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Rev. 0

Sampling and Analysis Instruction for Disposition of Legacy Materials at Pit 6

Prepared for the U.S. Department of Energy, Richland Operations Office
Office of Environmental Restoration

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TABLE

ACRONYMS

BHI	Bechtel Hanford, Inc.
COC	contaminant of concern
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
ERC	Environmental Restoration Contractor
HASQARD	*Hanford Analytical Services Quality Assurance Requirements Document*
HSRCM	*Hanford Site Radiological Control Manual*
ICP	inductively coupled plasma
LDR	land disposal restricted
MSDS	material safety data sheet
PCB	polychlorinated biphenyl
QA	quality assurance
QC	quality control
RCF	Radiological Counting Facility
SAF	sample authorization form
SAI	sampling and analysis instruction
SVOA	semi-volatile organic analyte
TCLP	toxicity characteristic leaching procedure
VOA	volatile organic analyte

METRIC CONVERSION CHART

Into Metric Units			Out of Metric Units		
If You Know	*Multiply By*	*To Get*	*If You Know*	*Multiply By*	*To Get*
Length			**Length**		
inches	25.4	millimeters	millimeters	0.039	inches
inches	2.54	centimeters	centimeters	0.394	inches
feet	0.305	meters	meters	3.281	feet
yards	0.914	meters	meters	1.094	yards
miles	1.609	kilometers	kilometers	0.621	miles
Area			**Area**		
sq. inches	6.452	sq. centimeters	sq. centimeters	0.155	sq. inches
sq. feet	0.093	sq. meters	sq. meters	10.76	sq. feet
sq. yards	0.0836	sq. meters	sq. meters	1.196	sq. yards
sq. miles	2.6	sq. kilometers	sq. kilometers	0.4	sq. miles
acres	0.405	hectares	hectares	2.47	acres
Mass (weight)			**Mass (weight)**		
ounces	28.35	grams	grams	0.035	ounces
pounds	0.454	kilograms	kilograms	2.205	pounds
ton	0.907	metric ton	metric ton	1.102	ton
Volume			**Volume**		
teaspoons	5	milliliters	milliliters	0.033	fluid ounces
tablespoons	15	milliliters	liters	2.1	pints
fluid ounces	30	milliliters	liters	1.057	quarts
cups	0.24	liters	liters	0.264	gallons
pints	0.47	liters	cubic meters	35.315	cubic feet
quarts	0.95	liters	cubic meters	1.308	cubic yards
gallons	3.8	liters			
cubic feet	0.028	cubic meters			
cubic yards	0.765	cubic meters			
Temperature			**Temperature**		
Fahrenheit	subtract 32, then multiply by 5/9	Celsius	Celsius	multiply by 9/5, then add 32	Fahrenheit
Radioactivity			**Radioactivity**		
picocuries	37	millibecquerel	millibecquerel	0.027	picocuries

1.0 INTRODUCTION

This sampling and analysis instruction (SAI) has been prepared to define the sampling and analysis activities to be performed in support of the disposition of materials stored at Pit 6. Pit 6 is located near Richland, Washington, west of Stevens Drive. The Pit 6 site is across from the Hanford Site's 300 Area and is used by the Groundwater/Vadose Integration Project for the storage of materials. There are several materials at this location that require further disposition (e.g., re-use or disposal). These materials are as follows:

- Material #1: Two 110-gal tanks attached to a remediation trailer system believed to contain sodium hydroxide (based on the tanks' labels).

- Material #2: Three 110-gal tanks attached to the same remediation trailer that contains diesel (based upon process knowledge, including visual inspection of the tanks).

- Material #3: One-quart can of Quaker State supreme brake fluid (in original container).

- Material #4: One can of Chesterfield sprayer flux surface lubricant (No. 81702) (in original container).

- Material #5: One can of Kason Corporation heavy-duty grease (Part No. 95, Newark, New Jersey) (in original container).

- Material #6: One 5-gal plastic bucket with snap lid containing Eclipse Gold floor sealer (believed to be in original container).

- Material #7: One small fiberboard box, containing three 120-mL (approximately) glass sample jars (believed to contain oil-contaminated soil samples).

The inside of the remediation system trailer has not recently been evaluated, but the trailer is known to contain piping and possibly a dry materials tank. These materials are not included in the scope of this SAI, nor are the contents of two other remediation trailers that are located at the site.

This section provides background information about the materials, a summary of the material disposition options, a list of contaminants of concern (COCs) for the materials that may require sampling and analysis prior to dispositioning, and decisions that will be made based upon the analytical results.

1.1 BACKGROUND

The Pit 6 site is used by the Groundwater/Vadose Integration Project for storing equipment and materials. The materials of concern for this SAI are associated with three remediation trailer

systems and equipment received in the early 1990s as part of an agreement between the U.S. Department of Energy (DOE) and the U.S. Environmental Protection Agency (EPA). The remediation trailers were never used to support Hanford Site work and have not been used since delivery to the Site. However, Groundwater/Vadose Integration Project personnel have removed miscellaneous hardware for other project uses. With the exception of the soil samples, there is no reason to suspect that any of these materials will be radioactive. Therefore, except for the soil, all potential disposition options will consider that the material may be released as nonradioactive. These materials are not needed and will be evaluated to determine if another suitable use can be identified or if the material will require disposal as waste.

1.2 MATERIAL DISPOSITION ALTERNATIVES

This section provides the proposed disposition alternatives for each of the Pit 6 materials identified in Section 1.0. The alternatives selected for each material are based upon knowledge of the material, which incorporates visual inspection of the materials and containers; container labeling and marking; the age of the material; and the use of material safety data sheets (MSDS). Sampling and analysis will be performed as necessary to supplement existing knowledge to adequately disposition materials for other uses or for disposal. The proposed options for each of the materials are identified below:

- Material #1: The tanks containing sodium hydroxide are marked “CAUSTIC” and “SODIUM HYDROXIDE.” There is no knowledge of the condition or concentration of the sodium hydroxide inside these tanks, other than one tank that is marked with “25% SODIUM HYDROXIDE.” A field pH measurement indicated the material has a pH greater than 14. The contents of the two tanks were transferred on February 21, 2001, into five 55-gal drums suitable containers for storage and shipment to meet the requirements of U.S. Department of Transportation (DOT) regulations. During transfer of the material, visual inspection was performed to evaluate the quality of the sodium hydroxide (including if sediment or precipitate has formed during storage), if the material appears to be unused, and if the material may be suitable for use as a product. The product appeared to be clean and unused. Because of the lack of information concerning the source of this material and its quality, sampling and analysis will be required prior to dispositioning this material either for use as a product or for disposal as a waste.

- Material #2: The contents of the three diesel tanks were transferred into seven 55-gal drums (suitable for storage and DOT transportation) on February 7, 2001. The diesel was visually evaluated during the transfer to support the disposition of this material to an offsite oil recycling facility. Based upon knowledge of this material, no additional sampling and analysis is required.

- Material #3: The 1-quart can of Quaker State supreme brake fluid will be evaluated for excess or will be disposed as waste using the MSDS.

- Material #4: The can of Chesterfield Sprayflex surface lubricant will be evaluated for excess or will be disposed as waste using the MSDS.

- Material #5: The can of Kason Corporation heavy-duty grease will be evaluated for excess or will be disposed as waste using the MSDS.

- Material #6: The 5-gal bucket of Eclipse Gold fast-acting floor sealer is approximately one-third full and will be disposed as waste using the MSDS.

- Material #7: The contents of the fiberboard box believed to contain oil-contaminated soil samples (as indicated by markings on the box and inspection of the inner sample jars) will require sampling and analysis to properly disposition the material. The box is marked with the words, "OIL/SOIL SAMPLES, ULLRICH COPPER, 7/14/89." The box contains three 120-mL (approximately) clear glass sample jars with screw top lids that contain a very oily soil media. Because this box was stored with the remediation trailer and based upon the markings on the box, it is believed that any samples inside this box would be associated with previous non-Hanford use of the remediation trailer. Further investigation has indicated that there is an "Ullrich Copper" company located in New Jersey and that these samples may be associated with EPA site remediation of radium-contaminated soil in New Jersey. Additionally, because the box is dated prior to the arrival of the remediation system trailers at the Hanford Site, it is reasonable to believe that these soil samples are from a New Jersey location and not from the Hanford Site. Because of the lack of knowledge concerning the source of these soil samples, sampling and analysis will be required prior to disposal of the material. All of the soil will be used to perform the laboratory analysis needed to dispose the material and no excess soil will remain that would require disposal by the Environmental Restoration Contractor (ERC).

As a result of the evaluation of the seven materials and the disposition options, only the sodium hydroxide (material #1) and the soil samples (material #7) require sampling and analysis prior to dispositioning. Therefore, materials #2 through #6 will not be carried forward in the sampling and analysis activities described in the remainder of this SAI.

1.3 CONTAMINANTS OF CONCERN

This section provides a list of COCs for the sodium hydroxide and soil samples located at the Pit 6 site. Because these materials have never been located in a radiological control zone, the materials are considered to be nonradioactive and the radionuclides are not COCs, with the exception of the soil. The soil may have naturally occurring radium and thorium as COCs. Each material will have a representative aliquot collected and screened for gross radioactivity at the ERC Radiological Counting Facility (RCF) prior to sample shipment offsite for laboratory analysis.

Based upon evaluation of the materials and lack of knowledge concerning the history of the materials, the following extensive list of chemical categories will apply in lieu of identifying specific chemical COCs for each of the materials (i.e., sodium hydroxide and soil samples):

- Volatile organic constituents
- Semi-volatile organic constituents
- Inorganic constituents
- Pesticides
- Herbicides
- Polychlorinated biphenyls (PCBs)
- Radium and thorium (soil only).

To support waste disposal, the following characteristic waste criteria for an unknown material must be evaluated:

- pH (liquids only)
- Flashpoint
- Reactivity (cyanide and sulfide)
- Toxicity characteristic leaching procedure (TCLP) for volatile organic analytes (VOAs), semi-volatile organic analytes (SVOAs), herbicides, pesticides, and metals.

1.4 PROBLEM DEFINITION

Inadequate information is available to properly disposition the sodium hydroxide and the soil samples located at the Pit 6 site. Sampling and analysis is necessary to determine (1) if the sodium hydroxide could be made available for use as a product or if it must be disposed as waste, and (2) proper disposal for the soil samples.

1.5 DECISIONS TO BE MADE

The following subsections present the decisions that need to be made to resolve the problem identified in Section 1.4 and the inputs needed to resolve each decision.

1.5.1 Decision Statements

1. Determine if the sodium hydroxide is a product that can be used for its intended purpose. If it is, then identify the product on the Hanford Site excess chemical list. If the sodium hydroxide cannot be used for its intended purpose, disposition the product as waste in accordance with decision statements #2 through #9.

2. Determine if the soil samples and sodium hydroxide are listed dangerous wastes and require the assignment of a listed waste codes. If not, do not assign listed dangerous waste codes.

3. Determine if the soil samples and sodium hydroxide are characteristic dangerous wastes (e.g., ignitable, corrosive, reactive, or toxic) and require the assignment of characteristic waste codes. If not, do not assign characteristic waste codes.

4. Determine if the soil samples and sodium hydroxide are toxic dangerous wastes as defined by Washington State Department of Ecology (Ecology) and require the assignment of toxic waste codes. If not, do not assign toxic waste codes.

5. Determine if the soil samples and sodium hydroxide are persistent dangerous wastes as defined by Ecology and require the assignment of persistent waste codes. If not, do not assign persistent waste codes.

6. Determine if the soil samples and sodium hydroxide are PCB-containing wastes and must be regulated as such. If not, do not regulate as PCB wastes.

7. Determine if the soil samples and sodium hydroxide are asbestos-containing wastes and require management as such. If not, do not manage as asbestos wastes.

8. Determine if the soil samples and sodium hydroxide are land disposal restricted (LDR) wastes and must be regulated as such. If not, do not regulate as LDR wastes.

9. If the soil samples and sodium hydroxide are LDR wastes, then determine if they meet treatment standards and disposal facility waste acceptance criteria. If not, perform waste treatment prior to disposal.

10. Determine if the soil samples contain naturally occurring radioactive material (radium and thorium) and will require shipment as radioactive material to the offsite laboratory. If not, do not ship as radioactive material.

1.5.2 Required Inputs for Decision Making

This section describes the informational inputs that are required to make each of the decisions identified in Section 1.5.1 for the sodium hydroxide and the soil samples and to determine which inputs require sampling and laboratory analysis. Based on knowledge of the materials, asbestos is not anticipated and will not be sampled for. The analyses described below for each of the materials will provide the information necessary to answer the decision statements identified in Section 1.5.1.

1.5.2.1 Sodium Hydroxide. To determine if the sodium hydroxide is a chemical product that can be used for its intended purpose and may be provided as a surplus chemical for excess, the specific chemical identification must be confirmed. Additionally, the purity of the chemical must be known, including the concentration of sodium hydroxide and the presence of any potential contaminants. Measurement of alkalinity and specific gravity and analysis of anions will be performed to provide an estimate of the concentration of the sodium hydroxide. Because of the lack of information concerning the material, sampling and analysis for volatile organic

constituents, semi-volatile organic constituents, inorganic constituents (including metals and anions), pesticides, herbicides, PCBs, specific gravity, and alkalinity is required.

If the sodium hydroxide does not qualify as material for excess, then sampling and analysis to support waste disposal is required. Because of the lack of information concerning the chemical, sampling and analysis for volatile organic constituents, semi-volatile organic constituents, metals (including mercury), herbicides, pesticides, PCBs, flashpoint, pH, sulfide, and cyanide is required. The TCLP analysis is not required to be performed on the sodium hydroxide because the sodium hydroxide is considered to be the extract for the purpose of evaluating the toxicity characteristic.

1.5.2.2 Soil Samples. To determine the disposal requirements for the soil samples and because there is a lack of information for this material, sampling and analysis of TCLP VOAs, TCLP SVOAs, TCLP metals, TCLP herbicides, TCLP pesticides, PCBs, sulfide, and cyanide is required. The sample will be screened for radioactivity at the RCF in order to support proper sample shipment to the offsite laboratory. The offsite laboratory may perform additional radiological analysis as necessary to support handling and disposition of the associated sample waste. Because there is insufficient soil (approximately 300 mL) to perform the necessary analysis, a list of priority analysis will be provided on the sample authorization form (SAF) and as identified in Section 3.2.1 of this SAI. The laboratory will be notified of the priority of analyses on the chain-of-custody form and on the SAF. All of material #7 will be used to perform the analysis (with no excess material remaining that would require disposal by the ERC). The laboratory will dispose all samples and analytical related waste.

2.0 PROJECT MANAGEMENT

This section identifies the individuals or organizations participating in the project and discusses the specific roles and responsibilities of the individuals/organizations. This section also discusses the quality objectives for measurement data and discusses the special training requirements for staff performing the work.

2.1 PROJECT/TASK ORGANIZATION

The following organizations will provide support for the sampling efforts:

- The Groundwater/Vadose Zone Integration Project will provide project management, task leadership, and engineering support for the planning and sampling associated with this SAI. Support will include the following:

  - Provide project, task, and engineering management necessary to carry out tasks
  - Coordinate support for sampling activities.

- The Analytical Field Services and Sample Management organizations will provide personnel to support planning and implementation of sampling activities. Support will include the following:

  - Develop and issue the SAF
  - Provide unique sample identification numbers
  - Arrange for laboratory analysis of samples
  - Provide clean certified sample bottle/containers
  - Document sampling activities in a controlled logbook
  - Initiate chain-of-custody documentation for samples
  - Package and ship samples
  - Receive data packages from the laboratory
  - Provide laboratory data packages to the project.

- The Field Support organization will provide field management, field engineering, and coordination of other field support functions as required to perform sampling. This includes the following support:

  - Provide industrial safety support and monitoring during sampling
  - Conduct and document pre-job meetings when supporting sampling.

- The Environmental Technologies organization will provide waste management and sampling support that will include the following:

- Coordinate placement of material on excess list, if appropriate
- Provide waste designation
- Prepare waste profiles
- Provide a Waste Transportation Specialist
- Coordinate waste disposal.

- The Compliance and Quality Programs organization is responsible for performing independent quality assurance (QA) activities, as appropriate.

2.2 QUALITY OBJECTIVES AND CRITERIA FOR MEASUREMENT DATA

The required detection limits and the precision and accuracy requirements for each of the analyses to be performed are summarized in Table 2-1.

Table 2-1. Analytical Performance Requirements. (10 Pages)

Analytical Method[a]	Analyte	CAS #	Action Level			Detection Limit[f]		Accuracy % Recovery	Precision % RSD
			Toxicity Criteria[b]	UTS[c]		Water (µg/L)	Soil (µg/kg)		
				NWW (mg/kg)	WW (mg/L)				
ICP metals (EPA Method 6010)	Aluminum	7429-90-5	N/A	N/A	N/A	200	20,000	75-125	±35
	Arsenic	7440-38-2	5.0 mg/L (100 mg/kg)	5.0 mg/L TCLP	1.4	100	10,000	75-125	±35
	Barium	7440-39-3	100 mg/L (2,000 mg/kg)	21 mg/L TCLP	1.2	200	20,000	75-125	±35
	Iron	7439-89-6	N/A	N/A	N/A	100	10,000	75-125	±35
	Lead	7439-92-1	5.0 mg/L (100 mg/kg)	0.75 mg/L TCLP	0.69	100	10,000	75-125	±35
	Magnesium	7439-95-4	N/A	N/A	N/A	5,000	500,000	75-125	±35
	Manganese	7439-96-5	N/A	N/A	N/A	15	1,500	75-125	±35
	Nickel	7440-02-0	N/A	11 mg/L TCLP	3.98	40	4,000	75-125	±35
	Potassium	7440-09-7	N/A	N/A	N/A	5,000	500,000	75-125	±35
	Silver	7440-22-4	5.0 mg/L (100 mg/kg)	0.14 mg/L TCLP	0.43	20	2,000	75-125	±35
	Sodium	7440-23-5	N/A	N/A	N/A	5,000	500,000	75-125	±35
	Antimony	7440-36-0	N/A	1.15 mg/L TCLP	1.9	60	6,000	75-125	±35
	Beryllium	7440-41-7	N/A	1.22 mg/L TCLP	0.82	5	500	75-125	±35
	Cadmium	7440-43-9	1.0 mg/L (20 mg/kg)	0.11 mg/L TCLP	0.69	5	500	75-125	±35

Table 2-1. Analytical Performance Requirements. (10 Pages)

Analytical Method[a]	Analyte	CAS #	Action Level			Detection Limit[f]		Accuracy % Recovery	Precision % RSD
			Toxicity Criteria[b]	UTS[c]		Water (µg/L)	Soil (µg/kg)		
				NWW (mg/kg)	WW (mg/L)				
	Chromium	7440-47-3	5.0 mg/L (100 mg/kg)	0.6 mg/L TCLP	2.77	10	1,000	75-125	±35
	Cobalt	7440-48-4	N/A	N/A	N/A	50	5,000	75-125	±35
	Copper	7440-50-8	N/A	N/A	N/A	25	2,500	75-125	±35
	Vanadium	7440-62-2	N/A	1.6 mg/L TCLP	4.3	50	5,000	75-125	±35
	Zinc	7440-66-6	N/A	4.3 mg/L TCLP	2.61	20	2,000	75-125	±35
	Selenium	7782-49-2	1.0 mg/L (20 mg/kg)	5.7 mg/L TCLP	0.82	100	10,000	75-125	±35
	Calcium	7440-70-2	N/A	N/A	N/A	5,000	500,000	75-125	±35
Mercury (Methods 7470/7471)	Mercury	7439-97-6	0.2 mg/L (4.0 mg/kg)	0.025 mg/L TCLP	0.15	5	500	75-125	±35
Pesticides (EPA Method 8081)	Heptachlor epoxide	1024-57-3	0.008 mg/L (0.16 mg/kg)	0.066	0.16	0.05	1.65	d	d
	Endosulfan sulfate	1031-07-8	N/A	0.13	0.029	0.1	3.3	d	d
	Aldrin	309-00-2	N/A	0.066	0.021	0.05	1.65	d	d
	Alpha-BHC	319-84-6	N/A	0.066	0.00014	0.05	1.65	d	d
	Beta-BHC	319-85-7	N/A	0.066	0.00014	0.05	1.65	d	d
	Delta-BHC	319-86-8	N/A	0.066	0.023	0.05	1.65	d	d
	Endosulfan II	33213-65-9	N/A	0.13	0.029	0.1	3.3	d	d
	4,4'-DDT	50-29-3	N/A	0.087	0.0039	0.1	3.3	d	d
	alpha-Chlordane	5103-71-9	N/A	0.26 total	0.0033	0.5	16.5	d	d
	gamma-Chlordane	5103-74-2	N/A			0.5	16.5	d	d
	Endrin ketone	53494-70-5	N/A	N/A	N/A	0.1	3.3	d	d
	Gamma-BHC (Lindane)	58-89-9	0.4 mg /L (8.0 mg/kg)	0.066	0.0017	0.05	1.65	d	d
	Dieldrin	60-57-1	N/A	0.13	0.017	0.1 (0.05)	3.3	d	d
	Endrin	72-20-8	0.02 mg/L (0.4 mg/kg)	0.13	0.0028	0.1	3.3	d	d
	Methoxychlor	72-43-5	10.0 mg/L (200 mg/kg)	0.18	0.25	0.5	16.5	d	d
	4,4'-DDD	72-54-8	N/A	0.087	0.023	0.1	3.3	d	d
	4,4'-DDE	72-55-9	N/A	0.087	0.031	0.1	3.3	d	d

Table 2-1. Analytical Performance Requirements. (10 Pages)

Analytical Method[a]	Analyte	CAS #	Action Level			Detection Limit[f]		Accuracy % Recovery	Precision % RSD
			Toxicity Criteria[b]	UTS[c]		Water (µg/L)	Soil (µg/kg)		
				NWW (mg/kg)	WW (mg/L)				
	Endrin aldehyde	7421-93-4	N/A	0.13	0.025	0.1	3.3	d	d
	Heptachlor	76-44-8	0.008 mg/L (0.16 mg/kg)	0.066	0.0012	0.05	1.65	d	d
	Toxaphene	8001-35-2	0.5 mg/L (10 mg/kg)	2.6	0.0095	5 (2)	165	d	d
	Endosulfan I	959-98-8	N/A	0.066	0.023	0.05	1.65	d	d
PCBs (EPA Method 8082)	Aroclor-1260	11096-82-5	N/A	10 total PCBs	0.10 total PCBs	0.5	16.5	d	d
	Aroclor-1254	11097-69-1	N/A			0.5	16.5	d	d
	Aroclor-1221	11104-28-2	N/A			0.5	16.5	d	d
	Aroclor-1232	11141-16-5	N/A			0.5	16.5	d	d
	Aroclor-1248	12672-29-6	N/A			0.5	16.5	d	d
	Aroclor-1016	12674-11-2	N/A			0.5	16.5	d	d
	Aroclor-1242	53469-21-9	N/A			0.5	16.5	d	d
Volatile organics (EPA Method 8260)	Ethylbenzene	100-41-4	N/A	10	0.057	5	5	d	d
	Styrene	100-42-5	N/A	N/A	N/A	5	5	d	d
	cis-1,3-dichloropropene	10061-01-5	N/A	18	0.036	5	5	d	d
	trans-1,3-dichloropropene	10061-02-6	N/A	18	0.036	5	5	d	d
	1,2-dichloroethane	107-06-2	0.5 mg/L (10 mg/kg)	6.0	0.21	5 (1.5)	5 (1.5)	d	d
	4-methyl-2-pentanone	108-10-1	N/A	33	0.14	10	10	d	d
	Toluene	108-88-3	N/A	10	0.080	5	5	d	d
	Chlorobenzene	108-90-7	100 mg/L (2,000 mg/kg)	6.0	0.057	5	5	d	d
	Dibromochloro-methane	124-48-1	N/A	15	0.057	5	5	d	d
	Tetrachloro-ethene	127-18-4	0.7 mg/L (14.0 mg/kg)	6.0	0.056	5	5	d	d
	Xylenes (total)	1330-20-7	N/A	30	0.32	10	10	d	d
	1,2-dichloro-ethene (total)	540-59-0	N/A	N/A	N/A	10	10	d	d
	Carbon tetrachloride	56-23-5	0.5 mg/L (10 mg/kg)	6.0	0.057	5 (2)	5 (2)	d	d
	2-hexanone	591-78-6	N/A	N/A	N/A	20	20	d	d

Table 2-1. Analytical Performance Requirements. (10 Pages)

Analytical Method[a]	Analyte	CAS #	Action Level			Detection Limit[f]		Accuracy % Recovery	Precision % RSD
			Toxicity Criteria[b]	UTS[c]		Water (µg/L)	Soil (µg/kg)		
				NWW (mg/kg)	WW (mg/L)				
	Acetone	67-64-1	N/A	160	0.28	20	20	d	d
	Chloroform	67-66-3	6.0 mg/L (120 mg/kg)	6.0	0.046	5	5	d	d
	Benzene	71-43-2	0.5 mg/L (10 mg/kg)	10	0.14	5 (1.5)	5 (1.5)	d	d
	1,1,1-trichloro-ethane	71-55-6	N/A	6.0	0.054	5	5	d	d
	Bromomethane	74-83-9	N/A	15	0.11	10	10	d	d
	Chloromethane	74-87-3	N/A	30	0.19	10	10	d	d
	Chloroethane	75-00-3	N/A	6.0	0.27	10	10	d	d
	Vinyl chloride	75-01-4	0.2 mg/L (4.0 mg/kg)	6.0	0.27	10 (5)	10 (5)	d	d
	Methylene-chloride	75-09-2	N/A	30	0.089	5	5	d	d
	Carbon disulfide	75-15-0	N/A	4.8 mg/L TCLP	3.8	5	5	d	d
	Bromoform	75-25-2	N/A	15	0.63	5	5	d	d
	Bromodichloro-methane	75-27-4	N/A	15	0.35	5	5	d	d
	1,1-dichloro-ethane	75-34-3	N/A	6.0	0.059	10 (1)	10 (1)	d	d
	1,1-dichloro-ethene	75-35-4	0.7 mg/L (14 mg/kg)	6.0	0.025	10 (2)	10 (2)	d	d
	1,2-dichloro-propane	78-87-5	N/A	18	0.85	5 (1.5)	5 (1.5)	d	d
	2-butanone	78-93-3	200 mg/L (4,000 mg/kg)	36	0.28	10	10	d	d
	1,1,2-trichloro-ethane	79-00-5	N/A	6.0	0.054	5 (2)	5 (2)	d	d
	Trichloroethene	79-01-6	0.5 mg/L (10 mg/kg)	6.0	0.054	5 (2)	5 (2)	d	d
	1,1,2,2-tetrachloro-ethane	79-34-5	N/A	6.0	0.057	5	5	d	d

Table 2-1. Analytical Performance Requirements. (10 Pages)

Analytical Method[a]	Analyte	CAS #	Action Level			Detection Limit[f]		Accuracy % Recovery	Precision % RSD
			Toxicity Criteria[b]	UTS[c]		Water (µg/L)	Soil (µg/kg)		
				NWW (mg/kg)	WW (mg/L)				
Semi-volatiles (EPA Method 8270)	4-nitroaniline	100-01-6	N/A	28	0.028	10	330	d	d
	4-nitrophenol	100-02-7	N/A	29	0.12	20	660	d	d
	4-bromophenyl-phenyl ether	101-55-3	N/A	15	0.055	10	330	d	d
	2,4-dimethyl-phenol	105-67-9	N/A	14	0.036	10	330	d	d
	4-methylphenol (cresol, p-)	106-44-5	200 mg/L (4000 mg/kg)	5.6	0.77	10	330	d	d
	1,4-dichloro-benzene	106-46-7	7.5 mg/L (150 mg/kg)	6.0	0.09	10 (5)	330	d	d
	4-chloroaniline	106-47-8	N/A	16	0.46	10	330	d	d
	2,2'-oxybis(1-chloropropane)	108-60-1	N/A	7.2	0.055	10	330	d	d
	Phenol	108-95-2	N/A	6.2	0.039	10	330	d	d
	Bis(2-chloroethyl) ether	111-44-4	N/A	6.0	0.033	10	330	d	d
	Bis(2-chloroethoxy)methane	111-91-1	N/A	7.2	0.036	10	330	d	d
	Bis(2-ethylhexyl) phthalate	117-81-7	N/A	28	0.028	10	330	d	d
	Di-n-octylphthalate	117-84-0	N/A	28	0.017	10	330	d	d
	Hexachloro-benzene	118-74-1	0.13 mg/L (0.26 mg/kg)	10	0.055	10	330	d	d
	Anthracene	120-12-7	N/A	3.4	0.059	10	330	d	d
	1,2,4-trichloro-benzene	120-82-1	N/A	19	0.055	10	330	d	d
	2,4-dichloro-phenol	120-83-2	N/A	14	0.044	10	330	d	d
	Pyrene	129-00-0	N/A	8.2	0.067	10	330	d	d
	Dimethyl phthalate	131-11-3	N/A	28	0.047	10	330	d	d
	Dibenzofuran	132-64-9	N/A	N/A	N/A	10	330	d	d

Table 2-1. Analytical Performance Requirements. (10 Pages)

Analytical Method[a]	Analyte	CAS #	Action Level			Detection Limit[f]		Accuracy % Recovery	Precision % RSD
			Toxicity Criteria[b]	UTS[c]		Water (µg/L)	Soil (µg/kg)		
				NWW (mg/kg)	WW (mg/L)				
	Benzo(ghi) perylene	191-24-2	N/A	1.8	0.0055	10	330	d	d
	Indeno(1,2,3-cd)pyrene	193-39-5	N/A	3.4	0.0055	10	330	d	d
	Benzo(b)fluoranthene	205-99-2	N/A	6.8	0.11	10	330	d	d
	Fluoranthene	206-44-0	N/A	3.4	0.068	10	330	d	d
	Benzo(k)fluoranthene	207-08-9	N/A	6.8	0.11	10	330	d	d
	Acenaphthylene	208-96-8	N/A	3.4	0.059	10	330	d	d
	Chrysene	218-01-9	N/A	3.4	0.059	10	330	d	d
	Benzo(a)pyrene	50-32-8	N/A	3.4	0.061	10	330	d	d
	2,4-dinitrophenol	51-28-5	N/A	160	0.12	25	825	d	d
	Dibenz[a,h]anthracene	53-70-3	N/A	8.2	0.055	10	330	d	d
	4,6-dinitro-2methyl phenol	534-52-1	N/A	160	0.28	10	330	d	d
	1,3-dichloro-benzene	541-73-1	N/A	6.0	0.036	10	330	d	d
	Benzo(a) anthracene	56-55-3	N/A	3.4	0.059	10	330	d	d
	4-chloro-3-methylphenol	59-50-7	N/A	14	0.018	10	330	d	d
	2,6-dinitro-toluene	606-20-2	N/A	28	0.55	10	330	d	d
	N-nitroso-di-n-dipropylamine	621-64-7	N/A	14	0.40	10	330	d	d
	Hexachloro-ethane	67-72-1	3.0 mg/L (60 mg/kg)	30	0.055	10	330	d	d
	4-chlorophenyl-phenyl ether	7005-72-3	N/A	N/A	N/A	10	330	d	d
	Hexachloro-cyclopentadiene	77-47-4	N/A	2.4	0.057	10	330	d	d
	Isophorone	78-59-1	N/A	N/A	N/A	10	330	d	d
	Acenaphthene	83-32-9	N/A	3.4	0.059	10	330	d	d
	Diethylphthalate	84-66-2	N/A	28	0.20	10	330	d	d

Table 2-1. Analytical Performance Requirements. (10 Pages)

Analytical Method[a]	Analyte	CAS #	Action Level			Detection Limit[f]		Accuracy % Recovery	Precision % RSD
			Toxicity Criteria[b]	UTS[c]		Water (µg/L)	Soil (µg/kg)		
				NWW (mg/kg)	WW (mg/L)				
	Di-n-butylphthalate	84-74-2	N/A	28	0.057	10	330	d	d
	Phenanthrene	85-01-8	N/A	5.6	0.059	10	330	d	d
	Butylbenzyl-phthalate	85-68-7	N/A	28	0.017	10	330	d	d
	N-nitrosodi-phenylamine	86-30-6	N/A	13	0.92	10	330	d	d
	Fluorene	86-73-7	N/A	3.4	0.059	10	330	d	d
	Carbazole	86-74-8	N/A	N/A	N/A	10	330	d	d
	Hexachloro-butadiene	87-68-3	0.5 mg/L (10 mg/kg)	5.6	0.055	10	330	d	d
	Pentachloro-phenol	87-86-5	100 mg/L (2,000 mg/kg)	7.4	0.089	10	330	d	d
	2,4,6-trichloro-phenol	88-06-2	mg/L (40 mg/kg)	7.4	0.035	10	330	d	d
	2-nitroaniline	88-74-4	N/A	14	0.27	10	330	d	d
	2-nitrophenol	88-75-5	N/A	13	0.028	20	660	d	d
	Naphthalene	91-20-3	N/A	5.6	0.059	10	330	d	d
	2-methyl-naphthalene	91-57-6	N/A	N/A	N/A	10	330	d	d
	2-chloro-naphthalene	91-58-7	N/A	5.6	0.055	10	330	d	d
	3,3'-dichloro-benzidine	91-94-1	N/A	N/A	N/A	10	330	d	d
	2-methylphenol (cresol, o-)	95-48-7	200 mg/L (4000 mg/kg)	5.6	0.11	10	330	d	d
	1,2-dichloro-benzene	95-50-1	N/A	6.0	0.088	10	330	d	d
	2-chlorophenol	95-57-8	N/A	5.7	0.044	10	330	d	d
	2,4,5-trichloro-phenol	95-95-4	400 mg/L (8,000 mg/kg)	7.4	0.18	10	330	d	d
	Nitrobenzene	98-95-3	2.0 mg/L (40 mg/kg)	14	0.068	10	330	d	d
	3-nitroaniline	99-09-2	N/A	N/A	N/A	10	330	d	d
Total cyanide (Method 9010)	Cyanide	57-12-5	N/A	590	1.2	5	500	75-125	±35

Table 2-1. Analytical Performance Requirements. (10 Pages)

Analytical Method[a]	Analyte	CAS #	Action Level			Detection Limit[f]		Accuracy % Recovery	Precision % RSD
			Toxicity Criteria[b]	UTS[c]		Water (µg/L)	Soil (µg/kg)		
				NWW (mg/kg)	WW (mg/L)				
Sulfides (Method 9030)	Sulfide	18496-25-8	N/A	N/A	14	500	5,000	75-125	±35
Anions (Method 300.0)	Phosphate	14265-44-2	N/A	N/A	N/A	500	5000	75-125	±35
	Sulfate	14808-79-8	N/A	N/A	N/A	500	5000	75-125	±35
	Chloride	16887-00-6	N/A	N/A	N/A	200	2000	75-125	±35
	Nitrogen in nitrite	NO_2-N	N/A	N/A	N/A	75	750	75-125	±35
	Nitrogen in nitrate	NO_3-N	N/A	N/A	N/A	75	750	75-125	±35
TCLP metals[e] (EPA Methods 1311/6010)	Arsenic	7440-38-2	5.0 mg/L	5.0 mg/L TCLP	1.4	5,000	N/A	75-125	±35
	Barium	7440-39-3	100 mg/L	21 mg/L TCLP	1.2	100,000	N/A	75-125	±35
	Cadmium	7440-43-9	1.0 mg/L	0.11 mg/L TCLP	0.69	1,000	N/A	75-125	±35
	Lead	7439-92-1	5.0 mg/L	0.75 mg/L TCLP	0.69	5,000	N/A	75-125	±35
	Selenium	7782-49-2	1.0 mg/L	5.7 mg/L TCLP	0.82	1,000	N/A	75-125	±35
	Silver	7440-22-4	5.0 mg/L	0.14 mg/L TCLP	0.43	5,000	N/A	75-125	±35
	Chromium	7440-47-3	5.0 mg/L	0.60 mg/L TCLP	2.77	5,000	N/A	75-125	±35
TCLP mercury[e] (Methods 1311/7471	Mercury	7439-97-6	0.2 mg/L	0.025 mg/L TCLP	0.15	200	N/A	75-125	±35
TCLP VOAs[e] (Methods 1311/8260)	Benzene	71-43-2	0.5 mg/L	10	0.14	500	N/A	d	d
	Carbon tetrachloride	56-23-5	0.5 mg/L	6.0	0.057	500	N/A	d	d
	Cholobenzene	108-90-7	100 mg/L	6.0	0.057	100,000	N/A	d	d
	Chloroform	67-66-3	6.0 mg/L	6.0	0.057	6,000	N/A	d	d
	1,2-dichloro-ethane	107-06-2	0.5 mg/L	6.0	0.21	500	N/A	d	d
	1,1-dichloro-ethylene	75-35-4	0.7 mg/L	6.0	0.025	700	N/A	d	d

Table 2-1. Analytical Performance Requirements. (10 Pages)

Analytical Method[a]	Analyte	CAS #	Action Level			Detection Limit[f]		Accuracy % Recovery	Precision % RSD
			Toxicity Criteria[b]	UTS[c]		Water (µg/L)	Soil (µg/kg)		
				NWW (mg/kg)	WW (mg/L)				
	Methyl ethyl ketone (2-butanone)	78-93-3	200 mg/L	36	0.28	200,000	N/A	d	d
	Tetrachloro-ethylene	127-18-4	0.7 mg/L	6.0	0.056	700	N/A	d	d
	Trichloroethylene	79-01-6	0.5 mg/L	6.0	0.054	500	N/A	d	d
	Vinyl chloride	75-01-4	0.2 mg/L	6.0	0.27	200	N/A	d	d
TCLP SVOAs[e] (EPA Methods 1311/8270)	o-cresol	95-48-7	200 mg/L	5.6	0.11	200,000	N/A	d	d
	m-cresol	108-39-4	200 mg/L	5.6	0.77	200,000	N/A	d	d
	p-cresol	106-44-5	200 mg/L	5.6	0.77	200,000	N/A	d	d
	Cresol	N/A	200 mg/L	5.6	0.77	200,000	N/A	d	d
	1,4-dichloro-benzene	106-46-7	7.5 mg/L	6.0	0.09	7,500	N/A	d	d
	2,4-dinitro-toluene	121-14-2	0.13 mg/L	140	0.32	130	N/A	d	d
	Hexachloro-benzene	118-74-1	0.13 mg/L	10	0.055	130	N/A	d	d
	Hexachloro-butadiene	87-68-3	0.5 mg/L	5.6	0.055	500	N/A	d	d
	Hexachloro-ethane	67-72-1	3.0 mg/L	30	0.055	3,000	N/A	d	d
	Nitrobenzene	98-95-3	2.0 mg/L	14	0.068	2,000	N/A	d	d
	Pentachloro-phenol	87-86-5	100 mg/L	7.4	0.089	100,000	N/A	d	d
	Pyridine	110-86-1	5.0 mg/L	16	0.014	5,000	N/A	d	d
	2,4,5-trichloro-phenol	95-95-4	400.0 mg/L	7.4	0.18	400,000	N/A	d	d
	2,4,6-trichloro-phenol	88-06-2	2.0 mg/L	7.4	0.035	2,000	N/A	d	d
TCLP pesticides[e] (EPA Methods 1311/8081)	Chlordane	57-74-9	0.03 mg/L	0.26	0.0033	30	N/A	d	d
	Endrin	72-20-8	0.02 mg/L	0.13	0.0028	20	N/A	d	d
	Heptachlor	76-44-8	0.008 mg/L	0.066	0.0012	8	N/A	d	d

Table 2-1. Analytical Performance Requirements. (10 Pages)

Analytical Method[a]	Analyte	CAS #	Action Level			Detection Limit[f]		Accuracy % Recovery	Precision % RSD
			Toxicity Criteria[b]	UTS[c]		Water (µg/L)	Soil (µg/kg)		
				NWW (mg/kg)	WW (mg/L)				
	Lindane	58-89-9	0.4 mg/L	0.066	0.0017	400	N/A	d	d
	Methoxychlor	72-43-5	10 mg/L	0.18	0.25	10,000	N/A	d	d
	Toxaphene	8001-35-2	0.5 mg/L	2.6	0.0095	500	N/A	d	d
TCLP herbicides[e] (Methods 1311/8151)	2,4-D	94-75-7	10.0 mg/L	10	0.72	10,000	N/A	d	d
	2,4,5-TP (silvex)	93-72-1	1.0 mg/L	7.9	0.72	1,000	N/A	d	d
pH (Method 9040)	PH	N/A	<2 and >12.5	N/A	N/A	0.1 pH unit	0.1 pH unit	N/A	N/A
Flashpoint (Method 1010)	Flashpoint	N/A	<60°C	N/A	N/A	2°C	N/A	N/A	N/A
Alkalinity (EPA Method 310.1)	% concentration NaOH	N/A	N/A	N/A	N/A	5,000	N/A	N/A	N/A
ASTM	Specific gravity	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

[a] Analytical methods used are EPA's *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods* (EPA 1986).
[b] Maximum concentration of contaminants for the toxicity characteristic as specified in *Washington Administrative Code* (WAC) 173-303-090(8)(c). Values provided in parenthesis apply the use of "20 times" the toxicity characteristic for soil samples in lieu of performing TCLP.
[c] Universal treatment standards, as specified in 40 *Code of Federal Regulations* (CFR) 268.48.
[d] Precision and accuracy requirements are identified and defined in the referenced EPA procedures.
[e] TCLP methods applicable only to soil sample analysis; TCLP will not be performed on sodium hydroxide samples because the material is considered to be the extract for the purpose of evaluating the toxicity criteria.
[f] Values are laboratory contract quantification limits.
ICP = inductively coupled plasma
N/A = not applicable
NWW = nonwastewater
RSD = relative standard deviation
UTS = universal treatment standards
WW = wastewater

2.3 SPECIAL TRAINING REQUIREMENTS

Training or certification requirements for personnel are described in BHI-HR-02, *ERC Training Procedures*, and BHI-QA-03, *ERC Quality Assurance Program Plans*, Plan No. 5.1, "Field Sampling Quality Assurance Program Plan." Field personnel shall have completed the following mandatory training before starting work:

- Occupational Safety and Health Administration 40-Hour Hazardous Waste Worker Training
- Radiation Worker Training
- Hanford General Employee Training.

In addition, sampling personnel shall review this SAI and the applicable sampling procedures identified in this SAI.

3.0 MEASUREMENT/DATA ACQUISITION

This section presents the sampling process design and the requirements for sampling methods, sample handling, custody, preservation, containers, and holding times. This section also addresses the requirements for field and laboratory quality control (QC), instrument calibration and maintenance, and field documentation.

3.1 SAMPLING PROCESS DESIGN

3.1.1 Sodium Hydroxide

The sodium hydroxide in the remediation system tanks was transferred to five 55-gal drums for storage and eventual transportation to an onsite or offsite facility for use as a product or for disposal as a waste. In order to evaluate the purity of the chemical, the material was visually inspected during the transfer to determine the presence of any sediment or precipitate or other observations that could indicate that the material is not a pure, unused chemical. The material appeared to be clean and unused as observed during the transfer from the tanks to the drums.

One composite sample and a duplicate sample representative of the total drummed liquid (five drums) will be collected for laboratory analysis. A coliwassa (or equivalent method) will be used to collect a vertical composite from each drum that will then be further composited into one sample and a duplicate sample for laboratory analysis. The coliwassa (or other sampling equipment) shall not be placed inside the containers of sodium hydroxide after sample collection but shall be managed separately as waste in accordance with the site-specific waste management instruction. The sample and duplicate shall be analyzed for inductively coupled plasma (ICP) metals, mercury, anions, pesticides, PCBs, VOAs, SVOAs, total cyanide, sulfide, pH, flashpoint, specific gravity, and alkalinity.

3.1.2 Soil Samples

Because the soil is already containerized in sample jars and because of the potential hazardous nature of the samples (e.g. oily), no sub-sampling will be performed, and the soil samples will be shipped to the laboratory in the existing containers as packaged. Each of the three sample jars has on original sample label and evidence tape attached and is placed inside of a plastic bag. There is no need to open the plastic bag and remove the existing labeling. The sampler will attach an ERC sample label to the outer plastic bag used and identify (on the label) the analysis to be performed for that sample container. The following analytical priority is identified for each of the three sample jars:

- TCLP metals (including mercury) for one sample container
- PCBs for one sample container
- Alpha energy analysis and gamma energy analysis.

The laboratory at their discretion may perform additional analysis to suitably characterize the soil for handling:

- TCLP SVOAs
- TCLP VOAs
- TCLP herbicides
- TCLP pesticides
- Sulfide
- Cyanide.

3.2 SAMPLING METHODS REQUIREMENTS

The procedures to be implemented in the field should be consistent with those outlined in BHI-EE-01, *Environmental Investigation Procedures*, including the following:

- Procedure 4.4, "Container Sampling"
- Procedure 4.5, "Sample Compositing."

3.3 SAMPLE HANDLING, SHIPPING, AND CUSTODY REQUIREMENTS

All sample handling, shipping, and custody should be performed in accordance with BHI-EE-01, Procedure 3.1, "Sample Packaging and Shipping"; Procedure 3.0, "Chain of Custody"; and Procedure 4.2, "Sample Storage and Shipping Facility."

For each of the sodium hydroxide and soil sample sets, one of the sample containers (either a 60-mL or 120-mL clear glass container) identified for submittal to the offsite laboratory will be selected and used to perform a pre-shipment radiological activity scan at the RCF. The activity scan container will be sealed with evidence tape by the sampler and shall not be opened at the RCF. Sampling personnel will pick up the container at the RCF upon completion of the pre-shipment radiological activity scan and will use the container as part of the offsite laboratory analysis sample set. This will ensure that no sample residues of sodium hydroxide or soil exist at the RCF that would require management as a waste. Because the existing sample container for the soil samples will be used rather than sub-sampling to collect a sample in a geometry suitable for the RCF, the radioactivity screen will be qualitative; however, this should be adequate to support evaluation of proper requirements to ship the sample offsite.

3.4 SAMPLE PRESERVATION, CONTAINERS, AND HOLDING TIMES

The sample preservation, container, and holding-time requirements for the analyses to be performed will be specified on the SAF in accordance with BHI-EE-01, Procedure 2.0, "Sample Event Coordination."

3.5 QUALITY CONTROL REQUIREMENTS

The QC procedures must be followed in the field and in the laboratory to ensure that reliable data are obtained. Sample collection QC will be performed in accordance with BHI-QA-03, Plan No. 5.1, "Field Sampling Quality Assurance Program Plan." When performing this field sampling effort, care shall be taken to prevent the cross-contamination of sampling equipment, sample bottles, and other equipment that could compromise sample integrity. All sample equipment will be pre-cleaned or cleaned prior to use in accordance with *Waste Management Northwest Sampling Services Procedure Manual*, Procedure 2.5, "Laboratory Cleaning of Sampling Equipment" (WMNW 1998).

Field QC samples are not required for the soil sample collection activity because of the limited amount of available sample media. Field QC associated with the sodium hydroxide sampling will consist of the following:

- One duplicate sample of sodium hydroxide will be collected and analyzed for the same constituents as the primary sample. The duplicate will be collected from the same material used for the primary sample and will be uniquely numbered. The field duplicate provides information regarding the homogeneity of the sodium hydroxide. A field duplicate may also provide an evaluation of the precision of the analysis process.

- One equipment blank of de-ionized water will be collected for the sampling equipment used to sample the sodium hydroxide. The equipment blank will be collected by rinsing the sampling equipment with the de-ionized water prior to use and collecting the rinsate in clean sample jars for analyses. The equipment blank will be analyzed for VOAs, SVOAs, ICP metals, anions, sulfide, and cyanide. Pesticides, PCBs, herbicides, pH, alkalinity, specific gravity, and flashpoint analysis are not necessary, as these constituents should not be potential contaminants or are not applicable for pre-cleaned sampling equipment. All sample results should be evaluated to determine the possible effects of any contamination detected in the equipment rinsate blank.

- One VOA trip blank consisting of de-ionized water will be collected and shipped with the sodium hydroxide sample set. The trip blank is used to detect contamination during sample shipping and handling, is transported to the sampling site, and is then shipped to the laboratory with the samples. Trip blanks are filled at the 3728 Sample Storage Facility and are not to be opened in the field. Each trip blank should be stored at the laboratory with associated samples and should be analyzed with those samples.

Laboratory QC requirements will be performed as specified in the analytical services statement of work for the selected laboratory.

3.6 INSTRUMENT CALIBRATION AND MAINTENANCE

All field screening and analytical instruments shall be calibrated and maintained in accordance BHI-QA-03, Plan No. 5.2, "Onsite Measurements Quality Assurance Program Plan." The results from all instrument calibration and maintenance activities shall be recorded in a bound logbook in accordance with procedures outlined in BHI-EE-01, Procedure 1.5, "Field Logbooks."

3.7 FIELD DOCUMENTATION

Field documentation shall be kept in accordance with BHI-EE-01, including the following procedures:

- Procedure 1.5, "Field Logbooks"
- Procedure 3.0, "Chain of Custody."

4.0 ASSESSMENTS AND RESPONSE ACTIONS

The Compliance and Quality Programs group may conduct random surveillance and assessments in accordance with BHI-MA-02, *ERC Project Procedures*, Procedure 5.3, "Self-Assessments," to verify compliance with the requirements outlined in this SAI, project work packages, the Bechtel Hanford, Inc. (BHI) quality management plan, BHI procedures, and regulatory requirements.

Deficiencies identified by one of these assessments shall be reported in accordance with BHI-MA-02, Procedure 5.3. When appropriate, corrective actions will be taken by the Project Engineer in accordance with the *Hanford Analytical Services Quality Assurance Requirements Document* (HASQARD), Volume 1, Section 4.0 (DOE-RL 1996a), to minimize recurrence.

5.0 DATA VERIFICATION AND VALIDATION REQUIREMENTS

Data verification and validation are performed on analytical data sets primarily to confirm that sampling and chain-of-custody documentation is complete, sample numbers can be tied to the specific sampling location, samples were analyzed within the required holding times, and analyses met the data quality requirements specified in this SAI.

Due to the limited scope of this characterization activity, formal data validation will not be performed. The QA/QC process used in sampling and laboratory procedures will be followed to ensure that the data are useable. The data will be reviewed by Waste Management personnel during the waste designation process.

6.0 WASTE MANAGEMENT

Waste generated by sampling activities will be managed in accordance with BHI-EE-10, *Waste Management Plan* and the project site-specific waste management instruction. Waste associated with laboratory analysis will be managed and disposed by the offsite analytical laboratory in accordance with the laboratory statement of work and all local, state, and Federal requirements.

7.0 HEALTH AND SAFETY

All field operations will be performed in accordance with BHI health and safety requirements, which are outlined in BHI-SH-01, *ERC Safety and Health Program*, and the requirements of the *Hanford Site Radiological Control Manual* (HSRCM) (DOE-RL 1996b). A work control package will be prepared in accordance with BHI-MA-02, which will further control site operations. The work control package will include an activity hazard analysis, site-specific health and safety plan, and applicable radiological work permits.

The sampling procedures and associated activities will consider exposure reduction and contamination control techniques that will minimize the radiation exposure to the sampling team as required by BHI-SH-01and BHI-QA-01, *ERC Quality Program*.

8.0 REFERENCES

40 CFR 268, "Land Disposal Restrictions," *Code of Federal Regulations*, as amended.

BHI-EE-01, *Environmental Investigations Procedures*, Bechtel Hanford, Inc., Richland, Washington.

BHI-EE-10, *Waste Management Plan*, Bechtel Hanford, Inc., Richland, Washington.

BHI-HR-02, *ERC Training* Procedures, Bechtel Hanford, Inc., Richland, Washington.

BHI-MA-02, *ERC Project Procedures*, Bechtel Hanford, Inc., Richland, Washington.

BHI-QA-01, *ERC Quality Program*, Bechtel Hanford, Inc., Richland, Washington.

BHI-QA-03, *ERC Quality Assurance Program Plans*, Bechtel Hanford, Inc., Richland, Washington.

BHI-SH-01, *ERC Safety and Health Program*, Bechtel Hanford, Inc., Richland, Washington.

DOE-RL, 1996a, *Hanford Analytical Services Quality Assurance Requirements Document* (HASQARD), DOE/RL-96-68, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE-RL, 1996b, *Hanford Site Radiological Control Manual* (HSRCM), DOE/RL-96-109, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

EPA, 1986, *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods*, SW-846, 3rd edition, U.S. Environmental Protection Agency, Washington, D.C.

WAC 173-303, "Dangerous Waste Regulations," *Washington Administrative Code*, as amended.

WMNW, 1998, *Waste Management Northwest Sampling Services Procedure Manual*, ES-SSPM-001, Waste Management Northwest, Richland, Washington.

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