0067911

Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

06-AMCP-0073

DEC 14 2005

Mr. Michael A. Wilson, Program Manager
Nuclear Waste Program
State of Washington
Department of Ecology
3100 Port of Benton Boulevard
Richland, Washington 99354

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EDMC

Dear Mr. Wilson:

BURIAL GROUND SAMPLING AND ANALYSIS RESULTS FOR JULY – SEPTEMBER 2005

The purpose of this letter is to transmit the Burial Ground Sampling and Analysis Results for July – September 2005. Tri-Party Agreement Milestone M-91-40, requirement 2, paragraph 3, requires quarterly reports of results from retrieval burial grounds sampling and analysis plan sampling activities. Since sampling and analysis activities were not conducted as part of the sampling and analysis plan for the 218-W-4C or 218-E 12B Burial Grounds during the July – September 2005 quarter, analysis results for those burial grounds are not included.

Sampling of the 218-W-3A Burial Ground was initiated during the July - September 2005 quarter. As described in the attached report, vapor samples were collected through existing vent risers in trenches T-05 and T-08 and analyzed for volatile organic compounds using field screening instruments. Preliminary action levels are not applicable to these vapor samples because there are no vapor cleanup levels for volatile organic compounds. No contaminant releases to the environment were documented as a result of the vent riser sampling. Results for vapor samples submitted for laboratory analysis are anticipated to be received during the next quarter and should be available for the next quarterly report.

If you have any questions, please contact me, or your staff may contact Mark French, of my staff, on (509) 373-9863.

Sincerely,

Matthew S. McCormick, Assistant Manager
for the Central Plateau

AMCP:GLS

Attachment

cc: See page 2

cc w/attach:
G. Bohnee, NPT
N. Ceto, EPA
L. J. Cusack, Ecology
S. Harris, CTUIR
R. Jim, YN
T. M. Martin, HAB
M. E. Mills, Ecology
K. Niles, ODOE
J. B. Price, Ecology
L. Seelatsee, Wanapum
D. G. Singleton, Ecology
R. R. Skinnarland, Ecology
Administrative Record (M-91)
Environmental Portal

cc w/o attach:
L. D. Crass, FHI
R. D. Morrison, FHI
R. E. Piippo, FHI
V. J. Rohay, FHI
R. T. Wilde, DFSH

BURIAL GROUND SAMPLING AND ANALYSIS RESULTS

FOR

JULY – SEPTEMBER 2005

BURIAL GROUND SAMPLING AND ANALYSIS RESULTS FOR JULY – SEPTEMBER 2005

SUMMARY

Step I of the sampling design in DOE/RL-2004-71, *218-W-3A Burial Ground Sampling and Analysis Plan*, was initiated during the July – September 2005 quarter. Vapor samples were collected through existing vent risers in the sections of trenches T-05 and T-08 containing retrievably stored waste (RSW)[1] and analyzed for volatile organic compounds (VOC) using field-screening instruments. The highest concentrations were detected in the western part of trench T-08. Preliminary action levels are not applicable to these vapor samples. Other than incidental and unavoidable vapor releases to atmosphere associated with sampling at the vent risers, no contaminant releases to the environment were documented as a result of the vent riser vapor sampling.

Results for vapor samples submitted for laboratory analysis are anticipated to be received during the next quarter (October – December 2005) and will be provided in the next quarterly letter report. Based on the sampling design in the sampling and analysis plan for the 218-W-3A Burial Ground (DOE/RL-2004-71), Step II sampling is planned following retrieval of the RSW.

Step I of the sampling design in DOE/RL-2004-32, *218-E-12B Burial Ground Sampling and Analysis Plan*, was completed during the April – June 2005 quarter. No sampling and analysis activities were conducted as part of the sampling and analysis plan for the 218-E-12B Burial Ground during the July – September 2005 quarter. Therefore, there are no analysis results for the 218-E-12B Burial Ground to be provided for this period.

Based on the sampling design in the sampling and analysis plan for the 218-E-12B Burial Ground (DOE/RL-2004-32), Step II sampling is planned following retrieval of the RSW.

Step I of the sampling design in DOE/RL-2003-48, *218-W-4C Burial Ground Sampling and Analysis Plan*, was initiated during the October – December 2003 quarter and completed during the January – March 2004 quarter. No sampling and analysis activities were conducted as part of the sampling and analysis plan for the 218-W-4C Burial Ground during the July – September 2005 quarter. Therefore, there are no analysis results for the 218-W-4C Burial Ground to be provided for this period.

Based on the sampling design in the sampling and analysis plan for the 218-W-4C Burial Ground (DOE/RL-2003-48), Step II sampling is planned following retrieval of the RSW.

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[1] Retrievably stored for purposes of the *Atomic Energy Act of 1954*.

BURIAL GROUND SAMPLING AND ANALYSIS RESULTS FOR JULY – SEPTEMBER 2005

1.0 INTRODUCTION

This quarterly letter report has been prepared in response to *Hanford Federal Facility Agreement and Consent Order* (Tri-Party Agreement) (Ecology et al. 1989) Interim Milestone M-91-40, Requirement 2, paragraph 3. This letter report covers the quarter from July through September 2005.

The sampling and analysis activities summarized in this quarterly letter report were conducted in accordance with DOE/RL-2004-71. Draft A of this sampling and analysis plan (SAP) was submitted to the Washington State Department of Ecology (Ecology) on August 29, 2005.

Vapor sampling at all of the vent risers in the 218-W-3A Burial Ground is required in support of the dispersed carbon tetrachloride vadose zone plume remedial investigation for the 200-PW-1 Operable Unit (OU). The sampling and analysis plan for the 200-PW-1 OU investigation was approved in 2004 (DOE/RL-2001-01, *Plutonium/Organic-Rich Process Condensate/Process Waste Group Operable Unit RI/FS Workplan: Includes the 200-PW-1, 200-PW-3 and 200-PW-6 Operable Units*, Appendix D). Vent riser vapor sampling was conducted in the 218-W-3A Burial Ground in support of the 200-PW-1 OU investigation in August and September 2005. In accordance with an agreement between Ecology and the U.S. Department of Energy, Richland Operations Office (RL), the field-screening results for the vent risers that are in the portions of trenches T-05 and T-08 that contain RSW will be used to meet the data needs for field-screening results in Step I of the 218-W-3A Burial Ground SAP.

The 218-W-3A Burial Ground SAP was developed to determine whether contaminants have been released to the vadose zone from RSW in the 218-W-3A Burial Ground in the 200 West Area of the Hanford Site. In the 218-W-3A Burial Ground, trenches T-9S, T-6S, T-01, T-04, T-05, T-06, T-08, T-10, T-15, T-17, T-23, T-30, T-32, and T-34 contain suspect TRU[2] RSW (Figure 1). Vent risers are present in portions of trenches T-05 and T-08 containing RSW. In these trenches, the RSW typically is contained in 208-L (55-gal) drums. The drums are assumed to be arranged in modules with plywood and a plastic cover over each module. A schematic cross section of a retrievable storage trench containing vent risers is shown in Figure 2.

The 218-W-3A sampling design consists of three steps. Step I is vapor sampling through vent risers in the trenches before waste retrieval. Step II and Step III are conducted following waste retrieval. Step II includes sampling the surface of the trench floor. Step III involves assessing the data collected in Step I and Step II, leading to potential characterization of the substrate soils beneath the trench floor.

The Step I sampling in the 218-W-3A Burial Ground was initiated during the July – September 2005 quarter addressed by this letter report. As specified in the 218-W-3A SAP, the

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[2] Transuranic (waste materials contaminated with 100 nCi/g of transuranic materials having half-lives longer than 20 years).

Step II and Step III sampling to characterize the substrate soils will be conducted when the entire RSW portion of the trench has become accessible and sampling activities will not interfere with waste retrieval operations. The results of the Step I sampling will be used to focus the Step II sampling.

2.0 SAMPLING METHODOLOGY

Nine vent risers are present in portions of trenches T-05 and T-08 containing RSW in the 218-W-3A Burial Ground (Table 1). No vent risers are present in the portions of the other trenches that contain RSW. As stated in the SAP, sampling was limited to the existing vent risers that were accessible without posing health and safety risks to workers. During Step I, vapor samples were collected from all nine of these vent risers.

Two types of vapor samples were collected. At each trench, vapor samples initially were collected from each riser and analyzed using a field-screening instrument. A vapor sample then was collected from the vent riser in that trench that had the highest VOC concentration, based on the field-screening results. This vapor sample was contained in a SUMMA[3] canister for laboratory analysis. A total of 13 vapor samples were collected. Of these, nine samples were collected for field screening and four samples were collected in SUMMA canisters for laboratory analysis. The samples collected in SUMMA canisters include one each from trenches T-05 and T-08, one additional sample from trench T-08, and one duplicate from trench T-08.

Vent riser sampling was initiated on August 25, 2005, and completed on September 8, 2005. The vent risers in trench T-05 were sampled on August 25, 2005, and analyzed using field-screening instruments. The vent risers in trench T-08 were sampled on September 6, 2005, and analyzed using field-screening instruments. The SUMMA canister samples were collected on September 8, 2005.

A sample location number (trench and riser) was established and recorded for each vent riser. The vent risers in each trench were numbered sequentially from west to east.

After removing the vent riser cap, a 15.2-m- (50-ft-) long piece of TYGON[4] tubing was lowered to the bottom of the riser or until refusal. The tubing was 0.64-cm (0.25-in.) inside diameter and 0.95-cm (0.375-in.) outside diameter with a metal filter on the lower end. The tubing was marked at 0.3-m (1-ft) intervals so that depth from the top of the riser to the bottom could be measured. The depth-to-bottom from the top of the riser was typically 5.8 to 6.4 m (19 to 21 ft) (Table 2). The tubing then was pulled back approximately 0.1 m (0.25 ft) to lift the filter off the bottom of the trench. The top of the riser was sealed to prevent intrusion of ambient air during purging and sampling. The vapor sampling method is shown schematically in Figure 2.

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[3] SUMMA is a trademark of Moletrics, Inc., Cleveland, Ohio.

[4] TYGON is a trademark of Norton Performance Plastics Corporation, a Saint-Gobain Company, Akron, Ohio.

The sample tubing was connected to a sampling pump, which was used to pump vapor from the bottom of the vent riser. The sampling pump was operated for 1 to 2 minutes to purge the tubing (purging time was dependent on the sampling pump flow rate). When the sampling pump was operating, the VOC concentrations at the outlet of the pump were monitored using an organic vapor analyzer (OVA). When the VOC concentration readings on the OVA stabilized after purging, or at the discretion of the industrial hygienist and field sampler, the vapor was introduced directly to a Miran SapphIRe Ambient Air Analyzer[5] (Miran analyzer) for field-screening analysis for VOCs. Following sample analysis, the sample tubing was removed from the riser and the cap was replaced.

Following analysis of the vapor samples using the Miran analyzer, the field-screening results were used to determine the locations for collection of vapor samples in SUMMA canisters for laboratory analysis. The sampling methodology was similar to that used for the field-screening samples. Following the 1- to 2-minute purge, the valve on the canister was opened for 5 minutes to allow vapor to flow into the 6 L canister. The SUMMA canisters were transported to the laboratory for analysis.

The locations of the vent risers in the 218-W-3A Burial Ground trenches were surveyed in March 2005. The coordinates were recorded using the local Hanford Site coordinate system. These coordinates later were converted to coordinates using NAVD88, *North American Vertical Datum of 1988*, and the Washington State plane (south zone) in NAD83, *North American Datum of 1983*, with the 1991 adjustment for horizontal coordinates. The survey data will allow the locations of the vent risers to be established following waste (and vent riser) retrieval. The relative locations of the vent risers are shown on Figure 3.

3.0 ANALYTICAL RESULTS

During Step I sampling at the 218-W-3A Burial Ground, vapor samples were collected from inside the engineered trenches through vent risers. Most of the samples were collected near the base of the trench, which is typically approximately 5 m (16 ft) below the engineered surface overlying the trench (Table 2).

The samples were introduced directly to the Miran analyzer. The Miran analyzer identifies up to five compounds with the highest concentrations in the vapor sample from a library of more than 100 VOCs.

The results measured using the Miran analyzer field-screening instrument for samples collected through 218-W-3A Burial Ground vent risers in portions of trenches T-05 and T-08 containing RSW are provided in Table 3.

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[5] MIRAN and the SapphIRe Ambient Air Analyzer are registered trademarks of Thermo Electron Corporation, Franklin, Massachusetts.

The Miran analyzer contains factory calibration data for 120 chemical compounds. The calibration data have been confirmed on site using calibration gases for the following eight VOCs: carbon tetrachloride, chloroform, methylene chloride, 1,1,1-trichloroethane (1,1,1-TCA), 1,1,2-trichloroethane (1,1,2-TCA), 1,1-dichloroethane (1,1-DCA), trichloroethylene (TCE), and tetrachloroethylene (PCE). Additionally, on a quarterly basis, the Miran analyzer is checked for instrument response using a closed-loop injection system and ten certified chemical compounds. Results of the instrument response checks indicate that all ten of these compounds show good response (Table 4). Good agreement between the expected concentration and the instrument response indicates that the data generated from these analyses are reliable.

The SUMMA canister samples for laboratory analysis were collected from vent risers T-05-02, T-08-03, and T-08-05 on September 8, 2005. A duplicate SUMMA canister sample was collected from vent riser T-08-05. Vapor samples from vent risers T-05-02 and T-08-03 contained the highest VOC concentrations, based on field screening, in trenches T-05 and T-08, respectively. An additional SUMMA canister sample and the duplicate sample were collected from vent riser T-08-05. The additional and duplicate SUMMA canister samples were collected from a vent riser with slightly lower VOC concentrations to reduce the potential that the highest VOC concentrations would exceed calibration standards and make the duplicate analysis of little value. The results of the SUMMA canister samples were not available by September 30, 2005, and will be included in a subsequent quarterly report.

The maximum concentrations of VOCs detected in each trench are summarized in Table 1. For each of these VOCs, the highest concentration was detected in the western part of trench T-08 (Table 3).

4.0 QUALITY CONTROL

For vent riser vapor samples introduced directly into the Miran analyzer, field quality control consisted of duplicate samples. For vent riser vapor samples collected in SUMMA canisters, field quality control consisted of duplicate samples and equipment blank samples.

For vent riser vapor samples drawn directly into the Miran analyzer, one duplicate sample was analyzed on each day of sampling. As a result, one field duplicate was analyzed for every 20 samples, as required. Duplicate samples in areas of RSW were collected on August 25 at vent riser T-05-02 and on September 6 at vent riser T-08-01 (Table 3). The duplicate samples were collected to evaluate the performance of the analytical method by comparing two analyses of the vapor concentration. Of the two sample/duplicate pairs analyzed using the Miran analyzer in areas of RSW, the pair from August 25 had three detectable VOCs in both the sample and the duplicate. The September 6 pair had four detected VOCs in the duplicate, of which three were also detected in the sample.

The relative percent difference (RPD) was calculated for the pairs of VOC results according to the formula:

$$RPD = \frac{(C_1 - C_2)x100}{(C_1 + C_2)/2}$$

where

C_1 = the larger of the two observed values

C_2 = the smaller of the two observed values.

For the three detections in the sample/duplicate pair from vent riser T-05-02, the RPD ranged from 2 to 33 percent. With the exception of the one VOC pair with an RPD of 33 percent, these data met the required precision of 25 percent. The RPD was calculated for two of the three VOC detections in the sample/duplicate pair from vent riser T-08-01. In this sample/duplicate pair, the RPD was not calculated for the VOC that was detected at concentrations that were less than five times the method detection limit. The required precision of 25 percent applies only to VOC detections that are greater than five times the method detection limit. The RPD calculated for the two VOC detections in the sample/duplicate pair ranged from 84 to 89 percent. These data did not meet the required precision of 25 percent. However, the positive detection of a compound still indicates that it is present in the sample. As a result, the Miran analyzer data still can be used to guide the Step II sampling, which was the basis for the Step I sampling in the sampling design.

The calculations for vent riser T-08-01 potentially indicate that the Miran analyzer analytical method did not produce repeatable measurements. However, another explanation may be that the concentration of VOCs in the vapor changed during pumping of the samples. The VOC concentrations in the original sample from vent riser T-08-01 were lower than the concentrations in the duplicate sample. While the original sample is being analyzed, the sample pump continues to run, but the flow is bypassed around the sample cell in the Miran analyzer. When the analysis of the original sample is complete, the sampling cell bypass is removed, the sampling cell is purged with sample vapor, and then filled with the next sample. This second sample is then analyzed as the duplicate. Vent riser T-08-01 was still being pumped during the 4 to 5 minutes it took to analyze the original sample. This continued pumping could have drawn higher concentration vapors from a contamination zone located further from vent riser T-08-01.

For the vent riser vapor samples collected in SUMMA canisters, one duplicate sample was collected from vent riser T-08-05 in a separate SUMMA canister. Results are not yet available.

The purpose of collecting equipment blanks is to verify the adequacy of sampling equipment decontamination procedures. The SUMMA canisters are analyzed for cleanliness at the laboratory.

As discussed above, an instrument response check is conducted quarterly using the Miran analyzer. The concentration of each chemical compound measured during the response check is

provided in Table 4. The pairs of standard and measured VOC concentrations were used to evaluate the accuracy of the analyses conducted using the Miran analyzer. The percent recovery (%R) was calculated according to the formula:

$$\%R = 100x(C_m / C_s)$$

where

C_m = the measured concentration

C_s = is the standard.

The maximum %R was 122 percent and the minimum was 75 percent. These calculations indicate that the analyses of the VOC concentrations using the Miran analyzer were accurate within 25 percent, as required. These results indicate good recovery.

A blank sample consisting of ambient atmosphere was analyzed each day using the Miran analyzer. No VOCs were detected in the blanks (Table 5).

No holding times were exceeded during collection and field screening of vent riser vapor samples.

Formal data validation was not performed on these field-screening analytical results. For field-screening data, the data were reviewed to ensure that they are usable.

5.0 HEALTH AND SAFETY MONITORING AND RADIOLOGICAL FIELD SCREENING

Health and safety monitoring was conducted by industrial hygienists during the Step I sampling activities at the 218-W-3A Burial Ground. Before they removed the cap from each vent riser, the industrial hygienists conducted screening for VOCs using an OVA and for combustible gases. (NOTE: Combustible gases were monitored to test the environment for intrinsic safeness for equipment selection and breathing zone exposure.) The OVA included an 11.8 eV lamp and was calibrated for carbon tetrachloride. The lamp will ionize and measure compounds with lower ionization potentials, such as carbon tetrachloride (ionization potential of 11.47 eV). However, the total concentration measured may include other VOCs with ionization potentials equal to or less than 11.8 eV. The industrial hygienists surveyed for VOCs again at the top of the riser following removal of the vent riser cap. VOC concentrations were detected at three vent risers using the OVA (Table 2). The radiological control technician then surveyed for radiological contamination. After each riser was surveyed and monitored for entry, a vapor sample was collected for analysis. During the sampling activities, the industrial hygienists performed continuous monitoring in the breathing zone and point source for VOCs. Controls put in place to prevent exposure included restricted access to limit personnel entry to only those designated to

perform the work. A vapor and gas barrier was placed at the top of the vent riser to prevent bypass during vapor sampling.

After the vent riser sample was collected, the radiological control technician wiped the tubing and filter with a cloth as it was retrieved to monitor for potential radiological contamination. Radiological field screening detected no radiological contamination at the vent risers in the 218-W-3A Burial Ground.

6.0 COMPARISON TO REGULATORY REQUIREMENTS

As determined through the data quality objectives process, preliminary action levels are not applicable to VOC vapor samples.

7.0 DOCUMENTED CONTAMINANT RELEASES TO THE ENVIRONMENT

Other than incidental and unavoidable vapor releases to atmosphere associated with sampling at the vent risers, no contaminant releases to the environment were documented as a result of the vent riser vapor sampling. The vent riser vapor samples were collected from within the engineered trench. The Step II and Step III characterization of the trench floor and vadose zone is designed to evaluate whether contaminants within the engineered trench were released to the environment.

8.0 PLANNED AND/OR SCHEDULED ADDITIONAL WORK

The fieldwork associated with the Step I sampling at the 218-W-3A Burial Ground was completed during this quarter (July – September 2005). The analytical results of the SUMMA canister samples are anticipated to be provided during the next quarter (October – December 2005). These results will be evaluated and reported in the next quarterly report.

Based on the sampling design in the 218-W-3A Burial Ground SAP (DOE/RL-2004-71), Step II sampling is planned following completion of Step I sampling and retrieval of the RSW. The Step II characterization will be scheduled when the entire RSW portion of the trench has become accessible and sampling will not interfere with waste retrieval operations.

Based on the sampling design in the 218-E-12B Burial Ground SAP (DOE/RL-2004-32), Step II sampling is planned following completion of Step I sampling and retrieval of the RSW. The Step II characterization will be scheduled when the entire RSW portion of the trench has become accessible and sampling will not interfere with waste retrieval operations.

Based on the sampling design in the 218-W-4C Burial Ground SAP (DOE/RL-2003-48), Step II sampling is planned following completion of Step I sampling and retrieval of the RSW. The Step II characterization will be scheduled when the asphalt pad in an entire trench has become accessible and sampling will not interfere with waste retrieval operations.

9.0 REFERENCES

Atomic Energy Act of 1954, 42 USC 2011, et seq.

DOE/RL-2001-01, 2004, *Plutonium/Organic-Rich Process Condensate/Process Waste Group Operable Unit RI/FS Workplan: Includes the 200-PW-1, 200-PW-3 and 200-PW-6 Operable Units*, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE/RL-2003-48, 2003, *218-W-4C Burial Ground Sampling and Analysis Plan*, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE/RL-2004-32, 2005, *218-E-12B Burial Ground Sampling and Analysis Plan*, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE/RL-2004-71, 2005, *218-W-3A Burial Ground Sampling and Analysis Plan*, Draft A, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

Ecology, EPA, and DOE, 1989, *Hanford Federal Facility Agreement and Consent Order*, 2 vols., Washington State Department of Ecology, U.S. Environmental Protection Agency, and U.S. Department of Energy, Olympia, Washington, as amended.

NAD83, 1991, *North American Datum of 1983*, National Geodetic Survey, Federal Geodetic Control Committee, Silver Spring, Maryland.

NAVD88, 1988, *North American Vertical Datum of 1988*, National Geodetic Survey, Federal Geodetic Control Committee, Silver Spring, Maryland.

Figure 1. Locations of Retrievably Stored Waste Trenches at the 218-W-3A Burial Ground.

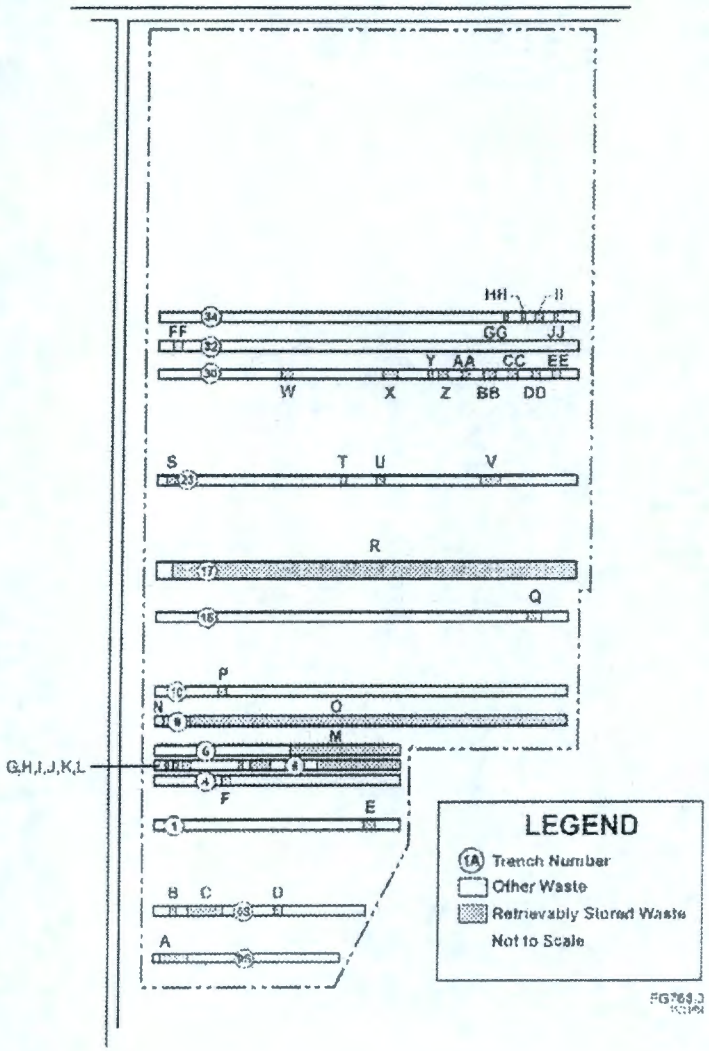

Figure 2. Schematic View of 218-W-3A Burial Ground Trench and Vent Riser Sampling Method.

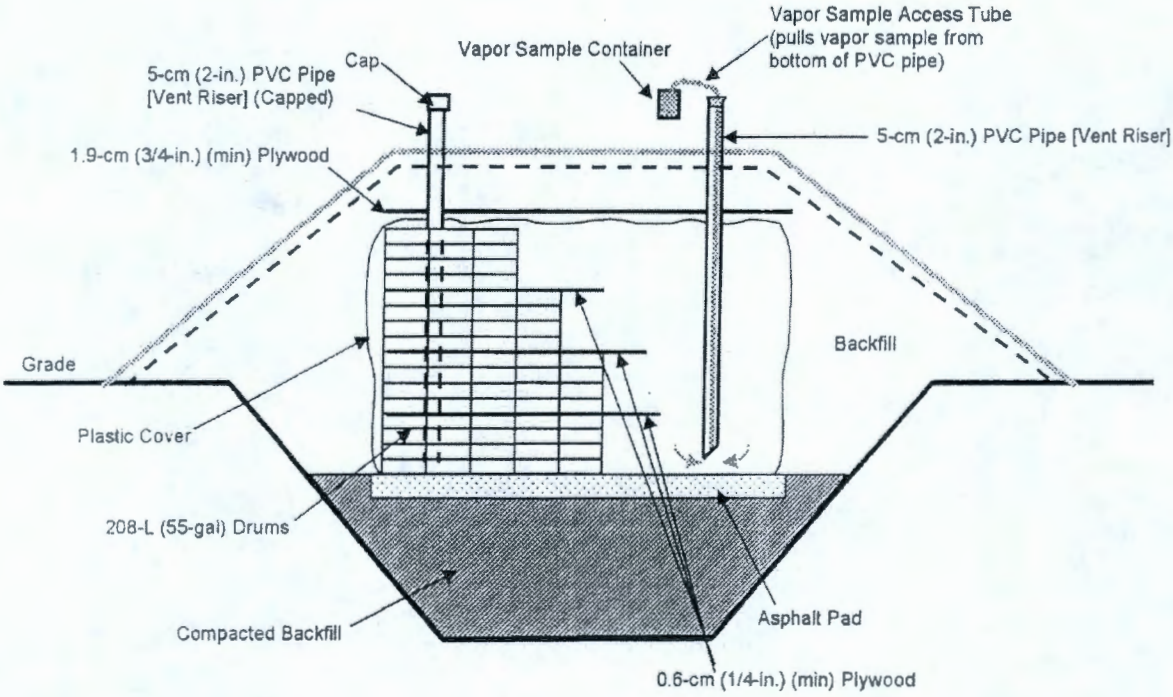

Figure 3. Locations of Vent Risers in 218-W-3A Burial Ground Trenches Containing Retrievably Stored Waste.

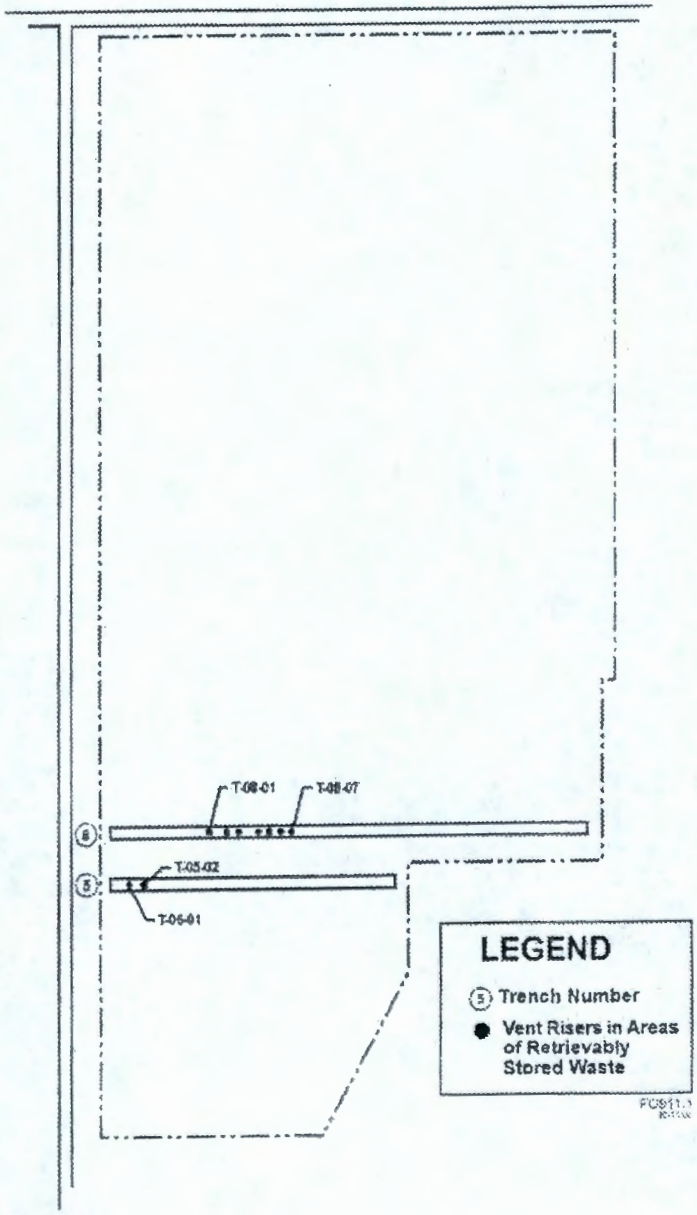

Table 1. Summary of 218-W-3A Burial Ground Step I Sampling.

Trench	# of Vent Risers	# of Vent Risers Sampled for Field Screening	# of SUMMA Canister Samples Collected*	Maximum Concentrations in Vent Riser Samples, Based on Field Screening							
				PCE (ppmv)	1,1,1-TCA (ppmv)	CCl_4 (ppmv)	Methyl Chloride (ppmv)	TCE (ppmv)	Acetylene (ppmv)	Nitrous Oxide (ppmv)	Carbon Dioxide (ppmv)
				CAS # 127-18-4	CAS # 71-55-6	CAS # 56-23-5	CAS # 74-87-3	CAS # 79-01-6	CAS # 74-86-2	CAS # 10024-97-2	CAS # 124-38-9
T-05	2	2	1	<2	11	<0.05	<1.7	<4	70	<0.04	3,055
T-08	7	7	3	460	19	36	186	13	<0.5	19	5,300

*A SUMMA canister sample was collected from the vent riser with the highest VOC concentrations, based on field screening, in trenches T-05 and T-08 (vent risers T-05-02 and T-08-03, respectively). A second SUMMA canister sample was collected in trench T-08 from a vent riser with slightly lower VOC concentrations (vent riser T-08-05). The duplicate SUMMA canister sample was collected from this vent riser (T-08-05) to reduce the potential that the PCE concentrations would exceed calibration standards and make the duplicate analysis of little value.

CAS = Chemical Abstracts Service.
CCl_4 = carbon tetrachloride.
PCE = tetrachloroethylene.
ppmv = parts per million by volume.
TCA = trichloroethane.
TCE = trichloroethylene.
VOC = volatile organic compound.

Table 2. Field Measurements for Samples Collected Through Vent Risers in the 218-W-3A Burial Ground Trenches.

Sample Identifier	Sample Depth[a]		VOC Concentration[b] (ppmv)	HEIS Number	Sample and Analysis Date	Sample and Analysis Time
	Below Top of Riser (m)	Below Surface (m)				
T-05-1	3.0	1.7	<1.0	B1DVL6	08/25/05	0950
T-05-2	5.8	5.0	<1.0	B1DVL7	08/25/05	1042
T-05-2 duplicate	5.8	5.0	<1.0	B1DVN5	08/25/05	1048
T-08-1	6.1	5.3	<1.0	B1DVM6	09/06/05	1005
T-08-1 duplicate	6.1	5.3	<1.0	B1DVN4	09/06/05	1012
T-08-2	6.1	5.4	<1.0	B1DVM7	09/06/05	1050
T-08-3	6.4	5.1	36	B1DVM8	09/06/05	1120
T-08-4	1.1	0.0	7	B1DVM9	09/06/05	1220
T-08-5	5.4	4.8	5	B1DVN0	09/06/05	1320
T-08-6	6.4	5.2	<1.0	B1DVN1	09/06/05	1345
T-08-7	6.4	3.7	<1.0	B1DVN2	09/06/05	1415

[a]Depths are approximate; all risers are assumed to be vertical.
[b]Measured at top of vent riser using organic vapor analyzer.

HEIS = *Hanford Environmental Information System*.
ppmv = parts per million by volume.
VOC = volatile organic compound.

Table 3. Field-Screening Results for Samples Collected Through Vent Risers in the 218-W-3A Burial Ground Trenches.

Sample Identifier	HEIS Number	Sample Date	Sample Time	Miran SapphIRe Ambient Air Analyzer*							
				PCE (ppmv)	1,1,1-TCA (ppmv)	CCl_4 (ppmv)	Methyl Chloride (ppmv)	TCE (ppmv)	Acetylene (ppmv)	Nitrous Oxide (ppmv)	Carbon Dioxide (ppmv)
				CAS # 127-18-4	CAS # 71-55-6	CAS # 56-23-5	CAS # 74-87-3	CAS # 79-01-6	CAS # 74-86-2	CAS # 10024-97-2	CAS # 124-38-9
T-05-1	B1DVL6	08/25/05	0950	<2	<0.15	<0.05	<1.7	<4	<0.5	<0.04	<1
T-05-2	B1DVL7	08/25/05	1042	<2	9	<0.05	<1.7	<4	70	<0.04	3,055
T-05-2 duplicate	B1DVN5	08/25/05	1048	<2	11	<0.05	<1.7	<4	50	<0.04	2,985
T-08-1	B1DVM6	09/06/05	1005	20	<0.15	<0.05	<1.7	3	<0.5	<0.04	1,200
T-08-1 duplicate	B1DVN4	09/06/05	1012	52	18.8	<0.05	<1.7	13	<0.5	<0.04	2,950
T-08-2	B1DVM7	09/06/05	1050	240	14	<0.05	<1.7	<4	<0.5	<0.04	2,800
T-08-3	B1DVM8	09/06/05	1120	460	<0.15	36	186	<4	<0.5	<0.04	<1
T-08-4	B1DVM9	09/06/05	1220	328	<0.15	7	<1.7	<4	<0.5	<0.04	<1
T-08-5	B1DVN0	09/06/05	1320	305	<0.15	5	<1.7	<4	<0.5	<0.04	1,000
T-08-6	B1DVN1	09/06/05	1345	153	<0.15	<0.05	<1.7	<4	<0.5	19	5,300
T-08-7	B1DVN2	09/06/05	1415	96	<0.15	<0.05	<1.7	<4	<0.5	<0.04	<1

*The Miran SapphIRe Ambient Air Analyzer identifies up to 5 compounds with the highest concentrations in the vapor sample.

CAS = Chemical Abstracts Service.
CCl_4 = carbon tetrachloride.
HEIS = *Hanford Environmental Information System.*
PCE = tetrachloroethylene.
ppmv = parts per million by volume.
TCA = trichloroethane.
TCE = trichloroethylene.

Table 4. Field-Screening Results for Calibration Standards.

Analysis Type	HEIS Number	Analysis Date	Analysis Time	Miran SapphIRe Ambient Air Analyzer									
				DCM (ppmv)	1,1-DCA (ppmv)	TCM (ppmv)	1,1,1-TCA (ppmv)	CCl_4 (ppmv)	TCE (ppmv)	1,1,2-TCA (ppmv)	PCE (ppmv)	Methane (ppmv)	CO_2 (ppmv)
Calibration Standard	NA	NA	NA	1.0	1.4	1.37	4.4	0.57	4	0.59	0.53	51	105.1
Calibration Check	B1D9R2	06/03/05	0900	0.8	1.5	1.40	4.5	0.65	4	0.64	0.4	62	105.0
% Recovery	NA	NA	NA	80	107	102	102	114	100	108	75	122	100

CCl_4 = carbon tetrachloride.
CO_2 = carbon dioxide.
DCA = dichloroethane.
DCM = dichloromethane (methylene chloride).
HEIS = *Hanford Environmental Information System*.
NA = not applicable.
ppmv = parts per million by volume.
PCE = tetrachloroethylene.
TCA = trichloroethane.
TCE = trichloroethylene.
TCM = trichloromethane (chloroform).

Table 5. Field-Screening Results for Blank Samples.

Analysis Type	HEIS Number	Analysis Date	Analysis Time	Miran SapphIRe Ambient Air Analyzer									
				DCM (ppmv)	1,1-DCA (ppmv)	TCM (ppmv)	1,1,1-TCA (ppmv)	CCl_4 (ppmv)	TCE (ppmv)	1,1,2 TCA (ppmv)	PCE (ppmv)	Methane (ppmv)	CO_2* (ppmv)
Ambient Air	NA	08/25/05	1346	<0.44	<0.22	<0.07	<0.15	<0.09	<1.2	<0.07	<0.16	0.0	0.0
Ambient Air	NA	09/06/05	1019	<0.44	<0.22	<0.07	<0.15	<0.09	<1.2	<0.07	<0.16	0.0	0.0

*CO_2 levels are baselined to zero at ambient atmospheric conditions of 360 ppmv. Values shown are CO_2 concentrations above ambient.

CCl_4 = carbon tetrachloride.
CO_2 = carbon dioxide.
DCA = dichloroethane.
DCM = dichloromethane (methylene chloride).
HEIS = *Hanford Environmental Information System*.
NA = not applicable.
ppmv = parts per million by volume.
PCE = tetrachloroethylene.
TCA = trichloroethane.
TCE = trichloroethylene.
TCM = trichloromethane (chloroform).