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Accession #: D195061603

Document #: SD-WM-RPT-169

Title/Desc:

VAPOR & GAS SAMPLING OF SST 241A101 USING THE  
VAPOR SAMPLING SYSTEM

Pages: 41

NOV 07 1995

ENGINEERING DATA TRANSMITTAL

Page 1 of 1  
1. EDT No 612772

2. To: (Receiving Organization) DISTRIBUTION	3. From: (Originating Organization) SAMPLING AND MOBILE LABS OM624	4. Related EDT No.: N/A
5. Proj./Prog./Dept./Div.: VAPOR/HTS/SAMPLING AND MOBILE LABS	6. Cog. Engr.: RICKY MAHON 3-7437	7. Purchase Order No.: N/A
8. Originator Remarks: 241-A-101, SAMPLING USING THE VAPOR SAMPLING SYSTEM		9. Equip./Component No.: N/A
		10. System/Blgd./Facility: M0292/WSCF
11. Receiver Remarks:		12. Major Assm. Dwg. No.: N/A
		13. Permit/Permit Application No.: N/A
		14. Required Response Date: 27 OCTOBER 95

15. DATA TRANSMITTED					(F)	(G)	(H)	(I)
(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	Approval Designator	Reason for Transmittal	Originator Disposition	Receiver Disposition
1	WHC-SD-WM-RPT-169	ALL	0	VAPOR AND GAS SAMPLING OF SINGLE-SHELL TANK 241-A-101 USING THE VAPOR SAMPLING SYSTEM	Q	2	1	

16. KEY			
Approval Designator (F)	Reason for Transmittal (G)		Disposition (H) & (I)
E, S, Q, D or M/A (see WHC-Q1-3-5, Sec. 12.7)	1. Approval 2. Release 3. Information	4. Review 5. Post-Review 6. Dist. (Receipt Acknow. Required)	1. Approved 2. Approved w/comment 3. Disapproved w/comment 4. Reviewed no/comment 5. Reviewed w/comment 6. Receipt acknowledged

17. SIGNATURE/DISTRIBUTION (See Approval Designator for required signatures)											
(G)	(H)	(J) Name	(K) Signature	(L) Date	(M) MSIN	(J) Name	(K) Signature	(L) Date	(M)	(G)	(H)
2	1	Cog. Eng.	R. D. MAHON	10/23/95	S3-27	RESOURCE CENTER		R2-12		3	
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BD-7400-172-2 (04/94) GEF097

## RELEASE AUTHORIZATION

**Document Number:** WHC-SD-WM-RPT-169, REV 0

**Document Title:** Vapor and Gas Sampling of Single-Shell Tank 241-A-101 Using the Vapor Sampling System

**Release Date:** 11/6/95

**This document was reviewed following the procedures described in WHC-CM-3-4 and is:**

**APPROVED FOR PUBLIC RELEASE**

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Kara Broz

  
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# SUPPORTING DOCUMENT

1. Total Pages **38**

2. Title

VAPOR AND GAS SAMPLING OF SINGLE-SHELL TANK 241-A-101 USING THE VAPOR SAMPLING SYSTEM

3. Number

WHC-SD-WM-RPT-169

4. Rev No.

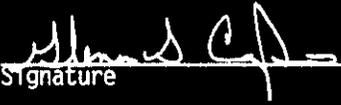
0

5. Key Words

241-A-101  
VSS  
SUMMA  
TST  
SORBENT  
TANK

6. Author

Name: G.S. CAPRIO

  
Signature

Organization/Charge Code **0M624/E61920**

7. Abstract

THIS DOCUMENT PRESENTS SAMPLING DATA RESULTING FROM THE JUNE 8, 1995, SAMPLING OF SST 241-A-101 USING THE VAPOR SAMPLING SYSTEM.

8. RELEASE STAMP

OFFICIAL RELEASE  
BY WHC **(2)**  
DATE **NOV 07 1995**  
*St 4*

APPROVALS

Document title: Vapor and Gas Sampling of Single-Shell Tank 241-A-101  
Using the Vapor Sampling System

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**CONTENTS**

1.0	SCOPE . . . . .	1
2.0	SAMPLING EQUIPMENT DESCRIPTION . . . . .	1
2.1	VAPOR SAMPLING SYSTEM . . . . .	1
3.0	SAMPLING EVENT DESCRIPTION . . . . .	3
3.1	SPECIFICATIONS . . . . .	3
3.2	OPERATIONS AND SAMPLING PERSONNEL . . . . .	4
3.3	INDUSTRIAL HYGIENE FIELD RESULTS . . . . .	4
3.4	AMBIENT CONDITIONS . . . . .	4
3.5	SAMPLE COLLECTION . . . . .	4
3.6	FIELD GC/FID RESULTS . . . . .	5
3.7	RADIATION SCREENING . . . . .	6
4.0	SAMPLE CHAIN OF CUSTODY: RECEIPT, STORAGE, AND SHIPMENT . . . . .	7
5.0	QUALITY ASSURANCE AND CONTROLS . . . . .	10
5.1	VAPOR SAMPLING SYSTEM CLEANING . . . . .	10
5.2	INSTRUMENT CALIBRATION . . . . .	10
5.3	BLANK SAMPLES . . . . .	11
6.0	ANOMALIES . . . . .	12
7.0	REFERENCES . . . . .	12
<b>APPENDICES</b>		
A	SAMPLE LOG SHEETS . . . . .	A-1
B	AMBIENT CONDITIONS . . . . .	B-1
C	CHAIN-OF-CUSTODY FORMS . . . . .	C-1

LIST OF TABLES

1	Flow Control Calibration . . . . .	2
2	TOC Results . . . . .	6
3	Radionuclide Analysis Results . . . . .	7
4	Oak Ridge National Laboratory Samples . . . . .	8
5	Pacific Northwest Laboratory Samples . . . . .	9
6	Calibration Data . . . . .	11

LIST OF TERMS

CGI	Combustible Gas Indicator
COC	Chain Of Custody
DOT	U.S. Department of Transportation
GC	Gas Chromatograph
GC/FID	Gas Chromatograph/Flame Ionization Detector
GEA	Gamma Energy Analysis
HEPA	High-Efficiency Particulate Air (filter)
NH <sub>3</sub>	Ammonia
NO <sub>2</sub>	Nitrogen Dioxide
NO	Nitric Oxide
H <sub>2</sub> O	Water Vapor
OPC	Offsite Property Control
ORNL	Oak Ridge National Laboratory
OVM	Organic Vapor Meter
PNL	Pacific Northwest Laboratory
SML	Sampling and Mobile Laboratories
SST	Single-Shell Tank
TCP	Tank Characterization Plan
team	SML Vapor Team
TOC	Total Organic Carbon
TST	Triple Sorbent Trap
VSS	Vapor Sampling System
WHC	Westinghouse Hanford Company

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**VAPOR AND GAS SAMPLING OF SINGLE-SHELL TANK 241-A-101  
USING THE VAPOR SAMPLING SYSTEM**

**1.0 SCOPE**

The Vapor Issue Resolution Program tasked the Sampling and Mobile Laboratories (SML) to collect representative headspace samples from Hanford Site single-shell tank (SST) 241-A-101. This document presents sampling data resulting from the June 8, 1995 sampling of SST 241-A-101. Analytical results will be presented in separate reports issued by the laboratories that supplied and analyzed the sampling media.

**2.0 SAMPLING EQUIPMENT DESCRIPTION**

**2.1 VAPOR SAMPLING SYSTEM**

The SML vapor team (the team) used the vapor sampling system (VSS) to collect representative samples of the air, gases, and vapors from the headspace of SST 241-A-101 on June 8, 1995. Mahon et al. (1994) describes in detail the VSS, its performance, and its operation. The team used the VSS to collect sorbent trap and SUMMA<sup>1</sup> canister headspace samples from SST 241-A-101. The team then sent these samples to the analytical laboratories for analysis.

The VSS comprises a mobile laboratory, a hot-water-jacketed stainless-steel probe that is inserted into the tank headspace, and stainless-steel transfer tubing that connects the mobile laboratory to the probe. A vacuum pump draws sample vapor from the tank headspace and through all transfer tubing and the sampling manifold. Electrically activated, pneumatically actuated, valves direct sample flow within the VSS. Instrumentation housed in the mobile laboratory monitors and controls system temperature, monitors absolute and differential system pressure, meters and controls vapor mass flow, and monitors sample vapor total organic carbon (TOC) content using a gas chromatograph/flame ionization detector (GC/FID).

A key feature of the VSS is its use of heated transfer tubing and a heated sampling manifold. Maintaining the system temperature at an electronically controlled, elevated temperature prevents vapor condensation and reduces vapor adsorption on surfaces exposed to sample vapor. Mahon et al. (1994) describes various tests and observations that indicate the VSS sample transfer efficiency is consistently high.

Sorbent trap samples are collected at the sorbent trap station of the sampling manifold. Sorbent traps are pencil-size stainless-steel or glass tubes that

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<sup>1</sup>SUMMA is a registered trademark of Moleetrics, Inc., Cleveland, Ohio.

contain vapor-adsorbing media. A known amount of sample vapor is passed through the tube, which traps (by adsorption) virtually all the target analytes. The concentration of analytes in the vapor sampled is calculated from the quantity of analyte found in the sorbent media and the volume of vapor passed through the sorbent trap.

The sorbent trap station uses highly accurate mass flow controllers to measure and control the flow rate of sample vapor through the sorbent traps. The controllers FICV-1 through FICV-9 are mounted on top of the sorbent station between the inlet and outlet valves. Controllers FICV-10 and FICV-11 are located downstream of the sorbent trap station and the in-line driers, which remove moisture from the sample vapor before it is metered. Errors associated with the mass flow controllers were determined by the Westinghouse Hanford Company (WHC) Standards Laboratory before the SST 241-A-101 sampling event (see Table 1). Flow rates and the duration of flow are specified by the analytical laboratories that supply and analyze the sorbent traps.

Table 1. Flow Control Calibration.

Flow-indicating Control valve	Typically used Flow (stdcm <sup>3</sup> /min)	% Change from 647 to Actual	% Change from Datalogger to Actual
1	200	-0.7	-0.85
2	200	0.05	-0.10
3	200	-0.45	-0.60
4	200	0.05	-0.10
5	200	0.55	0.35
6	200	0.25	0.05
7	200	0.4	0.20
8	200	0.25	-1.81
9	50	-0.128	-0.27
10	200	-1.1	-1.20
11	5000	0.332	0.17

The VSS is also equipped with a gas chromatograph (GC). The Hewlett Packard 5890 Series II GC is equipped with a flame-ionization detector (FID), a 1 mL sample loop, a 10 port injection valve, a 2 meter chromatographic column, a programmable oven, and a portable computer loaded with the HP-Chemstation<sup>2</sup> software used to control the GC. The GC is plumbed to directly transfer

<sup>2</sup>HP-Chemstation is a registered trademark of the Hewlett Packard Company, Avondale, Pennsylvania.

sample from the VSS manifold to the GC sample loop. After the sample is transferred into the sample loop and reaches equilibrium, the run is initiated manually. HP-Chemstation™ software activates the 10 port valve to transfer the sample from the sample loop to the column. The sample passes through the column and the FID generates a signal for total organic carbon (TOC). All data is then transmitted to the computer where it is stored for further analysis.

The GC is equipped with a HP-5 column which is 2 meters long, 0.25 mm inside diameter, and which contains a 0.25 um phenyl methyl silicone phase. The GC oven is programmed to heat from 50 °C to 270 °C at a rate of approximately 70 °C per minute. Helium is the carrier gas, air and hydrogen the combustion gases, and nitrogen the make-up gas.

The GC/FID is configured to quantitatively estimate concentrations of total organic carbon (TOC). The GC/FID confirms sampling system cleanliness, ambient air background TOC concentrations during sampling, and TOC concentration of tank vapor samples. The system is multi-point calibrated at the weather station on a as available basis, the last time being January 1995. The GC/FID has displayed a high degree of stability over a period of months. For further details, see Section 3.6, Field GC/FID Results.

The sampling manifold also has a station for sampling vapor with evacuated SUMMA™ canisters. SUMMA™ canisters are stainless-steel vessels with internal surfaces that have been prepared by the SUMMA™ process, which passivates active sites on the canister walls to minimize adsorption of gases and vapors. An analytical laboratory must clean and evacuate SUMMA™ canisters before use. The evacuated canister is filled with sample vapor through a manually operated valve, which is then closed to seal the sample inside. SUMMA™ canisters essentially allow collection and transfer of whole-air samples from the sample site to an analytical laboratory where the sample is analyzed. The standard capacity of each SUMMA™ canister is 6 liters.

### 3.0 SAMPLING EVENT DESCRIPTION

#### 3.1 SPECIFICATIONS

The Vapor Issue Resolution Program specifies sampling requirements in WHC-SD-WM-TP-335, Rev. 0C, *Vapor Sampling and Analysis Plan* (Homi 1995). The sampling and analysis plan also specifies the types and number of samples to be collected, flow rates, and durations. These key sampling parameters are summarized on the sample log sheets in Appendix A. In addition to the sample log sheets, checksheets for each individual sample help ensure correct sampling procedures. SML retains these documents in the project file. This sample event's project-specific number is S5-026.

### 3.2 OPERATIONS AND SAMPLING PERSONNEL

Steve Carter was the Tank Farm Operations person-in-charge. The other SML vapor team members included:

- G. S. Caprio, VSS Technician
- R. D. Mahon, VSS Lead Scientist
- T. B. Utecht, VSS Technician
- R. A. Westberg, Field Scientist.

The VSS was set up at SST 241-A-101 on June 7, 1995 and was allowed to warm up overnight. Sampling began shortly after 9:00 a.m. on June 8, 1995, and was completed by 2:00 p.m. the same day.

### 3.3 INDUSTRIAL HYGIENE FIELD RESULTS

Before hooking up to SST 241-A-101, an industrial hygiene technician field tested tank vapors. The technician purged the vapor probe sample tube for 5 minutes and then field measured vapor stream contents using a combustible gas indicator (CGI) and an organic vapor meter (OVM). The measurements were verbally reported, LEL 6%, NH<sub>3</sub> 500 ppm, O<sub>2</sub> 20.4%, CO 223 ppm, and total organic carbon 18.1 ppm.

### 3.4 AMBIENT CONDITIONS

The weather the day of the sampling event, June 8, 1995 was sunny, approximately 70 °F, with winds blowing from northeast at approximately 10 miles per hour. Graphs of ambient temperatures and pressures taken at the Hanford Meteorological Station, which is about 6 miles west of A-Farm, are provided in Appendix B.

### 3.5 SAMPLE COLLECTION

The hot-water-jacketed sampling probe was located in Riser R20 of SST 241-A-101. The probe length, from the sample inlet to the top of the riser flange, was 6.7 meters.

All zones of the VSS were heated to 60 °C during setup of the VSS at SST 241-A-101 on June 7, 1995. The team stabilized the VSS temperature zones by 9:00 a.m. on June 8, 1995, and the system was ready to collect samples. Measured according to the VSS operating procedure, the pressure and temperature of SST 241-A-101 were 989 mbar (742 torr) and 37 °C, respectively. The sample log sheets in Appendix A provide a complete chronology of the sample event including start and end times, flow rates, volumes, and specific sample identifiers.

Approximately 19 hours before the first samples were collected, the team began heating the VSS transfer tubing and sampling manifold. Before sampling tank vapors on June 8, 1995, the VSS was purged with ambient air for 30 minutes and

the team collected two SUMMA™ canister samples of ambient air, one manually 10 meters upwind of the VSS connection with SST 241-A-101, and the other using the VSS sampling manifold. The former was collected to establish background levels of trace organic vapors, and the latter was collected to establish the cleanliness of the sampling manifold.

A leak check of the VSS sampling manifold and transfer tubing (up to the connection to the sampling probe) was performed prior to opening the tank probe vapor sampling valve. The system was evacuated to 286 mbar (214.3 torr) and leakage of ambient air into the system was observed by monitoring system pressure for 15 minutes. Leakage resulted in an increase of 5.6 mbar (4.2 torr) in system pressure during the 15 minute test. Given a system volume of not more than 10 L, this pressure increase corresponds to a leak rate of approximately 13.1 mL/min at a 286 mbar (214.3 torr). This leak rate was then estimated for average SUMMA™, triple sorbent trap (TST), and sorbent sampling pressures. It was found that for the SUMMA™ canisters, dilution by ambient air was approximately 0.1%, for TSTs sampled at 50 mL/min the dilution was approximately 0.6%, for TSTs sampled at 200 mL/min the dilution was approximately 0.5%, and for sorbent traps the dilution was approximately 0.4%.

The tank probe vapor sampling valve was opened and the VSS was purged with sample vapor from SST 241-A-101 for 30 minutes at a total flow rate of 5.46 L/min. This purge was performed to flush ambient air from the system and saturate the system's active adsorption sites. Because the volume of transfer tubing and the sampling manifold upstream of the sampling devices is estimated to be no more than 10 L, this purge provided about 16.4 air turnovers in the system.

Two analytical laboratories provided sample media. Oak Ridge National Laboratory (ORNL) provided TSTs for organic vapors; and Pacific Northwest Laboratory (PNL) provided SUMMA™ canisters, TSTs, and sorbent traps for organic vapors, ammonia (NH<sub>3</sub>), nitrogen dioxide (NO<sub>2</sub>), and water vapor (H<sub>2</sub>O).

### 3.6 FIELD GC/FID RESULTS

The GC was single point calibrated on the day of sampling using 6.0 ppmC Propane standard by Scott Specialty Gas. The standard is an E.P.A. Protocol Gas that is ±2% NIST traceable.

Table 2 displays the Field GC/FID results from the sampling of SST 241-A-101.

Table 2. TOC Results.

Number of Runs	Description	Average TOC Concentration (ppmC)	% Standard Deviation
6	Propane	6.00	0.30
4	Ambient	2.78	0.13
4	Tank Vapor	40.34	0.40

### 3.7 RADIATION SCREENING

Samples are unconditionally released from the SST farm in accordance with 1995-33300-RSP-03, *Release of Vapor Sampling Equipment* (WHC 1995c).

Radiological screening results are used to determine (1) if the samples must be shipped as radioactive or nonradioactive in accordance with U.S. Department of Transportation (DOT) regulations and (2) if the samples meet the laboratory acceptance criteria.

The DOT limits for shipping a nonradioactive sample are 2,000 combined pCi/g of beta-gamma activity and alpha activity. Samples exceeding these DOT limits may be shipped as radioactive material if the samples do not exceed the following laboratory acceptance criteria:

ORNL: Beta-gamma activity <450 pCi/g of sample media. Alpha activity <135 pCi/g.

PNL: Beta-gamma activity <400 pCi/g of sample media. Alpha activity <100 pCi/g of sample media.

To protect the sampling manifold and sampling devices from radioactive particulates, all sample vapor for the June 8, 1995, SST 241-A-101 vapor sampling event was drawn through a series of four glass-fiber high-efficiency particulate air (HEPA) filters placed upstream of the sampling manifold. These four filters were in place any time tank vapors were flowing through the system. When sampling was complete, the filters were removed and assigned unique sample identifiers. All four HEPA filters were submitted to Laboratory 222-S for total alpha, total beta, and gamma energy analysis (GEA). The HEPA filter closest to the sampling manifold was analyzed to determine if the samples met DOT shipping criteria and laboratory acceptance criteria. Moisture from the tank vapors was collected in a silica gel trap through one of the sorbent station ports and analyzed for tritiated water. SST 241-A-101 filter and silica gel analysis results are shown in Table 3. SML scientists use the activity results in Table 3 to calculate pCi/g of sample media. SML maintains this information in the project-specific file. The results in Table 3 indicate that the samples collected from SST 241-A-101 met the laboratory acceptance criteria and the DOT definition of a nonradioactive shipment.

Table 3. Radionuclide Analysis Results.

Filter	Sample Identifier	Activity Results <sup>a</sup> (pCi/sample)	Activity <sup>b</sup> (pCi/L of tank gas)
Upstream HEPA filter (box)	S5026-A51.OU1	Total Alpha = 60.2 Total Beta = 311 GEA = 49.4 ( <sup>208</sup> Tl) GEA = 176 ( <sup>212</sup> Pb)	= 0.2 = 0.9 = 0.1 = 0.5
Downstream HEPA filter (box)	S5026-A52.OU1	Total Alpha = <0.949 Total Beta = <1.37 GEA = <detectable	= <0.003 = <0.004 = <detectable
Upstream HEPA filter (VSS)	S5026-A53.OU2	Total Alpha = <60.6 Total Beta = 6.61 GEA = <detectable	= <0.2 = 0.02 = <detectable
Downstream HEPA filter (VSS)	S5026-A54.OU2	Total Alpha = <0.759 Total Beta = <3.16 GEA = 17.4 ( <sup>137</sup> Cs)	= <0.07 = <0.006 = 0.05
Tritium trap	S5026-A03.OT1	Total activity = <50.0	= <50.0 <sup>c</sup>

## Notes:

The samples are nonradioactive. These results were evaluated against laboratory acceptance criteria and DOT limits.

<sup>a</sup>All less than (<) values represent the minimum detection limits at Laboratory 222-s.

<sup>b</sup>Numbers based on an approximation of the total volume of tank vapor through the HEPA filters. Appendix A and the sample checksheets were used to estimate a total flow through the VSS of 336 L.

<sup>c</sup>Number is calculated using a total volume of 1 L passing through the tritium trap.

#### 4.0 SAMPLE CHAIN OF CUSTODY: RECEIPT, STORAGE, AND SHIPMENT

All sorbent trains, sorbent tubes, and SUMMA<sup>™</sup> canisters received by SML are kept in a custody locked storage area maintained by SML. Sorbent trains and tubes were maintained at  $4 \pm 2$  °C in a refrigeration unit. SUMMA<sup>™</sup> canisters were stored in the same locked storage area, but were not refrigerated.

TSTs are supplied by ORNL and ORNL initiates the chain-of-custody (COC) forms. The sample media is placed in 40-mL volatile organic analysis vials. Evidence tape is applied to the vials, which are then placed in a shipping container along with the relinquished COC forms and shipped to SML. TSTs are shipped to SML in a cooler containing "blue" ice.

The TSTs were received, inventoried against the COC forms, and the "received by" block on the COC form was signed by SML. They were maintained at  $4 \pm 2$  °C before and after the sampling event in the storage area refrigeration unit.

The TSTs were shipped back to ORNL after the sampling event using offsite property control (OPC W95-0-0435-12). Table 4 lists the sample identifiers, sample types, and COC form numbers for all ORNL samples. The samples were delivered to shipping on June 20, 1995 with instructions to ship via Federal Express, next-day delivery.

Table 4. Oak Ridge National Laboratory Samples.

Sample Identifier	Sample Type	COC Number
S5026-A7.957	TST	006765
S5026-A8.958	TST	006765
S5026-A9.959	TST	006765
S5026-A10.969	TST field blank	006765
S5026-A11.940	TST	006765
S5026-A12.823	TST	006765
S5026-A13.846	TST	006765
S5026-A14.960	TST	006765
S5026-A15.961	TST	006765
S5026-A16.962	TST	006765
S5026-A17.970	TST field blank	006765
S5026-A18.964	TST	006765
S5026-A19.965	TST	006765
S5026-A20.966	TST	006765
S5026-A21.967	TST trip blank	006765
S5026-A22.968	TST trip blank	006765

PNL supplied sorbent chain traps, TSTs, and SUMMA™ canisters, including COC forms. These sampling devices were picked up from PNL by SML and transported in a government vehicle to a custody locked storage area. The sorbent trains were maintained at  $4 \pm 2$  °C before and after the sampling event in storage area refrigeration unit.

After sampling, the PNL sorbent tubes and SUMMA™ canisters were transported by government vehicle directly to PNL and delivered to J. A. Edwards on June 14, 1995. Table 5 lists the sample identifiers, sample types, and COC form numbers for all PNL samples.

Table 5. Pacific Northwest Laboratory Samples.

Sample Identifier	Sample Type	COC Number
S5026-A01.163	Ambient upwind SUMMA™	008890
S5026-A02.256	Ambient SUMMA™ (VSS)	008890
S5026-A04.232	SUMMA™	008890
S5026-A05.234	SUMMA™	008890
S5026-A06.235	SUMMA™	008890
S5026-A23.U27	NH <sub>3</sub> /NO <sub>x</sub> /H <sub>2</sub> O sorbent	008896
S5026-A24.U28	NH <sub>3</sub> /NO <sub>x</sub> /H <sub>2</sub> O sorbent	008896
S5026-A25.U29	NH <sub>3</sub> /NO <sub>x</sub> /H <sub>2</sub> O sorbent	008896
S5026-A26.U30	NH <sub>3</sub> /NO <sub>x</sub> /H <sub>2</sub> O sorbent	008896
S5026-A27.U31	NH <sub>3</sub> /NO <sub>x</sub> /H <sub>2</sub> O sorbent	008896
S5026-A28.U32	NH <sub>3</sub> /NO <sub>x</sub> /H <sub>2</sub> O sorbent	008896
S5026-A29.U33	NH <sub>3</sub> /NO <sub>x</sub> /H <sub>2</sub> O trip blank	008896
S5026-A30.U34	NH <sub>3</sub> /NO <sub>x</sub> /H <sub>2</sub> O trip blank	008896
S5026-A31.U35	NH <sub>3</sub> /NO <sub>x</sub> /H <sub>2</sub> O trip blank	008896
S5026-A32.U18	NH <sub>3</sub> /NO <sub>x</sub> /H <sub>2</sub> O field blank	008896
S5026-A33.U19	NH <sub>3</sub> /NO <sub>x</sub> /H <sub>2</sub> O field blank	008896
S5026-A34.U20	NH <sub>3</sub> /NO <sub>x</sub> /H <sub>2</sub> O field blank	008896
S5026-A35.021	PNL TST	008903
S5026-A36.022	PNL TST	008903
S5026-A37.023	PNL TST	008903
S5026-A38.024	PNL TST field blank	008903
S5026-A39.025	PNL TST	008903
S5026-A40.026	PNL TST	008903
S5026-A41.027	PNL TST	008903
S5026-A42.028	PNL TST	008903
S5026-A43.030	PNL TST	008903
S5026-A44.031	PNL TST	008903
S5026-A45.032	PNL TST field blank	008903
S5026-A46.033	PNL TST	008903
S5026-A47.034	PNL TST	008903
S5026-A48.035	PNL TST	008903
S5026-A49.036	PNL TST trip blank	008903
S5026-A50.037	PNL TST trip blank	008903

From the time that samples are received by SML until they are shipped back to the analytical laboratory, all COCs are maintained by SML in accordance with WHC-IP-1127-1.3, *Chain-of-Custody/Special Analysis Request for RCRA and CERCLA Protocol Samples* (WHC 1995a). Copies of the completed COC forms for this sampling event are included in Appendix C.

## 5.0 QUALITY ASSURANCE AND CONTROLS

### 5.1 VAPOR SAMPLING SYSTEM CLEANING

Immediately before sampling of SST 241-A-101, the VSS manifold and vapor sample transfer tubing was heated to 60 °C and ambient air was purged through the system for 30 minutes. Also, all pertinent system valves were actuated to release any contaminants that may have collected in the VSS valves themselves. After this purge an ambient air sample was drawn through the VSS manifold and a GC/FID run was initiated. No significant level of contaminants was detected. A second ambient air GC/FID run confirmed that the VSS manifold and transfer tubing was free of organic remnant residue down to ambient levels. A SUMMA<sup>™</sup> canister ambient air sample was then collected to confirm by laboratory analysis that the VSS sampling manifold was free of trace organic contaminants (or to determine which contaminants were present and at what concentration), as discussed in Section 3.5. For further details, refer to Appendix E of WHC-IP-1127-4.10 (WHC 1995b) and the project-specific file located with SML.

In compliance with LO-080-405/A0, *Vapor Space Probe Cleaning Procedure* (WHC 1993) the team cleaned the hot-water-jacketed probe before it was installed in SST 241-A-101. This procedure requires a solvent rinse of all internal probe surfaces with acetone and methanol to clear the sample line of possible contamination remaining from the construction process. The probes are then heated to 90 °C, and dry air is passed through the probe to evaporate the solvents. Before the probes are released, the team ensures by a hand-held organic vapor meter that the total organic concentration in the sample line is below 1 ppmv.

### 5.2 INSTRUMENT CALIBRATION

Instruments located in the VSS are calibrated on an annual basis at the WHC Standards Laboratory. VSS instrumentation calibration data, maintained in files by SML, are summarized in Table 6. According to the calibration schedule shown in Table 6, all instrumentation was within its calibration period during the SST 241-A-101 sampling event.

Table 6. Calibration Data.

Element	Calibration Date	Expiration Date	WHC Standards Laboratory Code
FICV-1	5/08/95	5/08/96	518-28-03-012
FICV-2	5/08/95	5/08/96	518-28-03-008
FICV-3	5/08/95	5/08/96	518-28-03-004
FICV-4	5/08/95	5/08/96	518-28-03-006
FICV-5	5/08/95	5/08/96	518-28-03-011
FICV-6	5/08/95	5/08/96	518-28-03-009
FICV-7	5/08/95	5/08/96	518-28-03-014
FICV-8	5/08/95	5/08/96	518-28-03-013
FICV-9	5/08/95	5/08/96	518-28-03-007
FICV-10	5/08/95	5/08/96	518-28-03-010
FICV-11	5/08/95	5/08/96	518-28-03-005
PE-1	5/04/95	5/04/96	518-80-02-005
PE-2	5/04/95	5/04/96	518-80-02-006
PE-3	5/04/95	5/04/96	518-80-02-008
PE-4	5/04/95	5/04/96	518-80-02-007
PD-1	5/04/95	5/04/96	518-80-02-004
PD-2	5/04/95	5/04/96	518-80-02-003
Temperature Control System	3/30/95	3/30/96	804-67-74-009

### 5.3 BLANK SAMPLES

Trip blanks are samples that accompany the sample media from the point of generation through sample analysis. They are transported to the field with the sample collection media but remain unopened during the sampling event. Analysis of trip blanks is used to assess cross-contamination of sample media during field transport and storage.

Field blanks are sampling devices similar to trip blanks. They are prepared and handled in the same manner as the sampling media, but no tank vapors are drawn through them.

Spiked blanks are prepared as regular sampling media but also contain a known amount of special analyte. Tank vapors are drawn through these blanks and

they are handled and analyzed just like any other sample. Analysis of the spiked blanks is used to evaluate potential sample loss during shipment or storage.

Ambient blanks are samples of ambient air collected at the sampling location. Analysis of ambient blanks is used to assess contamination that may be present in the atmosphere or in the transfer tubing or sampling manifold of the VSS immediately before sampling operations.

Tables 4 and 5 also list sample blanks used during the sampling of SST 241-A-101.

## 6.0 ANOMALIES

All samples were collected in accordance with the Tank Characterization Plan (TCP) and WHC-IP-1127-4.10, *Collection of Parallel Sorbent Tube and SUMMA Canister Samples Using the Vapor Sampling System* (1995b). There were no anomalies during the sample collection and the samples maintained their integrity.

## 7.0 REFERENCES

- 49 CFR 100-177, 1992, "Transportation," *Code of Federal Regulations*, as amended.
- Homi, C. S., 1995, *Vapor Sampling and Analysis Plan*, WHC-SD-WM-TP-335, Rev. 0C, Westinghouse Hanford Company, Richland, Washington.
- Mahon, R. D., C. M. Jones, and M. S. Story, 1994 (draft), *Evaluation of the Capabilities and Use of the Vapor Sampling System for Tank Headspace Sampling and Characterization*, SD-WM-RPT-094, Westinghouse Hanford Company, Richland, Washington.
- WHC, 1995a, *Chain-of-Custody/Special Analysis Request for RCRA and CERCLA Protocol Samples*, Procedure WHC-IP-1127-1.3, Rev. 1, Westinghouse Hanford Company, Richland, Washington.
- WHC, 1995b, *Collection of Sorbent Tube and SUMMA Canister Samples Using the Vapor Sampling System*, Procedure WHC-IP-1127-4.10, Westinghouse Hanford Company, Richland, Washington.
- WHC, 1995c, *Release of Vapor Sampling Equipment*, Procedure 1995-33300-RSP-03, Westinghouse Hanford Company, Richland, Washington.
- WHC, 1993, *Vapor Space Probe Cleaning Procedure*, Procedure LO-080-405/A0, Westinghouse Hanford Company, Richland, Washington.

**APPENDIX A**  
**SAMPLE LOG SHEETS**

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Waste Tank  
241-A-101

Date: 6/8/95  
VSS Personnel: R.A. Westberg, R.D. Mahon

Trailer Personnel: T. Utecht

Sat up VSS (Secton A) Temperature set point = 60°C

Ensure HEPA filters are installed

Ensure connection to sample probe

System status check sheet. (Verify zones are to temp)

Tank Temperature 37 C

GC Standard Runs

GC Ambient Air Runs through port 10

PNL

OG/ORNL Port Description

WHC Sample ID Sample ID Valve #

WHC Sample ID	Sample ID	Valve #	Description	Desired		Actual		Actual		Actual	
				Flow Rate SCCM	Duration (min.)	Total Flow SCCM	Start Time	End Time	Total Time (min.)	Total Flow Lifers	
Purge with ambient air for 30 min.											
S5026-A01.163	163		AMBIENT #1	5500	30	165000	5500	8:53	9:23	30	165
S5026-A01.163	163		AMBIENT #1		1			9:35	9:36	1	
GC Run #1 Ambient air/Cleanliness check											
S5026-A02.256	256	15	AMBIENT #2		1			9:47	9:48	1	
S5026-A02.256	256	15	AMBIENT #2		1			9:47	9:48	1	
GC RUN#2 Ambient air											
LEAK CHECK (APPENDIX A) Leak Rate: <u>16.8 torr/hr</u>											
Purge with tank air for 30 min											
				5500	30	165000	5500	10:36	11:06	30	165.00
Measure tank pressure				742.0 torr							
								11:09			
S5026-A03.0T1	T-1975 (222-S)	8	Tritium Trap	200	5	1000	200.00	11:16	11:21	5	1.00
GCRUN #3 (Tank run #1)											
				11:24							
S5026-A04.232	232	11	SUMMA #3		1			11:30	11:31	1	6.00
S5026-A05.234	234	13	SUMMA #4		1			11:34	11:35	1	6.00
S5026-A06.235	235	15	SUMMA #5		1			11:38	11:39	1	6.00
GCRUN #4 (Tank run #2)				11:41							

Waste Tank  
241-A-101

WHC Sample ID	PNL OGI/ORNL Sample ID	Port Valve #	Description	Desired		Actual		Desired Total Flow SCCM	Actual Flow Rate SCCM	Actual Start Time	Actual End Time	Actual Total Time (min.)	Actual Total Flow Liters
				Flow Rate SCCM	Duration (min.)	Flow Rate SCCM	Flow Rate SCCM						
S5026-A07.957	TST#957	1	TST #1	50	4	50.00	11:59	200	50.00	11:59	12:03	4	0.20
S5026-A35.021	PNL TST#021	2	PNL TST #1	50	4	50.00	11:59	200	50.00	11:59	12:03	4	0.20
S5026-A08.958	TST#958	3	TST #2	50	4	50.00	11:59	200	50.00	11:59	12:03	4	0.20
S5026-A36.022	PNL TST#022	4	PNL TST #2	50	4	50.00	11:59	200	50.00	11:59	12:03	4	0.20
S5026-A09.959	TST#959	5	TST #3	50	4	50.00	11:59	200	50.00	11:59	12:03	4	0.20
S5026-A37.023	PNL TST#023	6	PNL TST #3	50	4	50.00	11:59	200	50.00	11:59	12:03	4	0.20
S5026-A11.940	TST#940	7	TST #4	50	4	50.00	11:59	200	50.00	11:59	12:03	4	0.20
S5026-A39.025	PNL TST#025	8	PNL TST #4	50	4	50.00	11:59	200	50.00	11:59	12:03	4	0.20
S5026-A12.823	TST#823	1	TST #5	200	5	200.00	12:23	1000	200.00	12:23	12:28	5	1.00
S5026-A40.026	PNL TST#026	2	PNL TST #5	200	5	200.00	12:23	1000	200.00	12:23	12:28	5	1.00
S5026-A13.848	TST#848	3	TST #6	200	5	200.00	12:23	1000	200.00	12:23	12:28	5	1.00
S5026-A41.027	PNL TST#027	4	PNL TST #6	200	5	200.00	12:23	1000	200.00	12:23	12:28	5	1.00
S5026-A14.960	TST#960	5	TST #7	200	5	200.00	12:23	1000	200.00	12:23	12:28	5	1.00
S5026-A42.028	PNL TST#028	6	PNL TST #7	200	5	200.00	12:23	1000	200.00	12:23	12:28	5	1.00
S5026-A15.961	TST#961	7	TST #8	200	5	193.40	12:23	1000	193.40	12:23	12:28	5	0.97
S5026-A43.030	PNL TST#030	8	PNL TST #8	200	5	193.20	12:23	1000	193.20	12:23	12:28	5	0.97

Waste Tank  
251-A-101

WHC Sample ID	PNL OGI/ORNL Sample ID	Port Valve #	Description	Desired		Actual		Desired Total Flow SCCM	Actual Flow Rate SCCM	Actual Start Time	Actual End Time	Actual Total Time (min.)	Actual Total Flow Liters
				Flow Rate SCCM	Duration (min.)	Flow Rate SCCM	Time						
S5026-A16.962	TST#962	1	TST # 9	200	20	200.00	12:47	4000	200.00	12:47	13:07	20	4.00
S5026-A44.031	PNL TST#031	2	PNL TST # 9	200	20	200.00	12:47	4000	200.00	12:47	13:07	20	4.00
S5026-A18.964	TST#964	3	TST # 10	200	20	200.00	12:47	4000	200.00	12:47	13:07	20	4.00
S5026-A46.033	PNL TST#033	4	PNL TST # 10	200	20	200.00	12:47	4000	200.00	12:47	13:07	20	4.00
S5026-A19.965	TST#965	5	TST # 11	200	20	200.00	12:47	4000	200.00	12:47	13:07	20	4.00
S5026-A47.034	PNL TST#034	6	PNL TST # 11	200	20	200.00	12:47	4000	200.00	12:47	13:07	20	4.00
S5026-A20.966	TST#966	7	TST # 12	200	20	193.30	12:47	4000	193.30	12:47	13:07	20	3.87
S5026-A48.035	PNL TST#035	8	TST # 12	200	20	193.20	12:47	4000	193.20	12:47	13:07	20	3.86
S5026-A10.969	TST#969		TST FIELD BLANK #1				13:12			13:12	13:13	1	
S5026-A17.970	TST#970		TST FIELD BLANK #2				13:12			13:12	13:13	1	
S5026-A38.024	PNL TST#024		PNL TST FIELD BLANK #1				13:12			13:12	13:13	1	
S5026-A45.032	PNL TST#032		PNL TST FIELD BLANK #2				13:12			13:12	13:13	1	
GCRUN#5	(Tank run #3)						13:15						
S5026-A23.27U	27U	1	NH3/NOx/H2O #1	200	15	200.00	13:29	3000	200.00	13:29	13:44	15	3.00
S5026-A24.28U	28U	2	NH3/NOx/H2O #2	200	15	200.00	13:29	3000	200.00	13:29	13:44	15	3.00
S5026-A25.29U	29U	3	NH3/NOx/H2O #3	200	15	200.00	13:29	3000	200.00	13:29	13:44	15	3.00
S5026-A26.30U	30U	4	NH3/NOx/H2O #4	200	15	200.00	13:29	3000	200.00	13:29	13:44	15	3.00
S5026-A27.31U	31U	5	NH3/NOx/H2O #5	200	15	200.00	13:29	3000	200.00	13:29	13:44	15	3.00
S5026-A28.32U	32U	6	NH3/NOx/H2O #6	200	15	200.00	13:29	3000	200.00	13:29	13:44	15	3.00
S5026-A32.18U	18U		NH3/NOx/H2O FIELD BLANK #1				13:52			13:52	13:53	1	
S5026-A33.19U	19U		NH3/NOx/H2O FIELD BLANK #2				13:52			13:52	13:53	1	
S5026-A34.20U	20U		NH3/NOx/H2O FIELD BLANK #3				13:52			13:52	13:53	1	
GCRUN#6	(Tank run #4)						13:47						

TOTAL TANK GAS USED DURING SAMPLING RUNS

78.26

Waste Tank  
241-A-101

WHC Sample ID	PNL	OGI/ORNL	Port	Description	Desired Flow Rate SCCM	Desired Duration (min.)	Actual Flow Rate SCCM	Actual Start Time	Actual End Time	Actual Total Time (min.)	Actual Total Flow SCCM	Actual Total Flow Liters
---------------	-----	----------	------	-------------	---------------------------	----------------------------	--------------------------	-------------------	-----------------	-----------------------------	---------------------------	-----------------------------

S5026- A51. OU1 T-1976 ( 222S) Upstream HEPA(box)

S5026- A52. OD1 T-1977 (222S) Downstream HEPA(box)

S5026 A53. OU2 T-1978 ( 222S) Upstream HEPA(VSS)

S5026- A54. OD2 T-1979 (222S) Downstream HEPA (VSS)

Tripp Blanks (DO NOT EXPOSE)

S5026- A21. 967	TST#967			TST TRIP #1								
S5026- A22. 968	TST#968			TST TRIP #2								
S5026- A29. 33U	33U			NH3/NOx/H2O TRIP #1								
S5026- A30. 34U	34U			NH3/NOx/H2O TRIP #2								
S5026- A31. 35U	35U			NH3/NOx/H2O TRIP #3								
S5026- A49. 036	PNL TST#036			PNL TST TRIP #1								
S5026- A50. 037	PNL TST#037			PNL TST TRIP #2								

A-101  
TOTAL TANK VAPOR USED

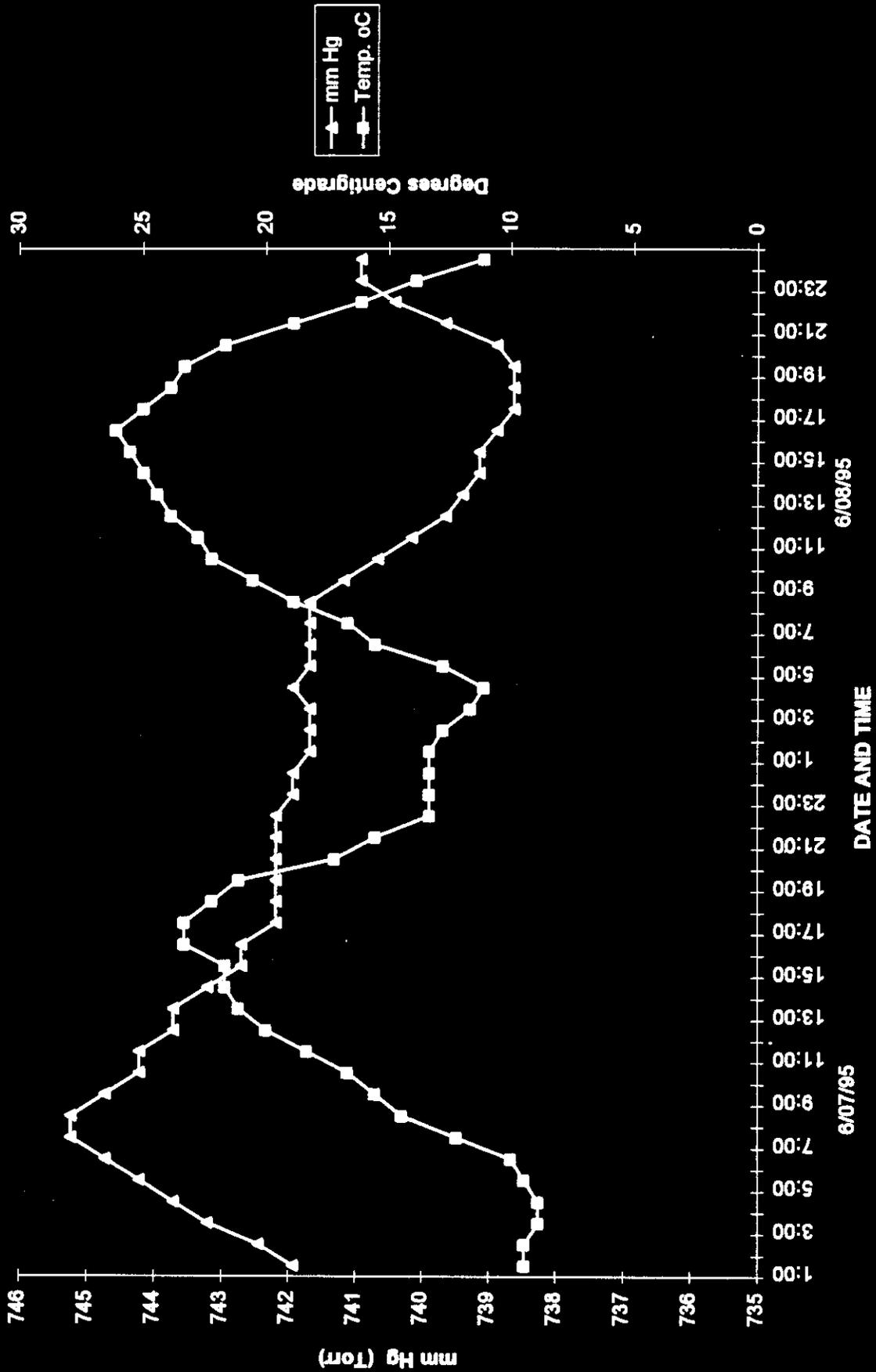
	NUMBER OF EVENTS	TIME IN MINUTES	VOLUME IN SCCM	TOTAL VOLUME, LITERS
LEAK CHECKS	1	0	5600	5.60
TANK PURGE PUMP DOWNS	3	1	5600	16.80
TANK PURGE TIME (From Spreadsheet)	1	30	5500	165.00
GC PURGES	4	2	5000	40.00
SUMMA PURGES	3	2	5000	30.00
ALL SAMPLES COLLECTED				78.26
TOTAL FOR TANK SAMPLING RUN				335.66



**APPENDIX B**  
**AMBIENT CONDITIONS**

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WEATHER DURING VSS SAMPLING OF 241-A-101



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**APPENDIX C**  
**CHAIN-OF-CUSTODY FORMS**

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009203

**COPY**

Westinghouse Hanford Company

**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**

Page 1 of 1  
 Data Transmitted  
 Priority  
 Normal

Collector: L.B. Utecht  
 Project Designation: 241-A101  
 Ice Chest No.: N/A  
 Shipped To: 222 S Labs  
 Possible Sample Hazards/Remarks: NONE

Company Contact: R.D. Mahon  
 Sampling Location: A-101 200 EAST  
 Field Logbook No.: WMC-N-647-10  
 Office Property No.: N/A

Telephone No.: 373-7002  
 SAF No.: SS026  
 Method of Shipment: Govt Vehicle 930  
 Bill of Lading/AF Bill No.: N/A

Sample No.	Matrix*	Date Sampled	Time Sampled	Preservative	Type of Container	No. of Containers(s)	Volume	Special Handling and/or Storage	Sign/Print Names	Date/Time	Date/Time
SS026-071	Silica	6-8-95		N/A	Dist. / silica gel	5	47ml				
SS026-041	MSA	"									
SS026-041	"	"									
SS026-042	"	"									
SS026-042	"	"									

**SPECIAL INSTRUCTIONS**  
 Please fax info to: Tim Utecht at 373-7076. Thanks  
 X = silica gel / Hepe filters.

**Matrix\***  
 S = Soil  
 SE = Sediment  
 SO = Solid  
 SL = Sludge  
 W = Water  
 O = Oil  
 A = Air  
 DS = Drums  
 DL = Drums Liquids  
 T = Tissue  
 WI = Waste  
 L = Liquid  
 V = Vegetation  
 X = Other

Received By: Tim Utecht Date/Time: 6-9-95 1315  
 Received By: Tim Utecht Date/Time: 6-9-95 1315  
 Received By: Tim Utecht Date/Time: 6-9-95 1315  
 Received By: Tim Utecht Date/Time: 6-9-95 1315

Disposed By: \_\_\_\_\_ Date/Time: \_\_\_\_\_

<b>ORNL</b>	<b>CHAIN OF CUSTODY (Rev 1)</b>	<b># 006765</b>	
Custody Form Initiator	Amy Dindal	Sampling Location	241-A-101 (VSS)
ORNL Contact	Roger Jenkins	Telephone	(615) 576-8594
Method of Shipment	Federal Express	Shipped to	Rick Mahon

Sample Identification

WHC Identifier	TST #	Trap Type	Received at WHC (✓)	Received at ORNL (✓)
S5026-A7.957	957	SAMPLE	✓	✓
S5026-A8.958	958	SAMPLE	✓	✓
S5026-A9.959	959	SAMPLE	✓	✓
S5026-A11.940	940	SAMPLE	✓	✓
S5026-A12.923	923	SAMPLE	✓	✓
S5026-A13.846	846	SAMPLE	✓	✓
S5026-A14.960	960	SAMPLE	✓	✓
S5026-A15.961	961	SAMPLE	✓	✓
S5026-A16.962	962	SAMPLE	✓	✓
S5026-A18.964	964	SAMPLE	✓	✓
S5026-A19.965	965	SAMPLE	✓	✓
S5026-A20.966	966	SAMPLE	✓	✓
S5026-A21.967	967	TRIP BLANK	✓	✓
S5026-A22.968	968	TRIP BLANK	✓	✓
S5026-A10.969	969	FIELD BLANK	✓	✓
S5026-A17.970	970	FIELD BLANK	✓	✓

**COMMENTS:** Sample Date: 8 JUN 95 Logbook No: WHC-N-647 10  
 Refrigerator failed from 1100 5 MAY 95 to 0800 8 MAY 95. Temperature recorder shows that 72 degrees Fahrenheit was reached and held for most of this time. Amy Dindal was contacted and informed. Amy directed that sample media is still good and can be used to sample. 11 MAY 95 AM

[ ] Field Transfer of Custody      Chain of Possession      (Sign and Print Names)

Relinquished By	Date	Time	Received By	Date	Time
A B Dindal / A B Dindal	4/19/95	0900	A P Bruchler / A P Bruchler	4-20-95	1450
A P Bruchler / A P Bruchler	6-8-95	0715	Tim Utecht / T B Utecht	6-8-95	0715
Tim Utecht / T B Utecht	6-8-95	0830	R A Westberg / R A Westberg	6-8-95	0830
R A Westberg / R A Westberg	6-8-95	1430	T B Utecht / T B Utecht	6-8-95	1430
T B Utecht / T B Utecht	6-20-95	1000	A B Dindal / A B Dindal	6/21/95	1415

Cooler Temperature Status

Temperature (°C)	Min	Max
When Shipped from ORNL	-3°	1°
When Received at WHC	3	6
When Shipped from WHC	-4	70
When Received at ORNL	-4	3

**Battelle Pacific Northwest Laboratory**

**CHAIN OF CUSTODY**

**WHC 008896**

Custody Form Initiator **J. A. Edwards - PNL**

Telephone (509) 373-0141  
Page 85-3009 / FAX 376-0418

Company Contact **R. D. Mahon - WHC**

Telephone (509) 373-2891  
Page 85-3152 / FAX 373-3793

Project Designation/Sampling Locations **200 West Tank Farm**  
**241-A-101 Tank** Vapor Sample SAF S5-026  
(VSS Truck)

Collection date <sup>06</sup> 05-01-95  
Preparation date <sup>05</sup> 05-11-95

Ice Chest No.

Field Logbook No. WHC- N-642/0

Bill of Lading/Airbill No. **N/A**

Offsite Property No. **N/A**

Method of Shipment **Government Truck**

Shipped to **WHC**

Possible Sample Hazards/Remarks **Unknown at time of sampling**

**Sample Identification**

S5-026 - A23 . U27 -	NH <sub>3</sub> /NO <sub>x</sub> /H <sub>2</sub> O (Sorbent Trap # 1)	Line # 9
S5-026 - A24 . U28 -	NH <sub>3</sub> /NO <sub>x</sub> /H <sub>2</sub> O (Sorbent Trap # 2)	Line # 10
S5-026 - A25 . U29 -	NH <sub>3</sub> /NO <sub>x</sub> /H <sub>2</sub> O (Sorbent Trap # 3)	Line # 8
S5-026 - A26 . U30 -	NH <sub>3</sub> /NO <sub>x</sub> /H <sub>2</sub> O (Sorbent Trap # 4)	Line # 10
S5-026 - A27 . U31 -	NH <sub>3</sub> /NO <sub>x</sub> /H <sub>2</sub> O (Sorbent Trap # 5)	Line # 9
S5-026 - A28 . U32 -	NH <sub>3</sub> /NO <sub>x</sub> /H <sub>2</sub> O (Sorbent Trap # 6)	Line # 10
S5-026 - A29 . U33 -	NH <sub>3</sub> /NO <sub>x</sub> /H <sub>2</sub> O (Trap Trip Blank # 1)	
S5-026 - A30 . U34 -	NH <sub>3</sub> /NO <sub>x</sub> /H <sub>2</sub> O (Trap Trip Blank # 2)	
S5-026 - A31 . U35 -	NH <sub>3</sub> /NO <sub>x</sub> /H <sub>2</sub> O (Trap Trip Blank # 3)	
S5-026 - A32 . U18 -	NH <sub>3</sub> /NO <sub>x</sub> /H <sub>2</sub> O (Field Blank # 1)	
S5-026 - A33 . U19 -	NH <sub>3</sub> /NO <sub>x</sub> /H <sub>2</sub> O (Field Blank # 2)	
S5-026 - A34 . U20 -	NH <sub>3</sub> /NO <sub>x</sub> /H <sub>2</sub> O (Field Blank # 3)	

[ ] Field Transfer of Custody			[ ] Chain of Possession			(Sign and Print Names)		
Relinquished By	Date	Time	Received By	Date	Time			
G W Dennis	05-12-95	1300	J A Edwards	05-12-95	1300			
J A Edwards	05-12-95	1300	T. U. Utecht	05-12-95	1300			
<del>T. U. Utecht</del>	<del>5-14-95</del>	<del>1030</del>	<del>J A Edwards</del>	<del>5-14-95</del>	<del>1030</del>			

**Final Sample Disposition**

Comments:

**PNL (only) Checklist**

- Media labeled and checked?
- Letter of instruction?
- Media in good condition?
- COC info/signatures complete?
- Sorbents shipped on ice? (<10°C)
- Rad release stickers on samples?
- Activity report from 222S?
- COC copy for LRB, RIDS filed?
- COC copy for sorbent follow-on?

**Pick-up / Delivery**

- /  N
- /  N
- /  N
- /  N
- /  N
- /  N
- /  N
- /  N

**Comments:**

Original COC follows sorbent media

POC (Signature) POC (Signature)

(Revised 05/10/95 PNL)

**Westinghouse  
Hanford Company**

**CHAIN OF CUSTODY**

**WHC 008890**

Custody Form Initiator **J. A. Edwards - PNL**

Telephone (509) 373-0141  
Page 85-3009 / FAX 376-0418

Company Contact **R. D. Mahon - WHC**

Telephone (509) 373-2891  
Page 85-3152 / FAX 373-3793

Project Designation/Sampling Locations **200 West Tank Farm  
241-A-101 Tank Vapor Sample SAF S5-026  
(VSS Truck)**

Collection date <sup>06</sup> ~~04~~ - ~~08~~ - 95  
Preparation date <sup>04</sup> ~~04~~ - 20 - 95

Ice Chest No.

Field Logbook No. **WHC- N - 647. 10**

Bill of Lading/Airbill No. **N/A**

Offsite Property No. **N/A**

Method of Shipment **Government Truck**

Shipped to **PNL**

Possible Sample Hazards/Remarks **Unknown at time of sampling**

**Sample Identification**

S5-026 - A01 . 163	Ambient Air SUMMA #1 Upwind of A-101
S5-026 - A02 . 256	Ambient Air SUMMA #2 Through Port 15
S5-026 - A04 . 232	SUMMA #3 Port 11
S5-026 - A05 . 234	SUMMA #4 Port 13
S5-026 - A06 . 235	SUMMA #5 Port 15

[ ] Field Transfer of Custody			[ ] Chain of Possession			(Sign and Print Names)		
Relinquished By	Date	Time	Received By	Date	Time			
J A Edwards <i>J A Edwards</i>	04-21-95	1040	Neil Buechler <i>N Buechler</i>	04-21-95	1040			
<i>N Buechler</i>	6-8-95	0715	<i>T R Uehlt</i>	6-8-95	0715			
<i>T R Uehlt</i>	6-8-95	0800	<i>R D Westing</i>	6-8-95	0800			
<i>R D Westing</i>	6-14-95	0905	<i>T R Uehlt</i>	6-14-95	0905			
<i>T R Uehlt</i>	6-14-95	1030	<i>J A Edwards</i>	6-14-95	1030			

**Final Sample Disposition**

Comments:

- |                                  |                                       |           |
|----------------------------------|---------------------------------------|-----------|
| PNL (only) Checklist             | Pick-up / Delivery                    | Comments: |
| Media labeled and checked?       | <input checked="" type="checkbox"/> N |           |
| Letter of instruction?           | <input checked="" type="checkbox"/> N |           |
| Media in good condition?         | <input checked="" type="checkbox"/> N |           |
| COC info/signatures complete?    | <input checked="" type="checkbox"/> N |           |
| Rad release stickers on samples? | <input checked="" type="checkbox"/> N |           |
| Activity report from 222S?       | <input checked="" type="checkbox"/> N |           |
| COC copy for LRB, RIDS filed?    | <input checked="" type="checkbox"/> N |           |
|                                  | POC <i>(Signature)</i>                |           |

(Revised 10/17/94 PNL)

Westinghouse  
Hanford Company

Custody Form Initiator J. A. Edwards - PNL Telephone (509) 373-0141  
Page 85-3009 / FAX 376-0418

Company Contact R. D. Mahon - WHC Telephone (509) 373-2891  
Page 85-3152 / FAX 373-3793

Project Designation/Sampling Locations 200 West Tank Farm Collection date 04 - \_\_\_ - 95  
241-A-101 Tank Vapor Sample SAF S5-026 Preparation date 04 - 20 - 95  
(VSS Truck)

Ice Chest No. Field Logbook No. WHC-\_\_\_-\_\_\_-\_\_\_

Bill of Lading/Airbill No. N/A Offsite Property No. N/A

Method of Shipment Government Truck

Shipped to PNL

Possible Sample Hazards/Remarks Unknown at time of sampling

Sample Identification

S5-026 - A23 . 90U	NH <sub>3</sub> /NO <sub>x</sub> /H <sub>2</sub> O (Sorbent Trap # 1)	Line # 9
S5-026 - A24 . 91U	NH <sub>3</sub> /NO <sub>x</sub> /H <sub>2</sub> O (Sorbent Trap # 2)	Line # 10
S5-026 - A25 . 92U	NH <sub>3</sub> /NO <sub>x</sub> /H <sub>2</sub> O (Sorbent Trap # 3)	Line # 8
S5-026 - A26 . 93U	NH <sub>3</sub> /NO <sub>x</sub> /H <sub>2</sub> O (Sorbent Trap # 4)	Line # 10
S5-026 - A27 . 94U	NH <sub>3</sub> /NO <sub>x</sub> /H <sub>2</sub> O (Sorbent Trap # 5)	Line # 9
S5-026 - A28 . 95U	NH <sub>3</sub> /NO <sub>x</sub> /H <sub>2</sub> O (Sorbent Trap # 6)	Line # 10
S5-026 - A29 . 96U	NH <sub>3</sub> /NO <sub>x</sub> /H <sub>2</sub> O (Trap Trip Blank # 1)	
S5-026 - A30 . 97U	NH <sub>3</sub> /NO <sub>x</sub> /H <sub>2</sub> O (Trap Trip Blank # 2)	
S5-026 - A31 . 98U	NH <sub>3</sub> /NO <sub>x</sub> /H <sub>2</sub> O (Trap Trip Blank # 3)	

Field Transfer of Custody			Chain of Possession		
Relinquished By	Date	Time	Received By	Date	Time
G W Dennis / J.A.W.	04-21-95	0930	J A Edwards / J.A. Edwards	04-21-95	0930
J A Edwards / J.A. Edwards	04-21-95	1040	Neil Buschler / Neil Buschler	04-21-95	1040
Neil Buschler / Neil Buschler	5-12-95	1300	Neil Buschler / Neil Buschler	5-12-95	1300
Neil Buschler / Neil Buschler	5-12-95	1300	G.W. Dennis / J.A.W.	5-12-95	1300

Final Sample Disposition

Comments:

- PNL (only) Checklist
- Media labeled and checked?
  - Letter of instruction?
  - Media in good condition?
  - COC info/signatures complete?
  - Sorbents shipped on ice?
  - Rad release stickers on samples?
  - Activity report from 222S?
  - COC copy for LRB, RIDS filed?
  - COC copy for sorbent follow-on?

Pick-up / Delivery

- Y/N

Comments:

SRL Refrigerator failed from 1100 5/11/95 to 0800 5/11/95. Temperature recorder shows that 72°F was reached and held most of this time. Mike Ligotke and J.A. Edwards were informed. Mike directed that the sample media can not be used for sampling and will need to be replaced 11/11/95 RM

POC

POC

(Revised 10/17/94 PNL)

**Battelle Pacific Northwest Laboratory**

**CHAIN OF CUSTODY**

**WHC 008903**

Custody Form Initiator **J. A. Edwards - PNL** Telephone **(509) 373-0141**  
 Page **85-3009 / P8-08 / FAX 376-0418**

Company Contact **R. D. Mahon - WHC** Telephone **(509) 373-7437**  
 Page **85-9656 / S3-27 / FAX 373-7076**

Project Designation/Sampling Locations **200 West Tank Farm**  
**241-A-101 Tank Vapor Sample SAF S5-026**  
**(VSS Truck)**

Collection date **06 - 08 - 95**  
 Preparation date **06 - 05 - 95**

Ice Chest No. Field Logbook No. **WHC- N-677-10**

Ertco Hi/Lo thermometer No. **PNL-T-001**

Bill of Lading/Airbill No. **N/A** Offsite Property No. **N/A**

Method of Shipment **Government Truck**

Shipped to **WHC**

Possible Sample Hazards/Remarks **Unknown at time of sampling**

**Sample Identification**

S5-026 - A35 . 021	Collect PNL Triple Sorbent Trap (TST) Sample # 1	Line # <u>2</u>
S5-026 - A36 . 022	PNL TST Sample # 2	Line # <u>4</u>
S5-026 - A37 . 023	PNL TST Sample # 3	Line # <u>6</u>
S5-026 - A38 . 024	Open, close & store PNL TST Field Blank # 1	In VSS truck
S5-026 - A39 . 025	PNL TST Sample # 4	Line # <u>8</u>
S5-026 - A40 . 026	PNL TST Sample # 5	Line # <u>2</u>
S5-026 - A41 . 027	PNL TST Sample # 6	Line # <u>4</u>
S5-026 - A42 . 028	PNL TST Sample # 7	Line # <u>6</u>
S5-026 - A43 . 030	PNL TST Sample # 8	Line # <u>8</u>
S5-026 - A44 . 031	PNL TST Sample # 9	Line # <u>2</u>
S5-026 - A45 . 032	Open, close & store PNL TST Field Blank # 2	In VSS truck
S5-026 - A46 . 033	PNL TST Sample # 10	Line # <u>4</u>
S5-026 - A47 . 034	PNL TST Sample # 11	Line # <u>6</u>
S5-026 - A48 . 035	PNL TST Sample # 12	Line # <u>8</u>
S5-026 - A49 . 036	Store PNL TST Trip Blank # 1	None
S5-026 - A50 . 037	Store PNL TST Trip Blank # 2	None

[ ] Field Transfer of Custody		[ ] Chain of Possession		(Sign and Print Names)	
Relinquished By	Date	Time	Received By	Date	Time
J A Edwards	06-06-95	1500	T. U. Utecht	06-06-95	1500
<i>[Signature]</i>	6-8-95	0800	R.A. Whiting	6-8-95	0800
<i>[Signature]</i>	6-14-95	0805	T.B. Utecht	6-14-95	0805
Comments: <i>[Signature]</i>		Final Sample Disposition		<i>[Signature]</i>	
		<i>[Signature]</i>		6-14-95 1036	

PNL (only) Checklist	Pick-up / Delivery	Comments:
<input type="checkbox"/> Media labeled and checked?	<input checked="" type="checkbox"/> N	
<input type="checkbox"/> Letter of instruction?	<input checked="" type="checkbox"/> N	
<input type="checkbox"/> Media in good condition?	<input checked="" type="checkbox"/> N	
<input type="checkbox"/> COC info/signatures complete?	<input checked="" type="checkbox"/> N	
<input type="checkbox"/> Sorbents shipped on ice? (5°C)	<input checked="" type="checkbox"/> N	
<input type="checkbox"/> HI/Lo thermometers - reset @ <u>4</u> °C	<input checked="" type="checkbox"/> N	
<input type="checkbox"/> HI/Lo thermometer - <i>Keep upright</i>	<input checked="" type="checkbox"/> N	
<input type="checkbox"/> Rad release stickers on samples?	<input checked="" type="checkbox"/> N	
<input type="checkbox"/> Activity report from 222S?	<input checked="" type="checkbox"/> N	
<input type="checkbox"/> COC copy for LRB, RIDS filed?	<input checked="" type="checkbox"/> N	
	POC <i>[Signature]</i>	Hi <u>10</u> °C / Lo <u>9</u> °C (at delivery from PNL to WHC) Hi <u>21</u> °C / Lo <u>3</u> °C (upon return to PNL from WHC)

(Revised 05/10/95 PNL)