

This document was too large to scan as a whole document, therefore it required breaking into smaller sections.

Document number: SD-WM-DP-053

Section 1 of 4

Title: Data Validation Report for
242A Evaporator Analytical
Services Project FY93 Tank 241API07
[Addendum 2A]

Date: 01/28/1994 Revision: A000

Originator: Miller GL
Co: WHC

Recipient: _____
Co: _____

References: EDT-140729

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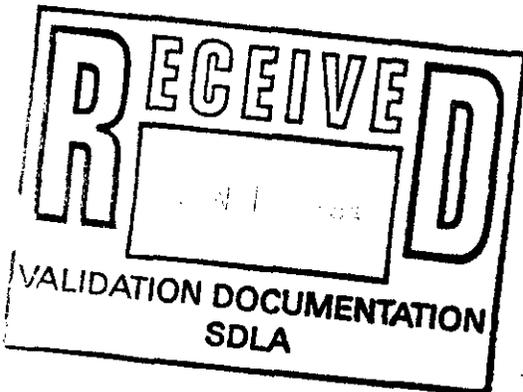
WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0

DATA VALIDATION REPORT
for
242-A EVAPORATOR ANALYTICAL SERVICES
PROJECT FY93
TANK 241-AP-107

SDG 9308651-PNL-104

Westinghouse Hanford Company
P.O. Box 1970
Richland, Washington 99352

January 10, 1994



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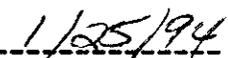
This document has under gone two or three pagination processes. Two are from WHC, one is from PNL and one is from HASM.

The different formats are identified as follows:

- | | Number Series |
|----|--|
| 1) | WHC 1, 2, 3 etc |
| 2) | WHC 1A-1, 1A-2, etc (for 222-S & PNL Addendums to original Document) |
| 3) | HASM 000006, 000007 etc |
| 4) | PNL B01-001, B02-002 etc |



Lola R. Webb
Records Management Specialist



Date

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WHC-SD-WM-DP-053
ADDENDUM *2A* REV. 0

TABLE OF CONTENTS

Data Validation Report	1
Contributors List	2
Certification Statement	3
Introduction	4
Data Summary	7
Validation Narrative	61
Data Assessment Forms	67
Chains of Custody	92
Supplemental Information	106
Data Package Report	115
Introduction	116
Appendices:	
Appendix A: Test Instructions	119
A1 - Test Instructions	121
Appendix B: Chains of Custody	152
B1-WHC Chain of Custody and PNL Sample Receipt forms	154
B2-PNL Chain of Custody Forms	165
Appendix C: Sample Verifications	156
C1-Appearance Test	169
Appendix D: Organic Analysis Primary Data	178
D1-Laboratory Analyst Signature List	180
D2-Total Organic Carbon Analysis	182
D3-Volatile Organic Analysis	196
D4 Semi-Volatile	535

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**DATA VALIDATION REPORT FOR
242-A EVAPORATOR ANALYTICAL SERVICES
PROJECT FY93 TANK 242-AP-107**

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ADDENDUM 2A REV. 0

Contributors List

PROJECT MANAGEMENT OFFICE

TY Hosaka, Project Manager
KJ Kuhl-Klinger, Project Manager/Quality Control Officer
TL Almeida, Quality Engineer
TG Walker, Quality Engineer
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KM Hilty, Senior Clerk
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RT Steele, Group Leader
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CE Chamberlin, Technician
JK Rau, Technician

ANALYTICAL LABORATORY OPERATIONS

SA Schubert, Manager

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CERTIFICATION STATEMENT

I certify that this data package has met the terms and conditions of TPP 21129. Release of the data contained in this hard copy data package has been authorized by the Project Manager, as verified by the following signature.

T. Y. Hosaka
T. Y. Hosaka
Project Manager
Analytical Laboratory Operations

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Date

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Evaporator 107AP Data Package
Summary Narrative
Revision 0
December, 1993

1.0 INTRODUCTION

This case narrative provides a summary of each of the analyses conducted on Tank 107AP by the Pacific Northwest Laboratory (PNL)¹, Analytical Chemistry Laboratory (ACL) under the Evaporator Characterization Project (PNL Project Number 21129). This narrative is divided into the following sections:

- 1.0 Introduction
- 2.0 Background
- 3.0 Analytical Summary

2.0 BACKGROUND

The following seven samples from Tank 107AP were delivered to the PNL, ACL for Volatile Organic Analysis (VOA), Semi-Volatile Organic Analysis (SVOA), and Total Organic Carbon (TOC) analysis:

<u>Customer ID</u>	<u>ACL-ID</u>
R3620	93-08651
R3622	93-08552
R3624	93-08553
R3626	93-08554
R3628	93-08655
R3629	93-08656 (TOC and Appearance Only)
R3631	93-08657

An ACL number was assigned to each sample upon receipt. The ACL number is used to cross-reference the Customer ID throughout this data package. Each of the requested analyses was successfully accomplished and reported in the data package, enclosed herewith. No major problems occurred during analysis, minor problems are documented in the narrative for each respective analysis.

3.0 ANALYTICAL SUMMARY

Volatile Organic Analysis (VOA) - Each sample listed in Section 2.0 was aliquoted and analyzed directly for VOA by procedure PNL-ALO-335 (GC/MS Analysis of Volatile Organic Compounds). All analyses were completed within the 14 day holding time (based on sample receipt). No major problems were noted during analysis/data review. A detailed report is found in the data package.

Semi-Volatile Organic Analysis - A 10 ml sample was extracted for SVOA. The samples were extracted following procedure PNL-ALO-120 (a single pH extraction was used). No major problems were noted during analysis/data review. A detailed report is found in the data package.

Total Organic Carbon (TOC) - A TOC determination was completed on each sample (as received). The TOC result is calculated/reported as the difference

¹Pacific Northwest Laboratory is operated for the U.S. Department of Energy by Battelle Memorial Institute under Contract DE-AC06-76 RLO 1830.

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Evaporator 107AP Data Package
Summary Narrative
Revision 0
December, 1993

between the Total Carbon (TC) and Total Inorganic Carbon (TIC) as determined by procedure PNL-ALO-381. One minor problem was noted during data review of the TOC results. It was found that the matrix spike recovery was calculated using an incorrect formula. The formula used to calculate the reported matrix spike recoveries is listed below:

$$\text{Spike Recovery} = \frac{\text{Matrix Spike Result}}{\text{Sample Result} + \text{Spike Amount}}$$

The spike results have been recalculated using the following formula, and some were found to be above the acceptance criteria limit; however, there is no impact on the quality of the data as reported. A detailed report of the TOC results is found in the data package.

$$\text{Spike Recovery} = \frac{\text{Matrix Spike Result} - \text{Sample Result}}{\text{Spike Amount}}$$

A summary of all analytical results generated for Tank 107AP can be found in Table 1.0.

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DATA SUMMARY

FOR

241-AP-107

PACIFIC NORTHWEST LABORATORY

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ORGANIC COMPOUND ANALYSIS REPORT
VOLATILE COMPOUNDS

SAMPLE ANALYSIS REPORTED

Analysis of six water samples for volatile organic compounds by gas chromatography/mass spectrometry (GC/MS) is the subject of this report.

SAMPLE DESCRIPTION

<u>Sample ID</u>	<u>ACL Lab Number</u>
R3620	93-08651
R3622	93-08652
R3624	93-08653
R3626	93-08654
R3628	93-08655
R3631	93-08657

The samples 93-08651, 93-08652, 93-08653, 93-08654 and 93-08655 and 93-08657 were received at ambient temperature with headspace present by the Organics Group on 08/03/93. The samples were refrigerated upon receipt. These samples are part of the 107AP sample delivery group.

SAMPLE PREPARATION

A 0.1mL aliquot of the sample water was combined with 4.9mL of blank lab water in a heated purge vessel attached to a Tekmar Liquid Sample Concentrator. The overall dilution for the samples was 50.

The analysis followed EPA-CLP SOW 2/88 procedures for analysis of volatile compounds (with exceptions noted in ADR #GAR121393) with a heated purge option for better recoveries. Additional Compounds, Tetrahydrofuran, Isopropylbenzene, 1,2,3-Trimethylbenzene, 1,2,4-Trimethylbenzene, and 1,3,5-Trimethylbenzene, were analyzed for beyond SOW requirements.

ANALYSIS METHOD

- GC/MS procedure: PNL-ALO-335 with ADR GAR121393.
- GC/MS instrumentation: HP-5890/5970 GC/MS (WB46864).
- GC/MS location: Lab 327A, 325 building.
- UNIX computer location: Lab 325, 325 building.

QUALITY CONTROL

Quality control procedures specified for this method were followed. These forms, or the equivalent due to additional non-CLP target compounds are all included in this report, the quality assurance performance requirements are summarized as follows:

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<u>Form Information</u>	<u>Comments</u>
2A Surrogate Recovery	Meets all requirements.
3A MS/MSD Recovery	Meets all requirements. Arbitrary limits were used for the additional compounds.
4A Method Blank Summary	Meets all requirements.
5A Tune/Mass Calibration	Meets all requirements.
6A Initial Calibration	5 point calibration. Meets all requirements.
7A Daily Calibration	Meets all requirements.
8A Internal Standards	Meets all requirements.

Deviations from protocol requirements are as follows:

- Holding time requirement was not met.
- The samples were received at room temperature with headspace present.

DATA

The data and calibration are archived on magnetic tape in the 325 building, 327-A laboratory. The following is the list of pertinent files:

<u>File Name</u>	<u>Sample Number</u>	<u>Sample Analyzed</u>
>VB301		Mass Calibration/Tune Check
>VB3B2		Continuing Calibration
>VB303	METHOD BLANK	METHOD BLANK
>VB504	PREP BLANK	PREP BLANK (with SDG 101AP)
>VB304	93-08651	R3620
>VB305	93-08651D	R3620D
>VB306	93-08652	R3622
>VB307	93-08652D	R3622D
>VB308	93-08653	R3624
>VB309	93-08653D	R3624D
>VB310	93-08654	R3626
>VB311	93-08654D	R3626D
>VB312	93-08657	R3631
>VB313	93-08657D	R3631D
>VB314	93-08655	R3628
>VB315	93-08655D	R3628D
>VB316	93-08655MS	R3628MS
>VB317	93-08655MSD	R3628MSD

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WHC-SD-WM-DP-053
ADDENDUM *2A* REV. 0

Lab data are also maintained as follows:

<u>Activity</u>	<u>LRB Number</u>	<u>Page Number</u>
GC/MS injection log	BNW-52907	138-139

RESULTS

CLP Target Compounds: The attached 1A equivalent forms show that no Target compounds were observed in the BLANK. No CLP target compounds were observed in the Prep Blank. Toluene was observed in samples 93-08651, 93-08651D, 93-08652, 93-08652D, 93-08653, 93-08653D, 93-08654, 93-08654D, 93-08655, 93-08655D, 93-08657, and 93-08657D. However, it was below the CRQL in these samples.

In summary, no volatile CLP target compounds were observed above the CRQL in any of the samples in this SDG 107AP.

The following defines the qualifiers, Q-flags, in the Form 1's:

<u>"Q" Flag</u>	<u>Definition</u>
U	Indicates the compound was analyzed for but not detected, the U-flagged concentration number is the CRQL.
J	Indicates an estimated value for the target or tentatively identified compounds, spectra meet criteria but response is below the CRQL for the target compounds.
B	Compound was found in the blank.
X	Indicates compound was manually deleted because all requirements were not met.
D	Analysis was performed on a diluted sample.
E	Indicates that Quantitation was outside the calibration range.

Tentatively Identified Compounds: No non-EPA Target Compounds were observed in the BLANK, or the samples in this report.

ANALYST *[Signature]* DATE 12-1-93 REVIEW *[Signature]* DATE 12-2-93

FILE: C:\ROSS\REPORTS\V9308651.VAP

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ADDENDUM *2A* REV. 0
 VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

R3620

Lab Name: Battelle PNL Contract: _____
 Lab Code: PNL Case No.: _____ SAS No.: _____ SDG No.: 107AP
 Matrix: (soil/water) WATER Lab Sample ID: 93-08651
 Sample wt/vol: 0.1 (g/mL) ML Lab File ID: DVB304.D
 Level: (low/med) LOW Date Received: 08/03/93
 † Moisture: not dec. _____ Data Analyzed: 10/13/93
 GC Column: DB-624 ID: 0.54 (mm) Dilution Factor: 1.0
 Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	500	U
74-83-9	Bromomethane	500	U
75-01-4	Vinyl Chloride	500	U
75-00-3	Chloroethane	500	U
75-09-2	Methylene Chloride	250	U
67-64-1	Acetone	500	U
75-15-0	Carbon Disulfide	250	U
75-35-4	1,1-Dichloroethene	250	U
75-34-3	1,1-Dichloroethane	250	U
540-59-0	trans-1,2-Dichloroethene	250	U
540-59-0	cis-1,2-Dichloroethene	250	U
67-66-3	Chloroform	250	U
107-02-2	1,2-Dichloroethane	250	U
78-93-3	2-Butanone	500	U
71-55-6	1,1,1-Trichloroethane	250	U
56-23-5	Carbon Tetrachloride	250	U
108-05-4	Vinyl Acetate	500	U
75-27-4	Bromodichloromethane	250	U
78-87-5	1,2-Dichloropropane	250	U
10061-01-5	cis-1,3-Dichloropropene	250	U
79-01-6	Trichloroethene	250	U
124-48-1	Dibromochloromethane	250	U
79-00-5	1,1,2-Trichloroethane	250	U
71-43-2	Benzene	250	U
10061-02-6	trans-1,3-Dichloropropene	250	U
75-25-2	Bromoform	250	U
108-10-1	4-Methyl-2-Pentanone	500	U
591-78-6	2-Hexanone	500	U
127-18-4	Tetrachloroethene	250	U
79-34-5	1,1,2,2-Tetrachloroethane	250	U
108-88-3	Toluene	130	U
108-90-7	Chlorobenzene	250	U
100-41-4	Ethylbenzene	250	U

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 VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

R3620

Lab Name: Battelle PNL Contract: _____
 Lab Code: PNL Case No.: _____ SAS No.: _____ SDG No.: 107AP
 Matrix: (soil/water) WATER Lab Sample ID: 93-08651
 Sample wt/vol: 0.1 (g/mL) ML Lab File ID: DVB304.D
 Level: (Low/med) LOW Date Received: 08/03/93
 % Moisture: not dec. _____ Data Analyzed: 10/13/93
 GC Column: DB-624 ID: 0.54 (mm) Dilution Factor: 1.0
 Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CAS NO. COMPOUND CONCENTRATION UNITS:
 (ug/L or ug/Kg) UG/L Q

100-42-5-----	Styrene	250	U
133-02-7-----	m,p-Xylene	250	U
133-02-7-----	o-Xylene	250	U
98-82-8-----	Isopropylbenzene	250	U
108-67-8-----	1,3,5-Trimethylbenzene	250	U
95-63-6-----	1,2,4-Trimethylbenzene	250	U
109-99-9-----	Tetrahydrofuran	500	U
526-73-8-----	1,2,3-Trimethylbenzene	500	U

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 VOLATILE ORGANICS ANALYSIS DATA SHEET
 TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

R3620

Lab Name: Battelle PNL Contract:
 Lab Code: PNL Case No.: SAS No.: SDG No.: 107AP
 Matrix: (soil/water) WATER Lab Sample ID: 93-08651
 Sample wt/vol: 0.1 (g/mL) ML Lab File ID: DVB304.D
 Level: (low/med) LOW Date Received: 08/03/93
 % Moisture: not dec. Data Analyzed: 10/13/93
 GC Column: DB-624 ID: 0.54 (mm) Dilution Factor: 1.0
 Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs found: 0

CONCENTRATION UNITS:
 (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

R3622

Lab Name: Battelle PNL Contract: _____
 Lab Code: PNL Case No.: _____ SAS No.: _____ SDG No.: 107AP
 Matrix: (soil/water) WATER Lab Sample ID: 93-08652
 Sample wt/vol: 0.1 (g/mL) ML Lab File ID: DVB306.D
 Level: (low/med) LOW Date Received: 08/03/93
 % Moisture: not dec. _____ Data Analyzed: 10/13/93
 GC Column: DB-624 ID: 0.54 (mm) Dilution Factor: 1.0
 Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-42-5	Styrene	250	U
133-02-7	m,p-Xylene	250	U
133-02-7	o-Xylene	250	U
98-82-8	Isopropylbenzene	250	U
108-67-8	1,3,5-Trimethylbenzene	250	U
95-63-6	1,2,4-Trimethylbenzene	250	U
109-99-9	Tetrahydrofuran	500	U
526-73-8	1,2,3-Trimethylbenzene	500	U

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

R3622

Lab Name: Battelle PNL Contract: _____
 Lab Code: PNL Case No.: _____ SAS No.: _____ SDG No.: 107AP
 Matrix: (soil/water) WATER Lab Sample ID: 93-08652
 Sample wt/vol: 0.1 (g/mL) ML Lab File ID: DVB306.D
 Level: (low/med) LOW Date Received: 08/03/93
 † Moisture: not dec. _____ Data Analyzed: 10/13/93
 GC Column: DB-624 ID: 0.54 (mm) Dilution Factor: 1.0
 Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 0 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

R3624

Lab Name: Battelle PNL Contract: _____
 Lab Code: PNL Case No.: _____ SAS No.: _____ SDG No.: 107AF
 Matrix: (soil/water) WATER Lab Sample ID: 93-08653
 Sample wt/vol: 0.1 (g/mL) ML Lab File ID: DVB308.D
 Level: (low/med) LOW Date Received: 08/03/93
 † Moisture: not dec. _____ Data Analyzed: 10/13/93
 GC Column: DB-624 ID: 0.54 (mm) Dilution Factor: 1.0
 Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

74-87-3	Chloromethane	500	U
74-83-9	Bromomethane	500	U
75-01-4	Vinyl Chloride	500	U
75-00-3	Chloroethane	500	U
75-09-2	Methylene Chloride	250	U
67-64-1	Acetone	500	U
75-15-0	Carbon Disulfide	250	U
75-35-4	1,1-Dichloroethene	250	U
75-34-3	1,1-Dichloroethane	250	U
540-59-0	trans-1,2-Dichloroethene	250	U
540-59-0	cis-1,2-Dichloroethene	250	U
67-66-3	Chloroform	250	U
107-02-2	1,2-Dichloroethane	250	U
78-93-3	2-Butanone	500	U
71-55-6	1,1,1-Trichloroethane	250	U
56-23-5	Carbon Tetrachloride	250	U
108-05-4	Vinyl Acetate	500	U
75-27-4	Bromodichloromethane	250	U
78-87-5	1,2-Dichloropropane	250	U
10061-01-5	cis-1,3-Dichloropropene	250	U
79-01-6	Trichloroethene	250	U
124-48-1	Dibromochloromethane	250	U
79-00-5	1,1,2-Trichloroethane	250	U
71-43-2	Benzene	250	U
10061-02-6	trans-1,3-Dichloropropene	250	U
75-25-2	Bromoform	250	U
108-10-1	4-Methyl-2-Pentanone	500	U
591-78-6	2-Hexanone	500	U
127-18-4	Tetrachloroethene	250	U
79-34-5	1,1,2,2-Tetrachloroethane	250	U
108-88-3	Toluene	120	J
108-90-7	Chlorobenzene	250	U
100-41-4	Ethylbenzene	250	U

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 VOLATILE ORGANICS ANALYSIS DATA SHEET
 TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

R3624

Lab Name: Battelle PNL Contract:
 Lab Code: PNL Case No.: SAS No.: SDG No.: 107AP
 Matrix: (soil/water) WATER Lab Sample ID: 93-08653
 Sample wt/vol: 0.1 (g/mL) ML Lab File ID: DVB308.D
 Level: (low/med) LOW Date Received: 08/03/93
 % Moisture: not dec. Data Analyzed: 10/13/93
 GC Column: DB-624 ID: 0.54 (mm) Dilution Factor: 1.0
 Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs found: 0

CONCENTRATION UNITS:
 (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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WHC-SD-WM-DP-053
ADDENDUM #2 REV. 0

1A
 VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

R3626

Lab Name: Battelle PNL Contract: _____
 Lab Code: PNL Case No.: _____ SAS No.: _____ SDG No.: 107AP
 Matrix: (soil/water) WATER Lab Sample ID: 93-08654
 Sample wt/vol: 0.1 (g/mL) ML Lab File ID: DVB310.D
 Level: (low/med) LOW Date Received: 08/03/93
 † Moisture: not dec. _____ Data Analyzed: 10/13/93
 GC Column: DB-624 ID: 0.54 (mm) Dilution Factor: 1.0
 Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:
 (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	500	U
74-83-9	Bromomethane	500	U
75-01-4	Vinyl Chloride	500	U
75-00-3	Chloroethane	500	U
75-09-2	Methylene Chloride	250	U
67-64-1	Acetone	500	U
75-15-0	Carbon Disulfide	250	U
75-35-4	1,1-Dichloroethene	250	U
75-34-3	1,1-Dichloroethane	250	U
540-59-0	trans-1,2-Dichloroethene	250	U
540-59-0	cis-1,2-Dichloroethene	250	U
67-66-3	Chloroform	250	U
107-02-2	1,2-Dichloroethane	250	U
78-93-3	2-Butanone	500	U
71-55-6	1,1,1-Trichloroethane	250	U
56-23-5	Carbon Tetrachloride	250	U
108-05-4	Vinyl Acetate	500	U
75-27-4	Bromodichloromethane	250	U
78-87-5	1,2-Dichloropropane	250	U
10061-01-5	cis-1,3-Dichloropropene	250	U
79-01-6	Trichloroethene	250	U
124-48-1	Dibromochloromethane	250	U
79-00-5	1,1,2-Trichloroethane	250	U
71-43-2	Benzene	250	U
10061-02-6	trans-1,3-Dichloropropene	250	U
75-25-2	Bromoform	250	U
108-10-1	4-Methyl-2-Pentanone	500	U
591-78-6	2-Hexanone	500	U
127-18-4	Tetrachloroethene	250	U
79-34-5	1,1,2,2-Tetrachloroethane	250	U
108-88-3	Toluene	130	J
108-90-7	Chlorobenzene	250	U
100-41-4	Ethylbenzene	250	U

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DSD 1/7/94

FORM I VOA

3/90

D03 C30

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

R3626

Lab Name: Battelle PNL

Contract:

Lab Code: PNL

Case No.:

SAS No.:

SDG No.: 107AP

Matrix: (soil/water) WATER

Lab Sample ID: 93-08654

Sample wt/vol: 0.1 (g/mL) ML

Lab File ID: DVB310.D

Level: (low/med) LOW

Date Received: 08/03/93

% Moisture: not dec. _____

Data Analyzed: 10/13/93

GC Column: DB-624 ID: 0.54 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

100-42-5	Styrene	250	U
133-02-7	m&p-Xylene	250	U
133-02-7	o-Xylene	250	U
98-82-8	Isopropylbenzene	250	U
108-67-8	1,3,5-Trimethylbenzene	250	U
95-63-6	1,2,4-Trimethylbenzene	250	U
109-99-9	Tetrahydrofuran	500	U
526-73-8	1,2,3-Trimethylbenzene	500	U

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WHC-SD-WM-DP-053
ADDENDUM *QA* REV. 0

DSY 1/1/94

FORM I VOA

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DO3-031

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WHC-SD-WM-DP-053
ADDENDUM 24 REV. 0

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

R3626

Lab Name: Battelle PNL Contract: _____
Lab Code: PNL Case No.: _____ SAS No.: _____ SDG No.: 107AP
Matrix: (soil/water) WATER Lab Sample ID: 93-08654
Sample wt/vol: 0.1 (g/mL) ML Lab File ID: DVB310.D
Level: (low/med) LOW Date Received: 08/03/93
† Moisture: not dec. _____ Data Analyzed: 10/13/93
GC Column: DB-624 ID: 0.54 (mm) Dilution Factor: 1.0
Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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FORM I VOA-TIC

DSY 1/7/94

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D03-032
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**WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0**

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

R3628

Lab Name: Battelle PNL Contract: _____
 Lab Code: PNL Case No.: _____ SAS No.: _____ SDG No.: 107AP
 Matrix: (soil/water) WATER Lab Sample ID: 93-08655
 Sample wt/vol: 0.1 (g/mL) ML Lab File ID: DVB314.D
 Level: (low/med) LOW Date Received: 08/03/93
 % Moisture: not dec. _____ Data Analyzed: 10/13/93
 GC Column: DB-624 ID: 0.54 (mm) Dilution Factor: 1.0
 Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-42-5	Styrene	250	U
133-02-7	m&p-Xylene	250	U
133-02-7	o-Xylene	250	U
98-82-8	Isopropylbenzene	250	U
108-67-8	1,3,5-Trimethylbenzene	250	U
95-63-6	1,2,4-Trimethylbenzene	250	U
109-99-9	Tetrahydrofuran	500	U
526-73-8	1,2,3-Trimethylbenzene	500	U

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DSD 1/2/94

FORM I VOA

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LE
VOLATILE ORGANICS ANALYSIS DATA SHEET
 TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

R3628

Lab Name: Battelle PNL Contract: _____
 Lab Code: PNL Case No.: _____ SAS No.: _____ SDG No.: 107AP
 Matrix: (soil/water) WATER Lab Sample ID: 93-08655
 Sample wt/vol: 0.1 (g/mL) ML Lab File ID: DVB314.D
 Level: (low/med) LOW Date Received: 08/03/93
 † Moisture: not dec. _____ Data Analyzed: 10/13/93
 GC Column: DB-624 ID: 0.54 (mm) Dilution Factor: 1.0
 Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 0 CONCENTRATION UNITS:
 (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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FORM I VOA-TIC

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**WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0**

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

R3631

Lab Name: Battelle PNL Contract: _____
 Lab Code: PNL Case No.: _____ SAS No.: _____ SDG No.: 107AP
 Matrix: (soil/water) WATER Lab Sample ID: 93-08657
 Sample wt/vol: 0.1 (g/mL) ML Lab File ID: DVB312.D
 Level: (low/med) LOW Date Received: 08/03/93
 † Moisture: not dec. _____ Data Analyzed: 10/13/93
 GC Column: DB-624 ID: 0.54 (mm) Dilution Factor: 1.0
 Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	500	U
74-83-9	Bromomethane	500	U
75-01-4	Vinyl Chloride	500	U
75-00-3	Chloroethane	500	U
75-09-2	Methylene Chloride	250	U
67-64-1	Acetone	500	U
75-15-0	Carbon Disulfide	250	U
75-35-4	1,1-Dichloroethene	250	U
75-34-3	1,1-Dichloroethane	250	U
540-59-0	trans-1,2-Dichloroethene	250	U
540-59-0	cis-1,2-Dichloroethene	250	U
67-66-3	Chloroform	250	U
107-02-2	1,2-Dichloroethane	250	U
78-93-3	2-Butanone	500	U
71-55-6	1,1,1-Trichloroethane	250	U
56-23-5	Carbon Tetrachloride	250	U
108-05-4	Vinyl Acetate	500	U
75-27-4	Bromodichloromethane	250	U
78-87-5	1,2-Dichloropropane	250	U
10061-01-5	cis-1,3-Dichloropropene	250	U
79-01-6	Trichloroethene	250	U
124-48-1	Dibromochloromethane	250	U
79-00-5	1,1,2-Trichloroethane	250	U
71-43-2	Benzene	250	U
10061-02-6	trans-1,3-Dichloropropene	250	U
75-25-2	Bromoform	250	U
108-10-1	4-Methyl-2-Pentanone	500	U
591-78-6	2-Hexanone	500	U
127-18-4	Tetrachloroethene	250	U
79-34-5	1,1,2,2-Tetrachloroethane	250	U
108-88-3	Toluene	130	U
108-90-7	Chlorobenzene	250	U
100-41-4	Ethylbenzene	250	U

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FORM I VOA

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WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

R3631

Lab Name: Battelle PNL Contract:
 Lab Code: PNL Case No.: SAS No.: SDG No.: 107AP
 Matrix: (soil/water) WATER Lab Sample ID: 93-08657
 Sample wt/vol: 0.1 (g/mL) ML Lab File ID: DVB312.D
 Level: (low/med) LOW Date Received: 08/03/93
 † Moisture: not dec. _____ Data Analyzed: 10/13/93
 GC Column: DB-624 ID: 0.54 (mm) Dilution Factor: 1.0
 Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-42-5	Styrene	250	D
133-02-7	m&p-Xylene	250	D
133-02-7	o-Xylene	250	D
98-82-8	Isopropylbenzene	250	D
108-67-8	1,3,5-Trimethylbenzene	250	D
95-63-6	1,2,4-Trimethylbenzene	250	D
109-99-9	Tetrahydrofuran	500	D
526-73-8	1,2,3-Trimethylbenzene	500	D

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DSD 1/7/94

FORM I VOA

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DO3-037

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ORGANIC COMPOUND ANALYSIS REPORT
SEMIVOLATILE COMPOUNDS

SAMPLE ANALYSIS REPORTED

Analysis of Grout Tank 107AP samples for semivolatile organic compounds by gas chromatography/mass spectrometry (GC/MS) is the subject of this report.

SAMPLE DESCRIPTION AND PREPARATION

<u>Sample ID</u>	<u>ACL Lab Number</u>
R3620	93-08651
R3622	93-08652
R3624	93-08653
R3626	93-08654
R3628	93-08655
R3631	93-08657

The samples were received at ambient temperature on 08/03/93. Extractions of both samples and spiked samples were performed.

- Extraction procedure PNL-ALO-120
- Extraction location Lab 306, 325 building
- Extraction type Sonication, low level, soil
- Sample/Extract storage temperature 4°C(+/-2°)

ANALYSIS METHOD

- GC/MS procedure: PNL-ALO-345.
- GC/MS instrumentation: HP-5890/5970 GC/MS (WB38473)
- GC/MS location: Lab 325, 325 building.

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WHO-SD-WM-DP-053
ADDENDUM 2A REV. 0

QUALITY CONTROL

The QC features in the analytical procedure were followed as described below. The following lists the attached CLP-like forms that relate to QC and summarizes the QC results.

<u>Form</u>	<u>QC Parameter</u>	<u>Comments</u>
2C	Surrogate Recovery	Met requirements.
3C	MS/MSD Recovery	Met requirements.
4B	Method Blank Summary	Met requirements.
5B	Tune/Mass Calibration	Met requirements.
6BC	Initial Calibration	Met requirements.
7BC	Daily Calibration	Met requirements.
8BC	Internal Standards	Met requirements.

DATA

The data and calibration are archived on magnetic tape in the 325 building 325 laboratory. The following is the list of the pertinent files.

<u>File Name</u>	<u>Sample Number</u>	<u>Sample Analyzed</u>
DV0801.d	SSTD050	Instrument Tuning Performance Check and Continuing Calibration Check
DV0802.d	SBLK	Method Blank
DV0803.d	93-08651	R3620
DV0804.d	93-08651D	R3620 Duplicate
DV0805.d	93-08652	R3622
DV0806.d	93-08652D	R3622 Duplicate

2A - 31

D04-004

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WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0

DV0807.d	93-08653	R3624
DV0808.d	93-08653D	R3624 Duplicate
DV0901.d	SSTD050	Instrument Tuning Performance Check and Continuing Calibration Check
DV0902.d	93-08654	R3626
DV0903.d	93-08654D	R3626 Duplicate
DV0904.d	93-08655	R3628
DV0905.d	93-08655D	R3628 Duplicate
DV0906.d	93-08655MS	R3628 Matrix Spike
DV0907.d	93-08655MSD	R3628 Matrix Spike Duplicate
DV0908.d	93-08657	R3631
DV0909.d	93-08657D	R3631 Duplicate

Laboratory data is maintained as follows:

<u>Activity</u>	<u>Location</u>
• GC/MS injection log	BNW-52916 pg. 18-20
• Extraction bench sheet:	filed with data in the ACL/ALO records center
• GC/MS data, sample report:	filed with data in the ACL/ALO records center

RESULTS

CLP Target Compounds: As seen in the summary sheet and the attached CLP-like forms, the only target compound detected was 1-Butanol, which was found in nearly every sample.

Tentatively Identified Compounds (TIC): The attached CLP-like forms show results for the TIC's. Concentration estimates for the TIC's are made assuming that the response factor for each TIC is one. The peak area for each TIC is then compared to the area of the nearest internal standard (for which concentrations are known) to estimate the TIC concentrations. Identification of the TIC is made by a computer search of the NIST mass spectral library to attempt a match with the spectrum of each of the TIC's. The TIC's reported as "Unknown" did not have satisfactory matches with library spectra. The TIC concentration estimate and identification are reported only if the TIC peak area is 10% or greater than the nearest internal standard peak area.

2A-32
D04-005

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WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0

Tributyl phosphate was detected in nearly every sample. Cyclohexene was found as a TIC in the method blank and nearly every sample. This compound is an artifact in that it is added to the GC/MS grade methylene chloride used in the extraction as a preservative.

Discussion

1-Butanol and 2-Butoxyethanol were added to the list of target compounds to be determined. A five point initial calibration was performed with these compounds. Additionally, a recovery study was performed using a nonradioactive simulant solution thought to be representative of the sample matrix. These additional compounds were also spiked into each matrix spike sample, and all showed good recoveries. Normally it would be difficult to extract low molecular weight polar compounds such as 1-Butanol and 2-Butoxyethanol. However, the high ionic strength of the sample helped to "salt out" these compounds, so that a single pH (7.0) methylene chloride extraction could be used. The initial pH of these samples was alkaline, but was adjusted to neutral before the extraction step. The spike recovery criteria used for comparison were CLP limits, which are not necessarily appropriate for this type of sample matrix.

The extraction holding time was exceeded for this group of samples.

Data was processed on a Hewlett-packard Unix Chemstation using the Target 2.4 and Envision software. Both the CLP-like forms and raw data were generated using this software. The raw data (total ion chromatograms) indicates two unknown peaks at 11.8 and 12.8 minutes. These peaks are 2-Chlorophenol-d4 and 1,2-Dichlorobenzene-d4, two unused surrogates. Deletion of these peaks from the list of unknowns does not, unfortunately, relabel the raw data.

As indicated in the extraction bench sheet, 1-Butanol and 2-Butoxyethanol were inadvertently omitted from the matrix spike and matrix spike duplicate samples. Matrix spike recovery data for these compounds in a similar matrix can be found with the IOIAP semivolatiles data.

A dilution factor of 2 was made to all the sample extracts due to the amount of surrogate and matrix spike added.

QA-33

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D04-006

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WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0

The following defines the Q-flags in the Form 1's

<u>"Q" Flag</u>	<u>Definition</u>
U	Indicates the compound was analyzed for but not detected, the U-flagged concentration is the Contract Required Quantitation Limit.
J	Indicates an estimated value for target and tentatively identified compounds, spectra meet criteria but response is below Contract Required Quantitation Limit for the target compounds.
B	Indicates compound was found in the blank.
N	Indicates presumptive evidence of a compound, based on a mass spectral library search.
A	Aldol condensation product.
M	Manual integration of chromatogram.

ANALYST *Doug A. Z...* DATE 12/11/93 REVIEW *[Signature]* DATE 12/12/93

2A - 34

D04-007

000037

**WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0**

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

R3620

Lab Name: BAITELLE PNL Contract: _____
 Lab Code: PNL Case No.: _____ SAS No.: _____ SDG No.: 107AP
 Matrix: (soil/water) WATER Lab Sample ID: 93-08651
 Sample wt/vol: 10 (g/mL) ML Lab File ID: DV0803.D
 Level: (low/med) LOW Date Received: 08/03/93
 % Moisture: _____ decanted: (Y/N) _____ Date Extracted: 08/19/93
 Concentrated Extract Volume: 1000(UL) Date Analyzed: 09/08/93
 Injection Volume: 1.0(uL) Dilution Factor: 2.0
 GPC Cleanup: (Y/N) N pH: 11.4

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

71-36-3	1-Butanol	14000	
108-95-2	Phenol	2000	U
111-44-4	bis(2-Chloroethyl) ether	2000	U
95-57-8	2-Chlorophenol	2000	U
541-73-1	1,3-Dichlorobenzene	2000	U
106-46-7	1,4-Dichlorobenzene	2000	U
100-51-6	Benzyl alcohol	2000	U
95-50-1	1,2-Dichlorobenzene	2000	U
95-48-7	2-Methylphenol	2000	U
108-60-1	bis(2-Chloroisopropyl) ether	2000	U
106-44-5	4-Methylphenol	2000	U
621-64-7	N-Nitroso-di-n-propylamine	2000	U
67-72-1	Hexachloroethane	2000	U
98-95-3	Nitrobenzene	2000	U
78-59-1	Isophorone	2000	U
88-75-5	2-Nitrophenol	2000	U
105-67-9	2,4-Dimethylphenol	2000	U
65-85-0	Benzoic acid	2000	U
111-91-1	bis(2-Chloroethoxy)methane	2000	U
120-83-2	2,4-Dichlorophenol	2000	U
120-82-1	1,2,4-Trichlorobenzene	2000	U
91-20-3	Naphthalene	2000	U
106-47-8	4-Chloroaniline	2000	U
87-68-3	Hexachlorobutadiene	2000	U
59-50-7	4-Chloro-3-methylphenol	2000	U
91-57-6	2-Methylnaphthalene	2000	U
77-47-4	Hexachlorocyclopentadiene	2000	U
88-06-2	2,4,6-Trichlorophenol	2000	U
95-95-4	2,4,5-Trichlorophenol	2000	U
91-58-7	2-Chloronaphthalene	2000	U
88-74-4	2-Nitroaniline	2000	U
131-11-3	Dimethylphthalate	2000	U
208-96-8	Acenaphthylene	2000	U

UJ

FORM I SV-1

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2A-35

D04-019

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**WHC-SD-WM-DP-053
ADDENDUM 2# REV. 0**

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

R3620

Lab Name: Battelle PNL Contract: _____
 Lab Code: PNL Case No.: _____ SAS No.: _____ SDG No.: 107AP
 Matrix: (soil/water) WATER Lab Sample ID: 93-08651
 Sample wt/vol: 10 (g/mL) ML Lab File ID: DV0803.D
 Level: (low/med) LOW Date Received: 08/03/93
 % Moisture: _____ decanted: (Y/N) _____ Date Extracted: 08/19/93
 Concentrated Extract Volume: 1000 (uL) Date Analyzed: 09/08/93
 Injection Volume: 1.0 (uL) Dilution Factor: 2.0
 GPC Cleanup: (Y/N) N pH: 11.4

Number TICs found: 2 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 110-83-8	Cyclohexane	3.968	2000	NJB
2. 126-73-8	Phosphoric acid, tributyl es	23.363	3200	J
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FORM I SV-TIC

DSD 1/7/94 3/90

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D04-022

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**WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0**

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

R3622

Lab Name: BAITELLE PNL Contract: _____
 Lab Code: PNL Case No.: _____ SAS No.: _____ SDG No.: 107AP
 Matrix: (soil/water) WATER Lab Sample ID: 93-08652
 Sample wt/vol: 10 (g/mL) ML Lab File ID: DV0805.D
 Level: (low/med) LOW Date Received: 08/03/93
 * Moisture: _____ decanted: (Y/N) _____ Date Extracted: 08/19/93
 Concentrated Extract Volume: 1000 (UL) Date Analyzed: 09/08/93
 Injection Volume: 1.0 (uL) Dilution Factor: 2.0
 GPC Cleanup: (Y/N) N pH: 11.6

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

71-36-3	1-Butanol	14000	
108-95-2	Phenol	2000	U
111-44-4	bis(2-Chloroethyl) ether	2000	U
95-57-8	2-Chlorophenol	2000	U
541-73-1	1,3-Dichlorobenzene	2000	U
106-46-7	1,4-Dichlorobenzene	2000	U
100-51-6	Benzyl alcohol	2000	U
95-50-1	1,2-Dichlorobenzene	2000	U
95-48-7	2-Methylphenol	2000	U
108-60-1	bis(2-Chloroisopropyl) ether	2000	U
106-44-5	4-Methylphenol	2000	U
621-64-7	N-Nitroso-di-n-propylamine	2000	U
67-72-1	Hexachloroethane	2000	U
98-95-3	Nitrobenzene	2000	U
78-59-1	Isophorone	2000	U
88-75-5	2-Nitrophenol	2000	U
105-67-9	2,4-Dimethylphenol	2000	U
65-85-0	Benzoic acid	2000	U
111-91-1	bis(2-Chloroethoxy)methane	2000	U
120-83-2	2,4-Dichlorophenol	2000	U
120-82-1	1,2,4-Trichlorobenzene	2000	U
91-20-3	Naphthalene	2000	U
106-47-8	4-Chloroaniline	2000	U
87-68-3	Hexachlorobutadiene	2000	U
59-50-7	4-Chloro-3-methylphenol	2000	U
91-57-6	2-Methylnaphthalene	2000	U
77-47-4	Hexachlorocyclopentadiene	2000	U
88-06-2	2,4,6-Trichlorophenol	2000	U
95-95-4	2,4,5-Trichlorophenol	2000	U
91-58-7	2-Chloronaphthalene	2000	U
88-74-4	2-Nitroaniline	2000	U
131-11-3	Dimethylphthalate	2000	U
208-96-8	Acenaphthylene	2000	U

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FORM I SV-1

3/90

DSD 1/1/94

2A-37

D04-027

000042

**WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0**

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

R3622

Lab Name: BATTELLE PNL Contract: _____
 Lab Code: PNL Case No.: _____ SAS No.: _____ SDG No.: 107AP
 Matrix: (soil/water) WATER Lab Sample ID: 93-08652
 Sample wt/vol: 10 (g/mL) ML Lab File ID: DV0805.D
 Level: (low/med) LOW Date Received: 08/03/93
 % Moisture: _____ decanted: (Y/N) _____ Date Extracted: 08/19/93
 Concentrated Extract Volume: 1000 (UL) Date Analyzed: 09/08/93
 Injection Volume: 1.0 (uL) Dilution Factor: 2.0
 GPC Cleanup: (Y/N) N pH: 11.6

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NO. COMPOUND UG/L Q

CAS NO.	COMPOUND	UG/L	Q
606-20-2	2,6-Dinitrotoluene	2000	U
99-09-2	3-Nitroaniline	2000	U
83-32-9	Acenaphthene	2000	U
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	2000	U
132-64-9	Dibenzofuran	2000	U
121-14-2	2,4-Dinitrotoluene	2000	U
84-66-2	Diethylphthalate	2000	U
7005-72-3	4-Chlorophenyl-phenylether	2000	U
86-73-7	Fluorene	2000	U
100-01-6	4-Nitroaniline	2000	U
534-52-1	4,6-Dinitro-2-methylphenol	2000	U
86-30-6	N-Nitrosodiphenylamine (1)	2000	U
101-55-3	4-Bromophenyl-phenylether	2000	U
118-74-1	Hexachlorobenzene	2000	U
87-86-5	Pentachlorophenol	2000	U
85-01-8	Phenanthrene	2000	U
120-12-7	Anthracene	2000	U
84-74-2	Di-n-butylphthalate	2000	U
206-44-0	Fluoranthene	2000	U
129-00-0	Pyrene	2000	U
85-68-7	Butylbenzylphthalate	2000	U
91-94-1	3,3'-Dichlorobenzidine	2000	U
56-55-3	Benzo(a)anthracene	2000	U
218-01-9	Chrysene	2000	U
117-81-7	Bis(2-Ethylhexyl)phthalate	2000	U
117-84-0	Di-n-octylphthalate	2000	U
205-99-2	Benzo(b)fluoranthene	2000	U
207-08-9	Benzo(k)fluoranthene	2000	U
50-32-8	Benzo(a)pyrene	2000	U
193-39-5	Indeno(1,2,3-cd)pyrene	2000	U
53-70-3	Dibenz(a,h)anthracene	2000	U
191-24-2	Benzo(g,h,i)perylene	2000	U

UJ
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FORM I SV-2

3/90

D 59 1/2/94

2A-38

D04-028

000043

**WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0**

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

R3622

Lab Name: BATTELLE PNL Contract: _____
 Lab Code: PNL Case No.: _____ SAS No.: _____ SDG No.: 107AP
 Matrix: (soil/water) WATER Lab Sample ID: 93-08652
 Sample wt/vol: 10 (g/mL) ML Lab File ID: DV0805.D
 Level: (low/med) LOW Date Received: 08/03/93
 % Moisture: _____ decanted: (Y/N) _____ Date Extracted: 08/19/93
 Concentrated Extract Volume: 1000 (UL) Date Analyzed: 09/08/93
 Injection Volume: 1.0 (uL) Dilution Factor: 2.0
 GPC Cleanup: (Y/N) N pH: 11.6

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
111-76-2-2-Butoxyethanol		2000	U <i>WJ</i>

DSJ
1/7/94

2A-39

D04-029

000044

WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

R3622

Lab Name: Battelle PNL Contract:
Lab Code: PNL Case No.: SAS No.: SDG No.: 107AP
Matrix: (soil/water) WATER Lab Sample ID: 93-08652
Sample wt/vol: 10 (g/mL) ML Lab File ID: DV0805.D
Level: (low/med) LOW Date Received: 08/03/93
% Moisture: _____ decanted: (Y/N) _____ Date Extracted: 08/19/93
Concentrated Extract Volume: 1000 (uL) Date Analyzed: 09/08/93
Injection Volume: 1.0 (uL) Dilution Factor: 2.0
GPC Cleanup: (Y/N) N pH: 11.6

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 110-83-8	Cyclohexane	3.966	2000	NJB
2.	Phosphoric acid, tributyl est	23.375	2200	J
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FORM I SV-TIC

3/90

DSD 1/7/94

2A-40

D04-030

000045

WHC-SD-WM-DP-053
ADDENDUM A REV. 0

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

R3624

Lab Name: BATTELLE PNL Contract: _____
 Lab Code: PNL Case No.: _____ SAS No.: _____ SDG No.: 107AP
 Matrix: (soil/water) WATER Lab Sample ID: 93-08653
 Sample wt/vol: 10 (g/mL) ML Lab File ID: DV0807.D
 Level: (low/med) LOW Date Received: 08/03/93
 ‡ Moisture: _____ decanted: (Y/N) _____ Date Extracted: 08/19/93
 Concentrated Extract Volume: 1000 (UL) Date Analyzed: 09/08/93
 Injection Volume: 1.0 (uL) Dilution Factor: 2.0
 GPC Cleanup: (Y/N) N pH: 11.6

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

71-36-3	1-Butanol	15000	
108-95-2	Phenol	2000	U
111-44-4	bis(2-Chloroethyl) ether	2000	U
95-57-8	2-Chlorophenol	2000	U
541-73-1	1,3-Dichlorobenzene	2000	U
106-46-7	1,4-Dichlorobenzene	2000	U
100-51-6	Benzyl alcohol	2000	U
95-50-1	1,2-Dichlorobenzene	2000	U
95-48-7	2-Methylphenol	2000	U
108-60-1	bis(2-Chloroisopropyl) ether	2000	U
106-44-5	4-Methylphenol	2000	U
621-64-7	N-Nitroso-di-n-propylamine	2000	U
67-72-1	Hexachloroethane	2000	U
98-95-3	Nitrobenzene	2000	U
78-59-1	Isophorone	2000	U
88-75-5	2-Nitrophenol	2000	U
105-67-9	2,4-Dimethylphenol	2000	U
65-85-0	Benzoic acid	2000	U
111-91-1	bis(2-Chloroethoxy)methane	2000	U
120-83-2	2,4-Dichlorophenol	2000	U
120-82-1	1,2,4-Trichlorobenzene	2000	U
91-20-3	Naphthalene	2000	U
106-47-8	4-Chloroaniline	2000	U
87-68-3	Hexachlorobutadiene	2000	U
59-50-7	4-Chloro-3-methylphenol	2000	U
91-57-6	2-Methylnaphthalene	2000	U
77-47-4	Hexachlorocyclopentadiene	2000	U
88-06-2	2,4,6-Trichlorophenol	2000	U
95-95-4	2,4,5-Trichlorophenol	2000	U
91-58-7	2-Chloronaphthalene	2000	U
88-74-4	2-Nitroaniline	2000	U
131-11-3	Dimethylphtalate	2000	U
208-96-8	Acenaphthylene	2000	U

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FORM I SV-1

3/90

Dsj 1/7/94

2A-41

DO4-035

000046

WHC-SD-WM-DP-053 ADDENDUM 2A REV. 0

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

R3624

Lab Name: BATTELLE PNL Contract: _____

Lab Code: PNL Case No.: _____ SAS No.: _____ SDG No.: 107AP

Matrix: (soil/water) WATER Lab Sample ID: 93-08653

Sample wt/vol: 10 (g/mL) ML Lab File ID: DV0807.D

Level: (low/med) LOW Date Received: 08/03/93

‡ Moisture: _____ decanted: (Y/N) _____ Date Extracted: 08/19/93

Concentrated Extract Volume: 1000 (UL) Date Analyzed: 09/08/93

Injection Volume: 1:0 (uL) Dilution Factor: 2.0

GPC Cleanup: (Y/N) N pH: 11.6

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
606-20-2	2,6-Dinitrotoluene	2000	U
99-09-2	3-Nitroaniline	2000	U
83-32-9	Acenaphthene	2000	U
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	2000	U
132-64-9	Dibenzofuran	2000	U
121-14-2	2,4-Dinitrotoluene	2000	U
84-66-2	Diethylphthalate	2000	U
7005-72-3	4-Chlorophenyl-phenylether	2000	U
86-73-7	Fluorene	2000	U
100-01-6	4-Nitroaniline	2000	U
534-52-1	4,6-Dinitro-2-methylphenol	2000	U
86-30-6	N-Nitrosodiphenylamine (1)	2000	U
101-55-3	4-Bromophenyl-phenylether	2000	U
118-74-1	Hexachlorobenzene	2000	U
87-86-5	Pentachlorophenol	2000	U
85-01-8	Phenanthrene	2000	U
120-12-7	Anthracene	2000	U
84-74-2	Di-n-butylphthalate	2000	U
206-44-0	Fluoranthene	2000	U
129-00-0	Pyrene	2000	U
85-68-7	Butylbenzylphthalate	2000	U
91-94-1	3,3'-Dichlorobenzidine	2000	U
56-55-3	Benzo(a)anthracene	2000	U
218-01-9	Chrysene	2000	U
117-81-7	Bis(2-Ethylhexyl)phthalate	2000	U
117-84-0	Di-n-octylphthalate	2000	U
205-99-2	Benzo(b)fluoranthene	2000	U
207-08-9	Benzo(k)fluoranthene	2000	U
50-32-8	Benzo(a)pyrene	2000	U
193-39-5	Indeno(1,2,3-cd)pyrene	2000	U
53-70-3	Dibenz(a,h)anthracene	2000	U
191-24-2	Benzo(g,h,i)perylene	2000	U

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FORM I SV-2

3/90

2A-42

DSD 1/7/94

D04-036

000047

W-0-SD-WV-D-056
ADDENDUM 2A REV. 0

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
 TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

R3624

Lab Name: Battelle PNL Contract:
 Lab Code: PNL Case No.: SAS No.: SDG No.: 107AP
 Matrix: (soil/water) WATER Lab Sample ID: 93-08653
 Sample wt/vol: 10 (g/mL) ML Lab File ID: DV0807.D
 Level: (low/med) LOW Date Received: 08/03/93
 % Moisture: _____ decanted: (Y/N) _____ Date Extracted: 08/19/93
 Concentrated Extract Volume: 1000 (uL) Date Analyzed: 09/08/93
 Injection Volume: 1.0 (uL) Dilution Factor: 2.0
 GPC Cleanup: (Y/N) N pH: 11.6

Number TICs found: 2 CONCENTRATION UNITS:
 (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 110-83-8	Cyclohexene	3.991	3300	NJB
2.	Phosphoric acid, tributyl est	23.424	2300	J
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FORM I SV-TIC

DSD 1/7/94 3/90

2A-44

D04-038

000049

WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

R3626

Lab Name: BATTELLE PNL Contract:
Lab Code: PNL Case No.: SAS No.: SDG No.: 107AP
Matrix: (soil/water) WATER Lab Sample ID: 93-08654
Sample wt/vol: 10 (g/mL) ML Lab File ID: DV0902.D
Level: (Low/med) LOW Date Received: 08/03/93
% Moisture: _____ decanted: (Y/N) _____ Date Extracted: 08/19/93
Concentrated Extract Volume: 1000 (UL) Date Analyzed: 09/09/93
Injection Volume: 1.0 (uL) Dilution Factor: 2.0
GPC Cleanup: (Y/N) N pH: 11.7

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

71-36-3	1-Butanol	7800	
108-95-2	Phenol	2000	U
111-44-4	bis(2-Chloroethyl) ether	2000	U
95-57-8	2-Chlorophenol	2000	U
541-73-1	1,3-Dichlorobenzene	2000	U
106-46-7	1,4-Dichlorobenzene	2000	U
100-51-6	Benzyl alcohol	2000	U
95-50-1	1,2-Dichlorobenzene	2000	U
95-48-7	2-Methylphenol	2000	U
108-60-1	bis(2-Chloroisopropyl) ether	2000	U
106-44-5	4-Methylphenol	2000	U
621-64-7	N-Nitroso-di-n-propylamine	2000	U
67-72-1	Hexachloroethane	2000	U
98-95-3	Nitrobenzene	2000	U
78-59-1	Isophorone	2000	U
88-75-5	2-Nitrophenol	2000	U
105-67-9	2,4-Dimethylphenol	2000	U
65-85-0	Benzoic acid	2000	U
111-91-1	bis(2-Chloroethoxy)methane	2000	U
120-83-2	2,4-Dichlorophenol	2000	U
120-82-1	1,2,4-Trichlorobenzene	2000	U
91-20-3	Naphthalene	2000	U
106-47-8	4-Chloroaniline	2000	U
87-68-3	Hexachlorobutadiene	2000	U
59-50-7	4-Chloro-3-methylphenol	2000	U
91-57-6	2-Methylnaphthalene	2000	U
77-47-4	Hexachlorocyclopentadiene	2000	U
88-06-2	2,4,6-Trichlorophenol	2000	U
95-95-4	2,4,5-Trichlorophenol	2000	U
91-58-7	2-Chloronaphthalene	2000	U
88-74-4	2-Nitroaniline	2000	U
131-11-3	Dimethylphthalate	2000	U
208-96-8	Acenaphthylene	2000	U

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FORM I SV-1

3/90

DSG 1/7/94

2A-45

D04-043

000050

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

R3626

Lab Name: BATTELLE PNL Contract: _____
 Lab Code: PNL Case No.: _____ SAS No.: _____ SDG No.: 107AP
 Matrix: (soil/water) WATER Lab Sample ID: 93-08654
 Sample wt/vol: 10 (g/mL) ML Lab File ID: DV0902.D
 Level: (low/med) LOW Date Received: 08/03/93
 % Moisture: _____ decanted: (Y/N) _____ Date Extracted: 08/19/93
 Concentrated Extract Volume: 1000 (UL) Date Analyzed: 09/09/93
 Injection Volume: 1.0 (uL) Dilution Factor: 2.0
 GPC Cleanup: (Y/N) N pH: 11.7

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
606-20-2	2,6-Dinitrotoluene	2000	U
99-09-2	3-Nitroaniline	2000	U
83-32-9	Acenaphthene	2000	U
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	2000	U
132-64-9	Dibenzofuran	2000	U
121-14-2	2,4-Dinitrotoluene	2000	U
84-66-2	Diethylphthalate	2000	U
7005-72-3	4-Chlorophenyl-phenylether	2000	U
86-73-7	Fluorene	2000	U
100-01-6	4-Nitroaniline	2000	U
534-52-1	4,6-Dinitro-2-methylphenol	2000	U
86-30-6	N-Nitrosodiphenylamine (1)	2000	U
101-55-3	4-Bromophenyl-phenylether	2000	U
118-74-1	Hexachlorobenzene	2000	U
87-86-5	Pentachlorophenol	2000	U
85-01-8	Phenanthrene	2000	U
120-12-7	Anthracene	2000	U
84-74-2	Di-n-butylphthalate	2000	U
206-44-0	Fluoranthene	2000	U
129-00-0	Pyrene	2000	U
85-68-7	Butylbenzylphthalate	2000	U
91-94-1	3,3'-Dichlorobenzidine	2000	U
56-55-3	Benzo(a)anthracene	2000	U
218-01-9	Chrysene	2000	U
117-81-7	Bis(2-Ethylhexyl)phthalate	2000	U
117-84-0	Di-n-octylphthalate	2000	U
205-99-2	Benzo(b)fluoranthene	2000	U
207-08-9	Benzo(k)fluoranthene	2000	U
50-32-8	Benzo(a)pyrene	2000	U
193-39-5	Indeno(1,2,3-cd)pyrene	2000	U
53-70-3	Dibenz(a,h)anthracene	2000	U
191-24-2	Benzo(g,h,i)perylene	2000	U

uJ
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FORM I SV-2

3/90

DSJ 1/7/94

2A-46

D04-044

000051

WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0

IC
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

R3626

Lab Name: BATTELLE PNL Contract:
 Lab Code: PNL Case No.: SAS No.: SDG No.: 107AP
 Matrix: (soil/water) WATER Lab Sample ID: 93-08654
 Sample wt/vol: 10 (g/mL) ML Lab File ID: DV0902.D
 Level: (low/med) LOW Date Received: 08/03/93
 % Moisture: _____ decanted: (Y/N) _____ Date Extracted: 08/19/93
 Concentrated Extract Volume: 1000 (UL) Date Analyzed: 09/09/93
 Injection Volume: 1.0 (uL) Dilution Factor: 2.0
 GPC Cleanup: (Y/N) N pH: 11.7

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	
	-----2-Butoxyethanol	2000	U <i>u5</i>

DSD 1/2/94

2A-47

D04-045

000052

ADDENDUM 2A REV. 0

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

R3626

Lab Name: Battelle PNL Contract: _____
 Lab Code: PNL Case No.: _____ SAS No.: _____ SDG No.: 107AP
 Matrix: (soil/water) WATER Lab Sample ID: 93-08654
 Sample wt/vol: 10 (g/mL) ML Lab File ID: DV0902.D
 Level: (low/med) LOW Date Received: 08/03/93
 % Moisture: _____ decanted: (Y/N) _____ Date Extracted: 08/19/93
 Concentrated Extract Volume: 1000 (uL) Date Analyzed: 09/09/93
 Injection Volume: 1.0 (uL) Dilution Factor: 2.0
 GPC Cleanup: (Y/N) N pH: 11.7

Number TICs found: 2 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 110-83-8	Cyclohexene	3.996	4000	NJB
2. 126-73-8	Phosphoric acid, tributyl es	23.375	4700	J
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WJ
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FORM I SV-TIC

DSD 1/7/94

3/90

2A-48

D04-046

000053

WHC-SD-WM-DP-053
ADDENDUM 4 REV. 0

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

R3628

Lab Name: BATTELLE PNL Contract:
Lab Code: PNL Case No.: SAS No.: SDG No.: 107AP
Matrix: (soil/water) WATER Lab Sample ID: 93-08655
Sample wt/vol: 10 (g/mL) ML Lab File ID: DV0904.D
Level: (Low/med) LOW Date Received: 08/03/93
% Moisture: _____ decanted: (Y/N) _____ Date Extracted: 08/19/93
Concentrated Extract Volume: 1000 (UL) Date Analyzed: 09/09/93
Injection Volume: 1.0 (uL) Dilution Factor: 2.0
GPC Cleanup: (Y/N) N pH: 11.7

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

71-36-3	1-Butanol	6400	
108-95-2	Phenol	2000	U
111-44-4	bis(2-Chloroethyl) ether	2000	U
95-57-8	2-Chlorophenol	2000	U
541-73-1	1,3-Dichlorobenzene	2000	U
106-46-7	1,4-Dichlorobenzene	2000	U
100-51-6	Benzyl alcohol	2000	U
95-50-1	1,2-Dichlorobenzene	2000	U
95-48-7	2-Methylphenol	2000	U
108-60-1	bis(2-Chloroisopropyl) ether	2000	U
106-44-5	4-Methylphenol	2000	U
621-64-7	N-Nitroso-di-n-propylamine	2000	U
67-72-1	Hexachloroethane	2000	U
98-95-3	Nitrobenzene	2000	U
78-59-1	Isophorone	2000	U
88-75-5	2-Nitrophenol	2000	U
105-67-9	2,4-Dimethylphenol	2000	U
65-85-0	Benzoic acid	2000	U
111-91-1	bis(2-Chloroethoxy)methane	2000	U
120-83-2	2,4-Dichlorophenol	2000	U
120-82-1	1,2,4-Trichlorobenzene	2000	U
91-20-3	Naphthalene	2000	U
106-47-8	4-Chloroaniline	2000	U
87-68-3	Hexachlorobutadiene	2000	U
59-50-7	4-Chloro-3-methylphenol	2000	U
91-57-6	2-Methylnaphthalene	2000	U
77-47-4	Hexachlorocyclopentadiene	2000	U
88-06-2	2,4,6-Trichlorophenol	2000	U
95-95-4	2,4,5-Trichlorophenol	2000	U
91-58-7	2-Chloronaphthalene	2000	U
88-74-4	2-Nitroaniline	2000	U
131-11-3	Dimethylphthalate	2000	U
208-96-8	Acenaphthylene	2000	U

FS

FORM I SV-1

3/90

DS, 1/7/94

2A-49

DO-051

000054

WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

R3628

Lab Name: BATTELLE PNL Contract:
 Lab Code: PNL Case No.: SAS No.: SDG No.: 107AP
 Matrix: (soil/water) WATER Lab Sample ID: 93-08655
 Sample wt/vol: 10 (g/mL) ML Lab File ID: DV0904.D
 Level: (low/med) LOW Date Received: 08/03/93
 % Moisture: _____ decanted: (Y/N) _____ Date Extracted: 08/19/93
 Concentrated Extract Volume: 1000 (UL) Date Analyzed: 09/09/93
 Injection Volume: 1.0 (uL) Dilution Factor: 2.0
 GPC Cleanup: (Y/N) N pH: 11.7

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

606-20-2	2,6-Dinitrotoluene	2000	U
99-09-2	3-Nitroaniline	2000	U
83-32-9	Acenaphthene	2000	U
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	2000	U
132-64-9	Dibenzofuran	2000	U
121-14-2	2,4-Dinitrotoluene	2000	U
84-66-2	Diethylphthalate	2000	U
7005-72-3	4-Chlorophenyl-phenylether	2000	U
86-73-7	Fluorene	2000	U
100-01-6	4-Nitroaniline	2000	U
534-52-1	4,6-Dinitro-2-methylphenol	2000	U
86-30-6	N-Nitrosodiphenylamine (1)	2000	U
101-55-3	4-Bromophenyl-phenylether	2000	U
118-74-1	Hexachlorobenzene	2000	U
87-86-5	Pentachlorophenol	2000	U
85-01-8	Phenanthrene	2000	U
120-12-7	Anthracene	2000	U
84-74-2	Di-n-butylphthalate	2000	U
206-44-0	Fluoranthene	2000	U
129-00-0	Pyrene	2000	U
85-68-7	Butylbenzylphthalate	2000	U
91-94-1	3,3'-Dichlorobenzidine	2000	U
56-55-3	Benzo(a)anthracene	2000	U
218-01-9	Chrysene	2000	U
117-81-7	Bis(2-Ethylhexyl)phthalate	2000	U
117-84-0	Di-n-octylphthalate	2000	U
205-99-2	Benzo(b)fluoranthene	2000	U
207-08-9	Benzo(k)fluoranthene	2000	U
50-32-8	Benzo(a)pyrene	2000	U
193-39-5	Indeno(1,2,3-cd)pyrene	2000	U
53-70-3	Dibenz(a,h)anthracene	2000	U
191-24-2	Benzo(g,h,i)perylene	2000	U

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FORM I SV-2

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WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

R3628

Lab Name: BATTELLE PNL

Contract:

Lab Code: PNL

Case No.:

SAS No.:

SDG No.: 107AP

Matrix: (soil/water) WATER

Lab Sample ID: 93-08655

Sample wt/vol: 10 (g/mL) ML

Lab File ID: DV0904.D

Level: (low/med) LOW

Date Received: 08/03/93

† Moisture: _____ decanted: (Y/N) _____

Date Extracted: 08/19/93

Concentrated Extract Volume: 1000 (UL)

Date Analyzed: 09/09/93

Injection Volume: 1.0 (uL)

Dilution Factor: 2.0

GPC Cleanup: (Y/N) N

pH: 11.7

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

-----2-Butoxyethanol	2000	U	uJ
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bsd 1/2/94

2A-51

D04-053

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WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

R3628

Lab Name: Battelle PNL Contract:
Lab Code: PNL Case No.: SAS No.: SDG No.: 107AP
Matrix: (soil/water) WATER Lab Sample ID: 93-08655
Sample wt/vol: 10 (g/mL) ML Lab File ID: DV0904.D
Level: (low/med) LOW Date Received: 08/03/93
% Moisture: _____ decanted: (Y/N) _____ Date Extracted: 08/19/93
Concentrated Extract Volume: 1000 (uL) Date Analyzed: 09/09/93
Injection Volume: 1.0 (uL) Dilution Factor: 2.0
GPC Cleanup: (Y/N) N pH: 11.7

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 110-83-8	Cyclohexene	3.975	2200	NJB
2. 126-73-8	Phosphoric acid, tributyl es	23.385	2600	J
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FORM I SV-TIC

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2A-52

DSY 1/7/94

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WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

R3631

Lab Name: BATTELLE PNL Contract:
Lab Code: PNL Case No.: SAS No.: SDG No.: 107AP
Matrix: (soil/water) WATER Lab Sample ID: 93-08657
Sample wt/vol: 10 (g/mL) ML Lab File ID: DV0908.D
Level: (low/med) LOW Date Received: 08/03/93
% Moisture: _____ decanted: (Y/N) _____ Date Extracted: 08/19/93
Concentrated Extract Volume: 1000 (UL) Date Analyzed: 09/09/93
Injection Volume: 1.0 (uL) Dilution Factor: 2.0
GPC Cleanup: (Y/N) N pH: 7.9

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

71-36-3	1-Butanol	2000	U
108-95-2	Phenol	2000	U
111-44-4	bis(2-Chloroethyl) ether	2000	U
95-57-8	2-Chlorophenol	2000	U
541-73-1	1,3-Dichlorobenzene	2000	U
106-46-7	1,4-Dichlorobenzene	2000	U
100-51-6	Benzyl alcohol	2000	U
95-50-1	1,2-Dichlorobenzene	2000	U
95-48-7	2-Methylphenol	2000	U
108-60-1	bis(2-Chloroisopropyl) ether	2000	U
106-44-5	4-Methylphenol	2000	U
621-64-7	N-Nitroso-di-n-propylamine	2000	U
67-72-1	Hexachloroethane	2000	U
98-95-3	Nitrobenzene	2000	U
78-59-1	Isophorone	2000	U
88-75-5	2-Nitrophenol	2000	U
105-67-9	2,4-Dimethylphenol	2000	U
65-85-0	Benzoic acid	2000	U
111-91-1	bis(2-Chloroethoxy)methane	2000	U
120-83-2	2,4-Dichlorophenol	2000	U
120-82-1	1,2,4-Trichlorobenzene	2000	U
91-20-3	Naphthalene	2000	U
106-47-8	4-Chloroaniline	2000	U
87-68-3	Hexachlorobutadiene	2000	U
59-50-7	4-Chloro-3-methylphenol	2000	U
91-57-6	2-Methylnaphthalene	2000	U
77-47-4	Hexachlorocyclopentadiene	2000	U
88-06-2	2,4,6-Trichlorophenol	2000	U
95-95-4	2,4,5-Trichlorophenol	2000	U
91-58-7	2-Chloronaphthalene	2000	U
88-74-4	2-Nitroaniline	2000	U
131-11-3	Dimethylphthalate	2000	U
208-96-8	Acenaphthylene	2000	U

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FORM I SV-1

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**WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0**

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

R3631

Lab Name: BATTELLE PNL Contract: _____
 Lab Code: PNL Case No.: _____ SAS No.: _____ SDG No.: 107AP
 Matrix: (soil/water) WATER Lab Sample ID: 93-08657
 Sample wt/vol: 10 (g/mL) ML Lab File ID: DV0908.D
 Level: (low/med) LOW Date Received: 08/03/93
 % Moisture: _____ decanted: (Y/N) _____ Date Extracted: 08/19/93
 Concentrated Extract Volume: 1000 (UL) Date Analyzed: 09/09/93
 Injection Volume: 1.0 (uL) Dilution Factor: 2.0
 GPC Cleanup: (Y/N) N pH: 7.9

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

606-20-2	2,6-Dinitrotoluene	2000	U
99-09-2	3-Nitroaniline	2000	U
83-32-9	Acenaphthene	2000	U
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	2000	U
132-64-9	Dibenzofuran	2000	U
121-14-2	2,4-Dinitrotoluene	2000	U
84-66-2	Diethylphthalate	2000	U
7005-72-3	4-Chlorophenyl-phenylether	2000	U
86-73-7	Fluorene	2000	U
100-01-6	4-Nitroaniline	2000	U
534-52-1	4,6-Dinitro-2-methylphenol	2000	U
86-30-6	N-Nitrosodiphenylamine (1)	2000	U
101-55-3	4-Bromophenyl-phenylether	2000	U
118-74-1	Hexachlorobenzene	2000	U
87-86-5	Pentachlorophenol	2000	U
85-01-8	Phenanthrene	2000	U
120-12-7	Anthracene	2000	U
84-74-2	Di-n-butylphthalate	2000	U
206-44-0	Fluoranthene	2000	U
129-00-0	Pyrene	2000	U
85-68-7	Butylbenzylphthalate	2000	U
91-94-1	3,3'-Dichlorobenzidine	2000	U
56-55-3	Benzo (a) anthracene	2000	U
218-01-9	Chrysene	2000	U
117-81-7	Bis(2-Ethylhexyl)phthalate	2000	U
117-84-0	Di-n-octylphthalate	2000	U
205-99-2	Benzo (b) fluoranthene	2000	U
207-08-9	Benzo (k) fluoranthene	2000	U
50-32-8	Benzo (a) pyrene	2000	U
193-39-5	Indeno (1,2,3-cd) pyrene	2000	U
53-70-3	Dibenz (a,h) anthracene	2000	U
191-24-2	Benzo (g,h,i) perylene	2000	U

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FORM I SV-2

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WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

R3631

Lab Name: BATTELLE PNL Contract:
Lab Code: PNL Case No.: SAS No.: SDG No.: 107AP
Matrix: (soil/water) WATER Lab Sample ID: 93-08657
Sample wt/vol: 10 (g/mL) ML Lab File ID: DV0908.D
Level: (low/med) LOW Date Received: 08/03/93
% Moisture: _____ decanted: (Y/N) _____ Date Extracted: 08/19/93
Concentrated Extract Volume: 1000 (UL) Date Analyzed: 09/09/93
Injection Volume: 1.0 (uL) Dilution Factor: 2.0
GPC Cleanup: (Y/N) N pH: 7.9

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
.....	2-Butoxyethanol	2000	U WJ

DSO 1/7/94

2A-55

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000060

WHC-SD-WM-DP-053
ADDENDUM A REV. 0

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

R3631

Lab Name: Battelle PNL Contract:
Lab Code: PNL Case No.: SAS No.: SDG No.: 107AP
Matrix: (soil/water) WATER Lab Sample ID: 93-08657
Sample wt/vol: 10 (g/mL) ML Lab File ID: DV0908.D
Level: (low/med) LOW Date Received: 08/03/93
% Moisture: _____ decanted: (Y/N) _____ Date Extracted: 08/19/93
Concentrated Extract Volume: 1000 (uL) Date Analyzed: 09/09/93
Injection Volume: 1.0 (uL) Dilution Factor: 2.0
GPC Cleanup: (Y/N) N pH: 7.9

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 110-83-8	Cyclohexane	4.028	2700	JB
2.				
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FORM I SV-TIC

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D04-068

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**WHC-SD-WM-DP-053
ADDENDUM *2A* REV. 0**



Project Number _____

Internal Distribution

System File/LB

Date October 15, 1993
 To TY Hosaka
 From DL Baldwin *DL Baldwin*
 Subject TOC Results for Evaporator Samples, Project
 Number 21129

This work is done by the UV-catalyzed persulfate/NDIR method, Test Procedure PNL-ALO-382, Rev. 0, "Solutions Analysis: Carbon", using the Dohrmann DC-80 Total Organic Carbon Analyzer. The M&TE No. for the carbon measurements is WA64102, M&TE No. for the balance is 362-06-01-046. The data is located in the ALO Records Office System File. TC standard used is potassium acid phthalate, lot# 52809, and the TIC standard is sodium carbonate, lot# 52815.

Narrative: This work was performed in two batches on 8/17/93 and 8/25/93. There were no apparent outliers. The required maximum holding time of 28 days was not met, but this should not adversely affect TOC results in this sample material. These samples were all analyzed in duplicate and reported as duplicates, as requested, though normally the duplicate sample injections are averaged and reported as a single result. The QC came within limits, except for 93-08651 TOC RPD of 29%. A probable explanation for this is that in this method TOC is not actually measured, but is the difference between TC and TIC, which are both large, resulting in large uncertainty for TOC. The 93-08653 TOC results were so low that a reported RPD was considered meaningless. Two sets of matrix spikes were performed, one for each batch. The 93-08655 TC matrix spikes, performed on 8-25-93, were 101% and 100% and the TIC matrix spikes were 102% and 97%. The 93-08656 matrix spikes for TC only, performed on 8-17-93, were 111% and 119%. Due to lack of time, no TIC samples were run on this day, therefore no TIC spikes were run either. On the following analysis day 8-25-93, the remaining TIC samples, as well as other TC and TIC work were performed. Precision and accuracy for this method are estimated at $\pm 10\%$ and $\pm 15\%$, respectively. The units are ug/ml, based on the volume of the original liquid.

<u>ALO Number</u>	<u>Evap No.</u>	<u>TC</u> <u>(ug/ml)</u>	<u>RPD</u>	<u>TOC</u> <u>(ug/ml)</u>	<u>RPD</u>	<u>TIC</u> <u>(ug/ml)</u>	<u>RPD</u>
93-08651	R3620	360	6	J 80	29	280	0
93-08651D		340		J 60		280	
93-08652	R3622	360	3	J 60	18	300	0
93-08652D		350		J 50		300	
93-08653	R3624	350	3	J 40	--	310	9

E54-1900-001 (10/89)

2A-57

DSO 1/7/94

D02-005

000062

WHC-SD-WM-DP-053
ADDENDUM ^{2A} REV. 0

DON'T SAY IT -- *Write It!*

Date: December 17, 1993

To: Evaporator Project File 21129

From: TY Hosaka

Subject: TOC Analysis



Please be advised that the matrix spike recoveries for TOC have been calculated using an unconventional formula. Because no formula is specified in the QAPjP for this project, and since the reported results do not exceed any operational limits (by orders of magnitude) for the evaporator, this data is considered adequate for reporting.

The formula used to calculate the spike recovery is as follows:

$$\text{Spike Recovery} = \frac{\text{Matrix Spike Result}}{\text{Sample Result} + \text{Spike Amount}}$$

The spike results have been recalculated using the following formula, and some were found to be above the acceptance criteria limit; however, there is no true impact on the quality of the data as reported and the results should be reported with an explanation in the summary case narrative:

$$\text{Spike Recovery} = \frac{\text{Matrix Spike Result} - \text{Sample Result}}{\text{Spike Amount}}$$

E54-3000-101 (10/89)

2A-59

D02-003

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WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0

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WHC-SD-WM-DP-053
ADDENDUM *2A* REV. 0

VALIDATION NARRATIVE

FOR

241-AP-107

PACIFIC NORTHWEST LABORATORY

WHC-SD-WM-DP-053
ADDENDUM *2A* REV. 0

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**WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0**

**Tank 241-AP-107
Data Validation Report**

Validation of the 107-AP data package was performed to the requirements provided in Section 2.0 of the *Sample Management and Administration* manual (WHC-CM-5-3, Rev. 0). The data validation was performed at level "C" as defined in Section 2.0 of WHC-CM-5-3. The overriding QA document was the *Evaporator Analytical Services Technical Project Plan, Revision 2*. Additional guidance was given by the *242-A Evaporator Waste Analysis Plan (WAP) (WHC-SD-WM-EV-060)*. The sample analyses were performed by the Battelle, Pacific Northwest Laboratory (PNL) Analytical Chemistry Laboratory (ACL).

The primary objective of the data validation effort was to ensure the usability and defensibility of the data produced for the project. This was accomplished through a detailed examination of the data package to recreate the analytical process and to verify that proper and acceptable analytical techniques had been applied. The data package was checked for correct submission of required deliverables, correct transcription of raw data to the summary forms, and for proper calculation of a number of parameters. An overall assessment of the data is provided on the Data Assessment Summary Form as required by WHC-CM-5-3. Assessments of individual quality control checks performed by the laboratory are located with the Data Assessment Summary Forms.

When Quality Assurance criteria are not met in a particular category for a sample result, the appropriate data qualifier is attached. The RCRA validation process data qualifiers are defined as follows:

- U The material was analyzed for, but was not detected. The associated value is the MDL or SQL.
- UJ The material was analyzed for, but was not detected. The MDL or SQL is an estimated quantity.
- J The associated value is an estimated quantity.
- R The data are unusable.

WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0

Data Validation Narrative

Analyses Requested

Samples R3620, R3622, R3624, R3626, R3628, R3629, and R3631 were collected on August 1, 1993 by WHC and transferred to the 325-PNL Laboratory for analysis. These samples were analyzed for Volatile and Semivolatile Organics (except for sample R3629), and for Total Organic Carbon.

MAJOR DEFICIENCIES (REJECTED DATA)

The following major deficiencies resulted in the qualification of the results as unusable.

The Volatile Organic hold time before analysis was 75 days, which grossly exceeded the 14 day EPA SW-846 hold time limit. The *Evaporator Analytical Services Technical Project Plan* states a 14 day hold time limit based on sample receipt by the laboratory. Guidance contained in WHC-CM-5-3, however, states that "the validity of results based on holding time of the sample (is) from its date of collection to the date of analysis or sample preparation." Furthermore, "professional judgement must be used in the case of grossly exceeded holding times." Such grossly exceeded hold times would possibly bias all sample results low (towards non-detect), and therefore it is reasonable to apply the more conservative SW-846 hold time limit. In addition, the samples were received at the laboratory at ambient temperature, with headspace in the sample containers. This resulted in the qualification of all Volatile Organics data as estimated (for detects) or unusable (for non-detects).

MINOR DEFICIENCIES

The following minor deficiencies were discovered. These minor shortcomings are not expected to significantly affect the overall quality of the data.

The hold time for all Semivolatile Organic samples before extraction was 18 days, which exceeds the 7 day EPA SW-846 hold time limit. In addition, the samples were received at the laboratory at ambient temperature, with headspace in the sample containers. All Semivolatile Organic analysis sample results were therefore qualified as estimated.

Blank contamination was indicated for the Semivolatile Tentatively Identified Compound (TIC) cyclohexene (RT = 3.957) at a concentration of 2,500 ug/L. Cyclohexene is added to the GC/MS grade methylene chloride used in the extraction as a preservative. The Semivolatile Organic sample results are therefore qualified as estimated (U) for cyclohexene, per the validation instructions.

The compounds 1-butanol and 2-butoxyethanol were omitted from the Semivolatile Organics matrix spike and matrix spike duplicate samples. Sample results associated with the compounds 1-butanol and 2-butoxyethanol are therefore qualified as estimated.

The perylene-d₁₂ internal standard area was below the quality control limit for Semivolatile Organic samples R3631 and R3631D; the

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WHC-SD-WM-DP-053
ADDENDUM *2A* REV. 0

Semivolatile Organic results for sample R3631 are therefore qualified as estimated.

Some duplicate Relative Percent Differences (RPDs) for the Semivolatile Organic compounds 1-butanol, cyclohexene, and phosphoric acid, tributyl ester were outside of the applicable control limits, resulting in the qualification of some results as estimated.

Total Organic Carbon samples were received at the laboratory at ambient temperature, with headspace in the sample containers. Therefore, due to inadequate storage and transport preservation, all Total Organic Carbon results are qualified as estimated.

Total Carbon and Total Inorganic Carbon matrix spike and matrix spike duplicate recoveries all exceeded the quality control limit, resulting in the qualification of all Total Organic Carbon sample results as estimated.

Duplicate Relative Percent Differences (RPDs) were outside of the quality control limit for several Total Organic Carbon samples, resulting in the qualification of some results as estimated.

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ADDENDUM *2A* REV. 0

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ADDENDUM 2A REV. 0

DATA ASSESSMENT FORMS

FOR

241-AP-107

PACIFIC NORTHWEST LABORATORY

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WHC-SD-WM-DP-053
ADDENDUM^{QA} REV. 0

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WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0

VOA DATA ASSESSMENT

DATE	<u>Jan. 7, 1994</u>	SAMPLES/MATRIX	<u>R3620</u>
			<u>R3622</u>
REVIEWED BY	<u>D.S. De Lorenzo</u>		<u>R3624</u>
			<u>R3626</u>
LABORATORY	<u>325-PNL Laboratory</u>		<u>R3628</u>
			<u>R3631</u>
CASE #	<u>242A EVAPORATOR</u>		
SDG #	<u>9308651-PNL-104</u>		

DATA ASSESSMENT SUMMARY

	<u>VOA</u>
1. <u>Chain of Custody/Holding Times</u>	<u>M</u>
2. <u>Instrument Calibration</u>	<u>0</u>
3. <u>Blanks</u>	<u>0</u>
4. <u>Accuracy</u>	<u>0</u>
5. <u>Precision</u>	<u>0</u>
6. <u>Instrument Performance</u>	<u>0</u>
7. <u>Other</u>	<u>N/A</u>

0 = data had no problems

X = minor problems, data may be qualified

M = data qualified due to major problems/some data may be unusable

OVERALL ASSESSMENT: Volatile organic analysis samples were received at the laboratory at ambient temperature with headspace in the sample containers, and the hold times were grossly exceeded, resulting in the qualification of data as estimated (for detects) or unusable (for non-detects). All other quality control criteria met. Data qualified as noted on the following pages.

NOTES: _____

o Refer to the corresponding attachments for explanation of any problems.

WHC-SD-WM-DP-053
ADDENDUM 2nd REV. 0

VOA QC

Name D.S. De Lorenzo

Date Jan. 7, 1994

QC Check: CHAIN OF CUSTODY/HOLDING TIMES

COMMENTS: Volatile organic analyses are to be conducted within fourteen days of sample collection. The samples were collected by WHC on 08/01/93 and transferred to the PNL Analytical Chemistry Laboratory for qualitative and quantitative evaluation. Volatile organic analyses were conducted on 10/13/93, which grossly exceeded the hold time limit. In addition, the samples were received at the laboratory at ambient temperature, with headspace in the sample containers.

ACTION: Qualify all detects as estimated (J) and all non-detects as unusable (R).

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
R3620	all non-detected compounds toluene	ND / R 130 ug/L / J
R3622	all non-detected compounds toluene	ND / R 140 ug/L / J
R3624	all non-detected compounds toluene	ND / R 120 ug/L / J
R3626	all non-detected compounds toluene	ND / R 130 ug/L / J
R3628	all non-detected compounds toluene	ND / R 130 ug/L / J
R3631	all non-detected compounds toluene	ND / R 130 ug/L / J

2A- 70

000071

WHC-SD-WM-DP-053
ADDENDUM ^{1A} REV. 0

VOA QC

Name D.S. De Lorenzo

Date Jan. 7, 1994

QC Check: INSTRUMENT CALIBRATION

COMMENTS: A GC/MS tune shall be performed at twelve hour intervals, and the bromofluorobenzene (BFB) percent relative ion abundance results must satisfy the ion abundance criteria.

With respect to initial calibration data, all average RRF values for system performance check compounds (SPCC) must be greater than the specified minimum of 0.300; the RRF value corresponding to bromoform must exceed 0.250. The percent relative standard deviation (%RSD) results of all calibration check compounds (CCC) are to be $\leq 30\%$. Initial calibration was conducted on 09/28/93.

All applicable SPCC RRF50 values associated with the continuing calibration data must be greater than 0.300, and the bromoform result shall exceed 0.250. The percent differences (%D) associated with the calibration check compounds are to be within $\pm 25\%$. Continuing calibration checks were run on 10/13/93.

ACTION: All quality control criteria were met; no action required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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2A-71

000072

WHC-SD-WM-DP-053
ADDENDUM^{2A} REV. 0

VOA QC

Name D.S. De Lorenzo

Date Jan. 7, 1994

QC Check: BLANKS

COMMENTS: The laboratory must conduct a blank analysis within every twelve hour period in which samples are analyzed. All analytes exhibiting a concentration ≤ 5 times the corresponding blank result shall be qualified as non-detects.

ACTION: All quality control criteria were met; no action required.

sample # constituent value/qualifier

2A - 72

000073

WHO-SD-WM-DP-053
ADDENDUM^{2A} REV. 0

VOA QC

Name D.S. De Lorenzo

Date Jan. 7, 1994

QC Check: ACCURACY (Surrogate and Matrix Spike Recoveries)

COMMENTS: The recoveries of the following surrogate compounds are to fall within the control limits as specified by the RCRA guidelines: Toluene-d₈, bromofluorobenzene, and 1,2-dichloroethane-d₄.

Sample R3628 was spiked with the following compounds: 1,1-dichloroethene, trichloroethene, benzene, toluene, chlorobenzene, isopropylbenzene, 1,3,5-trimethylbenzene, 1,2,4-trimethylbenzene, tetrahydrofuran, and 1,2,3-trimethylbenzene.

The recoveries resulting from the matrix spike and matrix spike duplicate analyses must satisfy the laboratory defined quality control criteria.

ACTION: All quality control criteria were met; no action required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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QA-73

000074

WHC-8D-WM-DP-053
ADDENDUM 2A REV. 0

VOA QC

Name D.S. De Lorenzo

Date Jan. 7, 1994

QC Check: PRECISION

COMMENTS: The relative percent difference (%RPD) values calculated from the matrix spike and matrix spike duplicate data must be within the laboratory specified quality control limits. For compounds at concentrations above the detection limit, the RPD between the sample and duplicate must be less than 20%.

ACTION: All quality control criteria were met; no action required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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QA-74-

000075

WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0

VOA QC

Name D.S. De Lorenzo

Date Jan. 7, 1994

QC Check: INSTRUMENT PERFORMANCE

COMMENTS: Bromochloromethane, 1,4-difluorobenzene, and chlorobenzene-d₅ were utilized as internal standards and evaluated on 10/13/93.

The extracted ion current profile (EICP) area of each internal standard must be within its corresponding control limit, and all internal standard retention times shall be within thirty seconds of the respective twelve hour standard.

ACTION: All quality control criteria were met; no action required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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2A-75

000076

WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0

SemiVOA DATA ASSESSMENT

DATE	<u>Jan. 10, 1994</u>	SAMPLES/MATRIX	<u>R3620</u>
			<u>R3622</u>
REVIEWED BY	<u>D.S. De Lorenzo</u>		<u>R3624</u>
			<u>R3626</u>
LABORATORY	<u>325-PNL Laboratory</u>		<u>R3628</u>
			<u>R3631</u>
CASE #	<u>242A EVAPORATOR</u>		
SDG #	<u>9308651-PNL-104</u>		

DATA ASSESSMENT SUMMARY

	<u>SVOA</u>
1. <u>Chain of Custody/Holding Times</u>	<u>X</u>
2. <u>Instrument Calibration</u>	<u>0</u>
3. <u>Blanks</u>	<u>X</u>
4. <u>Accuracy</u>	<u>X</u>
5. <u>Precision</u>	<u>X</u>
6. <u>Instrument Performance</u>	<u>X</u>
7. <u>Other</u>	<u>N/A</u>

0 = data had no problems

X = minor problems, data may be qualified

M = data qualified due to major problems/some data may be unusable

OVERALL ASSESSMENT: The hold time for all semivolatile organic samples before extraction was 18 days, which exceeds the 7 day EPA SW-846 hold time limit. The compounds 1-butanol and 2-butoxyethanol were omitted from the matrix spike and matrix spike duplicate samples. Blank contamination indicated for the Tentatively Identified Compound cyclohexene (RT = 3.957). Some duplicate Relative Percent Differences for 1-butanol, cyclohexene, and phosphoric acid, tributyl ester were outside of the applicable control limits. The perylene-d₁₂ internal standard area was below the QC limit for semivolatile organic samples R3631 and R3631D; therefore, the results for sample R3631 are qualified as estimated. Data was qualified as noted on the following pages.

NOTES: _____

o Refer to the corresponding attachments for explanation of any problems.

2A-76

000077

WHC-SD-WM-DP-053
ADDENDUM^{QA} REV. 0

SemiVOA QC

Name D.S. De Lorenzo

Date Jan. 10, 1994

QC Check: CHAIN OF CUSTODY/HOLDING TIMES

COMMENTS: Samples submitted for semivolatile organic analysis are required to be extracted within seven days of collection and evaluated within forty days of extraction. The samples were collected by WHC on 08/01/93 and transferred to the PNL Analytical Chemistry Laboratory for qualitative and quantitative evaluation. The extraction procedures were conducted on 08/19/93, which exceeded the hold time limit, and the semivolatile organic analyses were completed on 09/08/93. In addition, the samples were received at the laboratory at ambient temperature, with headspace in the sample containers.

ACTION: Qualify all semivolatile organic analysis sample results as estimated. Note that the cyclohexene results were determined to be non-detected due to blank contamination; due to missed holding times, the cyclohexene results are therefore concluded to be estimated and non-detected (UJ qualifier).

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
R3620	semivolatile organics non-detects	<detection limit / UJ
	1-butanol	14,000 ug/L / J
	cyclohexene	2,000 ug/L / UJ
	phosphoric acid, tributyl ester	3,200 ug/L / J
R3622	semivolatile organics non-detects	<detection limit / UJ
	1-butanol	14,000 ug/L / J
	cyclohexene	2,000 ug/L / UJ
	phosphoric acid, tributyl ester	2,200 ug/L / J
R3624	semivolatile organics non-detects	<detection limit / UJ
	1-butanol	15,000 ug/L / J
	cyclohexene	3,300 ug/L / UJ
	phosphoric acid, tributyl ester	2,300 ug/L / J
R3626	semivolatile organics non-detects	<detection limit / UJ
	1-butanol	7,800 ug/L / J
	cyclohexene	4,000 ug/L / UJ
	phosphoric acid, tributyl ester	4,700 ug/L / J
R3628	semivolatile organics non-detects	<detection limit / UJ
	1-butanol	6,400 ug/L / J
	cyclohexene	2,200 ug/L / UJ
	phosphoric acid, tributyl ester	2,600 ug/L / J
R3631	semivolatile organics non-detects	<detection limit / UJ
	1-butanol	<2,000 ug/L / UJ
	cyclohexene	2,700 ug/L / UJ

QA- 77

000078

WHC-SD-WM-DP-053
ADDENDUM *QA* REV. 0

SemiVOA QC

Name D.S. De Lorenzo

Date Jan. 10, 1994

QC Check: INSTRUMENT CALIBRATION

COMMENTS: A GC/MS tune shall be performed at twelve hour intervals, and the decafluorotriphenylphosphine (DFTPP) percent relative ion abundance results must satisfy the ion abundance criteria.

With respect to initial calibration data, all average RRF values for system performance check compounds (SPCC) must be greater than the specified minimum of 0.050. The percent relative standard deviation (%RSD) results of all calibration check compounds (CCC) are to be $\leq 30\%$. The initial calibration was conducted on 05/21/93.

All applicable SPCC RRF50 values associated with the continuing calibration data must be greater than 0.050, and the percent differences (%D) associated with the calibration check compounds (CCC) are to be within $\pm 25\%$. Continuing calibration checks were run on 09/08/93 and 09/09/93.

ACTION: All of the above criteria were met.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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QA - 78

000079

WHC-SD-WM-DP-053
ADDENDUM^{2A} REV. 0

SemiVOA QC

Name D.S. De Lorenzo

Date Jan. 10, 1994

QC Check: BLANKS

COMMENTS: The laboratory must conduct a blank analysis within every twelve hour period in which samples are analyzed. All analytes exhibiting a concentration ≤ 5 times the corresponding blank result shall be qualified as non-detects.

ACTION: Blank contamination indicated for the Tentatively Identified Compound cyclohexene (RT = 3.957) at a concentration of 2,500 ug/L. Cyclohexene is added to the GC/MS grade methylene chloride used in the extraction as a preservative. The semivolatile organic sample results were changed to non-detect (U) for cyclohexene, per the validation instructions.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
R3620	cyclohexene	2,000 ug/L / U
R3622	cyclohexene	2,000 ug/L / U
R3624	cyclohexene	3,300 ug/L / U
R3626	cyclohexene	4,000 ug/L / U
R3628	cyclohexene	2,200 ug/L / U
R3631	cyclohexene	2,700 ug/L / U

2A-79

600680

WHC-SD-WM-DP-053
ADDENDUM *2A* REV. 0

SemiVOA QC

Name D.S. De Lorenzo

Date Jan. 10, 1994

QC Check: ACCURACY (Surrogate and Matrix Spike Recoveries)

COMMENTS: The recoveries of the following surrogate compounds are to fall within the control limits as specified by the RCRA guidelines: nitrobenzene-d₅, 2-fluorobiphenyl, terphenyl, phenol-d₅, 2-fluorophenol, and 2,4,6-tribromophenol. All associated sample results are qualified as estimated for surrogates out of specification. If the surrogate was not detected (0% recovery) in the sample, qualify associated non-detects as unusable.

The recoveries resulting from the matrix spike and matrix spike duplicate analyses must satisfy the laboratory defined quality control criteria.

ACTION: The compounds 1-butanol and 2-butoxyethanol were omitted from the matrix spike and matrix spike duplicate samples. The laboratory reported that a recovery study for these compounds was performed using a nonradioactive simulant solution thought to be representative of the sample matrix, and "good" recoveries were achieved. For this reason, the 1-butanol and 2-butoxyethanol results are not considered unusable. Sample results associated with the compounds 1-butanol and 2-butoxyethanol are therefore qualified as estimated.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>	
R3620	1-butanol	14,000 ug/L	/ J
	2-butoxyethanol	<2,000 ug/L	/ UJ
R3622	1-butanol	14,000 ug/L	/ J
	2-butoxyethanol	<2,000 ug/L	/ UJ
R3624	1-butanol	15,000 ug/L	/ J
	2-butoxyethanol	<2,000 ug/L	/ UJ
R3626	1-butanol	7,800 ug/L	/ J
	2-butoxyethanol	<2,000 ug/L	/ UJ
R3628	1-butanol	6,400 ug/L	/ J
	2-butoxyethanol	<2,000 ug/L	/ UJ
R3631	1-butanol	<2,000 ug/L	/ UJ
	2-butoxyethanol	<2,000 ug/L	/ UJ

2A-80

000681

WHC-SD-WM-DP-053
ADDENDUM^{2A} REV. 0

SemiVOA QC

Name D.S. De Lorenzo

Date Jan. 10, 1994

QC Check: PRECISION

COMMENTS: The relative percent difference (%RPD) values calculated from the matrix spike and matrix spike duplicate data must be within the laboratory specified quality control limits. In addition, if the RPD is greater than 20% between a sample and its duplicate, the associated sample results are qualified as estimated.

ACTION: Semivolatile organic samples with RPD outside of the control limits, and the associated qualifier, are as follows:

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>	<u>%RPD</u>
R3620	phosphoric acid, tributyl ester	3,200 ug/L / J	24.6%
R3624	cyclohexene	3,300 ug/L / UJ	53.8%
R3626	1-butanol	7,800 ug/L / J	47.6%
	cyclohexene	4,000 ug/L / UJ	101.7%
	phosphoric acid, tributyl ester	4,700 ug/L / J	35.0%
R3628	1-butanol	6,400 ug/L / J	NC
	cyclohexene	2,200 ug/L / UJ	62.5%
	phosphoric acid, tributyl ester	2,600 ug/L / J	26.1%
R3631	cyclohexene	2,700 ug/L / UJ	45.5%

NC Not Calculable - due to either the laboratory reported sample or duplicate results falling below the detection limit. Using the detection limit as the upper range of the non-detected concentration, the RPD was calculated to be greater than 20%.

WHC-SD-WM-DP-053
ADDENDUM *AA* REV. 0

SemiVOA QC

Name D.S. De Lorenzo

Date Dec. 20, 1993

QC Check: INSTRUMENT PERFORMANCE

COMMENTS: 1,4-dichlorobenzene-d₄, naphthalene-d₈, acenaphthene-d₁₀, phenanthrene-d₁₀, chrysene-d₁₂, and perylene-d₁₂ were utilized as internal standards and evaluated on 09/08/93 and 09/09/93.

The extracted ion current profile (EICP) area of each internal standard must be within its corresponding control limit, and all internal standard retention times shall be within thirty seconds of the respective twelve hour standard.

ACTION: The perylene-d₁₂ internal standard area was below the QC limit for semivolatle organic samples R3631 and R3631D; the results for sample R3631 are therefore qualified as estimated.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
R3631	semivolatle organics non-detects	<detection limit / UJ
	1-butanol	<2,000 ug/L / UJ
	cyclohexene	2,700 ug/L / UJ

AA-82

000083

TOTAL ORGANIC CARBON DATA ASSESSMENT

DATE	<u>Jan. 10, 1994</u>	SAMPLES/MATRIX	<u>R3620</u>
			<u>R3622</u>
REVIEWED BY	<u>D.S. De Lorenzo</u>	<i>DSO 1/10/94</i>	<u>R3624</u>
			<u>R3626</u>
LABORATORY	<u>325-PNL Laboratory</u>		<u>R3628</u>
			<u>R3629</u>
CASE #	<u>242A EVAPORATOR</u>		<u>R3631</u>
			<u> </u>
SDG #	<u>9308651-PNL-104</u>		<u> </u>

DATA ASSESSMENT SUMMARY

	<u>TOC</u>
1. <u>Chain of Custody/Holding Times</u>	<u>X</u>
2. <u>Instrument Calibration</u>	<u>0</u>
3. <u>ICV/CCV Standards</u>	<u>0</u>
4. <u>Blanks</u>	<u>0</u>
5. <u>Laboratory Control Sample</u>	<u>0</u>
6. <u>Duplicate Analysis</u>	<u>X</u>
7. <u>Matrix Spike/Matrix Spike Dup.</u>	<u>X</u>
8. <u>Other Quality Control</u>	<u>N/A</u>

0 = data had no problems
 X = minor problems, data may be qualified
 M = data qualified due to major problems/some data may be unusable

OVERALL ASSESSMENT: Total Organic Carbon samples were received at the laboratory on 08/03/93 at ambient temperature with headspace in the sample containers. Matrix spike and matrix spike duplicate recoveries all exceeded the quality control limit. Duplicate relative percent differences were outside of the quality control limit for some TOC samples. Data qualified as noted on the following pages.

NOTES: _____

WHC-SD-WM-DP-053
ADDENDUM *QA* REV. 0

TOTAL ORGANIC CARBON QC

Name D.S. De Lorenzo

Date Jan. 10, 1994

QC Check: HOLDING TIMES

COMMENTS: Analytical holding times were assessed to determine whether the requirements for TOC analyses were met. The maximum holding time for Total Organic Carbon (TOC) is 28 days (per the July 1992 revision of EPA SW-846). A hold time limit of 7 days is specified in WHC-CM-5-3 (dated 8/27/90); this limit is believed to be out-dated and overly conservative, and therefore the more realistic SW-846 limit of 28 days is utilized.

The samples were collected on 08/01/93 and received by the PNL Analytical Chemistry Laboratory for qualitative and quantitative evaluation. TOC analyses were conducted on 08/17/93 and 08/25/93. TOC samples were received at the laboratory on 08/03/93 at ambient temperature with headspace in the sample containers. After receipt by the laboratory, the samples were placed in cooled storage at 4°C.

ACTION: Due to inadequate storage and transport preservation, all TOC results are qualified as estimated.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
R3620	Total Organic Carbon	80 ug/mL / J
R3622	Total Organic Carbon	60 ug/mL / J
R3624	Total Organic Carbon	40 ug/mL / J
R3626	Total Organic Carbon	70 ug/mL / J
R3628	Total Organic Carbon	100 ug/mL / J
R3629	Total Organic Carbon	10 ug/mL / J
R3631	Total Organic Carbon	0.6 ug/mL / J

WHC-SD-WM-DP-053
ADDENDUM^{QA} REV. 0

TOTAL ORGANIC CARBON QC

Name D.S. De Lorenzo

Date Jan. 10, 1994

QC Check: INSTRUMENT CALIBRATION

COMMENTS: The data was examined to determine whether the instruments used were calibrated at the correct frequency and that the calibration was performed correctly. All instruments must be calibrated on a daily basis or upon each set-up. Data is qualified as unusable if reported from an instrument that was not calibrated.

ACTION: All quality control criteria were met; no action required.

sample #

constituent

value/qualifier

QA-85

000086

WHC-SD-WM-DP-053
ADDENDUM^{2A} REV. 0

TOTAL ORGANIC CARBON OC

Name D.S. De Lorenzo

Date Jan. 10, 1994

QC Check: INITIAL AND CONTINUING CALIBRATION VERIFICATION

COMMENTS: An Initial Calibration Verification (ICV) standard must be run at the beginning of each run. A Continuing Calibration Verification (CCV) standard must be run at a 10% frequency. The recoveries for all ICVs and CCVs must be within $\pm 10\%$ of the true value. If the ICV/CCV results are outside the acceptable range, all associated sample results are qualified as estimated.

ACTION: All quality control criteria were met; no action required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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2A-86

000087

WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0

TOTAL ORGANIC CARBON QC

Name D.S. De Lorenzo

Date Jan. 10, 1994

QC Check: BLANKS

COMMENTS: Calibration and preparation blanks were evaluated for the presence of contaminants. Calibration blanks should be run at a 10% frequency. All analytes exhibiting a concentration ≤ 5 times the corresponding blank result shall be qualified as non-detects. If the absolute value of any negative blank values exceeded the Instrument Detection Limit (IDL), non-detects were qualified as estimated (UJ) and positive results within 2 times the absolute value of the blank value as estimated.

ACTION: All quality control criteria were met; no action required.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
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2A-87

000088

WHC-SD-WM-DP-053
ADDENDUM *QA* REV. 0
TOTAL ORGANIC CARBON QC

Name D.S. De Lorenzo

Date Jan. 10, 1994

QC Check: LABORATORY CONTROL STANDARD

COMMENTS: The Laboratory Control Sample (LCS) serves as a monitor of the overall performance of all steps in the analysis, including sample preparation. All LCS results must fall within the control limits of $\pm 20\%$ of the true value. If the LCS recovery is $> 120\%$ or $50 - 79\%$, sample results are qualified as estimated. Results associated with an LCS recovery of $< 50\%$ are qualified as unusable.

ACTION: All criteria were met by performing an ongoing precision and recovery procedure. For TOC analysis, this procedure serves as a monitor of overall performance.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
-----------------	--------------------	------------------------

QA-88

000089

WHC-SD-WM-DP-053
ADDENDUM *QA* REV. 0
TOTAL ORGANIC CARBON QC

Name D.S. De Lorenzo

Date Jan. 10, 1994

QC Check: DUPLICATE ANALYSIS

COMMENTS: Duplicate analyses are indicators of laboratory precision based on each sample matrix. Duplicate analysis must be performed at a 5% frequency or 1 per batch, whichever is greater. The relative percent difference (RPD) for duplicate analyses should be less than 20% for sample results greater than 10 times the IDL. If the RPD is greater than 20%, the associated sample results are qualified as estimated.

ACTION: TOC samples with RPD outside of the control limits, and the associated qualifiers, are as follows:

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>	<u>%RPD</u>
R3620	Total Organic Carbon	80 ug/mL / J	28.6%
R3624	Total Organic Carbon	40 ug/mL / J	200%
R3629	Total Organic Carbon	10 ug/mL / J	200%

QA-89

000090

WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0

TOTAL ORGANIC CARBON QC

Name D.S. De Lorenzo

Date Jan. 10, 1994

QC Check: MATRIX SPIKE/MATRIX SPIKE DUPLICATE

COMMENTS: Matrix spike sample analyses provide information about the effect of each sample matrix on the digestion and measurement methodology. Matrix spikes must be performed at a 20% frequency and recoveries should be between 75-125%. If the spike result is between 30-74% or >125%, results are qualified as estimated. Sample results associated with a spike recovery of less than 30% are qualified as unusable.

ACTION: Total Organic Carbon is not determined directly, but is calculated by taking the difference between the Total Carbon (TC) and Total Inorganic Carbon (TIC) results. Therefore, a TOC matrix spike is not analyzed, but TC and TIC matrix spike and matrix spike duplicate recoveries are determined. These recoveries were originally calculated by the laboratory using an incorrect formula. The original formula used was:

$$\text{Recovery} = \text{MS Result} / (\text{Sample Result} + \text{Spike Amount})$$

The correct formula was later used to recalculate the recovery for TC and TIC. This formula is given as follows:

$$\text{Recovery} = (\text{MS Result} - \text{Sample Result}) / \text{Spike Amount}$$

Using the original, incorrect formula results in matrix spike recoveries that are artificially closer to 1.00 (100%) than by using the later, correct formula. Matrix spike and matrix spike duplicate recoveries all exceeded the quality control limit, resulting in the qualification of all TOC sample results as estimated.

<u>sample #</u>	<u>constituent</u>	<u>value/qualifier</u>
R3620	Total Organic Carbon	80 ug/mL / J
R3622	Total Organic Carbon	60 ug/mL / J
R3624	Total Organic Carbon	40 ug/mL / J
R3626	Total Organic Carbon	70 ug/mL / J
R3628	Total Organic Carbon	100 ug/mL / J
R3629	Total Organic Carbon	10 ug/mL / J
R3631	Total Organic Carbon	0.6 ug/mL / J

2A-90

000091

WHC-SD-WM-DP-053
ADDENDUM *2A* REV. 0

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WHC-SD-WM-DP-053
ADDENDUM *2A* REV. 0

CHAINS OF CUSTODY

FOR

241-AP-107

PACIFIC NORTHWEST LABORATORY

2A-92

000092

WHC-SD-WM-DP-053
ADDENDUM 24 REV. 0

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WHC-SD-WM-DP-053
ADDENDUM *2A* REV. 0

B1 - WESTINGHOUSE CHAIN OF CUSTODY

AND

PACIFIC NORTHWEST LABORATORY (PNL)

SAMPLE RECEIPT FORMS

2A - 94

B01-001

000093

WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0

PNL-ALO-051, Rev. 0
Exhibit 1 Page 1 of 1

SAMPLE RECEIPT FORM

Delivered by: DS Older

Date/Time: 8-2-93 11:30

Received by: Cheryl Chamberlain

Cust ID No	ALO Sample No	Cust ID No	ALO Sample No	Cust ID No	ALO Sample No
✓ R 3624	93-08653				
✓ R 3625	93-08655				
✓ R 3626	93-08654				
✓ R 3629	93-08656				
✓ R 3622	93-08652				
✓ R 3631	93-08657				
→ R 3620	93-08651				

- Customer Chain-of-Custody form: Present Absent
- Additional shipping forms (list): ORSR
- Custody seals on shipping and/or sample containers and their conditions.
Present Absent
If Present, condition: OK
- Sample tag(s) ID numbers if not recorded on the Chain-of-Custody record or on sample vial. Sample Tag: 3620 not listed on Chain of Custody.
Notes: One chain has a signature in sample number line.
- Condition of shipping container (i.e., broken container, dented, breached plastic bag, temperature of sample container as defined in Section 3.0 PNL-ALO-051, etc).
Ambient Temp, Container condition OK
- Condition of sample vials. Not Visible
- Verification of agreement or nonagreement of information on receiving documents.
OK
- Resolution of problems or discrepancies. None

RETURN COMPLETED FORM TO PROJECT MANAGER

QA-95

000094

B01-002

WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0

Emergency Contact (509) 373-3800 ERG-70 in vehicle

SHIPPING INST.	SHIP TO:	OFFSITE RADIOACTIVE SHIPMENT RECORD - EXTERIOR INSPECTION PERMITTED -		14215
	Company: <u>PNL/Rattelle</u>	Contractor: <input type="checkbox"/> PNL <input type="checkbox"/> KEH <input checked="" type="checkbox"/> WHC		Ship: <input checked="" type="checkbox"/> Prepaid <input type="checkbox"/> Collect Via:
	Address: <u>325 Rld.</u>	Site Carrier: <u>AS Oider</u>		<input checked="" type="checkbox"/> Motor-Rail <input type="checkbox"/> Air Psgr <input type="checkbox"/> Excl. Use <input type="checkbox"/> Air Cargo <input type="checkbox"/> DOE Veh. <input type="checkbox"/> Mail <input type="checkbox"/> UPS Sur. <input type="checkbox"/>
	City, State, Zip: <u>300 Area</u>	PR No. <u>104431</u>	Veh. No. <u>16392</u>	
Attention: <u>Rick Steele</u>				

Proper Shipping Name Radioactive Material, <u>liquid of unknown quantity, Radioactive Material</u> Empty Packages <input type="checkbox"/> UN 2908 2. Low Specific Activity, n.o.s. <input type="checkbox"/> UN 2912 3. Limited quantity, n.o.s. <input type="checkbox"/> UN 2910 4. N.O.S. <input type="checkbox"/> UN 2982 5. Fissile n.o.s. <input type="checkbox"/> UN 2918 6. Special Form, n.o.s. <input type="checkbox"/> UN 2974 7. Instruments & Articles <input type="checkbox"/> UN 2911 8. <u>Corrosive liquid</u> <input checked="" type="checkbox"/> <u>1412760</u>	Material Form: <input type="checkbox"/> Special (A1) <input checked="" type="checkbox"/> Normal (A2) Labels Applied: <input type="checkbox"/> Empty <input type="checkbox"/> Radioactive LSA <input type="checkbox"/> White I <input type="checkbox"/> Yellow II <input type="checkbox"/> Yellow III <input checked="" type="checkbox"/> None <input type="checkbox"/> Danger (Air Cargo) <input type="checkbox"/> Secondary	Material Category: <input type="checkbox"/> Empty <input type="checkbox"/> Low Specific Act (LSA) <input checked="" type="checkbox"/> Limited Quantity <input type="checkbox"/> Type A Quantity <input type="checkbox"/> Type B Quantity <input type="checkbox"/> Highway Route <input type="checkbox"/> Controlled Quantity	For Normal Form Identify: Physical Form: <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas Chemical Form: <input type="checkbox"/> Metal <input type="checkbox"/> Oxide <input type="checkbox"/> Elemental <input type="checkbox"/> Nitrate Other: <u>plutonium</u>
			Type Package: <input checked="" type="checkbox"/> Strong Tight <input type="checkbox"/> Type A <input type="checkbox"/> Type B <input type="checkbox"/> Type B (U) <input type="checkbox"/> Type B (M)

CONSTRUCTION: <input type="checkbox"/> Box, FB <input type="checkbox"/> Wood <input type="checkbox"/> Steel <input type="checkbox"/> Drum <input type="checkbox"/> Cask <input checked="" type="checkbox"/> Other: <u>Fiber caskets</u>	FISSION CLASS: <input checked="" type="checkbox"/> Non Fissile <input type="checkbox"/> Fissile Exempt <input type="checkbox"/> Fissile I <input type="checkbox"/> Fissile II <input type="checkbox"/> Fissile III Grams Fissile:	SNM: <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> < 1 gr <input type="checkbox"/> Category I <input type="checkbox"/> Category II <input type="checkbox"/> Category III	ACCOUNTABILITY/SECURITY CONTROL: <input type="checkbox"/> Classified <input checked="" type="checkbox"/> Unclassified Consignee authorized to receive this qty: <input checked="" type="checkbox"/> Sig. Security Svc. Reg. <input type="checkbox"/> NA <input checked="" type="checkbox"/> Security Escorts Req. <input type="checkbox"/> Not Req. <input checked="" type="checkbox"/> External Cask Temperature (Max. 122°F FLT, 180°F Ex Use): <u>N/A</u>
---	---	--	---

Packaging conforms to appropriate packaging procedure N/A Yes
 Complies with D.O.T. packaging marking and labeling requirements N/A Yes
 Container acceptability documented (incl. 7A cert.) N/A Yes

Container examined: No evidence of deterioration or damage Yes
 QA Inspection Current Yes N/A Seals required No Yes
 Shipping Doc. 172421 Authorization No. _____

No. Pkgs.	Model Package	COC/Spec No.	Serial No.	Seal No.	Isotopes	Curies/Pkg	T	G
1	Strong Tight	N/A	N/A	N/A	<u>235, 238, 239, 240, 241</u>	222.6	N/A	2.12
(1 Fiber Blank woven sample included which is (main 147-148-149 sample 3631) (All samples are glass bottles)								
TOTAL						222.6	N/A	2.12

This is to certify that the above named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation, according to the applicable federal, state, local and international regulations for the transportation of hazardous materials.

Certifier's Signature: [Signature] Date: 8-2-93 Organization: TRC Complete Cost Code (inc. end function): 1117Y

Surface Dose Rate of Package: <input type="checkbox"/> ≤ 0.5 or ___ mrem/hr (N + Bγ) Dose Rate at 1 Meter from Surface: <input type="checkbox"/> ≤ 0.5 or ___ mrem/hr (N + Bγ) Smears of Outer Container: <input type="checkbox"/> ≤ 22 dpm Bγ/cm ² <input type="checkbox"/> ≤ 2.2 dpm α/cm ²	TRUCK LOAD OR EXCLUSIVE USE: Surface: <input type="checkbox"/> ≤ 200 mrem/hr (N + Bγ) @ 6 feet: <input type="checkbox"/> ≤ 10 mrem/hr (N + Bγ) @ Cab: <input type="checkbox"/> ≤ 20 mrem/hr (N + Bγ) or Sleeper
Additional Data and Instructions (inc. Readings on Internal Packaging): <u>N/A</u>	
Signature - Radiation Monitoring: <u>[Signature]</u>	Bldg: <u>401-AP</u> Survey No.: <u>137336</u> Date: <u>8/2/93</u>

AUTHORIZATION FOR SHIPMENT

AIR TRANSPORT CERTIFICATION: Cargo Only: Danger Labels Applied Passenger: 1. Ltd. Qty. 3. Research or Medical Diagnosis Pkg. Dimensions: N/A
 2. 31.1 4. Human Medical Research

Traffic has inspected and verified preshipment compliance to DOT regulations.

Authorized Signature: [Signature] Printed Name: Keith R. Smith Date: 8/2/93

APPROVED FOR OFFSITE SHIPMENT

B.L. No.: FJ-588 Date Shipped: 8-2-93 E.T.A.: 8-2-93 Routing: WHC Vehicle N/A
 Surveyed By: [Signature] Date: N/A Approved for Shipment: [Signature] Date: 8/2/93
 Westinghouse Hanford Company

U.S. GOVERNMENT PRINTING OFFICE: 1991-503-878/40000
 Recd. [Signature] 8-2-93 [Signature] COPIES TO 62-02
 54-6000-088 (10/88)

QA-96

B01-003

000095

From: Terry Y Hosaka at PNL26
Date: 8/3/93 4:23 PM
Priority: Normal
TO: Robert C (Clay) Smith at WHC321
TO: John F O'Rourke at WHC338
CC: Rick T Steele
BCC: Terry Y Hosaka
Subject: Evaporator (COC)

WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0

----- Message Contents -----

This is to inform you that one sample from tank 107AP, delivered to the ACL on 8/2/93, did not have a proper chain of custody form. We have deduced by a process of elimination that the sample ID is R3620. The chain of custody form we have associated with this sample has RL Wright's signature where the sample ID is supposed to be annotated. We have updated the form to reflect this error.

Should you have any questions regarding this matter please feel free to call me at 372-2207.

Thanks,
Terry

2A-97

B01-004

000096

TANK (PLANT OPERATING PROCEDURE

CHAIN OF CUSTODY			
Company Contact:	RL WRIGHT	Telephone:	323-2552
Bill of Lading No.:	NA	Offsite Property No.:	NA
Method of Shipment:	B-PLANT Sample TRUCK		
Shipped to:	225 LAB (PNL)		
SAMPLING INFORMATION			
Sample Collected by:	CM/BR/MERKT	Date:	8-1-93
Sample Location:	107-AP	Time:	1046 AM
Remarks:	NONE		
Ice Chest or Sample Bag No.:	ICE CREAM CARTON	Custody Seal #:	335B
		Field Logbook and Page No.:	N/A

SUPERVISION REVIEW: R. Wright DATE: 8-1-93

SAMPLE IDENTIFICATION	
Sample Number	R-3670 (from State 8/2/93)
Sample Schedule Number	NA

93-08031

CHAIN OF POSSESSION		
Relinquished by:	Received by:	Date/Time:
<u>R. Wright</u>	<u>D.S. Oca</u>	<u>8-2-93 1005 AM</u>
Relinquished by:	Received by:	Date/Time:
<u>D.S. Oca</u>	<u>Chad Chamberlain</u>	<u>8-2-93 1112</u>
Relinquished by:	Received by:	Date/Time:
<u>Chad Chamberlain</u>	<u>Dianna S. Slight</u>	<u>8/3/93 3:45p</u>
Relinquished by:	Received by:	Date/Time:

7A-98

WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0

TANK FARM PLANT OPERATING PROCEDURE

CHAIN OF CUSTODY			
Company Contact	RL WRIGHT	Telephone	313-3552
Bill of Lading No.	NA	Office Property No.	NA
Method of Shipment	B-PLANT SAMPLE TRUCK		
Shipped to	325 (PNI)		
SAMPLING INFORMATION			
Sample Collected by	CAYLER/MOART	Date	8-1-93
Sample Locations	127-AD	Time	1030 AM
Remarks	NONE		
Ice Chest or Sample Pkg. No.	ICE CREAM CARTON	Custody Seal #	3360
		Field Logbook and Page No.	N/A

SUPERVISION REVIEW: RJ Wright DATE: 8-1-93

SAMPLE IDENTIFICATION	
Sample Number	Sample Schedule Number
<u>R3622</u>	<u>NA</u>

23-02052

CHAIN OF POSSESSION		
Relinquished by: <u>RJ Wright</u>	Received by: <u>D.S. O'Quinn</u>	Date/Time: <u>8-2-93 1005 AM</u>
Relinquished by: <u>D.S. O'Quinn</u>	Received by: <u>Chad Chamberlain</u>	Date/Time: <u>8-2-93 1112</u>
Relinquished by: <u>Chad Chamberlain</u>	Received by: <u>Round C. Bell</u>	Date/Time: <u>8/3/93 3:45 p</u>
Relinquished by:	Received by:	Date/Time:

Document No.	Rev/Mod.	Page
TO-080-030	C-4	21

2A-99

B01-006

000098

TANK FARM PLANT OPERATING PROCEDURE

CHAIN OF CUSTODY			
Company Contract	RL WRIGHT	Telephone	373-3552
File of Reading No.	NA	Offsite Property No.	NA
Method of Shipment	R-PLANT Sample Truck		
Shipped to:	325 (PNL)		
SAMPLING INFORMATION			
Sample Collected by	CAVOR	Date	8-1-93 Time 1213
Sample Locations	107-AP / 1 (E)	Custody Seal #	3352
Remarks	NONE		
Ice Chest or Sample Pkg. No.	ICE CREAM CARTON	Field Logbook and Page No.	N/A

SUPERVISION REVIEW: *R. Wright* DATE: 8-1-93

SAMPLE IDENTIFICATION	
Sample Number	Sample Schedule Number
93-08053 <u>R3624</u>	<u>NA</u>

CHAIN OF POSSESSION		
Relinquished by: <i>R. Wright</i>	Received by: <i>D.S. Oden</i>	Date/Time: 8-2-93 1005AM
Relinquished by: <i>D.S. Oden</i>	Received by: <i>John Chamberlain</i>	Date/Time: 8-2-93 1112
Relinquished by: <i>John Chamberlain</i>	Received by: <i>Wanna Bellagatto</i>	Date/Time: 8/3/93 3:45p
Relinquished by:	Received by:	Date/Time:

2A-100

B01-007

000099

TANK FARM PLANT OPERATION PROCEDURE

CHAIN OF CUSTODY			
Company Contact:	RL WRIGHT	Telephone:	373-7552
Bill of Lading No.:	NA	Offsite Property No.:	NA
Method of Shipment:	B-Plant Sample Truck		
Shipped to:	325 (PNL)		
SAMPLING INFORMATION			
Sample Collected by:	Caylor/Meritt	Date:	8-1-93 Time 1217
Sample Location:	107-AP (E)	Custody Seal #:	2361
Remarks:	NONE		
Ice Chest or Sample Pkg No.:	ICE CREAM CARTON	Field Logbook and Page No.:	N/A

SUPERVISION REVIEW: Rf Wright DATE: 8-1-93

SAMPLE IDENTIFICATION	
Sample Number	Sample Schedule Number
<u>R3626</u>	<u>NA</u>

93-08534

CHAIN OF POSSESSION		
Relinquished by: <u>Rf Wright</u>	Received by: <u>D.S. O'Connell</u>	Date/Time: <u>8-2-93 1005AM</u>
Relinquished by: <u>D.S. O'Connell</u>	Received by: <u>Michael Chamberlain</u>	Date/Time: <u>8-2-93 1112</u>
Relinquished by: <u>Michael Chamberlain</u>	Received by: <u>Diana Colletto</u>	Date/Time: <u>8/3/93 3:45p</u>
Relinquished by:	Received by:	Date/Time:

2A-101

TANK FARM PLANT OPERATING PROCEDURE

CHAIN OF CUSTODY			
Company Contact:	ALWRIGHT	Telephone:	773-3552
Bill of Lading No.:	NA	Office Property No.:	NA
Method of Shipment:	3-Plant Sample Truck		
Shipped to:	325 (PML)		
SAMPLING INFORMATION			
Sample Collected by:	CAYLOR/MAGAT	Date:	8-1-93 Time 1135
Sample Location:	107-AP. 1(SW)	Custody Seal #:	3356
Remarks:	NONE		
Ice Chest or Sample Pkg. No.:	ICE CREAM CARTON	Field Logbook and Page No.:	N/A

SUPERVISION REVIEW: Al Wright DATE: 8-1-93

SAMPLE IDENTIFICATION	
Sample Number	Sample Schedule Number
<u>R3628</u>	<u>NA</u>

93-02655

CHAIN OF POSSESSION		
Relinquished by: <u>Al Wright</u>	Received by: <u>D.S. O'Leary</u>	Date/Time: <u>8-2-93 1005 AM</u>
Relinquished by: <u>D.S. O'Leary</u>	Received by: <u>Paul Chamberlain</u>	Date/Time: <u>8-29-93 1112</u>
Relinquished by: <u>Paul Chamberlain</u>	Received by: <u>Diana Belloratto</u>	Date/Time: <u>8/3/93 3:45p</u>
Relinquished by:	Received by:	Date/Time:

9A-102

TANK FARM PLANT OPERATING PROCEDURE

CHAIN OF CUSTODY			
Company Contact:	RL WRIGHT	Telephone:	323-2552
Bill of Lading No.:	NA	Offsite Property No.:	NA
Method of Shipment:	B-PLANT SAMPLE TRUCK		
Shipped to:	J25 (PNC)		
SAMPLING INFORMATION			
Sample Collected by:	CAYLOR/MUST	Date:	8-1-93 Time: 11:40AM
Sample Location:	107-AP 1(SW)	Custody Seal #:	3355
Remarks:	NONE		
Ice Chest or Sample Bag No.:	ICE CLEAN CARTON	Field Logbook and Page No.:	N/A

SUPERVISION REVIEW: R. Wright DATE: 8-2-93

SAMPLE IDENTIFICATION	
Sample Number	Sample Schedule Number
93-02656 <u>R3629</u>	<u>NA</u>

CHAIN OF POSSESSION		
Relinquished by: <u>R. Wright</u>	Received by: <u>D.S. Orr</u>	Date/Time: <u>8-2-93 10:54a</u>
Relinquished by: <u>D.S. Orr</u>	Received by: <u>Bob Chamberlain</u>	Date/Time: <u>8-2-93 11:12</u>
Relinquished by: <u>Bob Chamberlain</u>	Received by: <u>Kevin Salafetti</u>	Date/Time: <u>8/3/93 3:45p</u>
Relinquished by:	Received by:	Date/Time:

2A-103

WHC-SD-WM-DP-053
ADDENDUM *2A* REV. 0

TANK FARM PLANT OPERATING PROCEDURE

CHAIN OF CUSTODY			
Company Contact:	<i>RL WRIGHT</i>	Telephone:	<i>373-3552</i>
Bill of Lading No.:	<i>NA</i>	Offsite Property No.:	<i>NA</i>
Method of Shipment:	<i>D-Plant Sample TRUCK</i>		
Shipped to:	<i>325 LAB (PML)</i>		
SAMPLING INFORMATION			
Sample Collected by:	<i>Carol / [unclear]</i>	Date:	<i>8-1-93</i> Time <i>10-12:05 AM</i> <i>6-12:25 AM</i>
Sample Locations:	<i>107-AP1 PUCK</i>	Custody Seal #:	<i>3364</i>
Remarks:	<i>NONE</i>		
Ice Chest or Sample Pkg. No.:	<i>ICC CREAM CARTON</i>	Field Logbook and Page No.:	<i>N/A</i>

SUPERVISION REVIEW: *R. Wright* DATE: *8-2-93*

SAMPLE IDENTIFICATION

Sample Number	Sample Schedule Number
<i>R36.31</i>	<i>NA</i>

93-08657

CHAIN OF POSSESSION

Relinquished by:	Received by:	Date/Time:
<i>R. Wright</i>	<i>D.S. Ode</i>	<i>8-2-93 1005</i>
Relinquished by:	Received by:	Date/Time:
<i>D.S. Ode</i>	<i>Theresa [unclear]</i>	<i>8-2-93 1112</i>
Relinquished by:	Received by:	Date/Time:
<i>Cheryl [unclear]</i>	<i>Dianna Bellafante</i>	<i>8/3/93 3:45p</i>
Relinquished by:	Received by:	Date/Time:

2A 104

B01-011

000103

WHC-SD-WM-DP-053
ADDENDUM^{QA} REV. 0

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WHC-SD-WM-DP-053
ADDENDUM ^{2A} REV. 0

SUPPLEMENTAL INFORMATION

FOR

241-AP-107

PACIFIC NORTHWEST LABORATORY

^{2A}-106

000104

WHC-SD-WM-DP-053
ADDENDUM *2A* REV. 0

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WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0

Sample Receipt Appearance Form

ALO No.: 93-08651

Customer ID: R31620

1. Sample Color: clear

2. Turbidity: Yes No

3. Visible Solids: Yes No

If Yes describe: white precipitate (small flakes)
little bits of red possibly rust
maybe 5

4. Sediments: Yes No

If Yes describe:

6. Describe any general characteristics not covered above: Polypropylene
cap w/teflon tape wrapped around neck of
bottle
Head space ~ 500 ul

Quinn Belloratto
Name

Aug 6, 1993
Date

#819/93

2A-108

C01-003

000105

WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0

Sample Receipt Appearance Form

ALO No.: 93-08652

Customer ID: R3622

1. Sample Color: clear

2. Turbidity: Yes No

3. Visible Solids: Yes No

If Yes describe: white precipitate (small flakes)
small chunk of possibly rust with
about 10 small pieces with the chunk

4. Sediments: Yes No

If Yes describe:

6. Describe any general characteristics not covered above:

Polypropylene cap w/teflon tape wrapped
around neck of bottle
Head space of ~ 500ul

Luciana Bellogatto
Name

Aug 6, 1993
Date

* 8/9/93

2A-109

C01-004

000106

WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0

Sample Receipt Appearance Form

ALO No.: 93-08653

Customer ID: R3624

1. Sample Color: clear
2. Turbidity: Yes No
3. Visible Solids: Yes No

If Yes describe: white precipitate (small flakes)
Red stuff which is a deep maroon color
could be just 2 good size pieces with about
10 small pieces.

4. Sediments: Yes No
- If Yes describe:

6. Describe any general characteristics not covered above: little bit
of head space ~ 200 ^{µl} ~~ml~~ 1 ml
Polypropylene cap w/ Teflon tape wrapped
around neck of bottle
- Diana Bellogatto Name Aug 6, 1993 Date

8/9/93

2A-110

C01-005

000107

WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0

Sample Receipt Appearance Form

ALO No.: 93-08654

Customer ID: R3626

1. Sample Color: Clear

2. Turbidity: Yes No

3. Visible Solids: Yes No

If Yes describe: little bit of white flakes (precipitate) and looks like rust approximately 15 small pieces.

4. Sediments: Yes No

If Yes describe:

6. Describe any general characteristics not covered above:

There was alot of head space ~ 5ml polypropylene cap, w/teflon tape wrapped around neck of vial

Diana Sellofatto
Name

Aug 6, 1993
Date

819/93

2A- 111

C01-006

000108

WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0

Sample Receipt Appearance Form

ALO No.: 93-08655

Customer ID: R3628

1. Sample Color: clear

2. Turbidity: Yes No

3. Visible Solids: Yes No

If Yes describe: white precipitate (small flakes)
a ^{small} red chunk of something maybe rust
with a couple of small pieces

4. Sediments: Yes No

If Yes describe:

6. Describe any general characteristics not covered above: little bit
of headspace possibly 1ml
teflon cap w/teflon tape on neck of bottle

Diana Bellofatto
Name

Aug 6, 1993
Date

AS 8/9/93

QA-112

C01-007

000109

WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0

Sample Receipt Appearance Form

ALO No.: 93-08656 Customer ID: R31629

1. Sample Color: clear

2. Turbidity: Yes No

3. Visible Solids: Yes No

If Yes describe: just a little precipitate

Red small pieces looks like rust

4. Sediments: Yes No

If Yes describe:

6. Describe any general characteristics not covered above:

Polypropylene cap w/teflon tape wrapped
around neck.

Headspace of ~ 500ul

Quana Bellows
Name

Aug 6, 1993
Date

AS/9/93

2A-113

C01-068

000110

WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0

Sample Receipt Appearance Form

ALO No.: 93-08657

Customer ID: R31631

1. Sample Color: Clear

2. Turbidity: Yes No

3. Visible Solids: Yes No

If Yes describe:

4. Sediments: Yes No

If Yes describe:

6. Describe any general characteristics not covered above:

Head space of about 1 ml

Polypropylene cap⁰¹⁵₈₋₁₀₋₉₃

Quana Bellozatto
Name

Aug 6, 1993
Date

AS 8/19/93

QA-114

C01-009

000111

WHC-SD-WM-DP-053
ADDENDUM *2A* REV. 0

242-A EVAPORATOR ANALYTICAL SERVICES
PROJECT FY93

TANK - 107AP

DATA PACKAGE/REPORT

PNL Project #21129

Revision 0



December 29, 1993



*Battelle, Pacific Northwest Laboratory
Analytical Chemistry Laboratory*

2A- 115 |

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1.0 INTRODUCTION

This case narrative provides a summary of each of the analyses conducted on Tank 107AP by the Pacific Northwest Laboratory (PNL)¹, Analytical Chemistry Laboratory (ACL) under the Evaporator Characterization Project (PNL Project Number 21129). This narrative is divided into the following sections:

- 1.0 Introduction
- 2.0 Background
- 3.0 Analytical Summary

2.0 BACKGROUND

The following seven samples from Tank 107AP were delivered to the PNL, ACL for Volatile Organic Analysis (VOA), Semi-Volatile Organic Analysis (SVOA), and Total Organic Carbon (TOC) analysis:

<u>Customer ID</u>	<u>ACL-ID</u>
R3620	93-08651
R3622	93-08552
R3624	93-08553
R3626	93-08554
R3628	93-08655
R3629	93-08656 (TOC and Appearance Only)
R3631	93-08657

An ACL number was assigned to each sample upon receipt. The ACL number is used to cross-reference the Customer ID throughout this data package. Each of the requested analyses was successfully accomplished and reported in the data package, enclosed herewith. No major problems occurred during analysis, minor problems are documented in the narrative for each respective analysis.

3.0 ANALYTICAL SUMMARY

Volatile Organic Analysis (VOA) - Each sample listed in Section 2.0 was aliquoted and analyzed directly for VOA by procedure PNL-ALO-335 (GC/MS Analysis of Volatile Organic Compounds). All analyses were completed within the 14 day holding time (based on sample receipt). No major problems were noted during analysis/data review. A detailed report is found in the data package.

Semi-Volatile Organic Analysis - A 10 ml sample was extracted for SVOA. The samples were extracted following procedure PNL-ALO-120 (a single pH extraction was used). No major problems were noted during analysis/data review. A detailed report is found in the data package.

Total Organic Carbon (TOC) - A TOC determination was completed on each sample (as received). The TOC result is calculated/reported as the difference

¹Pacific Northwest Laboratory is operated for the U.S. Department of Energy by Battelle Memorial Institute under Contract DE-AC06-76 RLO 1830.

WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0

Evaporator 107AP Data Package
Summary Narrative
Revision 0
December, 1993

between the Total Carbon (TC) and Total Inorganic Carbon (TIC) as determined by procedure PNL-ALO-381. One minor problem was noted during data review of the TOC results. It was found that the matrix spike recovery was calculated using an incorrect formula. The formula used to calculate the reported matrix spike recoveries is listed below:

$$\text{Spike Recovery} = \frac{\text{Matrix Spike Result}}{\text{Sample Result} + \text{Spike Amount}}$$

The spike results have been recalculated using the following formula, and some were found to be above the acceptance criteria limit; however, there is no impact on the quality of the data as reported. A detailed report of the TOC results is found in the data package.

$$\text{Spike Recovery} = \frac{\text{Matrix Spike Result} - \text{Sample Result}}{\text{Spike Amount}}$$

A summary of all analytical results generated for Tank 107AP can be found in Table 1.0.

**WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0**

Table 1.0 Evaporator Characterization Project Tank 107-AP Summary Result Listing										
Volatile Organic Analysis Evaporator Target Compound Summary (ug/L)										
Analyte	R3620 93-08651	R3622 93-08652	R3624 93-08653	R3626 93-08654	R3628 93-08655	R3629 93-08656	R3631 93-08657	MS/MSD RPD R3628	MS Recovery R3628	MSD Recovery R3628
Acetone	ND	ND	ND	ND	ND	NA	ND	NA	NA	NA
2-Butanone	ND	ND	ND	ND	ND	NA	ND	NA	NA	NA
2-Hexanone	ND	ND	ND	ND	ND	NA	ND	NA	NA	NA
Tetrahydrofuran	ND	ND	ND	ND	ND	NA	ND	5	88	84
Semi-Volatile Organic Analysis Evaporator Target Compound Summary (ug/L)										
Analyte	R3620 93-08651	R3622 93-08652	R3624 93-08653	R3626 93-08654	R3628 93-08655	R3629 93-08656	R3631 93-08657	MS/MSD RPD R3628	MS Recovery R3628	MSD Recovery R3628
Benzyl Alcohol	ND	ND	ND	ND	ND	NA	ND	NA	NA	NA
1-Butanol	14000	14000	15000	7800	6400	NA	ND	NA	NA	NA
2-Butoxyethanol	ND	ND	ND	ND	ND	NA	ND	NA	NA	NA
Tetradecane	ND	ND	ND	ND	ND	NA	ND	NA	NA	NA
Tributylphosphate	3200	2200	2300	4700	2600	NA	ND	NA	NA	NA
Tridecane	ND	ND	ND	ND	ND	NA	ND	NA	NA	NA
2-Propanol	ND	ND	ND	ND	ND	NA	ND	NA	NA	NA
Total Organic Carbon Results (ug/L)										
Analyte	R3620 93-08651	R3622 93-08652	R3624 93-08653	R3626 93-08654	R3628 93-08655	R3629 93-08656	R3631 93-08657	RPD R3620	MS Recovery R3628 (Based on TIC)	MSD Recovery R3628 (Based on TIC)
TOC	80/60	60/50	40/0	70/60	100/90	10/0	.6/<.5	29	101	100

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WHC-SD-WM-DP-053
ADDENDUM^{QA} REV. 0

242-A EVAPORATOR ANALYTICAL SERVICES
PROJECT FY93

TANK 107AP

APPENDIX A

TEST INSTRUCTIONS

DATA PACKAGE/REPORT

Revision 0

^{QA}- 119
A00-001

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**WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0**

242-A EVAPORATOR ANALYTICAL SERVICES
PROJECT FY93

TANK 107AP

DATA PACKAGE/REPORT

Appendix A

TABLE OF CONTENTS

Appendix A: Test Instructions

A1 - Test Instructions

QA - 120

A00-002

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WHC-SD-WM-DP-053
ADDENDUM^{QA} REV. 0

**A1 - PNL EVAPORATOR SAMPLE
TEST INSTRUCTIONS**

QA - 121

A01-001

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**WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0**

DON'T SAY IT -- Write It!

Date: July 22, 1993

To: Distribution

From: TY Hosaka

Subject: Evaporator TI

Attached please find a controlled copy of the Evaporator-TI. This Test Instructions provides information for the first tank to be delivered under this project (101AP). New work packages will be assigned to subsequent tanks, and will be communicated to you as an addendum to this TI.

Also attached is a read and understand form for this TI. Please complete the form and return to me as soon as possible. (charge time for read and understand to M23805 Project Readiness)

Please note that each analysis needs to be run in duplicate for each sample delivered.

If you have any questions regarding this matter please feel free to call me at 372-2207.

Thanks
Terry


Distribution:

DL Bellofatto
CE Chamberlin
FV Hoopes
EW Hoppe
GS Klinger
GA Ross
MJ Steele
RT Steele

2A - 122

A01-002

WHC-SD-WM-DP-053
ADDENDUM *QA* REV. 0

CONTROLLED DOCUMENT
COPY NO. 01

TI-Evap-1
Page 1 of 8
Revision 0
07/02/93

PNL EVAPORATOR SAMPLE TEST INSTRUCTION
PROJECT NUMBER 21129
CASE NUMBER: EVAPORATOR

DATE PREPARED: July 21, 1993 PREPARED BY: TY HOSAKA

MATRIX: Liquid/aqueous

APPROVED BY:

Junji A. Hosaka
Project Manager

7-22-93
Date

CONTROLLING DOCUMENTS:

Project TPP: Evaporator Analytical Services Technical Project Plan, Revision 0.

Project QAPjP: 200-BP-1 QAPjP ALO-001, Revision 1.

Administrative Procedure: PNL-ALO-010

INTRODUCTION:

This Test Instruction (TI) defines the scope of work to be completed on all Double Shell Tank (DST) samples delivered to the Analytical Chemistry Laboratory (ACL) under the Evaporator Analytical Services Project. Samples from tanks 101AP, 107AP and 108AP are covered by this TI. This TI is based on the Evaporator Analytical Services Technical Project Plan (TPP) 20772.

All analyses are to be completed following the procedures listed in Table 1.0 (except where noted in Table 3.0). The procedures listed for VOA and Semi-VOA analysis will be modified to accommodate additional constituents required by the Evaporator Statement of Work (SOW). These additional compounds are listed in Table 2.0. Samples received shall be identified using the ACL Sample Log-In Form.

Please note that a data package will be required for all analyses conducted under this project. Data package requirements can be found in the TPP.

Any deviation from this TI requires prior approval from the Project Manager.

QA-123

A01-003

WHC-SD-WM-DP-053
ADDENDUM *QA* REV. 0

TI-Evap-1
Page 2 of 8
Revision 0
07/02/93

Table 1.0

REQUESTED ANALYSES:

ANALYSIS	PROCEDURE	TASK LEADER	WP# Tank 101AP*
Sample Receipt	PNL-ALO-010	Steele	M23815
Appearance	Standard Methods 2110	Steele	M23816
VOA Prep	PNL-ALO-121**	Steele	M23817
Semi-VOA Prep	PNL-ALO-120	Steele	M23818
Semi-VOA Prep	PNL-ALO-122	Steele	M23818
TOC	PNL-ALO-380	Steele	M23819
VOA	PNL-ALO-331**	Hoppe	M23817
	PNL-ALO-332**	Hoppe	M23817
	PNL-ALO-335	Hoppe	M23817
Semi-VOA	PNL-ALO-340**	Hoppe	M23818
	PNL-ALO-345	Hoppe	M23818

* note - updates to this TI will be provided to transmit work package numbers for subsequent tanks analyzed under this project.

** note - optional methods, employed at the discretion of the cognizant scientist.

QA - 124

A01-004

WHC-SD-WM-DP-053
ADDENDUM *QA* REV. 0

TI-Evap-1
Page 3 of 8
Revision 0
07/02/93

Table 2.0

ADDITIONAL NON-ROUTINE COMPOUNDS

COMPOUND	METHOD
2-Butoxyethanol	Semi-VOA
1-Butanol	Semi-VOA
Tetrahydrofuran	VOA

QA - 125

A01-005

WHC-SD-WM-DP-053
ADDENDUM^{2A} REV. 0

TI-Evap-1
Page 4 of 8
Revision 0
07/02/93

SAMPLE RECEIPT INSTRUCTIONS:

All samples covered by this TI will be received by the Shielded Analytical Laboratory (SAL). Chain of Custody requirements are in effect for these samples. The Appearance analysis will be completed at the time of sample receipt. The Appearance analysis shall be conducted in accordance to the 17th Edition of the Standard Methods for the Examination of Water and Wastewater (Method 2110), which is as follows:

To record the general physical appearance of a sample, use any terms that briefly describe its visible characteristics. These terms may state the presence of color, turbidity, suspended solids, crustacea, larvae, worms, sediment, floating material, and similar particulate matter detectable by the unaided eye.

All appearance information shall be documented using the Sample Receipt Appearance Form (Exhibit I). The Sample Receipt Appearance Form shall be completed and forwarded to the Project Manager along with the Sample Receipt Form and WHC Chain of Custody Forms.

SAMPLE PREPARATION INSTRUCTIONS:

Representative aliquots will be transferred to the appropriate Task Leader for sample preparation in accordance with PNL-AO-010. Each sample will be prepared/analyzed in duplicate. Whenever possible, samples from each tank should be processed separately as a single batch. If the batch size is too large, then two batches should be analyzed for each tank. The samples and corresponding tank identification are listed in Table 3.0. Table 3.0 should be used as a guide to determine sample batching.

2A - 126

A01-006

WHC-SD-WM-DP-053
ADDENDUM *QA* REV. 0

TI-Evap-1
Page 5 of 8
Revision 0
07/02/93

Table 3.0

ALO Number	Evap. Number*	Tank ID**	Comment
93-08644	R3607	101AP	277"
93-08645	R3609	101AP	613"
93-08646	R3611	101AP	373"
93-08647	R3613	101AP	469"
93-08648	R3615	101AP	565"
93-08649	R3616	101AP	Surface/Analyze for TOC** and Appearance ONLY.
93-08650	R3618	101AP	Field Blank
93-08651	R3620	107AP	589"
93-08652	R3622	107AP	505"
93-08653	R3624	107AP	445"
93-08654	R3626	107AP	625"
93-08655	R3628	107AP	421"
93-08656	R3629	107AP	Surface/Analyze for TOC** and Appearance ONLY.
93-08657	R3631	107AP	Field Blank
93-09333	R3633	108AP	
93-09334	R3635	108AP	
93-09335	R3637	108AP	
93-09336	R3639	108AP	
93-09337	R3641	108AP	
93-09338	R3642	108AP	Surface/Analyze for TOC** and Appearance ONLY.
93-09339	R3644	108AP	Field Blank

* note - Evaporator sample ID's to be provided by WHC upon sample receipt.

** note - All samples are to be analyzed in duplicate for each required analysis.

QA - 127

A01-007

WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0

TI-Evap-1
Page 6 of 8
Revision 0
07/02/93

QUALITY CONTROL:

All sample preparation and analyses shall be conducted following the CERCLA protocol option, if available, in the procedure (See Table 1.0).

Each sample will be analyzed in duplicate. In addition to the duplicate analysis a preparation blank (hot-cell blank), matrix spike (MS) and matrix spike duplicate (MSD) shall be analyzed with each analytical batch.

SAMPLE IDENTIFICATION SYSTEM:

The sample identification system, outlined below, will be followed. Each sample will be identified by a unique ALO number assigned at the time of log-in (See Table 3.0). Sample QC shall be identified as follows:

sample	93-xxxxx
duplicate	93-xxxxxD
matrix spike	93-xxxxxMS
MS duplicate	93-xxxxxMSD

Additional batch QC shall be designated as follows:

Preparation Blank	PB
Method Blank	FBLKXX

Where F is the fraction designator (F = V for Volatiles, S for Semi-volatiles, I for IC, and H for HPLC)

and XX is a unique numerical identifier (i.e., VBLK1, VBLK2, etc.)

DELIVERABLES:

A separate report will be issued for each tank analyzed under this project. All reports shall cross-reference Client ID to ACL sample number and both shall include appropriate QC suffixes.

VOA, SVOA, Appearance, and TOC data, for each tank, shall be reported in time to accommodate a 85 day turn around time (TAT). TAT will be based on the receipt date of the last sample delivered per tank.

Final data report deliverables shall include: case narrative for each analysis, summary of all analytes detected above IDL/CRDL/CRQL, RPD flags for duplicate precision, holding time flags when holding times are not met, and matrix spike recovery flags for sample accuracy. Detection limit guidelines shall be included in the final report.

A CLP-type data package is required for volatile and semi-volatile analysis. The routine CLP data package will be modified to accommodate additional non-CLP target compounds requested in the Evaporator SOW. These additional

2A-128

A01-008

WHC-SD-WM-DP-053
ADDENDUM *QA* REV. 0

TI-Evap-1
Page 7 of 8
Revision 0
07/02/93

compounds will be incorporated on the Form I report and also identified separately in the case narrative for each analysis. Appropriate spike, calibration, and standard information, for the non-routine compounds, will also be incorporated into the data package.

A data package is also required for the TOC analysis conducted under this project, however, the format need not be CLP. At a minimum this data packages should include: case narrative, summary data report, and raw data supporting the results (instrument calibration, balance/pipet checks, raw analytical data, standard information, etc.). These data packages will be reviewed by the ACL QA/QC Project Manager, or designee, to ensure that an adequate amount of information is available to complete a full data validation.

Volatile, semi-volatile, Appearance (Sample Receipt Appearance Form only) and TOC data packages, for Tank 101AP, are due to the ACL Records Processing Center by September 1, 1993. Data package due dates for Tanks 107AP and 108AP will be provided in updates to this TI.

QA - 129

A01-009

WHC-SD-WM-DP-053
ADDENDUM *QA* REV. 0

TI-Evap-1
Page 8 of 8
Revision 0
07/02/93

Sample Receipt Appearance Form

ALO No.: _____

Customer ID: _____

1. Sample Color: _____

2. Turbidity: Yes No

3. Visible Solids: Yes No

If Yes describe:

4. Sediments: Yes No

If Yes describe:

6. Describe any general characteristics not covered above:

Name

Date

QA-130

A01-010

WHC-SD-WM-DP-053
ADDENDUM ^{2A} REV. 0

DON'T SAY IT -- Write It!

Date: August 2, 1993

To: Distribution

From: TY Hosaka

Subject: Evaporator TI-Rev. 1

Attached please find a copy of the Evaporator Test Instruction, Revision 1. The revision changes the TOC procedure from ALO-380 (solids) to ALO-381 (liquids).

Also attached is the first addendum to the test instruction. The addendum was written to communicate new work packages set up for the second tank received under the evaporator project (107AP). Please use these new work packages when working on samples from tank 107AP.

If you have any questions regarding this matter please feel free to call me at 372-2207.

Thanks,
Terry

Distribution:

TY Hosaka
DL Bellofatto
CE Chamberlin
FV Hoopes
EW Hoppe
GS Klinger
GA Ross
MJ Steele
RT Steele

E54-3000-101 (10/89)

2A-131

A01-011

WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0

Evaporator - Test Instruction
Addendum #1
Work Packages for Tank 107AP

ANALYSIS	PROCEDURE	TASK LEADER	WP# Tank 107AP
Sample Receipt	PNL-ALO-010	Steele	M23821
Appearance	Standard Methods 2110	Steele	M23822
VOA Prep	PNL-ALO-121*	Steele	M23823
Semi-VOA Prep	PNL-ALO-120	Steele	M23824
Semi-VOA Prep	PNL-ALO-122	Steele	M23824
TOC	PNL-ALO-381	Steele	M23825
VOA	PNL-ALO-331*	Hoppe	M23823
	PNL-ALO-332*	Hoppe	M23823
	PNL-ALO-335	Hoppe	M23823
Semi-VOA	PNL-ALO-340*	Hoppe	M23824
	PNL-ALO-345	Hoppe	M23824

* note - optional methods, employed at the discretion of the cognizant scientist.

2A-132

A01-012

WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0

CONTROLLED DOCUMENT
COPY NO. 01

TI-Evap-1
Page 1 of 8
Revision 1
08/02/93

PNL EVAPORATOR SAMPLE TEST INSTRUCTION
PROJECT NUMBER 21129
CASE NUMBER: EVAPORATOR

DATE PREPARED: August 02, 1993 PREPARED BY: TY HOSAKA
MATRIX: Liquid/aqueous
APPROVED BY: Ty Hosaka 8-02-93
Project Manager Date

CONTROLLING DOCUMENTS:

Project TPP: Evaporator Analytical Services Technical Project Plan,
Revision 0.
Project QAPJP: 200-BP-1 QAPJP ALO-001, Revision 1.
Administrative Procedure: PNL-ALO-010

INTRODUCTION:

This Test Instruction (TI) defines the scope of work to be completed on all Double Shell Tank (DST) samples delivered to the Analytical Chemistry Laboratory (ACL) under the Evaporator Analytical Services Project. Samples from tanks 101AP, 107AP and 108AP are covered by this TI. This TI is based on the Evaporator Analytical Services Technical Project Plan (TPP) 20772.

All analyses are to be completed following the procedures listed in Table 1.0 (except where noted in Table 3.0). The procedures listed for VOA and Semi-VOA analysis will be modified to accommodate additional constituents required by the Evaporator Statement of Work (SOW). These additional compounds are listed in Table 2.0. Samples received shall be identified using the ACL Sample Log-In Form.

Please note that a data package will be required for all analyses conducted under this project. Data package requirements can be found in the TPP.

Any deviation from this TI requires prior approval from the Project Manager.

2A-133

A01-013

WHC-SD-WM-DP-053
ADDENDUM *QA* REV. 0

TI-Evap-1
Page 2 of 8
Revision 1
08/02/93

Table 1.0

REQUESTED ANALYSES:

ANALYSIS	PROCEDURE	TASK LEADER	WP# Tank 101AP*
Sample Receipt	PNL-ALO-010	Steele	M23815
Appearance	Standard Methods 2110	Steele	M23816
VOA Prep	PNL-ALO-121**	Steele	M23817
Semi-VOA Prep	PNL-ALO-120	Steele	M23818
Semi-VOA Prep	PNL-ALO-122	Steele	M23818
TOC	PNL-ALO-381	Steele	M23819
VOA	PNL-ALO-331**	Hoppe	M23817
	PNL-ALO-332**	Hoppe	M23817
	PNL-ALO-335	Hoppe	M23817
Semi-VOA	PNL-ALO-340**	Hoppe	M23818
	PNL-ALO-345	Hoppe	M23818

* note - updates to this TI will be provided to transmit work package numbers for subsequent tanks analyzed under this project.

** note - optional methods, employed at the discretion of the cognizant scientist.

QA-134

A01-014

WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0

TI-Evap-1
Page 3 of 8
Revision 1
08/02/93

Table 2.0

ADDITIONAL NON-ROUTINE COMPOUNDS

COMPOUND	METHOD
2-Butoxyethanol	Semi-VOA
1-Butanol	Semi-VOA
Tetrahydrofuran	VOA

2A-135

A01-015

WHC-SD-WM-DP-053
ADDENDUM *2* A REV. 0

TI-Evap-1
Page 4 of 8
Revision 1
08/02/93

SAMPLE RECEIPT INSTRUCTIONS:

All samples covered by this TI will be received by the Shielded Analytical Laboratory (SAL). Chain of Custody requirements are in effect for these samples. The Appearance analysis will be completed at the time of sample receipt. The Appearance analysis shall be conducted in accordance to the 17th Edition of the Standard Methods for the Examination of Water and Wastewater (Method 2110), which is as follows:

To record the general physical appearance of a sample, use any terms that briefly describe its visible characteristics. These terms may state the presence of color, turbidity, suspended solids, crustacea, larvae, worms, sediment, floating material, and similar particulate matter detectable by the unaided eye.

All appearance information shall be documented using the Sample Receipt Appearance Form (Exhibit I). The Sample Receipt Appearance Form shall be completed and forwarded to the Project Manager along with the Sample Receipt Form and WHC Chain of Custody Forms.

SAMPLE PREPARATION INSTRUCTIONS:

Representative aliquots will be transferred to the appropriate Task Leader for sample preparation in accordance with PNL-ALO-010. Each sample will be prepared/analyzed in duplicate. Whenever possible, samples from each tank should be processed separately as a single batch. If the batch size is too large, then two batches should be analyzed for each tank. The samples and corresponding tank identification are listed in Table 3.0. Table 3.0 should be used as a guide to determine sample batching.

JA-136

A01-016

WHC-SD-WM-DP-053
 ADDENDUM *QA* REV. 0

TI-Evap-1
 Page 5 of 8
 Revision 1
 08/02/93

Table 3.0

ALO Number	Evap. Number*	Tank ID**	Comment
93-08644	R3607	101AP	277"
93-08645	R3609	101AP	613"
93-08646	R3611	101AP	373"
93-08647	R3613	101AP	469"
93-08648	R3615	101AP	565"
93-08649	R3616	101AP	Surface/Analyze for TOC** and Appearance ONLY.
93-08650	R3618	101AP	Field Blank
93-08651	R3620	107AP	589"
93-08652	R3622	107AP	505"
93-08653	R3624	107AP	445"
93-08654	R3626	107AP	625"
93-08655	R3628	107AP	421"
93-08656	R3629	107AP	Surface/Analyze for TOC** and Appearance ONLY.
93-08657	R3631	107AP	Field Blank
93-09333	R3633	108AP	
93-09334	R3635	108AP	
93-09335	R3637	108AP	
93-09336	R3639	108AP	
93-09337	R3641	108AP	
93-09338	R3642	108AP	Surface/Analyze for TOC** and Appearance ONLY.
93-09339	R3644	108AP	Field Blank

* note - Evaporator sample ID's to be provided by WHC upon sample receipt.

** note - All samples are to be analyzed in duplicate for each required analysis.

QA-137

A01-017

WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0

TI-Evap-1
Page 6 of 8
Revision 1
08/02/93

QUALITY CONTROL:

All sample preparation and analyses shall be conducted following the CERCLA protocol option, if available, in the procedure (See Table 1.0).

Each sample will be analyzed in duplicate. In addition to the duplicate analysis a preparation blank (hot-cell blank), matrix spike (MS) and matrix spike duplicate (MSD) shall be analyzed with each analytical batch.

SAMPLE IDENTIFICATION SYSTEM:

The sample identification system, outlined below, will be followed. Each sample will be identified by a unique ALO number assigned at the time of log-in (See Table 3.0). Sample QC shall be identified as follows:

sample	93-xxxxx
duplicate	93-xxxxxD
matrix spike	93-xxxxxMS
MS duplicate	93-xxxxxMSD

Additional batch QC shall be designated as follows:

Preparation Blank	PB
Method Blank	FBLKXX

Where F is the fraction designator (F = V for Volatiles, S for Semi-volatiles, I for IC, and H for HPLC)

and XX is a unique numerical identifier (i.e., VBLK1, VBLK2, etc.)

DELIVERABLES:

A separate report will be issued for each tank analyzed under this project. All reports shall cross-reference Client ID to ACL sample number and both shall include appropriate QC suffixes.

VOA, SVOA, Appearance, and TOC data, for each tank, shall be reported in time to accommodate a 85 day turn around time (TAT). TAT will be based on the receipt date of the last sample delivered per tank.

Final data report deliverables shall include: case narrative for each analysis, summary of all analytes detected above IDL/CRDL/CRQL, RPD flags for duplicate precision, holding time flags when holding times are not met, and matrix spike recovery flags for sample accuracy. Detection limit guidelines shall be included in the final report.

A CLP-type data package is required for volatile and semi-volatile analysis. The routine CLP data package will be modified to accommodate additional non-CLP target compounds requested in the Evaporator SOW. These additional

2A-138

A01-018

WHC-SD-WM-DP-053
ADDENDUM *QA* REV. 0

TI-Evap-1
Page 7 of 8
Revision 1
08/02/93

compounds will be incorporated on the Form I report and also identified separately in the case narrative for each analysis. Appropriate spike, calibration, and standard information, for the non-routine compounds, will also be incorporated into the data package.

A data package is also required for the TOC analysis conducted under this project, however, the format need not be CLP. At a minimum this data packages should include: case narrative, summary data report, and raw data supporting the results (instrument calibration, balance/pipet checks, raw analytical data, standard information, etc.). These data packages will be reviewed by the ACL QA/QC Project Manager, or designee, to ensure that an adequate amount of information is available to complete a full data validation.

Volatile, semi-volatile, Appearance (Sample Receipt Appearance Form only) and TOC data packages, for Tank 101AP, are due to the ACL Records Processing Center by September 1, 1993. Data package due dates for Tanks 107AP and 108AP will be provided in updates to this TI.

QA - 139

A01-019

WHC-SD-WM-DP-053
ADDENDUM *QA* REV. 0

TI-Evap-1
Page 8 of 8
Revision 1
08/02/93

Sample Receipt Appearance Form

ALO No.: _____

Customer ID: _____

1. Sample Color: _____

2. Turbidity: Yes No

3. Visible Solids: Yes No

If Yes describe:

4. Sediments: Yes No

If Yes describe:

6. Describe any general characteristics not covered above:

Name

Date

QA-140

A01-020

WHC-SD-WM-DP-053
ADDENDUM 2 # REV. 0

QA Plan WHC-SD-053
Program 51100
Task 21129
File Cat. 5

DON'T SAY IT -- Write It!

Date: August 20, 1993

To: Distribution

From: TY Hosaka

Subject: Evaporator TI-Rev. 2

Attached please find a copy of the Evaporator Test Instruction, Revision 2. the revision changes the TOC procedure from ALO-381 to ALO-382.

Included in the revision are new work package numbers to be used for receipt of samples from Tank 108AP (analytical work will be done in FY94). Because of the shut-down at Tank Farm Operations, 108AP samples may not be delivered this fiscal year. If this is the case, new work packages will be provided next fiscal year.

If you have any questions regarding the updated TI please feel free to call me at 372-2207.

Thanks,
Terry

Distribution:

DL Baldwin
DL Bellofatto
CE Chamberlin
FV Hoopes
EW Hoppe
TY Hosaka
GS Klinger
GA Ross
MJ Steele
RT Steele

E54-3000-101 (10/89)

2A-141

A01-021

WHC-SD-WM-DP-053
ADDENDUM A REV. 0

CONTROLLED DOCUMENT
COPY NO. 01

TI-Evap-1
Page 1 of 8
Revision 2
08/20/93

PNL EVAPORATOR SAMPLE TEST INSTRUCTION
PROJECT NUMBER 21129
CASE NUMBER: EVAPORATOR

DATE PREPARED: August 20, 1993 PREPARED BY: TY HOSAKA

MATRIX: Liquid/aqueous

APPROVED BY: TY Hosaka
Project Manager

8/20/93
Date

CONTROLLING DOCUMENTS:

Project TPP: Evaporator Analytical Services Technical Project Plan,
Revision 2.

Project QAPjP: 200-BP-1 QAPjP ALO-001, Revision 1.

Administrative Procedure: PNL-ALO-010

INTRODUCTION:

This Test Instruction (TI) defines the scope of work to be completed on all Double Shell Tank (DST) samples delivered to the Analytical Chemistry Laboratory (ACL) under the Evaporator Analytical Services Project. Samples from tanks 101AP, 107AP and 108AP are covered by this TI. This TI is based on the Evaporator Analytical Services Technical Project Plan (TPP) 20772.

All analyses are to be completed following the procedures listed in Table 1.0 (except where noted in Table 3.0). The procedures listed for VOA and Semi-VOA analysis will be modified to accommodate additional constituents required by the Evaporator Statement of Work (SOW). These additional compounds are listed in Table 2.0. Samples received shall be identified using the ACL Sample Log-In Form.

Please note that a data package will be required for all analyses conducted under this project. Data package requirements can be found in the TPP.

Any deviation from this TI requires prior approval from the Project Manager.

QA-142

A01-022

WHC-SD-WM-DP-053
ADDENDUM *QA* REV. 0

TI-Evap-1
Page 2 of 8
Revision 2
08/20/93

Table 1.0

REQUESTED ANALYSES:

ANALYSIS	PROCEDURE	TASK LEADER	WP# Tank 101AP*
Sample Receipt	PNL-ALO-010	Steele	M23815
Appearance	Standard Methods 2110	Steele	M23816
VOA Prep	PNL-ALO-121**	Steele	M23817
Semi-VOA Prep	PNL-ALO-120	Steele	M23818
Semi-VOA Prep	PNL-ALO-122	Steele	M23818
TOC	PNL-ALO-382	Baldwin	M23819
VOA	PNL-ALO-331**	Hoppe	M23817
	PNL-ALO-332**	Hoppe	M23817
	PNL-ALO-335	Hoppe	M23817
Semi-VOA	PNL-ALO-340**	Hoppe	M23818
	PNL-ALO-345	Hoppe	M23818

* note - updates to this TI will be provided to transmit work package numbers for subsequent tanks analyzed under this project.

** note - optional methods, employed at the discretion of the cognizant scientist.

QA-143

A01-023

WHC-SD-WM-DP-053
ADDENDUM ^A REV. 0

TI-Evap-1
Page 3 of 8
Revision 2
08/20/93

Table 2.0

ADDITIONAL NON-ROUTINE COMPOUNDS

COMPOUND	METHOD
2-Butoxyethanol	Semi-VOA
1-Butanol	Semi-VOA
Tetrahydrofuran	VOA

QA-144

A01-024

WHC-SD-WM-DP-053
ADDENDUM α + REV. 0

TI-Evap-1
Page 4 of 8
Revision 2
08/20/93

SAMPLE RECEIPT INSTRUCTIONS:

All samples covered by this TI will be received by the Shielded Analytical Laboratory (SAL). Chain of Custody requirements are in effect for these samples. The Appearance analysis will be completed at the time of sample receipt. The Appearance analysis shall be conducted in accordance to the 17th Edition of the Standard Methods for the Examination of Water and Wastewater (Method 2110), which is as follows:

To record the general physical appearance of a sample, use any terms that briefly describe its visible characteristics. These terms may state the presence of color, turbidity, suspended solids, crustacea, larvae, worms, sediment, floating material, and similar particulate matter detectable by the unaided eye.

All appearance information shall be documented using the Sample Receipt Appearance Form (Exhibit I). The Sample Receipt Appearance Form shall be completed and forwarded to the Project Manager along with the Sample Receipt Form and WHC Chain of Custody Forms.

SAMPLE PREPARATION INSTRUCTIONS:

Representative aliquots will be transferred to the appropriate Task Leader for sample preparation in accordance with PNL-ALO-010. Each sample will be prepared/analyzed in duplicate. Whenever possible, samples from each tank should be processed separately as a single batch. If the batch size is too large, then two batches should be analyzed for each tank. The samples and corresponding tank identification are listed in Table 3.0. Table 3.0 should be used as a guide to determine sample batching.

QA 145

A01-025

WHC-SD-WM-DP-053
 ADDENDUM A REV. 0

TI-Evap-1
 Page 5 of 8
 Revision 2
 08/20/93

Table 3.0

ALO Number	Evap. Number*	Tank ID**	Comment
93-08644	R3607	101AP	277"
93-08645	R3609	101AP	613"
93-08646	R3611	101AP	373"
93-08647	R3613	101AP	469"
93-08648	R3615	101AP	565"
93-08649	R3616	101AP	Surface/Analyze for TOC** and Appearance ONLY.
93-08650	R3618	101AP	Field Blank
93-08651	R3620	107AP	589"
93-08652	R3622	107AP	505"
93-08653	R3624	107AP	445"
93-08654	R3626	107AP	625"
93-08655	R3628	107AP	421"
93-08656	R3629	107AP	Surface/Analyze for TOC** and Appearance ONLY.
93-08657	R3631	107AP	Field Blank
93-09333	R3633	108AP	
93-09334	R3635	108AP	
93-09335	R3637	108AP	
93-09336	R3639	108AP	
93-09337	R3641	108AP	
93-09338	R3642	108AP	Surface/Analyze for TOC** and Appearance ONLY.
93-09339	R3644	108AP	Field Blank

* note - Evaporator sample ID's to be provided by WHC upon sample receipt.

** note - All samples are to be analyzed in duplicate for each required analysis.

QA-146

A01-026

WHC-SD-WM-DP-053
ADDENDUM^{2A} REV. 0

TI-Evap-1
Page 6 of 8
Revision 2
08/20/93

QUALITY CONTROL:

All sample preparation and analyses shall be conducted following the CERCLA protocol option, if available, in the procedure (See Table 1.0).

Each sample will be analyzed in duplicate. In addition to the duplicate analysis a preparation blank (hot-cell blank), matrix spike (MS) and matrix spike duplicate (MSD) shall be analyzed with each analytical batch.

SAMPLE IDENTIFICATION SYSTEM:

The sample identification system, outlined below, will be followed. Each sample will be identified by a unique ALO number assigned at the time of log-in (See Table 3.0). Sample QC shall be identified as follows:

sample	93-xxxxx
duplicate	93-xxxxxD
matrix spike	93-xxxxxMS
MS duplicate	93-xxxxxMSD

Additional batch QC shall be designated as follows:

Preparation Blank	PB
Method Blank	FBLKXX

Where F is the fraction designator (F = V for Volatiles, S for Semi-volatiles, I for IC, and H for HPLC)

and XX is a unique numerical identifier (i.e., VBLK1, VBLK2, etc.)

DELIVERABLES:

A separate report will be issued for each tank analyzed under this project. All reports shall cross-reference Client ID to ACL sample number and both shall include appropriate QC suffixes.

VOA, SVOA, Appearance, and TOC data, for each tank, shall be reported in time to accommodate a 85 day turn around time (TAT). TAT will be based on the receipt date of the last sample delivered per tank.

Final data report deliverables shall include: case narrative for each analysis, summary of all analytes detected above IDL/CRDL/CRQL, RPD flags for duplicate precision, holding time flags when holding times are not met, and matrix spike recovery flags for sample accuracy. Detection limit guidelines shall be included in the final report.

A CLP-type data package is required for volatile and semi-volatile analysis. The routine CLP data package will be modified to accommodate additional non-CLP target compounds requested in the Evaporator SOW. These additional

QA 147

A01-027

WHC-SD-WM-DP-053
ADDENDUM *QA* REV. 0

TI-Evap-1
Page 7 of 8
Revision 2
08/20/93

compounds will be incorporated on the Form I report and also identified separately in the case narrative for each analysis. Appropriate spike, calibration, and standard information, for the non-routine compounds, will also be incorporated into the data package.

A data package is also required for the TOC analysis conducted under this project, however, the format need not be CLP. At a minimum this data packages should include: case narrative, summary data report, and raw data supporting the results (instrument calibration, balance/pipet checks, raw analytical data, standard information, etc.). These data packages will be reviewed by the ACL QA/QC Project Manager, or designee, to ensure that an adequate amount of information is available to complete a full data validation.

Volatile, semi-volatile, Appearance (Sample Receipt Appearance Form only) and TOC data packages, for Tank 101AP, are due to the ACL Records Processing Center by September 1, 1993. Data package due dates for Tanks 107AP and 108AP will be provided in updates to this TI.

QA-148

A01-028

WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0

TI-Evap-1
Page 8 of 8
Revision 2
08/20/93

Sample Receipt Appearance Form

ALO No.: _____

Customer ID: _____

1. Sample Color: _____

2. Turbidity: Yes No

3. Visible Solids: Yes No

If Yes describe:

4. Sediments: Yes No

If Yes describe:

6. Describe any general characteristics not covered above:

Name

Date

QA - 149

A01-029

WHC-SD-WM-DP-053
ADDENDUM *2A* REV. 0

Evaporator - Test Instruction
Addendum #1
Work Packages for Tank 107AP

ANALYSIS	PROCEDURE	TASK LEADER	WP# Tank 107AP
Sample Receipt Appearance	PNL-ALO-010 Standard Methods 2110	Steele Steele	M23821 M23822
VOA Prep	PNL-ALO-121*	Steele	M23823
Semi-VOA Prep	PNL-ALO-120	Steele	M23824
Semi-VOA Prep	PNL-ALO-122	Steele	M23824
TOC	PNL-ALO-382	Baldwin	M23825
VOA	PNL-ALO-331*	Hoppe	M23823
	PNL-ALO-332*	Hoppe	M23823
	PNL-ALO-335	Hoppe	M23823
Semi-VOA	PNL-ALO-340*	Hoppe	M23824
	PNL-ALO-345	Hoppe	M23824

* note - optional methods, employed at the discretion of the cognizant scientist.

VOA, SVOA, Appearance (Sample Receipt Appearance Form only) and TOC data packages, for Tank 107AP, are due to the ACL Records Processing Center by September 30, 1993.

2A - 150

A01-030

WHC-SD-WM-DP-053

ADDENDUM^{2A} - REV. 0

Evaporator - Test Instruction
Addendum #2
Work Packages for Tank 108AP

ANALYSIS	PROCEDURE	TASK LEADER	WP# Tank 108AP
Sample Receipt	PNL-ALO-010	Steele	M23827
Appearance	Standard Methods 2110	Steele	M23828
VOA Prep	PNL-ALO-121*	Steele	M23828
Semi-VOA Prep	PNL-ALO-120	Steele	M23828
Semi-VOA Prep	PNL-ALO-122	Steele	M23828

* note - optional methods, employed at the discretion of the cognizant scientist.

Data packages for tank 108AP are due to the ACL Records Processing Center 100 days after receipt of the last sample in the Sample Delivery Group.

2A 151

A01-031

WHC-SD-WM-DP-053
ADDENDUM *2A* REV. 0

242-A EVAPORATOR ANALYTICAL SERVICES
PROJECT FY93

TANK 107AP

APPENDIX B

CHAIN OF CUSTODY

DATA PACKAGE/REPORT
Revision 0

2A-152

B00-001

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ADDENDUM^{2A} REV. 0

242-A EVAPORATOR ANALYTICAL SERVICES
PROJECT FY93

TANK 107AP
DATA PACKAGE/REPORT

Appendix B

TABLE OF CONTENTS

Appendix B - Chain of Custody

B1 - Westinghouse Chain of Custody

B2 - PNL Chain of Custody Forms

2A-153

B00-002

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WHC-SD-WM-DP-053
ADDENDUM ^{2A} REV. 0

B1 - WESTINGHOUSE CHAIN OF CUSTODY

AND

PACIFIC NORTHWEST LABORATORY (PNL)

SAMPLE RECEIPT FORMS

2A - 154

B01-001

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WHC-SD-WM-DP-053
ADDENDUM A REV. 0

PNL-ALO-051, Rev. 0
Exhibit 1 Page 1 of 1

SAMPLE RECEIPT FORM

Delivered by: DS Older Date/Time: 8-2-93 11:30

Received by: Clyde Chamberlain

Cust ID No	ALO Sample No	Cust ID No	ALO Sample No	Cust ID No	ALO Sample No
✓ R 3624	93-08653				
✓ R 3628	93-08655				
✓ R 3626	93-08654				
✓ R 3629	93-08656				
✓ R 3622	93-08652				
✓ R 3631	93-08657				
→ R 3620	93-08651				

- Customer Chain-of-Custody form: Present Absent
- Additional shipping forms (list): ORSR
- Custody seals on shipping and/or sample containers and their conditions.
Present Absent
If Present, condition: OK
- Sample tag(s) ID numbers if not recorded on the Chain-of-Custody record or on sample vial. Sample Tag 3620 not listed on Chain of Custody -
Notes: One chain has a signature in sample number line.
- Condition of shipping container (i.e., broken container, dented, breached plastic bag, temperature of sample container as defined in Section 3.0 PNL-ALO-051, etc).
Ambient Temp. Container condition OK
- Condition of sample vials. Not visible.
- Verification of agreement or nonagreement of information on receiving documents.
OK
- Resolution of problems or discrepancies. None

RETURN COMPLETED FORM TO PROJECT MANAGER

QA - 155

B01-002

WHC-SD-WM-DP-053
ADDENDUM A REV. 0

Emergency Contact (509) 373-3800 ERG 70 in vehicle

SHIPPING INST.	SHIP TO:	OFFSITE RADIOACTIVE SHIPMENT RECORD - EXTERIOR INSPECTION PERMITTED -		14219
	Company	PNL/Rattelle		Contractor:
	Address	325 Ridge		<input type="checkbox"/> PNL <input type="checkbox"/> KEH <input checked="" type="checkbox"/> WHC
	City, State, Zip	300 Area		Ship: <input checked="" type="checkbox"/> Prepaid <input type="checkbox"/> Collect Via:
Attention:	Rick Steele		Site Carrier	<input checked="" type="checkbox"/> Motor-Veh <input type="checkbox"/> Air Psgr
			PR No. 64431	Veh. No. 16392
				<input type="checkbox"/> Excl. Use <input type="checkbox"/> Air Cargo
				<input type="checkbox"/> DOE Veh. <input type="checkbox"/> Mail
				<input type="checkbox"/> UPS Sur. <input type="checkbox"/>

Proper Shipping Name	UN Number	Material Form: <input type="checkbox"/> Special (A1) <input checked="" type="checkbox"/> Normal (A2)	For Normal Form Identify:
Radioactive Material	UN 2908	Labels Applied	Physical Form
1. Empty Packages		<input type="checkbox"/> Empty	<input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas
2. Low Specific Activity, n.o.s.	UN 2912	<input type="checkbox"/> Radioactive LSA	Chemical Form
3. Limited quantity, n.o.s.	UN 2910	<input type="checkbox"/> White I	<input type="checkbox"/> Metal <input type="checkbox"/> Oxide
4. N.O.S.	UN 2982	<input type="checkbox"/> Yellow II	<input type="checkbox"/> Elemental <input type="checkbox"/> Nitrate
5. Fissile n.o.s.	UN 2918	<input type="checkbox"/> Yellow III	Other: <u>Picture</u>
6. Special Form, n.o.s.	UN 2974	<input type="checkbox"/> None	
7. Instruments & Articles	UN 2911	<input type="checkbox"/> Danger (Air Cargo)	
8. <u>Consignment</u>	<u>UN 2900</u>	<input type="checkbox"/> Secondary	
		Material Category	Controlled Quantity
		<input type="checkbox"/> Empty	
		<input type="checkbox"/> Low Specific Act. (LSA)	
		<input checked="" type="checkbox"/> Limited Quantity	
		<input type="checkbox"/> Type A Quantity	
		<input type="checkbox"/> Type B Quantity	
		<input type="checkbox"/> Highway Route	

SHIPMENT DESCRIPTION AND CERTIFICATION	TYPE PACKAGE	CONSTRUCTION	FISSILE CLASS	SNM	ACCOUNTABILITY/SECURITY CONTROL
	<input checked="" type="checkbox"/> Strong Tight	<input type="checkbox"/> Box, FB	<input checked="" type="checkbox"/> Non Fissile	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> Classified <input checked="" type="checkbox"/> Unclassified
	<input type="checkbox"/> Type A	<input type="checkbox"/> Wood	<input type="checkbox"/> Fissile Exempt	<input type="checkbox"/> < 1 gr	Consignee authorized to receive this qty <input checked="" type="checkbox"/>
	<input type="checkbox"/> Type B	<input type="checkbox"/> Steel	<input type="checkbox"/> Fissile I	<input type="checkbox"/> Category I	Sig. Security Svc. Reg. <input type="checkbox"/> NA <input checked="" type="checkbox"/>
	<input type="checkbox"/> Type B (U)	<input type="checkbox"/> Drum	<input type="checkbox"/> Fissile II	<input type="checkbox"/> Category II	External Cask Temperature <input type="checkbox"/> N/A <input checked="" type="checkbox"/>
	<input type="checkbox"/> Type B (M)	<input type="checkbox"/> Cask	<input type="checkbox"/> Fissile III	<input type="checkbox"/> Category III	Security Escorts Req. <input type="checkbox"/> Not. Req. <input checked="" type="checkbox"/>
		<input checked="" type="checkbox"/> Other <u>Fiber cartons</u>	Grams Fissile		External Cask Temperature (Max. 122°F LTL, 180°F Ex. Use) <input checked="" type="checkbox"/>

Packaging conforms to appropriate packaging procedure N/A Yes
 Complies with D. O. T packaging marking and labeling requirements N/A Yes
 Container acceptability documented (incl. 7A cert.) N/A Yes

Container examined: No evidence of deterioration or damage Yes
 QA Inspection Current Yes N/A Seals required No Yes
 Shipping Doc. 49 CFR 173.421 Authorization No. _____

No. Pkgs.	Model Package	COC/Spec No.	Serial No.	Seal No.	Isotopes	Curies/Pkg	T. I.	Gr.	
6	Strong Tight	N/A	N/A	N/A	²³⁵ U, ¹³⁷ Cs, ⁶⁰ Co	222 uCi	N/A	2.16	
(1 Field Blank water sample included which is non hazardous sample 3631)									
(All seals are on glass bottles)									
Shipper may describe package in detail on one of unused lines above)						TOTAL	1432 uCi	N/A	14.16

This is to certify that the above named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation, according to the applicable federal, state, local and international regulations for the transportation of hazardous materials.

Certifier's Signature: [Signature] Date: 8-2-93 Organization: TWR Complete Cost Code (inc. end function): N117Y

AREA MONITOR	Surface Dose Rate of Package	Dose Rate at 1 Meter from Surface of Package	Smears of Outer Container	TRUCK LOAD OR EXCLUSIVE USE
	<input checked="" type="checkbox"/> ≤ 0.5 or _____ mrem/hr (N + Bγ)	<input checked="" type="checkbox"/> ≤ 0.5 or _____ mrem/hr (N + Bγ)	<input type="checkbox"/> ≤ 22 dpm Bγ/cm ² <input type="checkbox"/> ≤ 2.2 dpm α/cm ²	Surface: <input type="checkbox"/> ≤ 200 mrem/hr (N + Bγ) @ 6 feet: <input type="checkbox"/> ≤ 10 mrem/hr (N + Bγ) @ Cab <input type="checkbox"/> ≤ 20 mrem/hr (N + Bγ) or Sleeper
	Additional Data and Instructions (inc. Readings on Internal Packaging)			
	Signature - Radiation Monitoring	Bldg.	Survey No.	Date
	<u>[Signature]</u>	<u>141-4P</u>	<u>137336</u>	<u>8/2/93</u>

AUTHORIZATION FOR SHIPMENT

AIR TRANSPORT CERTIFICATION	Cargo Only: <input type="checkbox"/> Danger Labels Applied	Passenger: <input type="checkbox"/> 1. Ltd. Qty. <input type="checkbox"/> 3. Research or Medical Diagnosis	Pkg. Dimensions
		<input type="checkbox"/> 2. S.T.I. <input type="checkbox"/> 4. Human Medical Research	<u>N/A</u>
Traffic has inspected and verified preshipment compliance to DOT regulations.			
Authorized Signature	Printed Name	Date	
<u>[Signature]</u>	<u>Keith R Smith</u>	<u>8/2/93</u>	

TRAFFIC	B. L. No.	Date Shipped	E. T. A.	Routing	<input type="checkbox"/> N/A	Placards
	<u>FJ-588</u>	<u>8-2-93</u>	<u>8-2-93</u>	<u>WHC Vehicle</u>		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
	Surveyed By	Date	Approved for Shipment	Westinghouse Hanford Company	Date	Route Plan
	<u>N/A</u>	<u>N/A</u>	<u>[Signature]</u>	<u>[Signature]</u>	<u>8/2/93</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

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WH-156
B01-003

From: Terry Y Hosaka at PNL26
Date: 8/3/93 4:23 PM
Priority: Normal
TO: Robert C (Clay) Smith at WHC321
TO: John F O'Rourke at WHC338
CC: Rick T Steele
BCC: Terry Y Hosaka
Subject: Evaporator (COC)

WHC-SD-WM-DP-053
ADDENDUM *2* REV. 0

----- Message Contents -----

This is to inform you that one sample from tank 107AP, delivered to the ACL on 8/2/93, did not have a proper chain of custody form. We have deduced by a process of elimination that the sample ID is R3620. The chain of custody form we have associated with this sample has RL Wright's signature where the sample ID is supposed to be annotated. We have updated the form to reflect this error.

Should you have any questions regarding this matter please feel free to call me at 372-2207.

Thanks,
Terry

2A-157

B01-004

WHC-SD-WM-DP-053
ADDENDUM A REV. 0

TANK FARM PLANT OPERATION PROCEDURE

CHAIN OF CUSTODY			
Company Contact	RL WRIGHT	Telephone	323-3552
Bill of Lading No.	NA	Offsite Property No.	NA
Method of Shipment	8-Plant Sample Truck		
Shipped to	325 LAB (PNL)		
SAMPLING INFORMATION			
Sample Collected by	CM/R/MERKT	Date	8-1-93
Sample Location	107-AP	Time	1046 AM
Remarks	NONE		
Ice Chest or Sample Pkg No.	JCB CREAM CARTON	Custody Seat #	335B
		Field Logbook and Page No.	N/A

SUPERVISION REVIEW: R. Wright DATE: 8-1-93

SAMPLE IDENTIFICATION	
Sample Number	R-3670 (Per Schedule 8/2/93)
Sample Schedule Number	NA

93-08051

CHAIN OF POSSESSION		
Relinquished by: <u>R. Wright</u>	Received by: <u>D.S. Oca</u>	Date/Time: <u>8-2-93 1005 AM</u>
Relinquished by: <u>D.S. Oca</u>	Received by: <u>Chad Kumbeli</u>	Date/Time: <u>8-2-93 1112</u>
Relinquished by: <u>Chad Kumbeli</u>	Received by: <u>Riana Wright</u>	Date/Time: <u>8/3/93 3:45p</u>
Relinquished by:	Received by:	Date/Time:

QA-158

B01-005

TANK FARM PLANT OPERATING PROCEDURE

CHAIN OF CUSTODY			
Company Contact:	RL WRIGHT	Telephone:	773-3552
Bill of Lading No.:	NA	Office Property No.:	NA
Method of Shipment:	B-PLANT SAMPLE TRUCK		
Shipped to:	325 (PUL)		
SAMPLING INFORMATION			
Sample Collected by:	CAYLEN HEART	Date:	8-1-93 Time 1030 AM
Sample Location:	127-AD	Custody Seal #:	3360
Remarks:	NONE		
Ice Chest or Sample Pkg. No.:	ICE CREAM CARTON	Field Logbook and Page No.:	N/A

SUPERVISION REVIEW: Rf Wright DATE: 8-1-93

SAMPLE IDENTIFICATION	
Sample Number	Sample Schedule Number
<u>R3622</u>	<u>NA</u>

93-080-02

CHAIN OF POSSESSION		
Relinquished by: <u>Rf Wright</u>	Received by: <u>D. S. O'Quinn</u>	Date/Time: <u>8-2-93 1005 AM</u>
Relinquished by: <u>D. S. O'Quinn</u>	Received by: <u>Robert Chambers</u>	Date/Time: <u>8-2-93 1112</u>
Relinquished by: <u>Robert Chambers</u>	Received by: <u>Robert Chambers</u>	Date/Time: <u>8/2/93 3:45 p</u>
Relinquished by:	Received by:	Date/Time:

2A-159
 B01-006

TANK FARM PLANT OPERATION PROCEDURE

CHAIN OF CUSTODY			
Company Contact	RL WRIGHT	Telephone	323-3552
File of Coding No.	N/A	Office Property No.	N/A
Method of Shipment	B-PLANT Sample TRUCK		
Shipped to	325 (PNL)		
SAMPLING INFORMATION			
Sample Collected by	Caylor	Date	8-1-93 Time 1213
Sample Location	107-AP / (1E)	Custody Seal #	3352
Remarks	NONE		
Ice Chest or Sample Pkg. No.	ICE CREAM CARTON	Field Logbook and Page No.	N/A

SUPERVISION REVIEW: *R. Wright* DATE: 8-1-93

SAMPLE IDENTIFICATION	
Sample Number	Sample Schedule Number
<u>R3624</u>	<u>NA</u>

93-08053

CHAIN OF POSSESSION		
Relinquished by: <i>R. Wright</i>	Received by: <i>D.S. Ode</i>	Date/Time: 8-2-93 1005 AM
Relinquished by: <i>D.S. Ode</i>	Received by: <i>Chad Chamberlain</i>	Date/Time: 8-2-93 1112
Relinquished by: <i>Chad Chamberlain</i>	Received by: <i>Luiana Bellagatto</i>	Date/Time: 8/3/93 3:45p
Relinquished by:	Received by:	Date/Time:

2A-160

WHC-SD-WM-DP-053
ADDENDUM A REV. 0

TANK FARM PLANT OPERATING PROCEDURE

CHAIN OF CUSTODY			
Company Contact:	RL WRIGHT	Telephone:	323-7552
Bill of Lading No.:	NA	Offsite Property No.:	NA
Method of Shipment:	B-Plant Sample Truck		
Shipped to:	325 (PNL)		
SAMPLING INFORMATION			
Sample Collected by:	Caylor/Ment	Date:	8-1-93 Time 1217
Sample Locations:	107-AP (CE)	Custody Seal #:	2361
Remarks:	NONE		
Ice Chest or Sample Pkg. No.:	ICE CREAM CARTON	Field Logbook and Page No.:	N/A

SUPERVISION REVIEW: Rf Wright DATE: 8-1-93

SAMPLE IDENTIFICATION	
Sample Number	Sample Schedule Number
<u>R3626</u>	<u>NA</u>

93-08634

CHAIN OF POSSESSION		
Relinquished by:	Received by:	Date/Time:
<u>Rf Wright</u>	<u>D.S. Oja</u>	<u>8-2-93 1005AM</u>
Relinquished by:	Received by:	Date/Time:
<u>D.S. Oja</u>	<u>Chandra</u>	<u>8-2-93 1112</u>
Relinquished by:	Received by:	Date/Time:
<u>Chandra</u>	<u>Wiana Bellafante</u>	<u>8/3/93 3:45p</u>
Relinquished by:	Received by:	Date/Time:

Document No.:	Rev/Mod:	Page:
TC-080-030	C-4	21

QA-161

B01-008

TANK FARM PLANT OPERATING PROCEDURE

CHAIN OF CUSTODY			
Company Contact	ALWRIGHT	Telephone	323-3552
Bill of Lading No.	NA	Offsite Property No.	NA
Method of Shipment	B-Plant Sample Truck		
Shipped to	325 (PML)		
SAMPLING INFORMATION			
Sample Collected by	Caylor/MONT	Date	8-1-93 Time 1135
Sample Locations	107-AP (Sw)	Custody Seal #	3356
Remarks	NONE		
Ice Chest or Sample Pkg. No.	ECC CAN CARTON	Field Logbook and Page No.	N/A

SUPERVISION REVIEW: Al Wright DATE: 8-1-93

SAMPLE IDENTIFICATION	
Sample Number	Sample Schedule Number
93-08655 <u>R3628</u>	<u>NA</u>

CHAIN OF POSSESSION		
Relinquished by: <u>Al Wright</u>	Received by: <u>D.S. Old</u>	Date/Time: <u>8-2-93 10:05 AM</u>
Relinquished by: <u>D.S. Old</u>	Received by: <u>Frank Chamberlain</u>	Date/Time: <u>8-2-93 11:12</u>
Relinquished by: <u>Frank Chamberlain</u>	Received by: <u>Diana Belloratto</u>	Date/Time: <u>8/3/93 3:45 p</u>
Relinquished by:	Received by:	Date/Time:

2A-162

B01-009

TANK FARM PLANT OPERATING PROCEDURE

CHAIN OF CUSTODY			
Company Contract	RL WRIGHT	Telephone	323-3552
Bill of Lading No.	NA	Offsite Property No.	NA
Method of Shipment	B-Plant Sample TRUCK		
Shipped to	325 (PUL)		
SAMPLING INFORMATION			
Sample Collected by	CAYLOR/MCIST	Date	8-1-93
Sample Locations	107-AP (SW)	Time	1140AM
Remarks	NONE	Custody Seal #	3355
Ice Chest or Sample Pkg. No.	ICE CLEAN CARTON	Field Logbook and Page No.	N/A

SUPERVISION REVIEW: R. Wright DATE: 8-2-93

SAMPLE IDENTIFICATION	
Sample Number	Sample Schedule Number
93-00656 <u>R3629</u>	<u>NA</u>

CHAIN OF POSSESSION		
Relinquished by: <u>R. Wright</u>	Received by: <u>D.S. OIA</u>	Date/Time: <u>8-2-93 1005AM</u>
Relinquished by: <u>D.S. OIA</u>	Received by: <u>Bob Chumbley</u>	Date/Time: <u>8-2-93 1112</u>
Relinquished by: <u>Bob Chumbley</u>	Received by: <u>Rebecca Ballietti</u>	Date/Time: <u>8/3/93 3:45p</u>
Relinquished by:	Received by:	Date/Time:

QA-163

B01-010

TANK FARM PLANT OPERATING PROCEDURE

CHAIN OF CUSTODY			
Company Contact:	AL WRIGHT	Telephone:	323-3552
TITLE of Cadres No.	NA	Office Property No.	NA
Method of Shipment:	B-PLANT SAMPLE TRUCK		
Shipped to:	325 LAB (PML)		
SAMPLING INFORMATION			
Sample Collected by:	CAYLA LAMBERT	Date:	8-1-93
		Time:	10-1205 AM
Sample Location:	102-AP1 (E) ^{ROCK}	Custody Seal #:	3364
Remarks:	NONE		
Ice Chest or Sample Pkg. No.:	ICE CREAM CARTON	Field Logbook and Page No.:	N/A

SUPERVISION REVIEW: RFWright DATE: 8-2-93

SAMPLE IDENTIFICATION	
Sample Number	Sample Schedule Number
<u>R36.31</u>	<u>NA</u>

93-08657

CHAIN OF POSSESSION		
Relinquished by:	Received by:	Date/Time:
<u>RFWright</u>	<u>D.S. Ock</u>	<u>8-2-93 1005</u>
Relinquished by:	Received by:	Date/Time:
<u>D.S. Ock</u>	<u>Paul Chamberlain</u>	<u>8-2-93 1112</u>
Relinquished by:	Received by:	Date/Time:
<u>Paul Chamberlain</u>	<u>Diana Bellafant</u>	<u>8/3/93 3:45p</u>
Relinquished by:	Received by:	Date/Time:

2A-164

B01-011

WHC-SD-WM-DP-053
ADDENDUM *2A* REV. 0

B2 - PACIFIC NORTHWEST LABORATORY (PNL)

CHAIN OF CUSTODY FORMS

2A-165

B02-002

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WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0

Page 1 of 1

Chain of Custody Number EVAP-02

ACL CHAIN OF CUSTODY

SAMPLE DESCRIPTION TANK 107AP-EVAPORATOR/21129

ORIGINATOR ORGANIC

APPLICABLE TEST INSTRUCTION TL-EVAP-1 REV 1

ANALYSIS REQUESTED OR DEPARTMENT TOC

PREP METHOD NONE

ACL SAMPLE NUMBER	SAMPLE DESCRIPTION	SENDER	DATE	RECEIVER	DATE
93-08651	R3620	<i>DeBellis</i>	8/13/93	<i>John Curren</i>	8/13/93
93-08652	R3622	<i>DeBellis</i>		<i>John Curren</i>	
93-08653	R3624	<i>DeBellis</i>		<i>John Curren</i>	
93-08654	R3626	<i>DeBellis</i>		<i>John Curren</i>	
93-08655	R3628	<i>DeBellis</i>		<i>John Curren</i>	
93-08656	R3629	<i>DeBellis</i>		<i>John Curren</i>	
93-08657	R3631	<i>DeBellis</i>		<i>John Curren</i>	

Original - Project Management
Copy - Sender
Copy - Receiver

2A-166

B02-003

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WHC-SD-WM-DP-053
ADDENDUM ^{QA} REV. 0

242-A EVAPORATOR ANALYTICAL SERVICES
PROJECT FY93

TANK 107AP

APPENDIX C

SAMPLE VERIFICATION

DATA PACKAGE/REPORT

Revision 0

QA-167

C00-001

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WHC-SD-WM-DP-053
ADDENDUM ^{2A} REV. 0

242-A EVAPORATOR ANALYTICAL SERVICES
PROJECT FY93

TANK 107AP

DATA PACKAGE/REPORT

Appendix C

TABLE OF CONTENTS

Appendix C: Sample Verification

C1 - Appearance Test

2A-168

C00-002

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WHC-SD-WM-DP-053
ADDENDUM *2A* REV. 0

C1 - APPEARANCE TEST

2A-169

C01-001

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WHC-SD-WM-DP-053
ADDENDUM^{2A} REV. 0

CURRENT DATE: August 10, 1993

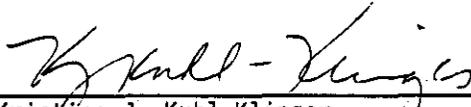
QUALITY CONTROL DATA REVIEW

I have reviewed the following data for completeness of the QC data and for compliance with project QC requirements as defined in the TPP 20772 and 21129 and the QAPJP ALO-001.

Analyte - Appearance Test

Data Package/Report - Evaporator

ALO Numbers - 93-08651 93-08652 93-08653 93-08654 93-08655 93-08656
93-08657



Kristine J. Kuhl-Klinger
PNL ACL Quality Representative

8/13/93

Date

2A-170

C01-002

WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0

Sample Receipt Appearance Form

ALO No.: 93-08651

Customer ID: R3620

1. Sample Color: clear

2. Turbidity: Yes No

3. Visible Solids: Yes No

If Yes describe: white precipitate (small flakes)
little bits of red possibly rust
maybe 5

4. Sediments: Yes No

If Yes describe:

6. Describe any general characteristics not covered above: Polypropylene

cap w/teflon tape wrapped around neck of
bottle

Head space ~ 500 ul

Name Diana Belloratto

Date Aug 6, 1993

#819193

2A- 171

C01-003

WHC-SD-WM-DP-053
ADDENDUM ^{2A} REV. 0

Sample Receipt Appearance Form

ALO No.: 93-08652

Customer ID: R3622

1. Sample Color: clear

2. Turbidity: Yes No

3. Visible Solids: Yes No

If Yes describe: white precipitate (small flakes)
small chunk of possibly rust with
about 10 small pieces with the chunk

4. Sediments: Yes No

If Yes describe:

6. Describe any general characteristics not covered above:

Polypropylene cap w/teflon tape wrapped
around neck of bottle
Head space of ~ 500ul

Luciana Bellogatto
Name

Aug 6, 1993
Date

8/9/93

2A-172

C01-004

WHC-SD-WM-DP-053
ADDENDUM 2A-REV. 0

Sample Receipt Appearance Form

ALO No.: 93-08653

Customer ID: R3624

1. Sample Color: clear

2. Turbidity: Yes No

3. Visible Solids: Yes No

If Yes describe: white precipitate (small flakes)
Red stuff which is a deep maroon color
could be rust 2 good size pieces with about
10 small pieces.

4. Sediments: Yes No

If Yes describe:

6. Describe any general characteristics not covered above: little bit
of head space ~ 200 ^{DA} ₅₆₇₂ 1 ml
Polypropylene cap w/teflon tape wrapped
around neck of bottle

Diana Bellocatto
Name

Aug 6, 1993
Date

11/8/93

2A-173

C01-005

WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0

Sample Receipt Appearance Form

ALO No.: 93-08654

Customer ID: R36216

1. Sample Color: Clear

2. Turbidity: Yes No

3. Visible Solids: Yes No

If Yes describe: little bit of white flakes (precipitate) and looks like rust approximately 15 small pieces.

4. Sediments: Yes No

If Yes describe:

6. Describe any general characteristics not covered above:

There was a lot of head space ~ 5ml polypropylene cap, w/teflon tape wrapped around neck of vial

Diana Bellocchio
Name

Aug 6, 1993
Date

8/9/93

QA - 174

CO1-006

WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0

Sample Receipt Appearance Form

ALO No.: 93-08655

Customer ID: R3628

1. Sample Color: clear

2. Turbidity: Yes No

3. Visible Solids: Yes No

If Yes describe: white precipitate (small flakes)
a ^{small} red chunk of something maybe rust
with a couple of small pieces

4. Sediments: Yes No

If Yes describe:

6. Describe any general characteristics not covered above: little bit
of headspace possibly 1ml
teflon cap w/teflon tape on neck of bottle

Diana Bellocchio
Name

Aug 6, 1993
Date

AA 8/9/93

2A-175

C01-007

WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0

Sample Receipt Appearance Form

ALO No.: 93-08656

Customer ID: R31629

1. Sample Color: clear

2. Turbidity: Yes No

3. Visible Solids: Yes No

If Yes describe: just a little precipitate

Red small pieces looks like rust

4. Sediments: Yes No

If Yes describe:

6. Describe any general characteristics not covered above:

Polypropylene cap w/teflon tape wrapped
around neck.

Headspace of ~ 500ul

Aisana Beloyatis
Name

Aug 6, 1993
Date

AS/9/93

77-176

C01-008

WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0

Sample Receipt Appearance Form

ALO No.: 93-08657

Customer ID: R31631

1. Sample Color: clear

2. Turbidity: Yes No

3. Visible Solids: Yes No

If Yes describe:

4. Sediments: Yes No

If Yes describe:

6. Describe any general characteristics not covered above:

Head space of about 1 ml
Polypropylene cap ^{OK}₈₋₆₋₉₃

Diana Belloyatto
Name

Aug 6, 1993
Date

2A 8/9/93

2A-177

C01-009

WHC-SD-WM-DP-053
ADDENDUM *2A* REV. 0

242-A EVAPORATOR ANALYTICAL SERVICES

PROJECT FY93

TANK 107AP

APPENDIX D

ORGANICS

DATA PACKAGE/REPORT

Revision 0

2A - 178

D00-001

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WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0

242-A EVAPORATOR ANALYTICAL SERVICES

PROJECT FY93

TANK 107AP

DATA PACKAGE/REPORT

Appendix D

TABLE OF CONTENTS

Appendix D: Primary Organic Analysis Data

D1 - Laboratory Analyst Signature List

D2 - Total Organic Carbon Analysis

D3 - Volatile Organic Analysis

D4 - Semi-Volatile Organic Analysis

2A - 179

D00-002

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WHC-SD-WM-DP-053
ADDENDUM 2A REV. 0

D1 - LABORATORY ANALYST SIGNATURE LIST

2A-180

D01-001

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