – title

Comparison of Potential Closure and Postclosure Requirements for Landfill Sites

