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Closure Certification Report for the TA-9 Hydrothermal Processing Unit

Revision 0.0

Los Alamos National Laboratory
Los Alamos, New Mexico

August 1997

3343

CLOSURE CERTIFICATION REPORT FOR THE TA-9 HYDROTHERMAL PROCESSING UNIT

Revision 0.0

Facility ID No.:	NM0890010515
Facility Name:	Los Alamos National Laboratory
Legal Owner:	U.S. Department of Energy
Legal Operator:	U.S. Department of Energy Los Alamos Area Office 528 35th Street Los Alamos, New Mexico 87544
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Date:	August 1997

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Executive Summary

This report summarizes the actions performed to meet facility closure requirements for the Hydrothermal Processing Unit (HPU) located at Technical Area (TA) 9, Los Alamos National Laboratory (LANL) and permitted under Research, Development and Demonstration (RD&D) Permit No. NM0890010515-RDD2. The closure requirements are specified in the Closure Plan contained in Permit Attachment I.

The approved closure plan states:

> "All equipment associated with the hydrothermal processing unit that has come in direct contact with hazardous waste will be decontaminated and either reused or disposed. Decontamination will be accomplished by flushing distilled water through the apparatus followed by verification sampling."

The HPU was never used to treat hazardous waste, nor was any hazardous waste destined for treatment by the HPU, stored in the RD&D ancillary storage area. This is documented by interviews with, and signed certification statements from the proposed operators of the unit. Therefore, based on the approved closure plan, no decontamination is necessary. However, under an agreement in response to the New Mexico Environment Department (NMED), Hazardous and Radioactive Materials Bureau's (HRMB) Compliance Order No. HRM-97-02, which required that LANL close the unit, the HPU was decontaminated and sampled in accordance with the approved closure plan.

Closure activities and decontamination verification were completed in accordance with the approved closure plan with the exception of the variance noted in Section 2.3 of this closure report. All excess rinsate was held in a less-than-90-day storage area awaiting the results of the analyses. Since the analyses indicated that the rinsate was not hazardous, the excess rinsate was disposed of as non-hazardous liquid waste.

The results of the analyses indicate the presence of minute concentrations of cyclotetramethylenetetranitramine (HMX) explosive, 2-butanone (methyl ethyl ketone), and phenol. HMX suspended in water, a surrogate, was introduced into the HPU to test the unit's ability to pump a suspension. This constituent was detected at a concentration of 2 micrograms per liter (μg/L), which is approximately 7 orders of magnitude less than the concentration of 2%, or 20,000,000 μg/L, introduced as a surrogate. The unit is intended for reuse in research and development operations that

will utilize surrogates containing concentrations of substances that pose a risk greater than that associated with the HMX remaining in the unit. Therefore, the presence of the trace amounts of HMX will have no adverse affect on the reuse of the unit. The 2-butanone and phenol were detected at very low concentrations in the HPU rinsate samples and in quality assurance samples making the results suspect. Although not identified as a method of determining decontamination of the unit in the NMED-approved closure plan, the concentrations detected were compared to risk-based concentrations for tap water published by the U.S. Environmental Protection Agency, Region III to assess relative risk. The remaining concentrations were found to be well below the risk-based levels.

Based on discussions with NMED, although decontamination did not remove the traces of the HMX surrogate suspension, a permit modification incorporating an alternative demonstration of decontamination is not required. The detection of constituents of concern in the HPU samples is being addressed as a variance to the approved closure plan.

The HPU will be reused in a laboratory environment with little or no potential for exposure to the general public and the risk posed by the remaining concentrations in the unit is much less than that posed by incorporating future surrogates into the unit. Therefore, the concentrations of HMX, 2-butanone, and phenol pose no threat to human health or the environment.

1.0 Introduction

1.1 Purpose

Los Alamos National Laboratory (LANL) obtained Research, Development, and Demonstration (RD&D) Permit No. NM0890010515-RDD2 on April 21, 1994, for operation of a hydrothermal processing unit (HPU) located at Technical Area (TA) 9. The New Mexico Environment Department (NMED) issued Compliance Order No. HRM-97-02 requiring the HPU to be closed in accordance with the Closure Plan contained in Permit Attachment I. The purpose of this report is to document that the HPU was closed in accordance with the approved closure plan with the exception of the variance discussed in Section 2.3 of this closure report. In addition, this report contains the results of the sampling and analysis performed during closure activities, a discussion of the variance from the approved closure plan, and the independent registered professional engineer certification as required by Title 20 of the New Mexico Administrative Code (20 NMAC 4.1), Subpart V, Part 264.115.

1.2 Report Organization

Chapter 1.0 presents the purpose of the report, the report organization, and a unit description. Chapter 2.0 includes a description of the closure activities, results of the sampling and analysis, any variances from the approved closure plan, and the location of the files of supporting documentation. Chapter 3.0 presents the certification of accuracy of this report. Appendix A contains the analytical results associated with the sampling and analysis performed during closure activities. Appendix B contains the certification statements from the proposed operators of the HPU. Appendix C contains the independent registered professional engineer certification.

1.3 Unit Description

The HPU includes: fluid supply reservoirs, pumps to bring the fluids to the operating pressure at the desired flow rate, and devices for mixing the fluids before they enter the reactor. All lines in the high-pressure, low-temperature portions of the system are constructed of high-pressure 316 stainless steel tubing and fittings. The reactor is constructed from Inconel 625 tubing. The system is 8 feet wide, 30 feet long, and 5 feet high.

The basic system of the HPU uses: a feed and oxygen supply system, with a 2 gallon per hour processing capability; a heated length of Inconel 625 tubing which serves as the reactor; and a cool-down and pressure let-down subsystem.

The permitted activity for the HPU was to demonstrate the technical feasibility and performance capability of the HPU through hydrothermal processing for the treatment of hazardous wastes containing propellants, explosives, and pyrotechnics. The HPU was never used to conduct this activity.

2.0 Performance of Closure

2.1 Closure Activities

Decontamination and sampling of the HPU were conducted on April 29, 1997. An equipment blank was taken from the distilled water hose prior to flushing the unit. The HPU was flushed with distilled water so that all surfaces of the unit that could have come in contact with the surrogates were decontaminated. The rinsate was sampled in accordance with the approved closure plan. A trip blank was also sent for analysis. All excess rinsate was held in a less-than-90-day storage area awaiting the results of the analyses. Since the analyses indicated that the rinsate was not a hazardous waste, the excess rinsate was disposed of as non-hazardous liquid waste.

2.2 Results

Analytical results for volatile organic compounds (VOC) obtained from LANL's Organic Analysis Group (CST-12) (Appendix A) indicate the presence of 2-butanone (methyl ethyl ketone) in the rinse water obtained from the HPU at 43 and 56 micrograms per liter (μg/L). This is roughly twice the concentration of 2-butanone found in the trip blank (23 μg/L). 2-butanone was not found in the method blank at the laboratory. The cause of the 2-butanone concentration in the rinse water is unknown as there is no corporate knowledge of this constituent ever having been included in the surrogates introduced to the system or having been used as a solvent to decontaminate the unit. Chloroform was also found in the samples but was discounted by the analytical laboratory as laboratory contamination due to its presence in the method blanks.

The Certificate of Analysis from LANL's High Explosives Science and Technology Group (DX-2) indicates the presence of the explosive cyclotetramethylenetetranitramine (HMX) at <2 μg/L (Appendix A). An ex-employee of DX-2, Mr. Phil Dell'Orco, indicated that a 2% (20,000,000 μg/L) HMX in water solution was used as a surrogate to test the HPU's ability to pump a suspension and has signed a certification statement attesting to that fact (Appendix B). Mr. Dell'Orco also indicated that the only substances introduced into the HPU after receipt of the RD&D permit include water to pressurize the system and acetone to remove the HMX surrogate suspension from the unit. The

HMX surrogate suspension was introduced to the system prior to issuance of the permit and is included in this report to account for the detection of HMX in the HPU rinsate samples.

The semivolatile organic compound (SVOC) analytical results obtained from CST-12 (Appendix A) indicate the presence of trace levels of phenol and dimethylphthalate. The concentrations of phenol in the rinse water are 12 and 14 μg/L. This is roughly twice the concentration of phenols found in the equipment blank. The blank concentration (7 μg/L), however, was an estimated value because the concentration of phenol in the sample was less than the limit of quantitation. The concentrations of dimethylphthalate (19 and 15 μg/L) are less than the concentration of this compound found in the equipment blank (23 μg/L) and are therefore not a concern.

2.3 Variance from the Approved Closure Plan

Closure of the HPU was conducted in accordance with the approved closure plan, except for the following variance.

- The closure plan states: "All equipment associated with the hydrothermal processing unit that has come in direct contact with hazardous waste will be decontaminated and either reused or disposed. Decontamination will be accomplished by flushing distilled water through the apparatus followed by verification sampling." It also states: "Successful decontamination will be defined as no explosive constituents of the input waste streams detected in the rinsate."

  Although no hazardous waste was treated by the HPU, the results of the sampling and analyses indicated the presence of HMX at concentrations below 2 μg/L. This constituent was mixed in a 2% solution with water to form a suspension that was run through the system to test its ability to pump the suspension. The HPU is intended to be reused for research and development experiments not involving treatment of regulated hazardous constituents. Future surrogates to be put through the unit will contain concentrations of substances that pose a greater risk to human health and the environment than the current level of HMX present in the unit. The HPU will be used in a laboratory environment with little or no potential for contact by the general public or release of material to the environment.

  Analytical results also indicate the presence of small concentrations of dimethylphthalate, 2-butanone, and phenol. The concentrations of dimethylphalate were less than the concentrations of this compound found in the equipment blank and therefore are not a concern. The 2-butanone and phenol are not "explosive constituents" of hazardous waste and were not part of the input surrogates. No explanation as to how these constituents may have been introduced into the HPU has been identified as there is no corporate knowledge of these constituents ever having been included as surrogates introduced into the unit or having been used as solvents

to decontaminate the unit. The analytical results for these constituents are also somewhat suspect.

2-butanone was detected in the trip blank at approximately half the concentration of the constituent found in the HPU rinsate samples. The trip blank was prepared at TA-59, and the sample container was taken to, but not opened at, the sampling event. Although 2-butanone was not found in the method blank, the concentrations found in the trip blank and HPU samples (23, 43, and 56 µg/L respectively) are very low. The small variance in the analytical results and the close proximity to the limit of quantitation (20 µg/L) indicate possible contamination from a source other than the HPU. 2-butanone is also a very volatile constituent and the HPU is located in a non-air conditioned laboratory. The fact that 2-butanone was not introduced into the unit as a surrogate and because it is so volatile support the conclusion that the 2-butanone came from a source other than the HPU. If, however, 2-butanone did originate from the HPU, the concentration poses no threat to human health or the environment.

Although not identified as a method of determining decontamination of the unit in the NMED-approved closure plan, the concentration of 2-butanone was compared to the U.S. Environmental Protection Agency (EPA), Region III Risk-Based Concentration (RBC) table to assess relative risk. The RBC table lists chemical concentrations corresponding to fixed levels of risk (i.e., a hazard quotient of 1, or lifetime cancer risk of one in a million, whichever occurs at a lower concentration) in water, air, fish tissue, and soil. The table lists a concentration for methyl ethyl ketone (2-butanone) in tap water of 1,900 µg/L. Therefore, a concentration of 56 µg/L poses an inherently minimal threat to human health or the environment.

Phenol was detected in the equipment blank, which was collected from distilled water prior to introduction into the HPU. The concentration of phenol in the equipment blank (7 µg/L) was about half the concentration of the constituent found in the HPU rinsate samples (12 and 14 µg/L); however, the equipment blank concentration was an estimated value because the amount of phenol detected was less than the limit of quantitation. The limit of quantitation for phenol was 10 µg/L. The small variance between the results and the close proximity to the limit of quantitation, along with the fact that phenol was not a surrogate introduced into the unit, suggests that the phenol came from a source other than the HPU. As a basis for comparison, the risk-based concentration for phenol in tap water from the EPA Region III RBC table is 22,000 µg/L. Therefore, even if phenol originated from the HPU, the concentrations pose no threat to human health and the environment.

Based on preliminary discussions with NMED, although decontamination did not remove the traces of the HMX surrogate suspension, a permit modification incorporating an alternative demonstration of decontamination is not required. Thus, the detection of constituents of concern in the HPU samples is being addressed herein as a variance to the approved closure plan.

The HPU was never used to treat hazardous waste, nor was any hazardous waste destined for treatment by the HPU stored in the RD&D ancillary storage area. The HPU is intended to be reused with substances that pose a greater risk to human health and the environment than the HMX surrogate suspension. The presence of 2-butanone and phenol is not certain, but even if present, would not affect the reuse of the equipment or pose a threat to human health or the environment. The unit will be kept in a laboratory environment away from the general public. Therefore, there is no adverse affect to human health or the environment from this variance.

2.4 Location of Supporting Documentation File

A file containing the following information is located in LANL's Hazardous and Solid Waste Group (ESH-19) library, at TA-59, Building OH-1, Room 152:

- Laboratory sample analysis reports
- Quality assurance/quality control documentation
- Chain of Custody records (VOC/SVOC and high explosives analyses)
- EPA Region III RBC table.

Contact Mr. H. L. Plum (U.S. Department of Energy-Los Alamos Area Office) at (505)665-5042 or Mr. Jack Ellvinger (ESH-19) at (505)667-0633 to gain access to or request additional information on the above file documentation.

3.0 Certification of Accuracy

I certify under penalty of law that these documents and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for known violations.

Document Title:

Closure Certification Report for the TA-9 Hydrothermal Processing Unit

Name: _____ Date: August 5, 1997
Dennis J. Erickson, Division Director
Environment, Safety, and Health Division
Los Alamos National Laboratory

Name: Barbara A. Stone for _____ Date: August 7, 1997
Robert H. Day, Division Director
Dynamic Experimentation Division
Los Alamos National Laboratory

Name: Thomas C. Le Dauc _____ Date: August 7, 1997
for G. Thomas Todd, Area Manager
U.S. Department of Energy-Los Alamos Area Office

Appendix A

Analytical Results

Los Alamos
NATIONAL LABORATORY

memorandum

Chemical Science and Technology

CST-12, Organic Chemistry
Los Alamos, New Mexico 87545

To/MS: Dustie Stephens/ESH-19/K498
Laura Kelly/CST-12/K484
Gerry Ansell/CST-12/E517

From/MS: Laura Kelly/CST-12/K484

Phone/FAX: 5-4993/5-5982

Symbol: CST-12:97-259

Date: 14 June, 1997

SUMMARY OF ANALYTICAL RESULTS FOR VOLATILE ORGANIC ANALYSIS - Submission ID 100018770

Method Summary
Four aqueous samples were analyzed by the Organic Analytical Specialty Team (OAST) using EPA SW-846 Method 8260. In summary, a measured volume of sample, 5 mL, was analyzed using the purge and trap method combined with capillary column GC/MS. A Delta Perspective PTA-30 Autosampler and a Tekmar 3000 Purge and Trap Concentrator were interfaced to a Hewlett-Packard 5890 Gas Chromatograph/5971 Mass Selective Detector to perform the analysis.

Results Summary

Sample	VOCs Detected	Amount (ug/L)
200024667	Chloroform	9
Method Blank		
200024658	2-Butanone	23
	Chloroform	5
200024663	Chloroform	6
200024664	2-Butanone	43
	Chloroform	6
200024665	2-Butanone	56
	Chloroform	6

VOCs: Volatile Organic Compounds

Analytical Summary and Anomalies
Below is a summary of required QA/QC parameters as outlined in EPA SW-846 as well as any anomalies that may have occurred during the analysis.

*Calibration QC were within acceptance criteria with the exception of chloroform. The % relative standard deviation (RSD) was above the acceptance criteria of 30%. The high % RSD is related to the presence of chloroform in the reagent water as evident by the method blank results.

*The method blanks analyzed with the samples contained chloroform above the limit of quantitation. The field samples contained chloroform at similar levels. Therefore, the detection of the VOC in the samples can be attributed to laboratory contamination.

*The surrogates were within the control limits for the reported sample data.

*A Matrix Spike (MS) and Matrix Spike Duplicate (MSD) were analyzed with the field sample. The percent recovery and the precision of the spiked analytes were within the acceptance limits. The results have been included as an attachment to this memo.

*Internal standard responses were within acceptance criteria.

*The sample were collected on 4/29/97 and analyzed on 4/30/97 meeting the 7 day holding time period for unpreserved aqueous samples.

*A QC sample was not analyzed with the field samples.

Due to the new data system implemented within CST, the reporting of the data took longer than usual. I apologize for any inconvenience this may have caused.

If you have any questions regarding the data, please contact OAST at 665-4993 or 699-3373.

Cy: CST-12 File

MS/MSD Summary

Spiking Level: 50 ug/kg

Sample 24665

MS

Compound	Amount	% Recovery
1,1-Dichloroethene	43.9	87.8
Benzene	49.2	98.4
Trichloroethene	42.6	85.2
Toluene	49	98
Chlorobenzene	45	90

MSD

			Precision
1,1-Dichloroethene	44.4	88.8	1.1
Benzene	50.3	100.6	1.8
Trichloroethene	46.5	93	8.8
Toluene	52	104	5.9
Chlorobenzene	47.4	94.8	5.2

2A

WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: CST-12 OAST Contract: _____

Project No.: 18770 Site: _____ Location: _____ Group: _____

	SAMPLE NO.	SMC1 #	SMC2 #	SMC3 #	OTHER #	TOT OUT
01	VBLK01	134 *	105	98		1
02	S200024663	106	104	97		
03	S200024664	107	104	96		
04	S200024665	103	104	94		
05	S200024665MS	103	104	83 *		1
06	S200024665MS	99	104	83 *		1
07	S200024658	104	105	95		
08						
09						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						

		QC LIMITS
SMC1	= 1,2-Dichloroethane-d4	(76-114)
SMC2	= Toluene-d8	(88-110)
SMC3	= BFB	(86-115)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D System Monitoring Compound diluted out

FORM II VOA-1

8A

VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: CST-12 OAST Contract: _____

Project No.: 18770 Site: _____ Location: _____ Group: _____

Lab File ID (Standard): VO430001.D Date Analyzed: 4/30/97

Instrument ID: PN917705 Time Analyzed: 1041

GC Column: DB624 ID: 0.53 (mm) Heated Purge (Y/N) Y

		IS1 14-DFB AREA #	RT #	IS2 AREA #	RT #	IS3 AREA #	RT #
	12 HOUR STD	345249	7.11	232358	10.54	104529	13.00
	UPPER LIMIT	690498	7.61	464716	11.04	209058	13.50
	LOWER LIMIT	172625	6.61	116179	10.04	52265	12.50
	SAMPLE NO.						
01	VBLK01	343183	7.14	260167	10.56	110850	13.03
02	S200024663	352232	7.15	256107	10.58	106037	13.04
03	S200024664	345687	7.15	253093	10.57	106482	13.04
04	S200024665	349343	7.16	254205	10.57	109303	13.04
05	S200024665MS	367571	7.15	269966	10.57	140985	13.03
06	S200024665MSD	376951	7.16	271051	10.58	141218	13.03
07	S200024658	352259	7.16	259832	10.58	110078	13.05
08							
09							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							

IS1 14-DFB = 1,4-Difluorobenzene
IS2 = Chlorobenzene-d5
IS3 = 1,4-Dichlorobenzene-d4

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = -50% of internal standard area
RT UPPER LIMIT = +0.50 minutes of internal standard RT
RT LOWER LIMIT = -0.50 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk
* Values outside of QC limits.

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

VBLK01

Lab Name: CST-12 OAST Contract: _____

Project No.: 18770 Site: _____ Location: _____ Group: _____

Matrix: (soil/water) WATER Lab Sample ID: B24666 7 JAL 6/11/97

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: VO430002.D

Level: (low/med) _____ Date Received: 4/30/97

% Moisture: not dec. _____ Date Analyzed: 4/30/97

GC Column: DB624 ID: 0.53 (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		Q
75-71-8	Dichlorodifluoromethane	10	U
74-87-3	Chloromethane	10	U
75-01-4	Vinyl Chloride	10	U
74-83-9	Bromomethane	10	U
75-00-3	Chloroethane	10	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
76-13-1	1,1,2-trichlorotriflouroethane	5	U
74-88-4	Iodomethane	5	U
75-15-0	Carbon Disulfide	5	U
67-64-1	Acetone	20	U
75-09-2	Methylene Chloride	5	U
156-60-5	Trans-1,2-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
594-20-7	2,2-Dichloropropane	5	U
540-59-0	Cis-1,2-Dichloroethene	5	U
78-93-3	2-Butanone	20	U
74-97-5	Bromochloromethane	5	U
67-66-3	Chloroform	7	
71-55-6	1,1,1-Trichloroethane	5	U
563-58-6	1,1-Dichloropropene	5	U
58-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
74-95-3	Dibromomethane	5	U
75-27-4	Bromodichloromethane	5	U
100-610-15	Cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-Pentanone	20	U
108-88-3	Toluene	5	U
100-610-26	Trans-1,2-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.
VBLK01

Lab Name: CST-12 OAST Contract: _____

Project No.: 18770 Site: _____ Location: _____ Group: _____

Matrix: (soil/water) WATER Lab Sample ID: B24666~~8~~7 vtc 6/14/97

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: VO430002.D

Level: (low/med) _____ Date Received: 4/30/97

% Moisture: not dec. _____ Date Analyzed: 4/30/97

GC Column: DB624 ID: 0.53 (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		Q
127-18-4	Tetrachloroethene	5	U
142-28-9	1,3-Dichloropropane	5	U
591-78-6	2-Hexanone	20	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U
108-90-7	Chlorobenzene	5	U
79-34-5	1,1,1,2-Tetrachloroethane	5	U
104-41-4	Ethylbenzene	5	U
108-38-3/106-	M+P-Xylene	5	U
100-42-5	Styrene	5	U
95-47-6	O-Xylene	5	U
75-25-2	Bromoform	5	U
98-82-8	Iso-propylbenzene	5	U
108-86-1	Bromobenzene	5	U
96-18-4	1,2,3-Trichloropropene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
103-65-1	N-propylbenzene	5	U
95-49-8	2-Chlorotoluene	5	U
106-43-4	4-Chlorotoluene	5	U
95-63-6	1,3,5-Trimethylbenzene	5	U
98-06-6	Tert-Butylbenzene	5	U
108-67-8	1,2,4-Trimethylbenzene	5	U
135-98-8	Sec-Butylbenzene	5	U
541-73-1	1,3-Dichlorobenzene	5	U
25155-15	P-Isopropyltoluene	5	U
106-46-7	1,4-Dichlorobenzene	5	U
104-51-8	N-Butylbenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
96-12-8	1,2-Dibromo-3-Chloropropane	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
87-68-3	Hexachlorobutadiene	10	U
95-20-3	Naphthalene	10	U
87-61-6	1,2,3-Trichlorobenzene	10	U

FORM I VOA

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.
S200024658

Lab Name: CST-12 OAST Contract: _____

Project No.: 18770 Site: _____ Location: _____ Group: _____

Matrix: (soil/water) WATER Lab Sample ID: S24658

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: VO430011.D

Level: (low/med) _____ Date Received: 4/30/97

% Moisture: not dec. _____ Date Analyzed: 4/30/97

GC Column: DB624 ID: 0.53 (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		Q
75-71-8	Dichlorodifluoromethane	10	U
74-87-3	Chloromethane	10	U
75-01-4	Vinyl Chloride	10	U
74-83-9	Bromomethane	10	U
75-00-3	Chloroethane	10	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
76-13-1	1,1,2-trichlorotriflouroethane	5	U
74-88-4	Iodomethane	5	U
75-15-0	Carbon Disulfide	5	U
67-64-1	Acetone	20	U
75-09-2	Methylene Chloride	5	U
156-60-5	Trans-1,2-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
594-20-7	2,2-Dichloropropane	5	U
540-59-0	Cis-1,2-Dichloroethene	5	U
78-93-3	2-Butanone	23	
74-97-5	Bromochloromethane	5	U
67-66-3	Chloroform	5	B
71-55-6	1,1,1-Trichloroethane	5	U
563-58-6	1,1-Dichloropropene	5	U
58-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
74-95-3	Dibromomethane	5	U
75-27-4	Bromodichloromethane	5	U
100-610-15	Cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-Pentanone	20	U
108-88-3	Toluene	5	U
100-610-26	Trans-1,2-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U

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6/14/97

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.
S200024658

Lab Name: CST-12 OAST Contract: _____

Project No.: 18770 Site: _____ Location: _____ Group: _____

Matrix: (soil/water) WATER Lab Sample ID: S24658

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: VO430011.D

Level: (low/med) _____ Date Received: 4/30/97

% Moisture: not dec. _____ Date Analyzed: 4/30/97

GC Column: DB624 ID: 0.53 (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		Q
127-18-4	Tetrachloroethene	5	U
142-28-9	1,3-Dichloropropane	5	U
591-78-6	2-Hexanone	20	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U
108-90-7	Chlorobenzene	5	U
79-34-5	1,1,1,2-Tetrachloroethane	5	U
104-41-4	Ethylbenzene	5	U
108-38-3/106-	M+P-Xylene	5	U
100-42-5	Styrene	5	U
95-47-6	O-Xylene	5	U
75-25-2	Bromoform	5	U
98-82-8	Iso-propylbenzene	5	U
108-86-1	Bromobenzene	5	U
96-18-4	1,2,3-Trichloropropene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
103-65-1	N-propylbenzene	5	U
95-49-8	2-Chlorotoluene	5	U
106-43-4	4-Chlorotoluene	5	U
95-63-6	1,3,5-Trimethylbenzene	5	U
98-06-6	Tert-Butylbenzene	5	U
108-67-8	1,2,4-Trimethylbenzene	5	U
135-98-8	Sec-Butylbenzene	5	U
541-73-1	1,3-Dichlorobenzene	5	U
25155-15	P-Isopropyltoluene	5	U
106-46-7	1,4-Dichlorobenzene	5	U
104-51-8	N-Butylbenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
96-12-8	1,2-Dibromo-3-Chloropropane	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
87-68-3	Hexachlorobutadiene	10	U
95-20-3	Naphthalene	10	U
87-61-6	1,2,3-Trichlorobenzene	10	U

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.
200024663

Lab Name: CST-12 OAST Contract: _____

Project No.: 18770 Site: _____ Location: _____ Group: _____

Matrix: (soil/water) WATER Lab Sample ID: S24663

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: VO430004.D

Level: (low/med) _____ Date Received: 4/30/97

% Moisture: not dec. _____ Date Analyzed: 4/30/97

GC Column: DB624 ID: 0.53 (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		Q
75-71-8	Dichlorodifluoromethane	10	U
74-87-3	Chloromethane	10	U
75-01-4	Vinyl Chloride	10	U
74-83-9	Bromomethane	10	U
75-00-3	Chloroethane	10	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
76-13-1	1,1,2-trichlorotriflouroethane	5	U
74-88-4	Iodomethane	5	U
75-15-0	Carbon Disulfide	5	U
67-64-1	Acetone	20	U
75-09-2	Methylene Chloride	5	U
156-60-5	Trans-1,2-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
594-20-7	2,2-Dichloropropane	5	U
540-59-0	Cis-1,2-Dichloroethene	5	U
78-93-3	2-Butanone	20	U
74-97-5	Bromochloromethane	5	U
67-66-3	Chloroform	6	B
71-55-6	1,1,1-Trichloroethane	5	U
563-58-6	1,1-Dichloropropene	5	U
58-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
74-95-3	Dibromomethane	5	U
75-27-4	Bromodichloromethane	5	U
100-610-15	Cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-Pentanone	20	U
108-88-3	Toluene	5	U
100-610-26	Trans-1,2-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.
S200024663

Lab Name: CST-12 OAST Contract: _____

Project No.: 18770 Site: _____ Location: _____ Group: _____

Matrix: (soil/water) WATER Lab Sample ID: S24663

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: VO430004.D

Level: (low/med) _____ Date Received: 4/30/97

% Moisture: not dec. _____ Date Analyzed: 4/30/97

GC Column: DB624 ID: 0.53 (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		Q
127-18-4	Tetrachloroethene	5	U
142-28-9	1,3-Dichloropropane	5	U
591-78-6	2-Hexanone	20	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U
108-90-7	Chlorobenzene	5	U
79-34-5	1,1,1,2-Tetrachloroethane	5	U
104-41-4	Ethylbenzene	5	U
108-38-3/106-	M+P-Xylene	5	U
100-42-5	Styrene	5	U
95-47-6	O-Xylene	5	U
75-25-2	Bromoform	5	U
98-82-8	Iso-propylbenzene	5	U
108-86-1	Bromobenzene	5	U
96-18-4	1,2,3-Trichloropropene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
103-65-1	N-propylbenzene	5	U
95-49-8	2-Chlorotoluene	5	U
106-43-4	4-Chlorotoluene	5	U
95-63-6	1,3,5-Trimethylbenzene	5	U
98-06-6	Tert-Butylbenzene	5	U
108-67-8	1,2,4-Trimethylbenzene	5	U
135-98-8	Sec-Butylbenzene	5	U
541-73-1	1,3-Dichlorobenzene	5	U
25155-15	P-Isopropyltoluene	5	U
106-46-7	1,4-Dichlorobenzene	5	U
104-51-8	N-Butylbenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
96-12-8	1,2-Dibromo-3-Chloropropane	10	U
120-82-	1,2,4-Trichlorobenzene	10	U
87-68-3	Hexachlorobutadiene	10	U
95-20-3	Naphthalene	10	U
87-61-6	1,2,3-Trichlorobenzene	10	U

FORM I VOA

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.
S200024664

Lab Name: CST-12 OAST Contract: _____

Project No.: 18770 Site: _____ Location: _____ Group: _____

Matrix: (soil/water) WATER Lab Sample ID: S24664

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: VO430005.D

Level: (low/med) _____ Date Received: 4/30/97

% Moisture: not dec. _____ Date Analyzed: 4/30/97

GC Column: DB624 ID: 0.53 (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		Q
75-71-8	Dichlorodifluoromethane	10	U
74-87-3	Chloromethane	10	U
75-01-4	Vinyl Chloride	10	U
74-83-9	Bromomethane	10	U
75-00-3	Chloroethane	10	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
76-13-1	1,1,2-trichlorotriflouroethane	5	U
74-88-4	Iodomethane	5	U
75-15-0	Carbon Disulfide	5	U
67-64-1	Acetone	20	U
75-09-2	Methylene Chloride	5	U
156-60-5	Trans-1,2-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
594-20-7	2,2-Dichloropropane	5	U
540-59-0	Cis-1,2-Dichloroethene	5	U
78-93-3	2-Butanone	43	
74-97-5	Bromochloromethane	5	U
67-66-3	Chloroform	6	B
71-55-6	1,1,1-Trichloroethane	5	U
563-58-6	1,1-Dichloropropene	5	U
58-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
74-95-3	Dibromomethane	5	U
75-27-4	Bromodichloromethane	5	U
100-610-15	Cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-Pentanone	20	U
108-88-3	Toluene	5	U
100-610-26	Trans-1,2-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.
S200024664

Lab Name: CST-12 OAST Contract:

Project No.: 18770 Site: Location: Group:

Matrix: (soil/water) WATER Lab Sample ID: S24664

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 430005.D

Level: (low/med) Date Received: 4/30/97

% Moisture: not dec. Date Analyzed: 4/30/97

GC Column: DB624 ID: 0.53 (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		Q
127-18-4	Tetrachloroethene	5	U
142-28-9	1,3-Dichloropropane	5	U
591-78-6	2-Hexanone	20	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U
108-90-7	Chlorobenzene	5	U
79-34-5	1,1,1,2-Tetrachloroethane	5	U
104-41-4	Ethylbenzene	5	U
108-38-3/106-	M+P-Xylene	5	U
100-42-5	Styrene	5	U
95-47-6	O-Xylene	5	U
75-25-2	Bromoform	5	U
98-82-8	Iso-propylbenzene	5	U
108-86-1	Bromobenzene	5	U
96-18-4	1,2,3-Trichloropropene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
103-65-1	N-propylbenzene	5	U
95-49-8	2-Chlorotoluene	5	U
106-43-4	4-Chlorotoluene	5	U
95-63-6	1,3,5-Trimethylbenzene	5	U
98-06-6	Tert-Butylbenzene	5	U
108-67-8	1,2,4-Trimethylbenzene	5	U
135-98-8	Sec-Butylbenzene	5	U
541-73-1	1,3-Dichlorobenzene	5	U
25155-15	P-Isopropyltoluene	5	U
106-46-7	1,4-Dichlorobenzene	5	U
104-51-8	N-Butylbenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
96-12-8	1,2-Dibromo-3-Chloropropane	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
87-68-3	Hexachlorobutadiene	10	U
95-20-3	Naphthalene	10	U
87-61-6	1,2,3-Trichlorobenzene	10	U

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4/19/97

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO

S200024665

Lab Name: CST-12 OAST Contract: _____

Project No.: 18770 Site: _____ Location: _____ Group: _____

Matrix: (soil/water) WATER Lab Sample ID: S24665

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: VO430006.D

Level: (low/med) _____ Date Received: 4/30/97

% Moisture: not dec. _____ Date Analyzed: 4/30/97

GC Column: DB624 ID: 0.53 (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		Q
75-71-8	Dichlorodifluoromethane	10	U
74-87-3	Chloromethane	10	U
75-01-4	Vinyl Chloride	10	U
74-83-9	Bromomethane	10	U
75-00-3	Chloroethane	10	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
76-13-1	1,1,2-trichlorotriflouroethane	5	U
74-88-4	Iodomethane	5	U
75-15-0	Carbon Disulfide	5	U
67-64-1	Acetone	20	U
75-09-2	Methylene Chloride	5	U
156-60-5	Trans-1,2-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
594-20-7	2,2-Dichloropropane	5	U
540-59-0	Cis-1,2-Dichloroethene	5	U
78-93-3	2-Butanone	56	
74-97-5	Bromochloromethane	5	U
67-66-3	Chloroform	6	B
71-55-6	1,1,1-Trichloroethane	5	U
563-58-6	1,1-Dichloropropene	5	U
58-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
74-95-3	Dibromomethane	5	U
75-27-4	Bromodichloromethane	5	U
100-610-15	Cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-Pentanone	20	U
108-88-3	Toluene	5	U
100-610-26	Trans-1,2-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U

FORM I VOA

6/14/97

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO
S200024665

Lab Name: CST-12 OAST Contract: _____

Project No.: 18770 Site: _____ Location: _____ Group: _____

Matrix: (soil/water) WATER Lab Sample ID: S24665

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: VO430006.D

Level: (low/med) _____ Date Received: 4/30/97

% Moisture: not dec. _____ Date Analyzed: 4/30/97

GC Column: DB624 ID: 0.53 (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		Q
127-18-4	Tetrachloroethene	5	U
142-28-9	1,3-Dichloropropane	5	U
591-78-6	2-Hexanone	20	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U
108-90-7	Chlorobenzene	5	U
79-34-5	1,1,1,2-Tetrachloroethane	5	U
104-41-4	Ethylbenzene	5	U
108-38-3/106-	M+P-Xylene	5	U
100-42-5	Styrene	5	U
95-47-6	O-Xylene	5	U
75-25-2	Bromoform	5	U
98-82-8	Iso-propylbenzene	5	U
108-86-1	Bromobenzene	5	U
96-18-4	1,2,3-Trichloropropene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
103-65-1	N-propylbenzene	5	U
95-49-8	2-Chlorotoluene	5	U
106-43-4	4-Chlorotoluene	5	U
95-63-6	1,3,5-Trimethylbenzene	5	U
98-06-6	Tert-Butylbenzene	5	U
108-67-8	1,2,4-Trimethylbenzene	5	U
135-98-8	Sec-Butylbenzene	5	U
541-73-1	1,3-Dichlorobenzene	5	U
25155-15	P-Isopropyltoluene	5	U
106-46-7	1,4-Dichlorobenzene	5	U
104-51-8	N-Butylbenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
96-12-8	1,2-Dibromo-3-Chloropropane	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
87-68-3	Hexachlorobutadiene	10	U
95-20-3	Naphthalene	10	U
87-61-6	1,2,3-Trichlorobenzene	10	U

FORM I VOA

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6/14/97

SUBMISSION ID: 100018770

for Laura Kelly	H. Canavan	Craig M.V. Taylor	mag
Analyst	Reviewer	Team Leader	QA Officer
6/20/97	6/20/97	6/20/96	6/20/97
Date	Date	Date	Date

Los Alamos
NATIONAL LABORATORY
memorandum
EXPLOSIVES TECHNOLOGY & SAFETY
DX-16

To/MS: Dustie Stephens, ESH-19, MS K498
om/MS: M. S. Campbell, DX-2, MS C920
ne/FAX: (505)667-4962/(505)667-0500
Symbol: DX-2:97-101
Date: May 7, 1997

SUBJECT: CERTIFICATE OF ANALYSIS

Attention: Dustie Stephens

Request Number : NA
Lab. File IDs : 22598
Date received by Lab : April 29, 1997
Number of Samples : Two (2)
Sample Type(s) : Water (2)

I. Introduction

On April 29, 1997, two (2) water samples were received at TA-9-21. The list of analytical tests performed, as well as receipt and analysis, can be found in the attached report. The samples were labeled as follows:

Sample ID
97DS185
97DS186

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical tests. Each set of data will include sample identification information, the analytical results, and the appropriate detection limits.

The analysis requested includes: Nitroaromatics by EPA method SW 846 8330, Revision 0 (September 1994), modified as described below.

1) Section 5.3, Stock Standard Solutions: Stock standard solutions were not prepared from dry powder explosive samples. Instead, a stock solution was purchased from AccuStandard, Inc. This solution contains all fourteen analytes at a concentration of 1000 µg/ml and was used to prepare all of the standard solutions used (see AccuStandard certificate attached to data package).

2) Section 5.4.1: Separate standards for 2,4-DNT and 2,6-DNT were not prepared.

3) Section 7.1.1.1, Low-Level Aqueous Sample Preparation: Approval was obtained to use a solid phase extraction procedure in place of the salting-out method. The solid phase extractant, Porapak® RDX, was purchased from Millipore Corporation. Quantitation limits for the method were obtained from the following reference: Jenkins, T.F. et al., *Analytica Chimica Acta*, **289** (1994) 69-78. Further evaluation was done by Jenkins and reported in "Evaluation of the New Clean Solid Phases for Extraction of Nitroaromatics and Nitramines from Water" at the Eleventh Annual Waste Testing and Quality Assurance Symposium, July 23-28, 1995 in Washington, DC in which he recommended solid phase concentration as an option for pre-concentration of water samples for Method 8330.

III. Quality Control

The QA/QC information can be found immediately following the analytical data. This QA/QC data are used to assess the laboratory's accuracy and precision during the analytical procedure.

The surrogate, 3,4-dinitrotoluene was used in this analysis. One blank and one blank spike sample were also extracted and analyzed with these samples.

IV. Nonconformances/Comments

Although several peaks corresponding to HE analytes were seen in the primary chromatogram, only HMX was confirmed by both a second column and the UV spectrum. Spectral analysis was done on the major peaks and compared to standards. A small amount of nitrobenzene was confirmed by a second column but it was not confirmed by UV spectrum. When several small peaks are in a chromatogram, the possibility of false positive confirmation with a second column becomes greater because one non-analyte compound can have an analyte retention time on one column and another non-analyte compound can have the retention time of the analyte on the second column. In this situation, the spectral confirmation must be used to avoid false positive identification. In conclusion, the only Method 8330 analyte found was HMX; however, the amount was less than 2 µg/L.

The HMX standard was slightly greater than 15% RSD but the daily standards stayed within 15%. 1,3,5-TNB and Tetryl were greater than 15% deviation in the standard at the end of the run. They had less decomposition than the standards. Blank spike recovery was high for Tetryl, which was due to an impurity washed off the cartridge. Neither of these compounds was in the sample.

I certify that this Certificate of Analysis is in compliance with the terms and conditions set forth between Group CST-3 and Group DX-2, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Group DX-2 Analytical Chemistry and Quality Assurance Team Leader, or his designee, as verified by the following signatures.

Reviewed and Approved:

T. Spontarelli

T. Spontarelli
Team Leader

M. S. Campbell

M. S. Campbell
QA Coordinator

Los Alamos
NATIONAL LABORATORY

Chemical Science and Technology
Responsible Chemistry for America

CST-12 Organic Chemistry
Semivolatile Analysis Team, MS G740
Los Alamos, New Mexico 87545

To/MS: Dustie Stephens, ESH-19/K498
From/MS: Anthony Lombardo, CST-12/G740 TL 6/16/97
Phone/FAX: 665-7410/665-9345
Date: June 13, 1997
Symbol: CST12:97-280

CASE NARRATIVE. SEMIVOLATILE ORGANIC ANALYSIS.

Request Number: 100018770

Sample Summary

Matrix: **Water**
Number of samples: 3
All hold times were met.

Date Sampled: April 29, 1997
Date Extracted: May 5, 1997
Date Analyzed: May 6, 1997

Tentatively Identified Compounds were reported for this request.
Attached is a summary of results (Table 1). Laboratory sample numbers are listed. Cross references to client sample numbers are included as part of the final report.

Method Summary

EPA method references: SW-846 methods 3510B and 8270.
Laboratory analytical procedures: EO531, *Semivolatile Organics in Aqueous Matrixes: Solvent Extraction.*
EO550, *Analysis of Semivolatile Organics by GC/MS.*

Samples were extracted by Separatory Funnel Liquid-Liquid Extraction. One liter of sample is placed in a 2 liter separatory funnel. Sample is acidified and shaken with methylene chloride. The methylene chloride is separated from the sample, more methylene chloride is added, and the process is repeated for a total of three times. The sample is made basic and methylene chloride extraction is repeated. Sample extracts were combined, dried and concentrated to 1.0 ml final volume. Analysis was performed by capillary column GC/MS methods. Analytical column used was a J&W Scientific DB5.MS 30 M by 0.25 mm ID, 0.25 micron film or equivalent.

Quality Control

A method blank was prepared and analyzed with the samples.
Matrix spike and matrix spike duplicate were analyzed as part of the analytical batch which included the samples from this work request. A copy of the MS/MSD recovery form is included with this report.

Anomalies And Analysis Notes

Except where noted below, analyses were performed following the analytical procedures listed above. Except where noted below, all calibration and quality control criteria stated in the analytical procedures were met.

Sample 200024656: Four of six surrogate recoveries were low. The sample was re-analyzed, similar results were obtained. There was insufficient sample to re-extract.

Due to a log in error, a blind quality assurance sample was not analyzed with this sample set.

If you have any questions regarding this data, please call Anthony Lombardo at 665-7410.

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

SBLK01

Lab Name: LANL-CST12 Contract: _____

Project No.: 100018770 Site: _____ Location: _____ Group: _____

Matrix: (soil/water) WATER Lab Sample ID: B24666

Sample wt/vol: 1000.0 (g/mL) M Lab File ID: K050607.D

Level: (low/med) _____ Date Received: 4/29/97

% Moisture: _____ decanted: (Y/N): N Date Extracted: 5/5/97

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 5/6/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7

CAS No.	Compound	Concentration Units: (ug/L or ug/Kg) ug/L	Q
62-75-9	N-Nitrosodimethylamine	10	U
110-86-1	Pyridine	10	U
109-06-8	2-Picoline	10	U
625-3-3	Aniline	10	U
108-95-2	Phenol	10	U
111-44-4	bis-2-Chloroethyl ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
100-51-6	Benzyl alcohol	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	bis-2-Chloroisopropyl ether	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-n-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
111-91-1	bis-2-Chloroethoxy methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
65-85-0	Benzoic acid	50	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	50	U
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	10	U
91-58-7	2-Chloronaphthalene	10	U

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

SBLK01

Lab Name: LANL-CST12 Contract: _____

Project No.: 100018770 Site: _____ Location: _____ Group: _____

Matrix: (soil/water) WATER Lab Sample ID: B24666

Sample wt/vol: 1000.0 (g/mL) M Lab File ID: K050607.D

Level: (low/med) _____ Date Received: 4/29/97

% Moisture: _____ decanted: (Y/N): N Date Extracted: 5/5/97

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 5/6/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7

CAS No.	Compound	Concentration Units: (ug/L or ug/Kg) ug/L	Q
88-74-4	2-Nitroaniline	20	U
131-11-3	Dimethylphthalate	10	U
208-96-8	Acenaphthylene	10	U
83-32-9	Acenaphthene	10	U
99-09-2	3-Nitroaniline	20	U
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	50	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
86-73-7	Fluorene	10	U
7005-72-3	4-Chlorophenyl phenyl ether	10	U
84-66-2	Diethylphthalate	5	J
100-01-6	4-Nitroaniline	20	U
534-52-1	4,6-Dinitro-2-methylphenol	50	U
86-30-6	N-Nitrosodiphenylamine	10	U
103-33-3	Azobenzene	10	U
101-55-3	4-Bromophenyl phenyl ether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	50	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
84-74-2	Di-n-butylphthalate	10	U
206-44-0	Fluoranthene	10	U
92-87-5	Benzidine	50	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	20	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-81-7	bis-2-Ethylhexylphthalate	40	
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.
SBLK01

Lab Name: LANL-CST12 Contract: _____

Project No.: 100018770 Site: _____ Location: _____ Group: _____

Matrix: (soil/water) WATER Lab Sample ID: B24666

Sample wt/vol: 1000.0 (g/mL) M Lab File ID: K050607.D

Level: (low/med) _____ Date Received: 4/29/97

% Moisture: _____ decanted: (Y/N): N Date Extracted: 5/5/97

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 5/6/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7

CAS No.	Compound	Concentration Units: (ug/L or ug/Kg) ug/L	Q
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

SAMPLE NO.

SBLK01

Lab Name: LANL-CST12 Contract: _____

Project No.: 10001 Site: _____ Location: _____ Group: _____

Matrix: (soil/water) WATER Lab Sample ID: B24666

Sample wt/vol: 1000.0 (g/mL) M Lab File ID: K050607.D

Level: (low/med) _____ Date Received: 4/29/97

% Moisture: _____ decanted: (Y/N) N Date Extracted: 5/5/97

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 5/6/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 2 Concentration Units: (ug/L or ug/Kg) ug/L

CAS Number	Compound Name	RT	Est. Conc.	Q
1.	Unknown acid ester	5.79	6	J
2.	Unknown chlorinated hydrocar	8.20	31	J
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				
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24.				
25.				
26.				
27.				
28.				
29.				
30.				

3C

WATER SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: LANL-CST12 Contract: _____

Project No.: 24691 Site: _____ Location: _____ Group: _____

Matrix Spike - Sample No.: B9703259

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC #	QC. LIMITS REC.
Phenol	100	0	28	28	(12-89)
2-Chlorophenol	100	0	57	57	(27-123)
1,4-Dichlorobenzene	50	0	25	50	(36-97)
N-Nitroso-di-n-propylamine	50	0	31	62	(41-116)
1,2,4-Trichlorobenzene	50	0	27	54	(39-98)
4-Chloro-3-methylphenol	100	0	66	66	(23-97)
Acenaphthene	50	0	36	72	(46-118)
4-Nitrophenol	100	0	28	28	(10-80)
2,4-Dinitrotoluene	50	0	34	68	(24-96)
Pentachlorophenol	100	0	57	57	(9-103)
Pyrene	50	0	36	72	(26-127)

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Phenol	100	27	27	4	42	(12-89)
2-Chlorophenol	100	58	58	2	40	(27-123)
1,4-Dichlorobenzene	50	25	50	0	28	(36-97)
N-Nitroso-di-n-propylamine	50	30	60	3	38	(41-116)
1,2,4-Trichlorobenzene	50	27	54	0	28	(39-98)
4-Chloro-3-methylphenol	100	66	66	0	42	(23-97)
Acenaphthene	50	35	70	3	31	(46-118)
4-Nitrophenol	100	26	26	7	50	(10-80)
2,4-Dinitrotoluene	50	33	66	3	38	(24-96)
Pentachlorophenol	100	56	56	2	50	(9-103)
Pyrene	50	35	70	3	31	(26-127)

(1) N-Nitroso-di-n-propylamine

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 11 outside limits

Spike Recovery: 0 out of 22 outside limits

Comments: TL 6/20/97

LOS ALAMOS NATIONAL LABORATORY
CST-12 ORGANIC ANALYSIS GROUP

DATA REVIEW CERTIFICATION

Request Number: 10001 8770 Analysis: Semivolatile SW-846 8270

The data contained in the enclosed report has been reviewed and approved by the people listed below:

Anthony Lombardo	Anthony Lombardo	6/16/97
Analyst Name (print)	Analyst Signature	Date
LAURA C. ORTEGA	[illegible]	6/16/97
Data Reviewer Name (print)	Data Reviewer Signature	Date

LOS ALAMOS NATIONAL LABORATORY
CST Analytical Chemistry
Analytical Results Report

Method Area: EH-ORGANIC

Submission Id : 100018770

Requester Name :	DUSTIE L. STEPHENS	**Customer Cost Code:**	C22E00000000	**Due Date :**	29-MAY-97
Requester Group:	ESH-19	**Logged Date :**	30-APR-97	**Screening Data :**	NO SCREENING DATA REQUIRED
Mail Stop :	K498				
Requester Phone:	665-0792			**Logged by:**	DDECKER
Requester Fax #:	1	**Analytical Service Agreement #:**			

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC SVOA-COLD	200024653	300081423	97DS181	110-86-1 Pyridine	<10		ug/L	U
				109-06-8 2-Picoline	<10		ug/L	U
				625-3-3 Aniline	<10		ug/L	U
				108-95-2 Phenol	14		ug/L	
				111-44-4 bis-2-Chloroethyl ether	<10		ug/L	U
				95[illegible]2-Chlorophenol	<10		ug/L	U
				541-73-1 1,3-Dichlorobenzene	<10		ug/L	U
				106-46-7 1,4-Dichlorobenzene	<10		ug/L	U
				95-50-1 1,2-Dichlorobenzene	<10		ug/L	U
				100-51-6 Benzyl alcohol	<10		ug/L	U
				95-48-7 2-Methylphenol	<10		ug/L	U
				108-60-1 bis-2-Chloroisopropyl ether	<10		ug/L	U
				106-44-5 4-Methylphenol	<10		ug/L	U
				621-64-7 N-Nitroso-di-n-propylamine	<10		ug/L	U
				67-72-1 Hexachloroethane	<10		ug/L	U
				98-95-3 Nitrobenzene	<10		ug/L	U
				78-59-1 Isophorone	<10		ug/L	U
				88-75-5 2-Nitrophenol	<10		ug/L	U
				105-67-9 2,4-Dimethylphenol	<10		ug/L	U
				111-91-1 bis-2-Chloroethoxy methane	<10		ug/L	U
				120-83-2 2,4-Dichlorophenol	<10		ug/L	U

Method Area: EH-ORGANIC

Submission Id : 100018770

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC SVOA-COLD	200024653	300081423	97DS181	120-82-1 1,2,4-Trichlorobenzene	<10		ug/L	U
				65-85-0 Benzoic acid	<52		ug/L	U
				91-20-3 Naphthalene	<10		ug/L	U
				106-47-8 4-Chloroaniline	<10		ug/L	U
				87-68-3 Hexachlorobutadiene	<52		ug/L	U
				59-50-7 4-Chloro-3-methylphenol	<10		ug/L	U
				91-57-6 2-Methylnaphthalene	<10		ug/L	U
				77-47-4 Hexachlorocyclopentadiene	<10		ug/L	U
				88-06-2 2,4,6-Trichlorophenol	<10		ug/L	U
				95-95-4 2,4,5-Trichlorophenol	<10		ug/L	U
				91-58-7 2-Chloronaphthalene	<10		ug/L	U
				88-74-4 2-Nitroaniline	<21		ug/L	U
				131-11-3 Dimethylphthalate	19		ug/L	
				208-96-8 Acenaphthylene	<10		ug/L	U
				83-32-9 Acenaphthene	<10		ug/L	U
				99-09-2 3-Nitroaniline	<21		ug/L	U
				51-28-5 2,4-Dinitrophenol	<52		ug/L	U
				100-02-7 4-Nitrophenol	<52		ug/L	U
				132-64-9 Dibenzofuran	<10		ug/L	U
				121-14-2 2,4-Dinitrotoluene	<10		ug/L	U
				606-20-2 2,6-Dinitrotoluene	<10		ug/L	U
				86-73-7 Fluorene	<10		ug/L	U
				7005-72-3 4-Chlorophenyl phenyl ether	<10		ug/L	U
				84-66-2 Diethylphthalate	4		ug/L	JB
				100-01-6 4-Nitroaniline	<21		ug/L	U
				534-52-1 4,6-Di[illegible]-2-methylphenol	<52		ug/L	U
				86-30-6 N-Nitrosodiphenylamine	<10		ug/L	U
				103-33-3 Azobenzene	<10		ug/L	U

Method Area: EH-ORGANIC

Submission Id : 100018770

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC SVOA-COLD	200024653	300081423	97DS181	101-55-3 4-Bromophenyl phenyl ether	<10		ug/L	U
				118-74-1 Hexachlorobenzene	<10		ug/L	U
				87-86-5 Pentachlorophenol	<52		ug/L	U
				85-01-8 Phenanthrene	<10		ug/L	U
				120-12-7 Anthracene	<10		ug/L	U
				84-74-2 Di-n-butylphthalate	2		ug/L	J
				206-44-0 Fluoranthene	<10		ug/L	U
				92-87-5 Benzidine	<52		ug/L	U
				129-00-0 Pyrene	<10		ug/L	U
				85-68-7 Butylbenzylphthalate	<10		ug/L	U
				91-94-1 3,3'-Dichlorobenzidine	<21		ug/L	U
				56-55-3 Benzo(a)anthracene	<10		ug	U
				218-01-9 Chrysene	<10		ug/L	U
				117-81-7 bis-2-Ethylhexylphthalate	9		ug/L	JB
				117-84-0 Di-n-octylphthalate	<10		ug/L	U
				205-99-2 Benzo(b)fluoranthene	<10		ug/L	U
				62-75-9 N-Nitrosodimethylamine	<10		ug/L	U
				207-08-9 Benzo(k)fluoranthene	<10		ug/L	U
				50-32-8 Benzo(a)pyrene	<10		ug/L	U
				193-39-5 Indeno(1,2,3-cd)pyrene	<10		ug/L	U
				53-70-3 Dibenzo(a,h)anthracene	<10		ug/L	U
				191-24-2 Benzo(g,h,i)perylene	<10		ug/L	U
	200024656	300081424	97DS182	62-75-9 N-Nitrosodimethylamine	<10		ug/L	U
				110-86-1 Pyridine	<10		ug/L	U
				109-06-8 2-Picoline	<10		ug/L	U
				625-3-3 Aniline	<10		ug/L	U
				108-95-2 Phenol	12		ug/L	
				111-44-4 bis-2-Chloroethyl ether	<10		ug/L	U
				95-57-8 2-Chlorophenol	<10		ug/L	U

Metho: Area: EH-ORGANIC Submission Id : 100018770

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC SVOA-COLD	200024656	300081424	97DS182	541-73-1 1,3-Dichlorobenzene	<10		ug/L	U
				106-46-7 1,4-Dichlorobenzene	<10		ug/L	U
				95-50-1 1,2-Dichlorobenzene	<10		ug/L	U
				100-51-6 Benzyl alcohol	<10		ug/L	U
				95-48-7 2-Methylphenol	<10		ug/L	U
				108-60-1 bis-2-Chloroisopropyl ether	<10		ug/L	U
				106-44-5 4-Methylphenol	<10		ug/L	U
				621-64-7 N-Nitroso-di-n-propylamine	<10		ug/L	U
				67-72-1 Hexachloroethane	<10		ug/L	U
				98-95-3 Nitrobenzene	<10		ug/L	U
				78-59-1 Isophorone	<10		ug/L	U
				88-75-5 2-Nitrophenol	<10		ug/L	U
				105-67-9 2,4-Dimethylphenol	<10		ug/L	U
				111-91-1 bis-2-Chloroethoxy methane	<10		ug/L	U
				120-83-2 2,4-Dichlorophenol	<10		ug/L	U
				120-82-1 1,2,4-Trichlorobenzene	<10		ug/L	U
				65-85-0 Benzoic acid	<51		ug/L	U
				91-20-3 Naphthalene	<10		ug/L	U
				106-47-8 4-Chloroaniline	<10		ug/L	U
				87-68-3 Hexachlorobutadiene	<51		ug/L	U
				59-50-7 4-Chloro-3-methylphenol	<10		ug/L	U
				91-57-6 2-Methylnaphthalene	<10		ug/L	U
				77-47-4 Hexachlorocyclopentadiene	<10		ug/L	U
				88-06-2 2,4,6-Trichlorophenol	<10		ug/L	U
				95-95-4 2,4,5-Trichlorophenol	<10		ug/L	U
				91-58-7 2-Chloronaphthalene	<10		ug/L	U
				88-74-4 2-Nitroaniline	<21		ug/L	U

Method Area: EH-ORGANIC

Submission Id : 100018770

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC SVOA-COLD	200024656	300081424	97DS182	131-11-3 Dimethylphthalate	15		ug/L	
				208-96-8 Acenaphthylene	<10		ug/L	U
				83-32-9 Acenaphthene	<10		ug/L	U
				99-09-2 3-Nitroaniline	<21		ug/L	U
				51-28-5 2,4-Dinitrophenol	<51		ug/L	U
				100-02-7 4-Nitrophenol	<51		ug/L	U
				132-64-9 Dibenzofuran	<10		ug/L	U
				121-14-2 2,4-Dinitrotoluene	<10		ug/L	U
				606-20-2 2,6-Dinitrotoluene	<10		ug/L	U
				86-73-7 Fluorene	<10		ug/L	U
				7005-72-3 4-Chlorophenyl phenyl ether	<10		ug/L	U
				84-66-2 Diethylphthalate	3		ug/L	JB
				100-01-6 4-Nitroaniline	<21		ug/L	U
				534-52-1 4,6-Dinitro-2-methylphenol	<51		ug/L	U
				86-30-6 N-Nitrosodiphenylamine	<10		ug/L	U
				103-33-3 Azobenzene	<10		ug/L	U
				101-55-3 4-Bromophenyl phenyl ether	<10		ug/L	U
				118-74-1 Hexachlorobenzene	<10		ug/L	U
				87-86-5 Pentachlorophenol	<51		ug/L	U
				85-01-8 Phenanthrene	<10		ug/L	U
				120-12-7 Anthracene	<10		ug/L	U
				84-74-2 Di-n-butylphthalate	<10		ug/L	U
				206-44-0 Fluoranthene	<10		ug/L	U
				92-87-5 Benzidine	<51		ug/L	U
				129-00-0 Pyrene	<10		ug/L	U
				85-68-7 Butylbenzylphthalate	<10		ug/L	U
				91-94-1 3,3'-Dichlorobenzidine	<21		ug/L	U
				56-55-3 Benzo(a)anthracene	<10		ug/L	U
				218-01-9 Chrysene	<10		ug/L	U
				117-81-7 bis-2-Ethylhexylphthalate	<10		ug/L	U

Method Area: EH-ORGANIC Submission Id : 100018770

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC SVOA-COLD	200024656	300081424	97DS182	117-84-0 Di-n-octylphthalate	<10		ug/L	U
				205-99-2 Benzo(b)fluoranthene	<10		ug/L	U
				207-08-9 Benzo(k)fluoranthene	<10		ug/L	U
				50-32-8 Benzo(a)pyrene	<10		ug/L	U
				193-39-5 Indeno(1,2,3-cd)pyrene	<10		ug/L	U
				53-70-3 Dibenzo(a,h)anthracene	<10		ug/L	U
				191-24-2 Benzo(g,h,i)perylene	<10		ug/L	U
	200024657	300081425	97DS183	62-75-9 N-Nitrosodimethylamine	<10		ug/L	U
				110-86-1 Pyridine	<10		ug/L	U
				109-06-8 2-Picoline	<10		ug/L	U
				625-3-3 Aniline	<10		ug/L	U
				108-95-2 Phenol	7		ug/L	J
				111-44-4 bis-2-Chloroethyl ether	<10		ug/L	U
				95-57-8 2-Chlorophenol	<10		ug/L	U
				541-73-1 1,3-Dichlorobenzene	<10		ug/L	U
				106-46-7 1,4-Dichlorobenzene	<10		ug/L	U
				95-50-1 1,2-Dichlorobenzene	<10		ug/L	U
				100-51-6 Benzyl alcohol	<10		ug/L	U
				95-48-7 2-Methylphenol	<10		ug/L	U
				108-60-1 bis-2-Chloroisopropyl ether	<10		ug/L	U
				106-44-5 4-Methylphenol	<10		ug/L	U
				621-64-7 N-Nitroso-di-n-propylamine	<10		ug/L	U
				67-72-1 Hexachloroethane	<10		ug/L	U
				98-95-3 Nitrobenzene	<10		ug/L	U
				78-59-1 Isophorone	<10		ug/L	U
				88-75-5 2-Nitrophenol	<10		ug/L	U
				105-67-9 2,4-Dimethylphenol	<10		ug/L	U
				111-91-1 bis-2-Chloroethoxy methane	<10		ug/L	U
				120-83-2 2,4-Dichlorophenol	<10		ug/L	U

Method Area: EH-ORGANIC Submission Id : 100018770

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC SVOA-C[illegible] D	200024657	300081425	97DS183	120-82-1 1,2,4-Trichlorobenzene	<10		ug/L	U
				65-85-0 Benzoic acid	<50		ug/L	U
				91-20-3 Naphthalene	<10		ug/L	U
				106-47-8 4-Chloroaniline	<10		ug/L	U
				87-68-3 Hexachlorobutadiene	<50		ug/L	U
				59-50-7 4-Chloro-3-methylphenol	<10		ug/L	U
				91-57-6 2-Methylnaphthalene	<10		ug/L	U
				77-47-4 Hexachlorocyclopentadiene	<10		ug/L	U
				88-06-2 2,4,6-Trichlorophenol	<10		ug/L	U
				95-95-4 2,4,5-Trichlorophenol	<10		ug/L	U
				91-58-7 2-Chloronaphthalene	<10		ug/L	U
				88-74-4 2-Nitroaniline	<20		ug/L	U
				131-11-3 Dimethylphthalate	23		ug/L	
				208-96-8 Acenaphthylene	<10		ug/L	U
				83-32-9 Acenaphthene	<10		ug/L	U
				99-09-2 3-Nitroaniline	<20		ug/L	U
				51-28-5 2,4-Dinitrophenol	<50		ug/L	U
				100-02-7 4-Nitrophenol	<50		ug/L	U
				132-64-9 Dibenzofuran	<10		ug/L	U
				121-14-2 2,4-Dinitrotoluene	<10		ug/L	U
				606-20-2 2,6-Dinitrotoluene	<10		ug/L	U
				86-73-7 Fluorene	<10		ug/L	U
				7005-72-3 4-Chlorophenyl phenyl ether	<10		ug/L	U
				84-66-2 Diethylphthalate	3		ug/L	JB
				100-01-6 4-Nitroanili[illegible]	<20		ug/L	U
				534-52-1 4,6-Dinitro-2-methylphenol	<50		ug/L	U
				86-30-6 N-Nitrosodiphenylamine	<10		ug/L	U
				103-33-3 Azobenzene	<10		ug/L	U

Method Area: ORGANIC

Submission Id : 100018770

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC SVOA-COLD	200024657	300081425	97DS183	101-55-3 4-Bromophenyl phenyl ether	<10		ug/L	U
				118-74-1 Hexachlorobenzene	<10		ug/L	U
				87-86-5 Pentachlorophenol	<50		ug/L	U
				85-01-8 Phenanthrene	<10		ug/L	U
				120-12-7 Anthracene	<10		ug/L	U
				84-74-2 Di-n-butylphthalate	2		ug/L	J
				206-44-0 Fluoranthene	<10		ug/L	U
				92-87-5 Benzidine	<50		ug/L	U
				129-00-0 Pyrene	<10		ug/L	U
				85-68-7 Butylbenzylphthalate	<10		ug/L	U
				91-94-1 3,3'-Dichlorobenzidine	<20		ug/L	U
				56-55-3 Benzo(a)anthracene	<10		ug/L	U
				218-01-9 Chrysene	<10		ug/L	U
				117-81-7 bis-2-Ethylhexylphthalate	<10		ug/L	U
				117-84-0 Di-n-octylphthalate	<10		ug/L	U
				205-99-2 Benzo(b)fluoranthene	<10		ug/L	U
				207-08-9 Benzo(k)fluoranthene	<10		ug/L	U
				50-32-8 Benzo(a)pyrene	<10		ug/L	U
				193-39-5 Indeno(1,2,3-cd)pyrene	<10		ug/L	U
				53-70-3 Dibenzo(a,h)anthracene	<10		ug/L	U
				191-24-2 Benzo(g,h,i)perylene	<10		ug/L	U

Method Area: EH-ORGANIC

Submission Id : 100018770

TENTATIVELY IDENTIFIED COMPOUNDS

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC SVOA-COLD	97DS181	300081423	97DS181	TIC 112-34-5 TIC Ethanol, 2-(2-butoxyethoxy)-	29		ug/L	J
				TIC 20324-33-8 TIC 2-Propanol, 1-[2-(2-methoxy-	6		ug/L	J
				TIC 80-05-7 TIC Phenol, 4,4'-(1-methylethyli	16		ug/L	J
GENERIC SVOA-COLD	97DS181	300081423	97DS181	TIC UNKNOWN ACID ESTER 1	7		ug/L	JB
				TIC UNKNOWN 3	8		ug/L	J
				TIC UNKNOWN HYDROCARBON 4	100		ug/L	J
	97DS182	300081424	97DS182	TIC 80-05-7 TIC Phenol, 4,4'-(1-methylethyli	9		ug/L	J
				TIC 103-23-1 TIC Hexanedioic acid, bis(2-ethy	14		ug/L	J
	97DS182	300081424	97DS182	TIC UNKNOWN ACID ESTER 1	4		ug/L	JB
				TIC UNKNOWN HYDROCARBON 3	71		ug/L	J
	97DS183	300081425	97DS183	TIC 104-76-7 TIC 1-Hexanol, 2-ethyl-	96		ug/L	J
				TIC 112-34-5 TIC Ethanol, 2-(2-butoxyethoxy)-	34		ug/L	J
				TIC 80-05-7 TIC Phenol, 4,4'-(1-methylethyli	9		ug/L	J

Appendix B

Certification Statements

HYDROTHERMAL PROCESSING UNIT
CERTIFICATION STATEMENT

I certify under oath and affirmation that I am personally familiar with the Hydrothermal Processing Unit (HPU), subject to Permit Number NM0890010515-RDD2. I have been an employee of the University of California at Los Alamos National Laboratory as a member of the Dynamic Experimentation Division since July 25, 1994. To the best of my knowledge, no hazardous waste has been treated in the HPU. Also, to the best of my knowledge, no hazardous waste, to be treated by the HPU in accordance with the permit, was ever accepted for storage in the ancillary storage unit. Based on my review of the operational logbook for the unit, a surrogate (HMX suspended in water) was run through the unit, prior to permit issuance, to test the unit's ability to pump a suspension. After this test was run, the unit was flushed with acetone. This flushed solution was then managed as a hazardous waste. I am aware that there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment.

Philip C. Dell'Orco
Printed Name

Philip C Dell'Orco
Signature

5/13/97
Date

HYDROTHERMAL PROCESSING UNIT
CERTIFICATION STATEMENT

I certify under oath and affirmation that I am personally familiar with the Research Development and Demonstration Permit for the Hydrothermal Processing Unit (HPU) and was to be the person in charge of its operation, in the event that it operated. To the best of my knowledge, no hazardous waste has been treated in the HPU or stored in the associated ancillary storage unit. Also, to the best of my knowledge, the hydrothermal processing reactor tube remained at Technical Area 9, Building 38, Room 101, from April 21, 1994, the date the permit was issued, to the present. I am aware that there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment.

Raymond L. Flesner
Printed Name

Raymond L. Flesner
Signature

6-5-97
Date

Appendix C

Independent Registered Professional Engineer Certification

Independent Registered Professional Engineer Certification

This certification was prepared in accordance with generally accepted professional engineering principles and practices pursuant to the requirements of the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20 NMAC 4.1) Subpart V, Part 264.115 for an independent professional engineering certification. These services have been performed with the care and skill ordinarily exercised by members of the profession practicing under similar conditions at the same time, and in the same or similar locality. We make no other warranty either expressed or implied. The finding and certification are based on: (1) review of the New Mexico Environment Department (NMED)-approved closure plan; (2) review of available documentation regarding the unit; (3) interviews with and review of information provided by facility personnel; and (4) review of the analytical data associated with sampling the unit.

With the signature and seal below, I certify that based on the documentation reviewed and with the exception of the variance noted in Section 2.3 of the closure report, the Technical Area 9 Hydrothermal Processing Unit has been closed in accordance with the NMED-approved closure plan. The information presented above is, to the best of my knowledge and belief, true, accurate, and complete.

Respectfully,

IT Corporation

JEFFREY K. TUCKER
NEW MEXICO
12183
REGISTERED PROFESSIONAL ENGINEER

Jeffrey K. Tucker, P.E.
New Mexico Registered Professional Engineer No. 12183
Expires December 31, 1997

Date: August 5, 1997