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ENGINEERING DATA TRANSMITTAL

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1. EDT 622565

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1	HNF-2698		0	SAMPLING AND ANALYSIS PLAN (SAP) FOR WESF DRAINS AND TK-100 SUMP	E	1		

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1		Design Authority L. D. Brist	<i>L. D. Brist</i>	5/11/98		1		Dan Edwards	<i>see attached</i>		
1		Design Agent N/A				1		Paul Saueressig	<i>Paul Saueressig</i>	4/14/98	
1		Cog. Eng. L. D. Brist	<i>L. D. Brist</i>	5/13/98		1		Rampur S Viswanath	<i>see attached</i>		
1		Cog. Mgr. E. Dewey Robbins	<i>E. Dewey Robbins</i>	5-12-98		1		Karl N. Pool	<i>see attached</i>		
		QA				1		F. M. Simmons	<i>F. M. Simmons</i>	5/12/98	660
		Safety				1		T. A. Wooley	<i>T. A. Wooley</i>	5/13/98	
1		Env. T.G. Beam	<i>Thomas G. Beam</i>	5/13/98		1		D. Hardy	<i>see attached</i>		

18. Signature of EDT Originator <i>F. M. Simmons</i> Date: 5/12/98	19. Authorized Representative Date for Receiving Organization N/A	20. Design Authority/Cognizant Manager <i>ED Robbins</i> Date: 5-12-98	21. DOE APPROVAL (if required) Ctrl. No. <input type="checkbox"/> Approved <input type="checkbox"/> Approved w/comments <input type="checkbox"/> Disapproved w/comments
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1		Cng. Mgr.	E. Dewey Robbins	5-11-78	
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		Safety			
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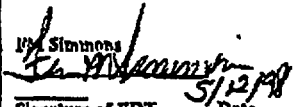

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# SAMPLING AND ANALYSIS PLAN (SAP) FOR WESF DRAINS AND TK-100 SUMP

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BWHC, Richland, WA 99352  
U.S. Department of Energy Contract DE-AC06-96RL13200

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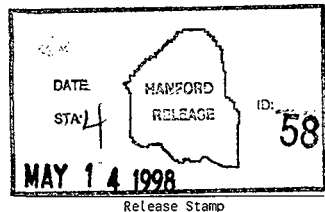
Key Words: Tk-100 sump, WESF floor drains, characterization, sampling, analysis

Abstract: The intent of this plan is to define the responsibilities of the various organizations involved in sampling and analyzing the WESF floor drains and Tk-100 sump.

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Date



**Approved for Public Release**

# SAMPLING AND ANALYSIS PLAN FOR WESF DRAINS AND TK-100 SUMP

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## 1.0 INTRODUCTION.

Tk-100 is currently used as a catch tank to transfer low level liquid waste from WESF to Tank Farms via B Plant. This system is being modified as part of the WESF decoupling since B Plant is being deactivated. As a result of the 1,1,1-trichloroethane (TCA) discovery in Tk-100, the associated WESF floor drains and the pit sump need to be sampled. Breakdown constituents have been reviewed and found to be non-hazardous. There are 29 floor drains that tie into a common header leading into the tank. To prevent high exposure during sampling of the drains, Tk-100 will be removed into the B Plant canyon and a new tank will be placed in the pit before any floor drain samples are taken. The sump will be sampled prior to Tk-100 removal. A sample of the sludge and any liquid in the sump will be taken and analyzed for TCA and polychlorinated biphenyl (PCB). After the sump has been sampled, the vault floor will be flushed. The flush will be transferred from the sump into Tk-100. Tk-100 will be moved into B Plant. The vault will then be cleaned of debris and visually inspected. If there is no visual indication of TCA or PCB staining, the vault will be painted and a new tank installed. If there is an indication of TCA or PCB from laboratory analysis or staining, further negotiations will be required to determine a path forward. A total of 8 sets of (3) 40ml samples will be required for all of the floor drains and sump. The sump set will include one 125ml solid sample. The only analysis required will be for TCA in liquids. PCBs will be checked in sump solids only.

The Sampling and Analysis Plan (SAP) is written to provide direction for the sampling and analytical activities of the 29 WESF floor drains and the Tk-100 sump. Analytical activities will meet the requirements of SW-846 (see Section 6.0, References).

### 1.1 Purpose and Scope.

The intent of this project is to determine whether the 29 Waste Encapsulation and Storage Facility (WESF) floor drain piping and the Tk-100 sump are free from contamination with TCA. The purpose of samples is to show the TCA has been effectively removed from the drain lines through about 10 years of use since discontinuation of TCA use in the plant. A total of 8 sets of (3) 40 ml samples will be taken for analysis. The floor drains will be grouped according to location, thereby minimizing the number of samples required.

This SAP defines the responsibilities and requirements of each organization involved. The responsibilities include proper documentation. Requirements are the Quality Assurance/Quality Control (QA/QC) controls as required by the SW846.



**This SAP describes activities associated with collecting samples from 29 WESF floor drains and Tk-100 sump and transferring the samples to the Special Analytical Support (SAS) Laboratory/222S for analysis. The activities associated with collecting the samples include:**

- 1. Pre-sampling activities**
- 2. Sample collection**
- 3. Sample transport to SAS Laboratory/222S**
- 4. Analysis requirements**

**Eight separate sets of three samples will be obtained. Each sample will be analyzed for TCA and/or PCB as shown in Table 1.**

## 2.0 DESCRIPTION

Eight sets of (3) 40ml samples will be taken. Seven of these sets of samples will be taken from the floor drains that will be grouped according to use and location. One sample set will be taken from the Tk-100 sump. Since the floor drains all tie into a common header, they will be sampled at the sample port upstream of Tk-100. Floor drains will be grouped as follows and each grouping will represent 1 sample set:

<b>Area:</b>	<b>Grouping:</b>
Crane Maintenance Area	One floor drain
Canyon	Four floor drains
HMS, CMS/Decon Sink/Shower	Five floor drains
Service Gallery and A Cell Airlock	Two floor drains
Truck Port/Pool Cell/G Cell Airlock	Three floor drains
AMU/Transmitter rooms/Mezzanine	Eleven floor drains
Operating Gallery	Three floor drains

Rank logic is based on use.

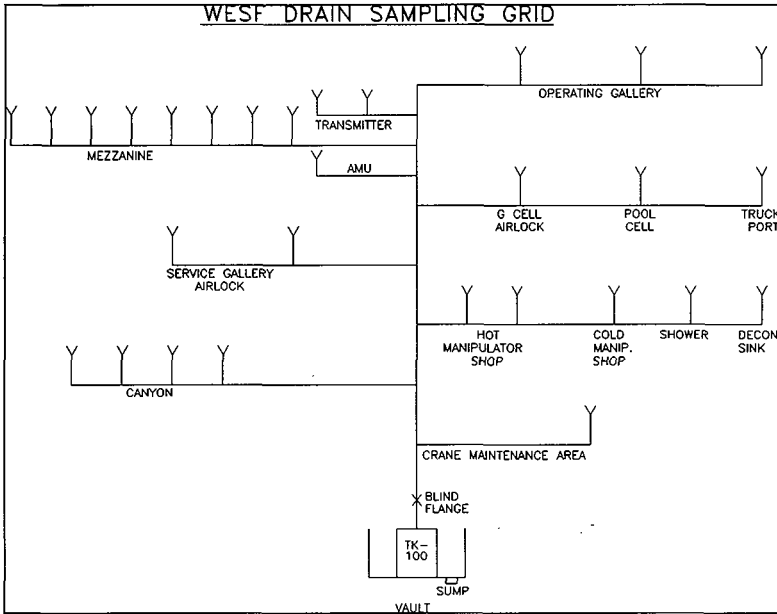


Figure 1 - WESF Drain Sampling Grid

### 3.0 ORGANIZATIONAL RESPONSIBILITIES

The responsibilities and descriptions below are related to activities required by the different organizations.

#### 3.1 WESF Technical Support

- Issue SAP and coordinate sampling requirements.

#### 3.2 WESF Facility Support

- Nuclear Process Operators will provide support to the sampling team by controlling water flow down each drain.
- Nuclear Process Operators will provide support to obtain the sample analysis according to the SAP, Sample Authorization Form, and the SAS Laboratory Quality Assurance Plan.
- Radiation Control Technicians will provide radiological surveys associated with sampling activities and shipping.

#### 3.3 Special Analytical Support Laboratory (SAS)

- The SAS Laboratory will conduct the sample analysis according to this SAP, Sample Authorization Form, and the SAS Laboratory Quality Assurance Plan.
- The SAS Laboratory will submit a standalone data package to Analytical Support -Waste Management Hanford for validation.

#### 3.4 Analytical Services - Waste Management Hanford

- Arrange and coordinate laboratory analysis of the samples.
- Maintain documentation for each sample.
- Transmit the complete data package to the Administrative Record and B&W Hanford Company.
- Validate data to a Level D.

#### 3.5 Sampling and Mobile Laboratories

This team is responsible for taking the samples per SW-846 protocol and transporting the samples to the SAS Laboratory and initiating Chain of Custody (COC). Sampling and Mobile Laboratories (SML) is responsible for a trip blank with each sample set.

### 3.6 222S Laboratory

- Responsible for PCB analysis in Table 1 and QA/QC requirements in Table 2.
- The 222S Laboratory will submit a standalone data package to Analytical Support-Waste Management Hanford for validation.

## 4.0 SAMPLING

All sampling will be performed per SW-846 protocol and in accordance with WESF Radiological Control requirements. Requirements for personal protective equipment to be worn during sampling will be identified in the Radiation Work Permit.

### 4.1 Sample Locations

Samples will be taken from the sample port at the top of Tk-100 and from the sump in the Tk-100 pit.

Less than 10 gallons of deionized water will be drained down each floor drain to obtain a sample at the sample port.

### 4.2 Sample Identification

A sample number will be obtained from the Sample and Data Tracking System. The following information will be shipped with the sample:

- Identification (signature or initials) of the person collecting the sample
- Sample number
- Date and time the sample was collected
- The analyses to be performed on the sample.
- Sample location and bottle specifications (volume, preservation, etc.).

### 4.3 Sampling Equipment

Sampling equipment will be provided by the SML. The sampling equipment will be cleaned per ES-SSPM-001 2.5.

### 4.4 Sample Collection

Samples will be collected with zero head space in (3) 40 ml containers for each sampling event or in 125 ml container for PCB.

### 4.5 Sample Handling

A COC and any radiological documentation will be filled out at the time of sampling and will accompany each sample set.

## 5.0 QUALITY ASSURANCE/QUALITY CONTROL REQUIREMENTS

### 5.1 Field Logbook

All sampling activities will be documented in logbooks maintained by the SML.

### 5.2 QA-QC

#### 5.2.1 Samples

Analysis will be completed according to SAS laboratory QA/QC requirements for TCA. Analysis will be completed according to 222S laboratory QA/QC requirements for PCB.

#### 5.2.2 Data Reporting and Validation

Each laboratory will issue a full data report including all QC within 45 days. A final validated data package is due to Ecology from Analytical Services within 90 days of when the sample is received in the laboratory.

The laboratory complete data package will contain:

1. All COC and laboratory forms
2. Analytical data
3. Case narrative from sample analysis (signed by a laboratory representative) to identify any anomalies and the corresponding corrective action
4. A reference table indicating which field sample number corresponds to the laboratory sample number
5. All QC analyses performed on the samples. All information required in WMH-CM-5-4, Sec 3.2, "Technical Verification of Analytical Laboratory Data Packages" for applicable method checklists

Data validation to Level D will be required for all samples.

### **5.2.3 Quality Assurance**

**Method-specific quality control calibrations are found in the analytical procedures. Sample quality requirements are identified in Table 2. The WESF Technical Support team will be notified prior to data reporting, should the quality control data not conform with the data requirements specified.**

**If the QA/QC requirements are not met, the samples are to be rerun. If the sample quantity does not allow a rerun, the data should be flagged as not meeting the limits.**



## 6.0 REFERENCES

ES-SSPM-001, 2.5, *Cleaning of RCRA/CERCLA Sampling Equipment.*

EPA, *Test Methods for Evaluating Solid Waste*, 3rd Edition, SW-846 EPA/Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, Washington, D.C., (latest revision).

HNF-SD-CP-QAPP-016, Rev. 2, *222S Laboratory Quality Assurance Plan*

HNF-SD-WM-QAPP-034, Rev. 2, *Special Analytical Support Quality Assurance Program Plan.*

LA-523-138, *Soxhlet Extraction of Solid Samples for Semivolatile and/or Pesticide and/or PCB Analysis*

Washington State Department of Ecology.

WHC-SD-EN-SPP-002, Rev. 2, *Data Validation Procedures for Chemical Analyses.*

WHC-SD-EN-SPP-001, Rev. 1, *Data Validation Procedures for Radiochemical Analyses.*

WMH-CM-5-4, *Laboratory Administration*, Section 3.20, "Technical Verification of Analytical Laboratory Data Packages"

## 7.0 LIST OF ACRONYMS

**1,1,1-trichloroethane (TCA)**

**Chain Of Custody (COC)**

**Matrix Spike (MS)**

**Matrix Spike Duplicate (MSD)**

**Polychlorinated biphenyl (PCB)**

**Quality Assurance/Quality Control (QA/QC)**

**Sampling Authorization Form (SAF)**

**Sampling and Mobile Laboratory (SML)**

**Sampling and Analysis Plan (SAP)**

**Special Analytical Support (SAS)**

**State of Washington, Department of Ecology (Ecology)**

**Waste Encapsulation and Storage Facility (WESF)**

TABLE 1. WESF ANALYSIS REQUIREMENTS

Analyte	Dangerous Waste Designation Threshold (mg/L)	Quantification limit	Analysis
1,1,1-trichloroethane	Detectable	< 5 $\mu$ g/L	VOA 8260B complete
PCB	2ppm	< 200 $\mu$ g/kg	LA-523-138

TABLE 2. QA/QC REQUIREMENTS

Parameter/ Analysis	Reference Method	Container/ Volume	VolReq	Preservation	Holding Time
VOA/TCA	EPA8260B	Glass/40ml	3x40ml VOA	Cool 4°C	14 days
PCB	EPA8081	Glass/125ml	1x125ml vials per sample	None	40 days

QC samples will include a matrix spike (MS), matrix spike duplicate (MSD), Laboratory Control Sample, and a Blank. Recovery for MS and MSD are 70-130%.

# DISTRIBUTION SHEET

To Distribution	From F. M. Simmons	Page 1 of 1
Project Title/Work Order B PLANT/WESF PROJECT, HNF-2698, REV. 0, SAMPLING AND ANALYSIS PLAN (SAP) FOR WESF DRAINS AND TK-100 SUMP		Date
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