

**APPENDIX F**

**APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS**

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## ABBREVIATIONS AND ACRONYMS

ARARs	applicable or relevant and appropriate requirement(s)
BACT	best available control technology
CAA	Clean Air Act
CCC	California Coastal Commission
CCR	California Code of Regulations
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFR	Code of Federal Regulations
DOI	Department of the Interior
EP	extraction procedures
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FS	Feasibility Study
H&SC	Health and Safety Code
HSWA	Hazardous and Solid Waste Amendments
IP	State Implementation Plan
JPL	Jet Propulsion Laboratory
LDRs	land disposal restrictions
MCL	maximum contaminant levels
mg/L	milligrams per liter
MICR	maximum individual cancer risk
NAAQs	National Primary and Secondary Ambient Air Quality Standards
NASA	National Aeronautics and Space Administration
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NEPA	National Environmental Policy Act of 1969
NESHAPs	National Emission Standards for Hazardous Air Pollutants
NHPA	National Historic Preservation Act
OU	operable unit
POC	point of compliance

RAO	remedial action objective
RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision
RWQCB	Regional Water Quality Control Board
SCAQMD	South Coast Air Quality Management District
SDWA	Safe Drinking Water Act
STLC	soluble threshold limit concentration(s)
SVE	soil vapor extraction
T-BACT	toxics best-available control technology
TBC	to be considered
TCE	trichloroethene
TCLP	toxicity characteristic leachate procedure
TDS	total dissolved solids
TTLC	total threshold limit concentration(s)
USC	United States Code
VOC	volatile organic compound
WET	waste extraction test
WQCP	water quality control plan
WQO	water quality objective

## F.1 INTRODUCTION

This appendix identifies and evaluates potential federal and state of California applicable or relevant and appropriate requirements (ARARs) and sets forth National Aeronautics and Space Administration's (NASA's) determinations regarding those potential ARARs for the selected remedy described in this Record of Decision (ROD).

### F.1.1 Summary of CERCLA and NCP Requirements

Section 121(d) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA, 42 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 remedial 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 40 Code of Federal Regulations (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;
- 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; and
- 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, 1988b).

Tables F-A, F-B, and F-C included at the end of this appendix present each potential ARAR with a determination of ARAR status (i.e., applicable, relevant and appropriate, or not an ARAR). 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 remedial 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 documented in the tables of this appendix and are discussed in the text only for specific cases. To qualify as a state ARAR under CERCLA and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), a state requirement must be:

- A state law,
- An environmental or facility siting law,
- Promulgated (of general applicability and legally enforceable),
- Substantive (not procedural or administrative),
- More stringent than the federal requirement,
- Identified in a timely manner, and
- 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 121(e)(1), 42 USC § 9621(e)(1), states that “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).

Nonpromulgated 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-specific basis for remedial actions where CERCLA authority is the basis for cleanup.

As the lead federal agency, NASA has primary responsibility for identifying federal ARARs at the Jet Propulsion Laboratory (JPL). Potential federal ARARs that have been identified for Operable Unit (OU-2) are discussed below. Pursuant to the definition of the term on-site in 40 CFR § 300.5, this remedial action covers OU-2, which consists of on-facility vadose zone soil. Equipment related to implementation of the selected remedy including soil vapor extraction wells, volatile organic compound (VOC) vapor treatment equipment, and piping connecting those items are defined as “on-site.” Regulatory requirements that apply to off-site actions are not ARARs. Off-site actions (i.e., off-site disposal) are required to comply with applicable requirements only and are not required to comply with relevant and appropriate requirements identified as ARARs for on-site actions.

Identification of potential state ARARs was carried out during the Feasibility Study (FS). Potential state ARARs that have been identified for OU-2 are discussed in Section F.1.2.3.

### **F.1.2 Methodology Description**

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

#### ***F.1.2.1 General Approach***

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

- Identified federal ARARs for the selected remedy addressed in the ROD, taking into account site-specific information for OU-2;
- Reviewed potential state ARARs identified during the OU-2 FS phase to determine whether they satisfy CERCLA and NCP criteria that must be met in order to constitute state ARARs; and

- Evaluated and compared federal ARARs and their state counterparts to determine which state ARARs are more stringent than the federal ARARs or are in addition to the federally required actions.

As outlined in Section 8.0 of this ROD, the remedial action objective (RAO) for OU-2 is to prevent, to the extent practicable, further migration of VOCs at potential levels of concern from the vadose zone to groundwater to protect an existing drinking water source. The selected remedial action, soil vapor extraction (SVE), will be implemented to achieve the RAO.

#### ***F.1.2.2 Identifying and Evaluating Federal ARARs***

NASA is responsible for identifying federal ARARs as the lead federal agency under CERCLA and NCP. 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 thereunder. Examples include the Resource Conservation and Recovery Act (RCRA), the Clean Water Act, the Safe Drinking Water Act, and their implementing regulations, to name a few. See NCP preamble at 55 Fed. Reg. 8764–8765 (1990) for a more complete listing.

The proposed remedial action 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 were applicable or relevant and appropriate utilizing the CERCLA and NCP criteria and procedures for ARARs identification by lead federal agencies.

#### ***F.1.2.3 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.

### **F.1.3 Waste Characterization**

Selection of ARARs involves the characterization of wastes as described below.

#### ***F.1.3.1 RCRA Hazardous Waste Determination***

RCRA is a federal statute passed in 1976 to meet four goals: 1) the protection of human health and the environment, 2) the reduction of waste, 3) the conservation of energy and natural resources, and 4) the elimination of the generation of hazardous waste as expeditiously as possible. The Hazardous and Solid Waste Amendments (HSWA) 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 remedial 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 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 23 July 1992 (57 Fed. Reg. 32726 [1992]). The state of California “Environmental Health Standards for the Management of Hazardous Waste,” set forth in Title 22 California Code of Regulations, Division 4.5 (Cal. Code Regs. tit. 22, div. 4.5), were approved by EPA as a component of the federally authorized state of California RCRA program.

The regulations of Cal. Code Regs. tit. 22, div. 4.5 are, therefore, a source of potential federal ARARs for CERCLA remedial actions. The exception is when a state regulation is “either broader in scope or more stringent” 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 23 July 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. Cal. Code Regs. tit. 22, div. 4.5 requirements would be potential state ARARs for such non-RCRA, state-regulated wastes.

Federal RCRA hazardous waste determination is necessary to determine whether a waste is subject to RCRA requirements at Cal. Code Regs. tit. 22, div. 4.5 and other state requirements at Cal. Code Regs. tit. 23, div. 3, Chapter (ch.) 15.

**RCRA Listed Wastes-** The first step in the RCRA hazardous waste characterization process is to evaluate contaminated media at the site and determine whether it 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, §§ 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-spec products (EPA, 1991). Not every waste containing a P or U 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 off-spec commercial products 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.

**RCRA Characteristic Wastes-** 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 §§ 261.21–261.24), 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 §§ 261.21–261.24, 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, div. 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, §§ 66261.21–66261.24. 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 leachate 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).

**OU-2 Waste Characterization-** An evaluation will be conducted at the time of waste generation to determine whether or not waste generated from the remedial action at OU-2 is a RCRA-listed or characteristic hazardous waste.

### ***F.1.3.2 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 (TTLCs) and the soluble threshold limit concentrations (STLCs) for non-RCRA hazardous waste. The state applies its own leaching procedure, waste extraction test (WET), that

uses a different acid reagent and has a different dilution factor (tenfold). 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, div. 4.5, ch. 11, Appendix [app.] II [b]).

An evaluation will be conducted at the time of waste generation to determine whether or not waste generated from the remedial action at OU-2 is a California-regulated, non-RCRA hazardous waste.

### ***F.1.3.3 Other California Waste Classifications***

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

A “designated waste” under Cal. Code Regs. tit. 27, § 20210 is defined at Cal. Water Code § 13173. Under Cal. Water Code § 13173, designated waste is hazardous waste that has been granted a variance from hazardous waste management requirements or nonhazardous 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 nonhazardous solid waste under Cal. Code Regs. tit. 27, § 20220 is all putrescible and nonputrescible 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.

These state requirements may be more stringent than hazardous waste requirements and proper waste classification at the time of waste generation will determine their applicability.

## F.2 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). This section presents ARARs determination conclusions addressing groundwater, soil, and air.

The evaluation of potential federal and state chemical-specific ARARs is summarized in Table F-A, which is included at the end of this appendix. Groundwater, soil, and air are the environmental media potentially affected by the OU-2 remedial actions. The conclusions for chemical-specific ARARs pertaining to these media are presented in the following sections.

### F.2.1 Groundwater ARARs Conclusions

This section summarizes potential ARARs for groundwater and identifies the controlling federal and state ARARs. Table F-1 summarizes the federal and state Maximum Contaminant Levels (MCLs) for the VOCs that have been detected in both the vadose zone and groundwater at JPL.

**Table F-1. MCLs for VOCs Detected in Vadose Zone and Groundwater at JPL**

<b>Constituent</b>	<b>Federal MCL<sup>(a)</sup>, mg/L</b>	<b>California MCL<sup>(b)</sup>, mg/L</b>
Carbon Tetrachloride	0.005	0.0005
1,1- Dichloroethylene	0.007	0.006
Freon 113™	NA	1.2
Trichloroethylene	0.005	0.005

(a) Based on the Safe Drinking Water Act

(b) Based on Title 22 of the California Code of Regulations

NA = Not applicable.

#### F.2.1.1 Federal

One of the significant issues in identifying ARARs for groundwater under the Safe Drinking Water Act (SDWA) is whether the groundwater at the site can be classified as a source of drinking water. EPA groundwater policy is set forth in the preamble to 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 is currently used by a substantial population or groundwater that supports a vital habitat is considered to be Class I. Class II consists of groundwater that is currently being used or that might be used as a source of drinking water in the future. Groundwater that cannot be used for drinking water due to insufficient quality (e.g., high salinity or widespread, naturally occurring contamination) or quantity is considered to be Class III. The EPA guidelines define Class III groundwater as groundwater with total dissolved solids (TDS) concentrations over 10,000 mg/L and a yield of less than 150 gallons per day (EPA, 1986). Class III groundwater can also be classified based on economic or technological treatability tests as well as quality or quantity (both criteria are not needed, just one or the other).

The Regional Water Quality Control Board (RWQCB), Los Angeles Region has designated the aquifer underlying JPL as a drinking water source.

**Safe Drinking Water Act-** Federal MCLs developed by EPA under the SDWA are potential relevant and appropriate requirements for aquifers with Class I and Class II characteristics, and therefore are potential federal ARARs. The point of compliance (POC) for MCLs under the SDWA is at the tap. Therefore, the MCLs are not “applicable” ARARs for NASA sites. However, MCLs 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 remedial actions under CERCLA.

MCLs are considered relevant and appropriate for OU-2 because VOCs in the vadose zone will be remediated to a level expected to protect groundwater quality. MCLs for the chemicals detected in the vadose zone and groundwater at OU-2 are found at 40 CFR § 141.61(a) and (c). Although MCLs are developed using cost and technical considerations, EPA considers them to be protective of human health as well.

#### ***F.2.1.2 State***

The following potential state ARARs have been identified:

- California Safe Drinking Water Act of 1976 (Health and Safety Code §§ 4010.1 and 4026(c)) and State MCLs (Cal. Code Regs. tit. 22, §64444);
- Porter-Cologne Water Quality Control Act as implemented in the Comprehensive Water Quality Plan for the Los Angeles River Basin (Cal. Water Code § 13240);
- SWRCB Resolution (Res.) 92-49 and Res. 68-16; and
- Cal. Code Regs. tit. 23, div. 3, ch. 15, § 2550(a), 2550.4(d), (e), and (f), and 2550.5; and tit. 22 § 66264.94.

**California Safe Drinking Water Act and State MCLs-** California has established standards for sources of public drinking water, under the California Safe Drinking Water Act of 1976 (Health and Safety Code [H&SC] §§ 4010.1 and 4026[c]) and state MCLs for organic chemicals are set forth in Cal. Code Regs. tit. 22 § 64444. Some state MCLs are more stringent than the

corresponding federal MCLs. In these instances, the more stringent state MCLs are applicable to the remedial action at JPL (See Table F-1). There are also some chemicals that lack federal MCLs. Where state MCLs exist, they are also applicable to these chemicals. NASA has determined that the substantive provisions of the standards in Cal. Code Regs. tit. 22, §64444 are relevant and appropriate because VOCs in the vadose zone will be remediated to a level expected to protect groundwater quality.

**Porter-Cologne Water Quality Control Act-** The Porter-Cologne Water Quality Control Act (Porter-Cologne Act) became Division 7 of the California Water Code in 1969. The Porter-Cologne Act requires each regional board to formulate and adopt Basin Plans for all areas within the region (Cal. Water Code § 13240). It also requires each regional board to establish water quality objectives (WQOs) that will protect the beneficial uses of the water basin (Cal. 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 (Cal. Water Code § 13263[a]).

Other sections of the Porter-Cologne Act include Cal. Water Code § 13243, which allows regional boards to specify conditions or areas where waste discharge is not permitted. Cal. Water Code § 13269 provides the boards authority for waivers for reports or compliance with requirements as long as it is not against the public interest. Cal. Water Code § 13360 specifies circumstances for regional boards to order compliance in a specific manner.

NASA accepts the substantive provisions of Cal. Water Code §§ 13241, 13243, 13263(a), 13269, and 13360 of the Porter-Cologne Act as enabling legislation as implemented through the beneficial uses, WQOs, waste discharge requirements, promulgated policies of the water quality control plan (WQCP) for the Los Angeles Region, SWRCB Res. 68-16 and Res. 88-63, and state primary MCLs as potential state ARARs. Where waste discharge requirements are specified in general permits, the substantive requirements in the permits, but not the permits themselves, are potential ARARs.

Cal. Water Code § 13304 sets forth enforcement authority and an enforcement process (orders issued by the state) and is procedural in nature. It does not constitute an ARAR because it does not itself establish or contain substantive environmental “standards, requirements, criteria, or limitations” (CERCLA § 121 [42 USC § 9621]) and is not in itself 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, Cal. Water Code § 13304 is no more stringent than the substantive requirements of other potential state ARARs identified above or potential federal ARARs for groundwater.

**Comprehensive Water Quality Control Plan for Los Angeles River Basin (Water Code 13240)-** The RWQCB, Los Angeles Region Basin Plan identifies beneficial uses of surface and groundwater in the Los Angeles River Basin watershed and water quality objectives necessary to protect these beneficial uses. Waters designated a Municipal and Domestic Supply have California MCLs as water quality objectives. Since the Basin Plan identifies Municipal and Domestic Supply as a potential beneficial use of the Arroyo Creek and the Monk Hill Subbasin, California MCLs are applicable to remedial actions involving potential impact to the Monk Hill

Subbasin. Therefore, the remedy selected for OU-2 at JPL will consider the soil to groundwater migration pathway to protect of beneficial uses of the groundwater.

**State Water Resources Control Board Res. 92-49 and 68-16-** State Water Resources Control Board Res. 92-49 (as Amended on 21 April 1994 and 02 October 1996) is titled Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Cal. Water Code § 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 Cal. Water Code § 13304.

SWRCB Res. 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 ensure 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 (SWRCB, 1968).

Cleanup to below background water quality conditions is not required by the SWRCB under the Porter-Cologne Act. SWRCB Res. 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 Regional Water Quality Control 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.”

NASA 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 Res. 92-49) require cleanup to background 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, NASA 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.

NASA has also determined that SWRCB Res. 68-16 is not a chemical-specific ARAR for determining remedial action goals. However, SWRCB Res. 68-16 is an action-specific ARAR for regulating discharged treated groundwater back into the aquifer. NASA has determined that

further migration of already impacted groundwater is not a discharge governed by the language in Res. 68-16. More specifically, the language of SWRCB Res. 68-16 indicates that it is prospective in intent, applying to new discharges in order to maintain existing high-quality waters. It is not intended to apply to restoration of waters that are already degraded.

NASA's position is that SWRCB Res. 68-16 and 92-49 and Cal. Code Regs. tit. 23, § 2550.4 do not constitute chemical-specific ARARs for this remedial 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 § 121(d)(2)(A)(ii) [42 USC § 9621(d)(2)(A)(ii)]).

The substantive technical standard in the equivalent state requirements (i.e., Cal. Code Regs. tit. 23, div. 3, ch. 15 and SWRCB Res. 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 Res. 92-49 and 68-16. Cal. Code Regs. tit. 22, § 66264.94 is not applicable but is relevant and appropriate.

## **F.2.2 Soil ARARs Conclusions**

The key threshold question for soil ARARs is whether or not the wastes located at OU-2 would be classified as hazardous waste. The soil 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 is determined to be hazardous waste, the appropriate requirements will apply.

### ***F.2.2.1 Federal***

**RCRA Hazardous Waste and Groundwater Protection Standards-** The federal RCRA requirements at 40 CFR pt. 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 a 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 § 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 (see Section F.1.3.1).

The requirements at Cal. Code Regs. tit. 22, § 66264.94(a)(1), (a)(3), (c), (d), and (e) are potential federal ARARs for the vadose zone (i.e., the unsaturated zone contamination). These sections set concentration limits for the unsaturated zone as well as for groundwater and surface water. These requirements are considered to be potential federal ARARs because they are part of the approved state RCRA program. Cal. Code Regs. tit. 22, § 66264.94 is not applicable but is relevant and appropriate.

RCRA land disposal restrictions (LDRs) at Cal. Code Regs. tit. 22, § 66268.1(f) are potential federal ARARs for discharging waste to land. This section prohibits the disposal of hazardous waste to 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. These are potentially applicable federal ARARs because they are part of the state-approved RCRA program. RCRA Treatment Standards for non-RCRA, state-regulated waste are not potentially applicable federal ARARs, but they may be relevant and appropriate state ARARs.

#### ***F.2.2.2 State***

**RCRA Requirements-** State RCRA requirements included within the EPA-authorized RCRA program for California are considered to be 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). The Cal. Code Regs. tit. 22, div. 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 to the definition of non-RCRA, state-regulated hazardous waste. The non-RCRA, state-regulated waste definition requirements at Cal. Code Regs. tit. 22, § 66261.24(a)(2) are potential state ARARs for determining whether other RCRA requirements are potential state ARARs. This section lists the TTLCs and STLCs. The site waste may be compared to these thresholds to determine whether it meets the characteristics for a non-RCRA, state-regulated hazardous waste.

#### **F.2.3 Air ARARs Conclusions**

South Coast Air Quality Management District (SCAQMD) Rules 201, 203, 401, 402, 403, 1303, and 1401 are potential ARARs for the remedial action outlined in this ROD. More specific information on these requirements is provided in the discussion of action-specific ARARs.

### F.3: Location-Specific ARARs

Potential location-specific ARARs are identified and discussed in this section. The discussions are presented based on various attributes of the site location, such as whether it is within a floodplain. Additional surveys will be performed in connection with the remedial action design and implementation to confirm location-specific ARARs where inadequate siting information currently exists, or in the event of changes to planned facility locations.

Cultural resources, wetlands protection, floodplain management, hydrologic resources, biological resources, other natural resources, and geologic characteristics are the resource categories relating to location-specific requirements potentially affected by the OU-2 remedial actions. A discussion of these resource categories can be found in the National Environmental Policy Act (NEPA) Values Assessment included in Appendix E of this ROD.

The following subsections provide a discussion of federal and state ARARs by location-specific resources. Pertinent and substantive provisions of the potential ARARs listed and described below were reviewed to determine whether they are potential federal or state ARARs for the OU-2 ROD.

Federal and state requirements that are determined to be ARARs or TBCs are identified in Table F-B at the end of this appendix. ARARs determinations are presented in the column denoted by the heading ARAR Determination. Determinations of status for location-specific ARARs were generally based on the results of the OU-2 Feasibility Study (FWEC, 1999a).

#### F.3.1 Cultural Resources ARARs

The following are potentially applicable ARARs related to cultural resources:

- National Historic Preservation Act of 1966, as amended (16 USC §§ 470–470x-6, 36 CFR pt. 800, 40 CFR § 6.301[b]);
- Archaeological and Historic Preservation Act (16 USC § 469–469c-1, 40 CFR § 6.301[c]).

**National Historic Preservation Act of 1966, As Amended-** Pursuant to Sections 106 and 110(f) of the National Historic Preservation Act (NHPA) (16 USC §§ 470–470x-6, and its implementing regulations [36 CFR pt. 800]), as amended, CERCLA remedial actions are required to take into account the effects of remedial activities on any historic properties included on or eligible for inclusion on the National Register of Historic Places (National Register). The National Register is a list of districts, sites, buildings, structures, and objects that are significant in American history, architecture, archaeology, engineering, and culture. Section 110(f) of the NHPA of 1966, as amended, requires that before approval of any federal undertaking that may directly and adversely affect any National Historic Landmark, the head of the responsible federal agency will, to the maximum extent possible, undertake such planning and actions as may be

necessary to minimize harm to the landmark, and will afford the Advisory Council a reasonable opportunity to comment on the undertaking.

Areas identified for soil remediation system component installation are located on previously disturbed and developed areas of the JPL campus. However, a historic, archaeological, architectural, and cultural resource review of surrounding and on-site property will be conducted prior to implementation of remedial actions involving structure demolition, construction, or intrusive groundwork.

**Archaeological and Historic Preservation Act-** The Archaeological and Historic Preservation Act, 16 USC § 469–469c-1, provides for the preservation of historical and archaeological data that might otherwise be lost as a result of dam construction or alterations of the terrain. If activities in connection with any federal construction project or federally approved project may cause irreparable loss to significant scientific, prehistoric, or archaeological data, the act requires the agency undertaking that project to preserve the data or request the Department of the Interior (DOI) to do so. This act differs from the NHPA in that it encompasses a broader range of resources than those listed on the National Register and mandates only the preservation of the data (including analysis and publication).

Areas identified for soil remediation system component installation are located on previously disturbed and developed areas of the JPL campus. However, a historic, archaeological, architectural, and cultural resource review of surrounding and on-site property will be conducted prior to implementation of remedial actions involving structure demolition, construction, or intrusive groundwork.

### **F.3.2 Wetlands Protection and Floodplains Management ARARs**

This section includes an evaluation of the following potential ARARs relating to wetland or floodplains management:

- Executive Order (Exec. Order No.) 11990, Protection of Wetlands (40 CFR § 6.302[a]);
- Exec. Order No. 11988, Floodplain Management (40 CFR § 6.302[b]); and
- Clean Water Act, §404, 33 USC § 1344.

**Protection of Wetlands, Exec. Order No. 11990-** Exec. 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. The Arroyo Seco has not been formally identified as a wetland and it is unlikely any remediation activities for soil will be conducted in or around Arroyo Seco.

**Floodplain Management, Exec. Order No. 11988-** Under 40 CFR § 6.302(b), federal agencies are required to evaluate the potential effects of action they may take in a floodplain to avoid, to the extent possible, adverse effects associated with direct and indirect development of a floodplain. Areas identified for soil remediation system component installation are located on

previously disturbed and developed areas of the JPL campus and outside of the 100-year floodplain of Arroyo Creek.

**Clean Water Act (33 USC § 1344)**- Section 404 of the Clean Water Act of 1977 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 have jurisdiction over wetlands. EPA's Section 404 guidelines are promulgated in 40 CFR § 230, and the U.S. Army Corps of Engineer's guidelines are promulgated in 33 CFR § 320.

Areas identified for soil remediation system component installation are located on previously disturbed and developed areas of the JPL campus and outside the area of any potential wetlands. Therefore, discharge of dredged or fill material to a wetland is not planned as part of the remedial action.

### **F.3.3 Biological Resources ARARs**

The following is an evaluation of potential ARARs related to biological resources at the site:

- Endangered Species Act of 1973 (substantive provisions of 16 USC §§ 1531–1543)
- California Fish and Game Code.

**Endangered Species Act of 1973**- The Endangered Species Act (ESA) of 1973 (16 USC §§ 1531–1543) 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. Consultation regulations at 50 CFR § 402 are administrative in nature and are therefore not ARARs. However, they may be TBCs to comply with the substantive provisions of the ESA.

**California Fish and Game Code**- This code specifies actions which must be taken to protect or conserve wetlands, rare native plants, and endangered species and wildlife habitat.

Areas identified for soil remediation system component installation are located on previously disturbed and developed areas of the JPL campus, which provide minimal wildlife habitat. The ESA and provisions of the California Fish and Game Code are not considered to be ARARs.

## F.4: Action-Specific ARARs

Table F-C at the end of this appendix lists and evaluates federal and state potential action-specific ARARs for OU-2. A discussion of the requirements determined to be pertinent to the selected remedy for OU-2 is presented in this section. A discussion of how the selected remedy complies with each identified ARAR is also provided.

The selected remedy at OU-2 includes the use of SVE to effect VOC source removal from the vadose zone. The extracted soil vapor will be treated to remove VOCs prior to discharge to the atmosphere in order to meet air permit requirements. The SVE system will be located on facility.

### F.4.1 Federal

Federal laws that give rise to potential ARARs for actions to be undertaken as part of the SVE remedy include RCRA and the Clean Air Act (CAA). These requirements are described below:

**RCRA-** Waste streams created in the course of implementing the remedial action will be subject to RCRA requirements for determining whether wastes will be classified as hazardous. Hazardous waste determinations for the soil cuttings generated from the installation of the SVE wells and the spent carbon generated from the off-gas treatment will be made at the time the waste is generated. If these wastes are determined to be hazardous, then the appropriate requirements for storing, manifesting, and transporting these materials for final disposal will be followed.

**Clean Air Act-** Several CAA requirements will apply to the operation of the SVE treatment system including standards set under the National Primary and Secondary Ambient Air Quality Standards (NAAQs) rules and the provisions of the State Implementation Plan (SIP). These CAA requirements are implemented by the California Air Resources Board through the local air quality management district. The designated district issues an air permit, which covers the air pollution control requirements from the federal CAA, the California Health and Safety Code, and local district rules. The local air district for JPL is the SCAQMD. The rules adopted by SCAQMD are discussed below.

### F.4.2 State

California state requirements that are potential ARARs for actions to be undertaken as part the selected remedy are described in the following subsections.

**SCAQMD Rules 201 and 203-** These rules require a permit to construct and operate equipment causing the issuance of air contaminants and are ARARs for the implementation of SVE at OU-2.

**SCAQMD Rule 401, 402, and 403-** Rule 401 limits visible emissions from a point source. Rule 402 prohibits the discharge of any air emissions in quantities that may cause injury, detriment, nuisance, or annoyance to the public. Rule 403 limits downwind particulate concentrations.

Rule 402 does not qualify as an ARAR for this remedial action because of its vague and subjective nature of the nuisance rule (Rule 402) and the lack of objective “standards, requirements, criteria or limitations” within the meaning of Section 121(d)(2) of CERCLA. Other federal and state ARARs addressing actual and potential air emissions will ensure adequate protection of human health and the environment.

**SCAQMD Rule 1303-** This rule requires that all new sources of air pollution that result in a net increase of any nonattainment air contaminant or any halogenated hydrocarbons employ the best available control technology (BACT). Current SCAQMD policy (SCAQMD, 1988) sets the threshold of net emissions increase at one pound per day of any nonattainment air contaminant (including reactive organic gases such as trichloroethene [TCE]) for any permitted unit when BACT is required.

**SCAQMD Rule 1401-** Rule 1401 involves new source review of carcinogenic air contaminants. It requires that an applicant substantiate that the cumulative impacts of emissions from new, relocated, or modified permit units and from all other permit units located within 100 meters that are owned or operated by the applicant will not result in any of the following:

- (a) A maximum individual cancer risk (MICR) of greater than 1 in 1 million ( $1 \times 10^{-6}$ ) at any receptor location, if the permit unit is constructed without toxics best-available control technology (T-BACT);
- (b) A MICR of greater than 10 in 1 million ( $1 \times 10^{-5}$ ) at any receptor location, if the permit unit is constructed with T-BACT; and
- (c) More than 0.5 excess cancer cases in the population that is subject to a risk of greater than 1 in 1 million ( $1 \times 10^{-6}$ ).

Furthermore, the MICR may not exceed 1/70 of the maximum allowable risk specified in item a) or b) above, in any one year at receptor locations within residential areas.

Rule 1401 specifies the risk assessment and emission calculation procedures to be used in determining compliance with the requirements. Currently, SCAQMD has no guidelines for what constitutes T-BACT; instead, the T-BACT determination will be made by the air quality engineer at SCAQMD who is reviewing the permit application.

## **F.5: Summary**

The ARARs for OU-2 have been identified and are summarized in the following tables:

- Table F-A. Chemical-Specific ARARs
- Table F-B. Location-Specific ARARs
- Table F-C. Action-Specific ARARs

**Table F-A. Potential Chemical-Specific ARARs Jet Propulsion Laboratory**

Requirement	Prerequisites	Citation	ARAR Determination	Comments
<i>EPA</i>				
Maximum contaminant levels for drinking water.	Remediation	Safe Drinking Water Act (40 CFR, Part 141)	Relevant and Appropriate	Soil will be remediated to a level expected to protect groundwater quality.
Preliminary Remediation Goals (PRGs) provide a risk-based criteria for evaluating soil contamination and cleanup actions.	Remediation	EPA Region IX Guidance	To be considered (TBC)	Soil will be remediated to a level expected to protect groundwater quality.
Soil Screening Levels (SSLs) used to provide a risk-based criteria for screening soil contamination.	Soil Remediation	EPA Soil Screening Guidance	To be considered (TBC)	Soil will be remediated to a level expected to protect groundwater quality.
<i>California Department of Health Services</i>				
Maximum contaminant levels for drinking water.	Remediation	California Safe Drinking Water Act (California Health and Safety Code, Division 5, Part 1, Chapter 7)	Relevant and Appropriate	Soil will be remediated to a level expected to protect groundwater quality.
<i>State and Regional Water Quality Control Board (RWQCB) *</i>				
Standards for corrective action of waste management units	Remediation	Title 22, CCR, Section 66264.94	Relevant and Appropriate	Soil will be remediated to a level expected to protect groundwater quality.
Incorporated into all Regional Board Basin Plans. Requires that quality of water of the state that is better than needed to protect all beneficial uses be maintained unless certain findings are made. Discharges to high quality water must be treated using best practicable treatment or control necessary to prevent pollution or nuisance and to maintain the highest quality water. Requires cleanup to background water quality or to lowest concentrations technically and economically feasible to achieve. Beneficial uses must, at least, be protected.	Waters of the state	SWRCB Resolution No. 68-16 (Policy with Respect to Maintaining High Quality of Waters in California) (Water Code Section 13140, Clean Water Act 40 CFR, Part 131.12)	Not an ARAR	Soil will be remediated to a level expected to protect groundwater quality.
Establishes policies and procedures for the oversight of investigations and cleanup and abatement activities resulting from discharges of waste that affect or threaten water quality. It authorizes the Regional Water Boards to require cleanup of all waste discharged and restoration of affected water to background conditions. Requires actions for cleanup and abatement to conform to Resolution 68-16 and applicable provisions of Title 23 CCR, Division 3, Chapter 15 as feasible.	Remediation affecting water.	SWRCB Resolution 92-49 (Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304) (Water Code Section 13307)	Not an ARAR	Soil will be remediated to a level expected to protect groundwater quality.

**Table F-A. Potential Chemical-Specific ARARs Jet Propulsion Laboratory (Continued)**

Requirement	Prerequisites	Citation	ARAR Determination	Comments
Describes the water basins in Los Angeles River Basin region, establishes beneficial uses of ground and surface waters, establishes water quality objectives, including narrative and numerical standards, establishes implementation plans to meet water quality objectives and protect beneficial uses, and incorporates statewide water quality control plans and policies.	Remediation affecting water.	Water Quality Control Plan for the Los Angeles River Basin (Water Code 13240)	Potentially applicable	Soil will be remediated to a level expected to protect groundwater quality.
Approach for investigation and cleanup of soil in the Los Angeles River Basin.	Remediation	RWQCB Interim Site Assessment and Cleanup Guidebook	To be considered (TBC)	Soil will be remediated to a level expected to protect groundwater quality.

\* 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 NASA 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.

- ARAR = Applicable or relevant and appropriate requirements.
- CCC = California Coastal Commission.
- CCR = California Code of Regulations.
- CFR = Code of Federal Regulations.
- RWQCB = California Regional Water Quality Control Board.
- SSL = Soil Screening Level
- USC = United States Code.

**Table F-B. Potential Location -Specific ARARs Jet Propulsion Laboratory**

Location	Requirement	Prerequisites	Citation	ARAR Determination	Comments
Federal Facility	Facility must comply with federal, state, and local requirements concerning waste management.	Waste management	<i>Federal Facilities Compliance Act *</i> 42 USC, Section 6901	Applicable	The facility will comply with federal, state, and local requirements concerning waste management.
Within floodplain	Actions taken should avoid adverse effects, minimize potential harm, and restore and preserve natural and beneficial resources.	Action that will occur in a floodplain (i.e., lowlands) and relatively flat areas adjoining inland and coastal waters and other flood-prone areas.	<i>Executive Order 11988, Protection of Floodplains *</i> 40 CFR 6, Appendix A (excluding Sections 6 [a][2], [4], and [6]); 40 CFR, Part 6.302	Potentially Applicable	Areas identified for soil remediation system component installation are located on previously disturbed and developed areas of the JPL campus and outside of the 100-year floodplain of Arroyo Creek.
Within area where action may cause irreparable harm, loss, or destruction of significant artifacts	Construction on previously undisturbed land would require an archaeological survey of the area.	Alteration of terrain that threatens significant scientific, prehistoric, historic, or archaeological data	<i>Archaeological Resources Protection Act, 16 USC Section 469 at seq *</i> 36 CFR, Part 65	Potentially Applicable	Areas identified for soil remediation system component installation are located on previously disturbed and developed areas of the JPL campus. However, a historic, archaeological, architectural, and cultural resource review of surrounding and on-site property will be conducted prior to implementation of remedial actions involving structure demolition, construction, or intrusive groundwork.
Historic project owned or controlled by federal agency	Action to preserve historic properties; planning of action to minimize harm to national historic landmarks	Property included in or eligible for the National Register of Historic Places	<i>National Historic Preservation Act, 16 USC Section 470 *</i> 36 CFR, Part 800	Potentially Applicable	Areas identified for soil remediation system component installation are located on previously disturbed and developed areas of the JPL campus, but no buildings or structures are likely to be impacted by system installation or operation. However, a historic, archaeological, architectural, and cultural resource review of surrounding and on-site property will be conducted prior to implementation of remedial actions involving structure demolition, construction, or intrusive groundwork.
Within area where Native American human remains, funerary objects, sacred objects, or objects of cultural patrimony are found	Provides requirements for the identification and appropriate disposition of human remains, funerary objects, sacred objects, or objects of cultural patrimony.	Determination of effect upon endangered or threatened species or their habitat	<i>Native American Graves Protection and Repatriation Act of 1990</i> 43 CFR, Part 10	Not an ARAR	Areas identified for soil remediation system component installation are located on previously disturbed and developed areas of the JPL campus. Therefore, human remains, funerary objects, sacred objects, or objects of cultural patrimony are not expected. If found, however, the substantive provisions of this law will be followed.
Critical habitat upon which endangered species or threatened species depend	Action to conserve endangered species or threatened species, including consultation with the Department of the Interior.	Determination of effect upon endangered or threatened species or their habitat	<i>Endangered Species Act of 1973 *</i> 16 USC 1536(a)	Not an ARAR	Areas identified for soil remediation system component installation are located on previously disturbed and developed areas of the JPL campus.

**Table F-B. Potential Location -Specific ARARs Jet Propulsion Laboratory (Continued)**

Location	Requirement	Prerequisites	Citation	ARAR Developments	Comments
<i>Executive Order 11990, Protection of Wetlands*</i>					
Wetland	Action to minimize the destruction, loss, or degradation of wetlands	Wetland as defined by Executive Order 11990, Section 7	40 CFR, Part 6	Not an ARAR	Areas identified for soil remediation system component installation are located on previously disturbed and developed areas of the JPL campus and outside the area of any potential wetlands.
<i>Clean Water Act, Section 404*</i>					
Wetland	Action to prohibit discharge of dredged or fill material into wetland without permit. Mitigation may be required to avoid net loss of wetlands.	Wetland as defined by Executive Order 11990, Section 7	40 CFR, Part 230.10	Not an ARAR	Areas identified for soil remediation system component installation are located on previously disturbed and developed areas of the JPL campus and outside the area of any potential wetlands.
<i>Fish and Game Code*</i>					
Wildlife Species/Habitats	Action must be taken for the general protection and conservation of fish and wildlife resources.		Fish & Game Code Section 1600	Not an ARAR	Areas identified for soil remediation system component installation are located on previously disturbed and developed areas of the JPL campus.
Wetlands	Actions must be taken to ensure that there is "no net loss" of wetlands acreage or habitat value. Action must be taken to reserve, protect, restore, and enhance California's wetland acreage and habitat values.		Fish and Game Commission Wetlands Policy (adopted 1987) included in Fish and Game Code Addenda	Not an ARAR	Areas identified for soil remediation system component installation are located on previously disturbed and developed areas of the JPL campus.
Rare native plants	Action must be taken to conserve native plants; there can be no releases and /or actions that would have a deleterious effect on species or habitat.		Fish & Game Code Sections 2080	Not an ARAR	Areas identified for soil remediation system component installation are located on previously disturbed and developed areas of the JPL campus.
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 1 January 1985 or a candidate species with proper notification	Fish and Game Code Section 2080	Not an ARAR	Areas identified for soil remediation system component installation are located on previously disturbed and developed areas of the JPL Campus.
Endangered Species Habitat	Department policy and legislative findings and definitions for significant natural areas		Fish and Game Code Sections 2050-2068	Not an ARAR	Areas identified for soil remediation system component installation are located on previously disturbed and developed areas of the JPL campus.
Endangered Species Habitat	Procedures for listing endangered species		Fish and Game Code Section 2070	Not an ARAR	Areas identified for soil remediation system component installation are located on previously disturbed and developed areas of the JPL campus.

**Table F-B. Potential Location -Specific ARARs Jet Propulsion Laboratory (Continued)**

Location	Requirement	Prerequisites	Citation	ARAR Developments	Comments
Endangered Species Habitat	Ensures that action taken will not jeopardize the survival and reproduction of any threatened or endangered species		Fish and Game Code Sections 2090-2096	Not an ARAR	Areas identified for soil remediation system component installation are located on previously disturbed and developed areas of the JPL campus.

\* 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 NASA 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.

ARAR = Applicable or relevant and appropriate requirements.

CCC = California Coastal Commission.

CCR = California Code of Regulations.

CFR = Code of Federal Regulations.

RWQCB = California Regional Water Quality Control Board.

USC = United States Code.

**Table F-C. Potential Action-Specific ARARs Jet Propulsion Laboratory**

Action	Requirement	Prerequisites	Citation	ARAR Developments	Comments
<i>Clean Air Act (CAA) 40 USC 7401 et seq.</i>					
Discharge to air	Provisions of State Implementation Plan (SIP) approved by EPA under section 110 of CAA.	Major sources of air pollutants	40 USC, Section 7410; portions of 40 CFR, Part 52.220, applicable to South Coast Quality Management District	Applicable	Appropriate protocols will be followed.
	National Primary and Secondary Ambient Air Quality Standards (NAAQS)- standards for ambient air quality to protect public health and welfare.	Contamination of air affecting public health and welfare	40 CFR, Parts 50.4-50.12	Applicable	Appropriate protocols will be followed.
<b>South Coast Air Quality Management District (SCAQMD)</b>					
Discharge of air emissions	Requires a permit to construct for equipment causing the issuance of air contaminants.	Sources of air pollutants	SCAQMD Regulation II, Rule 201	Applicable	Equipment used for the removal action will meet the appropriate permit requirements.
	Requires a permit to operate for equipments causing the issuance of air contaminants.	Sources of air pollutants	SCAQMD Regulation II, Rule 203	Applicable	Equipment used for the removal action will meet the appropriate permit requirements.
	Requires that all new sources of air pollution in the district use Best Available Control Technology (BACT) and meet appropriate offset requirements.	Sources of air pollutants	SCAQMD Regulation XIII, Rule 1303	Applicable	Equipment used for the removal action will meet the appropriate permit requirements.
	Requires BACT for toxics (T-BACT) be employed for new stationary operating equipment, so that the cumulative carcinogenic impact from air toxics does not exceed the maximum individual cancer risk limit of 10 in 1 million.	Sources of air pollutants	SCAQMD Regulation XIII, Rule 1401	Applicable	Equipment used for the removal action will meet the appropriate permit requirements.
	Limits visible emissions from any point source.	Visible emission to atmosphere.	SCAQMD Regulation IV, Rule 401	Applicable	Air emissions will be controlled.
	Prohibits the discharge of any air emissions in quantities that may cause injury, detriment, nuisance, or annoyance to the public.		SCAQMD Regulation IV, Rule 402	Not an ARAR	Air emissions will be controlled.
Discharge of fugitive dust	Limits onsite activities so that the concentrations of fugitive dust at the property line shall not be visible and the downwind particulate concentration shall not be more than 100 micrograms per cubic meter, averaged over 5 hours, above the upwind particulate concentration. This rule also requires every reasonable precaution to minimize fugitive dust and the prevention and cleanup of any material accidentally deposited on paved streets.	Sources of fugitive dust	SCAQMD Regulation IV, Rule 403	Applicable	Dust generated during removal actions will be controlled

**Table F-C. Potential Action-Specific ARARs Jet Propulsion Laboratory (Continued)**

Action	Requirement	Prerequisites	Citation	ARAR Developments	Comments
<i>Resource Conservation and Recovery Act</i>					
Hazardous waste generation, management, and disposal	Sets requirements for generations of hazardous waste concerning management, treatment, storage, and disposal. Authorizes California to enforce their own hazardous waste program under the California Hazardous Waste Act.	Generation of hazardous waste	40 CFR, Part 260-280 and 22 CCR, Sections 66260 - 66280.	Applicable	Implementation of the proposed remedy is not anticipated to generate significant amounts of hazardous waste. A determination of whether or not the waste is hazardous will be made at the time of generation.
<i>Regional Water Quality Control Board</i>					
Soil Remediation	Presents performance standards for vapor extraction systems.	Vapor extraction and treatment	RWQCB Interim Site Assessment and Cleanup Guidebook	To be considered (TBC)	Appropriate protocols will be followed.
Soil Gas Sampling	Presents procedures and techniques for soil gas investigation survey design, sample collection, analysis, and reporting.	Soil gas investigation	RWQCB Interim Guidance for Active Soil Gas Investigations	To be Considered (TBC)	Appropriate protocols will be followed.

\* 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 NASA 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.

ARAR = Applicable or relevant and appropriate requirements.  
 CCC = California Coastal Commission.  
 CCR = California Code of Regulations.  
 CFR = Code of Federal Regulations.  
 RWQCB = California Regional Water Quality Control Board.  
 USC = United States Code.  
 RCRA = Resource Conservation and Recovery Act.  
 EPA = U.S. Environmental Protection Agency.  
 NAAQS = National Ambient Air Quality Standards (primary and secondary)

SCAQMD = South Coast Air Quality Management District  
 SWRCB = California State Water Resources Control Board.  
 SDWA = Safe Drinking Water Act.  
 IP = State Implementation Plan.  
 TBC = To be considered.  
 NESHAPS = National emission standards for hazardous air pollutants.

## F.6: REFERENCES

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