ERDF-00091
Revision 0

Environmental Restoration Disposal Facility Lysimeter Monitoring and Sampling Plan

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

Contractor for the U.S. Department of Energy
under Contract DE-AC06-08RL14788

CH2MHILL
Plateau Remediation Company

P.O. Box 1600
Richland, Washington 99352

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P.O. Box 1600
Richland, Washington 99352

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Title: *Environmental Restoration Disposal Facility Lysimeter Monitoring and Sampling Plan*

Brian Stetter — Signature — 1/8/2020 Date

U.S. Department of Energy,
Richland Operations Office

Craig Cameron — Signature — 1/8/2020 Date

U.S. Environmental Protection Agency

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Terms

CERCLA	*Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
COC	contaminant of concern
DOE	U.S. Department of Energy
DTL	Designated Technical Lead
ECO	Environmental Compliance Officer
EPA	U.S. Environmental Protection Agency
ERDF	Environmental Restoration Disposal Facility
HASQARD	*Hanford Analytical Services Quality Assurance Requirements*
PQL	practical quantification limit
QA	quality assurance
QC	quality control
RCRA	*Resource Conservation and Recovery Act of 1976*
SAF	sample authorization form

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1 Background and Purpose

This document implements a plan to monitor and sample liquids that accumulate in lysimeters. Monitoring and sampling of lysimeters will assist in developing Hanford Site-specific data on system performance and providing information on vadose monitoring systems performance and potential future use in multi-use Hanford Site disposal facilities.

1.1 Facility and Lysimeter Background

The Environmental Restoration Disposal Facility (ERDF) is a Hanford Site low-level mixed waste disposal facility that was brought into service in July 1996. ERDF is located between the 200 East and 200 West Areas of the Hanford Site (Figure 1). This area was selected for the ERDF site over other possible locations because of the depth to groundwater in the geographical area, location above pre-existing groundwater plumes, flat topography, and the compatibility of this location with stakeholder recommendations.

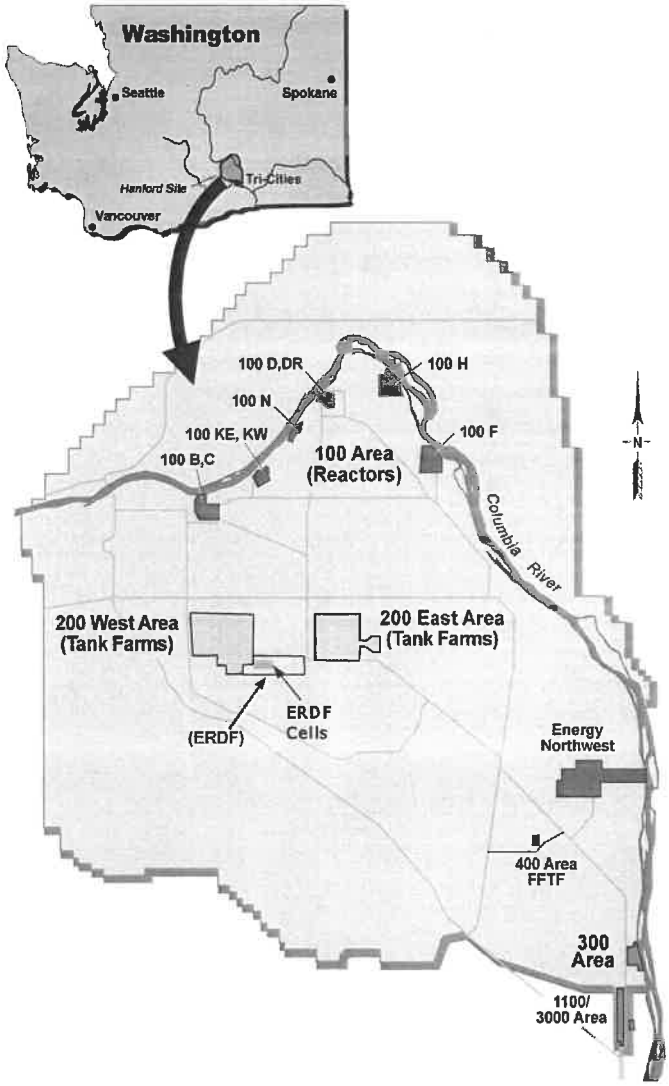


Figure 1. Location of the Environmental Restoration Disposal Facility

The ERDF landfill is authorized under the *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA). The landfill was designed to meet the *Resource Conservation and Recovery Act of 1976* (RCRA) minimum technology requirements; however, the ERDF is not permitted as a RCRA facility. Wastes disposed at ERDF contain elevated levels of radionuclides and/or hazardous constituents originating from the Hanford Site.

ERDF was designed as a series of side-by-side cells that measure 21.3 m (70 ft) in depth, 152.4 by 152.4 m (500 by 500 ft) wide at the base, with a wall slope of 3:1 to measure over 304 m (1,000 ft) wide at the surface. Two cells were authorized for initial construction that came online in 1996. There are currently 10 waste cells associated with the ERDF site. Additional pairs of cells were added in 1999, 2004, and 2009. Super cells 9 and 10, each the equivalent of a pair of preceding cells, were constructed in January 2011. Cells 5-10 have gravity collection lysimeters and any additional gravity collection lysimeters constructed in any future expansions of ERDF will be included under this plan.

Each of the ERDF cells was constructed with a double-liner system for the purpose of collecting liquids, or leachate, which may travel through the waste materials stored at the disposal site. These liquids are typically generated from natural precipitation, moisture within the waste matrix, and the application of dust control water that percolates downward through the disposed waste materials and collects on the surface of the lining material. The primary or upper liners and the secondary or lower liners each are designed to deliver leachate to sump areas. Sumps for the upper liners are independent from the sumps associated with the lower liners. The upper and lower sumps at each of the cells are routinely pumped down, and the leachate is stored in holding tanks.

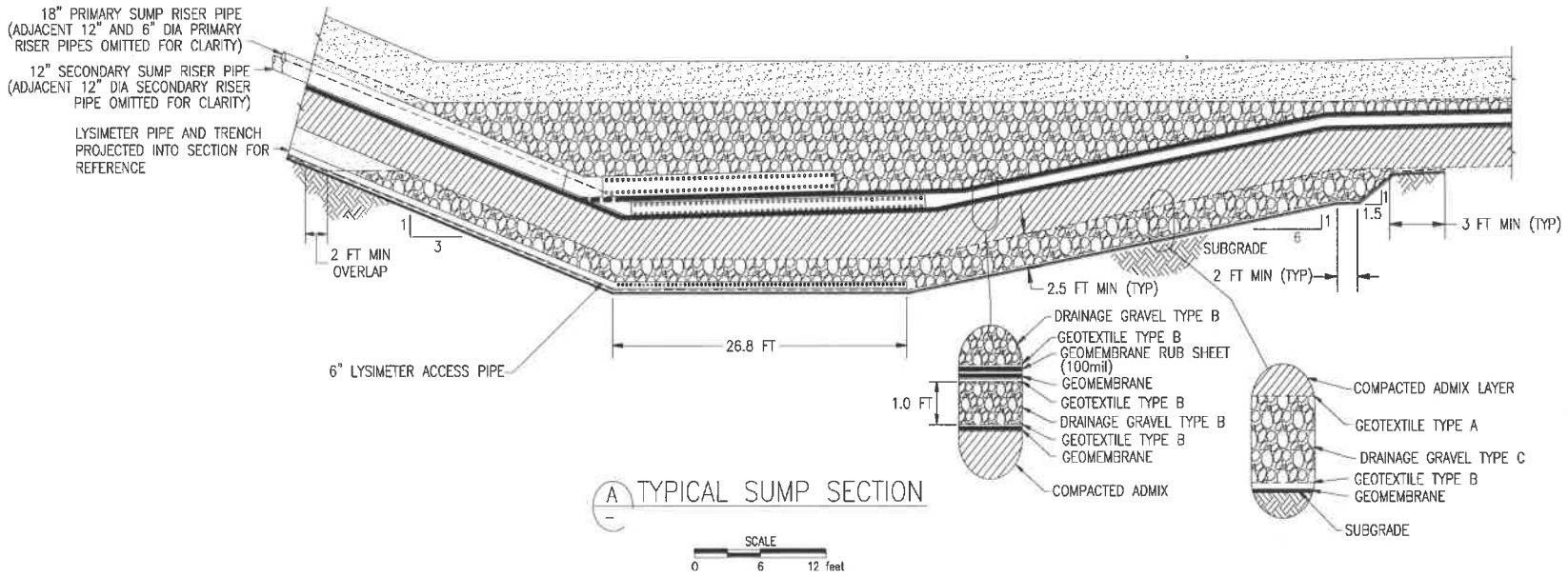
The lysimeters are constructed below the landfill liners and are located underneath the leachate collection sumps in cells 5-10.

The gravity collection lysimeters (basin lysimeters) were constructed in response to DOE/RL-2003-31, *Study of Vadose Zone Monitoring at the Hanford Site, Task 1, Use in New Cells at the Environmental Restoration Disposal Facility*. This study was performed by Fluor Hanford for the U.S. Department of Energy (DOE), Richland Operations Office. The purpose of the study was to report on the status of vadose zone monitoring and to recommend measures that could be taken at the Hanford Site to develop the technology of vadose zone monitoring. The study specifically states:

> For the double lined ERDF cells, as currently designed and operated, the addition of vadose zone monitoring during the operational phase is not required or necessary. However, it is recommended that vadose zone monitoring systems be installed for the purpose of developing Hanford Site specific data on the performance of these systems at a well-designed and well-controlled facility. This should provide information on the expected performance of vadose zone monitoring systems and their potential use in future multi-use disposal facilities at the Hanford Site.

The lysimeter design selected from the study for installation under the ERDF cells is a basin lysimeter. These are constructed by excavating a sloping recession within the cell sub-grade beneath the composite liner system and installing an approximately 381 m^2 (4,100 ft^2) liner into the area (Figure 2). A perforated pipe section is laid atop the lysimeter liner and connected to high-density polyethylene piping that is installed to the upper edge of the cell area.

This type of lysimeter is not configured to detect small increases in liquid accumulation. The perforated pipe is laid flat on the bottom of a collection area of approximately 51 m^2 (546 ft^2) increasing to 381 m^2 (4,100 ft^2) at the top of the lysimeter, which has an approximate capacity to contain 181,700 L (48,000 gal) within the available pore space of the soil.



Note: Image produced from the best available copy.

Figure 2. Typical Basin Lysimeter Construction Design

The vadose zone monitoring activities described herein are expected to continue until after the final landfill cap is installed and the annual quantity of leachate collected in the secondary leachate collection and removal system is shown to be insignificant (i.e., less than the amount needed to activate the removal pumps).

The information acquired from routine monitoring will be available to interested parties by including the monitoring information and evaluations into an annual report.

1.2 Purpose

The objectives of this plan are as follows:

- Evaluate the conditions and identify trends in the lysimeters beneath the ERDF.
- Define the monitoring and sampling plan for the lysimeters. The sampling emphasizes indicator parameters (analytes unique to leachate or present in concentrations that are significantly higher than other water sources) to determine conditions in the vadose zone.

1.3 Scope

This lysimeter monitoring and sampling plan is distinct and implemented as a stand-alone monitoring and sampling plan apart from other existing ERDF monitoring and sampling plans. This plan is limited to monitoring and sampling liquids collected in the lysimeter systems at ERDF. Analytical results associated with this plan will be used to establish a baseline to indicate the conditions in the vadose zone, characterization to ensure proper management of liquids, and monitoring for any trends in the data.

The analytical data obtained from the lysimeters is summarized in an annual report and should help develop a better site-wide understanding of the dynamic processes occurring in the vadose zone. This plan is not an integral part of the landfill compliance monitoring system; therefore, the data should not be used independently for any decisions regarding ERDF operations, maintenance, or monitoring.

1.4 Lysimeter Design Limitations

The lysimeter design is subject to several limitations as described below that affect its ability to detect leachate.

1.4.1 Liquids in the Lysimeter

Methods to characterize any accumulated liquids as leachate should recognize that there are potentially at least three types of liquid present in the lysimeters: construction, consolidation, and condensation water. Construction water refers to any water residing in the lysimeter that was introduced during construction from precipitation or water truck application. Consolidation water is water compressed from the overlying soil bentonite admix layer. Consolidation water should develop as the landfill is filled and the weight of the overlying fill compresses the bentonite-soil admix layer. Finally, condensation may form on the inside of the pipe depending on the moisture content and temperature of the air within the vented pipes.

Any method of differentiating between these liquids and leachate must recognize that captured leachate may be diluted in them.

1.4.2 Potential Additional Liquid Sources

It should be noted that perched groundwater was identified during the construction of cells 5 and 6 and may intersect the underside of the admix barrier on the trench side slopes. This water could flow along a

preferential flow path at the admix/subgrade interface to the lowest point of the constructed liner and end up in the lysimeter.

1.4.3 Non-representative Location

The surface of the secondary liner in the landfill is dry most of the time, and when it is conveying leachate, the depth of liquid on the liner is typically small. Conversely, the sump and pump system design ensures a permanent pool of liquid in the sump (typical depth on the liner less than 0.8 to 1.2 ft [0.2 to 0.4 m]) under normal operating conditions. Thus, the location of the lysimeter serves as a "worst-case" location for observing conditions in the vadose zone. Extrapolation of observations to the remainder of the landfill could be subject to potentially biased data and large uncertainties.

Collectively, these limitations may result in an extended dewatering process or irregular volumes of liquids collected in the lysimeters.

2 Monitoring and Reporting

All sampling and analysis activities fall within the scope of DOE/RL-96-68, *Hanford Analytical Services Quality Assurance Requirements Document* (HASQARD).

2.1 Responsibilities

There are several important positions and organizations within ERDF to ensure that operations proceed safely and compliantly. The following sections describe positions of responsibility from both the project and support efforts.

2.1.1 Project

ERDF Operations: ERDF personnel will coordinate efforts of operations as needed to complete required tasks.

ERDF Environmental Compliance Officer (ECO): The ECO or designee will review lysimeter, leachate, and groundwater monitoring data to determine required additions or changes to sampling and analysis activities. The ECO will identify needed additions or changes to sampling and analysis criteria documents (sample authorization forms [SAFs]) and review and approve changes to SAFs. The ECO will also interface with the regulators to ensure that the characterization objectives for the lysimeter sampling are consistent with regulatory requirements and will discuss the scope of routine laboratory analyses and recommendations for addition or deletion of selected constituents in the routine analyses regimen, if appropriate.

2.1.2 Support

Laboratory Services: SAFs will be generated as directed by the ECO in accordance with applicable procedures . Laboratory analysis, data reporting, data handling and storage, and data validation will also be performed in accordance with applicable procedures. Information will be stored in the applicable database.

Chemist: The chemist will assess the analytical data on receipt for completeness and consistency with previous data. The chemist will also assess the data for trends and provide written input to the ECO, as necessary. The chemist will coordinate with the ECO to ensure that analytes are added to and removed from the sampling program, as appropriate.

Performance and Quality Assurance: Quality Assurance (QA) assessments and surveillances will be performed upon the request of management.

2.2 Monitoring Schedule

The lysimeters will be inspected annually in accordance with the monitoring program.

2.3 Monitoring Program

The monitoring program is based on the following general steps. Changes in the order of these steps may be allowed based on changing conditions.

Note: All entries into the field logbook will be in accordance with SGRP-PRO-PM-50079, "*Field Sampling Operations Controlled Field Logbooks*."

Note: All equipment removed from a lysimeter will be decontaminated and/or cleaned using best management practices to ensure the potential for cross contamination between lysimeters does not occur.

2.3.1 Inspection

With the inspection camera system, the lysimeters will be visually inspected using a pipeline video inspection camera system. The inspection will cover the structural integrity of pipe interior, depth to obstructions, depth to water, evaluation of pump use, and general observations that will be documented in a field logbook.

2.3.2 Sampling

If enough liquid is present to allow removal with a sample pump, perform one of the following:

- Initial sampling of a newly installed lysimeter will consist of the routine leachate constituents referenced in Section 1.2.1 of CP-60070, *Environmental Restoration Disposal Facility Leachate Sampling and Analysis Plan, formerly WCH-173 Rev. 2*
- Routine lysimeter sampling events will consist of the indicator parameters listed in Section 3.1 and Table 1.

2.3.3 Dewatering

Prior to commencing the dewatering activity, sampling data should be evaluated to ensure proper management of the removed liquids.

Dewatering of the lysimeter is done through the use of a pump to the extent practicable that dispenses the pumped liquid into a mobile trailer-mounted poly-tank or similar method. Upon completion of the dewatering operation, the liquid may be added to the ERDF leachate tanks for future disposal or other approved disposition. The dewatering operation is documented in the field logbook with the total volume and other general observations of the water removed from the lysimeter.

2.3.4 Re-Inspection

After dewatering operations are complete, the lysimeters will be visually inspected using the pipeline video inspection camera system. The visual inspection performed in this step will be recorded in accordance with the video inspection camera system's operator's manual, and observations during the inspection will be documented in the field logbook.

2.4 Annual Report

An annual report will be submitted describing the information collected as part of the monitoring program. The objectives of this report are as follows:

- Describe the changes in the volume of liquid in the lysimeter.
- Describe and evaluate the sample data, identify changes or trends in the data, and incorporate a summary of the results.
- The U.S. Environmental Protection Agency EPA and DOE will be provided a copy of the annual report covering the lysimeter data and evaluations.

Recent annual reports have been combined into a single report on ERDF groundwater, leachate, and lysimeter liquid monitoring for each calendar year.

3 Analytical Approach

This chapter covers the type of sampling covered, techniques used for collection, proper documentation and procedures, and appropriate packaging and shipping methods for sampling related to the lysimeters.

3.1 Sample Contaminants of Concern

The contaminants of concern (COCs) for the initial sampling of newly installed lysimeters will be consistent with the COCs for the routine leachate sampling at ERDF described in Section 1.2.1 of CP-60070. The purpose of this initial characterization is to establish a baseline and determine if the routine lysimeter analyte list of indicator parameters (Table 1) is adequate. Any additions to Table 1 resulting from evaluation of initial baseline sampling will be initially documented in the SAF and incorporated into Table 1 as part of any future revisions of this plan. Upon completion of the initial characterization and sampling of the lysimeters, a routine sampling schedule will commence for the indicator parameters (Table 1).

Table 1. List of Routine Lysimeter Analytes by Analytical Method

Method	Target PQL	QC Element and Acceptance Criteria
General Chemical Parameters		
Total dissolved solids – SM2540C[a]	10 mg/L	Field duplicate: ±20% RPD[e] Method blank: <PQL Laboratory control sample: 80-120% recovery Lab duplicate: ±20% RPD[e] Matrix spike: 80-120% recovery
Total suspended solids – SM2540D[a]	5 mg/L	
Specific conductance – SW9050[b]	10 mg/L	
Total organic carbon – SW9060[b] or 120.1[c]	1 mg/L	
Anions by IC – SW9056[b] or 300.0[c]		
Chloride	0.5 mg/L	
Nitrate	0.5 mg/L	
Sulfate	1 mg/L	
Nitrogen in nitrate/nitrite – 353.2[d]	0.1 mg/L	
pH – 9045[b]	0.1 pH unit	
Metals		
Metals ICP-SW6010[b] or ICP/MS-SW6020[b]		Field duplicate: ±20% RPD[e] Method blank: <PQL Laboratory control sample: 80-120% recovery Matrix spike: 80-120% recovery
Calcium	1000 µg/L	
Magnesium	750 µg/L	
Potassium	4000 µg/L	

Table 1. List of Routine Lysimeter Analytes by Analytical Method

Method	Target PQL	QC Element and Acceptance Criteria
Sodium	500 µg/L	Matrix spike duplicate: ±20% RPD[e]
Uranium	1 µg/L	
Radionuclides		
Technetium-99 – LSC/GPC[f]	10 pCi/L	Field duplicate: ±25% RPD[e] Method blank: <2× MDA Laboratory control sample: 80-120% recovery Lab duplicate: ± 25% RPD[e] Matrix spike: 80-120% recovery
Gross alpha – GPC[f]	3 pCi/L	
Gross beta – GPC[f]	4 pCi/L	
Tritium – LSC[f]	400 pCi/L	
Total uranium – KPA[f]	1 µg/L	

a. APHA/AWWA/WEF, 2017, *Standard Methods for the Examination of Water and Wastewater* ().

b. SW-846, *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods Compendium*

c. EPA-600/4-84-017, *Method 300.0: Determination of Inorganic Anions by Ion Chromatography*.

d. EPA-600/4-79-020, *Methods for Chemical Analysis of Water and Wastes*. For nitrogen in nitrate/nitrite, specific method may change with laboratory.

e. RPD, which applies only in cases where one or both results are greater than 5× the detection limit.

f. Laboratory-developed procedures.

EPA = U.S. Environmental Protection Agency
GPC = gas proportional counting
KPA = kinetic phosphorescence analysis
IC = ion chromatography
ICP = inductively coupled plasma
ICP/MS = inductively coupled plasma mass spectrometry
LSC = liquid scintillation counting
MDA = minimum detectable activity
NTU = nephelometric turbidity units
pH = hydrogen ion concentration
PQL = practical quantitation limit
QC = quality control
RPD = relative percent difference

3.2 Sample Collection

This section provides the requirements for collecting, packaging, and shipping lysimeter samples. Sample collection will be performed in accordance with this plan and approved procedures.

3.2.1 Sample Collection Techniques

Samples are collected through use of portable or dedicated pumps. Care should be taken to ensure that no contaminants are introduced by the sampling equipment, environmental conditions, or other means. Prior to dispensing sampling media into sample collection containers, every effort should be made to allow the pump to purge until the discharged liquid is without apparent sediment, or at a minimum two discharge line volumes into a waste collection container. Purging of the lysimeter may be omitted if the purging activity will create inadequate liquid volume within the lysimeter for sample collection. The sampling equipment, sampling pump(s), and camera assembly will be decontaminated and/or cleaned using best management practices to ensure the potential for cross contamination between lysimeters does not occur.

3.2.2 Sample Volume, Preservation, and Holding Times

The volume of samples collected depends on the type and number of analyses needed, as reflected in the parameters to be measured and the requirements of the analytical laboratory being used. Sample volume must be sufficient for all analyses, including laboratory QA/quality control (QC). Several constituents can

be analyzed by one of two alternate methods, therefore, the total volume may depend on the methods selected. The sample volume required for analyses will be specified on the SAF. SAF creation is described in SGRP-PRO-SMP-53935, "*SMR Sampling Documentation for WCH Integration Work.*"

Sample preservation minimizes potential chemical changes to the lysimeter liquid from the time of collection until the time of analysis. Sample preservation techniques consist of refrigeration and pH adjustment. Where required, samples are aliquoted into pre-preserved bottles for specific analyses in accordance with the SAF and stored under refrigeration until shipping. Refrigeration continues using wet ice during sample shipment and the sample is refrigerated as necessary after receipt by the laboratory for analysis.

In addition to preservation techniques, holding times between sample collection and analysis must be met for the sample data to be considered valid. The lysimeter liquid becomes a sample upon collection. At that point, holding time limitations begin. Final sample holding times are specified in the SAF.

3.2.3 Sample Documentation

Each sampling event is recorded in the field logbook in accordance with SGRP-PRO-PM-50079, "*Field Sampling Operations Controlled Field Logbooks.*"

3.2.4 Sample Identification and Labeling

An electronic database is used to track sample and laboratory results. Sample numbers are issued to the sampling organization in accordance with SGRP-PRO-SMP-53935, "*SMR Sampling Documentation for WCH Integration Work.*" Each sample is identified and labeled with a unique sample number. The sample location, date, and time of collection along with the corresponding sample number is recorded on the chain-of-custody form and in the field logbook in accordance with SGRP-PRO-PM-50079, "*Field Sampling Operations Controlled Field Logbooks.*"

Each sample container will be labeled with the following information:

- Sample number
- Sample collection date/time
- Name/initials of sampler
- Analysis required
- Preservation method, if applicable

3.2.5 Chain-of-Custody Procedures

All samples will be controlled from the point of origin to the analytical laboratory in accordance with SGRP-PRO-SMP-50051, "*Chain of Custody/Sample Analyses Request.*" A chain-of-custody record will be initiated in the field and will accompany each set of samples. Chain-of-custody procedures will be followed throughout the sample collection, transfer, analysis, and disposal to ensure that the integrity of the sample is maintained.

A custody seal (evidence tape) will be affixed to the lid of each sample container. The custody seal will be initialed and dated.

3.2.6 Sample Packaging and Shipping

Upon completion of sample collection, containers will be labeled, COC paperwork completed, and samples secured in coolers for transport to the Sample Storage and Shipping Facility. Samples will be packaged and shipped offsite in accordance with PRC-PRO-SMP-54173, "*Sample Packaging and Shipping,*" under the direction of a U.S. Department of Transportation - Certified Shipper.

Sample shipments must comply with applicable U.S. Department of Transportation Hazardous Materials Regulations (49 CFR 171-177, "Transportation," "Subchapter C—Hazardous Materials Regulations") and International Air Transport Association air shipment requirements, as applicable.

3.3 Sampling Quality Assurance and Quality Control

QA guidance for sampling are established in CHPRC-00189, *Environmental Quality Assurance Program Plan*, which implements HASQARD requirements. All sampling shall be performed using methods and procedures designed to ensure accurate and defensible data collection and reporting.

3.3.1 Field Quality Control Requirements

QC samples are introduced into the collection process to monitor the adequacy of the sampling process and the integrity of the samples from their field collection point through laboratory analysis. QC requirements for the sample collection process are defined as follows:

- One field duplicate sample of the lysimeter water shall be collected for each sampling event. Field duplicates are composed of two samples produced from the same matrix and collected at the same location and time. The field duplicates provide information concerning the homogeneity of the matrix, as well as an evaluation of the precision of the sampling and analysis process.

  When the sampling event cycle is completed and aliquots are prepared for the individual sample analyses, equal aliquots will be assigned to field duplicate samples.

- One volatile organics analysis trip blank should be collected for every volatile organics analysis sampling event. Trip blanks are samples prepared by adding clean, analyte-free water to sample containers for analysis of volatile organic compounds. Preservatives are added to the blank, and the containers are sealed before the sampling trip. Trip blanks are usually prepared in the laboratory and are transported with empty sample containers to the site of work and remain sealed until analyzed with the collected samples at the laboratory. Trip blanks permit evaluation of contamination generated from sample containers or occurring during the shipping and laboratory storage process.

3.4 Laboratory Analysis

This section describes the methods, detection limits, and laboratory QA and QC measures taken with the laboratory samples.

3.4.1 Analytical Methods

Except as noted in Table 1, analytical methods shall be to the nationally identified references or replacements as defined by the EPA. Table 1 identifies all constituents and practical quantification limit goals. Analyses shall be performed on unfiltered samples. Analyses are expected to be performed on and reported as undiluted samples except for quantification of constituents exceeding the upper calibration limit of the associated analytical method. Analytical methods will be updated as required by EPA.

3.4.2 Detection Limits

Practical quantification limits (PQLs) should be used to assess method sensitivity. The PQL is equivalent to the estimated quantification limit as defined in Chapter 1 of SW-846, *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods Compendium*. PQL and estimated quantification limit values reflect analytical accuracies and precisions that are considered nominal for the method and can be routinely achieved in a variety of sample matrices.

Advances in commercially available technology are monitored periodically for revisions to PQLs/implementation of alternate methods with lower PQLs.

3.4.3 Laboratory Quality Assurance and Control

All samples will be analyzed to the requirements of the HASQARD. At a minimum, the following QC shall be performed:

- One method blank for every 20 samples, analytical batch, or sample delivery group (whichever is most frequent) will be used to monitor contamination resulting from the sample preparation process for each analytical method.
- One laboratory control sample or blank spike will be performed for every 20 samples, analytical batch, or sample delivery group (whichever is most frequent) of samples for each analytical method criteria to monitor the effectiveness of the sample preparation process. The results from the analysis are used to assess laboratory performance.
- As appropriate to the method, a combination of either a matrix spike and matrix spike duplicate or a matrix spike and duplicate sample will be prepared and analyzed for each 20 samples, analytical batch, or delivery group, whichever is most frequent. The matrix spike results are a measure of detection accuracy for the analytes of interest that are measured in the sample matrix. Laboratory duplicates or matrix spike duplicates are used to assess precision and will be analyzed at the same frequency as the matrix spikes. Note that a matrix spike is not appropriate or required for all analyses listed in Table 1.

3.4.4 Laboratory Quality Control Acceptance Criteria

The definitions of laboratory required QC samples found in the HASQARD (DOE/RL-96-68) are used for this project. Percent recoveries as defined in the HASQARD will be used to assess accuracy. Relative percent difference and relative standard deviation as defined in the HASQARD will be used to assess precision. The accuracy and precision limits that are listed in Table 1 will be applied to the results from the leachate for each sampling round. Analyses requiring matrix spikes will be in accordance with HASQARD specifications. Analytes without accuracy and precision limits in the HASQARD will be assessed based on statistical evaluation of laboratory control sample results using the same formulas presented for the compounds with limits.

3.5 Data Management

This section describes both the reporting and management of data related to the laboratory sampling.

3.5.1 Reporting

The laboratory will prepare a report summarizing the results of analysis, including associated laboratory QC. Data summaries shall include, at a minimum, sample identity, sampling and analysis dates, reduced data results, analytical detection limits for non-detect results, and a detailed case narrative for the following investigative and QC samples (as appropriate to the method):

- All associated laboratory method blanks
- Associated batch matrix spike/surrogate/tracer/carrier recoveries
- Associated batch duplicate/matrix spike duplicate relative percent differences
- Associated batch laboratory control sample recoveries

3.5.2 Administration

Data generated as a result of laboratory analysis are managed by the Sample Management and Reporting organization until its formal transfer to Document Control, as outlined in SGRP-PRO-SMP-50011, "*Sample Management and Reporting Data Package Receipt and Control and Verification*."

Electronic data access, when appropriate, is through computerized databases. Where electronic data are not available, hard copies will be provided in accordance with Section 9.6 of Ecology et al., 1989, *Hanford Federal Facility Agreement and Consent Order*.

3.6 Auditing and Assessment

Random surveillances and assessments may be conducted to verify compliance with the requirements outlined in this SAP in accordance with PRC-MP-QA-40092, "*CHPRC Assessment Program Plan*," PRC-PRO-QA-246, "*Management Assessment*," PRC-PRO-QA-9662, "*Independent Assessment*," and PRC-PRO-QA-9769, "*Surveillance Process*." When performed, the surveillance and assessments will address quality-affecting activities that may include but are not limited to measurement system accuracy; field activities; data collection, processing, validation, and management; and QA programs.

Random surveillance and assessments should be structured to meet system and performance audit classifications. System audits consist of the evaluation of the measurement system components to determine their proper selection and use. Performance audits ensure the accuracy of the total system and its individual parts.

3.7 Data Quality

Once the analytical data have been verified, the data should be assessed for trends and written input provided to the ECO.

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