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VAPOR & GAS SAMPLING OF SST 241-U-109 USING THE
VAPOR SAMPLING SYSTEM

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7. Abstract

THIS DOCUMENT PRESENTS SAMPLING DATA RESULTING FROM THE AUGUST 10, 1995, SAMPLING OF SST 241-U-109 USING THE VAPOR SAMPLING SYSTEM.

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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 ₃	Ammonia
NO ₂	Nitrogen Dioxide
NO _x	Nitric Oxide
H ₂ O	Water Vapor
OPC	Offsite Property Control
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-U-109 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-U-109. This document presents sampling data resulting from the August 10, 1995 sampling of SST 241-U-109. 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-U-109 on August 10, 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 SUMMA¹ canister headspace samples from SST 241-U-109. 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.

¹SUMMA is a registered trademark of Molectrics, Inc., Cleveland, Ohio.

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 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-U-109 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 ³ /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,² a programmable oven, and a portable computer loaded with the HP-Chemstation²

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

software used to control the GC. The GC is plumbed to directly transfer 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 μ m 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. 0E, *Vapor Sampling and Analysis Plan* (Horn 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 S5-055.

3.2 OPERATIONS AND SAMPLING PERSONNEL

Steve Carter was the Tank Farm Operations person-in-charge. The 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-U-109 on August 9, 1995 and was allowed to warm up overnight. Sampling began at 8:00 a.m. on August 10, 1995, and was completed by 10:30 a.m. the same day.

3.3 INDUSTRIAL HYGIENE FIELD RESULTS

Before hooking up to SST 241-U-109, 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 9%, NH_3 225 ppm, O_2 20.7%, and total organic carbon 15.7 ppm.

3.4 AMBIENT CONDITIONS

The weather the day of the sampling event, August 10, 1995 was cool and cloudy with winds between 5 and 10 miles per hour from the northwest. Graphs of ambient temperatures and pressures taken at the Hanford Meteorological Station, which is about 2.5 miles northeast of U-Farm, are provided in Appendix B.

3.5 SAMPLE COLLECTION

The hot-water-jacketed sampling probe was located in Riser 10 of SST 241-U-109. The probe length, from the sample inlet to the top of the riser flange, was 6.1 meters.

All zones of the VSS were heated to 60 °C during setup of the VSS at SST 241-U-109 on August 9, 1995. The team stabilized the VSS temperature zones by 8:00 a.m. on August 10, 1995, and the system was ready to collect samples. Measured according to the VSS operating procedure, the pressure and temperature of SST 241-U-109 were 977 mbar (733.0 torr) and 33.0 °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. During this warmup period, the team began a purge of all vapor transfer tubing and the sampling

manifold with ambient air. Before sampling tank vapors on August 10, 1995, the team collected two SUMMA[®] canister samples of ambient air, one manually 10 meters upwind of the VSS connection with SST 241-U-109, 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 269 mbar (202.1 torr) and leakage of ambient air into the system was observed by monitoring system pressure for 15 minutes. Leakage resulted in an increase of 4.53 mbar (3.4 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 11.2 mL/min at a 269 mbar (202.1 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 200 mL/min the dilution was approximately 0.3%, and for sorbent traps the dilution was approximately 0.3%.

The tank probe vapor sampling valve was opened and the VSS was purged with sample vapor from SST 241-U-109 for 30 minutes at a total flow rate of 5.5 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.

One analytical laboratory provided sample media. Pacific Northwest Laboratory (PNL) provided SUMMA[®] canisters, TSTs, and sorbent traps for organic vapors, ammonia (NH₃), nitrogen dioxide (NO₂), and water vapor (H₂O).

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 $\pm 2\%$ NIST traceable.

Table 2 displays the Field GC/FID results from the sampling of SST 241-U-109.

Table 2. TOC Results.

Number of Runs	Description	Average TOC Concentration (ppmC)	% Standard Deviation
3	Propane	6.00	0.60
4	Ambient	2.77	1.59
4	Tank Vapor	30.06	0.27

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:

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 August 10, 1995, SST 241-U-109 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-U-109 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-U-109 met the laboratory acceptance criteria and the DOT definition of a nonradioactive shipment.

Table 3. Radionuclide Analysis Results.

Filter	Sample Identifier	Activity Results ^a (pCi/sample)	Activity ^b (pCi/L of tank gas)
Upstream HEPA filter (box)	S5055-A28.OU1	Total Alpha = 66.7 Total Beta = 93.6 GEA = <detectable	= 0.22 = 0.31 = <detectable
Downstream HEPA filter (box)	S5055-A29.OD1	Total Alpha = <0.869 Total Beta = <1.68 GEA = <10.6 (¹³⁷ Cs)	= <0.003 = <0.005 = <0.03
Upstream HEPA filter (VSS)	S5055-A30.OU2	Total Alpha = <0.869 Total Beta = <1.35 GEA = <detectable	= <0.003 = <0.004 = <detectable
Downstream HEPA filter (VSS)	S5055-A31.OD2	Total Alpha = <0.869 Total Beta = <1.35 GEA = <detectable	= <0.003 = <0.004 = <detectable
Tritium trap	S5055-A03.OT1	Total activity = <50.0	= <50.0 ^c

Notes:

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

^aAll less than (<) values represent the minimum detection limits at Laboratory 222-S.

^bNumbers 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 306 L.

^cNumber 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[™] canisters received from PNL are kept in a custody locked storage area maintained by SML. Sorbent trains and tubes were maintained at 4 ± 2 °C in a refrigeration unit. SUMMA[™] canisters were stored in the same locked storage area, but were not refrigerated. These sampling devices were picked up from PNL by SML and transported in a government vehicle to a custody locked storage area.

After sampling, the PNL sorbent tubes and SUMMA[™] canisters were transported by government vehicle directly to PNL and delivered to J. A. Edwards on August 14, 1995. Table 4 lists the sample identifiers, sample types, and COC form numbers for all PNL samples.

Table 4. Pacific Northwest Laboratory Samples.

Sample Identifier	Sample Type	COC Number
S5055-A01.213	Ambient upwind SUMMA™	009251
S5055-A02.251	Ambient SUMMA™ (VSS)	009251
S5055-A04.252	SUMMA™	009251
S5055-A12.254	SUMMA™	009251
S5055-A20.255	SUMMA™	009251
S5055-A08.77T	NH ₃ /NO _x /H ₂ O sorbent	009253
S5055-A09.78T	NH ₃ /NO _x /H ₂ O sorbent	009253
S5055-A10.79T	NO _x /H ₂ O sorbent	009253
S5055-A11.80T	NH ₃ /H ₂ O/H ₂ O sorbent	009253
S5055-A16.81T	NH ₃ /NO _x /H ₂ O sorbent	009253
S5055-A17.82T	NH ₃ /NO _x /H ₂ O sorbent	009253
S5055-A18.83T	NO _x /H ₂ O sorbent	009253
S5055-A19.84T	NH ₃ /H ₂ O/H ₂ O sorbent	009253
S5055-A25.85T	NH ₃ /NO _x /H ₂ O field blank	009253
S5055-A26.86T	NH ₃ /NO _x /H ₂ O field blank	009253
S5055-A27.87T	NH ₃ /NO _x /H ₂ O field blank	009253
S5055-A05.648	PNL TST	009252
S5055-A06.649	PNL TST	009252
S5055-A07.650	PNL TST	009252
S5055-A13.651	PNL TST	009252
S5055-A14.652	PNL TST	009252
S5055-A15.653	PNL TST	009252
S5055-A21.654	PNL TST Field Blank	009252
S5055-A22.655	PNL TST Field Blank	009252
S5055-A23.656	PNL TST Trip Blank	009252
S5055-A24.657	PNL TST Trip Blank	009252

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 prior to sampling of SST 241-U-109, the VSS manifold and vapor sample transfer tubing was heated to 60 °C and ambient air was purged through the system for 19 hours. 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™ 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-U-109. 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 5. According to the calibration schedule shown in Table 5, all instrumentation was within its calibration period during the SST 241-U-109 sampling event.

Table 5. 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	03/30/95	03/30/96	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 prior to sampling operations.

Table 4 lists sample blanks used during the sampling of SST 241-U-109.

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 process.

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. 0E, 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 Parallel 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.

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APPENDIX A
SAMPLE LOG SHEETS

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Waste Tank
241-J-100

Date: 8/10/95

VSS Personnel: Rich Westberg and Glenn Caprio

Trailer Personnel: Tim Utecht

Set up VSS (Section 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 33.0 C

GC Standard Runs

GC Ambient Air Runs through port 10

WHC Sample ID		PNL	Port	Description	Desired Flow Rate SCCM	Desired Duration (min.)	Desired Total Flow SCCM	Actual Flow Rate SCCM	Actual Start Time	Actual End Time	Actual Total Time (min.)	Actual Total Flow Liters
Purge with ambient air for 30 min.				Over night	5500	30	165000	5500	8/9-12:35	8/10-07:53	1158	6369.00
S5055-A01. 213		213		AMBIENT #1		1			08:05	08:06	1	
GC Run #1				Ambient air/Cleanliness check								
S5055-A02. 251		251	15	AMBIENT #2		1			08:13	08:14	1	
GC RUN#2				Ambient air								
LEAK CHECK(APPENDIX A)				Leak Rate:	13.6 torr/hr							
Purge with tank air for 30 min					5500	30	165000	5500	08:47	09:17	30	165.00
Measure tank pressure				PE-1 = 733 torr								
GGRUN #3 (Tank run #1)				09:22								
S5055-A04. 252		252	11	SUMMA #3		1			09:26	09:27	1	6.00

				Waste Tank 241-U-100							
WHC Sample ID	PNL Sample ID	Port Valve #	Description	Desired Flow Rate SCCM	Desired Duration (min.)	Desired Total Flow SCCM	Actual Flow Rate SCCM	Actual Start Time	Actual End Time	Actual Total Time (min.)	Actual Total Flow Liters
S5055- A05. 648	<u>TST#648</u>	1	TST #1	<u>200</u>	<u>5</u>	1000	<u>200.00</u>	<u>09:32</u>	<u>09:37</u>	<u>5</u>	1.00
S5055- A06. 649	<u>TST#649</u>	2	TST #2	<u>200</u>	<u>5</u>	1000	<u>200.00</u>	<u>09:32</u>	<u>09:37</u>	<u>5</u>	1.00
S5055- A07. 650	<u>TST#650</u>	3	TST #3	<u>200</u>	<u>5</u>	1000	<u>190.10</u>	<u>09:32</u>	<u>09:37</u>	<u>5</u>	0.95
S5055- A03. 0T1	T-2288 (222-S)	4	Tritium Trap	<u>200</u>	<u>5</u>	1000	<u>200.00</u>	<u>09:32</u>	<u>09:37</u>	<u>5</u>	1.00
S5055- A08. 77T	<u>77T</u>	5	NH3/NOx/H2O (#1)	<u>200</u>	<u>15</u>	3000	<u>200.00</u>	<u>09:32</u>	<u>09:47</u>	<u>15</u>	3.00
S5055- A09. 78T	<u>78T</u>	6	NH3/NOx/H2O (#2)	<u>200</u>	<u>15</u>	3000	<u>200.00</u>	<u>09:32</u>	<u>09:47</u>	<u>15</u>	3.00
S5055- A10. 79T	<u>79T</u>	7	NOx/H2O (#3)	<u>200</u>	<u>15</u>	3000	<u>189.90</u>	<u>09:32</u>	<u>09:47</u>	<u>15</u>	2.85
S5055- A11. 80T	<u>80T</u>	8	NH3/H2O/H2O (#4)	<u>200</u>	<u>15</u>	3000	<u>193.80</u>	<u>09:32</u>	<u>09:47</u>	<u>15</u>	2.91
GCRUN #4 (Tank run # 2)								09:48			
S5055- A12. 254	<u>254</u>	13	SUMMA #4		<u>1</u>			<u>09:54</u>	<u>09:55</u>	<u>1</u>	6.00
S5055- A13. 651	<u>TST#651</u>	1	TST #4	<u>200</u>	<u>5</u>	1000	<u>200.00</u>	<u>09:59</u>	<u>10:04</u>	<u>5</u>	1.00
S5055- A14. 652	<u>TST#652</u>	2	TST #5	<u>200</u>	<u>5</u>	1000	<u>200.00</u>	<u>09:59</u>	<u>10:04</u>	<u>5</u>	1.00
S5055- A15. 653	<u>TST#653</u>	3	TST #6	<u>200</u>	<u>5</u>	1000	<u>189.00</u>	<u>09:59</u>	<u>10:04</u>	<u>5</u>	0.95
S5055- A16. 81T	<u>81T</u>	5	NH3/NOx/H2O (#5)	<u>200</u>	<u>15</u>	3000	<u>200.00</u>	<u>09:59</u>	<u>10:14</u>	<u>15</u>	3.00
S5055- A17. 82T	<u>82T</u>	6	NH3/NOx/H2O (#6)	<u>200</u>	<u>15</u>	3000	<u>200.00</u>	<u>09:59</u>	<u>10:14</u>	<u>15</u>	3.00
S5055- A18. 83T	<u>83T</u>	7	NOx/H2O (#7)	<u>200</u>	<u>15</u>	3000	<u>188.70</u>	<u>09:59</u>	<u>10:14</u>	<u>15</u>	2.83
S5055- A19. 84T	<u>84T</u>	8	NH3/H2O/H2O (#8)	<u>200</u>	<u>15</u>	3000	<u>193.80</u>	<u>09:59</u>	<u>10:14</u>	<u>15</u>	2.91
GCRUN #5 (Tank run # 3)								10:16			
S5055- A20. 255	<u>255</u>	15	SUMMA # 5		<u>1</u>			<u>10:20</u>	<u>10:21</u>	<u>1</u>	6.00

WHC-SD-WM-RPT-182, Rev. 0

Waste Tank 241-U-108	Sample ID	PML	Port	Description	Desired Flow	Desired Rate SCM (mtn.)	Desired Duration	Desired Total Flow SCM	Actual Flow SCM	Actual Start Time	Actual End Time	Actual Total Time (mtn.)	Actual Total Flow Liters
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S5055-A21.654	TST#654	2	TST FIELD BLANK #1	10:09	10:10
S5055-A22.655	TST#655	3	TST FIELD BLANK #2	10:09	10:10
S5055-A25.851	851	6	MEMO-A120 FIELD BLANK #1	10:23	10:24
S5055-A26.861	861	7	MEMO-A120 FIELD BLANK #2	10:23	10:24
S5055-A27.871	871	8	MEMO-A120 FIELD BLANK #3	10:23	10:24
GCRUN#6 (Tank run # 4)					
10:28					

TOTAL TANK GAS USED DURING SAMPLING RUNS

48.39

S5055-A28.0U1	T-2289 (222S)	Upstream HEPA(box)
S5055-A29.0D1	T-2290 (222S)	Downstream HEPA(box)
S5055-A30.0U2	T-2291 (222S)	Upstream HEPA(VSS)
S5055-A31.0D2	T-2292 (222S)	Downstream HEPA (VSS)
Tip Blanks (DO NOT EXPOSE)		
S5055-A23.656	TST#656	TST TRIP #1
S5055-A24.657	TST#657	TST TRIP #2

U-109
TOTAL TANK VAPOR USED

	NUMBER		TIME		VOLUME	
	OF		IN		IN	TOTAL
	EVENTS		MINUTES		SCCM	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		5450	165.00
GC PURGES	4		2		5000	40.00
SUMMA PURGES	3		2		5000	30.00
ALL SAMPLES COLLECTED						48.39
TOTAL FOR TANK SAMPLING RUN						305.79

A-6

MHC-SD-WM-RPT-182, Rev. 0

A-7

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APPENDIX B
AMBIENT CONDITIONS

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WEATHER DURING VSS SAMPLING OF 241-U-109

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APPENDIX C
CHAIN-OF-CUSTODY FORMS

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CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST FOOPY		Westinghouse Hanford Company	
COC# 009490 Page 1 of 1		Collector T.B. Utkin SAF Number 55055 Project Title VSS Vapor Sampling Shipped To (Lab) 223-S 6465 Method of Shipment 5504 Utkin #1930 Date Returned NEXT Day	
Tel No. 373-7437 MISSN 53-27 FAX 373-7076 Sample Origin U-109 Logbook # WHC-N-647 #10 Ice Check # N/A Temp. N/A Bill of Lading/Air Bill No. N/A Office Property No. N/A		Sample No. 55055-071 Lab ID 55055-071 Date 8-10-87 Time 1130 No/Type Container (1) 5.0L Gal Sample Analysis TOTAL ACTIVITY Preservative N/A	
T-2299 55055-001 T-2290 55055-002 T-2291 55055-003 T-2292 55055-004 T-2293 55055-005 T-2294 55055-006 T-2295 55055-007 T-2296 55055-008 T-2297 55055-009 T-2298 55055-010 T-2299 55055-011 T-2300 55055-012 T-2301 55055-013 T-2302 55055-014 T-2303 55055-015 T-2304 55055-016 T-2305 55055-017 T-2306 55055-018 T-2307 55055-019 T-2308 55055-020 T-2309 55055-021 T-2310 55055-022 T-2311 55055-023 T-2312 55055-024 T-2313 55055-025 T-2314 55055-026 T-2315 55055-027 T-2316 55055-028 T-2317 55055-029 T-2318 55055-030 T-2319 55055-031 T-2320 55055-032 T-2321 55055-033 T-2322 55055-034 T-2323 55055-035 T-2324 55055-036 T-2325 55055-037 T-2326 55055-038 T-2327 55055-039 T-2328 55055-040 T-2329 55055-041 T-2330 55055-042 T-2331 55055-043 T-2332 55055-044 T-2333 55055-045 T-2334 55055-046 T-2335 55055-047 T-2336 55055-048 T-2337 55055-049 T-2338 55055-050 T-2339 55055-051 T-2340 55055-052 T-2341 55055-053 T-2342 55055-054 T-2343 55055-055 T-2344 55055-056 T-2345 55055-057 T-2346 55055-058 T-2347 55055-059 T-2348 55055-060 T-2349 55055-061 T-2350 55055-062 T-2351 55055-063 T-2352 55055-064 T-2353 55055-065 T-2354 55055-066 T-2355 55055-067 T-2356 55055-068 T-2357 55055-069 T-2358 55055-070 T-2359 55055-071 T-2360 55055-072 T-2361 55055-073 T-2362 55055-074 T-2363 55055-075 T-2364 55055-076 T-2365 55055-077 T-2366 55055-078 T-2367 55055-079 T-2368 55055-080 T-2369 55055-081 T-2370 55055-082 T-2371 55055-083 T-2372 55055-084 T-2373 55055-085 T-2374 55055-086 T-2375 55055-087 T-2376 55055-088 T-2377 55055-089 T-2378 55055-090 T-2379 55055-091 T-2380 55055-092 T-2381 55055-093 T-2382 55055-094 T-2383 55055-095 T-2384 55055-096 T-2385 55055-097 T-2386 55055-098 T-2387 55055-099 T-2388 55055-100 T-2389 55055-101 T-2390 55055-102 T-2391 55055-103 T-2392 55055-104 T-2393 55055-105 T-2394 55055-106 T-2395 55055-107 T-2396 55055-108 T-2397 55055-109 T-2398 55055-110 T-2399 55055-111 T-2400 55055-112 T-2401 55055-113 T-2402 55055-114 T-2403 55055-115 T-2404 55055-116 T-2405 55055-117 T-2406 55055-118 T-2407 55055-119 T-2408 55055-120 T-2409 55055-121 T-2410 55055-122 T-2411 55055-123 T-2412 55055-124 T-2413 55055-125 T-2414 55055-126 T-2415 55055-127 T-2416 55055-128 T-2417 55055-129 T-2418 55055-130 T-2419 55055-131 T-2420 55055-132 T-2421 55055-133 T-2422 55055-134 T-2423 55055-135 T-2424 55055-136 T-2425 55055-137 T-2426 55055-138 T-2427 55055-139 T-2428 55055-140 T-2429 55055-141 T-2430 55055-142 T-2431 55055-143 T-2432 55055-144 T-2433 55055-145 T-2434 55055-146 T-2435 55055-147 T-2436 55055-148 T-2437 55055-149 T-2438 55055-150 T-2439 55055-151 T-2440 55055-152 T-2441 55055-153 T-2442 55055-154 T-2443 55055-155 T-2444 55055-156 T-2445 55055-157 T-2446 55055-158 T-2447 55055-159 T-2448 55055-160 T-2449 55055-161 T-2450 55055-162 T-2451 55055-163 T-2452 55055-164 T-2453 55055-165 T-2454 55055-166 T-2455 55055-167 T-2456 55055-168 T-2457 55055-169 T-2458 55055-170 T-2459 55055-171 T-2460 55055-172 T-2461 55055-173 T-2462 55055-174 T-2463 55055-175 T-2464 55055-176 T-2465 55055-177 T-2466 55055-178 T-2467 55055-179 T-2468 55055-180 T-2469 55055-181 T-2470 55055-182 T-2471 55055-183 T-2472 55055-184 T-2473 55055-185 T-2474 55055-186 T-2475 55055-187 T-2476 55055-188 T-2477 55055-189 T-2478 55055-190 T-2479 55055-191 T-2480 55055-192 T-2481 55055-193 T-2482 55055-194 T-2483 55055-195 T-2484 55055-196 T-2485 55055-197 T-2486 55055-198 T-2487 55055-199 T-2488 55055-200 T-2489 55055-201 T-2490 55055-202 T-2491 55055-203 T-2492 55055-204 T-2493 55055-205 T-2494 55055-206 T-2495 55055-207 T-2496 55055-208 T-2497 55055-209 T-2498 55055-210 T-2499 55055-211 T-2500 55055-212 T-2501 55055-213 T-2502 55055-214 T-2503 55055-215 T-2504 55055-216 T-2505 55055-217 T-2506 55055-218 T-2507 55055-219 T-2508 55055-220 T-2509 55055-221 T-2510 55055-222 T-2511 55055-223 T-2512 55055-224 T-2513 55055-225 T-2514 55055-226 T-2515 55055-227 T-2516 55055-228 T-2517 55055-229 T-2518 55055-230 T-2519 55055-231 T-2520 55055-232 T-2521 55055-233 T-2522 55055-234 T-2523 55055-235 T-2524 55055-236 T-2525 55055-237 T-2526 55055-238 T-2527 55055-239 T-2528 55055-240 T-2529 55055-241 T-2530 55055-242 T-2531 55055-243 T-2532 55055-244 T-2533 55055-245 T-2534 55055-246 T-2535 55055-247 T-2536 55055-248 T-2537 55055-249 T-2538 55055-250 T-2539 55055-251 T-2540 55055-252 T-2541 55055-253 T-2542 55055-254 T-2543 55055-255 T-2544 55055-256 T-2545 55055-257 T-2546 55055-258 T-2547 55055-259 T-2548 55055-260 T-2549 55055-261 T-2550 55055-262 T-2551 55055-263 T-2552 55055-264 T-2553 55055-265 T-2554 55055-266 T-2555 55055-267 T-2556 55055-268 T-2557 55055-269 T-2558 55055-270 T-2559 55055-271 T-2560 55055-272 T-2561 55055-273 T-2562 55055-274 T-2563 55055-275 T-2564 55055-276 T-2565 55055-277 T-2566 55055-278 T-2567 55055-279 T-2568 55055-280 T-2569 55055-281 T-2570 55055-282 T-2571 55055-283 T-2572 55055-284 T-2573 55055-285 T-2574 55055-286 T-2575 55055-287 T-2576 55055-288 T-2577 55055-289 T-2578 55055-290 T-2579 55055-291 T-2580 55055-292 T-2581 55055-293 T-2582 55055-294 T-2583 55055-295 T-2584 55055-296 T-2585 55055-297 T-2586 55055-298 T-2587 55055-299 T-2588 55055-300 T-2589 55055-301 T-2590 55055-302 T-2591 55055-303 T-2592 55055-304 T-2593 55055-305 T-2594 55055-306 T-2595 55055-307 T-2596 55055-308 T-2597 55055-309 T-2598 55055-310 T-2599 55055-311 T-2600 55055-312 T-2601 55055-313 T-2602 55055-314 T-2603 55055-315 T-2604 55055-316 T-2605 55055-317 T-2606 55055-318 T-2607 55055-319 T-2608 55055-320 T-2609 55055-321 T-2610 55055-322 T-2611 55055-323 T-2612 55055-324 T-2613 55055-325 T-2614 55055-326 T-2615 55055-327 T-2616 55055-328 T-2617 55055-329 T-2618 55055-330 T-2619 55055-331 T-2620 55055-332 T-2621 55055-333 T-2622 55055-334 T-2623 55055-335 T-2624 55055-336 T-2625 55055-337 T-2626 55055-338 T-2627 55055-339 T-2628 55055-340 T-2629 55055-341 T-2630 55055-342 T-2631 55055-343 T-2632 55055-344 T-2633 55055-345 T-2634 55055-346 T-2635 55055-347 T-2636 55055-348 T-2637 55055-349 T-2638 55055-350 T-2639 55055-351 T-2640 55055-352 T-2641 55055-353 T-2642 55055-354 T-2643 55055-355 T-2644 55055-356 T-2645 55055-357 T-2646 55055-358 T-2647 55055-359 T-2648 55055-360 T-2649 55055-361 T-2650 55055-362 T-2651 55055-363 T-2652 55055-364 T-2653 55055-365 T-2654 55055-366 T-2655 55055-367 T-2656 55055-368 T-2657 55055-369 T-2658 55055-370 T-2659 55055-371 T-2660 55055-372 T-2661 55055-373 T-2662 55055-374 T-2663 55055-375 T-2664 55055-376 T-2665 55055-377 T-2666 55055-378 T-2667 55055-379 T-2668 55055-380 T-2669 55055-381 T-2670 55055-382 T-2671 55055-383 T-2672 55055-384 T-2673 55055-385 T-2674 55055-386 T-2675 55055-387 T-2676 55055-388 T-2677 55055-389 T-2678 55055-390 T-2679 55055-391 T-2680 55055-392 T-2681 55055-393 T-2682 55055-394 T-2683 55055-395 T-2684 55055-396 T-2685 55055-397 T-2686 55055-398 T-2687 55055-399 T-2688 55055-400 T-2689 55055-401 T-2690 55055-402 T-2691 55055-403 T-2692 55055-404 T-2693 55055-405 T-2694 55055-406 T-2695 55055-407 T-2696 55055-408 T-2697 55055-409 T-2698 55055-410 T-2699 55055-411 T-2700 55055-412 T-2701 55055-413 T-2702 55055-414 T-2703 55055-415 T-2704 55055-416 T-2705 55055-417 T-2706 55055-418 T-2707 55055-419 T-2708 55055-420 T-2709 55055-421 T-2710 55055-422 T-2711 55055-423 T-2712 55055-424 T-2713 55055-425 T-2714 55055-426 T-2715 55055-427 T-2716 55055-428 T-2717 55055-429 T-2718 55055-430 T-2719 55055-431 T-2720 55055-432 T-2721 55055-433 T-2722 55055-434 T-2723 55055-435 T-2724 55055-436 T-2725 55055-437 T-2726 55055-438 T-2727 55055-439 T-2728 55055-440 T-2729 55055-441 T-2730 55055-442 T-2731 55055-443 T-2732 55055-444 T-2733 55055-445 T-2734 55055-446 T-2735 55055-447 T-2736 55055-448 T-2737 55055-449 T-2738 55055-450 T-2739 55055-451 T-2740 55055-452 T-2741 55055-453 T-2742 55055-454 T-2743 55055-455 T-2744 55055-456 T-2745 55055-457 T-2746 55055-458 T-2747 55055-459 T-2748 55055-460 T-2749 55055-461 T-2750 55055-462 T-2751 55055-463 T-2752 55055-464 T-2753 55055-465 T-2754 55055-466 T-2755 55055-467 T-2756 55055-468 T-2757 55055-469 T-2758 55055-470 T-2759 55055-471 T-2760 55055-472 T-2761 55055-473 T-2762 55055-474 T-2763 55055-475 T-2764 55055-476 T-2765 55055-477 T-2766 55055-478 T-2767 55055-479 T-2768 55055-480 T-2769 55055-481 T-2770 55055-482 T-2771 55055-483 T-2772 55055-484 T-2773 55055-485 T-2774 55055-486 T-2775 55055-487 T-2776 55055-488 T-2777 55055-489 T-2778 55055-490 T-2779 55055-491 T-2780 55055-492 T-2781 55055-493 T-2782 55055-494 T-2783 55055-495 T-2784 55055-496 T-2785 55055-497 T-2786 55055-498 T-2787 55055-499 T-2788 55055-500 T-2789 55055-501 T-2790 55055-502 T-2791 55055-503 T-2792 55055-504 T-2793 55055-505 T-2794 55055-506 T-2795 55055-507 T-2796 55055-508 T-2797 55055-509 T-2798 55055-510 T-2799 55055-511 T-2800 55055-512 T-2801 55055-513 T-2802 55055-514 T-2803 55055-515 T-2804 55055-516 T-2805 55055-517 T-2806 55055-518 T-2807 55055-519 T-2808 55055-520 T-2809 55055-521 T-2810 55055-522 T-2811 55055-523 T-2812 55055-524 T-2813 55055-525 T-2814 55055-526 T-2815 55055-527 T-2816 55055-528 T-2817 55055-529 T-2818 55055-530 T-2819 55055-531 T-2820 55055-532 T-2821 55055-533 T-2822 55055-534 T-2823 55055-535 T-2824 55055-536 T-2825 55055-537 T-2826 55055-538 T-2827 55055-539 T-2828 55055-540 T-2829 55055-541 T-2830 55055-542 T-2831 55055-543 T-2832 55055-544 T-2833 55055-545 T-2834 55055-546 T-2835 55055-547 T-2836 55055-548 T-2837 55055-549 T-2838 55055-550 T-2839 55055-551 T-2840 55055-552 T-2841 55055-553 T-2842 55055-554 T-2843 55055-555 T-2844 55055-556 T-2845 55055-557 T-2846 55055-558 T-2847 55055-559 T-2848 55055-560 T-2849 55055-561 T-2850 55055-562 T-2851 55055-563 T-2852 55055-564 T-2853 55055-565 T-2854 55055-566 T-2855 55055-567 T-2856 55055-568 T-2857 55055-569 T-2858 55055-570 T-2859 55055-571 T-2860 55055-572 T-2861 55055-573 T-2862 55055-574 T-2863 55055-575 T-2864 55055-576 T-2865 55055-577 T-2866 55055-578 T-2867 55055-579 T-2868 55055-580 T-2869 55055-581 T-2870 55055-582 T-2871 55055-583 T-2872 55055-584 T-2873 55055-585 T-2874 55055-586 T-2875 55055-587 T-2876 5			

Battelle
Pacific Northwest Lab

CHAIN OF CUSTODY

WHC 009251

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-U-109 Tank Vapor Sample SAF S5055
(VSS Truck)

Collection date 08 - 10 - 95

Preparation date 08 - 09 - 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

S5055 - A01 . 213

Ambient Air SUMMA #1 Upwind of U-109

S5055 - A02 . 251

Ambient Air SUMMA #2 Through Port # 15

S5055 - A04 . 252

SUMMA #3 Port # 15

S5055 - A12 . 254

SUMMA #4 Port # 15

S5055 - A20 . 255

SUMMA #5 Port # 13

[] 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>	08-09-95	1415	T R Utahd / <i>T R Utahd</i>	08-09-95	1415
T B Lutz / <i>T B Lutz</i>	8-14-95	0915	J A Edwards - <i>J A Edwards</i>	8-14-95	0915

Comments:

Final Sample Disposition

PNL (only) Checklist

- 0 Media labeled and checked?
- 0 Letter of instruction?
- 0 Media in good condition?
- 0 COC info/signatures complete?
- 0 Rad release stickers on samples?
- 0 Activity report from 222S?
- 0 COC copy for LRB, RIDS filed?

Pick-up / Delivery

☒ Y/N
☒ Y/N
☒ Y/N / ☒ Y/N
☒ Y/N / ☒ Y/N
☒ Y/N / ☒ Y/N
☒ Y/N / ☒ Y/N

Comments:

POC

POC

(Revised 10/17/94 PNL)

Battelle Pacific
Northwest Laboratory

CHAIN OF CUSTODY

WHC 009253

Custody Form Initiator J. A. Edwards - PNL

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Project Designation/Sampling Locations 200 West Tank Farm
241-U-109 Tank Vapor Sample SAF S5055
(VSS Truck)

Collection date 08 - 10 - 95

Preparation date 08 - 09 - 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 WHC

Possible Sample Hazards/Remarks Unknown at time of sampling

Sample Identification

S5055 - A08 . 77T	NH ₃ /NO _x /H ₂ O	(INORG Sorbent Trap # 1)
S5055 - A09 . 78T	NH ₃ /NO _x /H ₂ O	(INORG Sorbent Trap # 2)
S5055 - A10 . 79T	NO _x /H ₂ O	(INORG Sorbent Trap # 3)
S5055 - A11 . 80T	NH ₃ /H ₂ O/H ₂ O	(INORG Sorbent Trap # 4)
S5055 - A16 . 81T	NH ₃ /NO _x /H ₂ O	(INORG Sorbent Trap # 5)
S5055 - A17 . 82T	NH ₃ /NO _x /H ₂ O	(INORG Sorbent Trap # 6)
S5055 - A18 . 83T	NO _x /H ₂ O	(INORG Sorbent Trap # 7)
S5055 - A19 . 84T	NH ₃ /H ₂ O/H ₂ O	(INORG Sorbent Trap # 8)
S5055 - A25 . 85T	NH ₃ /NO _x /H ₂ O	(INORG Field Blank # 1)
S5055 - A26 . 86T	NH ₃ /NO _x /H ₂ O	(INORG Field Blank # 2)
S5055 - A27 . 87T	NH ₃ /NO _x /H ₂ O	(INORG 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	08-09-95	1445	J A Edwards	08-09-95	1445
J A Edwards	08-09-95	1445	J A Edwards	08-09-95	1445
J A Edwards	8-14-95	0930	J A Edwards	08-14-95	0930

Final Sample Disposition

Comments:

PNL (only) Checklist	Pick-up / Delivery	Comments:
Media labeled and checked?	☒ Y / ☐ N	
Letter of instruction?	☒ Y / ☐ N	
Media in good condition?	☒ Y / ☐ N	
COC info/signatures complete?	☒ Y / ☐ N	
Sorbents shipped on ice? (<10°C)	☒ Y / ☐ N	
Rnd release stickers on samples?	☒ Y / ☐ N	
Activity report from 222S?	☒ Y / ☐ N	
COC copy for LRB, RIDS filed?	☒ Y / ☐ N	
COC copy for sorbent follow-on?	☒ Y / ☐ N	
	POC ☒ / POC ☒	Original COC follows sorbent media

Battelle Pacific
Northwest Laboratory

CHAIN OF CUSTODY

WHC 009252

Custody Form Initiator J. A. Edwards - PNL

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Company Contact R. D. Mahon - WHC

Telephone (509) 373-7437
Page 85-9656 / S3-27 / FAX 373-7076Project Designation/Sampling Locations 200 West Tank Farm
241-U-109 Tank Vapor Sample SAF S5055
(VSS Truck)Collection date 08 - 08 - 95
Preparation date 08 - 01 - 95

Ice Chest No.

Field Logbook No. WHC- N-64210Ertco Hi/Lo thermometer No. PNL-T-00 1

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

S5055 - A05 . 648	PNL Triple Sorbent Trap (TST) Sample # 1	
S5055 - A06 . 649	PNL TST Sample # 2	
S5055 - A07 . 650	PNL TST Sample # 3	
S5055 - A13 . 651	PNL TST Sample # 4	
S5055 - A14 . 652	PNL TST Sample # 5	
S5055 - A15 . 653	PNL TST Sample # 6	
S5055 - A21 . 654	Open, close & store PNL TST Field Blank # 1	In VSS truck
S5055 - A22 . 655	Open, close & store PNL TST Field Blank # 2	In VSS truck
S5055 - A23 . 656	Store PNL TST Trip Blank # 1	None
S5055 - A24 . 657	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 <i>J A Edwards</i>	08-09-95	1430	T B Utecht <i>T B Utecht</i>	08-09-95	1430			
<i>T B Utecht</i>	8-14-95	0920	<i>J A Edwards</i>	8-14-95	0920			

Final Sample Disposition

Comments:

	PNL (only) Checklist	Pick-up / Delivery	Comments:
0	Media labeled and checked?	(Y) N	
0	Letter of instruction?	(Y) N	
0	Media in good condition?	(Y) N	
0	COC info/signatures complete?	(Y) N	
0	Sorbents shipped on ice? (<5°C)	(Y) N	
0	Hi/Lo thermometer - <i>Keep upright!</i>	(Y) N	
0	Hi/Lo thermometer	/ (Y) N	
0	Rad release stickers on samples?	/ (Y) N	
0	Activity report from 222S?	/ (Y) N	
0	COC copy for LRB, RIDS filed?	/ (Y) N	

POC

POC

Cooler Temperature Status
III 15 °C / Lo -15 °C (pick up at PNL to WHC)
III 5 °C / Lo 5 °C (delivery at WHC from PNL)
III °C / Lo °C (at return to PNL from WHC)
III 3 °C / Lo 3 °C (at delivery from WHC to PNL)

(Revised 06/21/95 PNL)