Statement of Work for Services Provided by the Waste Sampling and Characterization Facility for the Effluent and Environmental Monitoring Program Calendar Year 1999

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

FLUOR DANIEL HANFORD, INC.

Richland, Washington

RECORD COPY

Hanford Management and Integration Contractor for the
U.S. Department of Energy under Contract DE-AC06-96RL13200

Approved for Public Release; Further Dissemination Unlimited

Statement of Work for Services Provided by the Waste Sampling and Characterization Facility for the Effluent and Environmental Monitoring Program Calendar Year 1999

Date Published
May 1999

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

FLUOR DANIEL HANFORD, INC.

Richland, Washington

Hanford Management and Integration Contractor for the
U.S. Department of Energy under Contract DE-AC06-96RL13200

Approved for Public Release; Further Dissemination Unlimited

RELEASE AUTHORIZATION

**Document
Number:**

HNF-EP-0835-3

**Document
Title:**

Statement of Work for Services Provided by the Waste
Sampling and Characterization Facility for the
Effluent and Environmental Monitoring Program,
Calendar Year 1999

**This document, reviewed in accordance with DOE
Order 241.1, "Scientific and Technical Information
Management," and DOE G 241.1-1, "Guide to the
Management of Scientific and Technical
Information," does not contain classified or
sensitive unclassified information and is:**

APPROVED FOR PUBLIC RELEASE

C. Willingham

6/3/99

Date

Lockheed Martin Services, Inc.
Document Control/Information Release

Reviewed for Applied Technology, Business Sensitive, Classified, Copyrighted, Export Controlled, Patent, Personal/Private, Proprietary, Protected CRADA, Trademark, Unclassified Controlled Nuclear Information.

Trademark Disclaimer. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof or its contractors or subcontractors. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof. This report has been reproduced from the best available copy.

Printed in the United States of America.

Available to the U.S. Department of Energy and its contractors from the U.S. Department of Energy Office of Scientific and Technical Information, P.O. Box 62, Oak Ridge, TN 37831; Telephone: 423/576-8401.

Available to the public from the U.S. Department of Commerce National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161; Telephone: 703/487-4650.

Document Title: **STATEMENT OF WORK FOR SERVICES PROVIDED BY THE WASTE SAMPLING AND CHARACTERIZATION FACILITY FOR THE EFFLUENT AND ENVIRONMENTAL MONITORING PROGRAM, CALENDAR YEAR 1999**

Approved by: 4-19-99
L. P. Diediker, Team Leader
WMH Air & Water Services
Date

Approved by: 4/19/99
E. M. Greager, Manager
WMH Air & Water Services
Date

Approved by: 5/21/99
J. J. Dorian, Program Manager
WMNW Environmental Monitoring & Investigations
Date

Approved by: WML Analytical Production Mgr. 4/26/99
S. L. Fitzgerald, Radiochemistry Team Leader
WMH Waste Sampling and Characterization Facility
Date

Approved by: 4/20/99
D. G. Ranade, Technical Representative
FDH Environmental Integration
Date

This page intentionally left blank.

CONTENTS

GLOSSARY	vii
1.0 SCOPE OF SERVICES	1
2.0 REGULATORY REPORTING REQUIREMENTS	1
2.1 RADIONUCLIDE AIR EMISSIONS REPORT FOR THE CLEAN AIR ACT	1
2.2 ENVIRONMENTAL RELEASES REPORT	1
2.3 HANFORD SITE ENVIRONMENTAL REPORT	2
2.4 EFFLUENT INFORMATION SYSTEM-ONSITE DISCHARGE INFORMATION SYSTEM REPORT	2
2.5 HANFORD SITE NEAR-FACILITY ENVIRONMENTAL MONITORING ANNUAL REPORT	2
3.0 WASTE SAMPLING AND CHARACTERIZATION FACILITY SERVICES AND DATA QUALITY OBJECTIVES	2
3.1 SAMPLE AND ANALYSIS REQUIREMENTS	2
3.2 COMPOSITE SAMPLE REQUIREMENTS	2
3.3 YEAR-END DATA REPORTING DUE DATES	3
3.4 LABORATORY PROCEDURES	3
3.5 QUALITY CONTROL	3
3.5.1 Quality Control Tests for Water, Vegetation, and Soil Sample Analyses	4
3.5.2 Quality Control Tests for Air Sample Analyses	4
3.6 RETENTION OF AND ACCESS TO RAW DATA AND RESULTS	5
3.7 ANALYTICAL ERROR AND MINIMUM DETECTABLE CONCENTRATION	5
3.8 ARCHIVING OF SAMPLES	5
3.9 ANALYSIS COSTS	5
4.0 REFERENCES	6

ATTACHMENT

ANALYTICAL REQUIREMENTS FOR ENVIRONMENTAL COMPLIANCE PROGRAM SAMPLING DURING CALENDAR YEAR 1999	ATT-1

TABLES

Table 1. Stack and Ambient Air Sample Analysis Criteria for Waste Sampling and Characterization Facility.	7
Table 2. Liquid Effluent Sample Analysis Criteria for Waste Sampling and Characterization Facility.	8
Table 3. Vegetation and Soil Samples, Sample Analysis Criteria for Waste Sampling and Characterization Facility.	9
Table 4. Additional Services Factored into Waste Sampling and Characterization Facility Sample Analysis Prices for Effluent and Environmental Monitoring Program.	10

This page intentionally left blank.

GLOSSARY

ACRONYMS

ABCASH	automated bar coding of air samples at Hanford
ARC	archive only
AWS	WMH Air & Water Services Organization
CACN	cost account charge number
CAM	continuous air monitor
CSB	Canister Storage Building
DOE	U.S. Department of Energy
DOE-RL	U.S. Department of Energy, Richland Operations Office
ECP	Environmental Compliance Program
EDP	electronic data processing
EEM	effluent and environmental monitoring
EIS-ODIS	effluent information system-onsite discharge information system
EMI	WMNW <i>Environmental Monitoring & Investigations</i> Organization
EML	Environmental Measurements Laboratory
EPA	U.S. Environmental Protection Agency
ERC	Environmental Restoration Contract
ERDF	Environmental Restoration Disposal Facility
ETF	Effluent Treatment Facility
FFTF	Fast Flux Test Facility
GEA	gamma energy analysis
LCS	Laboratory Control Standards
MDA	minimum detectable activity
MDC	minimum detectable concentration
MDL	minimum detection limit
N/A	not applicable
NFM	near-facility monitoring
PCB	polychlorinated biphenyls
PHMC	Project Hanford Management Contract
PNNL	Pacific Northwest National Laboratory
PPF	Plutonium Finishing Plant
PUREX	Plutonium-Uranium Extraction (Facility)
QC	quality control
TT	turnaround time
TBD	to be determined
TEDF	Treated Effluent Disposal Facility
TRUSAF	Transuranic Waste Storage and Assay Facility
TWRS	Tank Waste Remediation System
WAC	Washington Administrative Code
WESF	Waste Encapsulation and Storage Facility
WMH	Waste Management Federal Services of Hanford, Inc.
WMNW	Waste Management Federal Services Northwest, Inc., Northwest Operations
WRAP	Waste Receiving and Processing
WSCF	Waste Sampling and Characterization Facility

GLOSSARY (cont)

ft ³	cubic foot
g	grams
g/mL	grams per milliliter
L	liter
ml	milliliter
pCi/g	picocurie per gram
pH	potential of hydrogen
ppm	parts per million
(\$)	dollars
μCi	microcurie
μCi/mL	microcurie per milliliter.

TERMS

Accuracy. The degree of agreement of a measurement with a true or known value.

Completeness. A measure of the amount of valid and usable data obtained from a measurement system compared to the amount that was expected to be obtained under correct normal conditions.

Precision. A measure of mutual agreement among individual measurements of the same property under similar conditions. Precision is best expressed in terms of standard deviation.

Turnaround time. Elapsed time, in days, starting from the receipt of all samples to be analyzed and all relevant sampling data, and ending when the results, in units of concentration, are received electronically.

**STATEMENT OF WORK FOR SERVICES PROVIDED BY THE
WASTE SAMPLING AND CHARACTERIZATION FACILITY
FOR THE EFFLUENT AND ENVIRONMENTAL MONITORING
PROGRAM, CALENDAR YEAR 1999**

1.0 SCOPE OF SERVICES

This document defines the services that the Waste Sampling and Characterization Facility (WSCF) shall provide the Environmental Compliance Program (ECP) throughout the calendar year for effluent and environmental monitoring (EEM) analysis. One of the purposes of EEM is to monitor liquid and gaseous effluents and the environment immediately around facilities that might contain radioactive and hazardous materials. Monitoring data are collected, evaluated, and reported to determine the degree of compliance with applicable federal and state regulations and permits.

Samples to be submitted for analysis in calendar year (CY) 1999 are identified in the Attachment. Analysis of effluent (liquid and air discharges) and environmental (air, liquid, animal, and vegetative) samples is required using standard laboratory procedures, in accordance with regulatory and control requirements cited in *NESHAP Quality Assurance Project Plan for Radioactive Air Emissions Data* (HNF-EP-0528-3), *Near-Facility Environmental Monitoring Quality Assurance Project Plan* (HNF-EP-0538-3), and *Hanford Analytical Services Quality Assurance Requirements Documents* (DOE/RL-96-68). Should changes to this Statement of Work be necessary, WSCF or the Waste Management Federal Services, Inc. (WMH) Air & Water Services (AWS) organization could amend the document at any time with a jointly approved internal memo.

2.0 REGULATORY REPORTING REQUIREMENTS

It is essential for the WSCF to meet the due dates specified. The analytical data required by these due dates are necessary to maintain compliance with environmental release reporting commitments mandated by regulatory agencies and the U.S. Department of Energy (DOE). Variances to technical criteria or due dates in this document must be documented by WSCF and approved or acknowledged by AWS.

2.1 RADIONUCLIDE AIR EMISSIONS REPORT FOR THE CLEAN AIR ACT

This report documents radionuclide air emissions from the Hanford Site and the resulting effective dose equivalent to any member of the public from those emissions. This report complies with the reporting requirements of the Code of Federal Regulations (CFR), Title 40, "Protection of the Environment," Part 61, "National Emissions Standards for Hazardous Air Pollutants," Subpart H, "National Emission Standards for Emissions of Radionuclides Other Than Radon From Department of Energy Facilities" (40 CFR 61 Subpart H) and Chapter 246-247 of the Washington Administrative Code (WAC).

2.2 ENVIRONMENTAL RELEASES REPORT

The report fulfills the effluent discharge reporting requirements of DOE Order 5400.1 and summarizes the compliance status of effluent releases from facilities under the Project Hanford Management Contract (PHMC) and the Environmental Restoration Contractor (ERC).

2.3 HANFORD SITE ENVIRONMENTAL REPORT

Pacific Northwest National Laboratory (PNNL) annually compiles and publishes this report for DOE, in compliance with DOE Order 5400.1. AWS and Waste Management Federal Services, Inc., Northwest Operations (WMNW) Environmental Monitoring & Investigations Organization (EMI) provide the effluent and near-facility monitoring (NFM) sections of this report.

2.4 EFFLUENT INFORMATION SYSTEM-ONSITE DISCHARGE INFORMATION SYSTEM REPORT

Each year AWS compiles and transmits this report electronically, for all Hanford Site contractors, to the Idaho National Environmental and Engineering Laboratory in Idaho Falls, Idaho, for inclusion in the effluent information system/onsite discharge information system (EIS/ODIS) database, in compliance with DOE Order 5484.1.

2.5 HANFORD SITE NEAR-FACILITY ENVIRONMENTAL MONITORING ANNUAL REPORT

EMI publishes this annual report for the ECP. The report provides a yearly summary of sampling and analysis of soil, vegetation, ambient air, etc., near Hanford Site facilities. This monitoring is performed in accordance with 40 CFR 61, Subpart H; WAC 246-247; and DOE Orders 5400.1 and 5820.2A requirements.

3.0 WASTE SAMPLING AND CHARACTERIZATION FACILITY SERVICES AND DATA QUALITY OBJECTIVES

WSCF shall provide the following analytical services when analyzing EEM low-level effluent and environmental samples.

3.1 SAMPLE AND ANALYSIS REQUIREMENTS

All services necessary shall be provided to complete the analytical requirements listed in Tables 1 through 4. Analyses shall be performed in accordance with applicable requirements and procedures contained in the references listed in Section 1.0. Analytical results shall be expressed in the units shown in the tables for the respective minimum detectable levels (MDLs).

3.2 COMPOSITE SAMPLE REQUIREMENTS

Effluent air emission samples shall be combined quarterly or monthly into composite samples and the first three quarters shall be reported electronically to AWS by the following dates:

- First quarter air emission composite sample results ..... June 30, 1999
- Second quarter air emission composite sample results ..... September 30, 1999
- Third quarter air emission composite sample results ..... December 31, 1999

Ambient air samples shall be combined into composite samples biannually and reported electronically to EMI within 90 days of receiving all samples and data needed to create the composite sample. All results shall be in units of concentration unless otherwise specified.

3.3 YEAR-END DATA REPORTING DUE DATES

The due date for submission of year-end analysis results to AWS for all samples collected up through December 31st is:

- Air emission data ..... **February 15, 2000**

The due date for submission of year-end analysis results to EMI for all samples collected up through December 31st is:

- Environmental data
(air, surface water, and pond vegetation and sediment)..... **March 15, 2000**

All results shall be transmitted electronically and shall be in units of concentration unless otherwise specified. The analysis results from any weekly, biweekly, or monthly air samples collected on or after January 1st will be applied to that year.

3.4 LABORATORY PROCEDURES

WSCF shall use laboratory analytical procedures that are:

- In compliance with EPA Method 114, Section 4.0, "Quality Assurance Methods," 40 CFR Part 61, Appendix B (specifically, 4.4 and 4.5), and applicable requirements and procedures contained in the references listed in Section 1.0
- In compliance with Chapter 6.0 of the *Environmental Regulatory Guide for Radiological Effluent Monitoring and Environmental Surveillance* document (DOE-EH-0173T)
- In compliance with the requirements specified in the *Hanford Analytical Services Quality Assurance Requirements Documents* (DOE/RL-96-68)
- Appropriate to the sample medium, sample size, and the analysis requirements listed in Tables 1 through 4.

3.5 QUALITY CONTROL

WSCF shall ensure the integrity and validity of analytical test results through implementation of an internal quality control program. Standard methods shall be used whenever possible and methods that are developed or adapted shall be tested and completely documented.

Calibration and quality controls methods shall be performed using methods consistent with DOE/RL-96-68. WSCF shall provide data biannually to AWS that demonstrate that the data quality objectives for accuracy, precision, and completeness have been met. Auditable quality control (QC) test

results shall be provided within 2 weeks of requesting specific records, without any additional charges. Regulator requests for records will be provided as soon as possible.

WSCF shall participate in the U.S. DOE Environmental Measurements Laboratory (EML) inter-comparison program, as required per DOE/EH-0173T. EML laboratory inter-comparison results shall be provided annually.

3.5.1 Quality Control Tests for Water, Vegetation, and Soil Sample Analyses

These QC tests shall be for accuracy, precision, and completeness. The results of all QC tests shall be documented. Analytical problems identified through analysis of QC samples shall be corrected promptly. WSCF shall produce a minimum of 90 percent usable and valid analytical data for all ECP-related samples received. WSCF shall provide data to AWS that demonstrate that the accuracy, precision, and completeness objectives have been met.

WSCF shall prepare and analyze laboratory control standards (LCSs), blank, and duplicate samples to verify the accuracy and precision of all radiochemical methods. The total number of all QC samples shall be no less than 10 percent of all ordered sample analyses. The LCSs shall be included with each batch of samples processed and have, insofar as possible, a matrix, volume, mass, and other relevant characteristics of the actual samples being analyzed. The LCSs shall have range of activity from 5 times to no greater than 20 times the MDL values in Tables 1 through 4.

Method accuracy requirements shall be met when 95 percent of the LCS results fall within ± 25 percent. Precision requirements shall be met when duplicate results, for samples ≥ 5 times the MDL values in Tables 1 through 4 or when the analytical uncertainty is ≤ 20 percent, fall within ± 30 percent relative percent difference.

3.5.2 Quality Control Tests for Air Sample Analyses

These QC tests shall be for accuracy, precision, and completeness. The results of all QC tests shall be documented. Analytical problems identified through analysis of QC samples shall be corrected promptly. WSCF shall produce a minimum of 90 percent usable analytical data for all EEM-related samples received. WSCF shall provide data biannually to AWS that demonstrates that the accuracy, precision, and completeness objectives have been met.

Accuracy requirements shall be met when 95 percent of the results from counting instrument performance check standards fall within ± 25 percent. Precision of air sample data shall be evaluated by recounting a portion of the samples analyzed, as the creation of duplicate samples is not feasible for air samples. AWS will identify quarterly the samples to be used for precision analysis. A minimum of 10 percent of the samples analyzed, in which the sample results will be used for calculating effluent emissions, shall be recounted to determine precision, approximately 70 samples. Precision requirements shall be met when samples, with activities ≥ 5 times the MDL values in Tables 1 through 4 or when the analytical uncertainty is ≤ 20 percent, fall within ± 30 percent relative percent difference.

The requirements of Section 3.5.1 apply to air sample analyses that involve radiochemical separations. The data quality objectives for air samples requiring radiochemical separations shall be met when the objectives as specified Section 3.5.1 are met.

3.6 RETENTION OF AND ACCESS TO RAW DATA AND RESULTS

All raw data and analytical results shall be retained as quality assurance documents for a minimum of 5 years, as specified by 40 CFR 61, Subpart H.

As needed, AWS shall have access to all available EEM-related raw data and results. WSCF shall provide analysis printouts upon request (e.g., gamma energy analysis list of identified peaks).

3.7 ANALYTICAL ERROR AND MINIMUM DETECTABLE CONCENTRATION

WSCF shall provide the overall analytical error associated with each analytical result. Total analytical error shall be calculated at the 95 percent confidence interval.

WSCF shall ensure that the MDL of the sample does not exceed the values specified in Tables 1 through 4.

3.8 ARCHIVING OF SAMPLES

Ambient air monitoring samples shall be archived on the completion of the total alpha and beta analysis. Archived ambient air samples shall be combined into composite samples and analyzed biannually by WSCF. These samples shall be identified as samples with the Nxxx series electronic data processing (EDP) codes.

Effluent air samples with EDP codes listed in the Table A-2 of the Attachment shall be archived before performing any analyses. On receipt, WSCF shall sort effluent samples into samples to be analyzed and samples to be archived, regardless of any labeling on the samples. WSCF shall enter the sample collection data into automated bar coding of air samples at Hanford (ABCASH), when samples with EDP codes listed in Tables A1 and A2 have not been entered by the facility into ABCASH. After each quarter, AWS will provide specific analysis instructions to WSCF regarding the archived samples. All archived effluent air samples, from CY-1999, can be disposed after **July 15, 2000**. Following the preparation of composite samples, any residual liquid may be disposed of after 60 days.

Backup record and effluent continuous air monitor (CAM) air samples shall not be analyzed but shall be archived until **July 15, 2000**. These samples can be identified as the samples received in white envelopes stamped "Archive Only", with EDP codes that are not listed in the Attachment.

3.9 ANALYSIS COSTS

The sample analysis costs are provided in Tables 1 through 4. These costs contain additional fees associated with services specific to ECP. Table 5 contains additional services factored into unit prices. The analysis costs in Tables 1 through 4 are estimated and could fluctuate because of changes in prices and workscope. Adjustments made to sample analysis costs shall have the concurrence of AWS. Tables A-1 through A-5 include the cost account charge numbers (CACNs) to assist in charging analysis costs to the appropriate cost account.

Note: Base unit prices will increase by 10% effective June 1, 1999 through September 30, 2000. The increase is included in the unit prices quoted in Tables 1 through 4.

4.0 REFERENCES

DOE Order 5400.1, *General Environmental Protection Program*.

DOE Order 5820.2A, *Radioactive Waste Management*.

DOE Order 5484.1, *Environmental Protection, Safety and Health Protection Information Reporting Requirements*.

DOE/EH-0173T, *Environmental Regulatory Guide for Radiological Effluent Monitoring and Environmental Surveillance*, 1991.

DOE/RL-96-68, *Hanford Analytical Services Quality Assurance Requirements Documents*, U.S. Department of Energy, Richland Operations Office, Richland, Washington, 1996.

HNF-EP-0528-3, *NESHAP Quality Assurance Project Plan for Radioactive Air Emissions*, September 1998, Fluor Daniel Hanford, Inc., Richland, Washington.

HNF-EP-0538-3, *Near-Facility Environmental Monitoring Quality Assurance Project Plan*, November 1997, Fluor Daniel Hanford, Inc., Richland, Washington.

WAC 246-247, *Washington Administrative Code Chapter 246-247*, "Radiation Protection - Air Emissions," as amended, Washington Department of Health, Olympia, Washington.

Table 1. Stack and Ambient Air Sample Analysis Criteria for Waste Sampling and Characterization Facility.

Nominal sample volume	Type of analysis	MDC ^a ($\mu\text{Ci/ml}$)	MDA ^b (μCi)	TT (days)	Unit price ^c (\$)
20,000 ft ³ (5.66 E8 ml)	Total α/β	2.0 E-15 (α) and 1.9 E-14 (β)	1.1 E-6 (α) and 1.1 E-5 (β)	14	155
	Ag zeolite	3.4 E-13 (¹⁰⁶ Ru)	1.9 E-4 (¹⁰⁶ Ru)	30	272
262,000 ft ³ (7.42 E9 ml)	⁹⁰ Sr	1.9 E-14	1.4 E-4	90	310
	GEA ^d	1.9 E-14 (¹³⁷ Cs)	1.4 E-4 (¹³⁷ Cs)	90	194
	Isotopic U (²³⁴ U, ²³⁵ U, ²³⁸ U)	7.1 E-15	5.3 E-5	90	388
	Isotopic Pu (²³⁸ Pu, ^{239/240} Pu)	2.0 E-15	1.5 E-5	90	427
	²⁴¹ Pu	1.0 E-13	7.4 E-4	90	465
	²⁴¹ Am	1.9 E-15	1.4 E-5	90	388
262,000 ft ³ (7.42 E9 ml)	Total α/β Composite Analysis	2.0 E-15(α) and 1.9 E-14 (β)	1.5 E-5 (α) and 1.4 E-4 (β)	90	155
22 ft ³ (6.23 E5 ml)	Tritium	1.5 E-9	9.3 E-04	90	155

a MDCs obtained from 40 CFR 61, Appendix E Table II.

b MDAs shall be as low as reasonably attainable, but shall not exceed the values specified in the table. MDA values obtained from 40 CFR 61, Appendix E Table II and multiplied by the nominal sample volume. A minimum sample volume of 20,000 ft³ is expected for all analyses, with the exception of tritium, which is 22 ft³.

c These prices contain additional fees associated with services specific to the ECP. Table 5 contains additional services factored into unit prices. Price increase effective June 1, 1999.

d All positive gamma energy analysis results shall be reported, with the exception of the short-lived ²²³Rn and ²²⁰Rn progeny.

MDC = minimum detectable concentrations

MDA = minimum detectable activity

TT = turnaround time.

GEA = gamma energy analysis.

ft³ = cubic foot.

ml = milliliter.

$\mu\text{Ci/ml}$ = microcurie per milliliter.

μCi = microcurie.

(\$)

ECP = Environmental Compliance Program.

Table 2. Liquid Effluent Sample Analysis Criteria for Waste Sampling and Characterization Facility^a.

Sample size	Type of analysis	MDC ^b ($\mu\text{Ci/mL}$) ^c	TT (days)	Unit price ^d (\$)
Radiological Analyses				
1.0 L	Total α/β	1.2 E-09 (α) and 4.0 E-08 (β)	45	155
	^3H	8.0 E-05	45	155
	^{90}Sr	4.0 E-08	45	264
	GEA ^e	1.2 E-07 (^{137}Cs)	45	194
	Isotopic U (^{234}U , ^{235}U , ^{238}U)	2.0 E-08	45	310
	Isotopic Pu (^{238}Pu , $^{239/240}\text{Pu}$)	1.2 E-09	45	326
	^{241}Am	1.2 E-09	45	310
Nonradiological Analyses				
1.0 L	pH	NA	60	28
	NO_3	1.0 E-06 g/mL	60	233

a Liquid effluent samples shall be analyzed unfiltered, whereas groundwater samples shall be filtered and only the filtrate analyzed.

b MDCs shall be as low as reasonably attainable, but shall not exceed the values specified in the table.

MDC values obtained from 4 percent of the derived concentration guidelines.

c Unless other units of measure are indicated.

d These prices contain additional fees associated with services specific to the ECP. Table 5 contains a detailed list of the additional services factored into unit prices. Price increase effective June 1, 1999.

e All positive gamma energy analysis results shall be reported, with the exception of the short-lived ^{222}Rn and ^{220}Rn progeny.

GEA = gamma energy analysis.

MDC = minimum detectable concentration

TT = turnaround time.

L = liter.

$\mu\text{Ci/mL}$ = microcurie per milliliter.

(\$)

g/mL = grams per milliliter.

ECP = Environmental Compliance Program.

Table 3. Vegetation and Soil Samples, Sample Analysis Criteria for Waste Sampling and Characterization Facility.

Sample size	Type of analysis	MDC	TT ^a (days)	Unit price ^e (\$)
Radiological Analyses				
500 g (dry wt)	⁹⁰ Sr	1.0 pCi/g	45	350
500 g (dry wt)	GEA ^b	0.20 pCi/g (¹³⁷ Cs)	45	226
500 g (dry wt)	Isotopic U (²³⁴ U, ²³⁵ U, ²³⁸ U)	0.040 pCi/g	45	427
500 g (dry wt)	Isotopic Pu (²³⁸ Pu, ^{239/240} Pu)	1.0 pCi/g	45	427
500 g (dry wt)	²⁴¹ Pu	1.0 pCi/g	45	465
500 g (dry wt)	²⁴¹ Am	1.0 pCi/g	45	388 ^d
500 g (dry wt)	²⁴⁴ Cm	1.0 pCi/g	45	388 ^d
Nonradiological Analyses				
N/A	pH	N/A	45	40
200 g	Anions	1.0 ppm	45	310
200 g	Metals EPA Method 200.8 ^c	1.0 ppm	45	273
200 g	Cyanide	1.0 ppm	45	186
200 g	PCB		45	162

a 30 day turnaround times are available for a higher price. Prices for 30 day turnaround times are approximately 1.5 the 45-day turnaround price for most sample analyses.

b All positive gamma energy analysis results shall be reported, with the exception of the short-lived ²²²Rn and ²²⁰Rn progeny.

c The minimum list of metals for EPA Method 200.7 shall include: Ag, Al, As, B, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, K, Li, Mg, Mn, Na, Ni, P, Pb, Sc, Se, Si, Sb, Sr, Th, Ti, U, V, Y, Zn, Zr.

d When ²⁴¹Am and ²⁴⁴Cm are requested together, the combined price is \$388.

e WSCF unit prices increase 10% effective June 1, 1999.

MDC = minimum detectable concentration

TT = turnaround time

N/A = not applicable.

g = grams.

PCB = polychlorinated biphenyls.

pCi/g = picocuries per gram.

ppm = parts per million.

pH = potential of hydrogen.

EPA = U.S. Environmental Protection Agency.

Table 4. Additional Services Factored into Waste Sampling and Characterization Facility Sample Analysis Prices for Effluent and Environmental Monitoring.

Sample category	Additional services provided
Air samples	Entering sample collection data into ABCASH for facilities not equipped with barcoding equipment.
	Downloading all air sample results into ABCASH.
	Disposal of samples and waste from chemical processing.
	Archiving near-field monitoring samples and effluent samples from major emission units that receive composite analyses.
	Archiving samples from minor emission units that receive quarterly analysis.
	Archiving backup effluent samples and effluent samples from minor emission units that do not get analyzed.
	Notifying AWS about zero ABCASH results.
	Sorting effluent samples into two groups: (1) samples to be analyzed and (2) samples to be archived.
	Assembly and preparation of samples for composite analysis.
Liquid samples	Preparation and analysis of QC samples (e.g., control standards, blanks, duplicates, matrix spikes, etc.).
	Archiving samples until composite analysis is performed.
	Archiving unused samples until EEM reports are issued.
	Assembly and preparation of samples for composite analysis. Includes verifying receipt of all samples for composite, calculating effluent stream volumes, and determining aliquot sizes for composite.
	Disposal of samples and waste from chemical processing.
Miscellaneous	Preparation and analysis of QC samples (e.g., control standards, blanks, duplicates, matrix spikes, etc.)
	Supporting audits of the EEM activities.
	Participate in the prescribed laboratory intercomparison programs.
	Provide laboratory intercomparison results to AWS.
	Perform rush and emergency sample analyses.

ABCASH = automated bar coding of air samples at Hanford.

QC = quality control.

AWS = Waste Management Federal Services of Hanford, Inc., Air & Water Services Organization.

ATTACHMENT

ANALYTICAL REQUIREMENTS
FOR
ENVIRONMENTAL COMPLIANCE PROGRAM SAMPLING
DURING CALENDAR YEAR 1999

Table A-1. Airborne Effluent Samples and Analyses for Calendar Year 1999.

Facility	Stack/Bldg ID number	Location Code	Sampling Frequency	Compositing Frequency	Analyses							CACN		
					Total alpha/beta	GEA ^c	Sr-90	Isotopic Pu ³	Pu-241	Am-241	Tritium		Ag zeolite ^f	
100-N	RCF-1-EX	Y215	Q	I	4								109271	
	RCF-2-EX	Y216	Q	I	4									
	105-KE	Y245	W	M	52	12	12	12	12	12	12			
100-K		Y246	W	M	52	12	12	12	12	12	12			
		Y248	W	M	52	12	12	12	12	12	12			
		Y234	W	M	52	12	12	12	12	12	12		105381	
	105-KW	Y235	W	M	52	12	12	12	12	12	12			
		Y236	W	M	52	12	12	12	12	12	12			
		Y243	Q	I	4									
PUREX	291-A-1	A552	M	Q	12	4	4	4	4	4	4	12	100019	
	A007	A530	M	Q										
B-Plant WRSF	296-B-10	E001	M	Q	12	4	4	4	4	4	4	100019		
	296-A-10	E048	BW	Q	26	4	4	4	4	4	4	100019		
	296-A-25	E270	BW	Q	26	4	4	4	4	4	4	100019		
	296-A-27	E013	BW	Q	26	4	4	4	4	4	4	100019		
	296-A-40	E028 & E029	V	I								4		
	296-A-42	E147	BW	Q	26	4	4	4	4	4	4	4		
		E152	V	I								4		
	296-C-5	E069	BW	Q	26	4	4	4	4	4	4	4		
	296-C-6	E083	BW	Q	1	1	1	1	1	1	1	1		
		E084	V	I								1		
	296-P-16	E068	BW	Q	26	4	4	4	4	4	4	1		
	296-P-32	E401	V	I			1	1	1	1	1	1		
	296-A-27	E270	BW	Q	26	4	4	4	4	4	4	4		
	296-A-29	E001	BW	Q	26	4	4	4	4	4	4	4		
	296-P-43	E045	V	A	1	1	1	1	1	1	1	1	100019	
	East Tank Farms	296-P-44	E046	V	A	1	1	1	1	1	1	1	1	
296-A-18		E060	BW	ARC	4									
296-A-19		E061	BW	ARC	4									
296-A-20		E197	BW	ARC	4									
296-A-26		E257	BW	ARC	4									
296-A-28		E272	BW	ARC	4									
296-A-30		E063	BW	ARC	4									
296-A-41		E015	BW	ARC	4									
296-A-43		E148	BW	ARC	4									
296-P-31		E044	BW	ARC	4									
296-P-37		E209	BW	ARC	4									
296-P-41		E037	BW	ARC	4									
TWRS		296-P-33	E307	V	A	10	1	1	1	1	1	1	100019	
Char. Protect 242-A Evaporator		296-P-34	E308	V	A	10	1	1	1	1	1	1	100019	
		296-A-21	E643	BW	ARC	4							100019	
		296-A-22	E645	BW	ARC	4							100019	
	296-E-1	E036	Q	ARC	4							100019		
222-S Lab	296-S-16	S164	BW	ARC	4							100019		
	296-S-21	S239	BW	ARC	4							100019		

Table A-1. Airborne Effluent Samples and Analyses for Calendar Year 1999.

Facility	Stack/Bldg ID number	Location Code	Sampling Frequency	Compositing Frequency	Analyses							CACN	
					Total alpha/beta	GEAC	Sr-90	Isotopic Pu	Pu-241	Am-241	Tritium		Ag zeolite
S-Plant & U-Plant	291-S-1	S006	BW	ARC	4								100019
	296-S-2	S032	BW	ARC	4								
	296-S-7E	S015	V	ARC	1								
	296-S-7W	S016	W	ARC	4								
T-Plant	291-U-1	U771	BW	ARC	4								100019
	291-T-1	T785	BW	1	26								
	296-T-7	T154	M	ARC	4								
	296-T-11	T783	Q	1	4								
TRUSAF	296-T-12	T784	Q	1	4								100019
	296-B-28	B586	BW	Q	26	4	4	4			4		
	296-S-22	W880	BW	Q	26	4	4	4			4		
	296-U-11	W884	BW	Q	1	1	1	1			1		
West Tank Farms	296-P-23	W190	BW	1	26								100019
	296-P-28	W195	BW	1	26								
	296-S-15	W111	BW	1	26								
	296-S-25	W145	BW	1	26								
	296-T-18	W882	BW	Q	26								
	296-P-22	W191	BW	ARC	4								
	296-S-18	W096	BW	ARC	4								
	296-T-17	W117	BW	ARC	4								
WRAP	296-W-3	W003	BW	ARC	4								100019
	296-W-4	W173	BW	Q	26	4	4	4	4	4	4		
WSCF	696-W-1	W010	M	ARC	4								100019
	696-W-2	W011	M	ARC	4								
PPF	291-Z-1	Z810	BW	Q	26	4	4	4	4	4	4		100019
	296-Z-3	Z813	BW	Q	26	4	4	4	4	4	4		
	296-Z-5	Z913	BW	ARC	4								
	296-Z-6	Z802	BW	ARC	4								
	296-Z-14	Z814	BW	ARC	4								
	296-Z-15	Z915	A	ARC	1								
300 Area Facilities	303A	F101	V	A	1								101333
	304B	F102	V	A	1								
	305E	F103	V	A	1								
	306E & 311	F104	V	A	1								
	307G	F105	V	A	1								
	308K & 320G	F106	V	A	1								
	313	F107	V	A	1								
	333	F108	V	A	1								
	334/334A	F109	V	A	1								
	3712	F110	V	A	1								
	3716	F111	V	A	1								
	WTFPS	F112	V	A	1								
340 Facility	340-NT-EX	F002	BW	Q	26	4	4	4			4		101734
	340-B-BLD	F008	Q	1	4								
	340-DECON	F009	Q	1	4								
324 Building	BP-324-01-S	P025	M	Q	12	4	4	4	4	4	4		101021
327 Building	BP-327-01-S	P026	M	Q	12	4	4	4	4	4	4		101161
	BP-327-02-V	P027	A	1	1								

Table A-1. Airborne Effluent Samples and Analyses for Calendar Year 1999.

Facility	Stack/Bldg ID number	Location Code	Sampling Frequency ^a	Compositing Frequency ^b	Analyses							CACN
					Total alpha/beta	CEA ^c	Sr-90	Isotopic Pu ^d	Pu-241	Am-241	Tritium	Ag zeolite ^e
FFTF	FFTF-CB-EX	P011	V	1	4							
		P024	V	1	4						4	
	FFTF-RE-SB	P012	V	1	4							
	FFTF-HI-TR	P013	V	1	4							
	437-MN&ST	P014	V	1	4							
	437-I-61	P019	V	1	4							
Total					1093	139	135	143	88	143	4	21

Notes:

- ^a Sampling frequencies are: W – weekly, BW – biweekly (every other week), M – monthly, A – annually, V – variable (dependent on activities)
^b Compositing frequencies are: M – monthly, Q – quarterly, A – annually, I – individual sample analysis (no composite sample), ARC – archive only.
^c Minimum gamma energy analysis shall include Co-60, Ru-106, Sn-113, Sb-125, Cs-134, Cs-137, Eu-152, Eu-154, and Eu-155. All positive gamma energy analysis results shall be reported.
^d Minimum isotopic Pu analysis shall include Pu-238 and Pu-239/240.
^e Minimum Ag zeolite analysis shall include Ru-106, Sn-113, Sb-125, and I-129.

Table A-2. Liquid Effluent Samples and Analyses for Calendar Year 1999.

Facility	Stack/Bldg ID number	Location Code	Sampling Frequency	Compositing Frequency	Analyses							CACN
					Total alpha/beta	GEA ^c	Sr-90	Isotopic Pu ^b	Pu-241	Am-241	Tritium	
100-K	1908-K	Y215	BW	M	12	12	12	12	12	12		105381
		Total			12	12	12	0	12	0	0	

Notes:

A Sampling frequencies are: W – weekly, BW – biweekly (every other week), M – monthly, A – annually, V – variable (dependent on activities).

B Compositing frequencies are: M – monthly, Q – quarterly, A – annually, I – individual sample analysis (no composite sample), ARC – archive only.

C Minimum gamma energy analysis shall include Co-60, Ru-106, Sn-113, Sb-125, Cs-134, Cs-137, Eu-152, Eu-154, and Eu-155. All positive gamma energy analysis results shall be reported.

D Minimum isotopic U analysis shall include U-234, U-235, and U-238.

E Minimum isotopic Pu analysis shall include Pu-238 and Pu-239/240.

Table A-3. Near-Facility Monitoring Air Samples and Analyses for Calendar Year 1999.

Operating Area	Location Code	Sampling Frequency	Compositing Frequency	Analyses							CACN	
				Total alpha/beta	GEA ^c	Sr-90	Isotopic U ²³⁵	Isotopic Pu ²³⁹	Pu-241	Am-241		Tritium
100-B/C	N464	BW	S	26	2	2	2	2	2			108860
	N465	BW	S	26	2	2	2	2	2			
	N466	BW	S	26	2	2	2	2	2			
	N467	BW	S	26	2	2	2	2	2			
	N496	BW	S	26	2	2	2	2	2			
100-D	N467	BW	S	26	2	2	2	2	2			108859
	N468	BW	S	26	2	2	2	2	2			
	N469	BW	S	26	2	2	2	2	2			
	N470	BW	S	26	2	2	2	2	2			
	N492	BW	O	26	4	4	4	4	4			
100-DR	N493	BW	O	26	4	4	4	4	4			108901
100-F	N494	BW	O	26	4	4	4	4	4			108900
	N495	BW	O	26	4	4	4	4	4			
100-KE	N401	BW	S	26	2	2	2	2	2	2	2	100019
	N402	BW	S	26	2	2	2	2	2	2	2	
	N403	BW	S	26	2	2	2	2	2	2	2	
	N404	BW	S	26	2	2	2	2	2	2	2	
100-KW	N476	BW	S	26	2	2	2	2	2	2	2	106789
	N477	BW	S	26	2	2	2	2	2	2	2	
	N478	BW	S	26	2	2	2	2	2	2	2	
	N479	BW	S	26	2	2	2	2	2	2	2	
100-N	N102	BW	S	26	2	2	2	2	2	2	2	108885
	N103	BW	S	26	2	2	2	2	2	2	2	
	N105	BW	S	26	2	2	2	2	2	2	2	
	N106	BW	S	26	2	2	2	2	2	2	2	
200-E	N019	BW	S	26	2	2	2	2	2	2	2	100019
	N138	BW	S	26	2	2	2	2	2	2	2	
	N498	BW	S	26	2	2	2	2	2	2	2	
	N499	BW	S	26	2	2	2	2	2	2	2	
	N957	BW	S	26	2	2	2	2	2	2	2	
	N957	BW	S	26	2	2	2	2	2	2	2	
	N968	BW	S	26	2	2	2	2	2	2	2	
	N969	BW	S	26	2	2	2	2	2	2	2	
	N970	BW	S	26	2	2	2	2	2	2	2	
	N972	BW	S	26	2	2	2	2	2	2	2	
	N973	BW	S	26	2	2	2	2	2	2	2	
	N977	BW	S	26	2	2	2	2	2	2	2	
CSB	N978	BW	S	26	2	2	2	2	2	2	2	105650
	N984	BW	S	26	2	2	2	2	2	2	2	
	N985	BW	S	26	2	2	2	2	2	2	2	
	N999	BW	S	26	2	2	2	2	2	2	2	
	N480	BW	S	26	2	2	2	2	2	2	2	
CSB	N481	BW	S	26	2	2	2	2	2	2	2	105650

Table A-3. Near-Facility Monitoring Air Samples and Analyses for Calendar Year 1999.

Operating Area	Location Code	Sampling frequency	Compositing frequency	Analyses							CACN		
				Total alpha/beta	GEA ^c	Sr-90	Isotopic U ^b	Isotopic Pu ^e	Pu-241	Am-241		Tritium	
200-W	N155	BW	S	26	2	2	2	2	2				100019
	N161	BW	S	26	2	2	2	2	2				
	N165	BW	S	26	2	2	2	2	2				
	N168	BW	S	26	2	2	2	2	2				
	N204	BW	S	26	2	2	2	2	2				
	N411	BW	S	26	2	2	2	2	2				
	N413	BW	S	26	2	2	2	2	2				
	N441	BW	S	26	2	2	2	2	2				
	N442	BW	S	26	2	2	2	2	2				
	N449	BW	S	26	2	2	2	2	2				
	N456	BW	S	26	2	2	2	2	2				
	N457	BW	S	26	2	2	2	2	2				
	N956	BW	S	26	2	2	2	2	2				
	N962	BW	S	26	2	2	2	2	2				
	N963	BW	S	26	2	2	2	2	2				
	N964	BW	S	26	2	2	2	2	2				
TEDEF Wye	N965	BW	S	26	2	2	2	2	2				108871
	N967	BW	S	26	2	2	2	2	2				
	N974	BW	S	26	2	2	2	2	2				
	N975	BW	S	26	2	2	2	2	2				
	N994	BW	S	26	2	2	2	2	2				
	N200	BW	S	26	2	2	2	2	2				
	N130	BW	S	26	2	2	2	2	2				
	N981	BW	S	26	2	2	2	2	2				
300	N485	BW	S	26	2	2	2	2	2				108902
	N486	BW	S	26	2	2	2	2	2				
	N487	BW	S	26	2	2	2	2	2				
	N488	BW	S	26	2	2	2	2	2				
ERDF	N489	BW	S	26	2	2	2	2	2				108902
	N482	BW	S	26	2	2	2	2	2				
	N483	BW	S	26	2	2	2	2	2				
	N484	BW	S	26	2	2	2	2	2				
Total				2002	162	152	162	152	20	20	0		

Notes:

- a Sampling frequencies are: W – weekly, BW – biweekly (every other week), M – monthly, A – annually, V – variable (dependent on activities).
- b Compositing frequencies are: M – monthly, Q – quarterly, A – annually, I – individual sample analysis (no composite sample), ARC – archive only.
- c Minimum gamma energy analysis shall include Co-60, Ru-106, Sn-113, Sb-125, Cs-134, Cs-137, Eu-152, Eu-154, and Eu-155. All positive gamma energy analysis results shall be reported.
- d Minimum isotopic U analysis shall include U-234, U-235, and U-238.
- e Minimum isotopic Pu analysis shall include Pu-238 and Pu-239/240.

Table A-4. Near-Field Monitoring Soil Samples and Analyses for Calendar Year 1999.

Operating Area	Location Code	Sampling frequency	Compositing frequency	Analyses							CACN	
				Total alpha/beta	GEA ^c	Sr-90	Isotopic U ^b	Isotopic Pu ^e	Pu-241	Am-241		Tritium
100-N	Y602	A	I		I	I	I	I				108855
	Y603	A	I		I	I	I	I				
	Y604	A	I		I	I	I	I				
	Y605	A	I		I	I	I	I				
	Y608	A	I		I	I	I	I				
	Y610	A	I		I	I	I	I				
100-D	Y611	A	I		I	I	I	I				108859
	D147	A	I		I	I	I	I				
	D148	A	I		I	I	I	I				
	D149	A	I		I	I	I	I				
	D150	A	I		I	I	I	I				
	D153	A	I		I	I	I	I				
100-H	D151	A	I		I	I	I	I				108872
	D152	A	I		I	I	I	I				
	D053	BA	I		I	I	I	I				
	D054	BA	I		I	I	I	I				
	D055	BA	I		I	I	I	I				
	D056	BA	I		I	I	I	I				
200-E	D057	BA	I		I	I	I	I				100019
	D058	BA	I		I	I	I	I				
	D059	BA	I		I	I	I	I				
	D060	BA	I		I	I	I	I				
	D061	BA	I		I	I	I	I				
	D062	BA	I		I	I	I	I				
	D063	BA	I		I	I	I	I				
	D064	BA	I		I	I	I	I				
	D065	BA	I		I	I	I	I				
	D066	BA	I		I	I	I	I				
	D067	BA	I		I	I	I	I				
	D068	BA	I		I	I	I	I				
	D069	BA	I		I	I	I	I				
	D070	BA	I		I	I	I	I				
200-W	D071	BA	I		I	I	I	I				100019
	D072	BA	I		I	I	I	I				
	D073	BA	I		I	I	I	I				
	D074	BA	I		I	I	I	I				
	D075	BA	I		I	I	I	I				
	D076	BA	I		I	I	I	I				
	D077	BA	I		I	I	I	I				
	D078	BA	I		I	I	I	I				
200-W	D079	BA	I		I	I	I	I				100019
	D080	BA	I		I	I	I	I				

Table A-4. Near-Field Monitoring Soil Samples and Analyses for Calendar Year 1999.

Operating Area	Location Code	Sampling Frequency	Compositing Frequency	Analyses							CACN	
				Total alpha/beta	GEA ^c	Sr-90	Isotopic U ^b	Isotopic Pu ^b	Pu-241	Am-241		Tritium
200-W	D001	BA	1			1	1	1				100019
	D002	BA	1			1	1	1				
	D003	BA	1			1	1	1				
	D004	BA	1									
	D005	BA	1			1	1	1				
	D006	BA	1									
	D007	BA	1			1	1	1				
	D008	BA	1									
	D009	BA	1			1	1	1				
	D010	BA	1			1	1	1				
	D011	BA	1			1	1	1				
	D012	BA	1									
	D013	BA	1			1	1	1				
	D014	BA	1			1	1	1				
	D015	BA	1			1	1	1				
	D016	BA	1									
	D017	BA	1			1	1	1				
	D018	BA	1			1	1	1				
	D019	BA	1			1	1	1				
	D020	BA	1									
	D021	BA	1			1	1	1				
	D022	BA	1									
	D023	BA	1			1	1	1				
	D024	BA	1									
	D025	BA	1			1	1	1				
	D026	BA	1									
	D027	BA	1			1	1	1				
	D028	BA	1									
	D029	BA	1			1	1	1				
	D030	BA	1									
	D031	BA	1			1	1	1				
	D032	BA	1									
	D033	BA	1			1	1	1				
	D034	BA	1									
	D035	BA	1			1	1	1				
	D036	BA	1									
	D037	BA	1			1	1	1				
	D038	BA	1									
	D039	BA	1			1	1	1				
	D040	BA	1									
	D041	BA	1			1	1	1				
	D042	BA	1									
	D043	BA	1			1	1	1				
	D044	BA	1									
	D045	BA	1			1	1	1				
	D046	BA	1									
	D047	BA	1			1	1	1				
	D048	BA	1									
	D049	BA	1			1	1	1				

Table A-4. Near-Field Monitoring Soil Samples and Analyses for Calendar Year 1999.

Operating Area	Location Code	Sampling frequency	Compositing frequency	Analyses							CACN	
				Total alpha/beta	GEA ^c	Sr-90	Isotopic U ^b	Isotopic Pu ^b	Pu-241	Am-241		Tritium
200-W	D050	BA	1									100019
	D051	BA	1									
	D052	BA	1									
	D116	A	1									
	D117	A	1									
300	D118	A	1									100019
	D119	A	1									
	D120	A	1									
	D121	A	1									
	D122	A	1									
	D123	A	1									
	D124	A	1									
	D125	A	1									
	D126	A	1									
	D127	A	1									
	D128	A	1									
	D129	A	1									
	D130	A	1									
	D095	BA	1									
D096	BA	1										
D097	BA	1										
D098	BA	1										
D099	BA	1										
D100	BA	1										
D101	BA	1										
D102	BA	1										
D103	BA	1										
D104	BA	1										
D105	BA	1										
D106	BA	1										
D107	BA	1										
D108	BA	1										
D109	BA	1										
D110	BA	1										
D146	A	1									108902	
Total				0	85	85	85	85	0	0	0	

Notes:

a Sampling frequencies are: W – weekly, BW – biweekly (every other week), M – monthly, A – annually, V – variable (dependent on activities).

b Compositing frequencies are: M – monthly, Q – quarterly, A – annually, 1 – individual sample analysis (no composite sample), ARC – archive only.

c Minimum gamma energy analysis shall include Co-60, Ru-106, Sn-113, Sb-125, Cs-134, Cs-137, Eu-152, Eu-154, and Eu-155. All positive gamma energy analysis results shall be reported.

d Minimum isotopic U analysis shall include U-234, U-235, and U-238.

e Minimum isotopic Pu analysis shall include Pu-238 and Pu-239/240.

Table A.5. Near Field Monitoring Vegetation Samples and Analyses for Calendar Year 1999.

Operating Area	Location Code	Sampling frequency	Compositing frequency	Analyses							CACN		
				Total alpha/beta	GEA	Sr-90	Isotopic U	Isotopic Pu	Pu-241	Am-241		Tritium	
100-N	V703	A	1			1	1	1				108885	
	V703	A	1			1	1	1					
	V704	A	1			1	1	1					
	V705	A	1			1	1	1					
	V708	A	1			1	1	1					
	V710	A	1			1	1	1					
	V711	A	1			1	1	1					
	V718	A	1			1	1	1					
	V719	A	1			1	1	1					
	V724	A	1			1	1	1					
	V053	BA	1			1	1	1					100019
	V054	BA	1			1	1	1					
V055	BA	1			1	1	1						
V056	BA	1			1	1	1						
V057	BA	1			1	1	1						
V058	BA	1			1	1	1						
V059	BA	1			1	1	1						
V060	BA	1			1	1	1						
V061	BA	1			1	1	1						
V062	BA	1			1	1	1						
V063	BA	1			1	1	1						
V064	BA	1			1	1	1						
V065	BA	1			1	1	1						
V066	BA	1			1	1	1						
V067	BA	1			1	1	1						
V068	BA	1			1	1	1						
V069	BA	1			1	1	1						
V070	BA	1			1	1	1						
V071	BA	1			1	1	1						
V072	BA	1			1	1	1						
V073	BA	1			1	1	1						
V074	BA	1			1	1	1						
V075	BA	1			1	1	1						
V076	BA	1			1	1	1						
V077	BA	1			1	1	1						
V078	BA	1			1	1	1						
V079	BA	1			1	1	1						
V080	BA	1			1	1	1						
V001	BA	1			1	1	1						
V002	BA	1			1	1	1						
V003	BA	1			1	1	1						

Table A-5. Near Field Monitoring Vegetation Samples and Analyses for Calendar Year 1999.

Operating Area	Location Code	Sampling Frequency	Compositing Frequency	Analyses							CACN
				Total alpha/beta	GEA	Sr-90	Isotopic U	Isotopic Pu	Pu-241	Am-241	Tritium
200-W	V003	BA	1								
	V005	BA	1								
	V006	BA	1								
	V007	BA	1								
	V008	BA	1								
	V009	BA	1								
	V010	BA	1								
	V011	BA	1								
	V012	BA	1								
	V013	BA	1								
	V014	BA	1								
	V015	BA	1								
	V016	BA	1								
	V017	BA	1								
	V018	BA	1								
	V019	BA	1								
	V020	BA	1								
	V021	BA	1								
	V022	BA	1								
	V023	BA	1								
	V024	BA	1								
	V025	BA	1								
	V026	BA	1								
	V027	BA	1								
	V028	BA	1								
	V029	BA	1								
	V030	BA	1								
	V031	BA	1								
	V032	BA	1								
	V033	BA	1								
	V034	BA	1								
	V035	BA	1								
	V036	BA	1								
	V037	BA	1								
	V038	BA	1								
	V039	BA	1								
	V040	BA	1								
	V041	BA	1								
	V042	BA	1								
	V043	BA	1								
	V044	BA	1								
	V045	BA	1								
	V050	BA	1								
	V051	BA	1								
	V052	BA	1								

100019

200-W

Table A-5. Near Field Monitoring Vegetation Samples and Analyses for Calendar Year 1999.

Operating Area	Location Code	Sampling frequency	Compositing frequency	Analyses						CACN																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
				Total alpha/beta	GEA	Sr-90	Isotopic U	Isotopic Pu	Pu-241		Am-241	Tritium																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
300	V116	A	1																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								

This page intentionally left blank.

DISTRIBUTION

MSIN

U.S. Department of Energy, Richland Operations Office

A. V. Ingle	A5-15
J. B. Hall	A5-15
D. C. Ward	A5-15
Public Reading Room	H2-53

Bechtel Hanford, Inc.

R. J. Landon	H0-02
D. W. Long	X5-54
J. E. Rugg	S3-21
J. G. Woolard	H0-02
J. P. Zoric	X5-53

Fluor Daniel Hanford, Inc.

K. A. Giese	H6-21
D. G. Ranade	H6-23
S. M. Price	X6-23

B&W Hanford Company

N. R. Dahl	N2-57
D. L. Johnson	L1-05
D. E. Rasmussen	L1-04

DE&S Hanford, Inc.

R. G. Gant	X3-79
D. J. Watson	X3-79

Lockheed Martin Hanford, Inc.

M. J. Brown	R1-51
G. C. Crummel	R1-51

Lockheed Martin Services, Inc.

J. N. Diven	H8-41
Central Files	B1-07
DPC	H6-08

Pacific Northwest National Laboratory

Hanford Technical Library	P8-55

DISTRIBUTION (cont)**MSIN**SGN Eurisys Services Corporation

J. D. Criddle

S7-12

Waste Management Federal Services of Hanford, Inc.

S. N. Bakhtiar

S3-28

S. L. Cobb

S3-28

B. M. Colley

S3-28

A. K. Dasgupta (5)

S3-28

L. K. Deere

S3-31

L. P. Diediker (20)

H6-36

S. L. Fitzgerald

T6-50

E. M. Greager

H6-36

L. D. Kamberg

H6-25

K. L. Kunzweiler

S3-28

R. E. Johnson

H6-25

H. K. Mezmarich

S3-31

K. L. Powell

S3-30

W. R. Thackaberry

T4-52

Waste Management Federal Services, Inc., Northwest Operations

J. J. Dorian

H1-13

A. R. Johnson

H1-13

B. M. Markes

H1-13

S. M. McKinney

H1-12

C. J. Perkins

H1-12