0059823

ACTION MEMORANDUM

SITE NAME AND LOCATION

U.S. Department of Energy
200 West Area, Central Waste Complex, 183-H Solar Evaporation Basin Waste
Hanford Site
Benton County, Washington

I. STATEMENT OF BASIS AND PURPOSE

The purpose of this Action Memorandum is to document approval of the proposed non-time-critical removal action described herein for the 183-H Solar Evaporation Basin (183-H Basin) waste located at the Central Waste Complex (CWC), U.S. Department of Energy's (DOE's) 200 West Area, Hanford Site, Benton County, Washington.

This removal action shall reduce the risks to human health, the environment, and site workers by minimizing the potential for release of hazardous substances by removing and disposing the 183-H Basin waste that is currently stored at the CWC in the 200 West Area. The waste originated from the 183-H Basins, which are located in the 100-H Area of the Hanford Site.

This Action Memorandum has been developed in accordance with the *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA), as amended by the *Superfund Amendments and Reauthorization Act of 1986*, and to the extent practicable, in accordance with the *National Oil and Hazardous Substances Pollution Contingency Plan* (NCP). This decision is based on the Administrative Record for the site.

A public comment period was held from March 31 through April 29, 2003, on the DOE report entitled *Engineering Evaluation/Cost Analysis (EE/CA) for Disposition of Mixed Waste from the 183-H Solar Evaporation Basins* (DOE/RL-2002-63). Two comment letters were received and were supportive of the action. One commenter also pointed out that a waste designation was attributed to the federal regulations rather than the state regulations. The other also questioned what would happen if the treated wastes did not meet the waste acceptance criteria at the disposal facility. No changes to the proposed remedy were necessary. The comments and responses to these comments are filed in the Administrative Record for this site.

II. BACKGROUND AND FACILITY DESCRIPTION

A. Background

The Hanford Site is a Federal facility managed by DOE. In1943, Hanford began producing plutonium for nuclear weapons using reactors and chemical processing. The Hanford Site occupies approximately 1,517 km^2 (586 mi^2) along the Columbia River in Benton County, which

is in southeastern Washington State. Hanford is located north and west of the cities of Richland, Kennewick, and Pasco, an area commonly known as the Tri-Cities. Hanford was added to the National Priorities List in November 1989.

The 183-H Basins included a series of 16 concrete basins in the Hanford Site's 100-H Area that were originally used to support the 183-H Water Treatment Facility associated with operation of H Reactor. In 1973, 4 of the 16 basins, which are the subject of this Action Memorandum, were designated to treat chemical wastes generated during the fabrication of nuclear fuel in the 300 Area. The remaining 12 basins were demolished in 1974. Very small quantities of compatible chemical wastes (e.g., unused inorganic laboratory chemicals) were also discharged into the basins on a nonroutine basis. The treatment process in the basins consisted of natural solar evaporation to achieve volume reduction of the waste. In 1985, the last shipment of process waste was sent to the 183-H Basins.

Closure of the remaining four 183-H Basins began in 1986 and was completed in 1996. The primary document that enabled cleanup to proceed was a *Resource Conservation and Recovery Act of 1976* (RCRA) closure plan approved by the Washington State Department of Ecology (Ecology), which is included in the Hanford Facility RCRA Permit. Completed closure activities consisted of removing chemical wastes, sediment, and debris from the basins, and then sandblasting and scabbling the basin walls to remove contaminated concrete. A CERCLA remedial action was conducted in 1996 that involved demolishing and disposing the remaining concrete structures and equipment and removing the underlying soil. Cleanup of the 183-H Basins has involved implementation of both the RCRA and CERCLA authorities.

Waste generated during the RCRA closure was packaged into drums and boxes in preparation for storage because, at the time these waste streams were generated, the Hanford Site lacked the capacity for treating and disposing these mixed wastes (i.e., radioactive and hazardous). Approximately 12,235 drums and 48 boxes of mixed waste streams were generated and transferred to the CWC during 183-H Basin cleanup. These wastes are the subject of this Action Memorandum. Wastes generated during the 1996 CERCLA remedial action were disposed at the Environmental Restoration Disposal Facility (ERDF).

III. THREAT TO PUBLIC HEALTH/WELFARE/ENVIRONMENT

The 183-H Basin waste is contaminated with hazardous substances, including radionuclides. The waste is currently stored in containers in the CWC; however, continued long-term storage does not reduce the risks to public health and welfare or to the environment. Continued storage requires weekly physical inspections to ensure container integrity and legible labeling. More significantly, several inspections have revealed breached containers or questionable container integrity, and the affected containers must be overpacked to mitigate further breaching and prevent the release of hazardous substances that could cause substantial risk to site workers and the environment. Overpacking involves placing waste containers into larger containers (i.e., overpack containers), adding absorbent material, placing a lid on the overpack container, applying new labels, and placing the overpack container on a pallet. The inspection and overpacking activities expose site workers to the hazards associated with the waste, and the large number of containers results in substantial cumulative risk to workers. The dose incurred by

workers at the CWC as a result of managing the 183-H Basin waste is estimated at 2,100 millirem/year, and the dose incurred increases as the need for overpacking increases. In addition, radionuclides are known carcinogens, and the nonradioactive contaminants present the potential for both carcinogenic and acute toxicity risks. In the event of a container breach, workers could be exposed directly to these contaminants through skin contact, ingestion, or inhalation. Industrial hazards are associated with the operation of equipment used in overpacking (e.g., hoists, forklifts, and banding machines).

The waste streams that exhibit elevated sodium nitrate concentrations present a physical risk due to their oxidizing nature that could accelerate the combustion of organic matter. A potential threat to the environment exists because the containers continue to deteriorate during storage. Although breached containers can be overpacked, overpacks will not maintain containment indefinitely.

IV. ENDANGERMENT DETERMINATION

Although the 183-H Basin waste has been stored in compliance with regulations, as the containers continue to age the threat of a potential release increases and could present a risk to human health and the environment. Actual or threatened releases of hazardous substances from the 183-H Basin waste, as the containers continue to age and deteriorate, may present an imminent and substantial endangerment to public health, welfare, or the environment. The response action selected herein is necessary to protect the public health, welfare, or the environment from actual or threatened releases of hazardous substance into the environment.

V. PROPOSED ACTIONS AND ESTIMATED COSTS

An EE/CA was prepared to develop removal action alternatives for the 183-H Basin waste. Three removal action alternatives were evaluated in the EE/CA. These three alternatives are briefly discussed below. The Department of Energy is responsible for all costs of the alternatives.

1. Alternative 1 – No Action

The no action alternative would consist of continued storage of the 183-H Basin waste at the CWC for an indefinite period of time. The waste containers would be inspected on a routine basis, and maintenance (e.g., repackaging leaking containers) would be performed as needed. Although these inspection and maintenance activities are more involved than the typical no action alternative under CERCLA, the activities would be necessary to maintain compliance with RCRA requirements. Access by the general public to the CWC would be prevented through ongoing Hanford Site access restrictions. There would continue to be a potential that a release could expose site workers to hazardous substances over time as the containers continue to age and deteriorate. Additionally, surveillance and maintenance would continue on the waste at some incremental cost.

2. Alternative 2 – Treatment/ERDF Disposal

The alternative for treatment/ERDF disposal (which was identified as the preferred alternative in the EE/CA) would consist of preparing the 183-H Basin waste containers for shipment at the CWC, transporting the containers to the ERDF, treating a portion of the waste at the ERDF, and disposing the treated waste and the waste not requiring treatment to the ERDF. The ERDF is designed to meet RCRA Subtitle C landfill requirements because it has a double liner and a leachate collection system. The ERDF is equivalent to a RCRA permitted treatment, storage, and disposal facility and is an acceptable disposal facility for this action. The treatment for each subset of 183-H waste streams is summarized in Table 1.

Table 1, Treatment/ERDF Disposal Alternative: Meeting LDR Treatment Standards. (2 Pages)

Waste Stream	Waste Codes and LDR Treatment Standards (WAC 173-303-140)	UHCs	LDR Compliance Approach Proposed in Treatment/ERDF Disposal Alternative
Basin 3 solids	• U123 – combustion • P029, 030, 098, 106 – total Cn <590 mg/kg, amenable Cn <30 mg/kg • P120 – stabilization	N/A	• U123 – treatability variance • P029, 030, 098, 106 – standards already met in waste • P120 – treatability variance
Repackaged solids	• U123 – combustion • P029, 030, 098, 106 – total Cn <590 mg/kg, amenable Cn <30 mg/kg • P120 – stabilization	N/A	• U123 – treatability variance • P029, 030, 098, 106 – standards already met in waste • P120 – treatability variance
Solidified liquid (includes solidified seepage liquids)	• U123 – combustion • P029, 030, 098, 106 – total Cn <590 mg/kg, amenable Cn <30 mg/kg • P120 – stabilization	N/A	• U123 – treatability variance • P029, 030, 098, 106 – standards already met in waste • P120 – treatability variance
Sandblast grit	• U123 – combustion • P029, 030, 098, 106 – total Cn <590 mg/kg, amenable Cn <30 mg/kg • P120 – stabilization	N/A	• U123 – treatability variance • P029, 030, 098, 106 – standards already met in waste • P120 – treatability variance
Miscellaneous waste[a]	• U123 – combustion • P029, 030, 098, 106 – total Cn <590 mg/kg, amenable Cn <30 mg/kg • P120 – stabilization • Organic/carbonaceous waste – land disposal prohibited unless treatment facilities not available	N/A	• U123 – treatability variance • P029, 030, 098, 106 – standards already met in waste • P120 – treatability variance • Organic/carbonaceous – no treatment required; facilities not available

Table 1. Treatment/ERDF Disposal Alternative: Meeting LDR Treatment Standards. (2 Pages)

Waste Stream	Waste Codes and LDR Treatment Standards (WAC 173-303-140)	UHCs	LDR Compliance Approach Proposed in Treatment/ERDF Disposal Alternative
Basin 4 solids	• U123 – combustion • P029, 030, 098, 106 – total Cn <590 mg/kg, amenable Cn <30 mg/kg • P120 – stabilization • D001 – deactivation and meet 40 CFR 268.48 standards (UTS) or recovery of organics or combustion D007 – Cr <0.6 mg/L TCLP and meet the requirements of 40 CFR 268.48 • D009 (low-mercury non-RMERC residual subcategory) – Hg <0.025 mg/L TCLP and meet the requirements of 40 CFR 268.48 • D011 – Ag <0.14 mg/L TCLP and meet the requirements of 40 CFR 268.48	Sb, Pb, Tl, Cd	• U123 – treatability variance • P029, 030, 098, 106 – standards already met in waste • P120 – treatability variance • D001 – deactivation by chemical reduction • D007, D009, D011 – reduction of leachability to LDR standard via cement stabilization • UHCs – reduction of leachability to UTS via cement stabilization
Precipitated crystal solids	• U123 – combustion • P029, 030, 098, 106 – total Cn <590 mg/kg, amenable Cn <30 mg/kg • P120 – stabilization • D001 – deactivation and meet 40 CFR 268.48 standards or recovery of organics or combustion	Tl	• U123 – treatability variance • P029, 030, 098, 106 – standards already met in waste • P120 – treatability variance • D001 – deactivation by chemical reduction

[a] Secondary waste consisting of debris such as protective clothing, pallets, and equipment generated during waste management.

CFR = *Code of Federal Regulations*
Cn = cyanide
LDR = land disposal restriction
N/A = not applicable
RMERC = roasting or retorting of mercury-bearing hazardous wastes
TCLP = toxicity characteristic leaching procedure
UTS = universal treatment standard
UHC = underlying hazardous constituent
WAC = *Washington Administrative Code*

Note: While specific waste codes are stated above, changes to specific waste codes may be necessary. If any changes are necessary, they will be documented in the removal action work plan or in a letter to file following issuance of the Action Memorandum. For example, TCLP data was found for Basin 3 solids indicating that this waste stream is not a characteristic hazardous waste.

The 183-H Basin waste containers would be transported from the CWC to the ERDF using trucks/flatbed trailers; for waste that would be direct disposed, ERDF roll-off containers may be used. Waste not requiring treatment would be directly disposed at the ERDF. Waste management personnel at the CWC would ensure that the waste is packaged and the transport vehicle is placarded for shipment in compliance with applicable requirements.

Approximately 5,700 drums and 17 boxes of 183-H Basin waste (consisting of the Basin 4 solids and precipitated crystal waste) require treatment to eliminate the characteristic of ignitability, toxicity for heavy metals and to meet standards for underlying hazardous constituents (UHCs) before disposal at the ERDF (note that the precipitated crystal only requires treatment for the ignitability characteristic and UHCs). They may also require stabilization in the event that free liquids are encountered.

This alternative is protective of human health and the environment and would satisfy the applicable or relevant and appropriate requirements (ARARs). The total estimated cost of this alternative is $3,700,000.

3. Alternative 3 – No Treatment/ERDF Disposal

The alternative for no treatment/ERDF disposal would consist of preparing the 183-H Basin waste containers at the CWC, transporting the containers to the ERDF, and placing the waste in the ERDF cells. At the ERDF, the containers would be offloaded, placed directly into the ERDF cell, compacted, and buried. This alternative would not satisfy all of the ARARs and would not be as protective of human health and the environment as the alternative for treatment/ERDF disposal.

The total estimated cost of this alternative is $2,100,000.

A. Applicable or Relevant and Appropriate Requirements

As required by CERCLA, removal actions shall, to the extent practicable considering the exigencies of the situation, satisfy the ARARs. The selected alternative (treatment/ERDF disposal) will comply with all of the identified Federal and state ARARs. No CERCLA ARAR waivers are being requested. The ARARs identified for this removal action are as follows:

- *Hazardous Waste Management Act of 1976* (*Revised Code of Washington* [RCW] 70.105) and "Dangerous Waste Regulations" (WAC 173-303) – This RCRA-authorized state program is applicable to the identification and generation of dangerous waste (which includes all federally regulated hazardous waste under RCRA) and the storage, transportation, treatment, and disposal of the wastes generated during the removal action that designate as dangerous waste.

- "Land Disposal Restrictions," *Washington Administrative Code* (WAC) 173-303-140 – Establishes the treatment requirements and disposal prohibitions for dangerous waste, including the invocation of Federal LDRs identified in 40 *Code of Federal Regulations* (CFR) 268.

- "Land Disposal Restrictions," 40 CFR 268 – Establishes treatment standards for LDR hazardous waste (40 CFR 268.40) and hazardous debris (40 CFR 268.45), including treatment of UHCs (40 CFR 268.48), where applicable. The 183-H Basin waste will be treated to meet these standards, except for constituents subject to a treatability variance pursuant to 40 CFR 268.44, as described below.

- "Variance from a Treatment Standard" (40 CFR 268.44(h)(2)) – Establishes the requirements for obtaining a variance from a treatment standard that are applicable to Alternative 2 (treatment/ERDF disposal). The alternate treatment standards for the 183-H Basin waste are for the waste codes P120 (vanadium pentoxide) and U123 (formic acid). Upon approval of this Action Memorandum, the alternate standard set for P120 is established equal to the background level of vanadium in Hanford Site soils at the true upper 90th percentile, which is 85.1 mg/kg. The alternate standard set for U123 is established at 160,000 mg/kg of formate, which is equal to the *Model Toxics Control Act* cleanup regulation (WAC 173-340-740[3]) direct contact pathway cleanup standard for formate in residential soils.

- "Licensing Requirements for Land Disposal of Radioactive Wastes" (10 CFR 61) – Establishes the requirements for management and disposal of radioactive waste at U.S. Nuclear Regulatory Commission-licensed facilities. Substantive provisions are relevant and appropriate for radioactive wastes disposed at ERDF.

- *Clean Air Act* (42 U.S.C. 7401, et seq.) and "National Emissions Standards for Hazardous Air Pollutants" (40 CFR 61, Subpart H) – Limits airborne radionuclide emissions from all combined operations at the Hanford Site to less than 10 mrem/year effective dose equivalent to the hypothetical offsite maximally exposed individual. Applicable to the handling and treatment of 183-H Basin waste to ensure that the 10 mrem/year limit is not exceeded.

- "Radiation Protection – Air Emissions" (WAC 246-247) – Applicable to CERCLA activities that will result in airborne emissions of radionuclides, including the requirement to provide for best available radionuclide control technology (BARCT) and periodic confirmatory air monitoring. Applicable to handling and treatment of 183-H Basin waste. Compliance will be attained by conforming with the existing ERDF air monitoring plan.

B. Project Schedule

This removal action is expected to begin in June 2003 and to be completed by October 1, 2006. This Action Memorandum requires DOE to submit the following reports/documents to the U.S. Environmental Protection Agency (EPA) for review and approval:

- Removal action work plan that shall describe how DOE will comply with this Action Memorandum, including ARARs. The work plan must be approved prior to initiating any removal work.

- Treatment plan prior to treatment of waste at the ERDF. This plan must be approved prior to initiating treatment.

VI. EXPECTED CHANGE SHOULD ACTION BE DELAYED OR NOT TAKEN

The expected change to the 183-H Basin waste, should action be delayed or no action taken, would be that the waste would remain as it currently is today. Because the waste containers would continue to deteriorate, there would continue to be a potential that a release could expose

site workers to hazardous substances over time. Additionally, workers will continue to accumulate dose from monitoring and inspecting the containers.

VII. OUTSTANDING POLICY ISSUES

None.

VIII. RECOMMENDATION

Alternative 2, (treatment/ERDF disposal) is the selected removal action for the 183-H Basin waste that is currently stored at the 200 West Area's CWC. The alternative is protective of human health and the environment and is cost effective. This removal action addresses the mandate for permanence and treatment to the maximum extent practicable. Additionally, a treatability variance is approved for formic acid and vanadium pentoxide, as outlined in the *Engineering Evaluation/Cost Analysis (EE/CA) for Disposition of Mixed Waste from the 183-H Solar Evaporation Basins* (DOE/RL-2002-63).

The preamble to the NCP states that when noncontiguous facilities are reasonably close to one another and the wastes at these sites are compatible for a selected treatment or disposal approach, CERCLA Section 104(d)(4) allows the lead agency to treat these related facilities as one site for response purposes and, therefore, allows the lead agency to manage waste transferred between such noncontiguous facilities without obtaining a permit. Therefore, the CWC and ERDF addressed in this Action Memorandum are reasonably close to one another and are considered to be a single site for response purposes.

Signature sheet for the DOE Hanford Site Action Memorandum covering the 200 West Area Central Waste Complex storage of waste from the 183-H Solar Evaporation Basin. This action is between the U.S. Department of Energy and the U.S. Environmental Protection Agency, with concurrence by the Washington State Department of Ecology.

Michael H. Schlender (for) 6/24/03

Keith A. Klein
Manager, Richland Operations Office
U.S. Department of Energy

Date

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Michael Gearheard
Director, Office of Environmental Cleanup
U.S. Environmental Protection Agency, Region 10

24 June 2003
Date

Signature sheet for the DOE Hanford Site Action Memorandum covering the 200 West Area Central Waste Complex storage of waste from the 183-H Solar Evaporation Basin. This action is between the U.S. Department of Energy and the U.S. Environmental Protection Agency, with concurrence by the Washington State Department of Ecology.

[signature] for — 6/25/03

Michael Wilson
Program Manager, Nuclear Waste Program
Washington State Department of Ecology

Date