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Revision 0

Removal Action Work Plan for 11 Waste Sites in the 200-MG-1 Operable Unit

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

U.S. DEPARTMENT OF ENERGY
Richland Operations Office

P.O. Box 550
Richland, Washington 99352

Approved for Public Release;
Further Dissemination Unlimited

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Approval Page

Title: *Removal Action Work Plan for 11 Waste Sites in the 200-MG-1 Operable Unit*

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Terms

ALARA	as low as reasonably achievable
ARAR	applicable or relevant and appropriate requirement
bgs	below ground surface
CERCLA	*Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
CFR	*Code of Federal Regulations*
COPC	contaminant of potential concern
CS/NFA	confirmatory sampling/no further action
DOE	U.S. Department of Energy
DOE-RL	U.S. Department of Energy, Richland Operations Office
EE/CA	engineering evaluation/cost analysis
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
ERDF	Environmental Restoration Disposal Facility
ETF	200 Area Effluent Treatment Facility
LDR	land-disposal restriction
NPL	40 CFR 300, Appendix B, "National Priorities List"
NRDWL	nonradioactive dangerous waste landfill
OU	operable unit
RAL	removal action level
RAWP	removal action work plan
RTD	removal, treatment, and disposal
RWP	radiological work permit
SSHASP	site-specific health and safety plan
Tri-Party Agreement	Ecology et al., 1989a, *Hanford Federal Facility Agreement and Consent Order*
UPR	unplanned release
WAC	*Washington Administrative Code*

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1 Introduction

This removal action work plan (RAWP) contains the pertinent information to support implementation of DOE/RL-2009-48, *Action Memorandum for Non-Time-Critical Removal Action for 11 Waste Sites in 200-MG-1 Operable Unit*, which implements the selected alternatives from DOE/RL-2008-44, *Engineering Evaluation/Cost Analysis for the 200-MG-1 Operable Unit Waste Sites* with public comments addressed.

As part of this removal action, the U.S. Department of Energy (DOE) has designated an on-scene coordinator pursuant to the requirements of 40 CFR 300.120, "On-Scene Coordinators and Remedial Project Managers: General Responsibilities," to ensure compliance with 40 CFR 300, "National Oil and Hazardous Substances Pollution Contingency Plan" and Ecology et al., 1989a, *Hanford Federal Facility Agreement and Consent Order* (Tri-Party Agreement).

The removal actions for the 200-MG-1 Operable Unit (OU) will minimize the release or threat of release of hazardous substances that pose a risk to human health and the environment. Completion of the removal actions will protect personnel and provide an end state consistent with commitments of the Tri-Party Agreement.

1.1 Background

The Hanford Site encompasses approximately 1,517 km^2 (586 mi^2) in the Columbia River Basin of south-central Washington State. In 1989, the U.S. Environmental Protection Agency (EPA) placed the 100, 200, 300, and 1100 Areas of the Hanford Site on the "National Priorities List" (NPL) (40 CFR 300, Appendix B, "National Priorities List"). The 200 Area NPL site contains the 200 East and 200 West Areas (including waste management facilities and inactive irradiated fuel-reprocessing facilities) and the 200 North Area (formerly used for interim storage and staging of irradiated fuel). The 200 Area NPL also includes the 200-MG-1 OU and its assigned waste sites.

The 200-MG-1 OU consists of 194 waste sites in the 200 and 600 Areas. The waste sites include French drains, trenches, cribs, ditches, and retention basins with shallow contamination (generally less than 4.6 m [15 ft] deep). This OU also includes waste sites where chemical and radioactive contaminants were released during material transfers (i.e., unplanned release [UPR] sites). Some sites were produced by airborne dissemination of radioactive particles, or dispersal through plant or animal fecal matter. The 11 waste sites are located outside of the Industrial-Exclusive Zone as defined in DOE/EIS-0222-SA-01, *Supplement Analysis Hanford Comprehensive Land-Use Plan Environmental Impact Statement*, and are addressed in DOE/RL-2009-48. Table 1-1 lists the 11 waste sites and Figure 1-1 shows the locations of the waste sites and their preferred removal action.

Table 1-1. 200-MG-1 Operable Unit – 11 Waste Sites Considered for Removal Actions

Waste Site Code	Waste Site Type	Waste Site Code	Waste Site Type	Waste Site Code	Waste Site Type
200-E-101	Experiment/Test Site	600-40	Dumping Area	600-275	Foundations
200-E-110	Dumping Area	600-51	Dumping Area	Old Central Shop Area (OCSA)	Foundations
600-36	Burn Pit	600-218	Dumping Area	UPR-600-21	Unplanned Release
600-38	Dumping Area	600-262	Crib	–	–

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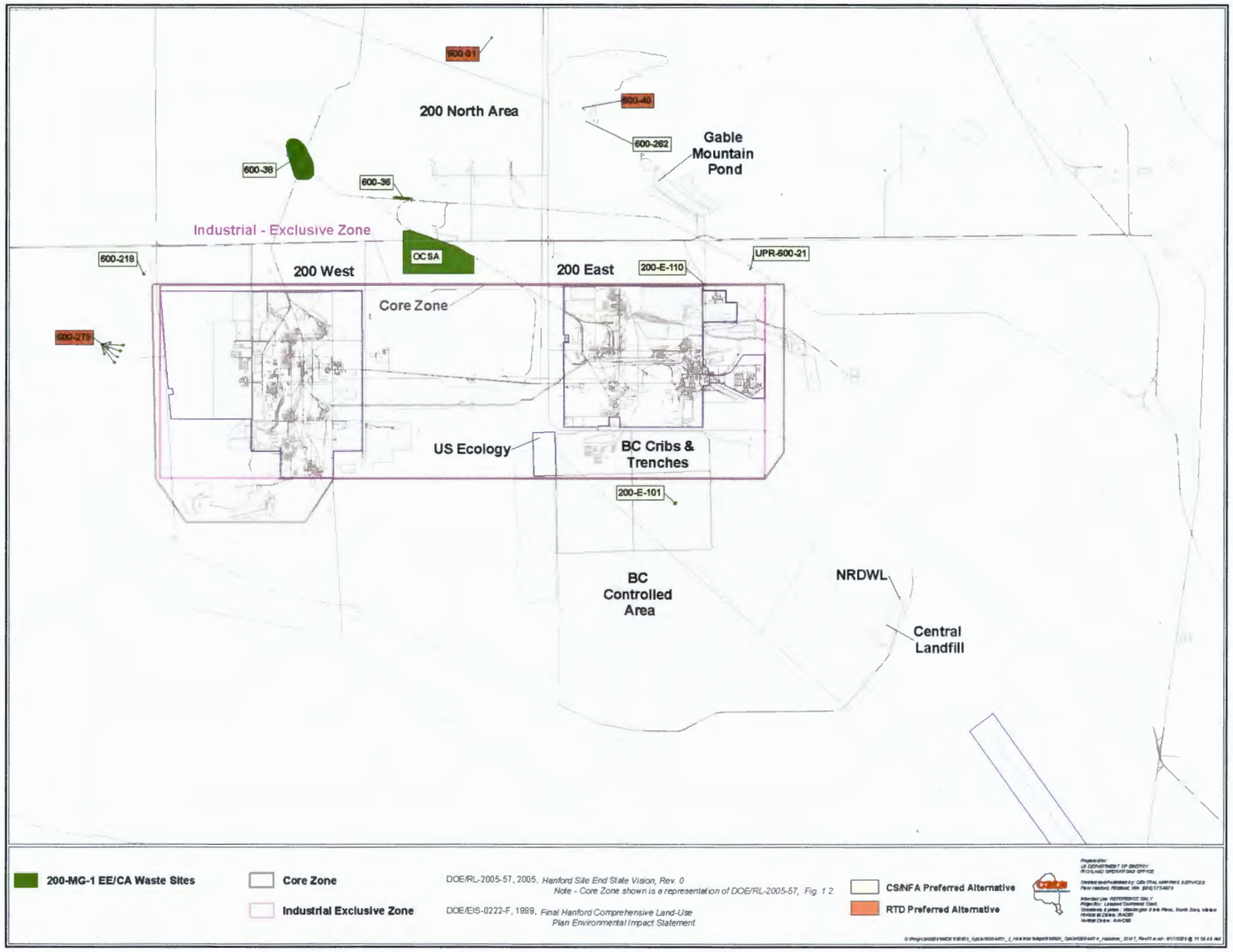

Figure 1-1. 200-MG-1 OU Waste Sites and Preferred Alternatives – 11 Waste Sites

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The confirmatory sampling/no further action (CS/NFA) or removal, treatment, and disposal (RTD) alternatives were recommended based on their overall ability to protect human health and the environment and their effectiveness in maintaining protection for both the short and the long term, as well as providing an end state consistent with future cleanup actions and commitments of the Tri-Party Agreement. These alternatives also would reduce the potential for further releases to the environment by reducing the inventory of contaminants to below the removal action levels (RALs).

1.2 Purpose

This RAWP establishes the required methods and activities in support of soil evaluation and removal of above RALs for the 200-MG-1 OU waste sites. The intent of this RAWP is to identify the basis and to provide criteria for the preparation of work packages and subcontract task orders for the project tasks. Using the most recent information concerning the conditions for each waste site, field-level work packages will be developed to direct work activities and instruct workers in the applicable work methods.

The removal action supports minimization of potential releases of hazardous substances from the 11 waste sites that could adversely impact human health and the environment, is protective of site personnel and the environment, and contributes to the efficient performance of any future removal and/or remedial actions.

1.3 Scope

The scope for the removal action for each of the 200-MG-1 OU waste sites is either CS/NFA or RTD. Use of these actions as appropriate for each waste site provides overall protection of human health and the environment, complies with applicable or relevant and appropriate requirements (ARARs), and is cost-effective.

If sampling shows the site below the RALs, no further action is required. If sampling (past or present) shows constituents at the site to be above RALs, RTD action will be implemented. Changes to selected alternatives (based on sampling results), will be documented in the removal action completion report.

1.4 Objectives

The removal alternatives for the 200-MG-1 OU waste sites were evaluated for the disposition of contaminated soil and other materials against their performance to mitigate potential threats to human and ecological receptors. The selected removal action alternatives must meet the following removal action objectives.

- Removal Action Objective 1: Prevent unacceptable risk to human health and ecological receptors from exposure to soils and/or debris contaminated with nonradiological constituents to 4.6 m (15 ft) below ground surface (bgs) at concentrations above the appropriate RALs.
- Removal Action Objective 2: Prevent unacceptable risk to human health and ecological receptors from exposure to soils and/or debris contaminated with radiological constituents to 4.6 m (15 ft) bgs at concentrations above the appropriate RALs.
- Removal Action Objective 3: Control the sources of groundwater contamination to minimize impacts to groundwater resources, protect the Columbia River from adverse impacts, and reduce the degree of groundwater cleanup that may be required under future actions.
- Removal Action Objective 4: Prevent adverse impacts to cultural resources and threatened or endangered species, and minimize wildlife habitat disruption.

The RALs, for the waste sites identified in DOE/RL-2009-48, are based on the removal action objectives noted above. To meet the DOE priority in expediting this removal action and to get into the field quickly, existing cleanup levels from the River Corridor will be used for 11 waste sites (Appendix A). Protection of the Columbia River will be through the groundwater pathway only. These RALs are based on attainment of acceptable levels of human health, ecological risk, and protection of groundwater, but not lower than background levels or detection limits for waste sites. Attainment of RALs is intended to meet the first three removal action objectives and is expected to satisfy the remedial action objectives established in the final record of decision. More specifically, Removal Action Objective 3 will be achieved by preventing migration and/or leaching of radiological/nonradiological contamination to groundwater by reducing the soil concentration of contaminants to at or below RALs.

Ecological screening values, based on WAC 173-340-900, "Tables," Table 749-3, are included in Appendix A and are for screening purposes only. Ecological screening values are not considered cleanup levels for this removal action. If cleanup verification sampling values exceed the ecological screening values provided, additional analysis will be conducted in the remedial investigation/feasibility study and ecological risk assessment for the Central Plateau in order to make final cleanup decisions.

The removal action closeout documentation will contain information on whether the RALs were attained for each waste site. This information will be used in support of the final record of decision to determine if any additional remediation is needed.

1.5 Facility and Hazard Description

The 200-MG-1 OU contains several different types of waste sites as noted in Appendix B. The majority of the waste sites are small. Generally, the very small area waste sites are associated with an engineered structure (e.g., burn pit, crib, storage yard) or a UPR of very limited extent. The engineered structures that have been in direct contact with process waste streams (i.e., cribs, foundations) also may be contaminated, and include materials such as concrete and infiltration gravels.

Larger area sites include dumping areas, experiment/test site, or wind-disseminated UPRs. Dumping areas include many different types of waste materials, such as scrap materials, construction debris (concrete, wood, and metal), used containers, and other miscellaneous items. The contamination at these sites generally is limited to the soil in immediate contact with the waste materials, with little or no migration into the underlying soil.

Sites identified as UPRs consist of areas where a release has been disseminated by wind or liquid was released onto the ground. In other cases, radioactive tumbleweeds and tumbleweed fragments or contaminated fecal material from animals was dispersed over a wide surface area. The majority of the UPR areas have been cleaned up by previous soil removal actions, and/or placement of a 0.3 to 0.6 m (1- to 2-ft) thick soil stabilization cover over the site. Soil stabilization covers are used to prevent or minimize the uncontrolled spread of contamination. Appendix B notes those waste sites with a soil stabilization cover. Six of the 11 waste sites have undergone previous actions.

Existing site descriptions indicate that potential release locations and lateral extent are poorly defined or undefined at 200-MG-1 OU waste sites. Windblown contaminated materials such as particulates from surface leaks and spills were assumed to result in spotty contamination. The lateral extent of potential contamination for waste sites that received liquid discharges was determined by considering the portion of the site that was in direct contact with the liquid, yielding contaminated soil volume estimates for the cost analyses.

Table 1-2 shows preliminary contaminants of potential concern (COPCs). Polynuclear aromatic hydrocarbons, aroclors, and metals also have been added to the list of COPCs because of the processes defined in DOE/RL-2008-44 and because they may be present as a result of Hanford Site operations based on current information from other waste sites.

To ensure an effective means for detecting and reporting constituents that may not have been identified in the process, a method-based approach will be used for reporting analytical results. Also, a COPC screening approach will be developed to identify those analytes that are the most likely to contribute to risk from exposure. Process knowledge, where available, will be used to guide sampling and analysis, and may expand the COPCs for a particular waste site. Where no process knowledge exists, samples will be analyzed using analytical methods targeting the preliminary list of COPCs shown in Table 1-2.

Table 1-2. Preliminary COPCs

Metals		
Antimony*	Copper*	Silver
Arsenic*	Lead*	Thallium*
Barium*	Manganese	Uranium*
Beryllium	Mercury*	Vanadium*
Chromium*	Nickel*	Zinc*
Cobalt	Selenium*	
Radionuclides		
Americium-241*	Europium-155*	Uranium-235*
Cesium-137*	Strontium-90*	Uranium-233/234*
Europium-152*	Plutonium-238*	Uranium-238*
Europium-154*	Plutonium-239/240*	
Polynuclear Aromatic Hydrocarbons		
Acenaphthene	Benzo(b)fluoranthene	Fluorene
Acenaphthylene	Benzo(g,h,i)perylene	Naphthalene
Anthracene	Chrysene	Phenanthrene
Benzo(a)anthracene	Dibenz(a,h)anthracene	Pyrene
Benzo(a)pyrene	Fluoranthene	
Polychlorinated Biphenyls		
Aroclor-1016	Aroclor-1242	Aroclor-1260*
Aroclor-1221	Aroclor-1248	
Aroclor-1232	Aroclor-1254*	
Total Petroleum Hydrocarbons		
Total petroleum hydrocarbons (diesel range)*	Total petroleum hydrocarbons (kerosene range)*	

*Constituents identified were determined during the screening process.

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2 Removal Action Elements

The following sections provide a general description of how work activities will be performed at the 200-MG-1 OU waste sites.

2.1 Removal Action Work Activities

Soil and plant debris with contaminant concentrations above the RALs will be removed using conventional techniques. Initial screening and sampling data will be used to develop a profile for the Environmental Restoration Disposal Facility (ERDF). An ERDF profile will be used so that the removal action project manager and the on-scene coordinator know the soil and/or debris meet the ERDF waste acceptance criteria for disposal at the ERDF. Excavation depths will be to a minimum of 15 cm (6 in.). For areas where contamination exists at greater depths, removal to greater depths (up to 4.6 m [15 ft]) may occur. Depending on the configuration of the area to be excavated, shoring or sloping might be required to comply with safety requirements and to reduce the quantity of excavated soil. Excavations will be backfilled and/or contoured after removal action is completed. The areas may be reseeded or stabilized using fixatives as appropriate.

2.2 CS/NFA

Under the CS/NFA alternative, sampling and analysis (or direct radiological surveys for waste sites contaminated only with radionuclides) confirm that soil is at or below RALs and that no further action is required. Radiological and/or chemical surveys will be included in the initial site investigation as appropriate for site conditions to support the selection of sampling locations. A sampling and analysis plan will be developed and will contain the necessary information to support both chemical and radionuclide data collection at a sufficient quantity and quality to make a determination whether RALs have been met.

This alternative is being used for waste sites that meet one or more of the following conditions.

- Prior cleanup activities have been performed, but insufficient data are currently available to close out the waste site.
- Contaminants of potential concern concentrations are not expected to exceed RALs.
- The contamination status of the site is uncertain and a strong possibility exists that the site is not contaminated.

If results of confirmatory sampling indicate that contaminant concentrations are above RALs, then the RTD alternative will be implemented.

2.3 RTD

Under the RTD alternative, sampling and analysis confirm that soil contains contamination above RALs and requires removal. However, where process knowledge and information are available to make a determination, removal actions may be conducted without prior confirmation sampling to remove and dispose of other materials above RALs, with treatment as required for disposal. Verification sampling and analysis demonstrate that the remaining in situ soils are at or below RALs. Residual soil concentrations at or below RALs will be considered a demonstration that the first three removal action objectives have been met. This alternative is for waste sites that meet one or more of the following conditions.

- Contaminant concentrations are known or expected to exceed RALs.
- Contaminants will not naturally attenuate within 150 years or below RALs by 2050. Additionally, results will be compared to a 30-year attenuation. The decision to RTD will be based on both results.

The cleanup of sites under the RTD alternative will be guided by the observational approach. The observational approach is a method of planning, designing, and implementing a removal action that relies on information (e.g., field instrument readings and/or field screening samples) collected during the removal to guide the direction and scope of the activity. Initial screening and sampling data are used for an ERDF profile to assess the extent of contamination and to make real-time decisions in the field. Following some excavation, the extent of contamination may be further assessed by additional screening and sampling. The extent of removal is then adjusted based on those results. Targeted removals will be conducted under this alternative if contamination is localized in only a portion of a waste site.

In this alternative, soils will be removed until the RALs are achieved, generally to a depth of less than 4.6 m (15 ft). Direct radiological surveys without additional sampling and analysis may be used for verifying that radiological contamination is below RALs for waste sites contaminated only with radionuclides for which the isotopic ratios have been established. If results of confirmatory sampling indicate that the RTD is inappropriate (i.e., at or below RALs), then the CS/NFA alternative will be implemented.

In some cases, excavation beyond 4.6 m (15 ft) depth may be required. These cases may include waste sites where removal of an engineered structure is required, or where verification sampling indicates that deeper excavation is required to attain RALs. If waste sites are encountered with contamination deeper than 4.6 m (15 ft) bgs, then soil samples will be taken at depths greater than 4.6 m (15 ft) to characterize potential groundwater risk drivers and the information will be further evaluated in the outer area remedial investigation/feasibility study. The on-scene coordinator (in consultation with Washington State Department of Ecology [Ecology]) will determine if excavation to greater depths is justified to remove soil with concentrations greater than the RALs. Extent of excavation will be consistent with the anticipated remedial action to the extent practicable. Figure 2-1 provides a decision matrix for determining the path forward in this situation.

2.4 Field Activities

The following sections describe the field activities that may be, on a site-specific basis, associated with the 200-MG-1 OU 11 waste sites, including waste site excavation, material handling, and containerization of contaminated soil for disposal at the ERDF.

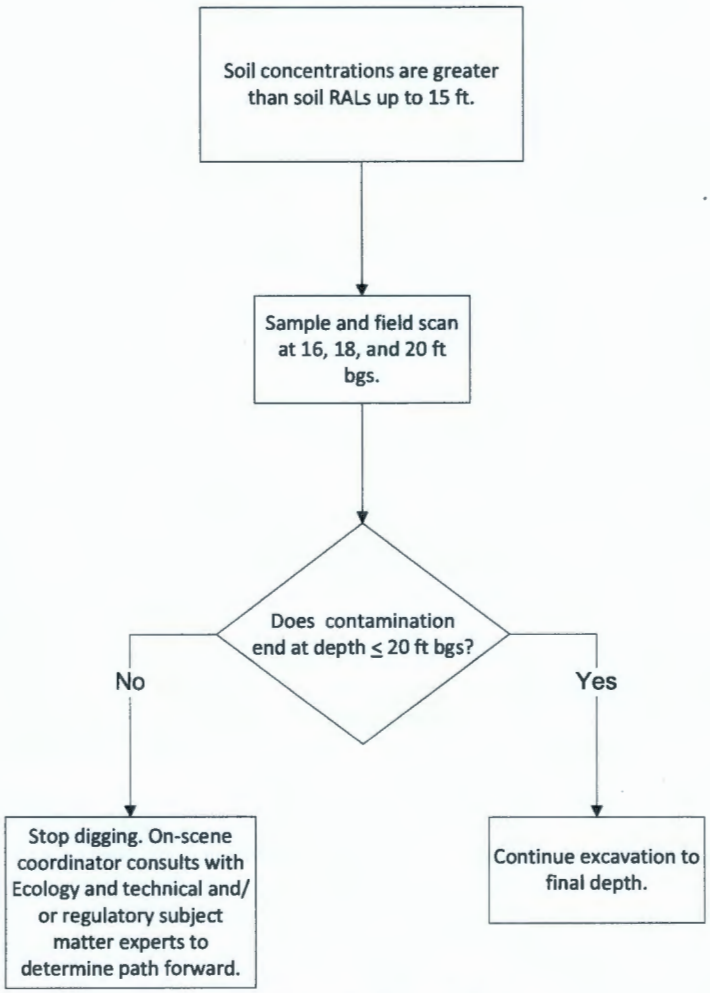

Figure 2-1. Decision Matrix

2.4.1 Mobilization and Site Preparation

Mobilization and site preparation include the following activities to prepare the site for excavation.

- Establishing site utility services as required.
- Constructing roads, field support facilities, container survey stations, and decontamination stations. Hanford Site roadways are constructed of existing site materials, except the surface course, which is imported. Field support facilities provide a changing area, lunchroom, and construction offices at individual sites. The changing area includes lockers, benches, showers/restrooms, and storage for both clean and contaminated personal protection equipment.
- Stripping the existing vegetation and debris. Stripping removes surface and near-surface materials (including vegetation and roots, cobbles, and boulders) as appropriate.

2.4.2 Waste Site Excavation and Utility Removal

Excavation requires equipment operations in uncontaminated and contaminated soil and debris of varying physical properties (e.g., fine sand to boulders of varying sizes). Guidance for the excavation will be

determined in accordance with the requirements of 29 CFR 1910, "Occupational Safety and Health Administration, Department of Labor" and 29 CFR 1926, Subpart P, "Excavations."

During excavation layout and preliminary civil land survey, local topography will be reviewed to determine whether precipitation run-on/run-off potential exists and whether mitigative measures (e.g., installation of earthen berms) must be taken. Excessive run-on from surrounding areas could affect slope stability and has the potential to spread contamination.

Water usage for dust control will be minimized to protect against contaminant migration. Material to be disposed at the ERDF will comply with the moisture content and other applicable requirements of WCH-191, *Environmental Restoration Disposal Facility Waste Acceptance Criteria.*

2.4.3 Stabilization

Although not anticipated, some waste materials may require more stringent types of stabilization to maintain worker exposures to airborne and/or direct radiation as low as reasonably achievable (ALARA).

2.4.4 Material Handling and Transportation

All contaminated materials (including excavated soils, debris, disposable protective clothing, and trash) require proper packaging, handling, and transportation in accordance with Section 4.2 of this RAWP.

Contaminated bulk materials will be hauled in the standard ERDF open-top, hinged-gate roll-off boxes that are designed for a maximum payload of approximately 18.1 metric tons (20 tons) or an equivalent alternative. The bulk containers will be transported on roll-on/roll-off trailers with hydraulic dumping capabilities that are towed by conventional tractor units or dump trucks. The trailers and tractors will be suitable for operating on sloped excavation access ramps and other off-road ramps, and meet applicable U.S. Department of Transportation requirements. The wheel wells of the tractor will be constructed to prevent soil from being thrown onto the trailer and its containers during transport.

Containers will be transported from the specific 200-MG-1 OU waste sites to the ERDF over existing Hanford Site roadways or by a direct-haul route. Each shipment of soil/debris transported to the ERDF will be referenced to a waste profile that is intended to bound the levels of hazardous constituents in the material found at each site. The waste profile is in effect unless and until the characteristics of an excavation site change significantly.

Empty containers returning from the ERDF will be removed from the ERDF tractor trailers in either a site-specific waste container storage area or inside the area of contamination, and rolled on to project haul trucks for refilling or kept on the direct haul truck, as appropriate.

2.4.5 Data Quality Objectives Process

The EPA-developed data quality objectives process has been used to develop the data collection, sampling, analysis rationale, strategy, and requirements for characterization efforts. The results of the data quality objectives process will be documented in either a data quality objectives report or in a sampling and analysis plan as appropriate for the 200-MG-1 OU 11 waste sites.

2.4.6 Confirmatory and Verification Sampling

Confirmatory sampling will be used to support waste characterization, health, and safety, and to determine whether a waste site's soil and/or debris are less than the RALs. If the RALs are exceeded, then the waste site will undergo RTD and verification sampling will be conducted once the contaminated soil and/or debris have been removed to verify that the remaining site is below the RALs.

DOE/RL-2009-60, *Sampling and Analysis Plan for Selected 200-MG-1 Operable Unit Waste Sites*, will be used for both confirmatory sampling and for verification sampling as appropriate for each waste site.

2.4.7 Decontamination

Decontamination of equipment, waste containers, and other items to support excavation activities generally will be performed using dry methods (such as wiping) to the extent possible. When the use of wet methods (e.g., pressure washers) is required to achieve decontamination objectives, the associated water or cleaning solutions will be collected, and work will be conducted by trained site workers in accordance with the following best management practices.

- Decontamination activities will be performed within active excavation areas within the area of contamination.
- The amount of water used to clean equipment will be minimized.
- Only raw or potable water will be used.
- Regulated soaps, detergents, or other cleaning agents will not be added to wash water.
- Pressure washing normally will use cold water.

When excavation operations are completed at a given site, equipment generally will be relocated to the next site that will undergo removal action, and decontamination may be performed at the new site or may be conducted at the present removal action site. If decontamination is performed at the completed site, then a pre- and post-survey will be performed on the washing/decontamination area to determine whether any supplemental removal actions are needed in that area as a result of the process.

The project may opt to perform other methods of equipment washing and/or decontamination for a completed site (e.g., wrap the equipment for transfer to a decontamination pad, provide for a temporary facility at the site to collect wash water, or fix the contamination to the equipment). Decontamination fluid/wash water that is collected will be managed in accordance with Section 4.2 of this RAWP.

2.4.8 Waste Disposal

All waste management activities will be performed in accordance with waste management ARARs identified in DOE/RL-2009-48, and as discussed in Section 4.2 of this RAWP. Solid radiologically contaminated *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA) waste from the removal action will be disposed of either at the ERDF or temporarily stored offsite at the Central Waste Complex before treatment and disposal. Liquid waste will be disposed of offsite at the 200 Areas Effluent Treatment Facility (ETF). The movement and treatment, storage, and/or disposal of waste at the Central Waste Complex or the ETF require an offsite determination approval.

The CERCLA waste also could be disposed of at another offsite facility that has been approved in accordance with 40 CFR 300.400, "General." Treatment of waste could be necessary before disposal at the ERDF, and containerized waste could be stored at the ERDF with the appropriate concurrence(s) while the waste is awaiting treatment. Liquid waste sent to the ETF will be treated separately from other non-CERCLA sources, and any treatment residues that meet the ERDF waste acceptance criteria (WCH-191) could be disposed of at the ERDF. Section 4.2 discusses waste management in further detail.

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3 Safety and Health Management and Controls

All emergency planning and preparedness activities for this project will be consistent with planning and preparedness actions taken by other Hanford Site contractors and similar projects. Activities will be in a manner that ensures the health and safety of workers and the public and the protection of the environment in the event of an abnormal incident during removal action activities.

3.1 Emergency Management

The contractor's Emergency Management Program (including preparedness, planning, and response) contains the administrative responsibilities for compliance with DOE/RL-94-02, *Hanford Emergency Response Plan*, and all applicable DOE orders. The Emergency Management Program establishes a coordinated emergency response organization capable of planning for, responding to, and recovering from industrial, security, and hazardous material incidents. Emergency action plans for contractor-managed hazardous facilities identify the capabilities necessary to respond to emergency conditions, provide guidance and instruction for initiating emergency response actions, and serve as a basis for training personnel in emergency actions for each facility.

The emergency response actions within the emergency action plan are provided for recognizing incidents and/or abnormal conditions, initiating protective actions, and making the proper notifications. Emergency response for this project will include U.S. Nuclear Regulatory Commission notification for reportable quantity releases and on-scene coordinator notification for other emergencies.

3.2 Safeguards and Security

Access to the Hanford Site is controlled via manned guard stations. Access to each removal action area is controlled by the contractor using such items as fences and signs. Access requirements for employees, non-employees, and/or visitors are defined in a site-specific health and safety plan (SSHASP).

3.3 Health and Safety Program

The contractor's Hazardous Waste Operations Safety and Health Program was developed for employees involved in hazardous waste site activities. The program was developed to comply with the requirements of 29 CFR 1910.120, "Hazardous Waste Operations and Emergency Response," and 10 CFR 835, "Occupational Radiation Protection," to ensure the safety and health of workers during hazardous waste operations.

3.3.1 Worker Safety Program

The Integrated Safety Management System will be incorporated into all work activities. The program includes the following elements:

- Organizational structure specifying the official chain of command and the overall responsibilities of supervisors and employees
- Comprehensive work plan developed before work begins at a site to identify operations and objectives and to address the logistics and resources required to accomplish project goals
- SSHASP developed when workers could be exposed to hazardous substances
- Worker training commensurate with individual job duties and work assignments

- Medical surveillance program administered to comply with the Occupational Safety and Health Administration requirements (29 CFR 1910.120)
- Contractor's internal work requirements and processes
- Voluntary protection program.

3.3.2 Health and Safety Plan and Activity Hazards Analysis

An SSHASP will be prepared that defines the chemical, radiological, and physical hazards and specifies the controls and requirements for work activities. In some cases, multiple SSHASPs or appendices to a specific SSHASP may be used based on the number and complexity of each waste site.

Access and work activities are controlled in accordance with approved work packages, as required by established internal work requirements and processes. An SSHASP addresses the health and safety hazards of each phase of site operation and includes the requirements for hazardous waste operations and/or construction activities, as specified in 29 CFR 1910.120. As part of work package development, a job or activity hazards analysis will be written to identify the hazards associated with specific tasks already not covered under an SSHASP. The elements included in an SSHASP are as follows:

- General overview of the hazards associated with the area
- List of employee training assignments
- List of personal protective equipment to be used at the work site
- Medical surveillance requirements
- Work site control measures
- Emergency response
- Confined space entry internal work requirements and processes
- Spill containment program.

In addition to an SSHASP, a radiological work permit (RWP) will be prepared, as needed, for work in areas with potential radiological hazards. The RWP extends the Radiological Protection Program (discussed in Section 3.3.3) to the specific work site or operation. All personnel assigned to the project and all work site visitors must strictly adhere to the provisions identified in the SSHASP and RWP.

Before work and before each activity begins, a pre-job briefing will be held with the involved workers. This briefing will include reviews of the hazards that could be encountered and the associated requirements. Throughout an activity, daily briefings, as well as special briefings before major evolutions, also could be held.

3.3.3 Radiological Controls and Protection

The radiological controls and protection program is defined in DOE-approved programs and contractor-approved internal work requirements and processes. The radiological controls and protection program implements the contractor's policy to reduce risks to safety or health to levels that are ALARA and to ensure the adequate protection of workers. The contractor's radiological protection program meets the requirements of 10 CFR 835. Appropriate dosimetry, RWPs, personal protective equipment, ALARA planning, periodic surveys, and radiological control technical support will be provided.

The standard contractor's controls for work in radiological areas are assessed as adequate to control project activities. These controls will provide for radiological controls planning to identify the specific conditions, and will govern the specific requirements for an activity, periodic radiation and contamination surveys of the work area, and periodic or continuous observation of the work by the radiological controls

organization. The ALARA planning process will be used to identify shielding requirements, contamination control requirements, radiation-monitoring requirements, and other radiation control requirements for the individual tasks conducted during the projects.

Measures also will be taken to minimize the possibility of releases to the environment. Section 4.3 of this RAWP quantitatively addresses the radionuclide inventory and controls which may be used during project activities that could prevent the potential release of the inventory, but not to the exclusion of 10 CFR 835 requirements. Therefore, monitoring will be completed as described in Section 4.3 and radiological worker exposure must be monitored using approved occupational radiological protection methods.

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4 Environmental Management and Controls

The following sections provide a discussion of how the removal action will comply with environmental management and controls.

4.1 ARARs

The ARARs for this removal action are identified in DOE/RL-2009-48.

4.2 Waste Management Plan

Waste management activities performed in this RAWP include waste storage, transportation, packaging, handling, and labeling.

Treatment will be required for land-disposal restriction (LDR) material unless a treatability variance or ARAR waiver is requested by DOE and approved by the regulatory agencies. If LDR wastes are encountered, the requirements of 40 CFR 268, "Land Disposal Restrictions," will be applied. Should LDR material be encountered, it will be temporarily stored within the area of contamination and disposed in accordance with applicable regulations. If treatment is required to address LDR wastes at facilities considered "offsite" in accordance with 40 CFR 300.440, DOE will obtain regulatory agency approval.

4.2.1 Projected Waste Streams

One or all of the waste streams listed below are anticipated and may fall into any combination of the following categories: radioactive, mixed, hazardous, dangerous, suspect radioactive, suspect dangerous, and suspect mixed:

- Miscellaneous waste (e.g., rubber, glass, paper, personal protective equipment, cloth, plastic, metal)
- Soils
- Equipment and construction materials (e.g., drift fences, pitfall traps, related materials, and sampling equipment)
- Wastewater from decontamination activities and from waste site structures such as tanks.

4.2.2 Waste Characterization, Designation, and Disposal

Waste from the excavation sites will be containerized (as appropriate) and transported for storage, treatment (if required), and/or disposal. Shipment of U.S. Department of Transportation hazardous materials will comply with all applicable DOE and/or U.S. Department of Transportation requirements.

Miscellaneous solid waste that has contacted contaminated soil, and/or is designated as contaminated by process knowledge or other information, may be disposed at the ERDF. Waste will be characterized and designated in accordance with requirements of the receiving facility and in accordance with an approved sampling and analysis plan. Waste will be designated using process knowledge, historical analytical data, engineering calculations, and/or analyses of samples identified in the referenced documents or sampling and analysis plan as appropriate. Every effort will be made to minimize waste volume for disposal at the ERDF.

The ERDF is the preferred disposal location, if the waste acceptance criteria are met. Waste will be staged within the area of contamination or at the ERDF. If field screening methods are sufficient to determine if soil is uncontaminated, then that soil will be placed on the ground near the point of origin. If field

screening methods are not sufficient to determine soil status, then stockpiled soils will be placed on tarps or liners until soil status can be determined, if soil is being staged.

Small volumes of liquid that have been solidified may be disposed at the ERDF if the waste meets the ERDF waste acceptance criteria. Liquid waste that does not meet the acceptance criteria will be shipped to an appropriate offsite facility such as the 200 Area ETF, including any approved treatment, storage, and disposal facility, depending on the waste designation. Offsite facilities that receive contaminated waste must be deemed acceptable by the EPA in accordance with 40 CFR 300.440, "Procedures for Planning and Implementing Off-Site Response Actions."

Used oil will be sent off site for recycling or disposal. Spent or unusable chemicals/reagents may be generated during field sampling and analysis and would require disposal at the appropriate facility based on the designation.

Three categories of waste exist from a designation standpoint: (1) wastes that do not require additional characterization or special handling, (2) wastes that do not require additional characterization but do require special handling, and (3) wastes that require additional characterization.

- Wastes that do not require additional characterization or special handling. These include untreated wastes, and/or process soil, that may be designated without characterization and do not require special handling for human exposure protection or waste acceptance.
- Wastes that do not require additional characterization, but do require special handling. These are untreated wastes, and/or process soil, that may be designated without characterization, but do require special handling for human exposure protection or waste acceptance. Waste types in this category include, but are not limited to, high-dose, highly contaminated components that do not contain dangerous/hazardous materials.
- Wastes that require additional characterization. These include untreated and/or treated wastes that cannot be designated without characterization and may require special handling for human exposure protection or waste acceptance. Unknown or anomalous materials are included in this category.

4.2.2.1 Returned Sample Waste

Screening and analysis of both solids and liquids may be conducted at the waste site, offsite or onsite laboratories, and/or a radiological counting facility. Samples from a radiological counting facility and from onsite laboratories may be returned to the area of contamination for disposal. Unused samples and associated laboratory waste from offsite analyses will be managed by the applicable laboratory in accordance with contract specifications. Waste from field screening and onsite laboratories will be managed depending on whether it has been altered. Altered samples will be contained and disposed at the ETF, ERDF, or other appropriate facilities as authorized by EPA, depending on waste designation. Unaltered liquid waste generated during sample screening and analysis that does not exceed collection criteria limits may be discharged to the ground near the point of generation; if it exceeds the collection criteria, it may be disposed at the ETF, ERDF, or other appropriate facilities. Some liquids may be neutralized and/or stabilized to meet the disposal facility's waste acceptance criteria.

In conducting the removal action, various waste steams will be encountered. Each waste stream will require specific processing and disposal. Similar types of waste will be managed uniformly. Assignment of waste to the appropriate waste stream depends on knowing the designation of the waste and appropriate disposal facility.

4.2.2.2 Waste Size Reduction

The most current version of WCH-191 is used to ensure compliance with the ERDF shipping requirements, including waste size reduction requirements.

4.2.2.3 Waste Handling

At each site, containers and the ERDF haul trucks being released from radiologically controlled areas will meet exterior contamination limits for staging and transport.

4.2.2.4 Waste Profile

The contractor will provide waste characterization and necessary transport papers. Waste profiling for establishing values for the waste tracking form will take place concurrently with removal action activities. Field screening measurements will be used to obtain data to adjust the waste tracking form. The waste profile will be adjusted (as necessary) through a combination of in-process field screening methods, analytical laboratory analysis, and notification of the field engineer.

Sampling and laboratory analysis of anomalous waste will be used to characterize soil and debris. The data will be used to prepare or update waste profiles, as necessary.

4.2.3 Waste Generation Management

Marking, labeling, segregation, and staging of waste containers will be performed or directed by the waste transportation specialist.

Wastes will be stored at a site-specific waste container storage area or area of contamination for each waste site.

The following sections describe types and management of expected wastes.

4.2.3.1 Miscellaneous Waste

Miscellaneous waste that has contacted suspect dangerous or suspect mixed waste will be treated as such. Field screening will be used to segregate radioactive waste from no-radiation-added (nonradioactive) waste. Container(s) will be properly marked and labeled. The containers will be segregated from other materials in accordance with their field screening results and locations, then staged at the designated site-specific waste container storage area. The containers of miscellaneous waste will be dispositioned based on analytical results obtained from the soil contacted in conjunction with analytical results.

4.2.3.2 Soils

Soils will be sampled, analyzed, and evaluated to determine if the RALs have been met. Soils at an RTD waste site that exceed the RALs will be packaged, marked and labeled, and disposed of at the ERDF. Any waste that is not acceptable at the ERDF or ETF, requiring treatment before disposal, requires approval by EPA.

4.2.3.3 Equipment and Construction Materials

Equipment and construction materials that contact suspect dangerous and/or suspect mixed waste will be decontaminated as described in Section 2.4.7 and if the liquid must be contained, the waste will be managed as described in Section 4.2.3.4. If equipment is to be dispositioned, a declaration of excess form will be completed and the material will be containerized. If necessary, equipment and construction materials can be containerized and stored at the designated site-specific waste container storage area or area of contamination.

4.2.3.4 Decontamination Fluids

Decontamination fluids (water and/or nondangerous cleaning solutions) generated from cleaning equipment and tools in the area of contamination may need to be contained, sampled, and as necessary transported, and discharged into the ETF. If necessary, decontamination fluids can be containerized, overpacked, and temporarily stored at the designated site-specific waste container storage area or area of contamination.

4.2.4 Management of Waste Containers

Waste containers, including the ERDF roll-on/roll-off containers, are inspected before use to ensure container integrity. The containers will be stored inside the applicable site-specific waste container storage area or area of contamination. Containers awaiting analytical results will be marked and labeled as appropriate. Weekly inspections of the containers will be performed to document the integrity, container marking/labeling, physical container placement, storage area boundaries/identification/warning signs, and sign of any potential leakage. Containers showing signs of deterioration will be identified on the container inspection form and will be overpacked or repackaged.

Spills or releases will be reported as stated in Section 4.4. In the event of a spill or release, appropriate and immediate action will be taken to protect human health and the environment.

4.2.5 Final Disposal/Storage

All waste will be stored in the appropriate site-specific waste container storage area or area of contamination until the proper waste shipping papers are completed. The process for developing proper waste shipping papers includes the receipt of analytical results, designation, profiling, and proper disposal paperwork. The designation process ensures the waste will be profiled for the appropriate disposal facility. Waste profiling provides information concerning each waste stream. The designation and profiling are conducted in accordance with the requirements of WAC 173-303-070, "Designation of Dangerous Waste," specifically WAC 173-303-070(3). Dangerous waste will be evaluated for applicable LDRs in accordance with WAC 173-303-140, "Land Disposal Restrictions."

Any waste that does not meet the ERDF waste acceptance criteria will remain at the designated site-specific waste container storage area or area of contamination pending disposal at an appropriate location or treatment to meet the ERDF acceptance. A case-by-case disposal determination by the ERDF will be made in instances where waste exceeds the ERDF waste acceptance criteria. Any waste that is not acceptable at the ERDF or ETF, requiring treatment before disposal, requires approval by the lead regulatory agency.

Waste above radiological release levels that meets the ERDF waste acceptance criteria will be transported to the ERDF for disposal. Nonradiologically contaminated dangerous waste may be shipped to the ERDF or to an offsite facility, contingent upon the waste meeting the offsite facility's waste acceptance criteria and the disposal facility having received a determination of acceptability by the EPA, in accordance with the Off-Site Rule, 40 CFR 300.400, as applicable.

Soils associated with analytical results below site-specific RALs (Appendix A) may be returned to the environment at the site-specific waste site location.

4.2.6 Waste Disposal Records

Original copies of all sampling records, waste inventory documentation, and waste container certification forms will be forwarded to the assigned waste specialist to be included in the waste file and to initiate waste tracking in the Solid Waste Information Tracking System. The completed waste files will be included in the project file following final waste disposition.

4.2.7 Waste Treatment

When necessary, treatment may be conducted at the site, at the ERDF (in special cases), or at an EPA-approved offsite facility. If LDR wastes are encountered, the requirements of 40 CFR 268 will be applied, unless the EPA approves a treatability variance. Offsite treatment must be performed at a facility approved by the EPA in accordance with 40 CFR 300.440. Return of treated waste from offsite treatment facilities for disposal at the ERDF will require additional authorization from the DOE Remedial Project Manager.

4.2.8 Waste Minimization and Recycling

By using waste separation and segregation, waste generation will be kept to a minimum. Waste will be segregated within the area of contamination as generated, which will minimize the volume of regulated waste.

Waste minimization practices will be followed to the extent technically and economically feasible during all phases of waste management. Introduction of clean materials into a contamination area as well as contamination of clean materials will be minimized to the extent practicable. During all phases of waste management, emphasis will be placed on source reduction to eliminate or minimize the volume of waste generated.

All materials released offsite for disposal/recycle must be certified free of contamination in accordance with DOE guidance for nonreal property. Waste materials meeting this criterion are not considered CERCLA waste and therefore are not subject to the 40 CFR 300.440 offsite acceptability determination.

4.3 Standards Controlling Releases to the Environment

4.3.1 Radiological Air Emissions

The state implementing regulation WAC 173-480, "Ambient Air Quality Standards and Emission Limits for Radionuclides," sets standards that are as stringent or more than the federal *Clean Air Act of 1990* and amendments and under the federal implementing regulation, 40 CFR 61, "National Emission Standards for Emissions of Radionuclides Other than Radon from Department of Energy Facilities," Subpart H, "National Emission Standards for Emissions of Radionuclides Other than Radon from Department of Energy Facilities."The EPA partial delegation of the 40 CFR 61 authority to the state of Washington includes all substantive emissions monitoring, abatement, and reporting aspects of the federal regulation. The state standards protect the public by conservatively establishing exposure standards applicable to even the maximally exposed public individual, be that individual real or hypothetical. To that end, the standards address any member of the public, at the point of maximum annual air concentration in an unrestricted area where any member of the public may be located. Radionuclide airborne emissions from the DOE Hanford Site "facility" are not to exceed amounts that would cause an exposure to any said member of the public of greater than 10 mrem/yr effective dose equivalent. The state implementing regulation WAC 246-247, "Radiation Protection – Air Emissions," adopts the WAC 173-480 standards and 40 CFR 61, Subpart H standard, requires verification of compliance with the 10 mrem/yr standard, and would be applicable to the removal action.

WAC 246-247 further addresses emission sources emitting radioactive airborne emissions by requiring monitoring of such sources. Such monitoring requires physical measurement of the effluent or ambient air. The substantive provisions of WAC 246-247 that require monitoring radioactive airborne emissions would be applicable to the removal action.

The state implementing regulations discussed above further address control of radioactive airborne emissions where economically and technologically feasible (WAC 246-247-040, "General Standards,"

and associated definitions for radiation protection – air emissions). To address the substantive aspect of these requirements, best or reasonably achieved control technology will be addressed by ensuring applicable emission control technologies (those successfully operated in similar applications) will be used when economically and technologically feasible (i.e., based on cost/benefit). If it is determined there are substantive aspects of the requirement for control of radioactive airborne emissions, controls will be administered as appropriate using reasonable and effective methods.

4.3.2 Criteria/Toxic Air Emissions

Under WAC 173-400, "General Regulations for Air Pollution Sources," and WAC 173-460, "Controls for New Sources of Toxic Air Pollutants," requirements are established for the regulation of emissions of criteria/toxic air pollutants. The primary nonradioactive emissions resulting from this removal action will be fugitive particulate matter. In accordance with WAC 173-400-040, "General Standards for Maximum Emissions," reasonable precautions must be taken to (1) prevent the release of air contaminants associated with fugitive emissions resulting from excavation, materials handling, or other operations and (2) prevent fugitive dust from becoming airborne from fugitive sources of emissions. The use of treatment technologies that would result in emissions of toxic air pollutants that would be subject to the substantive applicable requirements of WAC 173-460 are not anticipated to be a part of this removal action. Treatment of some waste encountered during the removal action may be required to meet the ERDF waste acceptance criteria. In most cases, the type of treatment anticipated would consist of solidification/ stabilization techniques such as macroencapsulation or grouting, and WAC 173-460 would not be considered an ARAR. If more aggressive treatment is required that would result in the emission of regulated air pollutants, the substantive requirements of WAC 173-400-113(2), "Requirements for New Sources in Attainment or Unclassified Areas," and WAC 173-460-060, "Control Technology Requirements," would be evaluated to determine applicability.

Emissions to the air will be minimized during implementation of the removal action through use of standard industry practices such as the application of water sprays and fixatives. These techniques are considered reasonable precautions to control fugitive emissions as required by the regulatory standards.

4.3.3 Radiological Airborne Source Information

There is a potential for particulate radionuclide airborne emissions to result from the removal action activities. The estimated primary radionuclides with estimated curie values for the 11 waste sites are provided in Table 4-1. Since most of the 11 waste sites may not contain measurable levels of radiological contamination, conservative estimates were used with americium-241 representing the total alpha component and cesium-137 representing the total beta-gamma component for the waste sites. Information on each waste site is based on the Waste Information Data System and estimates from HNF-2418, *Soil Contamination Standards for Protection of Personnel*. The values used in HNF-2418 assume homogeneous contamination throughout the soil for different dose limits for onsite workers. Any readings above the documented levels will involve risk evaluation by the radiological control organization and compliance with radiological controls. Other radionuclides may be encountered during the removal activities, though in amounts small enough such that the above-listed radionuclides and associated estimates of curie amounts adequately account for potential airborne impacts due to all radionuclides.

Table 4-1 provides emissions and dose information related to the removal activities for the first 11 waste sites. The estimates shown for abated emissions very conservatively assume no abatement affect. Therefore, the abated and unabated estimates are listed as the same.

Table 4-1. 200-MG-1 OU Dose Calculations for the 11 Waste Sites in Table 1-1

Isotope[a]	dpm	pCi/g[b]	Density[c] (g/m^3)	pCi/m^3	Contaminated Soil Excavation Volume (m^3)	Ci	WAC 246-247-030-(21)(a) Release Factor	Ci Released	Dose Factor[d] (mrem/Ci)	Unabated PTE (mrem/yr)	Abated PTE (mrem/yr)
Excavation of soil at contamination detected level											
Cs-137+D[e]	5.00E+03	1.41E+03	1,600,000	2.25E+09	5.0E+03	1.13E+01	1.00E-03	1.13E-02	2.7E-01	3.04E-03	3.04E-03
Am-241	1.00E+02	1.99E+02	1,600,000	3.19E+08	5.0E+03	1.60E+00	1.00E-03	1.60E-03	1.5E+01	2.39E-02	2.39E-02
Subtotal										2.69E-02	2.69E-02
Excavation of soil at high contamination detected level											
Cs-137+D[e]	1.00E+05	2.82E+04	1,600,000	4.51E+10	2.5E+02	1.13E+01	1.00E-03	1.13E-02	2.7E-01	3.04E-03	3.04E-03
Am-241	2.00E+03	3.98E+03	1,600,000	6.38E+09	2.5E+02	1.60E+00	1.00E-03	1.60E-03	1.5E+01	2.39E-02	2.39E-02
Sub total										2.69E-02	2.69E-02
Total					**5.25E+03**					**5.38E-02**	**5.38E-02**

a. Assume all beta-gamma is Cs-137+D; all alpha is Am-241.

b. Derived from values in Tables 2, 3, and 4 of HNF-2418, using an efficiency factor of 10% to convert counts per minute to disintegrations per minute for GM-P11 instruments (beta-gamma) and an efficiency of 14% to convert counts per minute to disintegrations per minute for PAM instruments (alpha).

c. Soil density of 1.6 gm/cc used from HNF-2418 and volumes are based on 480 yd^3 excavated at control levels or higher.

d. DOE/RL-2006-29, *Calculating the Potential-to-Emit Radiological Releases and Doses*, Table 4-9.

e. Many radionuclides decay into other radionuclides, creating a radioactive decay chain consisting of a parent nuclide and its radioactive progeny (i.e., decay products, also called daughters identified with a "+D"). The dose factor for Cs-137 included its daughters.

HNF-2418, *Soil Contamination Standards for Protection of Personnel*.

WAC 246-247-030, "Definitions."

PAM = portable alpha meter

PTE = potential-to-emit

The distance to the Laser Interferometer Gravitational Wave Observatory receptor is 16,630 m (10.3 mi) east-southeast of the 200 East Area. This is the nearest public location where the hypothetical maximally exposed individual might be located. Dose factors used specific to this location were taken from DOE/RL-2006-29, *Calculating Potential-to-Emit Radiological Releases and Doses*. The total unabated and abated potential-to-emit to the receptor from the removal action activities for the 11 waste sites is 5.38E-02 mrem/yr.

4.3.4 Emission Controls

Assessment of best available radiological control technology with regard to potential emissions in this work plan resulted in identification of established and standard airborne controls applicable to the straightforward removal action techniques.

In general, the best available radiological control technology evaluation for an outdoor, shallow, relatively short-term removal action involving minor potential for radiological airborne emissions supports using proven technology on a cost/benefit basis. Based on analysis of the potential emissions and analysis of available control technologies, the following controls have been selected for use during the removal action.

- Water will be applied, as needed, during any excavation and backfilling activities, for suppression of fugitive emissions and dust.
- Fixatives will be applied to contaminated soil and/or debris and equipment, as needed, to minimize airborne contamination during the removal action activities for fugitive emissions and dust. Fixative application techniques may include spraying, brushing on, pouring, or some other method, as necessary.
- Fixatives or cover material (e.g., soil, gravel) will be applied to disturbed contaminated soils, associated with the investigative action, when field activities will be inactive more than 24 hours except as noted in the next bullet.
- If the sustained wind speed is predicted overnight to be greater than 32 km/h (20 mi/h) based on the Hanford Meteorological Station afternoon forecast, fixative or cover material will be applied as needed before occurrence of the predicted winds. This will allow the project enough time to prepare for the application of dust control measures. If a fixative already has been applied and the fixed contaminated items will remain undisturbed, further use of fixatives will not be needed. The fixatives or other controls will not be applied when the contaminated items are frozen, or it is raining, snowing, or other freezing precipitation is falling at the end of work operations.
- Field activities should be temporarily ceased and the area should be placed in a safe configuration if contamination control measures are not adequate, based on site conditions (e.g., excessive wind).
- The waste packages will remain closed, except during packaging and waste inspection activities, once they are staged.
- Operational limits for removable or transferable contamination levels will be established in the activity work packages and associated radiation work plans. Fixatives or other controls will be employed if removable or transferable contamination levels (other than specks of contamination) above 100,000 dpm per 100 cm^2 beta/gamma or exceeding 2,000 dpm per 100 cm^2 alpha are measured or expected.

4.3.5 Monitoring

The calculated unabated annual dose for each activity during the removal action at each waste site is expected to be below 0.1 mrem/yr; therefore, these activities are not subject to continuous emissions monitoring as required by the ARAR based in WAC 246-247-075(1). Periodic confirmatory measurement will be provided, however, as required by the ARAR based in WAC 246-247-075, "Monitoring, Testing and Quality Assurance," specifically bullets (3) and (8). Alternative monitoring techniques have been considered and near-facility monitors and radiological field surveys using hand-held instruments are sufficient to meet the periodic confirmatory measurement requirement.

Both alpha and beta/gamma surveys will be performed for all removable contamination surveys and for soil surveys (direct readings).

Excavation activities will be stopped if removable or transferable contamination (other than specks of contamination) with detection readings greater than 500,000 dpm per 100 cm^2 beta/gamma or greater than 28,000 dpm per 100 cm^2 alpha is encountered on the soil outside of active work areas posted for contamination control. The size of the posted area at any one time will be minimized to facilitate contamination control and the area stabilized. Excavation in that immediate area will not continue until an internal review of the work and encountered conditions has been performed and an internal determination has been made that no threat to personnel safety or the environmental exists, or until proper controls (i.e., removal and disposal, water, fixatives, or covers) have been put in place to mitigate any further potential for emissions, and Ecology and the U.S. Department of Energy, Richland Operations Office (DOE-RL) have been contacted and briefed of the situation.

4.4 Reporting Requirements for Nonroutine Releases

The following reporting requirements apply for hazardous substances that could be released during the removal action activities.

Federal Hazardous Substance

40 CFR 302, "Designation, Reportable Quantities, and Notification," requires immediate notification to the National Response Center on discovery of a release of a hazardous substance into the environment in excess of a reportable quantity.

40 CFR 355, "Emergency Planning and Notification," requires immediate notification to the community emergency coordinator for the local emergency planning committee and to the State Emergency Response Commission for a release of a reportable quantity of an extremely hazardous substance, a comprehensive release of a reportable quantity of an extremely hazardous substance, or a CERCLA hazardous substance.

4.5 Release of Property

All property released for offsite disposal and/or reuse and recycle is nonreal property. The release of nonreal property will follow DOE guidance. If the property meets the surface contamination limits based on radiological surveys and/or characterization information, and the person or entity receiving the property is aware of the measured radioactivity on the property, the property could be dispositioned with low levels of residual radioactivity. Property released via this process is not considered CERCLA hazardous waste and, therefore, will not be subject to CERCLA.

4.6 Cultural, Historical, and Ecological Resource Protection Standards

Cultural and ecological resource reviews will be performed before starting removal action activities for each waste site where work will be conducted to identify any potential impacts.

Impacts on ecological resources in the vicinity of the removal actions will continue to be mitigated in accordance with DOE/RL-96-32, *Hanford Site Biological Resources Management Plan* and DOE/RL-96-88, *Biological Resources Mitigation Strategy* and with the applicable standards of all relevant biological species protection regulations.

Because these sites already have been disturbed, and only isolated artifacts could be encountered during project activities, implementation of DOE/RL-98-10, *Hanford Cultural Resource Management Plan* and consultation with area Tribes will help ensure appropriate mitigation to avoid or minimize any adverse cultural or historical resource effects and address any relevant concerns.

Impacts to other cultural values including the view shed from nearby traditional cultural properties will be minimized through implementation of DOE/RL-98-10 and DOE/RL-2005-27, *Revised Mitigation Action Plan for the Environmental Restoration Disposal Facility*, and through consultation with area Tribes as needed. This will help ensure appropriate mitigation to avoid or minimize any adverse effects to natural and cultural resources and address any other relevant concerns.

Potential impacts to cultural and historical resources that may be encountered during the short-term activities associated with implementing the removal action will be mitigated through compliance with the appropriate substantive requirements of the *National Historic Preservation Act of 1966* and other ARARs related to cultural preservation.

5 Project Administration

5.1 Project Schedule and Cost Estimate

The 200-MG-1 OU waste sites removal actions will be scheduled and estimated using established site priorities and the contractor's hierarchy of schedules, which include activity logic and restraints.

Activities will be resource-loaded for personnel. Equipment needs will be identified and other materials estimated and included in the budgeted cost of work scheduled.

Estimates of project costs will be prepared at the activity level by the project team and subsequently will be reviewed and approved by the contractor and DOE-RL. Cost collection will occur at the code of account level.

The schedule, which encompasses the work scope for the 11 waste sites in the 200-MG-1 OU removal actions (beginning in fiscal year 2010), is included in Appendix A. The schedule included in this document will be subject to change to be compliant with the funding of continued work for the removal actions.

Project Cost and Schedule Tracking

Performance measurement and analysis will be performed by the contractor. Project cost and schedule will be controlled and updated using the contractor's project management system.

An earned-value system will track the cost, schedule, and performance as the project progresses towards completion. Cost/schedule performance reports will provide budgeted cost of work-scheduled comparisons and budgeted costs of work performed against the actual cost of work performed. These reports will provide variances to the baseline schedule and cost as budgeted. Variances above threshold values, as well as the rationale for the variance(s) and any recovery plan required, will be documented.

Trends and baseline change proposals readily will be identified through the contractor's formal trend and change control program. All changes that affect the baseline will be documented. The contractor's trend register, which will be reviewed monthly by contractor senior management, categorizes trends from conception to final resolution. Trends will be identified as either performance trends or scope trends and will be defined further as resolved or unresolved.

Fiscal year project staffing, as budgeted, will be reconciled monthly during project review meetings to the actual number of full-time-equivalent personnel used during the month. Likewise, the corresponding number of hours actually worked will be presented and compared to the budgeted current work plan. Actual overtime will be monitored monthly (by department) and will be reconciled to the current budgeted overtime.

Cost and schedule variances to the current budget will be tracked monthly and on a to-date basis and will be reconciled back to the cause of the variance. Project impacts because of the cost and/or schedule variance will be described and corrective actions identified and tracked to the point of final resolution.

5.2 Change Management/Configuration Control

There are three types of changes in the 200-MG-1 OU waste sites removal actions that could affect compliance with the requirements in DOE/RL-2009-48: (1) a nonsignificant or minor change, (2) a significant change to a component of the alternative, and (3) a fundamental change to the overall alternative.

1. A nonsignificant or minor change falls within the normal scope of changes occurring during the removal action processes. These minor changes should be documented in the appropriate post-decision project file (e.g., through inter-office memoranda or logbooks). Nonsignificant changes will not impact the requirements of DOE/RL-2009-48 nor will they impact the functional requirements. An example of nonsignificant changes may include, but is not limited to, the following:

   - Modifications to the removal action schedule that do not impact agreed-upon milestones.

2. Significant changes are defined as changes that significantly modify the scope, performance, or component cost for each alternative as presented in DOE/RL-2009-48. It may be determined that a significant change to the selected alternative as described in DOE/RL-2009-48 is necessary after the two documents have been signed. All significant changes will be addressed in a fact sheet. Examples of significant changes may include, but are not limited to, the following:

   - A significant increase or decrease in the total cost of site removal action (greater than +50 percent or more than –30 percent) addressed in DOE/RL-2009-48:

     – A significant delay in the point in time when the removal action or objectives are met.

3. A fundamental change is a change that does not meet the requirements set forth in DOE/RL-2009-48 or that incorporates removal activities not defined in the scope of the two documents. In few cases are there fundamental changes to an action memorandum. Should the situation arise, the action memorandum must be amended. An example of a change that would fundamentally alter the alternative might be a situation where:

   - A land use is defined that is not compatible with DOE/RL-2009-48.

Determining the significance of the change is the lead regulatory agency's responsibility. The project manager is responsible for tracking all changes and obtaining appropriate reviews by staff. The project manager will discuss the change with DOE-RL, who will then discuss the type of change that is necessary with Ecology up to and including changes in Ecology et al., 1989b, *Hanford Federal Facility Agreement and Consent Order Action Plan*, Section 9.3 or 12.0. Appropriate documentation will follow in accordance with the requirements for that type of change.

5.3 Personnel Training and Qualifications

During the performance of project activities, the experience and capabilities of the operating staff will be extremely important in maintaining worker and environmental safety. Day-to-day knowledge of ongoing operations, month-to-month understanding of conditions encountered, and lessons learned will be used for continued safe operations.

Training requirements will ensure that personnel have been instructed in the technologies to work safely in and around radiological areas, and to maintain their individual radiation exposure and the radiation exposures of others ALARA. Standardized core courses and training material will be presented, and site-specific information and technologies will be added to adequately train workers. Records of required training will be maintained in accessible files.

Health physics workers will be required to have completed and be current in radiological control technician qualification training. These training courses require the successful completion of examinations to demonstrate understanding of theoretical and classroom material.

Specialized training will be provided as needed to instruct workers in the use of nonstandard equipment, in the performance of abnormal operations, and in the hazards of specific activities.

Specialized training could be provided by on-the-job training activities, classroom instruction and testing, or pre-job briefings. The depth of training in any discipline will be commensurate with the degree of the hazard(s) involved and the knowledge required for task performance.

Some activities will require the acquisition of expert services as opposed to project staff training.

The contractor Training Program will provide workers with the knowledge and skills necessary to safely execute assigned duties. A graded approach will be used to ensure that workers receive a level of training commensurate with their responsibility and that complies with applicable requirements. Specialized employee training will include pre-job safety briefings, plan-of-the-day meetings, and facility/work site orientations. Training and qualifications will be determined as required by job assignment for work activities.

The SSHASP, RWP, and activity hazards analysis will include specific requirements for project activities being conducted, which will include personal protective equipment and required training for project personnel.

5.4 Quality Assurance Requirements

Overall quality assurance for the RAWP will be planned and implemented in accordance with 10 CFR 830, Subpart A, "Quality Assurance Requirements;" EPA/240/B-01/003, *EPA Requirements for Quality Assurance Project Plans*, EPA QA/R-5; and SW-846, *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, Third Edition; Final Update III-A*. The quality assurance activities will use a graded approach based on the potential impact on the environment, safety, health, reliability, and continuity of operations. The approved sampling and analysis plan will contain a quality assurance project plan, which will be used to support the confirmation and verification sampling activities. Other specific activities will include quality assurance implementation, responsibilities and authority, document control, quality assurance records, and audits. These activities are discussed in the following sections.

Best Management Practices/Quality Control

Removal action quality control will be performed in accordance with contractor's best management practices and established quality control program. Such a program will include the following:

- Summary of responsibilities and authorities of all organizations and key personnel involved in the design and construction of the site removal action
- Qualifications of the quality assurance personnel to demonstrate that they possess the training and experience necessary to fulfill their identified responsibilities
- Sampling activities, sample size, sample locations, frequency of testing, acceptance and rejection criteria, and plans for implementing corrective measures as addressed in the plans and specifications
- Descriptions of the reporting requirements for quality assurance activities (including such items as daily summary reports, schedule of data submissions, inspection data sheets, problem identification and corrective measures reports, evaluation reports, acceptance reports, and final documentation) and descriptions of the provisions for the final storage of all records consistent with overall requirements of the contractor's records management program.

5.5 Post-Removal Action Activities

Post-removal action activities for each 200-MG-1 OU waste site include sample collection, demonstration of attainment of removal action objectives, and generation of documentation for waste site closure as summarized in the following subsections.

5.5.1 Post-Removal Action Sample Collection

Verification samples of the residual soil from the excavated site will be collected in accordance with Section 2.3 and, where applicable, an approved sampling and analysis plan. Results from samples collected will be used to demonstrate attainment of the removal action objectives. Data packages will be submitted to the Administrative Record.

5.5.2 CERCLA Cleanup Documentation

After completion of the removal action activities for either CS/NFA or RTD, a removal action completion report will be completed for use in future remedial actions and to support the eventual deletion of the waste site from the NPL. The report will be placed in the Administrative Record.

At a minimum, the following documentation is required for the 200-MG-1 OU waste sites:

- Description of current waste site condition after removal action
- Basis for reclassification
- Verification sampling results that indicate RALs are achieved.

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Appendix A

Site-Specific RAL Tables and Field Schedule for 200-MG-1 Operable Unit Waste Sites

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A1 Introduction

Tables A-1 and A-2 provide the site-specific RALs (based on COPCs and process knowledge identified in DOE/RL-2008-44, *Engineering Evaluation/Cost Analysis for the 200-MG-1 Operable Unit Waste Sites*) to support removal actions at the 11 wastes.

Table A-3 provides the project schedule to support removal actions at the 11 sites as listed in Section 1.1, Table 1-1.

Table A-1. Radioactive RALs for Eleven Waste Sites

Contaminant of Concern	Background Concentration (pCi/g)[a]	RALs (pCi/g)			
		Direct Exposure[b] (pCi/g)	Soil Cleanup Level for Groundwater Protection[c] (pCi/g)	Required Detection Limit (pCi/g)	Overall RALs (pCi/g)
Americium-241	NA	31.1	NA[d]	1.0	31.1
Cesium-137	1.1	6.2	1,465	0.1	6.2
Europium-152	NA	3.3	NA[d]	0.1	3.3
Europium-154	0.033	3.0	NA[d]	0.1	3.0
Europium-155	0.054	125	NA[d]	0.1	125
Plutonium-238	0.004	38.8	NA[d]	1.0	38.8
Plutonium-239/240	0.025	33.9	NA[d]	1.0	33.9
Strontium-90	0.18	4.5	27.6	1.0	4.5
Uranium-233/234	1.1	1.1	1.1	1.0	1.1
Uranium-235	0.11	0.61	0.5	0.5	0.5
Uranium-238	1.1	1.1	1.1	1.0	1.1

a. If Hanford Site-specific background data are not available, values are then taken from Ecology Publication No. 94-115, *Natural Background Soil Metals Concentrations in Washington State*. Hanford Site background values are available from nonradiological background data in DOE/RL-92-24, *Hanford Site Soil Background*, Table D9-2; radiological background data are from DOE/RL-96-12, *Hanford Site Background: Part 2, Soil Background for Radionuclides*, Table 5-1.

b. Radionuclide concentrations for beta/gamma in water correspond to a 4 mrem/yr dose from EPA/540-R-00-007, *Soil Screening Guidance for Radionuclides: User's Guide*. Calculations are based on either RESRAD or WDOH/320-015, *Hanford Guidance for Radiological Cleanup*.

c. Soil concentration for groundwater protection were calculated using RESRAD with the maximum contaminant levels calculated from National Bureau of Standards (NBS Handbook 69, *Maximum Permissible Body Burdens and Maximum Permissible Concentrations of Radionuclides in Air or Water for Occupational Exposure*) maximum permissible concentration as cited in EPA/540-R-00-007 or from 40 CFR 141.66, "Maximum Contaminant Levels for Radionuclides."

d. RESRAD predicts constituent will not reach groundwater within 1,000 years based on 100 Area generic site model using soil column layers and depths.

NA = not available

REDRAD = RESidual RADioactivity (dose model)

Table A-2. Nonradioactive RALs for Eleven Waste Sites

Contaminant of Concern	Background Concentration[a] (mg/kg)	RALs (mg/kg)				Ecological Risk Screening Values[g] (mg/kg)
		Direct Exposure[b] (mg/kg)	Soil Cleanup Level for Groundwater Protection[c] (mg/kg)	Required Detection Limit (mg/kg)	Overall RALs (mg/kg)	
Antimony	5	32	5.4	0.6	5.4	5
Arsenic	6.5	6.5[d]	6.5[d]	10	6.5[d]	7
Barium	132	16,000	1,650	2	1,650	102
Beryllium	1.51	160	63.2	0.5	63.2	10
Boron	NA	16,000	210	2	210	0.5
Cadmium	0.81	80	0.81[d]	0.5	0.81[d]	4
Chromium total	18.5	120,000	2,000	1	2,000	42
Chromium (VI)	NA	240	f	0.5	f	N/A
Cobalt	15.7	24	15.7[d]	2	15.7[d]	20
Copper	22.0	3,200	284	1	284	50
Lead	10.2	250	3,000	5	250	50
Lithium	33.5	160	192	2.5	160	35
Manganese	512	3,760	512[d]	5	512[d]	1100
Mercury	0.33	24	2.09	0.2	2.09	0.1
Nickel	19.1	1,600	130	4	130	30
Selenium	0.78	400	5.2	1	5.2	0.3
Silver	0.73	400	13.6	0.2	13.6	2
Strontium	NA	48,000	2,920	1	2,920	N/A
Tin	NA	48,000	48,000	10	48,000	50
Uranium (soluble salts)	3.21	240	3.21[d]	1	3.21[d]	5
Vanadium	85.1	560	2,240	2.5	560	2
Zinc	67.8	24,000	5,970	1	5,970	86
PCB Aroclor-1016	NA	0.5	0.094	0.017	0.094	0.65
PCB Aroclor-1221	NA	0.5	0.017[d]	0.017	0.017[d]	0.65
PCB Aroclor-1232	NA	0.5	0.017[d]	0.017	0.017[d]	0.65
PCB Aroclor-1242	NA	0.5	0.039	0.017	0.039	0.65
PCB Aroclor-1248	NA	0.5	0.039	0.017	0.039	0.65
PCB Aroclor-1254	NA	0.5	0.066	0.017	0.066	0.65
PCB Aroclor-1260	NA	0.5	0.72	0.017	0.5	0.65

Table A-2. Nonradioactive RALs for Eleven Waste Sites

Contaminant of Concern	Background Concentration[a] (mg/kg)	RALs (mg/kg)				
		Direct Exposure[b] (mg/kg)	Soil Cleanup Level for Groundwater Protection[c] (mg/kg)	Required Detection Limit (mg/kg)	Overall RALs (mg/kg)	Ecological Risk Screening Values[g] (mg/kg)
Acenaphthene	NA	4,800	98	0.33	98	20
Acenaphthylene	NA	4,800	98	0.33	98	N/A
Anthracene	NA	24,000	2,270	0.33	2,270	N/A
Benzo(a)anthracene	NA	1.37	0.86	0.33	0.86	N/A
Benzo(a)pyrene	NA	0.137	2.33	0.33	0.33[d]	12
Benzo(b)fluoranthene	NA	1.37	2.95	0.33	1.37	N/A
Benzo(g,h,i)perylene	NA	2,400	25,700	0.33	2,400	N/A
Benzo(k)fluoranthene	NA	1.37	21.5	0.33	1.37	N/A
Chrysene	NA	13.7	9.56	0.33	9.56	N/A
Dibenz(a,h)anthracene	NA	1.37	4.29	0.33	1.37	N/A
Fluoranthene	NA	3,200	631	0.33	631	N/A
Fluorene	NA	3,200	101	0.33	101	30
Indeno(1,2,3-cd) pyrene	NA	1.37	8.33	0.33	1.37	N/A
Naphthalene	NA	1,600	4.46	0.33	4.46	N/A
Phenanthrene	NA	24,000	1,140	0.33	1,140	N/A
Pyrene	NA	2,400	655	0.33	655	N/A
Carbon tetrachloride	NA	7.69	0.0031	0.005	0.005	N/A
Nitrate (as nitrogen)	11.8	128,000	40	0.75	40	N/A
TPH-diesel[e]	NA	2,000	2,000	5	2,000	200
TPH-kerosene[e]	NA	2,000	2,000	5	2,000	200

a. If Hanford Site-specific background data are not available, values are then taken from Ecology Publication No. 94-115, *Natural Background Soil Metals Concentrations in Washington State*. Hanford Site background values are available from nonradiological background data in DOE/RL-92-24, *Hanford Site Soil Background*, Table D9-2; radiological background data are from DOE/RL-96-12, *Hanford Site Background: Part 2, Soil Background for Radionuclides*, Table 5-1.

b. The direct-contact values were obtained from WAC 173-340-900, "Tables," Table 740-1.

c. The groundwater protection values were obtained using equations provided in WAC 173-340-747(4), "Deriving Soil Concentrations for Ground Water Protection," with the physical parameters obtained from http://www.ecy.wa.gov/.

d. Where cleanup levels are less than background or RDLs, cleanup levels default to background or RDLs in accordance with WAC 173-340-700(6)(d), "Overview of Cleanup Standards," and WAC 173-340-707(2), "Analytical Considerations," respectively.

e. The direct-contact values were obtained from WAC 173-340-900, Table 740-1. The groundwater protection values

Table A-2. Nonradioactive RALs for Eleven Waste Sites

Contaminant of Concern	Background Concentration[a] (mg/kg)	RALs (mg/kg) Direct Exposure[b] (mg/kg)	Soil Cleanup Level for Groundwater Protection[c] (mg/kg)	Required Detection Limit (mg/kg)	Overall RALs (mg/kg)	Ecological Risk Screening Values[g] (mg/kg)

were obtained using equations provided in WAC-173-340-747(4) with the physical parameters obtained from http://www.ecy.wa.gov/.

f. Based on process knowledge, chromium (VI) is not expected to be present at 200-MG-1 OU waste sites. The following values are given to help guide cleanup:

- 0.2 mg/kg – calculated value using K_d=0, based on PNNL-13895, *Hanford Contamination Distribution Coefficient Database and Users Guide* and WAC 173-340-747, "Deriving Soil Concentrations for Groundwater Protection," equation 747-1.
- 2.1 mg/kg – based on DOE/RL-96-17, *Remedial Design Report/Remedial Action Work Plan for the 100 Area.*
- 18.4 mg/kg – based on Ecology 2007, *Cleanup Levels & Risk Calculations (CLARC).*

g. The ecological values provided in this table are for screening purposes only and are not considered cleanup levels for this removal action. If cleanup verification sampling values exceed the ecological screening values provided, additional analysis will be conducted in the remedial investigation/feasibility study and ecological risk assessment for the Central Plateau in order to make final cleanup decisions.

N/A = not applicable
K_d = distribution coefficient
PCB = polychlorinated biphenyl
TPH = total petroleum hydrocarbon

Table A-3. Schedule for 200-MG-1 OU – First 11 Waste Sites

Activity	Start Date	End Date
Field execution	07/11/2009	11/20/2009
Data analysis at laboratory	08/03/2009	11/20/2009
Interim closure of sites	08/13/2009	12/30/2009

A2 References

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Appendix B

Waste Site Attributes

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Appendix B

Waste Site Attributes

This appendix presents attributes of each site evaluated to determine the preferred removal action alternative. Table B-1 is organized by site type, which allows a row-by-row comparison by waste site type. The table also lists the attributes of the 200-MG-1 OU waste sites. The following attributes are given in the table:

- Waste site code
- Current status
- Waste site type
- Waste site name
- Facility area
- Physical setting
- Backfill status
- Surface cover status
- Surface cover thickness
- Site area, length, width, depth
- Potential contaminant interval
- Summary of prior cleanup activities
- Release mechanism
- Release type
- Potential constituents (radioactive and nonradioactive).

Waste site descriptions and other information are quoted directly from the Waste Information Data System database and other references. No modifications have been made to maintain consistent format.

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Table B-1. 200-MG-1 Operable Unit, 11 Waste Site Attributes

Waste Site Code	Current Status	Waste Site Type	Waste Site Name	Facility Area	Physical Setting	Back-fill (Y/N)	Surface Cover Present (Y/N)	Surface Cover Thickness (ft)	Site Area (ft^2)	Site Length (ft)	Site Width (ft)	Site Depth (ft)	Potential Cont. Interval (ft)	Prior Cleanup Activities	Release Mechanism	Release Type (Solid and/or Liquid)	Potential Constituents	
																	Radiological	Nonradiological
600-36	Inactive	Burn Pit	600-36, Ethel Railroad Siding (Burn Pit)	200 E Ponds Area	Burn Pit	N	N	None	1.8E+4	60	300	Unk.	0-1 (spotty)	None	Dumping Area	Solid and Liquid	None	Misc. debris, demolition and inert waste
600-262	Inactive	Crib	600-262, West Lake Test Crib	200 E Ponds Area	Test Crib and Wells	N	N	None	4	2	2	2	2-15	None	Test Site	Liquid	Sr-85	Calcium nitrate
200-E-110	Inactive	Dumping Area	200-E-110, Contaminated Tumbleweed Dump Site	200 E Ponds Area	Dumping Area	N	N	None	5046	87	58	Unk.	0-1 (spotty)	In 1999, the bulk of the tumbleweeds were removed, leaving only fragments.	Vegetation (tumble-weeds)	Solid	Contaminated Vegetation	None
600-218	Inactive	Dumping Area	600-218, H-61-H Anti-Aircraft Artillery Site Dumping Area	W. 200 W Area	Dumping Area	N	N	None	1.6E+4	243	67	Unk.	0-3 (spotty)	None	Dumping Area	Solid and Liquid	None	Oil and paint, misc. trash and construction debris
600-38	Inactive	Dumping Area	600-38, Railroad Siding Susie, 600-25, Susie Junction	W. 200 E Ponds Area	Dumping Area	N	N	None	3.6E+6	Irr.	Irr.	Unk.	0-3 (spotty)	Most of the trash, including the drums, had been removed by 1996.	Dumping Area	Solid and Liquid	None	Misc. debris, demolition and inert waste, asbestos, petroleum hydrocarbon
600-40	Inactive	Dumping Area	600-40, West of West Lake Dumping Area	200 E Ponds Area	Dumping Area	N	N	None	5242	Irr.	Irr.	Unk.	0-1 (spotty)	None	Dumping Area	Solid	None	Misc. debris, demolition and inert waste
600-51	Inactive	Dumping Area	600-51, Chemical Dump, Pile of White Powder	N. 200 E Ponds Area	Dumping Area	N	N	None	15	3	5	Unk.	0-1	A sample of this material was analyzed with the HAZCAT field analysis kit. The bulk of this material appears to be a sodium compound. The sodium compound has been removed.	Dumping Area	Solid	None	Unk.
200-E-101	Active	Experiment/ Test Site	200-E-101, 200 East Deep Lysimeter Site	BC Con-trolled Area	Experiment/ Test Site	N	N	None	591	59	10	Unk.	58-60	The open bottom pit was decommissioned in 1994; the access pipes and cables were removed.	Test Site	Unk.	Short-lived isotope tracers	Lead bricks
600-275	Inactive	Foundations	600-275, 218-W-14, Igloo Site, Army Ammo Site, Regulated Storage Area	W. 200 W Area	Storage Yard	N	N	None	3.3E+6	2050	1625	Unk.	0-6 (spotty)	The bunkers, guard house and fence have been removed. The stored scrap has been removed.	Leak/ Spill	Solid and Liquid	Plutonium scrap	Carbon tetrachloride
OCSA	Inactive	Foundations	Old Central Shop Area, Central Shop Area	200 E Ponds Area	Foundations	N	N	None	1.1E+7	Irr.	Irr.	Unk.	0-2 (spotty)	None	Former Construction Staging Area With Fuel Tanks	Solid and Liquid	None	Misc. debris, demolition and inert waste, petroleum hydrocarbons

Table B-1. 200-MG-1 Operable Unit, 11 Waste Site Attributes

Waste Site Code	Current Status	Waste Site Type	Waste Site Name	Facility Area	Physical Setting	Back-fill (Y/N)	Surface Cover Present (Y/N)	Surface Cover Thickness (ft)	Site Area (ft^2)	Site Length (ft)	Site Width (ft)	Site Depth (ft)	Potential Cont. Interval (ft)	Prior Cleanup Activities	Release Mechanism	Release Type (Solid and/or Liquid)	Potential Constituents	
																	Radiological	Nonradiological
UPR-600-21	Inactive	Unplanned Release	UPR-600-21, Contamination found Northeast of 200 East Area, UN-216-E-31	200 E Ponds Area	Outlying Area	N	N	None	Unk.	Irr.	Irr.	Unk.	0-1 (spotty)	The majority of contamination was removed using buckets and shovels. Other specs may have decayed below detectable limits. An additional radiation survey was done on June 22, 1993, of the previously down-posted railroad track area. This survey concluded contamination levels were at less than detection levels.	Vegetation (tumble-weeds)	Solid	Unk.	None

Column titled "Backfill" is defined as soil being replaced inside a waste sites to refill it to grade; however, this action is not associated with construction (e.g., cribs being backfilled with gravel) of the waste site.
Column titled "Surface cover present" is defined as soils that were added to a waste site above grade and column "Surface cover thickness" is only used when there is a "Y" in surface cover present.

HAZCAT = Hazard Categorization
Irr = irregular
LERF = Liquid Effluent Retention Facility
OSCA = Old Central Shop Area
Unk. = unknown
WM = waste management

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