RF/RMRS-99-414.UN

ANALYSIS REPORT ON GEOPROBE™BOREHOLES FOR BUILDING 984

AUG 1999
RECEIVED
RECORDS CENTER

AUGUST, 1999

REVISION 0

1/112

ADMIN RECORD
IA-IA-A-00205

TABLE OF CONTENTS

1 0 INTRODUCTION 2

2 0 PURPOSE 2

3 0 BACKGROUND 4

4 0 SITE CONDITIONS 5

5 0 FIELD PROCEDURES 5

6 0 LABORATORY ANALYSES 6

7 0 LABORATORY RESULTS 6

8 0 CONCLUSIONS 7

9 0 REFERENCES 8

APPENDIX A BOREHOLE LOGS

APPENDIX B LAB RESULTS

B 1 Rad-Screen Results

B 2 VOCs and Metals Results

B 3 Radioisotope Results

Best Available Copy

2

ANALYSIS REPORT
FOR THE INSTALLATION OF THREE GEOPROBE™ BOREHOLES
AT BUILDING 984 IN THE PROTECTED AREA

1.0 INTRODUCTION

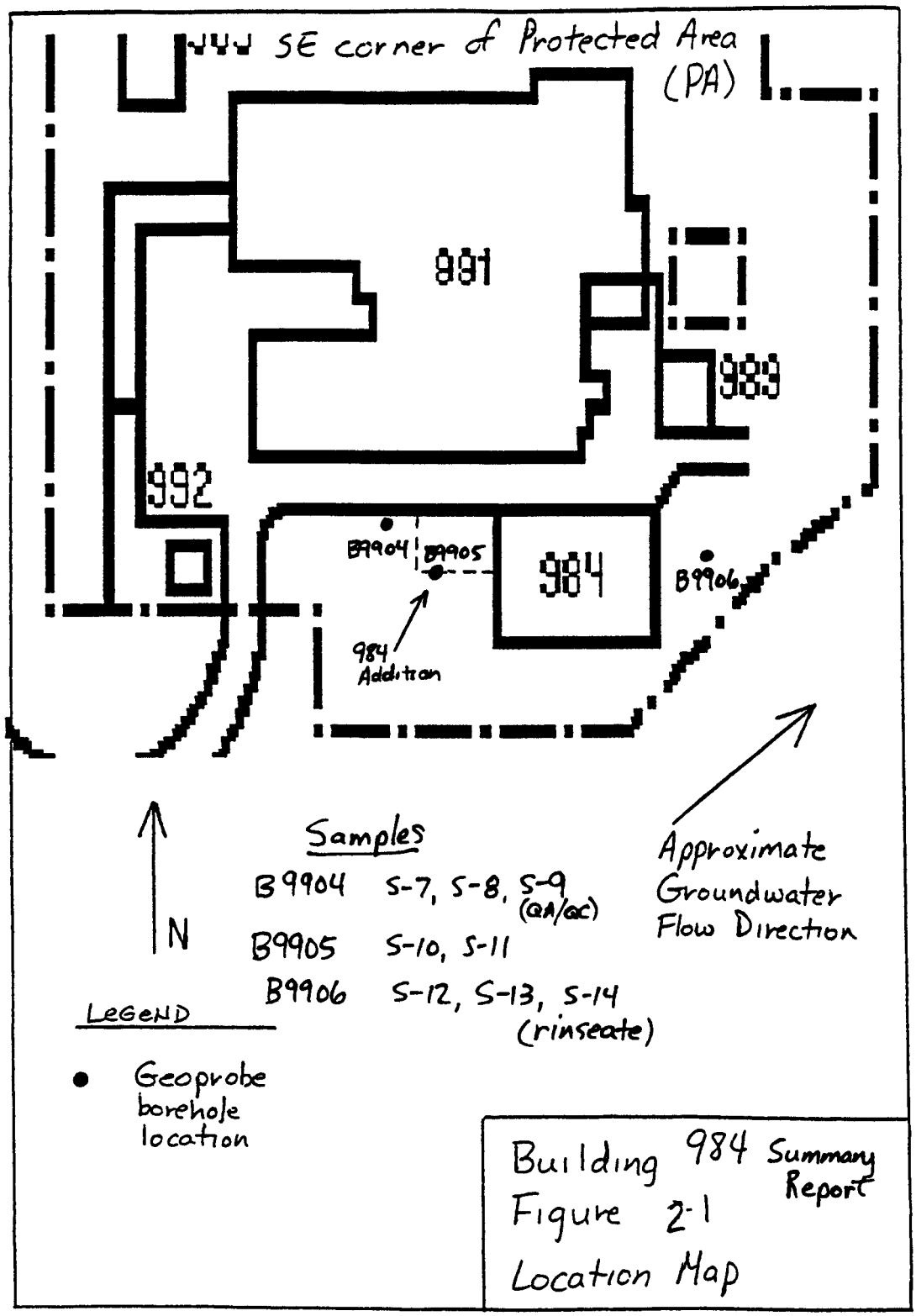
Rocky Mountain Remediation Services, L L C (RMRS) has prepared this Summary Report for the Department of Energy (DOE) at the Rocky Flats Environmental Technology Site (RFETS) Activities performed during this investigation were conducted under applicable Federal, State, and local regulations and agreements, as well as DOE Orders, RFETS policies and procedures, Environmental Restoration (ER) Operating Procedures, the RFETS Integrated Monitoring Plan (IMP), the Rocky Flats Cleanup Agreement (RFCA), and the *Sampling and Analysis Plan for the Installation of Three Geoprobe™ Boreholes at Building 984 in the Protected Area* (RF/RMRS-99-356), which was written specifically for this project

2.0 PURPOSE

This investigation was performed in association with proposed modifications to Building 984 in the Protected Area (PA) at RFETS Building 984 is located immediately southeast of Building 991 in the southeast corner of the PA (Figure 2-1) The modifications to Building 984 consist of construction of a 24 foot by 30 foot addition along the northwest corner (including a 6-inch water line) and the installation of a utility pole adjacent to the northeast corner of the building The purpose of this investigation was to assess the impact of potential soil contamination in the area on activities associated with each modification at Building 984 In order to assess existing soil conditions, three Geoprobe™ boreholes were completed within the anticipated construction areas The Geoprobe™ boreholes were completed to ensure construction worker safety and to ensure that there is not a Resource Conservation and Recovery Act (RCRA) issue with material that will be excavated during the construction phase of the project Excavated material may consist of soil and construction demolition debris All work completed during the investigative portion of this project was performed in accordance with the RMRS Quality Assurance Program Description (QAPD) (RMRS 1998, Rev 2)

3

Figure 2-1, Geoprobe™ Borehole Locations



This drawing photo-enlarged from a RFETS provided diagram at 1 2270 scale.

4

3.0 BACKGROUND

Building 984 is located approximately 50 feet southeast of Building 991, and is part of the Building 991 complex Attached to Building 991are a series of tunnels which lead to four underground vaults that are used for storage All of the tunnels and vaults are located either north or northwest of Building 991 Building 991 was the original final assembly building where plutonium, enriched and depleted uranium, and other materials were assembled into final products Uranium and plutonium pits were assembled in Building 991 Plutonium and enriched and depleted uranium are the major constituents that were used in the building In addition, solvents were used and possibly stored at this location A beryllium coating operation took place in Building 991 for twelve years (DOE 1992) The Building 991 area includes Individual Hazardous Substance Sites (IHSSs) 173 and 184

The Potential Areas of Contamination (PACs) were established at RFETS as a result of documented spill incidents There are two pertinent Building 984 PACs, PAC 900-173 (South Dock Building 991), and PAC 900-1301 (Building 991 Enclosed Area) The South Dock of Building 991 is located on the west side of the building and is a loading facility for the tunnels Spills have occurred in the area Small parts and equipment were washed in the dock area Acetone, PCE, and TCA were the solvents used No documentation was found which details the constituents which may be present in the dock area or which details the fate of constituents released to the environment The Enclosed Area, approximately 50 feet wide and located south of and adjacent to Building 991, was used for drum storage of various radioactively contaminated waste materials The drums were contaminated with enriched and depleted uranium No documentation was found which detailed a release to the environment from these drums (DOE 1992) Other potentially contaminated materials were stored in the same general area

The contaminants of concern (COCs) are volatile organic compounds (VOCs), metals, and radionuclides There was little data available relating to the specific metals and VOCs, and their concentrations, which could potentially be encountered Plutonium (Pu-239/240) and enriched and depleted uranium (U-233/234, U-235, and U-238) are the radionuclides which could have potentially been encountered at the site

It was thought that groundwater may be encountered during the completion of the Geoprobe™ boreholes and the approved site specific SAP referenced above provided for this possibility

4.0 SITE CONDITIONS

The RFETS is situated on a gently eastward sloping topographic and bedrock pediment surface mantled by, depending on location, unconsolidated Rocky Flats Alluvium and/or colluvium, and underlain mainly by claystones and siltstones of the Cretaceous Laramie Formation (EG&G, 1995 A) Building 984 lies on alluvium associated with South Walnut Creek

Soils identified during the completion of the three Geoprobe™ boreholes at Building 984 consist mainly of gray to black clay Gravelly sand was found at the surface and shallow subsurface in borehole B9904 All of the boreholes terminated in gray to black clay or silty clay that was described at borehole B9904 as weathered bedrock

There was no groundwater encountered in any of the three boreholes The total depth of borehole B9904 was ten feet The total depth of boreholes B9905 and B9906 was six feet There were no photoionization detector (PID) readings above background for any soil sample which was field screened during this investigation Borehole logs can be found in Appendix A

5.0 FIELD PROCEDURES

The boreholes were advanced with a standard Geoprobe™ rig owned and operated by TEG Rocky Mountain of Denver, Colorado The Geoprobe™ operates by pneumatically hammering a string of steel rods into the ground to the desired depth A variety of sampling tools allows the investigation team to acquire soil and/or groundwater samples

Field procedures were followed as outlined in the approved site specific SAP referenced above Two soil samples were collected from boreholes B9905 and B9906 and three from B9904 for submittal to the analytical laboratory The first sample, a grab sample, was collected at 0 5 feet below ground surface The second sample, a composite, was collected from the interval of 3 to 6 feet below ground surface (bgs) in boreholes B9905 and B9906, and the interval of 7 to 10 feet bgs in borehole B9904 The additional sample in B9904 was a QA/QC duplicate soil sample of the

6

lower sample interval All sample equipment and investigation team members were scanned by a radiation control technician (RCT) between samples and after the completion of a borehole No radiological contamination was encountered during the soil investigation

Borehole B9904 was backfilled with bentonite chips from approximately 10 feet to 0 5 feet bgs, boreholes B9905 and B9906 were backfilled with bentonite chips from approximately 6 feet to 0 5 feet bgs Six inches of concrete were placed at the top of each abandoned borehole

Decontamination procedures were followed as outlined in the SAP A rinseate (water) sample was collected at the end of the day after completion of the three Geoprobe™ boreholes at Building 984

6.0 LABORATORY ANALYSES

Soil samples collected as part of this investigation were sent to analytical laboratories for analysis Rad-screen samples were hand delivered to Thermo NUtech at RFETS Metals and VOC samples were shipped via Federal Express to Southwest Laboratory of Oklahoma located in Broken Arrow, Oklahoma Radionuclide Isotopic samples were shipped via Federal Express to Sanford Cohen & Associates (Southeastern Environmental Laboratory) located in Montgomery, Alabama

All samples were analyzed by the analytical methods specified in the SAP As stated above a duplicate soil sample was collected at borehole B9904 (S-9), and a rinseate sample (S-14) was collected of deionized water poured over and through a decontaminated Geoprobe™ core barrel

7.0 LABORATORY RESULTS

Laboratory results, which consisted of Rad-screen, volatile organic compounds, metals, and radionuclides, were reviewed thoroughly to ensure that there were no exceedances of any RFETS standards which might affect construction at the site Sixty-four (64) different VOCs were analyzed for, including acetone, PCE, and TCE Twenty-seven (27) different metals were analyzed for including beryllium Plutonium, Americium and uranium isotopes (U-233/234 and U-238) were the radionuclides analyzed for

7

Results of the laboratory analyses are as follows

Rad-screen – All analyses resulted in a Department of Transportation (DOT) rating of NONRAD

VOCs – All VOC results are well below Tier II action levels for surface and subsurface soils

Metals – All metals results are below Tier II action levels for surface and subsurface soils Although some of the iron results appear high, they are all within the RFETS sitewide background soil results mean plus two standard deviations This is the criterion for evaluating if a result is within the range of expected background levels (EG &G 1995 B)

Radionuclide Isotopes – All radionuclide isotope analyses were well below the Tier II action levels for surface and subsurface soil

The individual reports from the analytical laboratories can be found in Appendix B as follows Appendix B-1 contains Rad-screen results, Appendix B-2 contains the list of VOCs analyzed for and VOCs and metals lab results, and Appendix B-3 contains radionuclide isotope results

8.0 CONCLUSIONS

There are no levels of VOCs, metals, or radioisotopes which will impact the construction activities associated with Building 984 modifications in the PA at RFETS Construction worker safety will not be impacted from an environmental standpoint because there does not appear to be any contaminated surface and shallow subsurface soils in the vicinity of the construction sites at Building 984 There will not be an issue of a RCRA waste being generated during construction activities If groundwater is encountered during construction activities, it should be sampled to ensure that it does not pose a threat to construction workers

8

9.0 REFERENCES

DOE 1992, *Historical Release Report for the Rocky Flats Plant,* Rocky Flats Plant, Golden, CO

EG&G, 1995 A, *Geologic Characterization Report for the Rocky Flats Environmental Technology Site, Volume 1 of the Sitewide Geoscience Characterization Study,* Final Report, April

EG&G, 1995 B, Geochemical Characterization of Background Surface Soils Background Soils Characterization Program, Final Report, May

RMRS 1998, *RMRS Quality Assurance Program Description,* RMRS-QAPD-001, Rev 2, April

RMRS 1999, *Sampling and Analysis Plan for the Installation of Three Geoprobe™ Boreholes at Building 984 in the Protected Area*

9

APPENDIX A

BOREHOLE LOGS

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE BOREHOLE LOG

Borehole Number: B9904
Location - North: NA East: NA
Date: 6/11/99
Geologist: Paul Graham
Drilling Equip: GeoProbe

Surface Elevation: NA
Area: B984
Total Depth: 10.0
Company: Tierra ENV Project No: TE 1015
Sample Type: Push - Continuous

RMRS LOGGING SUPERVISOR
APPROVAL _____ DATE _____

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL FIELD MEASUREMENT	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	SOIL/LITHOLOGIC LOG	SAMPLE DESCRIPTION
		1' Rec						1.0, 2.0		gravelly sands, rounded
								3.0, 4.0, 5.0, 6.0, 7.0		weathered clay
		2' Rec						8.0, 9.0, 10.0		weathered bedrock, gray, silty TD = 10'

NOTES General: USCS is modified for this log as follows
Materials amounts are estimated by % volume instead of % weight
(1) Badly broken core accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

Procedure No RMRS/OPS-PRO 101
Revision 0
Date effective 12/31/98

11

U.S. DEPARTMENT OF ENERGY ROCKY FLATS PLANT

FORM PRO 101A

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE BOREHOLE LOG

Borehole Number: B9905
Location - North: NA East: NA
Date: 6/11/99
Geologist: Paul Graham
Drilling Equip: Geo Probe

Surface Elevation: NA
Area: B984
Total Depth 6.0'
Company Tierra ENV Project No TE1015
Sample Type Push - Continuous

RMRS LOGGING SUPERVISOR
APPROVAL _____ DATE _____

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL FIELD MEASUREMENT	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	SOIL/ LITHOLOGIC LOG	SAMPLE DESCRIPTION
		2' Rec						1.0, 2.0, 3.0		greyish black weathered clay
		1' Rec.						4.0, 5.0, 6.0		greyish/black weathered clay
								7.0, 8.0, 9.0, 10.0		TD = 6'

NOTES General: USCS is modified for this log as follows
Materials amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

Procedure No RMRS/OPS-PRO 101
Revision 0
Date effective 12/31/98

(4011 430-0134-030)(Form GT LA)(03/01.V2)

12

U.S. DEPARTMENT OF ENERGY ROCKY FLATS PLANT

FORM PRO.101A

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE BOREHOLE LOG

PAGE 6 OF 6

Borehole Number: B9906
Location - North: NA East: NA
Date: 6/11/99
Geologist: Paul Graham
Drilling Equip: GeoProbe

Surface Elevation: NA
Area: B984
Total Depth: 6.0'
Company: Tierra ENV Project No: TE1015
Sample Type: Push - Continuous

RMRS LOGGING SUPERVISOR
APPROVAL _____ DATE _____

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL (FIELD MEASUREMENT)	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	SOIL/LITHOLOGIC UNIT	SAMPLE DESCRIPTION
		1.5' Rec						10, 20, 30		Brownish/grey powdery clay
		3' Rec.						40, 50, 60		greyish/black clay
								70, 80, 90, 10.0		TD = 6'

NOTES General. USCS is modified for this log as follows
Materials amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

Procedure No RMRS/OPS-PRO 101
Revision 0
Date effective 12/31/98

(4011 930-0134-930)(Form GT (A)(03/01 92))

13

APPENDIX B 1

LABORATORY RESULTS – RAD SCREENS

Tierra

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C.# 99A8058#001

Page 1 of 1

Collector HS, PG	Contact/Requester GARCIA, ERNIE	Telephone No. 5980 MSIN FAX
RIN 99A8058	Sampling Origin PA – 750 PAD/Bldg 984	Purchase Order/Charge Code EC430500
Project Title 750 PAD/Bldg 984 Geoprobe (6/11/99)	Logbook No.	Ice Chest No. Temp.
To (Lab) Thermo NuTech	Method of Shipment Hand Delivered	Bill of Lading/Air Bill No
Protocol		Offsite Property No.

POSSIBLE SAMPLE HAZARDS/REMARKS

** **

COPY

Total Activity Exemption. Yes ☐ No ☐

Fax results to John Boylan (6079)

Bottle No	Customer Number	Matrix	Date	Time	Location	No/Type Container	Sample Analysis	Preservative Packing
99A8058-001 001	B-9901	SOLID	6/11/99	0926	750 PAD	125-G G	OS01A003 (Rad-Screen - Solid) [Routine-r screen]	None None
99A8058-003 003	B-9902	SOLID	6/11/99	0959	750 PAD	125-G G	OS01A003 (Rad-Screen - Solid) [Routine-r screen]	None None
99A8058-005 003	B-9903	SOLID	6/11/99	1042	750 PAD	125-G G	OS01A003 (Rad-Screen - Solid) [Routine-r screen]	None None
99A8058-007 003	B-9904	SOLID	6/11/99	1210	750 PAD	125-G G	OS01A003 (Rad-Screen - Solid) [Routine-r screen]	None None
99A8058-010 003	B-9905	SOLID	6/11/99	1317	750 PAD	125-G G	OS01A003 (Rad-Screen - Solid) [Routine-r screen]	None None
99A8058-012 003	B-9906	SOLID	6/11/99	1340	750 PAD	125-G G	OS01A003 (Rad-Screen - Solid) [Routine-r screen]	None None
99A8058-014 001	Equip Rinsate	AQUEOUS	6/11/99	1430	750 PAD	125-ML G	OS01A002 (RadScreen - Aqueous) [Routine-r screen]	None None

Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time
Kayla Mickad	6-15-99 0810	[illegible]	6/15/99 0810				

FINAL SAMPLE DISPOSITION — Disposal Method (e.g. Return to customer per lab procedure, used in process) — Disposed By — Date/Time

B1-1

15

Thermo NUtech - Rocky Flats
Radscreen Results

RIN 99A8058
Analysis Radscreen
Report Date 06/16/99

Distribution/Fax ASD/ 4555
J Boylan/ 6079

Laboratory Sample ID	APO Sample ID			Matrix	Gross Alpha		Gross Beta		Total Activity	DOT
	RIN	Event	Bottle		pCi/g	2σ	pCi/g	2σ	pCi/g	Class
99060183-01	99A8058	001	001	Soil	19	9	42	6	76 00	NONRAD
99060183-02	99A8058	003	003	Soil	21	9	33	5	68 00	NONRAD
99060183-03	99A8058	005	003	Soil	26	8	27	5	66 00	NONRAD
99060183-04	99A8058	007	003	Soil	22	8	27	5	62 00	NONRAD
99060183-05	99A8058	010	003	Soil	23	8	31	5	67 00	NONRAD
99060183-06	99A8058	012	003	Soil	34	9	31	5	79 00	NONRAD

DOT Classification <2000 pCi/g total activity is NONRAD
>= 2000 pCi/g total activity is RAD

Total Activity Calculated as the sum of the gross alpha and beta activities AND the measurement uncertainties for these two measurements
If the measured activity is negative 0 pCi/g (instead of the negative value) is used to calculate the total activity

Analysis Methods Sample Preparation Procedure L 6783-A, "Sample Preparation for Radiological Screening of Soil Samples by Gas Proportional Counting"
Counting Procedure L 6295-A "Operation of Tennelec LB4100 Gas Proportional Counters"

/Date 6/16/99
Technical Review

/Date 6/16/99
Quality Assurance Review

Thermo NUtech Rocky Flats
RFETS Building T886D
Golden, Colorado 80402
(303) 966 6000

B1-2

16

Thermo NUtech - Rocky Flats
Radscreen Results

RIN 99A8058
Analysis Radscreen
Report Date 06/15/99

Distribution/Fax ASD/ 4555
J Boylan/ 6079

Laboratory Sample ID	APO Sample ID			Matrix	Gross Alpha		Gross Beta		Total Activity pCi/ml	DOT Class
	RIN	Event	Bottle		pCi/L	2σ	pCi/L	2σ		
99060183-07	99A8058	014	001	Water	38	84	93	142	0 36	NONRAD

DOT Classification <2000 pCi/ml total activity is NONRAD
>= 2000 pCi/ml total activity is RAD

Total Activity Calculated as the sum of the gross alpha and beta activities AND the measurement uncertainties for these two measurements
If the measured activity is negative 0 pCi/L (instead of the negative value) is used to calculate the total activity

Analysis Methods Sample Preparation Procedure L 6278 A "Sample Preparation for Radiological Screening by Gas Proportional Counting"
Counting Procedure L 6295-A "Operation of Tennelec LB4100 Gas Proportional Counters"

/Date 6/16/99
Technical Review

for D. Taylor /Date 6/16/99
Quality Assurance Review

Thermo NUtech Rocky Flats
RFETS Building T886D
Golden, Colorado 80402
(303) 966-6660

B1-3

17

APPENDIX B-2

LABORATORY RESULTS – VOCs and METALS

18

TABLE C2 ROUTINE SW-846 METHODS

	Line Item Code	SS01B004	SS01B005	SS01B006	SS01B010
	Approved Method Source[3]	SW-846 METHOD 8260 (Low Level)	SW-846 METHOD 8260	SW-846 METHOD 8260	Routine 24 Hour [4] SW-846 METHOD 8260 (Medium Level Soil Method)
	Matrices:	Water, Waste Water	Water, Aqueous Waste	Soil, Sediment, Waste	Soil, Sediment
CAS #	ANALYTE	RDL[1] (ug/L)	RDL[1] (ug/L)	RDL[1] (ug/kg)	RDL[1] (ug/kg)
75-71-8	Dichlorodifluoromethane	1	5	5	1200
74-87 3	Chloromethane	1	5	5	1200
74-83-9	Bromomethane	1	5	5	1200
75-01-4	Vinyl Chloride	1	5	5	1200
75 00-3	Chloroethane	1	5	5	600
75-69-4	Trichlorofluoromethane	1	5	5	600
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	5	5	600
75-09-2	Methylene Chloride	1	5	5	600
67-64-1	Acetone	10	100	100	1200
75-15-0	Carbon Disulfide	1	5	5	600
75-35-4	1,1-Dichloroethene	1	5	5	600
75-34-3	1,1-Dichloroethane	1	5	5	600
156-60-5	trans-1,2-Dichloroethene	1	5	5	600
594-20-7	2,2-Dichloropropane	1	5	5	600
156-59-2	cis-1,2-Dichloroethene	1	5	5	600
74-97-5	Bromochloromethane	1	5	5	600
67-66-3	Chloroform	1	5	5	600
107-06-2	1,2-Dichloroethane	1	5	5	600
78-93-3	2-Butanone	10	100	100	1200
71-55-6	1,1,1-Trichloroethane	1	5	5	600
56-23-5	Carbon Tetrachloride	1	5	5	600
75-27-4	Bromodichloromethane	1	5	5	600
79-34-5	1,1,2,2-Tetrachloroethane	1	5	5	600
78-87-5	1,2-Dichloropropane	1	5	5	600
10061-02-6	trans-1,3-Dichloropropene	1	5	5	600
74-95-3	Dibromomethane	1	5	5	600
79-01-6	Trichloroethene	1	5	5	600
124-48-1	Dibromochloromethane	1	5	5	600
79-00-5	1,1,2-Trichloroethane	1	5	5	600
563-58-6	1,1-Dichloropropene	1	5	5	600
71-43-2	Benzene	1	5	5	600
10061-01-5	cis-1,3-Dichloropropene	1	5	5	600

19

TABLE C2 ROUTINE SW-846 METHODS (continued)

	Line Item Code:	SS01B004	SS01B005	SS01B006	SS01B010
	Approved Method Source[2]	SW-846 METHOD 8260 (Low Level)	SW-846 METHOD 8260	SW-846 METHOD 8260	Routine 24 Hour [4] SW-846 METHOD 8260 (Medium Level Soil Method)
	Matrices.	Water, Waste Water	Water, Aqueous Waste	Soil, Sediment, Waste	Soil, Sediment
CAS #	ANALYTE	RDL[1] (ug/L)	RDL[1] (ug/L)	RDL[1] (ug/kg)	RDL[1] (ug/kg)
75-25-2	Bromoform	1	5	5	600
591-78-6	2-Hexanone	10	50	50	1200
108-10-1	4-Methyl-2-pentanone	10	50	50	1200
142-28-9	1,3-Dichloropropane	1	5	5	600
127-18-4	Tetrachloroethene	1	5	5	600
108-88-3	Toluene	1	5	5	600
108-90-7	Chlorobenzene	1	5	5	600
100-41-4	Ethylbenzene	1	5	5	600
100-42-5	Styrene	1	5	5	600
1330-20-7	Xylenes (total)	1	5	5	600
630-20-6	1,1,1,2-Tetrachloroethane	1	5	5	600
106-93-4	1,2-Dibromoethane	1	5	5	600
98-82-8	Isopropylbenzene	1	5	5	600
108-86-1	Bromobenzene	1	5	5	600
96-18-4	1,2,3-Trichloropropane	1	5	5	600
103-65-1	n-Propylbenzene	1	5	5	600
95-49-8	2-Chlorotoluene	1	5	5	600
106-43-4	4-Chlorotoluene	1	5	5	600
108-67-8	1,3,5-Trimethylbenzene	1	5	5	600
98-06-6	tert-Butylbenzene	1	5	5	600
95-63-6	1,2,4-Trimethylbenzene	1	5	5	600
135-98-8	sec-Butylbenzene	1	5	5	600
541-73-1	m-Dichlorobenzene	1	5	5	600
99-87-6	4-Isopropyltoluene	1	5	5	600
106-46-7	p-Dichlorobenzene	1	5	5	600
95-50-1	o-Dichlorobenzene	1	5	5	600
104-51-8	n-Butylbenzene	1	5	5	600
96-12-8	1,2-Dibromo-3-chloropropane	1	5	5	600
120-82-1	1,2,4-Trichlorobenzene	1	5	5	600
87-68-3	Hexachlorobutadiene	1	5	5	600
91-20-3	Naphthalene	1	5	5	600
87-61-6	1,2,3-Trichlorobenzene	1	5	5	600

B2-iii

SECTION 5 NARRATIVE

ANALYTE VOLATILE ORGANICS

RIN NUMBER 99A8058A (Episode 39048A)

SAMPLE MATRIX Thirteen soil samples

METHOD REFERENCE NUMBERS AND REVISIONS

SWLO SOP ID SWL-OV-303
REVISION # 3 1
METHOD SW846-8260B Organic Statement of Work

DESCRIPTIONS OF MATRIX INTERFERENCES

Sample 8-013-001 contained surrogates outside QC recovery limits They were within limits in the reanalysis but both sets of data are submitted to verify that the original analysis was run within holding time VBLK1 contained low level methylene chloride less than five times the PQL and low level naphthalene contamination less than the PQL. VBLK 3 contained low level methylene chloride contamination less than the PQL. VBLK4 contained low level methylene chloride and low level naphthalene contamination each less than the PQL

DESCRIPTIONS OF REQUIRED DILUTIONS

None for this data set

EXPLANATIONS OF QC DEFICIENCIES

Sample 8-008-001MS and 8-008-001MSD each contained four compounds outside QC recovery limits Two compounds exceeded their RPD limits LCS1 contained three compounds and LCSD1 contained six compounds outside QC recovery limits LCS2 contained nine compounds and LCS3 contained one compound outside QC recovery limits LCS4 contained two compounds outside QC recovery limits Sample 8-013-001RE was run outside holding time ((see above)

REASONS FOR REANALYSIS

Surrogates out of QC limits (see above)

EXPLANATIONS OF ANY DEVIATIONS FROM ROUTINE PROTOCOLS

The MS/MSD on sample 8-008-001 was run as part of our laboratory QC
The LCS/LCSD QC results form is not automatically generated from our software

EXPLANATIONS FOR "N" MARKED ON "DATA REVIEW CHECKLIST"

6 a)1 Surrogates outside QC recovery limits (see above)
6 a)2 LCS/D and MS/MSD compounds out of QC limits (see above)
6 b)7 "B" flags (see above)

Note Sample names have been shortened to accommodate our processing software

B2-1

SECTION 5 NARRATIVE

ANALYTE VOLATILE ORGANICS

RIN NUMBER 99A8058B (Episode 39048B)

SAMPLE MATRIX One water sample

METHOD REFERENCE NUMBERS AND REVISIONS

SWLO SOP ID SWL-OV-315
REVISION # 2 1
METHOD 524 2 Protocol

DESCRIPTIONS OF MATRIX INTERFERENCES
None for this data set

DESCRIPTIONS OF REQUIRED DILUTIONS
None for this data set

EXPLANATIONS OF QC DEFICIENCIES
FBLK1 contained one compound outside QC recovery limits

REASONS FOR REANALYSIS
None for this data set

EXPLANATIONS OF ANY DEVIATIONS FROM ROUTINE PROTOCOLS
None for this data set

EXPLANATIONS FOR "N" MARKED ON "DATA REVIEW CHECKLIST"
6 a)2 FBLK out of QC limits (see above)

Note The fortified blanks (FBLKX) are reported as LCX in the EDD due to lack of applicable syntax. Sample names may be shortened to accommodate our processing software

B7-8

Tierra

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

COC # 99A8058#002

Page 1 of 4

Collector PG/HS	Contact/Requester GARCIA, ERNIE	Telephone No (303) 966-5980 MSIN FAX
RIN 99A8058	Sampling Origin	Purchase Order/Charge Code LC430500
Project Title 750 PAD/B984	Logbook No	Ice Chest No Temp 4°C
To (Lab) SouthWest Lab of Oklahoma	Method of Shipment FEDEX	Bill of Lading/Air Bill No 807912276954
Protocol		Offsite Property No

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption Yes [ ] No [ ]
TWO EXTRA BOTTLES HAVE BEEN SENT FOR EACH AQUEOUS VOA EVENT

Bottle No	Customer Number	Matrix	Date	Time	Location	No/Type Container	Sample Analysis	Preservative Packing
99A8058-001 002	Boring 9901, S-1	SOLID	6/11/99	0905	750 PAD	125-G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-001 003	Boring 9901, S-1	SOLID	6/11/99	0905	750 PAD	125-G P/G	SS05B048 (Mils SW846) [Priority]	None 4 degrees C
99A8058-002 001	Boring 9901, S-2	SOLID	6/11/99	0926	750 PAD	125-G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-002 002	Boring 9901, S-2	SOLID	6/11/99	0926	750 PAD	125-G P/G	SS05B048 (Mils SW846) [Priority]	None 4 degrees C
99A8058-003 001	Boring 9902, S-3	SOLID	6/11/99	0956	750 PAD	125-G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-003 002	Boring 9902, S-3	SOLID	6/11/99	0956	750 PAD	125-G P/G	SS05B048 (Mils SW846) [Priority]	None 4 degrees C
99A8058-004 001	Boring 9902, S-4	SOLID	6/11/99	1011	750 PAD	125-G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C

Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time
[signature]	6-16-99 1800						

FINAL SAMPLE DISPOSITION: Disposal Method (e.g. Return to customer per lab procedure, used in process) Disposed By Date/Time

-23 B2-3

Tierra

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

COC 99A8058#002

RIN 99A8058

Contact/Requestor GARCIA, ERNIE

Telephone No (303) 966-5980

MSIN

FAX

Bottle No	Customer Number	Matrix	Date	Time	Location	No/Type Container	Sample Analysis	Preservative Packing
99A8058-004 002	Boring 9902, S-4	SOLID	6/11/99	1011	750 PAD	125-G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-005 001	Boring 9903, S-5	SOLID	6/11/99	1025	750 PAD	125-G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-005 002	Boring 9903, S-5	SOLID	6/11/99	1025	750 PAD	125-G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-006 001	Boring 9903, S-6	SOLID	6/11/99	1042	750 PAD	125-G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-006 002	Boring 9903, S-6	SOLID	6/11/99	1042	750 PAD	125-G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-007 001	Boring 9904, S-7	SOLID	6/11/99	1210	750 PAD	125-G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-007 002	Boring 9904, S-7	SOLID	6/11/99	1210	750 PAD	125-G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-008 001	Boring 9904, S-8	SOLID	6/11/99	1215	750 PAD	125-G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-008 002	Boring 9904, S-8	SOLID	6/11/99	1215	750 PAD	125-G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-009 001	Boring 9904, S-9	SOLID	6/11/99	1220	750 PAD	125-G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-009 002	Boring 9904, S-9	SOLID	6/11/99	1220	750 PAD	125-G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C

Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time
Kayle McCall	6-16-99 1800						
Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time
						Stoll SWRO	6/17/99 1000

FINAL SAMPLE DISPOSITION

Disposal Method (e.g., Return to customer per lab procedure, used in process)

Disposed By

Date/Time

B2-4

Tierra

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

COC 99A8058#002

Page 1 of 1

RIN 99A8058

Contact/Requestor GARCIA, ERNIE

Telephone No (303) 966 5980

MSIN

FAX

Bottle No	Customer Number	Matrix	Date	Time	Location	No/Type Container	Sample Analysis	Preservative Packing
99A8058-010 001	Boring 9905, S-10	SOLID	6/11/99	1317	750 PAD	125-G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-010 002	Boring 9905, S-10	SOLID	6/11/99	1317	750 PAD	125-G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-011 001	Boring 9905, S-11	SOLID	6/11/99	1326	750 PAD	125-G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-011 002	Boring 9905, S-11	SOLID	6/11/99	1326	750 PAD	125-G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-012 001	Boring 9906 S-12	SOLID	6/11/99	1344	750 PAD	125-G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-012 002	Boring 9906, S-12	SOLID	6/11/99	1344	750 PAD	125-G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-013 001	Boring 9906, S-13	SOLID	6/11/99	1357	750 PAD	125-G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-013 002	Boring 9906, S-13	SOLID	6/11/99	1357	750 PAD	125-G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-014 002	Rinsate	AQUEOUS	6/11/99	1430	750 PAD	40-ML G	SS01B009 (VOA 524 2 Water) [Priority]	None 4 degs C w/zl
99A8058-014 003	Rinsate	AQUEOUS	6/11/99	1430	750 PAD	40-ML G	SS01B009 (VOA 524 2 Water) [Priority] Spare	None 4 degs C w/zl
99A8058-014 004	Rinsate	AQUEOUS	6/11/99	1430	750 PAD	40-ML G	SS01B009 (VOA 524 2 Water) [Priority] Spare	None 4 degs C w/zl

Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time
[illegible]	6-16-99 8:00						

FINAL SAMPLE DISPOSITION: Disposal Method (e.g., Return to customer per lab procedure, used in process) — Disposed By — Date/Time

25 B2-5

Tierra

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

COC # 99A8058#002

Page 1 of 4

RIN	Contact/Requestor	Telephone No	MSIN	TAX
99A8058	GARCIA, ERNIE	(303) 966-5980		

Bottle No	Customer Number	Matrix	Date	Time	Location	No/Type Container	Sample Analysis	Preservative Packing
99A8058-014 005	Rinsate	AQUEOUS	4/11/99	1430	750 PAD	1-L P/G	SS05B022 (Mls Unfiltered SW846) [Priority]	HN03 4 degrees C

Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time
Ralph/Michael	6-16-99 1800						

FINAL SAMPLE DISPOSITION	Disposal Method (e.g. Return to customer per lab procedure, used in process)	Disposed By	Date/Time

Received By: SWLO 6/17/99 1000

26 B2-6

①

LCS\LCSD RECOVERY REPORT

Lab Name: SWOK\AATS | Matrix. SOIL

Instrument. r | Analyst: SERETHA

LCS Analysis Date: 23-JUN-99 16.41 | LCS File id: r33389 d

LCSD Analysis Date: 23-JUN-99 21.46 | LCSD File id. r33400.d

Units· Water ug/L Soil ug/Kg Air ppbv

COMPOUND	SPIKE ADDED	LCS CONCENTRATION	LCS % REC #	QC LIMITS REC
DICHLORODIFLUOROMETHANE	50.00	37 77	76	10-182
CHLOROMETHANE	50.00	34.52	69	38-130
VINYL CHLORIDE	50.00	40.40	81	34-153
BROMOMETHANE	50.00	43.38	87	16-188
CHLOROETHANE	50.00	54.24	108	28-181
TRICHLOROFLUOROMETHANE	50.00	29.20	58	46-155
1 1-DICHLOROETHENE	50.00	30.70	61	61-152
ACETONE	50.00	30.76	62	55-152
CARBON DISULFIDE	50.00	28.51	57	35-183
METHYLENE CHLORIDE	50.00	37.53	75	16-200
trans-1 2-DICHLOROETHENE	50.00	40.12	80	30-177
1 1-DICHLOROETHANE	50.00	36.51	73	48-149
2 2-DICHLOROPROPANE	50.00	45.94	92	44-135
cis-1 2-DICHLOROETHENE	50.00	43.52	87	57-139
2-BUTANONE	50.00	54.38	109	20-180
BROMOCHLOROMETHANE	50.00	36.56	-73*	81-112
CHLOROFORM	50.00	41.50	83	62-125
1 1 1-TRICHLOROETHANE	50.00	46.90	94	68-120
CARBON TETRACHLORIDE	50.00	49.95	100	48-140
1 1-DICHLOROPROPENE	50.00	49.99	100	50-141
BENZENE	50.00	49.03	98	58-133
1 2-DICHLOROETHANE	50.00	46.54	93	66-126
TRICHLOROETHENE	50.00	47.39	95	63-129
1 2-DICHLOROPROPANE	50.00	44.25	88	67-126
DIBROMOMETHANE	50.00	38.09	76	75-124
BROMODICHLOROMETHANE	50.00	40.23	80	78-116
cis-1,3-Dichloropropene	50.00	44.44	89	73-125
4-METHYL-2-PENTANONE	50.00	49.37	99	45-151
TOLUENE	50.00	46.24	92	71-119
trans-1,3-Dichloropropene	50.00	45.80	92	70-129
1 1 2-TRICHLOROETHANE	50.00	43.28	86	54-146
TETRACHLOROETHENE	50.00	47.37	95	47-153
1 3-DICHLOROPROPANE	50.00	50.24	100	82-123
2-HEXANONE	50.00	58.20	116	38-155
DIBROMOCHLOROMETHANE	50.00	46.39	93	85-121
1 2-DIBROMOETHANE	50.00	44.01	88	72-143
CHLOROBENZENE	50.00	49.73	99	81-114
1 1 1 2-TETRACHLOROETHANE	50.00	50.30	101	87-117
ETHYL BENZENE	50.00	56.31	113	74-115
m,p-XYLENES	100.00	99.86	100	71-128
o-XYLENE	50.00	49.00	98	76-120
STYRENE	50.00	49.09	98	81-118
BROMOFORM	50.00	47.23	94	77-125

Column to be used to flag recovery with an asterisk 3 LIPPO

* Value outside of QC limits

27

B7-7

COMPOUND	SPIKE ADDED	LCS CONCENTRATION	LCS % REC #	QC LIMITS REC
ISOPROPYLBENZENE	50.00	55.01	110	73-114
BROMOBENZENE	50.00	50 64	101	81-112
1 1 2 2-TETRACHLOROETHANE	50.00	52.73	105	52-145
1 2 3-TRICHLOROPROPANE	50.00	54 38	109	73-135
n-PROPYLBENZENE	50 00	52.28	104	80-115
2-CHLOROTOLUENE	50.00	48.57	97	79-115
4-CHLOROTOLUENE	50.00	48.67	97	77-106
1 3 5-TRIMETHYLBENZENE	50.00	47.86	96	78-113
tert-BUTYLBENZENE	50.00	49 94	100	80-112
1 2 4-TRIMETHYLBENZENE	50.00	46.26	92	76-112
sec-BUTYLBENZENE	50.00	48.29	96	72-112
1 3-DICHLOROBENZENE	50.00	42.81	86	79-113
p-ISOPROPYLTOLUENE	50.00	46.11	92	78-115
1 4-DICHLOROBENZENE	50.00	42.04	84	78-111
1 2-DICHLOROBENZENE	50.00	41.92	84	83-113
n-BUTYLBENZENE	50.00	44.11	88	73-118
1 2-DIBROMO-3-CHLOROPROPANE	50.00	38.95	78	52-162
1 2 4-TRICHLOROBENZENE	50.00	32.95	66	32-155
HEXACHLOROBUTADIENE	50.00	34.55	69*	70-121
NAPHTHALENE	50.00	35.37	71	27-181
1 2 3-TRICHLOROBENZENE	50.00	30.46	61*	68-127

Column to be used to flag recovery with an asterisk

* Value outside of QC limits

LCS Recovery: 3 out of 64 outside limits

LCS\LCSD RECOVERY REPORT

Lab Name: SWOK\AATS | Matrix: SOIL

Instrument. r | Analyst SERETHA

LCS Analysis Date: 23-JUN-99 16:41 | LCS File id r33389.d

LCSD Analysis Date: 23-JUN-99 21:46 | LCSD File id. r33400.d

Units Water ug/L Soil ug/Kg Air ppbv

COMPOUND	SPIKE ADDED	LCSD CONC.	LCSD % REC #	% RPD	QC LIMITS REC
DICHLORODIFLUOROMETHANE	50.00	41.43	83	9	10-182
CHLOROMETHANE	50.00	46.94	94	31	38-130
VINYL CHLORIDE	50.00	42.35	85	5	34-153
BROMOMETHANE	50.00	37.21	74	16	16-188
CHLOROETHANE	50.00	59.44	119	10	28-181
TRICHLOROFLUOROMETHANE	50.00	33.80	68	16	46-155
1 1-DICHLOROETHENE	50.00	34.75	70	14	61-152
ACETONE	50.00	26.39	53*	16	55-152
CARBON DISULFIDE	50.00	29.55	59	3	35-183
METHYLENE CHLORIDE	50.00	35.90	72	4	16-200
trans-1 2-DICHLOROETHENE	50.00	40.40	81	1	30-177
1 1-DICHLOROETHANE	50.00	38.49	77	5	48-149
2 2-DICHLOROPROPANE	50.00	41.50	83	10	44-135
cis-1 2-DICHLOROETHENE	50.00	43.31	87	0	57-139
2-BUTANONE	50.00	57.84	116	6	20-180
BROMOCHLOROMETHANE	50.00	38.74	77*	5	81-112
CHLOROFORM	50.00	43.23	86	4	62-125
1 1 1-TRICHLOROETHANE	50.00	45.89	92	2	68-120
CARBON TETRACHLORIDE	50.00	46.58	93	7	48-140
1 1-DICHLOROPROPENE	50.00	49.87	100	0	50-141
BENZENE	50.00	47.87	96	2	58-133
1 2-DICHLOROETHANE	50.00	50.24	100	7	66-126
TRICHLOROETHENE	50.00	46.42	93	2	63-129
1 2-DICHLOROPROPANE	50.00	45.79	92	4	67-126
DIBROMOMETHANE	50.00	38.20	76	0	75-124
BROMODICHLOROMETHANE	50.00	40.04	80	0	78-116
cis-1,3-Dichloropropene	50.00	44.27	88	1	73-125
4-METHYL-2-PENTANONE	50.00	50.14	100	1	45-151
TOLUENE	50.00	44.87	90	2	71-119
trans-1,3-Dichloropropene	50.00	47.02	94	2	70-129
1 1 2-TRICHLOROETHANE	50.00	47.83	96	11	54-146
TETRACHLOROETHENE	50.00	47.18	94	1	47-153
1 3-DICHLOROPROPANE	50.00	56.44	113	12	82-123
2-HEXANONE	50.00	65.83	132	13	38-155
DIBROMOCHLOROMETHANE	50.00	49.35	99	6	85-121
1 2-DIBROMOETHANE	50.00	44.41	89	1	72-143
CHLOROBENZENE	50.00	51.42	103	4	81-114
1 1 1 2-TETRACHLOROETHANE	50.00	54.15	108	7	87-117
ETHYL BENZENE	50.00	51 13	102	10	74-115
m,p-XYLENES	100.00	104 46	104	4	71-128
o-XYLENE	50.00	54.32	109	11	76-120
STYRENE	50.00	53.60	107	9	81-118
BROMOFORM	50.00	49.63	99	5	77-125

Column to be used to flag recovery with an asterisk

* Value outside of QC limits

COMPOUND	SPIKE ADDED	LCSD CONC.	LCSD % REC #	% RPD	QC LIMITS REC
ISOPROPYLBENZENE	50.00	60.40	121*	10	73-114
BROMOBENZENE	50.00	55.67	111	9	81-112
1 1 2 2-TETRACHLOROETHANE	50.00	62.73	125	17	52-145
1 2 3-TRICHLOROPROPANE	50.00	64.63	129	17	73-135
n-PROPYLBENZENE	50.00	60.13	120*	14	80-115
2-CHLOROTOLUENE	50.00	56.59	113	15	79-115
4-CHLOROTOLUENE	50 00	52 77	106	9	77-106
1 3 5-TRIMETHYLBENZENE	50 00	55 68	111	14	78-113
tert-BUTYLBENZENE	50 00	57.21	114*	13	80-112
1 2 4-TRIMETHYLBENZENE	50.00	54.28	108	16	76-112
sec-BUTYLBENZENE	50.00	57.15	114*	17	72-112
1 3-DICHLOROBENZENE	50.00	51.75	104	19	79-113
p-ISOPROPYLTOLUENE	50.00	56 05	112	20	78-115
1 4-DICHLOROBENZENE	50.00	51.11	102	19	78-111
1 2-DICHLOROBENZENE	50.00	51.89	104	21	83-113
n-BUTYLBENZENE	50.00	56.28	112	24	73-118
1 2-DIBROMO-3-CHLOROPROPANE	50.00	51.99	104	29	52-162
1 2 4-TRICHLOROBENZENE	50.00	45.37	91	32	32-155
HEXACHLOROBUTADIENE	50.00	48.74	97	34	70-121
NAPHTHALENE	50.00	50.09	100	34	27-181
1 2 3-TRICHLOROBENZENE	50.00	45.99	92	41	68-127

Column to be used to flag recovery with an asterisk

* Value outside of QC limits

LCSD Recovery: 6 out of 64 outside limits

30

LCS\LCSD RECOVERY REPORT

(8)

Lab Name: SWOK\AATS | Matrix. SOIL

Instrument· b | Analyst: sam

LCS Analysis Date: 23-JUN-99 18:05 | LCS File id: b3252 d

LCSD Analysis Date: 23-JUN-99 18:34 | LCSD File id: b3253.d

Units Water ug/L Soil ug/Kg Air ppbv

COMPOUND	SPIKE ADDED	LCS CONCENTRATION	LCS % REC #	QC LIMITS REC
DICHLORODIFLUOROMETHANE	50.00	51.74	103	60-140
CHLOROMETHANE	50.00	47.68	95	65-127
VINYL CHLORIDE	50.00	35.85	72	68-126
BROMOMETHANE	50.00	43.23	86	33-159
CHLOROETHANE	50.00	54.42	109	65-132
TRICHLOROFLUOROMETHANE	50.00	56.77	114	65-129
1 1-DICHLOROETHENE	50.00	48.84	98	83-116
ACETONE	50.00	20.08	40*	60-140
CARBON DISULFIDE	50.00	38.57	77	60-140
METHYLENE CHLORIDE	50.00	38.09	76*	78-124
trans-1 2-DICHLOROETHENE	50.00	46.99	94	81-117
1 1-DICHLOROETHANE	50.00	38.87	78*	82-121
2 2-DICHLOROPROPANE	50.00	39.35	79	65-128
cis-1 2-DICHLOROETHENE	50.00	49.74	99	84-115
2-BUTANONE	50.00	39.46	79	60-140
BROMOCHLOROMETHANE	50.00	48.02	96	82-119
CHLOROFORM	50.00	41.88	84*	85-116
1 1 1-TRICHLOROETHANE	50.00	42.23	84	83-116
1 1-DICHLOROPROPENE	50.00	47.12	94	60-140
CARBON TETRACHLORIDE	50.00	49.52	99	85-115
BENZENE	50.00	52.65	105	87-115
1 2-DICHLOROETHANE	50.00	41.88	84	83-123
TRICHLOROETHENE	50.00	57.30	115	87-116
1 2-DICHLOROPROPANE	50.00	46.95	94	86-119
DIBROMOMETHANE	50.00	51.57	103	80-127
BROMODICHLOROMETHANE	50.00	47.63	95	82-119
cis-1,3-Dichloropropene	50.00	47.55	95	60-140
4-METHYL-2-PENTANONE	50.00	44.24	88	60-140
TOLUENE	50.00	53.06	106	85-115
trans-1,3-Dichloropropene	50.00	46.09	92	60-140
1 1 2-TRICHLOROETHANE	50.00	50 73	101	79-129
TETRACHLOROETHENE	50.00	64.40	129*	85-114
1 3-DICHLOROPROPANE	50.00	47.17	94	79-126
2-HEXANONE	50.00	44.51	89	60-140
DIBROMOCHLOROMETHANE	50.00	55 55	111	79-126
1 2-DIBROMOETHANE	50.00	52.35	105	74-133
CHLOROBENZENE	50.00	56.46	113	86-114
1 1 1 2-TETRACHLOROETHANE	50.00	53.20	106	85-115
ETHYL BENZENE	50.00	52.27	104	88-113
m,p-XYLENES	100.00	112.41	112	86-116
o-XYLENE	50.00	54 75	110	84-115
STYRENE	50.00	56.40	113	86-116
BROMOFORM	50.00	61.22	122	69-139

B2-11

6 HI
4 HO (2 hl 0 ppb)

Column to be used to flag recovery with an asterisk

* Value outside of QC limits

31

(2)

COMPOUND	SPIKE ADDED	LCS CONCENTRATION	LCS % REC #	QC LIMITS REC
ISOPROPYLBENZENE	50.00	50.43	101	85-115
BROMOBENZENE	50.00	57.97	116*	85-114
1 1 2 2-TETRACHLOROETHANE	50.00	39.27	78	53-161
1 2 3-TRICHLOROPROPANE	50.00	44 06	88	64-145
n-PROPYLBENZENE	50.00	53.20	106	82-119
2-CHLOROTOLUENE	50 00	53.78	108	86-115
4-CHLOROTOLUENE	50.00	72.66	145*	83-117
1 3 5-TRIMETHYLBENZENE	50.00	49.95	100	85-116
tert-BUTYLBENZENE	50.00	49 98	100	85-116
1 2 4-TRIMETHYLBENZENE	50.00	49.52	99	85-116
sec-BUTYLBENZENE	50.00	50.52	101	85-115
1 3-DICHLOROBENZENE	50.00	56 29	112	86-112
p-ISOPROPYLTOLUENE	50.00	50.63	101	87-113
1 4-DICHLOROBENZENE	50.00	54.48	109	86-112
1 2-DICHLOROBENZENE	50.00	55.29	110	85-116
n-BUTYLBENZENE	50.00	49.21	98	84-117
1 2-DIBROMO-3-CHLOROPROPANE	50.00	35.77	72	53-158
1 2 4-TRICHLOROBENZENE	50.00	61.18	122*	85-114
HEXACHLOROBUTADIENE	50.00	62.62	125	68-136
NAPHTHALENE	50.00	54.08	108	68-137
1 2 3-TRICHLOROBENZENE	50.00	61.12	122*	83-117

Column to be used to flag recovery with an asterisk

* Value outside of QC limits

LCS Recovery: 9 out of 64 outside limits

B2-12

32

LCS\LCSD RECOVERY REPORT

(3)

Lab Name· SWOK\AATS | Matrix SOIL

Instrument. r | Analyst SERETHA

LCS Analysis Date. 25-JUN-99 11 47 | LCS File id r33420 d

~~LCSD Analysis Date· 25-JUN-99 18·27 | LCSD File id r33432 d~~

Units· Water ug/L Soil ug/Kg Air ppbv

COMPOUND	SPIKE ADDED	LCS CONCENTRATION	LCS % REC #	QC LIMITS REC
DICHLORODIFLUOROMETHANE	50.00	42 92	86	10-182
CHLOROMETHANE	50 00	43 61	87	38-130
VINYL CHLORIDE	50 00	46 83	94	34-153
BROMOMETHANE	50 00	53 67	107	16-188
CHLOROETHANE	50 00	65 85	132	28-181
TRICHLOROFLUOROMETHANE	50.00	59 45	119	46-155
~~ACROLEIN~~	~~500.00~~	~~1357.99~~	~~272*~~	~~10-185~~
1 1-DICHLOROETHENE	50.00	38 43	77	61-152
ACETONE	50 00	31.63	63	55-152
CARBON DISULFIDE	50 00	25.95	52	35-183
METHYLENE CHLORIDE	50 00	40 44	81	16-200
ACRYLONITRILE	500 00	450 46	90	10-219
trans-1 2-DICHLOROETHENE	50.00	36 07	72	30-177
Methyl-tert-Butyl Ether	50 00	48.29	96	53-111
1 1-DICHLOROETHANE	50.00	38 52	77	48-149
VINYL ACETATE	50.00	30.41	61	43-141
2 2-DICHLOROPROPANE	50.00	31 25	62	44-135
cis-1 2-DICHLOROETHENE	50.00	38.60	77	57-139
2-BUTANONE	50.00	56.37	113	20-180
BROMOCHLOROMETHANE	50.00	37.73	75*	81-112
CHLOROFORM	50.00	39 16	78	62-125
1 1 1-TRICHLOROETHANE	50.00	40.99	82	68-120
CARBON TETRACHLORIDE	50 00	38.53	77	48-140
1 1-DICHLOROPROPENE	50.00	39.99	80	50-141
BENZENE	50.00	41 17	82	58-133
1 2-DICHLOROETHANE	50.00	44.85	90	66-126
TRICHLOROETHENE	50.00	43 82	88	63-129
1 2-DICHLOROPROPANE	50.00	46 06	92	67-126
DIBROMOMETHANE	50.00	39 14	78	75-124
BROMODICHLOROMETHANE	50 00	42 54	85	78-116
2-CHLOROETHYL VINYL ETHER	50 00	61 72	123	39-134
cis-1,3-Dichloropropene	50 00	43.17	86	73-125
4-METHYL-2-PENTANONE	50.00	54 29	108	45-151
TOLUENE	50.00	43 03	86	71-119
trans-1,3-Dichloropropene	50.00	44 66	89	70-129
1 1 2-TRICHLOROETHANE	50 00	49 10	98	54-146
TETRACHLOROETHENE	50 00	42 70	85	47-153
1 3-DICHLOROPROPANE	50.00	55 52	111	82-123
2-HEXANONE	50 00	66 64	133	38-155
DIBROMOCHLOROMETHANE	50 00	50 54	101	85-121
1 2-DIBROMOETHANE	50 00	46 57	93	72-143
CHLOROBENZENE	50 00	49.76	100	81-114
1-CHLOROHEXANE	50 00	38 91	78	22-151

Column to be used to flag recovery with an asterisk

1 10 (1 1090)

* Value outside of QC limits

B2-13

33

(13)

COMPOUND	SPIKE ADDED	LCS CONCENTRATION	LCS % REC #	QC LIMITS REC
1 1 1 2-TETRACHLOROETHANE	50.00	52 71	105	87-117
ETHYL BENZENE	50 00	49 84	100	74-115
m,p-XYLENES	100 00	98 40	98	71-128
o-XYLENE	50.00	51 59	103	76-120
STYRENE	50 00	51 07	102	81-118
BROMOFORM	50 00	51.13	102	77-125
ISOPROPYLBENZENE	50 00	52 96	106	73-114
BROMOBENZENE	50 00	53 91	108	81-112
1 1 2 2-TETRACHLOROETHANE	50 00	59 76	120	52-145
1 2 3-TRICHLOROPROPANE	50 00	58 48	117	73-135
n-PROPYLBENZENE	50 00	52 38	105	80-115
2-CHLOROTOLUENE	50 00	53 72	107	79-115
4-CHLOROTOLUENE	50 00	48 16	96	77-106
1 3 5-TRIMETHYLBENZENE	50 00	49.21	98	78-113
tert-BUTYLBENZENE	50.00	51.59	103	80-112
1 2 4-TRIMETHYLBENZENE	50 00	48.22	96	76-112
sec-BUTYLBENZENE	50 00	50 08	100	72-112
1 3-DICHLOROBENZENE	50.00	48 43	97	79-113
p-ISOPROPYLTOLUENE	50 00	47 84	96	78-115
1 4-DICHLOROBENZENE	50 00	46 99	94	78-111
1 2-DICHLOROBENZENE	50 00	50 59	101	83-113
n-BUTYLBENZENE	50 00	46 21	92	73-118
1 2-DIBROMO-3-CHLOROPROPANE	50 00	50 14	100	52-162
1 2 4-TRICHLOROBENZENE	50.00	37.45	75	32-155
HEXACHLOROBUTADIENE	50.00	41 93	84	70-121
NAPHTHALENE	50.00	46.95	94	27-181
1 2 3-TRICHLOROBENZENE	50 00	39.63	79	68-127

Column to be used to flag recovery with an asterisk

* Value outside of QC limits

LCS Recovery· 2 out of 70 outside limits

B2-14

LCS\LCSD RECOVERY REPORT

(A)

Lab Name SWOK\AATS Matrix SOIL

Instrument r Analyst SERETHA

LCS Analysis Date: 29-JUN-99 12 42 LCS File id r33472 d

Units· Water ug/L Soil ug/Kg Air ppbv

COMPOUND	SPIKE ADDED	LCS CONCENTRATION	LCS % REC #	QC LIMITS REC
DICHLORODIFLUOROMETHANE	50.00	30 47	61	10-182
CHLOROMETHANE	50.00	29 69	59	38-130
VINYL CHLORIDE	50 00	29 78	60	34-153
BROMOMETHANE	50 00	36.84	74	16-188
CHLOROETHANE	50.00	35 01	70	28-181
TRICHLOROFLUOROMETHANE	50.00	48 61	97	46-155
~~ACROLEIN~~	~~500.00~~	~~1630.01~~	~~326*~~	~~10-185~~
1 1-DICHLOROETHENE	50.00	35.15	70	61-152
ACETONE	50.00	51 80	104	55-152
CARBON DISULFIDE	50.00	30 28	60	35-183
METHYLENE CHLORIDE	50.00	38 51	77	16-200
ACRYLONITRILE	500.00	397 18	79	10-219
trans-1 2-DICHLOROETHENE	50.00	46 79	94	30-177
Methyl-tert-Butyl Ether	50.00	43 73	87	53-111
1 1-DICHLOROETHANE	50.00	34 43	69	48-149
VINYL ACETATE	50.00	42 27	84	43-141
2 2-DICHLOROPROPANE	50.00	43.97	88	44-135
cis-1 2-DICHLOROETHENE	50.00	42 67	85	57-139
2-BUTANONE	50.00	56 11	112	20-180
BROMOCHLOROMETHANE	50.00	39.20	- 78*	81-112
CHLOROFORM	50.00	41.23	82	62-125
1 1 1-TRICHLOROETHANE	50.00	46 68	93	68-120
CARBON TETRACHLORIDE	50.00	53 83	108	48-140
1 1-DICHLOROPROPENE	50.00	50.86	102	50-141
BENZENE	50.00	48 64	- 97	58-133
1 2-DICHLOROETHANE	50.00	49 30	99	66-126
TRICHLOROETHENE	50.00	49 57	99	63-129
1 2-DICHLOROPROPANE	50.00	44 08	88	67-126
DIBROMOMETHANE	50.00	45.85	92	75-124
BROMODICHLOROMETHANE	50.00	49 10	98	78-116
2-CHLOROETHYL VINYL ETHER	50.00	37 65	75	39-134
cis-1,3-Dichloropropene	50.00	48 76	98	73-125
4-METHYL-2-PENTANONE	50.00	54 42	109	45-151
TOLUENE	50.00	51.17 -	102	71-119
trans-1,3-Dichloropropene	50.00	50 16	100	70-129
1 1 2-TRICHLOROETHANE	50.00	49 45	99	54-146
TETRACHLOROETHENE	50.00	53 77	108	47-153
1 3-DICHLOROPROPANE	50 00	51.84	104	82-123
2-HEXANONE	50 00	70 52	141	38-155
DIBROMOCHLOROMETHANE	50.00	52 70	105	85-121
1 2-DIBROMOETHANE	50 00	55 68	111	72-143
CHLOROBENZENE	50.00	53 25	106	81-114
1-CHLOROHEXANE	50 00	38 15	76	22-151

Column to be used to flag recovery with an asterisk

* Value outside of QC limits

ϕ BTEX

8260 1H1 1/10/99 ϕ

B2-15

35

(A)

COMPOUND	SPIKE ADDED	LCS CONCENTRATION	LCS % REC #	QC LIMITS REC
1 1 1 2-TETRACHLOROETHANE	50.00	56 71	113	87-117
ETHYL BENZENE	50 00	51 20	102	74-115
m,p-XYLENES	100 00	99 51	100	71-128
o-XYLENE	50.00	52.44	105	76-120
STYRENE	50 00	53 15	106	81-118
BROMOFORM	50 00	55 47	111	77-125
ISOPROPYLBENZENE	50.00	55.24	110	73-114
BROMOBENZENE	50 00	57.16	114*	81-112
1 1 2 2-TETRACHLOROETHANE	50.00	58 23	116	52-145
1 2 3-TRICHLOROPROPANE	50.00	57 96	116	73-135
n-PROPYLBENZENE	50.00	54 95	110	80-115
2-CHLOROTOLUENE	50.00	53 22	106	79-115
4-CHLOROTOLUENE	50.00	51.05	102	77-106
1 3 5-TRIMETHYLBENZENE	50.00	52.08	104	78-113
tert-BUTYLBENZENE	50.00	53.64	107	80-112
1 2 4-TRIMETHYLBENZENE	50 00	51 94	104	76-112
sec-BUTYLBENZENE	50 00	52 77	106	72-112
1 3-DICHLOROBENZENE	50.00	52 42	105	79-113
p-ISOPROPYLTOLUENE	50.00	52 35	105	78-115
1 4-DICHLOROBENZENE	50.00	49.58	99	78-111
1 2-DICHLOROBENZENE	50.00	50.84	102	83-113
n-BUTYLBENZENE	50 00	50 64	101	73-118
1 2-DIBROMO-3-CHLOROPROPANE	50.00	47 18	94	52-162
1 2 4-TRICHLOROBENZENE	50 00	51.38	103	32-155
HEXACHLOROBUTADIENE	50.00	52.30	105	70-121
NAPHTHALENE	50.00	49.09	98	27-181
1 2 3-TRICHLOROBENZENE	50.00	50.30	101	68-127

Column to be used to flag recovery with an asterisk

* Value outside of QC limits

LCS Recovery. 3 out of 70 outside limits

B2-16

36

LCS\LCSD RECOVERY REPORT

Lab Name: SWOK\AATS | Matrix WATER

Instrument: n | Analyst seretha

LCS Analysis Date· 25-JUN-99 15·43 | LCS File id n35462.d

Units· Water ug/L Soil ug/Kg Air ppbv

COMPOUND	SPIKE ADDED	LCS CONCENTRATION	LCS % REC #	QC LIMITS REC
DICHLORODIFLUOROMETHANE	1 00	0 84	84	70-130
CHLOROMETHANE	1 00	0 94	94	70-130
VINYL CHLORIDE	1.00	0 84	84	70-130
BROMOMETHANE	1 00	0 98	98	70-130
CHLOROETHANE	1 00	0 83	83	70-130
TRICHLOROFLUOROMETHANE	1 00	0 82	82	70-130
1 1-DICHLOROETHENE	1.00	0 82	82	70-130
METHYLENE CHLORIDE	1.00	1.75	175*	70-130
trans-1 2-DICHLOROETHENE	1.00	0.87	87	70-130
1 1-DICHLOROETHANE	1.00	0 97	97	70-130
2 2-DICHLOROPROPANE	1.00	1 01	101	70-130
cis-1 2-DICHLOROETHENE	1.00	0.95	95	70-130
BROMOCHLOROMETHANE	1.00	0.91	91	70-130
CHLOROFORM	1.00	1 00	100	70-130
1 1 1-TRICHLOROETHANE	1.00	0.92	92	70-130
CARBON TETRACHLORIDE	1.00	0.87	87	70-130
1 1-DICHLOROPROPENE	1.00	0.98	98	70-130
BENZENE	1 00	1.05	105	70-130
1 2-DICHLOROETHANE	1.00	1.03	103	70-130
TRICHLOROETHENE	1.00	0.93	93	70-130
1 2-DICHLOROPROPANE	1.00	0.92	92	70-130
DIBROMOMETHANE	1.00	0.98	98	70-130
BROMODICHLOROMETHANE	1.00	0.88	88	70-130
cis-1,3-DICHLOROPROPENE	1.00	0.87	87	70-130
TOLUENE	1 00	0.97	97	70-130
trans-1,3-DICHLOROPROPENE	1.00	0.84	84	70-130
1 1 2-TRICHLOROETHANE	1.00	0 95	95	70-130
TETRACHLOROETHENE	1 00	0 92	92	70-130
1 3-DICHLOROPROPANE	1.00	0 94	94	70-130
DIBROMOCHLOROMETHANE	1.00	0.83	83	70-130
1 2-DIBROMOETHANE	1.00	0 93	93	70-130
CHLOROBENZENE	1.00	0.92	92	70-130
1 1 1 2-TETRACHLOROETHANE	1.00	0.92	92	70-130
ETHYL BENZENE	1 00	0.96	96	70-130
m,p-XYLENES	2 00	1.91	96	70-130
o-XYLENE	1.00	0 95	95	70-130
STYRENE	1 00	0 88	88	70-130
BROMOFORM	1.00	0.74	74	70-130
ISOPROPYLBENZENE	1 00	0.92	92	70-130
BROMOBENZENE	1 00	0.87	87	70-130
1 2 3-TRICHLOROPROPANE	1 00	1 16	116	70-130
1 1 2 2-TETRACHLOROETHANE	1 00	0 88	88	70-130
n-PROPYLBENZENE	1 00	0 88	88	70-130

Column to be used to flag recovery with an asterisk

* Value outside of QC limits

B2-17

37

COMPOUND	SPIKE ADDED	LCS CONCENTRATION	LCS % REC #	QC LIMITS REC
2-CHLOROTOLUENE	1 00	0.85	85	70-130
4-CHLOROTOLUENE	1 00	0.95	95	70-130
1 3 5-TRIMETHYLBENZENE	1.00	0 94	94	70-130
tert-BUTYLBENZENE	1 00	0 82	82	70-130
1 2 4-TRIMETHYLBENZENE	1 00	0 90	90	70-130
sec-BUTYLBENZENE	1.00	0 94	94	70-130
1 3-DICHLOROBENZENE	1 00	0.87	87	70-130
1 4-DICHLOROBENZENE	1.00	0 96	96	70-130
p-ISOPROPYLTOLUENE	1.00	0.91	91	70-130
1 2-DICHLOROBENZENE	1 00	0 88	88	70-130
n-BUTYLBENZENE	1 00	0 88	88	70-130
1 2-DIBROMO-3-CHLOROPROPANE	1.00	0 72	72	70-130
1 2 4-TRICHLOROBENZENE	1 00	0 70	70	70-130
NAPHTHALENE	1 00	0 71	71	70-130
HEXACHLOROBUTADIENE	1 00	0 84	84	70-130
1 2 3-TRICHLOROBENZENE	1 00	0 72	72	70-130

Column to be used to flag recovery with an asterisk

* Value outside of QC limits

LCS Recovery. 1 out of 59 outside limits

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO

8058-014-002

Lab Name SWL-TULSA Contract 99A8058B

Lab Code SWOK Case No KAISHIL SAS No SDG No 39048B

Lab Sample ID 39048 27 Lab File ID N35464 D

Purge Volume 25 0 mL Date Received. 06/17/99

Matrix WATER Date Analyzed 06/25/99

GC Column DB624 ID. 0 53 (mm) Dilution Factor 1 0

CAS NO	COMPOUND	CONCENTRATION ug/L	Q
74-87-3	CHLOROMETHANE	1	U
74-83-9	BROMOMETHANE	1	U
75-01-4	VINYL CHLORIDE	1	U
75-00-3	CHLOROETHANE	1	U
75-09-2	METHYLENE CHLORIDE	1	U
75-35-4	1 1-DICHLOROETHENE	1	U
75-34-3	1 1-DICHLOROETHANE	1	U
67-66-3	CHLOROFORM	1	U
107-06-2	1 2-DICHLOROETHANE	1	U
71-55-6	1 1 1-TRICHLOROETHANE	1	U
56-23-5	CARBON TETRACHLORIDE	1	U
75-27-4	BROMODICHLOROMETHANE	1	U
78-87-5	1 2-DICHLOROPROPANE	1	U
10061-01-5	cis-1,3-DICHLOROPROPENE	1	U
79-01-6	TRICHLOROETHENE	1	U
124-48-1	DIBROMOCHLOROMETHANE	1	U
79-00-5	1 1 2-TRICHLOROETHANE	1	U
71-43-2	BENZENE	1	U
10061-02-6	trans-1,3-DICHLOROPROPENE	1	U
75-25-2	BROMOFORM	1	U
127-18-4	TETRACHLOROETHENE	1	U
108-88-3	TOLUENE	1	U
79-34-5	1 1 2 2-TETRACHLOROETHANE	1	U
108-90-7	CHLOROBENZENE	1	U
100-41-4	ETHYL BENZENE	1	U
100-42-5	STYRENE	1	U
1330-20-7	Xylene (total)	1	U
156-59-2	cis-1 2-DICHLOROETHENE	1	U
156-60-5	trans-1 2-DICHLOROETHENE	1	U
106-93-4	1 2-DIBROMOETHANE	1	U
630-20-6	1 1 1 2-TETRACHLOROETHANE	1	U
75-71-8	DICHLORODIFLUOROMETHANE	1	U
75-69-4	TRICHLOROFLUOROMETHANE	1	U
74-95-3	DIBROMOMETHANE	1	U
96-12-8	1 2-DIBROMO-3-CHLOROPROPANE	1	U
108-86-1	BROMOBENZENE	1	U
104-51-8	n-BUTYLBENZENE	1	U
98-06-6	tert-BUTYLBENZENE	1	U
135-98-8	sec-BUTYLBENZENE	1	U
95-49-8	2-CHLOROTOLUENE	1	U
106-43-4	4-CHLOROTOLUENE	1	U

B2-19

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

8058-014-002

Lab Name SWL-TULSA Contract 99A8058B

Lab Code SWOK Case No KAISHIL SAS No SDG No 39048B

Lab Sample ID 39048 27 Lab File ID N35464 D

Purge Volume 25 0 mL Date Received 06/17/99

Matrix WATER Date Analyzed 06/25/99

GC Column DB624 ID 0 53 (mm) Dilution Factor 1 0

CAS NO	COMPOUND	CONCENTRATION ug/L	Q
95-50-1	1 2-DICHLOROBENZENE	1	U
541-73-1	1 3-DICHLOROBENZENE	1	U
106-46-7	1 4-DICHLOROBENZENE	1	U
142-28-9	1 3-DICHLOROPROPANE	1	U
590-20-7	2 2-DICHLOROPROPANE	1	U
563-58-6	1 1-DICHLOROPROPENE	1	U
87-68-3	HEXACHLOROBUTADIENE	1	U
98-82-8	ISOPROPYLBENZENE	1	U
99-87-6	p-ISOPROPYLTOLUENE	1	U
91-20-3	NAPHTHALENE	1	U
103-65-1	n-PROPYLBENZENE	1	U
87-61-6	1 2 3-TRICHLOROBENZENE	1	U
120-82-1	1 2 4-TRICHLOROBENZENE	1	U
96-18-4	1 2 3-TRICHLOROPROPANE	1	U
95-63-6	1 2 4-TRIMETHYLBENZENE	1	U
108-67-8	1 3 5-TRIMETHYLBENZENE	1	U
74-97-5	BROMOCHLOROMETHANE	1	U

B2-20

40

9904-5-7

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO

8-007-001

Lab Name SWL-TULSA Contract 99A8058A

Lab Code SWOK Case No KAISHIL SAS No SDG No 39048A

Matrix (soil/water) SOIL Lab Sample ID 39048 07

Sample wt/vol 5 0 (g/mL) G Lab File ID R33397 D

Level (low/med) LOW Date Received 06/17/99

% Moisture not dec 7 Date Analyzed 06/23/99

Column (pack/cap) CAP Dilution Factor 1 0

CAS NO	COMPOUND	CONCENTRATION UNITS (ug/L or ug/Kg) UG/KG	Q
74-87-3	CHLOROMETHANE	5	U
74-83-9	BROMOMETHANE	5	U
75-01-4	VINYL CHLORIDE	5	U
75-00-3	CHLOROETHANE	5	U
75-09-2	METHYLENE CHLORIDE	6	B
67-64-1	ACETONE	5	U
75-15-0	CARBON DISULFIDE	5	U
75-35-4	1 1-DICHLOROETHENE	5	U
75-34-3	1 1-DICHLOROETHANE	5	U
67-66-3	CHLOROFORM	5	U
107-06-2	1 2-DICHLOROETHANE	5	U
78-93-3	2-BUTANONE	5	U
71-55-6	1 1 1-TRICHLOROETHANE	5	U
56-23-5	CARBON TETRACHLORIDE	5	U
75-27-4	BROMODICHLOROMETHANE	5	U
78-87-5	1 2-DICHLOROPROPANE	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	TRICHLOROETHENE	5	U
124-48-1	DIBROMOCHLOROMETHANE	5	U
79-00-5	1 1 2-TRICHLOROETHANE	5	U
71-43-2	BENZENE	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
75-25-2	BROMOFORM	5	U
108-10-1	4-METHYL-2-PENTANONE	5	U
591-78-6	2-HEXANONE	5	U
127-18-4	TETRACHLOROETHENE	5	U
108-88-3	TOLUENE	5	U
79-34-5	1 1 2 2-TETRACHLOROETHANE	5	U
108-90-7	CHLOROBENZENE	5	U
100-41-4	ETHYL BENZENE	5	U
100-42-5	STYRENE	5	U
1330-20-7	Xylene (Total)	5	U
156-59-2	cis-1 2-DICHLOROETHENE	5	U
156-60-5	trans-1 2-DICHLOROETHENE	5	U

B2-21

9904 5-7

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO

8-007-001

Lab Name SWL-TULSA Contract 99A8058A

Lab Code SWOK Case No KAISHIL SAS No SDG No 39048A

Matrix (soil/water) SOIL Lab Sample ID 39048 07

Sample wt/vol 5 0 (g/mL) G Lab File ID R33397 D

Level (low/med) LOW Date Received 06/17/99

% Moisture not dec 7 Date Analyzed 06/23/99

Column (pack/cap) CAP Dilution Factor 1 0

CAS NO	COMPOUND	CONCENTRATION UNITS (ug/L or ug/Kg) UG/KG	Q
106-93-4	1 2-DIBROMOETHANE	5	U
630-20-6	1 1 1 2-TETRACHLOROETHANE	5	U
96-18-4	1 2 3-TRICHLOROPROPANE	5	U
75-71-8	DICHLORODIFLUOROMETHANE	5	U
75-69-4	TRICHLOROFLUOROMETHANE	5	U
74-95-3	DIBROMOMETHANE	5	U
96-12-8	1 2-DIBROMO-3-CHLOROPROPANE	5	U
108-86-1	BROMOBENZENE	5	U
104-51-8	n-BUTYLBENZENE	5	U
98-06-6	tert-BUTYLBENZENE	5	U
135-98-8	sec-BUTYLBENZENE	5	U
95-49-8	2-CHLOROTOLUENE	5	U
106-43-4	4-CHLOROTOLUENE	5	U
95-50-1	1 2-DICHLOROBENZENE	5	U
541-73-1	1 3-DICHLOROBENZENE	5	U
106-46-7	1 4-DICHLOROBENZENE	5	U
142-28-9	1 3-DICHLOROPROPANE	5	U
594-20-7	2 2-DICHLOROPROPANE	5	U
563-58-6	1 1-DICHLOROPROPENE	5	U
87-68-3	HEXACHLOROBUTADIENE	5	U
98-82-8	ISOPROPYLBENZENE	5	U
99-87-6	p-ISOPROPYLTOLUENE	5	U
91-20-3	NAPHTHALENE	5	U
103-65-1	n-PROPYLBENZENE	5	U
87-61-6	1 2 3-TRICHLOROBENZENE	5	U
120-82-1	1 2 4-TRICHLOROBENZENE	5	U
95-63-6	1 2 4-TRIMETHYLBENZENE	5	U
108-67-8	1 3 5-TRIMETHYLBENZENE	5	U
76-13-1	1,1,2-TRICHLOROTRIFLUOROETHA	5	U
74-97-5	BROMOCHLOROMETHANE	5	U

B2-22

9904 5-7

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO
8-007-001

Lab Name SWL-TULSA Contract 99A8058A

Lab Code SWOK Case No KAISHIL SAS No SDG No 39048A

Matrix (soil/water) SOIL Lab Sample ID 39048 07

Sample wt/vol 5 0 (g/mL) G Lab File ID R33397 D

Level (low/med) LOW Date Received 06/17/99

% Moisture not dec 7 Date Analyzed 06/23/99

Soil Extract Volume _____(uL) Soil Aliquot Volume _____(uL)

Column· (pack/cap) CAP Dilution Factor· 1 0

Number TICs found 2

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

CAS NUMBER	COMPOUND NAME	RT	EST CONC	Q
1	UNKNOWN	19 319	23	JB
2	UNKNOWN	21 528	18	J
3				
4				
5.				
6				
7.				
8				
9.				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20.				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				

82-23

43

FORM I VOA-TIC

9404-S-8

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO

8-008-001

Lab Name SWL-TULSA Contract 99A8058A

Lab Code SWOK Case No KAISHIL SAS No. SDG No 39048A

Matrix (soil/water) SOIL Lab Sample ID 39048 08

Sample wt/vol 5 0 (g/mL) G Lab File ID B3249 D

Level (low/med) LOW Date Received 06/17/99

% Moisture not dec 19 Date Analyzed 06/23/99

Column (pack/cap) CAP Dilution Factor 1 0

CAS NO	COMPOUND	CONCENTRATION UNITS (ug/L or ug/Kg) UG/KG	Q
74-87-3	CHLOROMETHANE	6	U
74-83-9	BROMOMETHANE	6	U
75-01-4	VINYL CHLORIDE	6	U
75-00-3	CHLOROETHANE	6	U
75-09-2	METHYLENE CHLORIDE	3	J
67-64-1	ACETONE	5	J
75-15-0	CARBON DISULFIDE	6	U
75-35-4	1 1-DICHLOROETHENE	6	U
75-34-3	1 1-DICHLOROETHANE	6	U
67-66-3	CHLOROFORM	6	U
107-06-2	1 2-DICHLOROETHANE	6	U
78-93-3	2-BUTANONE	6	U
71-55-6	1 1 1-TRICHLOROETHANE	6	U
56-23-5	CARBON TETRACHLORIDE	6	U
75-27-4	BROMODICHLOROMETHANE	6	U
78-87-5	1 2-DICHLOROPROPANE	6	U
10061-01-5	cis-1,3-Dichloropropene	6	U
79-01-6	TRICHLOROETHENE	8	
124-48-1	DIBROMOCHLOROMETHANE	6	U
79-00-5	1 1 2-TRICHLOROETHANE	6	U
71-43-2	BENZENE	6	U
10061-02-6	trans-1,3-Dichloropropene	6	U
75-25-2	BROMOFORM	6	U
108-10-1	4-METHYL-2-PENTANONE	6	U
591-78-6	2-HEXANONE	6	U
127-18-4	TETRACHLOROETHENE	6	U
108-88-3	TOLUENE	6	U
79-34-5	1 1 2 2-TETRACHLOROETHANE	6	U
108-90-7	CHLOROBENZENE	6	U
100-41-4	ETHYL BENZENE	6	U
100-42-5	STYRENE	6	U
1330-20-7	Xylene (Total)	6	U
156-59-2	cis-1 2-DICHLOROETHENE	3	J
156-60-5	trans-1 2-DICHLOROETHENE	6	U

B2-24

9904 S-8

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO

8-008-001

Lab Name SWL-TULSA Contract 99A8058A

Lab Code SWOK Case No KAISHIL SAS No SDG No 39048A

Matrix (soil/water) SOIL Lab Sample ID 39048 08

Sample wt/vol 5 0 (g/mL) G Lab File ID B3249 D

Level (low/med) LOW Date Received 06/17/99

% Moisture not dec 19 Date Analyzed 06/23/99

Column (pack/cap) CAP Dilution Factor 1 0

CAS NO	COMPOUND	CONCENTRATION UNITS (ug/L or ug/Kg) UG/KG	Q
106-93-4	1 2-DIBROMOETHANE	6	U
630-20-6	1 1 1 2-TETRACHLOROETHANE	6	U
96-18-4	1 2 3-TRICHLOROPROPANE	6	U
75-71-8	DICHLORODIFLUOROMETHANE	6	U
75-69-4	TRICHLOROFLUOROMETHANE	6	U
74-95-3	DIBROMOMETHANE	6	U
96-12-8	1 2-DIBROMO-3-CHLOROPROPANE	6	U
108-86-1	BROMOBENZENE	6	U
104-51-8	n-BUTYLBENZENE	6	U
98-06-6	tert-BUTYLBENZENE	6	U
135-98-8	sec-BUTYLBENZENE	6	U
95-49-8	2-CHLOROTOLUENE	6	U
106-43-4	4-CHLOROTOLUENE	6	U
95-50-1	1 2-DICHLOROBENZENE	6	U
541-73-1	1 3-DICHLOROBENZENE	6	U
106-46-7	1 4-DICHLOROBENZENE	6	U
142-28-9	1 3-DICHLOROPROPANE	6	U
594-20-7	2 2-DICHLOROPROPANE	6	U
563-58-6	1 1-DICHLOROPROPENE	6	U
87-68-3	HEXACHLOROBUTADIENE	6	U
98-82-8	ISOPROPYLBENZENE	6	U
99-87-6	p-ISOPROPYLTOLUENE	6	U
91-20-3	NAPHTHALENE	11	
103-65-1	n-PROPYLBENZENE	6	U
87-61-6	1 2 3-TRICHLOROBENZENE	6	U
120-82-1	1 2 4-TRICHLOROBENZENE	6	U
95-63-6	1 2 4-TRIMETHYLBENZENE	6	U
108-67-8	1 3 5-TRIMETHYLBENZENE	6	U
76-13-1	1,1,2-TRICHLOROTRIFLUOROETHA	6	U
74-97-5	BROMOCHLOROMETHANE	6	U

87-35

45

FORM I VOA

8260

9904 5-8

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO
8-008-001

Lab Name SWL-TULSA Contract 99A8058A

Lab Code SWOK Case No KAISHIL SAS No SDG No 39048A

Matrix (soil/water) SOIL Lab Sample ID 39048 08

Sample wt/vol 5 0 (g/mL) G Lab File ID B3249 D

Level (low/med) LOW Date Received 06/17/99

% Moisture not dec 19 Date Analyzed 06/23/99

Soil Extract Volume _____(uL) Soil Aliquot Volume _____(uL)

Column (pack/cap) CAP Dilution Factor 1 0

Number TICs found 0

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

	CAS NUMBER	COMPOUND NAME	RT	EST CONC	Q
1					
2					
3					
4					
5					
6					
7.					
8					
9.					
10					
11					
12					
13.					
14.					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					

46

B2-26

9904-5-9

EPA SAMPLE NO

8-009-001

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name SWL-TULSA Contract 99A8058A

Lab Code SWOK Case No KAISHIL SAS No SDG No 39048A

Matrix (soil/water) SOIL Lab Sample ID 39048 09

Sample wt/vol 5 0 (g/mL) G Lab File ID R33398 D

Level (low/med) LOW Date Received 06/17/99

% Moisture not dec 20 Date Analyzed 06/23/99

Column (pack/cap) CAP Dilution Factor 1 0

CAS NO	COMPOUND	CONCENTRATION UNITS (ug/L or ug/Kg) UG/KG	Q
74-87-3	CHLOROMETHANE	6	U
74-83-9	BROMOMETHANE	6	U
75-01-4	VINYL CHLORIDE	6	U
75-00-3	CHLOROETHANE	6	U
75-09-2	METHYLENE CHLORIDE	4	JB
67-64-1	ACETONE	6	U
75-15-0	CARBON DISULFIDE	6	U
75-35-4	1 1-DICHLOROETHENE	6	U
75-34-3	1 1-DICHLOROETHANE	6	U
67-66-3	CHLOROFORM	6	U
107-06-2	1 2-DICHLOROETHANE	6	U
78-93-3	2-BUTANONE	6	U
71-55-6	1 1 1-TRICHLOROETHANE	6	U
56-23-5	CARBON TETRACHLORIDE	6	U
75-27-4	BROMODICHLOROMETHANE	6	U
78-87-5	1 2-DICHLOROPROPANE	6	U
10061-01-5	cis-1,3-Dichloropropene	6	U
79-01-6	TRICHLOROETHENE	6	J
124-48-1	DIBROMOCHLOROMETHANE	6	U
79-00-5	1 1 2-TRICHLOROETHANE	6	U
71-43-2	BENZENE	6	U
10061-02-6	trans-1,3-Dichloropropene	6	U
75-25-2	BROMOFORM	6	U
108-10-1	4-METHYL-2-PENTANONE	6	U
591-78-6	2-HEXANONE	6	U
127-18-4	TETRACHLOROETHENE	6	U
108-88-3	TOLUENE	6	U
79-34-5	1 1 2 2-TETRACHLOROETHANE	6	U
108-90-7	CHLOROBENZENE	6	U
100-41-4	ETHYL BENZENE	6	U
100-42-5	STYRENE	6	U
1330-20-7	Xylene (Total)	6	U
156-59-2	cis-1 2-DICHLOROETHENE	2	J
156-60-5	trans-1 2-DICHLOROETHENE	6	U

47

B7-37

9904 S-9

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO

8-009-001

Lab Name SWL-TULSA Contract 99A8058A

Lab Code SWOK Case No KAISHIL SAS No SDG No 39048A

Matrix (soil/water) SOIL Lab Sample ID 39048 09

Sample wt/vol 5 0 (g/mL) G Lab File ID R33398 D

Level (low/med) LOW Date Received 06/17/99

% Moisture not dec 20 Date Analyzed 06/23/99

Column (pack/cap) CAP Dilution Factor 1 0

CAS NO	COMPOUND	CONCENTRATION UNITS (ug/L or ug/Kg) UG/KG	Q
106-93-4	1 2-DIBROMOETHANE	6	U
630-20-6	1 1 1 2-TETRACHLOROETHANE	6	U
96-18-4	1 2 3-TRICHLOROPROPANE	6	U
75-71-8	DICHLORODIFLUOROMETHANE	6	U
75-69-4	TRICHLOROFLUOROMETHANE	6	U
74-95-3	DIBROMOMETHANE	6	U
96-12-8	1 2-DIBROMO-3-CHLOROPROPANE	6	U
108-86-1	BROMOBENZENE	6	U
104-51-8	n-BUTYLBENZENE	6	U
98-06-6	tert-BUTYLBENZENE	6	U
135-98-8	sec-BUTYLBENZENE	6	U
95-49-8	2-CHLOROTOLUENE	6	U
106-43-4	4-CHLOROTOLUENE	6	U
95-50-1	1 2-DICHLOROBENZENE	6	U
541-73-1	1 3-DICHLOROBENZENE	6	U
106-46-7	1 4-DICHLOROBENZENE	6	U
142-28-9	1 3-DICHLOROPROPANE	6	U
594-20-7	2 2-DICHLOROPROPANE	6	U
563-58-6	1 1-DICHLOROPROPENE	6	U
87-68-3	HEXACHLOROBUTADIENE	6	U
98-82-8	ISOPROPYLBENZENE	6	U
99-87-6	p-ISOPROPYLTOLUENE	6	U
91-20-3	NAPHTHALENE	6	U
103-65-1	n-PROPYLBENZENE	6	U
87-61-6	1 2 3-TRICHLOROBENZENE	6	U
120-82-1	1 2 4-TRICHLOROBENZENE	6	U
95-63-6	1 2 4-TRIMETHYLBENZENE	6	U
108-67-8	1 3 5-TRIMETHYLBENZENE	6	U
76-13-1	1,1,2-TRICHLOROTRIFLUOROETHA	6	U
74-97-5	BROMOCHLOROMETHANE	6	U

BZ-28

9904 5-9

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO

8-009-001

Lab Name SWL-TULSA Contract 99A8058A

Lab Code SWOK Case No KAISHIL SAS No SDG No 39048A

Matrix (soil/water) SOIL Lab Sample ID 39048 09

Sample wt/vol 5 0 (g/mL) G Lab File ID R33398 D

Level (low/med) LOW Date Received 06/17/99

% Moisture not dec 20 Date Analyzed 06/23/99

Soil Extract Volume _____(uL) Soil Aliquot Volume _____(uL)

Column (pack/cap) CAP Dilution Factor 1 0

Number TICs found· 3

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

CAS NUMBER	COMPOUND NAME	RT	EST -CONC	Q
1	Cyclotrisiloxane	9 075	6	J
2	UNKNOWN	19 313	31	JB
3	UNKNOWN	21 510	17	J
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				

44

82-79

9905-5-10

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO

8-010-001

Lab Name SWL-TULSA Contract 99A8058A

Lab Code SWOK Case No KAISHIL SAS No SDG No 39048A

Matrix (soil/water) SOIL Lab Sample ID 39048 10

Sample wt/vol 5 0 (g/mL) G Lab File ID R33399 D

Level (low/med) LOW Date Received 06/17/99

% Moisture not dec 16 Date Analyzed 06/23/99

Column (pack/cap) CAP Dilution Factor 1 0

CAS NO.	COMPOUND	CONCENTRATION UNITS (ug/L or ug/Kg) UG/KG	Q
74-87-3	CHLOROMETHANE	6	U
74-83-9	BROMOMETHANE	6	U
75-01-4	VINYL CHLORIDE	6	U
75-00-3	CHLOROETHANE	6	U
75-09-2	METHYLENE CHLORIDE	7	B
67-64-1	ACETONE	19	
75-15-0	CARBON DISULFIDE	6	U
75-35-4	1 1-DICHLOROETHENE	6	U
75-34-3	1 1-DICHLOROETHANE	6	U
67-66-3	CHLOROFORM	6	U
107-06-2	1 2-DICHLOROETHANE	6	U
78-93-3	2-BUTANONE	6	U
71-55-6	1 1 1-TRICHLOROETHANE	6	U
56-23-5	CARBON TETRACHLORIDE	6	U
75-27-4	BROMODICHLOROMETHANE	6	U
78-87-5	1 2-DICHLOROPROPANE	6	U
10061-01-5	cis-1,3-Dichloropropene	6	U
79-01-6	TRICHLOROETHENE	6	U
124-48-1	DIBROMOCHLOROMETHANE	6	U
79-00-5	1 1 2-TRICHLOROETHANE	6	U
71-43-2	BENZENE	6	U
10061-02-6	trans-1,3-Dichloropropene	6	U
75-25-2	BROMOFORM	6	U
108-10-1	4-METHYL-2-PENTANONE	6	U
591-78-6	2-HEXANONE	6	U
127-18-4	TETRACHLOROETHENE	6	U
108-88-3	TOLUENE	6	U
79-34-5	1 1 2 2-TETRACHLOROETHANE	6	U
108-90-7	CHLOROBENZENE	6	U
100-41-4	ETHYL BENZENE	6	U
100-42-5	STYRENE	6	U
1330-20-7	Xylene (Total)	6	U
156-59-2	cis-1 2-DICHLOROETHENE	6	U
156-60-5	trans-1 2-DICHLOROETHENE	6	U

BZ-30

50

1

9905 S-10

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO

8-010-001

Lab Name SWL-TULSA Contract 99A8058A

Lab Code SWOK Case No KAISHIL SAS No SDG No 39048A

Matrix (soil/water) SOIL Lab Sample ID 39048 10

Sample wt/vol 5 0 (g/mL) G Lab File ID R33399 D

Level (low/med) LOW Date Received 06/17/99

% Moisture not dec 16 Date Analyzed 06/23/99

Column (pack/cap) CAP Dilution Factor 1 0

CAS NO.	COMPOUND	CONCENTRATION UNITS (ug/L or ug/Kg) UG/KG	Q
106-93-4	1 2-DIBROMOETHANE	6	U
630-20-6	1 1 1 2-TETRACHLOROETHANE	6	U
96-18-4	1 2 3-TRICHLOROPROPANE	6	U
75-71-8	DICHLORODIFLUOROMETHANE	6	U
75-69-4	TRICHLOROFLUOROMETHANE	6	U
74-95-3	DIBROMOMETHANE	6	U
96-12-8	1 2-DIBROMO-3-CHLOROPROPANE	6	U
108-86-1	BROMOBENZENE	6	U
104-51-8	n-BUTYLBENZENE	6	U
98-06-6	tert-BUTYLBENZENE	6	U
135-98-8	sec-BUTYLBENZENE	6	U
95-49-8	2-CHLOROTOLUENE	6	U
106-43-4	4-CHLOROTOLUENE	6	U
95-50-1	1 2-DICHLOROBENZENE	6	U
541-73-1	1 3-DICHLOROBENZENE	6	U
106-46-7	1 4-DICHLOROBENZENE	6	U
142-28-9	1 3-DICHLOROPROPANE	6	U
594-20-7	2 2-DICHLOROPROPANE	6	U
563-58-6	1 1-DICHLOROPROPENE	6	U
87-68-3	HEXACHLOROBUTADIENE	6	U
98-82-8	ISOPROPYLBENZENE	6	U
99-87-6	p-ISOPROPYLTOLUENE	6	U
91-20-3	NAPHTHALENE	6	U
103-65-1	n-PROPYLBENZENE	6	U
87-61-6	1 2 3-TRICHLOROBENZENE	6	U
120-82-1	1 2 4-TRICHLOROBENZENE	6	U
95-63-6	1 2 4-TRIMETHYLBENZENE	6	U
108-67-8	1 3 5-TRIMETHYLBENZENE	6	U
76-13-1	1,1,2-TRICHLOROTRIFLUOROETHA	6	U
74-97-5	BROMOCHLOROMETHANE	6	U

B2-31

57

9905 S-10

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO
8-010-001

Lab Name SWL-TULSA Contract 99A8058A

Lab Code SWOK Case No KAISHIL SAS No SDG No 39048A

Matrix (soil/water) SOIL Lab Sample ID 39048 10

Sample wt/vol 5 0 (g/mL) G Lab File ID R33399 D

Level (low/med) LOW Date Received 06/17/99

% Moisture not dec 16 Date Analyzed 06/23/99

Soil Extract Volume _____(uL) Soil Aliquot Volume _____(uL)

Column (pack/cap) CAP Dilution Factor 1 0

Number TICs found 3

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

CAS NUMBER	COMPOUND NAME	RT	EST CONC	Q
1	UNKNOWN	16 990	6	J
2	UNKNOWN	19 304	31	JB
3	UNKNOWN	21 513	16	J
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				

52

B2-32

9905-S-11

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO

8-011-001

Lab Name SWL-TULSA Contract 99A8058A

Lab Code SWOK Case No KAISHIL SAS No SDG No 39048A

Matrix (soil/water) SOIL Lab Sample ID 39048 11

Sample wt/vol 5 0 (g/mL) G Lab File ID R33401 D

Level (low/med) LOW Date Received 06/17/99

% Moisture not dec 14 Date Analyzed 06/23/99

Column (pack/cap) CAP Dilution Factor 1 0

CAS NO	COMPOUND	CONCENTRATION UNITS (ug/L or ug/Kg) UG/KG	Q
74-87-3	CHLOROMETHANE	6	U
74-83-9	BROMOMETHANE	6	U
75-01-4	VINYL CHLORIDE	6	U
75-00-3	CHLOROETHANE	6	U
75-09-2	METHYLENE CHLORIDE	6	B
67-64-1	ACETONE	6	U
75-15-0	CARBON DISULFIDE	6	U
75-35-4	1 1-DICHLOROETHENE	6	U
75-34-3	1 1-DICHLOROETHANE	6	U
67-66-3	CHLOROFORM	6	U
107-06-2	1 2-DICHLOROETHANE	6	U
78-93-3	2-BUTANONE	6	U
71-55-6	1 1 1-TRICHLOROETHANE	6	U
56-23-5	CARBON TETRACHLORIDE	6	U
75-27-4	BROMODICHLOROMETHANE	6	U
78-87-5	1 2-DICHLOROPROPANE	6	U
10061-01-5	cis-1,3-Dichloropropene	6	U
79-01-6	TRICHLOROETHENE	6	U
124-48-1	DIBROMOCHLOROMETHANE	6	U
79-00-5	1 1 2-TRICHLOROETHANE	6	U
71-43-2	BENZENE	6	U
10061-02-6	trans-1,3-Dichloropropene	6	U
75-25-2	BROMOFORM	6	U
108-10-1	4-METHYL-2-PENTANONE	6	U
591-78-6	2-HEXANONE	6	U
127-18-4	TETRACHLOROETHENE	6	U
108-88-3	TOLUENE	6	U
79-34-5	1 1 2 2-TETRACHLOROETHANE	6	U
108-90-7	CHLOROBENZENE	6	U
100-41-4	ETHYL BENZENE	6	U
100-42-5	STYRENE	6	U
1330-20-7	Xylene (Total)	6	U
156-59-2	cis-1 2-DICHLOROETHENE	6	U
156-60-5	trans-1 2-DICHLOROETHENE	6	U

182-33

53

9905 S-11

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO

8-011-001

Lab Name SWL-TULSA Contract 99A8058A

Lab Code SWOK Case No KAISHIL SAS No SDG No 39048A

Matrix (soil/water) SOIL Lab Sample ID 39048 11

Sample wt/vol 5 0 (g/mL) G Lab File ID R33401 D

Level (low/med) LOW Date Received 06/17/99

% Moisture not dec 14 Date Analyzed 06/23/99

Column (pack/cap) CAP Dilution Factor 1 0

CAS NO	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
106-93-4	1 2-DIBROMOETHANE	6	U
630-20-6	1 1 1 2-TETRACHLOROETHANE	6	U
96-18-4	1 2 3-TRICHLOROPROPANE	6	U
75-71-8	DICHLORODIFLUOROMETHANE	6	U
75-69-4	TRICHLOROFLUOROMETHANE	6	U
74-95-3	DIBROMOMETHANE	6	U
96-12-8	1 2-DIBROMO-3-CHLOROPROPANE	6	U
108-86-1	BROMOBENZENE	6	U
104-51-8	n-BUTYLBENZENE	6	U
98-06-6	tert-BUTYLBENZENE	6	U
135-98-8	sec-BUTYLBENZENE	6	U
95-49-8	2-CHLOROTOLUENE	6	U
106-43-4	4-CHLOROTOLUENE	6	U
95-50-1	1 2-DICHLOROBENZENE	6	U
541-73-1	1 3-DICHLOROBENZENE	6	U
106-46-7	1 4-DICHLOROBENZENE	6	U
142-28-9	1 3-DICHLOROPROPANE	6	U
594-20-7	2 2-DICHLOROPROPANE	6	U
563-58-6	1 1-DICHLOROPROPENE	6	U
87-68-3	HEXACHLOROBUTADIENE	6	U
98-82-8	ISOPROPYLBENZENE	6	U
99-87-6	p-ISOPROPYLTOLUENE	6	U
91-20-3	NAPHTHALENE	6	U
103-65-1	n-PROPYLBENZENE	6	U
87-61-6	1 2 3-TRICHLOROBENZENE	6	U
120-82-1	1 2 4-TRICHLOROBENZENE	6	U
95-63-6	1 2 4-TRIMETHYLBENZENE	6	U
108-67-8	1 3 5-TRIMETHYLBENZENE	6	U
76-13-1	1,1,2-TRICHLOROTRIFLUOROETHA	6	U
74-97-5	BROMOCHLOROMETHANE	6	U

B2-34

54

9905 5-11

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO
8-011-001

Lab Name SWL-TULSA Contract 99A8058A

Lab Code SWOK Case No KAISHIL SAS No SDG No 39048A

Matrix (soil/water) SOIL Lab Sample ID 39048 11

Sample wt/vol 5 0 (g/mL) G Lab File ID R33401 D

Level (low/med) LOW Date Received 06/17/99

% Moisture not dec 14 Date Analyzed 06/23/99

Soil Extract Volume _____(uL) Soil Aliquot Volume _____(uL)

Column (pack/cap) CAP Dilution Factor 1 0

Number TICs found 2

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

CAS NUMBER	COMPOUND NAME	RT	EST CONC	Q
1	UNKNOWN	19 311	23	JB
2	UNKNOWN	21 511	21	J
3.				
4				
5				
6.				
7.				
8.				
9.				
10				
11.				
12.				
13				
14				
15				
16				
17				
18				
19				
20.				
21				
22.				
23				
24				
25				
26				
27				
28.				
29				
30				

55

B2-35

9906-5-12

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO

8-012-001

Lab Name SWL-TULSA Contract 99A8058A

Lab Code SWOK Case No KAISHIL SAS No SDG No 39048A

Matrix (soil/water) SOIL Lab Sample ID 39048 12

Sample wt/vol 5 0 (g/mL) G Lab File ID R33402 D

Level (low/med) LOW Date Received 06/17/99

% Moisture not dec 16 Date Analyzed 06/23/99

Column (pack/cap) CAP Dilution Factor 1 0

CAS NO	COMPOUND	CONCENTRATION UNITS (ug/L or ug/Kg) UG/KG	Q
74-87-3	CHLOROMETHANE	6	U
74-83-9	BROMOMETHANE	6	U
75-01-4	VINYL CHLORIDE	6	U
75-00-3	CHLOROETHANE	6	U
75-09-2	METHYLENE CHLORIDE	7	B
67-64-1	ACETONE	6	U
75-15-0	CARBON DISULFIDE	6	U
75-35-4	1 1-DICHLOROETHENE	6	U
75-34-3	1 1-DICHLOROETHANE	6	U
67-66-3	CHLOROFORM	6	U
107-06-2	1 2-DICHLOROETHANE	6	U
78-93-3	2-BUTANONE	6	U
71-55-6	1 1 1-TRICHLOROETHANE	6	U
56-23-5	CARBON TETRACHLORIDE	6	U
75-27-4	BROMODICHLOROMETHANE	6	U
78-87-5	1 2-DICHLOROPROPANE	6	U
10061-01-5	cis-1,3-Dichloropropene	6	U
79-01-6	TRICHLOROETHENE	6	U
124-48-1	DIBROMOCHLOROMETHANE	6	U
79-00-5	1 1 2-TRICHLOROETHANE	6	U
71-43-2	BENZENE	6	U
10061-02-6	trans-1,3-Dichloropropene	6	U
75-25-2	BROMOFORM	6	U
108-10-1	4-METHYL-2-PENTANONE	6	U
591-78-6	2-HEXANONE	6	U
127-18-4	TETRACHLOROETHENE	6	U
108-88-3	TOLUENE	6	U
79-34-5	1 1 2 2-TETRACHLOROETHANE	6	U
108-90-7	CHLOROBENZENE	6	U
100-41-4	ETHYL BENZENE	6	U
100-42-5	STYRENE	6	U
1330-20-7	Xylene (Total)	6	U
156-59-2	cis-1 2-DICHLOROETHENE	6	U
156-60-5	trans-1 2-DICHLOROETHENE	6	U

B2-36

9906 S-12

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO

8-012-001

Lab Name SWL-TULSA Contract 99A8058A

Lab Code SWOK Case No KAISHIL SAS No SDG No. 39048A

Matrix (soil/water) SOIL Lab Sample ID 39048.12

Sample wt/vol 5 0 (g/mL) G Lab File ID R33402 D

Level (low/med) LOW Date Received 06/17/99

% Moisture not dec. 16 Date Analyzed 06/23/99

Column (pack/cap) CAP Dilution Factor 1 0

CAS NO	COMPOUND	CONCENTRATION UNITS (ug/L or ug/Kg) UG/KG	Q
106-93-4	1 2-DIBROMOETHANE	6	U
630-20-6	1 1 1 2-TETRACHLOROETHANE	6	U
96-18-4	1 2 3-TRICHLOROPROPANE	6	U
75-71-8	DICHLORODIFLUOROMETHANE	6	U
75-69-4	TRICHLOROFLUOROMETHANE	6	U
74-95-3	DIBROMOMETHANE	6	U
96-12-8	1 2-DIBROMO-3-CHLOROPROPANE	6	U
108-86-1	BROMOBENZENE	6	U
104-51-8	n-BUTYLBENZENE	6	U
98-06-6	tert-BUTYLBENZENE	6	U
135-98-8	sec-BUTYLBENZENE	6	U
95-49-8	2-CHLOROTOLUENE	6	U
106-43-4	4-CHLOROTOLUENE	6	U
95-50-1	1 2-DICHLOROBENZENE	6	U
541-73-1	1 3-DICHLOROBENZENE	6	U
106-46-7	1 4-DICHLOROBENZENE	6	U
142-28-9	1 3-DICHLOROPROPANE	6	U
594-20-7	2 2-DICHLOROPROPANE	6	U
563-58-6	1 1-DICHLOROPROPENE	6	U
87-68-3	HEXACHLOROBUTADIENE	6	U
98-82-8	ISOPROPYLBENZENE	6	U
99-87-6	p-ISOPROPYLTOLUENE	6	U
91-20-3	NAPHTHALENE	6	U
103-65-1	n-PROPYLBENZENE	6	U
87-61-6	1 2 3-TRICHLOROBENZENE	6	U
120-82-1	1 2 4-TRICHLOROBENZENE	6	U
95-63-6	1 2 4-TRIMETHYLBENZENE	6	U
108-67-8	1 3 5-TRIMETHYLBENZENE	6	U
76-13-1	1,1,2-TRICHLOROTRIFLUOROETHA	6	U
74-97-5	BROMOCHLOROMETHANE	6	U

B2-37

57

9906 5/2

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO

8-012-001

Lab Name SWL-TULSA Contract 99A8058A

Lab Code SWOK Case No KAISHIL SAS No SDG No 39048A

Matrix (soil/water) SOIL Lab Sample ID 39048 12

Sample wt/vol 5 0 (g/mL) G Lab File ID R33402 D

Level (low/med) LOW Date Received 06/17/99

% Moisture not dec 16 Date Analyzed 06/23/99

Soil Extract Volume _____ (uL) Soil Aliquot Volume _____ (uL)

Column (pack/cap) CAP Dilution Factor 1.0

Number TICs found 2

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

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC	Q
1		UNKNOWN	19 308	29	JB
2		UNKNOWN	21 518	32	J
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					

B2-38

58

9906-S-13

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO

8-013-001RE

Lab Name SWL-TULSA Contract 99A8058A

Lab Code SWOK Case No KAISHIL SAS No SDG No 39048A

Matrix (soil/water) SOIL Lab Sample ID 39048 13RA

Sample wt/vol 5 0 (g/mL) G Lab File ID R33476 D

Level (low/med) LOW Date Received 06/17/99

% Moisture not dec 19 Date Analyzed 06/29/99

Column (pack/cap) CAP Dilution Factor 1 0

CAS NO	COMPOUND	CONCENTRATION UNITS. (ug/L or ug/Kg) UG/KG	Q
74-87-3	CHLOROMETHANE	6	U
74-83-9	BROMOMETHANE	6	U
75-01-4	VINYL CHLORIDE	6	U
75-00-3	CHLOROETHANE	6	U
75-09-2	METHYLENE CHLORIDE	5	JB
67-64-1	ACETONE	33	
75-15-0	CARBON DISULFIDE	6	U
75-35-4	1 1-DICHLOROETHENE	6	U
75-34-3	1 1-DICHLOROETHANE	6	U
67-66-3	CHLOROFORM	6	U
107-06-2	1 2-DICHLOROETHANE	6	U
78-93-3	2-BUTANONE	6	U
71-55-6	1 1 1-TRICHLOROETHANE	6	U
56-23-5	CARBON TETRACHLORIDE	6	U
75-27-4	BROMODICHLOROMETHANE	6	U
78-87-5	1 2-DICHLOROPROPANE	6	U
10061-01-5	cis-1,3-Dichloropropene	6	U
79-01-6	TRICHLOROETHENE	6	U
124-48-1	DIBROMOCHLOROMETHANE	6	U
79-00-5	1 1 2-TRICHLOROETHANE	6	U
71-43-2	BENZENE	6	U
10061-02-6	trans-1,3-Dichloropropene	6	U
75-25-2	BROMOFORM	6	U
108-10-1	4-METHYL-2-PENTANONE	6	U
591-78-6	2-HEXANONE	6	U
127-18-4	TETRACHLOROETHENE	6	U
108-88-3	TOLUENE	6	U
79-34-5	1 1 2 2-TETRACHLOROETHANE	6	U
108-90-7	CHLOROBENZENE	6	U
100-41-4	ETHYL BENZENE	6	U
100-42-5	STYRENE	6	U
1330-20-7	Xylene (Total)	6	U
156-59-2	cis-1 2-DICHLOROETHENE	6	U
156-60-5	trans-1 2-DICHLOROETHENE	6	U

B2-39

59

9906 S-13

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO

8-013-001RE

Lab Name SWL-TULSA Contract 99A8058A

Lab Code SWOK Case No KAISHIL SAS No SDG No 39048A

Matrix (soil/water) SOIL Lab Sample ID 39048 13RA

Sample wt/vol 5 0 (g/mL) G Lab File ID R33476 D

Level (low/med) LOW Date Received 06/17/99

% Moisture not dec 19 Date Analyzed 06/29/99

Column (pack/cap) CAP Dilution Factor 1 0

CAS NO	COMPOUND	CONCENTRATION UNITS (ug/L or ug/Kg) UG/KG	Q
106-93-4	1 2-DIBROMOETHANE	6	U
630-20-6	1 1 1 2-TETRACHLOROETHANE	6	U
96-18-4	1 2 3-TRICHLOROPROPANE	6	U
75-71-8	DICHLORODIFLUOROMETHANE	6	U
75-69-4	TRICHLOROFLUOROMETHANE	6	U
74-95-3	DIBROMOMETHANE	6	U
96-12-8	1 2-DIBROMO-3-CHLOROPROPANE	6	U
108-86-1	BROMOBENZENE	6	U
104-51-8	n-BUTYLBENZENE	6	U
98-06-6	tert-BUTYLBENZENE	6	U
135-98-8	sec-BUTYLBENZENE	6	U
95-49-8	2-CHLOROTOLUENE	6	U
106-43-4	4-CHLOROTOLUENE	6	U
95-50-1	1 2-DICHLOROBENZENE	6	U
541-73-1	1 3-DICHLOROBENZENE	6	U
106-46-7	1 4-DICHLOROBENZENE	6	U
142-28-9	1 3-DICHLOROPROPANE	6	U
594-20-7	2 2-DICHLOROPROPANE	6	U
563-58-6	1 1-DICHLOROPROPENE	6	U
87-68-3	HEXACHLOROBUTADIENE	6	U
98-82-8	ISOPROPYLBENZENE	6	U
99-87-6	p-ISOPROPYLTOLUENE	6	U
91-20-3	NAPHTHALENE	6	U
103-65-1	n-PROPYLBENZENE	6	U
87-61-6	1 2 3-TRICHLOROBENZENE	6	U
120-82-1	1 2 4-TRICHLOROBENZENE	6	U
95-63-6	1 2 4-TRIMETHYLBENZENE	6	U
108-67-8	1 3 5-TRIMETHYLBENZENE	6	U
76-13-1	1,1,2-TRICHLOROTRIFLUOROETHA	6	U
74-97-5	BROMOCHLOROMETHANE	6	U

B2-40

60

9906 5-13

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO

8-013-001RE

Lab Name SWL-TULSA Contract 99A8058A

Lab Code SWOK Case No KAISHIL SAS No SDG No 39048A

Matrix (soil/water) SOIL Lab Sample ID 39048 13RA

Sample wt/vol 5 0 (g/mL) G Lab File ID R33476 D

Level (low/med) LOW Date Received 06/17/99

% Moisture not dec 19 Date Analyzed 06/29/99

Soil Extract Volume _____(uL) Soil Aliquot Volume _____(uL)

Column (pack/cap) CAP Dilution Factor 1 0

Number TICs found 3

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

CAS NUMBER	COMPOUND NAME	RT	EST CONC	Q
1.	UNKNOWN	16 805	8	JB
2	UNKNOWN	19 142	32	JB
3	UNKNOWN	21 264	56	JB
4				
5.				
6				
7.				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18.				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				

B2-41

61

9906-1-13

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO

8-013-001

Lab Name SWL-TULSA Contract 99A8058A

Lab Code SWOK Case No KAISHIL SAS No SDG No 39048A

Matrix (soil/water) SOIL Lab Sample ID 39048 13

Sample wt/vol 5 0 (g/mL) G Lab File ID R33423 D

Level (low/med) LOW Date Received 06/17/99

% Moisture not dec 19 Date Analyzed 06/25/99

Column (pack/cap) CAP Dilution Factor 1 0

CAS NO	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	CHLOROMETHANE	6	U
74-83-9	BROMOMETHANE	6	U
75-01-4	VINYL CHLORIDE	6	U
75-00-3	CHLOROETHANE	6	U
75-09-2	METHYLENE CHLORIDE	8	B
67-64-1	ACETONE	91	
75-15-0	CARBON DISULFIDE	6	U
75-35-4	1 1-DICHLOROETHENE	6	U
75-34-3	1 1-DICHLOROETHANE	6	U
67-66-3	CHLOROFORM	6	U
107-06-2	1 2-DICHLOROETHANE	6	U
78-93-3	2-BUTANONE	24	
71-55-6	1 1 1-TRICHLOROETHANE	6	U
56-23-5	CARBON TETRACHLORIDE	6	U
75-27-4	BROMODICHLOROMETHANE	6	U
78-87-5	1 2-DICHLOROPROPANE	6	U
10061-01-5	cis-1,3-Dichloropropene	6	U
79-01-6	TRICHLOROETHENE	6	U
124-48-1	DIBROMOCHLOROMETHANE	6	U
79-00-5	1 1 2-TRICHLOROETHANE	6	U
71-43-2	BENZENE	6	U
10061-02-6	trans-1,3-Dichloropropene	6	U
75-25-2	BROMOFORM	6	U
108-10-1	4-METHYL-2-PENTANONE	6	U
591-78-6	2-HEXANONE	6	U
127-18-4	TETRACHLOROETHENE	6	U
108-88-3	TOLUENE	6	U
79-34-5	1 1 2 2-TETRACHLOROETHANE	6	U
108-90-7	CHLOROBENZENE	6	U
100-41-4	ETHYL BENZENE	6	U
100-42-5	STYRENE	6	U
1330-20-7	Xylene (Total)	6	U
156-59-2	cis-1 2-DICHLOROETHENE	6	U
156-60-5	trans-1 2-DICHLOROETHENE	6	U

B2-47

62

9906 - 513

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO

8-013-001

Lab Name SWL-TULSA Contract 99A8058A

Lab Code SWOK Case No KAISHIL SAS No SDG No 39048A

Matrix (soil/water) SOIL Lab Sample ID 39048 13

Sample wt/vol 5 0 (g/mL) G Lab File ID R33423 D

Level (low/med) LOW Date Received 06/17/99

% Moisture not dec 19 Date Analyzed 06/25/99

Column (pack/cap) CAP Dilution Factor 1 0

CAS NO	COMPOUND	CONCENTRATION UNITS (ug/L or ug/Kg) UG/KG	Q
106-93-4	1 2-DIBROMOETHANE	6	U
630-20-6	1 1 1 2-TETRACHLOROETHANE	6	U
96-18-4	1 2 3-TRICHLOROPROPANE	6	U
75-71-8	DICHLORODIFLUOROMETHANE	6	U
75-69-4	TRICHLOROFLUOROMETHANE	6	U
74-95-3	DIBROMOMETHANE	6	U
96-12-8	1 2-DIBROMO-3-CHLOROPROPANE	6	U
108-86-1	BROMOBENZENE	6	U
104-51-8	n-BUTYLBENZENE	6	U
98-06-6	tert-BUTYLBENZENE	6	U
135-98-8	sec-BUTYLBENZENE	6	U
95-49-8	2-CHLOROTOLUENE	6	U
106-43-4	4-CHLOROTOLUENE	6	U
95-50-1	1 2-DICHLOROBENZENE	6	U
541-73-1	1 3-DICHLOROBENZENE	6	U
106-46-7	1 4-DICHLOROBENZENE	6	U
142-28-9	1 3-DICHLOROPROPANE	6	U
594-20-7	2 2-DICHLOROPROPANE	6	U
563-58-6	1 1-DICHLOROPROPENE	6	U
87-68-3	HEXACHLOROBUTADIENE	6	U
98-82-8	ISOPROPYLBENZENE	6	U
99-87-6	p-ISOPROPYLTOLUENE	6	U
91-20-3	NAPHTHALENE	6	U
103-65-1	n-PROPYLBENZENE	6	U
87-61-6	1 2 3-TRICHLOROBENZENE	6	U
120-82-1	1 2 4-TRICHLOROBENZENE	6	U
95-63-6	1 2 4-TRIMETHYLBENZENE	6	U
108-67-8	1 3 5-TRIMETHYLBENZENE	6	U
76-13-1	1,1,2-TRICHLOROTRIFLUOROETHA	6	U
74-97-5	BROMOCHLOROMETHANE	6	U

B2-43

63

9906 5-13

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO

8-013-001

Lab Name SWL-TULSA Contract 99A8058A

Lab Code SWOK Case No KAISHIL SAS No SDG No 39048A

Matrix (soil/water) SOIL Lab Sample ID 39048 13

Sample wt/vol 5 0 (g/mL) G Lab File ID R33423 D

Level (low/med) LOW Date Received 06/17/99

% Moisture not dec 19 Date Analyzed 06/25/99

Soil Extract Volume _____(uL) Soil Aliquot Volume _____(uL)

Column (pack/cap) CAP Dilution Factor 1 0

Number TICs found 2

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

CAS NUMBER	COMPOUND NAME	RT	EST CONC	Q
1	UNKNOWN	19 265	20	JB
2	UNKNOWN	21 452	36	JB
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				

64

B2-44

SECTION 5

SDG NARRATIVE: INORGANIC METALS FRACTION

RIN #:	99A8058
SWLO SDG:	39048A(soils) & 39048B(water)
PSA MODULE:	SS05-C
REPORT DATE:	July 1, 1999

Thirteen soil samples and one water sample was submitted for ICP analysis. No major problems occurred during the digestion or analysis of these samples.

METHOD REFERENCE NUMBERS AND REVISIONS:
The samples were analyzed according to the following SWLO procedures and in accordance to specifications in SS05-C.

SWL SOP #	Method SOP is based	SWLO Batch ID
SWL-IN-205	SW846 3010A, 3050A & 6010B	990622I1(soils) & 990622I2(water)

DESCRIPTION OF MATRIX INTERFERENCE:
Possible matrix interference was observed for the soil samples due to an "N" flag required for Antimony and Calcium and a "*" flag required for Calcium. The water sample did not observe any matrix interferences.

DESCRIPTION OF REQUIRED DILUTION'S:
Dilutions were not required.

Site Sample Numbers Used for QC
The cover page of the Inorganic Analysis Data Package indicates the Site Sample Numbers used for Quality Control as well as a cross reference to the SWLO ID number.

EXPLANATION OF QC DEFICIENCIES:
All QC samples were within the specified control limits for this data group. RDL-3 requirements were met for all parameters There were no hold time violations. Prep QC consisted of a prep blank a lab control sample and a lab control sample duplicate for each digestion batch and was within specified control limits. A replicate analysis was performed on a frequency of 1 in 20 samples per digestion batch

REASONS FOR REANALYSIS:
Lithium is added to the samples to enhance the recovery for potassium and sodium so therefore lithium had to be analyzed on a separate run.

B2-45

65

In the soil analysis Zn, Al, Ca, Mn, Fe, and Sr were reanalyzed due to QC failures in the original run Zn was reanalyzed a third time due to QC failure in the second ICP run
In the water analysis· Zn was reanalyzed due to the analyst having concern over the calibration of zinc during the initial analysis. The second calibration read better and this is the run that was reported for zinc

EXPLANATIONS OF ANY DEVIATIONS FROM ROUTINE PROTOCOLS:
There were no deviations from routine protocol.

EXPLANATIONS FOR ITEMS MARKED 'N' ON DATA REVIEW CHECKLIST:
For the water analysis: The ICP CRDL standard was outside the 80-120% recovery limits for Mo and Sn, no out of control action is required.
For the soil analysis No were marked 'N'.

Sincerely,

Deborah J. Inman
Inorganic Program Manager

B2-46

66

Tierra

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

COC #: 99A8058#002

Collector: PG/HS	Contact/Requester: GARCIA, ERNIE	Telephone No: (303) 966-5980 MSIN FAX
RIN: 99A8058	Sampling Origin	Purchase Order/Charge Code: EC430500
Project Title: 750 PAD/B984	Logbook No	Ice Chest No Temp: 4°C
To (Lab): SouthWest Lab of Oklahoma	Method of Shipment: FEDEX	Bill of Lading/Air Bill No: 807912276954
Protocol		Offsite Property No

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption Yes ☐ No ☐
TWO EXTRA BOTTLES HAVE BEEN SENT FOR EACH AQUEOUS VOA EVENT

Bottle No	Customer Number	Matrix	Date	Time	Location	No/Type Container	Sample Analysis	Preservative Packing
99A8058-001 002	Boring 9901, S-1	SOLID	6/11/99	0905	750 PAD	125-G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-001 003	Boring 9901, S-1	SOLID	6/11/99	0905	750 PAD	125-G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-002 001	Boring 9901, S-2	SOLID	6/11/99	0926	750 PAD	125-G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-002 002	Boring 9901, S-2	SOLID	6/11/99	0926	750 PAD	125-G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-003 001	Boring 9902, S-3	SOLID	6/11/99	0956	750 PAD	125-G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-003 002	Boring 9902, S-3	SOLID	6/11/99	0956	750 PAD	125-G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-004 001	Boring 9902, S-4	SOLID	6/11/99	1011	750 PAD	125 G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C

Relinquished By	Received By	Relinquished By	Received By
Date/Time: 6-16-99 1800	Date/Time	Date/Time	Date/Time
Relinquished By / Date/Time	Received By / Date/Time	Relinquished By / Date/Time	Received By / Date/Time
Relinquished By / Date/Time	Received By / Date/Time	Relinquished By / Date/Time	Received By / Date/Time
Relinquished By / Date/Time	Received By / Date/Time	Relinquished By / Date/Time	Received By / Date/Time: SWLO 6/17/99 1000

FINAL SAMPLE DISPOSITION: Disposal Method (e.g. Return to customer per lab procedure, used in process) Disposed By Date/Time

B2-47

67

Tierra

CHAIN OF CUSTODY SAMPLE ANALYSIS REQUEST

COC # A8058#002

RIN 99A8058

Contact/Requestor GARCIA, ERNIE

Telephone No (303) 966 5980 MSIN FAX

Bottle No	Customer Number	Matrix	Date	Time	Location	No/Type Container	Sample Analysis	Preservative Packing
99A8058-004 002	Boring 9902, S-4	SOLID	6/11/99	1011	750 PAD	125-G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-005 001	Boring 9903, S-5	SOLID	6/11/99	1025	750 PAD	125-G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-005 002	Boring 9903, S-5	SOLID	6/11/99	1025	750 PAD	125-G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-006 001	Boring 9903, S-6	SOLID	6/11/99	1042	750 PAD	125-G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-006 002	Boring 9903, S-6	SOLID	6/11/99	1042	750 PAD	125-G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-007 001	Boring 9904, S-7	SOLID	6/11/99	1210	750 PAD	125-G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-007 002	Boring 9904, S-7	SOLID	6/11/99	1210	750 PAD	125-G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-008 001	Boring 9904, S-8	SOLID	6/11/99	1215	750 PAD	125-G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-008 002	Boring 9904, S-8	SOLID	6/11/99	1215	750 PAD	125-G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-009 001	Boring 9904, S-9	SOLID	6/11/99	1220	750 PAD	125-G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-009 002	Boring 9904, S-9	SOLID	6/11/99	1220	750 PAD	125-G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C

Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time
Ralph McCleod	6-16-99 1900						

FINAL SAMPLE DISPOSITION

Disposal Method (e.g. Return to customer per lab procedure used in process)

Disposed By

Date/Time

Received By: Stoll SWRO 6/17/99 1000

B2-48

68

Tierra

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

COC # A8058#002

RIN 99A8058

Contact/Requestor GARCIA, ERNIE

Telephone No (303) 966-5980 MSIN FAX

Bottle No	Customer Number	Matrix	Date	Time	Location	No/Type Container	Sample Analysis	Preservative Packing
99A8058-010 001	Boring 9905, S-10	SOLID	6/11/99	1317	750 PAD	125-G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-010 002	Boring 9905, S-10	SOLID	6/11/99	1317	750 PAD	125-G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-011 001	Boring 9905, S-11	SOLID	6/11/99	1326	750 PAD	125-G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-011 002	Boring 9905, S-11	SOLID	6/11/99	1326	750 PAD	125-G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-012 001	Boring 9906 S-12	SOLID	6/11/99	1344	750 PAD	125-G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-012 002	Boring 9906, S-12	SOLID	6/11/99	1344	750 PAD	125-G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-013 001	Boring 9906, S-13	SOLID	6/11/99	1357	750 PAD	125-G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-013 002	Boring 9906, S-13	SOLID	6/11/99	1357	750 PAD	125-G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-014 002	Rinsate	AQUEOUS	6/11/99	1430	750 PAD	40-ML G	SS01B009 (VOA 524 2 Water) [Priority]	None 4 degs C w/zh
99A8058-014 003	Rinsate	AQUEOUS	6/11/99	1430	750 PAD	40-ML G	SS01B009 (VOA 524 2 Water) [Priority] Spare	None 4 degs C w/zh
99A8058-014 004	Rinsate	AQUEOUS	6/11/99	1430	750 PAD	40-ML G	SS01B009 (VOA 524 2 Water) [Priority] Spare	None 4 degs C w/zh

Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time
[illegible]	6-16-99 0800						

FINAL SAMPLE DISPOSITION: Disposal Method (e g Return to customer per lab procedure, used in process) Disposed By Date/Time

Received By: SWLO 6/12/99 1000

B2-49

69

Tierra

CHAIN OF CUSTODY SAMPLE ANALYSIS REQUEST

COC # A8058#002

RIN 99A8058

Contact/Requestor GARCIA, ERNIE

Telephone No (303) 966-5980 MSIN FAX

Bottle No	Customer Number	Matrix	Date	Time	Location	No/Type Container	Sample Analysis	Preservative Packing
99A8058-014 005	Rinsate	AQUEOUS	4/11/99	1430	750 PAD	1-L P/G	SS05B022 (Mtls Unfiltered SW846) [Priority]	HN03 4 degrees C

Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time
Ralph Michael	6-16-99 1800						

FINAL SAMPLE DISPOSITION: Disposal Method (e.g. Return to customer per lab procedure, used in process) — Disposed By — Date/Time

B2-50

20

3
BLANKS

Lab Name SOUTHWEST_LAB_OF_OK_____ Contract 99A8058___

Lab Code SWOK__ Case No. 39048 SAS No _____ SDG No 39048A

Preparation Blank Matrix (soil/water) SOIL_

Preparation Blank Concentration Units (ug/L or mg/kg) MG/KG

Analyte	Initial Calib Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum	28 0	U	28 0	U	28 0	U	28 0	U	2 80	U	P
Antimony	4 7	B	2.9	B	2 8	B	3 4	B	0 48	B	P
Arsenic	1.9	U	1.9	U	1 9	U	1 9	U	0 19	U	P
Barium	1.2	U	1 2	U	1.2	U	9 8	B	0.12	U	P
Beryllium	0 8	U	0 8	U	0 8	U	0 8	U	0 08	U	P
Cadmium	0 3	U	0.3	U	0 3	B	0 3	U	0 03	U	P
Calcium	258.0	U	258.0	U	258 0	U	258 0	U	25.80	U	P
Chromium	1 4	U	1 4	U	1 4	U	1 8	B	0.14	U	P
Cobalt	0.8	U	0.8	U	0.8	U	0 8	B	0 08	U	P
Copper	2.5	U	2.5	U	2.5	U	2.5	U	0 44	B	P
Iron	33.0	U	33.0	U	33 0	U	33 0	U	3.30	U	P
Lead	2.2	U	2.2	U	2 2	U	2.2	U	0.22	U	P
Magnesium	92.0	U	92.0	U	92.0	U	1095.3	B	9.20	U	P
Manganese	0.6	U	0.6	U	0 6	U	0.6	U	0.06	U	P
Nickel	3.6	U	3.6	U	3 6	U	3.6	U	0.36	U	P
Potassium	152.0	U	152.0	U	152 0	U	152.0	U	15 20	U	P
Selenium	3 3	U	3.3	U	3.3	U	3.3	U	0.33	U	P
Silver	1.2	U	1.7	B	1 2	U	1.5	B	0.15	B	P
Sodium	502.0	U	502.0	U	502.0	U	502.0	U	50.20	U	P
Thallium	3.4	U	3 4	U	3 4	U	3 4	U	0 34	U	P
Vanadium	0.7	U	0.7	U	0.7	U	1.5	B	0 07	U	P
Zinc	3.8	U	3 8	U	3 8	U	3 8	U	0 83	B	P
Molybdenu	1 7	U	1.7	U	1 7	U	2 2	B	0 17	U	P
Tin	4 1	U	4 1	U	4 1	U	4.1	U	1 22	B	P
Strontium	0 6	U	0.6	U	0 6	U	0 6	U	0 06	U	P
Lithium	7 2	U	7.2	U	7 2	U	7.2	U	4 59	B	P
Uranium	9 6	U	19 7	B	13 8	B	16 7	B	1.31	B	P

FORM III - IN

B2-51

71

3
BLANKS

Lab Name SOUTHWEST_LAB_OF_OK_____ Contract 99A8058___

Lab Code· SWOK__ Case No 39048 SAS No _____ SDG No 39048A

Preparation Blank Matrix (soil/water) _____

Preparation Blank Concentration Units (ug/L or mg/kg) _____

Analyte	Initial Calib Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum			28.0	U							P
Antimony			3 3	B							P
Arsenic			1 9	U							P
Barium			1.2	U							P
Beryllium			0 8	U							P
Cadmium			0.3	U							P
Calcium			258.0	U							P
Chromium			1.4	U							P
Cobalt			0.8	U							P
Copper			2.5	U							P
Iron			33.0	U							P
Lead			2.2	U							P
Magnesium			92.0	U							P
Manganese			0.6	U							P
Nickel			3.6	U							P
Potassium			152 0	U							P
Selenium			3.3	U							P
Silver			1.2	U							P
Sodium			502 0	U							P
Thallium			3 4	U							P
Vanadium			0.7	U							P
Zinc			3.8	U							P
Molybdenu			1.7	U							P
Tin			4 1	U							P
Strontium			0.6	U							P
Lithium			7.2	U							P
Uranium			15.8	B							P

FORM III - IN

B7-52

72

LABORATORY CONTROL SAMPLE

Lab Name SOUTHWEST_LAB_OF_OK_____ Contract 99A8058___

Lab Code SWOK__ Case No 39048 SAS No _____ SDG No 39048A_

Solid LCS Source IN.VEN _____

Aqueous LCS Source _____

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/kg) True	Found	C	Limits		%R
Aluminum				200 000	180 018		160 000	240 000	90.01
Antimony				50 000	42.943		40 000	60 000	85 89
Arsenic				8.000	7 518	B	6.400	9.600	93.97
Barium				25 000	23 674		20 000	30 000	94 70
Beryllium				5 000	4.594		4 000	6.000	91.88
Cadmium				5 000	4 317		4 000	6 000	86.34
Calcium				500 000	502 396	B	400 000	600 000	100 4
Chromium				20 000	18.546		16 000	24.000	92.73
Cobalt				50 000	44.982		40.000	60 000	89.96
Copper				25.000	21.347		20 000	30.000	85.39
Iron				100 000	92.098		80.000	120.000	92.10
Lead				8.000	7.458	B	6.400	9.600	93.22
Magnesium				500.000	476.369	B	400.000	600.000	95.27
Manganese				50.000	45.875		40.000	60.000	91.75
Nickel				50 000	45.520		40.000	60.000	91.04
Potassium				1000.000	897.718	B	800.000	1200.000	89.77
Selenium				8.000	7.570	B	6.400	9.600	94.62
Silver				5.000	5.405		4.000	6.000	108.1
Sodium				1000 000	995.726	B	800 000	1200.000	99.57
Thallium				8.000	7.499	B	6.400	9.600	93.74
Vanadium				50 000	44.824		40.000	60.000	89.65
Zinc				50.000	48.638		40.000	60.000	97.28
Molybdenu				20 000	18 839	B	16 000	24.000	94.19
Tin				25 000	25.364	B	20 000	30 000	101 4
Strontium				20.000	19.423	B	16 000	24.000	97.11
Lithium				100 000	114.510		80.000	120.000	114 5
Uranium				50 000	45.420		40.000	60.000	90 84

FORM VII - IN

B2-53

73

LABORATORY CONTROL SAMPLE

Lab Name SOUTHWEST_LAB_OF_OK_____ Contract 99A8058___

Lab Code SWOK__ Case No 39048 SAS No _____ SDG No 39048A_

Solid LCS Source IN VEN _____

Aqueous LCS Source _____

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/kg) True	Found	C	Limits		%R
Aluminum_				200 000	179 962		160 000	240 000	89 98
Antimony_				50 000	43.623		40 000	60 000	87 25
Arsenic__				8.000	7 446	B	6 400	9 600	93 07
Barium___				25 000	23.357		20 000	30 000	93 43
Beryllium				5.000	4 522		4 000	6 000	90 44
Cadmium__				5 000	4 228		4 000	6 000	84 56
Calcium__				500 000	503 766	B	400 000	600 000	100 7
Chromium_				20 000	18.275		16 000	24.000	91 37
Cobalt___				50 000	44.062		40 000	60.000	88.12
Copper___				25.000	21.100		20 000	30.000	84.40
Iron_____				100 000	93.098		80.000	120.000	93.10
Lead____				8.000	7.365	B	6 400	9.600	92.06
agnesium				500 000	467.367	B	400.000	600.000	93 47
nganese				50.000	45.942		40.000	60.000	91.88
ickel___				50.000	44.759		40.000	60.000	89.52
Potassium				1000.000	874.637	B	800.000	1200.000	87 46
Selenium_				8.000	7.443	B	6.400	9.600	93.04
Silver___				5.000	5.263		4.000	6.000	105.2
Sodium___				1000 000	997.070	B	800 000	1200.000	99 71
Thallium_				8 000	7 579	B	6.400	9.600	94.74
Vanadium_				50.000	44.020		40.000	60.000	88.04
Zinc____				50 000	48 588		40 000	60.000	97.18
Molybdenu				20.000	18 708	B	16.000	24.000	93 54
Tin_____				25 000	24 901	B	20.000	30.000	99 60
Strontium				20.000	19 414	B	16.000	24 000	97 07
Lithium__				100.000	113 489		80 000	120 000	113 4
Uranium__				50.000	44.878		40.000	60 000	89 76

FORM VII - IN

74

B2-54

9904 S-7

1

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

8058-007002

Lab Name SOUTHWEST_LAB_OF_OK Contract 99A8058
Lab Code SWOK Case No 39048 SAS No SDG No 39048A
Matrix (soil/water) SOIL Lab Sample ID· 39048 20
Level (low/med) LOW Date Received 06/17/99
% Solids 94 3

Concentration Units (ug/L or mg/kg dry weight) MG/KG

CAS No	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	5090			P
7440-36-0	Antimony	0 49	B	N	P
7440-38-2	Arsenic	3 1	B		P
7440-39-3	Barium	47 1			P
7440-41-7	Beryllium	0 29	B		P
7440-43-9	Cadmium	0 21	B		P
7440-70-2	Calcium	1220	B	N	P
7440-47-3	Chromium	9 8			P
7440-48-4	Cobalt	4 2	B		P
7440-50-8	Copper	14.8			P
7439-89-6	Iron	10100			P
7439-92-1	Lead	7.3	B		P
7439-95-4	Magnesium	1890	B		P
7439-96-5	Manganese	117			P
7440-02-0	Nickel	6 0	B		P
7440-09-7	Potassium	1230	B	E	P
7782-49-2	Selenium	0.33	U		P
7440-22-4	Silver	0.12	U		P
7440-23-5	Sodium	250	B		P
7440-28-0	Thallium	0.35	B		P
7440-62-2	Vanadium	17.2			P
7440-66-6	Zinc	24.6			P
7439-98-7	Molybdenu	1 0	B		P
7440-31-5	Tin	2 4	B		P
7440-24-6	Strontium	11.7	B		P
7439-93-2	Lithium	29 1			P
7440-61-1	Uranium	1 4	B		P

Color Before BROWN Clarity Before Texture MEDIUM
Color After COLORLESS Clarity After. CLEAR Artifacts

Comments
CLIENT_ID= 99A8058-007 002

B2-55

FORM I - IN

75

31

9904 S-7

1

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

8058-007002

Lab Name SOUTHWEST_LAB_OF_OK Contract 99A8058

Lab Code SWOK Case No 39048 SAS No SDG No 39048A

Matrix (soil/water) SOIL Lab Sample ID 39048.20

Level (low/med) LOW Date Received 06/17/99

% Solids 94 3

Concentration Units (ug/L or mg/kg dry weight) MG/KG

CAS No	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	5090			P
7440-36-0	Antimony	0.49	B	N	P
7440-38-2	Arsenic	3 1	B		P
7440-39-3	Barium	47 1			P
7440-41-7	Beryllium	0 29	B		P
7440-43-9	Cadmium	0.21	B		P
7440-70-2	Calcium	1220	B	N	P
7440-47-3	Chromium	9 8			P
7440-48-4	Cobalt	4 2	B		P
7440-50-8	Copper	14 8			P
7439-89-6	Iron	10100			P
7439-92-1	Lead	7.3	B		P
7439-95-4	Magnesium	1890	B		P
7439-96-5	Manganese	117			P
7440-02-0	Nickel	6.0	B		P
7440-09-7	Potassium	1230	B	E	P
7782-49-2	Selenium	0.33	U		P
7440-22-4	Silver	0.12	U		P
7440-23-5	Sodium	250	B		P
7440-28-0	Thallium	0 35	B		P
7440-62-2	Vanadium	17.2			P
7440-66-6	Zinc	24.6			P
7439-98-7	Molybdenu	1.0	B		P
7440-31-5	Tin	2 4	B		P
7440-24-6	Strontium	11 7	B		P
7439-93-2	Lithium	29 1			P
7440-61-1	Uranium	1 4	B		P

Color Before BROWN Clarity Before. Texture MEDIUM

Color After COLORLESS Clarity After CLEAR Artifacts

Comments

CLIENT_ID= 99A8058-007 002

FORM I - IN

B2-56

74

31

9904 S-8

1

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

8058-008002

Lab Name SOUTHWEST_LAB_OF_OK Contract 99A8058
Lab Code SWOK Case No 39048 SAS No SDG No 39048A
Matrix (soil/water) SOIL Lab Sample ID 39048.21
Level (low/med) LOW Date Received 06/17/99
% Solids 79 3

Concentration Units (ug/L or mg/kg dry weight) MG/KG

CAS No	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	11000			P
7440-36-0	Antimony	0 58	B	N	P
7440-38-2	Arsenic	2 1	B		P
7440-39-3	Barium	51.7			P
7440-41-7	Beryllium	1 6			P
7440-43-9	Cadmium	0 64	B		P
7440-70-2	Calcium	5160	B	N	P
7440-47-3	Chromium	16 7			P
7440-48-4	Cobalt	4 9	B		P
7440-50-8	Copper	49 0			P
7439-89-6	Iron	3040			P
7439-92-1	Lead	29.4			P
7439-95-4	Magnesium	2890	B		P
7439-96-5	Manganese	25.8			P
7440-02-0	Nickel	16.7			P
7440-09-7	Potassium	953	B	E	P
7782-49-2	Selenium	0.41	U		P
7440-22-4	Silver	0.15	U		P
7440-23-5	Sodium	675	B		P
7440-28-0	Thallium	0.42	U		P
7440-62-2	Vanadium	22 9			P
7440-66-6	Zinc	74.0			P
7439-98-7	Molybdenu	0 64	B		P
7440-31-5	Tin	2.6	B		P
7440-24-6	Strontium	89 9	B		P
7439-93-2	Lithium	25 0			P
7440-61-1	Uranium	1 2	U		P

Color Before BROWN Clarity Before Texture MEDIUM
Color After COLORLESS Clarity After CLEAR Artifacts

Comments
CLIENT_ID= 99A8058-008 002

B2-57

FORM I - IN

77

9904 S-8

1

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

8058-008002

Lab Name SOUTHWEST_LAB_OF_OK Contract 99A8058
Lab Code SWOK Case No 39048 SAS No SDG No 39048A
Matrix (soil/water) SOIL Lab Sample ID 39048 21
Level (low/med) LOW Date Received 06/17/99
% Solids 79 3

Concentration Units (ug/L or mg/kg dry weight) MG/KG

CAS No	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	11000			P
7440-36-0	Antimony	0.58	B	N	P
7440-38-2	Arsenic	2 1	B		P
7440-39-3	Barium	51 7			P
7440-41-7	Beryllium	1 6			P
7440-43-9	Cadmium	0 64	B		P
7440-70-2	Calcium	5160	B	N	P
7440-47-3	Chromium	16 7			P
7440-48-4	Cobalt	4.9	B		P
7440-50-8	Copper	49.0			P
7439-89-6	Iron	3040			P
7439-92-1	Lead	29.4			P
7439-95-4	Magnesium	2890	B		P
7439-96-5	Manganese	25.8			P
7440-02-0	Nickel	16.7			P
7440-09-7	Potassium	953	B	E	P
7782-49-2	Selenium	0 41	U		P
7440-22-4	Silver	0 15	U		P
7440-23-5	Sodium	675	B		P
7440-28-0	Thallium	0.42	U		P
7440-62-2	Vanadium	22 9			P
7440-66-6	Zinc	74.0			P
7439-98-7	Molybdenu	0.64	B		P
7440-31-5	Tin	2.6	B		P
7440-24-6	Strontium	89.9	B		P
7439-93-2	Lithium	25 0			P
7440-61-1	Uranium	1 2	U		P

Color Before BROWN Clarity Before: Texture MEDIUM
Color After COLORLESS Clarity After: CLEAR Artifacts

Comments
CLIENT_ID= 99A8058-008 002

FORM I - IN

B2-58

A

35

9904 S-9

1

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

8058-009002

Lab Name SOUTHWEST_LAB_OF_OK Contract 99A8058
Lab Code SWOK Case No 39048 SAS No SDG No 39048A
Matrix (soil/water) SOIL Lab Sample ID 39048.22
Level (low/med) LOW Date Received 06/17/99
% Solids 78 3

Concentration Units (ug/L or mg/kg dry weight) MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7640			P
7440-36-0	Antimony	0 36	B	N	P
7440-38-2	Arsenic	2 3	B		P
7440-39-3	Barium	44 9			P
7440-41-7	Beryllium	1 6			P
7440-43-9	Cadmium	0 94	B		P
7440-70-2	Calcium	5870	B	N	P
7440-47-3	Chromium	14 7			P
7440-48-4	Cobalt	3 0	B		P
7440-50-8	Copper	84 4			P
7439-89-6	Iron	2330			P
7439-92-1	Lead	28.8			P
7439-95-4	Magnesium	2600	B		P
7439-96-5	Manganese	11.1			P
7440-02-0	Nickel	23.2			P
7440-09-7	Potassium	709	B	E	P
7782-49-2	Selenium	0.41	U		P
7440-22-4	Silver	0 15	U		P
7440-23-5	Sodium	725	B		P
7440-28-0	Thallium	0 43	U		P
7440-62-2	Vanadium	20.9			P
7440-66-6	Zinc	76 1			P
7439-98-7	Molybdenu	0 73	B		P
7440-31-5	Tin	2 4	B		P
7440-24-6	Strontium	95 8	B		P
7439-93-2	Lithium	23 2	B		P
7440-61-1	Uranium	1 2	U		P

Color Before BROWN Clarity Before Texture MEDIUM
Color After COLORLESS Clarity After CLEAR Artifacts

Comments
CLIENT_ID= 99A8058-009 002

FORM I - IN

B7-57

74

36

9904 S-9

1

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

8058-009002

Lab Name SOUTHWEST_LAB_OF_OK Contract 99A8058
Lab Code SWOK Case No 39048 SAS No SDG No 39048A
Matrix (soil/water) SOIL Lab Sample ID 39048 22
Level (low/med) LOW Date Received 06/17/99
% Solids 78 3

Concentration Units (ug/L or mg/kg dry weight) MG/KG

CAS No	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7640			P
7440-36-0	Antimony	0.36	B	N	P
7440-38-2	Arsenic	2 3	B		P
7440-39-3	Barium	44 9			P
7440-41-7	Beryllium	1 6			P
7440-43-9	Cadmium	0 94	B		P
7440-70-2	Calcium	5870	B	N	P
7440-47-3	Chromium	14 7			P
7440-48-4	Cobalt	3 0	B		P
7440-50-8	Copper	84 4			P
7439-89-6	Iron	2330			P
7439-92-1	Lead	28 8			P
7439-95-4	Magnesium	2600	B		P
7439-96-5	Manganese	11 1			P
7440-02-0	Nickel	23.2			P
7440-09-7	Potassium	709	B	E	P
7782-49-2	Selenium	0.41	U		P
7440-22-4	Silver	0 15	U		P
7440-23-5	Sodium	725	B		P
7440-28-0	Thallium	0 43	U		P
7440-62-2	Vanadium	20.9			P
7440-66-6	Zinc	76.1			P
7439-98-7	Molybdenu	0 73	B		P
7440-31-5	Tin	2 4	B		P
7440-24-6	Strontium	95.8	B		P
7439-93-2	Lithium	23 2	B		P
7440-61-1	Uranium	1 2	U		P

Color Before BROWN Clarity Before Texture MEDIUM
Color After COLORLESS Clarity After CLEAR Artifacts

Comments
CLIENT_ID= 99A8058-009 002

BZ-60

FORM I - IN

40

9905-510

1

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

8058-010002

Lab Name SOUTHWEST_LAB_OF_OK Contract 99A8058
Lab Code SWOK Case No 39048 SAS No SDG No 39048A
Matrix (soil/water) SOIL Lab Sample ID 39048 23
Level (low/med) LOW Date Received 06/17/99
% Solids 82 4

Concentration Units (ug/L or mg/kg dry weight) MG/KG

CAS No	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	8280			P
7440-36-0	Antimony	0.32	U	N	P
7440-38-2	Arsenic	5 2	B		P
7440-39-3	Barium	114			P
7440-41-7	Beryllium	0 77	B		P
7440-43-9	Cadmium	1 3			P
7440-70-2	Calcium	19600		N	P
7440-47-3	Chromium	9 0			P
7440-48-4	Cobalt	6 0	B		P
7440-50-8	Copper	16 8			P
7439-89-6	Iron	10200			P
7439-92-1	Lead	15.5			P
7439-95-4	Magnesium	6790	B		P
7439-96-5	Manganese	199			P
7440-02-0	Nickel	10.6			P
7440-09-7	Potassium	1020	B	E	P
7782-49-2	Selenium	0.39	U		P
7440-22-4	Silver	0.14	U		P
7440-23-5	Sodium	499	B		P
7440-28-0	Thallium	0 43	B		P
7440-62-2	Vanadium	23 6			P
7440-66-6	Zinc	54.8			P
7439-98-7	Molybdenu	0 46	B		P
7440-31-5	Tin	2 1	B		P
7440-24-6	Strontium	101	B		P
7439-93-2	Lithium	26 1			P
7440-61-1	Uranium	1 1	U		P

Color Before BROWN Clarity Before Texture MEDIUM
Color After COLORLESS Clarity After CLEAR Artifacts

Comments
CLIENT_ID= 99A8058-010 002

FORM I - IN

B2-61

9905-S 10

1

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

8058-010002

Lab Name SOUTHWEST_LAB_OF_OK Contract 99A8058
Lab Code SWOK Case No 39048 SAS No SDG No 39048A
Matrix (soil/water) SOIL Lab Sample ID 39048 23
Level (low/med) LOW Date Received 06/17/99
% Solids 82 4

Concentration Units (ug/L or mg/kg dry weight) MG/KG

CAS No	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	8280			P
7440-36-0	Antimony	0.32	U	N	P
7440-38-2	Arsenic	5 2	B		P
7440-39-3	Barium	114			P
7440-41-7	Beryllium	0.77	B		P
7440-43-9	Cadmium	1 3			P
7440-70-2	Calcium	19600		N	P
7440-47-3	Chromium	9 0			P
7440-48-4	Cobalt	6 0	B		P
7440-50-8	Copper	16.8			P
7439-89-6	Iron	10200			P
7439-92-1	Lead	15.5			P
7439-95-4	Magnesium	6790	B		P
7439-96-5	Manganese	199			P
7440-02-0	Nickel	10.6			P
7440-09-7	Potassium	1020	B	E	P
7782-49-2	Selenium	0 39	U		P
7440-22-4	Silver	0.14	U		P
7440-23-5	Sodium	499	B		P
7440-28-0	Thallium	0 43	B		P
7440-62-2	Vanadium	23 6			P
7440-66-6	Zinc	54 8			P
7439-98-7	Molybdenu	0 46	B		P
7440-31-5	Tin	2.1	B		P
7440-24-6	Strontium	101	B		P
7439-93-2	Lithium	26 1			P
7440-61-1	Uranium	1 1	U		P

Color Before BROWN Clarity Before Texture MEDIUM
Color After COLORLESS Clarity After CLEAR Artifacts

Comments
CLIENT_ID= 99A8058-010.002

FORM I - IN

82

B2-62

9905 S-11

1

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

8058-011002

Lab Name SOUTHWEST_LAB_OF_OK Contract 99A8058
Lab Code SWOK Case No · 39048 SAS No SDG No 39048A
Matrix (soil/water) SOIL Lab Sample ID 39048 24
Level (low/med) LOW Date Received 06/17/99
% Solids 85 3

Concentration Units (ug/L or mg/kg dry weight) MG/KG

CAS No	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7650			P
7440-36-0	Antimony	0 32	U	N	P
7440-38-2	Arsenic	4 2	B		P
7440-39-3	Barium	110			P
7440-41-7	Beryllium	0 67	B		P
7440-43-9	Cadmium	0 26	B		P
7440-70-2	Calcium	8970	B	N	P
7440-47-3	Chromium	10.4			P
7440-48-4	Cobalt	5 2	B		P
7440-50-8	Copper	15.5			P
7439-89-6	Iron	8820			P
7439-92-1	Lead	16.4			P
7439-95-4	Magnesium	2280	B		P
7439-96-5	Manganese	168			P
7440-02-0	Nickel	9.3	B		P
7440-09-7	Potassium	970	B	E	P
7782-49-2	Selenium	0.39	U		P
7440-22-4	Silver	0.14	U		P
7440-23-5	Sodium	475	B		P
7440-28-0	Thallium	0.40	U		P
7440-62-2	Vanadium	22.3			P
7440-66-6	Zinc	49 0			P
7439-98-7	Molybdenu	0.55	B		P
7440-31-5	Tin	2 6	B		P
7440-24-6	Strontium	53.3	B		P
7439-93-2	Lithium	30.9			P
7440-61-1	Uranium	1.2	B		P

Color Before BROWN Clarity Before Texture MEDIUM
Color After COLORLESS Clarity After CLEAR Artifacts

Comments
CLIENT_ID= 99A8058-011 002

83

B2-63

9905 S-11

1

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

8058-011002

Lab Name SOUTHWEST_LAB_OF_OK Contract 99A8058
Lab Code SWOK Case No 39048 SAS No SDG No 39048A
Matrix (soil/water) SOIL Lab Sample ID 39048 24
Level (low/med) LOW Date Received 06/17/99
% Solids 85 3

Concentration Units (ug/L or mg/kg dry weight) MG/KG

CAS No	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7650			P
7440-36-0	Antimony	0 32	U	N	P
7440-38-2	Arsenic	4 2	B		P
7440-39-3	Barium	110			P
7440-41-7	Beryllium	0 67	B		P
7440-43-9	Cadmium	0 26	B		P
7440-70-2	Calcium	8970	B	N	P
7440-47-3	Chromium	10 4			P
7440-48-4	Cobalt	5 2	B		P
7440-50-8	Copper	15 5			P
7439-89-6	Iron	8820			P
7439-92-1	Lead	16.4			P
7439-95-4	Magnesium	2280	B		P
7439-96-5	Manganese	168			P
7440-02-0	Nickel	9.3	B		P
7440-09-7	Potassium	970	B	E	P
7782-49-2	Selenium	0.39	U		P
7440-22-4	Silver	0 14	U		P
7440-23-5	Sodium	475	B		P
7440-28-0	Thallium	0.40	U		P
7440-62-2	Vanadium	22 3			P
7440-66-6	Zinc	49.0			P
7439-98-7	Molybdenu	0.55	B		P
7440-31-5	Tin	2 6	B		P
7440-24-6	Strontium	53.3	B		P
7439-93-2	Lithium	30.9			P
7440-61-1	Uranium	1 2	B		P

Color Before BROWN Clarity Before Texture MEDIUM
Color After COLORLESS Clarity After CLEAR Artifacts

Comments
CLIENT_ID= 99A8058-011 002

FORM I - IN

89-29

9906 S-12

1

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

8058-012002

Lab Name SOUTHWEST_LAB_OF_OK Contract 99A8058
Lab Code SWOK Case No . 39048 SAS No SDG No 39048A
Matrix (soil/water). SOIL Lab Sample ID 39048 25
Level (low/med) LOW Date Received 06/17/99
% Solids 85 3

Concentration Units (ug/L or mg/kg dry weight) MG/KG

CAS No	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	10700			P
7440-36-0	Antimony	0 31	U	N	P
7440-38-2	Arsenic	4 7	B		P
7440-39-3	Barium	120			P
7440-41-7	Beryllium	0 82	B		P
7440-43-9	Cadmium	0 40	B		P
7440-70-2	Calcium	11800		N	P
7440-47-3	Chromium	11 6			P
7440-48-4	Cobalt	5 4	B		P
7440-50-8	Copper	18 1			P
7439-89-6	Iron	10800			P
7439-92-1	Lead	16.5			P
7439-95-4	Magnesium	3020	B		P
7439-96-5	Manganese	151			P
7440-02-0	Nickel	11 3			P
7440-09-7	Potassium	1160	B	E	P
7782-49-2	Selenium	0.38	U		P
7440-22-4	Silver	0.14	U		P
7440-23-5	Sodium	438	B		P
7440-28-0	Thallium	0.39	U		P
7440-62-2	Vanadium	20.9			P
7440-66-6	Zinc	56.8			P
7439-98-7	Molybdenu	0 39	B		P
7440-31-5	Tin	3.2	B		P
7440-24-6	Strontium	63 7	B		P
7439-93-2	Lithium	30 2			P
7440-61-1	Uranium	1 1	U		P

Color Before BROWN Clarity Before Texture MEDIUM
Color After COLORLESS Clarity After CLEAR Artifacts

Comments
CLIENT_ID= 99A8058-012 002

FORM I - IN

85

B2-65

9906 S-12

1

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

8058-012002

Lab Name SOUTHWEST_LAB_OF_OK Contract 99A8058
Lab Code SWOK Case No 39048 SAS No SDG No 39048A
Matrix (soil/water) SOIL Lab Sample ID 39048 25
Level (low/med) LOW Date Received 06/17/99
% Solids 85 3

Concentration Units (ug/L or mg/kg dry weight) MG/KG

CAS No	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	10700			P
7440-36-0	Antimony	0.31	U	N	P
7440-38-2	Arsenic	4 7	B		P
7440-39-3	Barium	120			P
7440-41-7	Beryllium	0 82	B		P
7440-43-9	Cadmium	0 40	B		P
7440-70-2	Calcium	11800		N	P
7440-47-3	Chromium	11 6			P
7440-48-4	Cobalt	5 4	B		P
7440-50-8	Copper	18 1			P
7439-89-6	Iron	10800			P
7439-92-1	Lead	16.5			P
7439-95-4	Magnesium	3020	B		P
7439-96-5	Manganese	151			P
7440-02-0	Nickel	11.3			P
7440-09-7	Potassium	1160	B	E	P
7782-49-2	Selenium	0.38	U		P
7440-22-4	Silver	0.14	U		P
7440-23-5	Sodium	438	B		P
7440-28-0	Thallium	0.39	U		P
7440-62-2	Vanadium	20.9			P
7440-66-6	Zinc	56 8			P
7439-98-7	Molybdenu	0 39	B		P
7440-31-5	Tin	3 2	B		P
7440-24-6	Strontium	63 7	B		P
7439-93-2	Lithium	30.2			P
7440-61-1	Uranium	1 1	U		P

Color Before BROWN Clarity Before Texture MEDIUM
Color After COLORLESS Clarity After CLEAR Artifacts

Comments
CLIENT_ID= 99A8058-012 002

FORM I - IN

B2-66

84

9906-1-13

1

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

8058-013002

Lab Name SOUTHWEST_LAB_OF_OK Contract 99A8058
Lab Code SWOK Case No 39048 SAS No SDG No 39048A
Matrix (soil/water) SOIL Lab Sample ID 39048 26
Level (low/med) LOW Date Received 06/17/99
% Solids 81 5

Concentration Units (ug/L or mg/kg dry weight) MG/KG

CAS No	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	14300			P
7440-36-0	Antimony	0 33	B	N	P
7440-38-2	Arsenic	4 9	B		P
7440-39-3	Barium	182			P
7440-41-7	Beryllium	1 0	B		P
7440-43-9	Cadmium	0 49	B		P
7440-70-2	Calcium	4490	B	N	P
7440-47-3	Chromium	15 7			P
7440-48-4	Cobalt	8 9	B		P
7440-50-8	Copper	18 5			P
7439-89-6	Iron	16200			P
7439-92-1	Lead	15.9			P
7439-95-4	Magnesium	3540	B		P
7439-96-5	Manganese	412			P
7440-02-0	Nickel	13 7			P
7440-09-7	Potassium	1680	B	E	P
7782-49-2	Selenium	0 39	U		P
7440-22-4	Silver	0.14	U		P
7440-23-5	Sodium	514	B		P
7440-28-0	Thallium	0 61	B		P
7440-62-2	Vanadium	29 4			P
7440-66-6	Zinc	59.3			P
7439-98-7	Molybdenu	0 20	U		P
7440-31-5	Tin	2 8	B		P
7440-24-6	Strontium	52 4	B		P
7439-93-2	Lithium	30.7			P
7440-61-1	Uranium	1 4	B		P

Color Before BROWN Clarity Before Texture MEDIUM
Color After COLORLESS Clarity After CLEAR Artifacts

Comments
CLIENT_ID= 99A8058-013 002

FORM I - IN

87

B7-67

9906-S-13

1

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

8058-013002

Lab Name SOUTHWEST_LAB_OF_OK Contract 99A8058
Lab Code SWOK Case No 39048 SAS No SDG No 39048A
Matrix (soil/water) SOIL Lab Sample ID 39048 26
Level (low/med) LOW Date Received 06/17/99
% Solids 81 5

Concentration Units (ug/L or mg/kg dry weight) MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	14300			P
7440-36-0	Antimony	0 33	B	N	P
7440-38-2	Arsenic	4 9	B		P
7440-39-3	Barium	182			P
7440-41-7	Beryllium	1.0	B		P
7440-43-9	Cadmium	0 49	B		P
7440-70-2	Calcium	4490	B	N	P
7440-47-3	Chromium	15 7			P
7440-48-4	Cobalt	8 9	B		P
7440-50-8	Copper	18 5			P
7439-89-6	Iron	16200			P
7439-92-1	Lead	15.9			P
7439-95-4	Magnesium	3540	B		P
7439-96-5	Manganese	412			P
7440-02-0	Nickel	13 7			P
7440-09-7	Potassium	1680	B	E	P
7782-49-2	Selenium	0 39	U		P
7440-22-4	Silver	0.14	U		P
7440-23-5	Sodium	514	B		P
7440-28-0	Thallium	0.61	B		P
7440-62-2	Vanadium	29 4			P
7440-66-6	Zinc	59 3			P
7439-98-7	Molybdenu	0.20	U		P
7440-31-5	Tin	2 8	B		P
7440-24-6	Strontium	52 4	B		P
7439-93-2	Lithium	30 7			P
7440-61-1	Uranium	1 4	B		P

Color Before BROWN Clarity Before Texture MEDIUM
Color After COLORLESS Clarity After CLEAR Artifacts

Comments
CLIENT_ID= 99A8058-013 002

88

B7-68

APPENDIX B-3

LABORATORY RESULTS - RADIOISOTOPES

Tierra

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

COC # 9[illegible]8058#003

Collector: PG/HS	Contact/Requester: GARCIA, LRNIL	Telephone No: (303)966-5980 MSIN FAX
RIN: 99A8058	Sampling Origin	Purchase Order/Charge Code: LC130500
Project Title: 750 PAD / B984	Logbook No	Ice Chest No Temp
To (Lab): S Cohen & Associates	Method of Shipment: Fed EX	Bill of Lading/Air Bill No: 8079122676932
Protocol		Offsite Property No

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption Yes [ ] No [ ]

Bottle ID	Customer Number	Matrix	Date	Time	Location	Bottle Container	Sample Analysis	Preservative Packing
99A8058-001 004	Boring 9901, S-1	SOLID	6/11/99	0905	750 PAD	250 G P/G	RC01B003 (Isotopic (Soil)) [Priority]	None 4 degrees C
99A8058-002 004	Boring 9901, S-2	SOLID	6/11/99	0926	750 PAD	250 G P/G	RC01B003 (Isotopic (Soil)) [Priority]	None 4 degrees C
99A8058-003 004	Boring 9902, S-3	SOLID	6/11/99	0956	750 PAD	250 G P/G	RC01B003 (Isotopic (Soil)) [Priority]	None 4 degrees C
99A8058-004 004	Boring 9902, S-4	SOLID	6/11/99	1011	750 PAD	250 G P/G	RC01B003 (Isotopic (Soil)) [Priority]	None 4 degrees C
99A8058-005 004	Boring 9903, S-5	SOLID	6/11/99	1025	750 PAD	250-G P/G	RC01B003 (Isotopic (Soil)) [Priority]	None 4 degrees C
99A8058-006 004	Boring 9903, S-6	SOLID	6/11/99	1042	750 PAD	250 G P/G	RC01B003 (Isotopic (Soil)) [Priority]	None 4 degrees C
99A8058-007 004	Boring 9904, S-7	SOLID	6/11/99	1210	750 PAD	250 G P/G	RC01B003 (Isotopic (Soil)) [Priority]	None 4 degrees C

Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time
Ray Mudd	6-16-99 1800						
Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time

FINAL SAMPLE DISPOSITION: Disposal Method (e.g. Return to customer, laboratory procedure, use in process) Disposed By Date/Time

B3-1

90

Tierra

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

COC # 8058#003

RIN 99A8058

Contact/Requestor GARCIA, ERNIE

Telephone No (303)966 5980 MSIN TAX

Bottle No	Container Number	Matrix	Date	Time	Location	Number Type Container	Sample Analysis	Preservative Lacking
99A8058-008 004	Boring 9904, S-8	SOLID	6/11/99	1215	750 PAD	250 G P/G	RC01B003 (Isotopic (Soil)) [Priority]	None 4 degrees C
99A8058-009 004	Boring 9904, S-9	SOLID	6/11/99	1220	750 PAD	250 G P/G	RC01B003 (Isotopic (Soil)) [Priority]	None 4 degrees C
99A8058-010 004	Boring 9905, S-10	SOLID	6/11/99	1317	750 PAD	250 G P/G	RC01B003 (Isotopic (Soil)) [Priority]	None 4 degrees C
99A8058-011 004	Boring 9905, S-11	SOLID	6/11/99	1326	750 PAD	250 G P/G	RC01B003 (Isotopic (Soil)) [Priority]	None 4 degrees C
99A8058-012 004	Boring 9906, S-12	SOLID	6/11/99	1344	750 PAD	250 G P/G	RC01B003 (Isotopic (Soil)) [Priority]	None 4 degrees C
99A8058-013 004	Boring 9906, S-13	SOLID	6/11/99	1357	750 PAD	250 G P/G	RC01B003 (Isotopic (Soil)) [Priority]	None 4 degrees C
99A8058-014 006	Rinsate	AQUEOUS	6/11/99	1430	750 PAD	1 L P	RC01B007 (Americium - Water) [Priority], RC01B012 (Plutonium (Water)) [Priority]	HN03 4 degrees C
99A8058-014 007	Rinsate	AQUEOUS	6/11/99	1430	750 PAD	1 L P	RC01B017 (Uranium (Water)) [Priority]	HN03 4 degrees C

Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time
Ralph Michael	6-16-99 1800						
Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time

FINAL SAMPLE DISPOSITION: Disposal Method (e.g. Return to customer, per lab procedure, used in process) Disposed By Date/Time

B3-2

81

COVER PAGE

Sanford Cohen & Associates
Southeastern Environmental Laboratory
1000 Monticello Court
Montgomery, Alabama 36117

Laboratory Code: SCA Subcontract Number: KH700325EP6

RIN: 99A8058
LIC. RC01B003
LIC. RC01B007
LIC RC01B017
Laboratory Report Identification Code: 1604, 1605, 1606

Sample Matrix: Soil

Site Sample Numbers	Laboratory Sample Number		
	Uranium	Plutonium	Americium
99A8058-001.004 Boring 9901, S-1 750 Pad	KH199-1604-01	KH199-1604-01	KH199-1604-01
99A8058-002.004 Boring 9901, S-2 750 Pad	KH199-1604-02	KH199-1604-02	KH199-1604-02
99A8058-003 004 Boring 9901, S-3 750 Pad	KH199-1604-03	KH199-1604-03	KH199-1604-03
99A8058-004.004 Boring 9901, S-4 750 Pad	KH199-1604-04	KH199-1604-04	KH199-1604-04
99A8058-005.004 Boring 9901, S-5 750 Pad	KH199-1604-05	KH199-1604-05	KH199-1604-05
99A8058-006.004 Boring 9901, S-6 750 Pad	KH199-1604-06	KH199-1604-06	KH199-1604-06
99A8058-007.004 Boring 9901, S-7 750 Pad	KH199-1604-07	KH199-1604-07	KH199-1604-07
99A8058-008.004 Boring 9901, S-8 750 Pad	KH199-1604-08	KH199-1604-08	KH199-1604-08
99A8058-009.004 Boring 9901, S-9 750 Pad	KH199-1604-09	KH199-1604-09	KH199-1604-09
99A8058-010 004 Boring 9901, S-10 750 Pad	KH199-1604-010	KH199-1604-010	KH199-1604-10
Laboratory Control Sample (LC)	SCAQC-1604-LC1	SCAQC-1604-LC1	SCAQC-1604-LC1
Duplicate (LD)	SCAQC-1604-LD1	SCAQC-1604-LD1	SCAQC-1604-LD1
Preparation Blank (PB)	SCAQC-1604-PB	SCAQC-1604-PB	SCAQC-1604-PB

Site Sample Numbers	Laboratory Sample Number		
	Uranium	Plutonium	Americium
99A8058-011.004 Boring 9901, S-11 750 Pad	KH199-1605-01	KH199-1605-01	KH199-1605-01
99A8058-012 004 Boring 9901, S-12 750 Pad	KH199-1605-02	KH199-1605-02	KH199-1605-02
99A8058-013 004 Boring 9901, S-13 750 Pad	KH199-1605-03	KH199-1605-03	KH199-1605-03
Laboratory Control Sample (LC)	SCAQC-1604-LC1	SCAQC-1604-LC1	SCAQC-1604-LC1
Duplicate (LD)	SCAQC-1604-LD1	SCAQC-1604-LD1	SCAQC-1604-LD1
Preparation Blank (PB)	SCAQC-1604-PB	SCAQC-1604-PB	SCAQC-1604-PB

B3-3

92

COVER PAGE (Continued)

Sanford Cohen & Associates
Southeastern Environmental Laboratory
1000 Monticello Court
Montgomery, Alabama 36117

Laboratory Code: SCA Subcontract Number: KH700325EP6

RIN: 99A8058
LIC: RC01B003
LIC. RC01B007
LIC: RC01B017
Laboratory Report Identification Code: 1604, 1605, 1606

Sample Matrix: Water

Site Sample Numbers	Laboratory Sample Number		
	Uranium	Plutonium	Americium
99A8058-014.006 Rinsate 750 Pad	KH199-1606-01	KH199-1606-01	KH199-1606-01
99A8058-014.007 Rinsate 750 Pad	KH199-1606-02	KH199-1606-02	KH199-1606-02
Laboratory Control Sample (LC)	SCAQC-1599-LC1	SCAQC-1599-LC1	SCAQC-1599-LC1
Duplicate (LD)	SCAQC-1599-LD1	SCAQC-1599-LD1	SCAQC-1599-LD1
Preparation Blank (PB)	SCAQC-1599-PB	SCAQC-1599-PB	SCAQC-1599-PB

Comments: There were no problems encountered during sample receiving

"I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy sample data package and the computer-readable EDD, as applicable, submitted on diskette or by modem, has been authorized by the laboratory Manager or the Manager's designee, as verified by the following signature."

Joe Stinson
Signature

Joe Stinson
Name

Laboratory Manager
Title

7/8/99
Date

B3-4

43

Tierra

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

COC # 8058#003

Collector PG/HS	Contact/Requester GARCIA ERNIE	Telephone No. (303)966 5980 MSIN FAX
RIN 99A8058	Sampling Origin	Purchase Order/Charge Code EC430500
Project Title 750 PAD / 8984	Logbook No	Ice Chest No Temp
To (Lab) S Cohen & Associates	Method of Shipment Fed EX	Bill of Lading/Air Bill No. 8079122276932
Protocol		Offsite Property No

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption Yes ☐ No ☐

KH199 - 1604 -

Bottle No	Customer Number	Matrix	Date	Time	Location	No/Type Container	Sample Analysis	Preservative, Packing
99A8058 001 004	Boring 9901, S-1	SOLID	6/11/99	0905	750 PAD	250 G P/G	RC01B003 (Isotopic (Soil)) [Priority] -01	None 4 degrees C
99A8058-002 004	Boring 9901, S-2	SOLID	6/11/99	0926	750 PAD	250 G P/G	RC01B003 (Isotopic (Soil)) [Priority] 02	None 4 degrees C
99A8058-003 004	Boring 9902, S-3	SOLID	6/11/99	0956	750 PAD	250 G P/G	RC01B003 (Isotopic (Soil)) [Priority] 03	None 4 degrees C
99A8058-004 004	Boring 9902, S-4	SOLID	6/11/99	1011	750 PAD	250-G P/G	RC01B003 (Isotopic (Soil)) [Priority] 04	None 4 degrees C
99A8058-005 004	Boring 9903, S-5	SOLID	6/11/99	1025	750 PAD	250-G P/G	RC01B003 (Isotopic (Soil)) [Priority] 05	None 4 degrees C
99A8058-006 004	Boring 9903, S-6	SOLID	6/11/99	1042	750 PAD	250-G P/G	RC01B003 (Isotopic (Soil)) [Priority] 06	None 4 degrees C
99A8058-007 004	Boring 9904, S-7	SOLID	6/11/99	1210	750 PAD	250 G P/G	RC01B003 (Isotopic (Soil)) [Priority] 07	None 4 degrees C

Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time
Ryan Michael	6-12-99 1800	S Fisher/SCA	6-18-99 0930				
Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time

FINAL SAMPLE DISPOSITION | Disposal Method (e.g. Return to customer per lab procedure used in process) | Disposed By | Date/Time

The time on the sample label for -007-004 reads 1155 rather than 1210.

B3-5

94

07/08/99 11:44 S COHEN & ASSOC 005

Tierra

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

COC # 9 8058#003

07/08/99 11:44 S COHEN & ASSOC 008

RIN	Contact/Requestor	Telephone No	MSIN	FAX
99A8058	GARCIA, ERNIE	(303)966 5980		

Bottle No	Customer Number	Matrix	Date	Time	Location	Container Type	Sample Analysis KH199-1604 -	Preservative Packing
99A8058-008 004	Boring 9904, S-8	SOLID	6/11/99	1215	750 PAD	250-G P/G	RC01B003 (Isotopic (Soil)) [Priority] 08	None 4 degrees C
99A8058-009 004	Boring 9904, S-9	SOLID	6/11/99	1220	750 PAD	250-G P/G	RC01B003 (Isotopic (Soil)) [Priority] 09	None 4 degrees C
99A8058-010 004	Boring 9905, S-10	SOLID	6/11/99	1317	750 PAD	250-G P/G	RC01B003 (Isotopic (Soil)) [Priority] 10	None 4 degrees C
99A8058-011 004	Boring 9905, S-11	SOLID	6/11/99	1326	750 PAD	250-G P/G	RC01B003 (Isotopic (Soil)) [Priority] KH199-1605 - 01	None 4 degrees C
99A8058-012 004	Boring 9906, S-12	SOLID	6/11/99	1344	750 PAD	250-G P/G	RC01B003 (Isotopic (Soil)) [Priority] 02	None 4 degrees C
99A8058-013 004	Boring 9906, S-13	SOLID	6/11/99	1357	750 PAD	250-G P/G	RC01B003 (Isotopic (Soil)) [Priority] 03	None 4 degrees C
99A8058-014 006	Rinsate	AQUEOUS	6/11/99	1430	750 PAD	4-L P	RC01B007 (Americium - Water) [Priority], RC01B012 (Plutonium (Water)) [Priority] KH199-1606 - 01	HN03 4 degrees C
99A8058-014 007	Rinsate	AQUEOUS	6/11/99	1430	750 PAD	1-L P	RC01B017 (Uranium (Water)) [Priority] 02	HN03 4 degrees C

Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time
Ralph Nicholson	6-16-99 1800	S Fisher/SCCA	0930 06-18-99				

FINAL SAMPLE DISPOSITION	Disposal Method (e.g. Return to customer per lab procedure, used in process)	Disposed By	Date/Time

B3-6

85

CASE NARRATIVE
RIN 99A8058
Laboratory Report Identification Number: 1604, 1605, 1606
PSA Module RC01B.3

July 8, 1999

I. Introduction

On June 18, 1999, 13 soil samples and two water samples, (RIN 99A8058), were received for analysis at the Sanford Cohen and Associates (SC&A) Southeastern Environmental Laboratory, located in Montgomery, Alabama. The chain-of-custody accompanying the sample requested they be analyzed on a "priority" basis. The samples were analyzed in accordance with Kaiser-Hill specifications stated in the "Statement of Work for Analytical Measurements, Isotopic Determinations by Alpha Spectrometry, Module RCO1-B.3", dated April 24, 1998, and Modification 09, dated July 16, 1998.

II. Analytical Methodology

The radioanalytical results reported for each sample include the site and laboratory sample identification numbers, collection date, method of analysis, and the quality control samples that were analyzed concurrently. All samples were analyzed by Eichrom Industries, Inc extraction chromatography method (ACW03) for isotopic uranium, plutonium, and americium.

III. Analytical Results

Deficiencies

None.

Matrix Interferences

There were no indications of matrix interference.

Dilutions

No dilutions were required.

Detection Limits

The required detection limits (RDL) were met for all sample analyses

Reanalysis

There were no reanalysis.

B3-7

96

Deviations from Protocols

There were no deviations from the written protocols and analytical methods

Contacts with the CTR

There were no contacts with the contract technical representative (CTR) regarding these samples

IV. Quality Control

Site Samples Used for Quality Control Samples:

Site Sample Number	Laboratory Sample Number	Type of Quality Control Analysis Sample
Laboratory Type II Water	SCAQC-1604-LC1	Laboratory Control Sample
99A8058-001 004 Boring 9901, S-1 Pad 750	SCAQC-1604-LD1	Laboratory Duplicate Sample
Laboratory Type II Water	SCAQC-1604-PB	Preparation Blank

Site Samples Used for Quality Control Samples:

Site Sample Number	Laboratory Sample Number	Type of Quality Control Analysis Sample
Laboratory Type II Water	SCAQC-1599-LC1	Laboratory Control Sample
99A7799-007.005 25.0 BH95998	SCAQC-1599-LD1	Laboratory Duplicate Sample
Laboratory Type II Water	SCAQC-1599-PB	Preparation Blank

The water sample received on 6/18/99, RIN 99A8058 (Batch No. 1606), was analyzed concurrently with one water sample received on 6/10/99, RIN 99A6825, (Batch No. 1599). Therefore, the Laboratory Control Sample (SCAQC-1599-LC1), the Laboratory Duplicate Sample (SCAQC-1599-LD1), and the Preparation Blank (SCAQC-1599-PB) were used as quality control samples for both sample batches.

The analytical results of all quality control samples met the acceptance criteria specified in the SOW

Sincerely,

Joe Stinson

Joe Stinson
Laboratory Manager

7/8/99
Date

B3-8

97

Sanford Cohen & Associates
Southeastern Environmental Laboratory

Radioanalytical Results

Report Identification Number 99A8058

Project Name:	Kaiser-Hill	Chain-of-Custody Number	99A8058#003	Matrix:	Soil
Site Sample ID:	007.004				
Other Sample ID:	BORING 9904 S-7	Collection Date	6/11/99	Date Received	6/18/99
		Batch Number	1604	Laboratory Code	SCA

Method Number	Radionuclide	Laboratory Sample ID	Activity (pCi/g)	2 σ Counting Error (pCi/g)	Total Error (pCi/g)	MDA (pCi/g)
ACW03	U-233/234	KH199-1604-07	0.944	0.243	0.308	0.065
ACW03	U-235	KH199-1604-07	0.094	0.084	0.086	0.080
ACW03	U-238	KH199-1604-07	0.576	0.185	0.218	0.065
ACW03	PU-239/240	KH199-1604-07	-0.003	0.036	0.038	0.098
ACW03	AM-241	KH199-1604-07	0.009	0.031	0.031	0.069

Quality Control Samples

Radionuclide	Laboratory Control Sample (LC)	Laboratory Duplicate Analysis (LD)	Preparation Blank (PB)
U	SCAQC-1604-LC1	SCAQC-1604-LD1	SCAQC-1604-PB
Pu	SCAQC-1604-LC1	SCAQC-1604-LD1	SCAQC-1604-PB
Am	SCAQC-1604-LC1	SCAQC-1604-LD1	SCAQC-1604-PB

1000 Monticello Court * Montgomery Alabama * 36117 * 334 272-2234 * FAX 334.213.0407

B3-9

98

Sanford Cohen & Associates
Southeastern Environmental Laboratory

Radioanalytical Results

Report Identification Number 99A8058

Project Name	Kaiser-Hill	Chain-of-Custody Number	99A8058#03	Matrix	Soil
Site Sample ID	008.004				
Other Sample ID	BORING 9904 S-8	Collection Date:	6/11/99	Date Received:	6/18/99
		Batch Number	1604	Laboratory Code	SCA

Method Number	Radionuclide	Laboratory Sample ID	Activity (pCi/g)	2 σ Counting Error (pCi/g)	Total Error (pCi/g)	MDA (pCi/g)
ACW03	U-233/234	KH199-1604-08	1 41	0 312	0 421	0 038
ACW03	U-235	KH199-1604-08	0 087	0 078	0 083	0 047
ACW03	U-238	KH199-1604-08	1.27	0.292	0 387	0 038
ACW03	PU-239/240	KH199-1604-08	0 018	0 037	0 037	0 050
ACW03	AM-241	KH199-1604-08	0 016	0 031	0 032	0 043

Quality Control Samples			
Radionuclide	Laboratory Control Sample (LC)	Laboratory Duplicate Analysis (LD)	Preparation Blank (PB)
U	SCAQC-1604-LC1	SCAQC-1604-LD1	SCAQC-1604-PB
Pu	SCAQC-1604-LC1	SCAQC-1604-LD1	SCAQC-1604-PB
Am	SCAQC-1604-LC1	SCAQC-1604-LD1	SCAQC-1604-PB

B3-10

1000 Monticello Court * Montgomery Alabama * 36117 334.272.2234 * FAX 334.213.0407

99

Sanford Cohen & Associates
Southeastern Environmental Laboratory

Radioanalytical Results

Report Identification Number 99A8058

Project Name	Kaiser-Hill	Chain-of-Custody Number	99A8058#003	Matrix	Soil
Site Sample ID	009.004				
Other Sample ID	BORING 9904 S-9	Collection Date	6/11/99	Date Received	6/18/99
		Batch Number	1604	Laboratory Code	SCA

Method Number	Radionuclide	Laboratory Sample ID	Activity (pCi/g)	2 σ Counting Error (pCi/g)	Total Error (pCi/g)	MDA (pCi/g)
ACW03	U-233/234	KH199-1604-09	0.25	0.284	0.379	0.037
ACW03	U-235	KH199-1604-09	0.050	0.058	0.060	0.045
ACW03	U-238	KH199-1604-09	1.20	0.278	0.367	0.065
ACW03	PU-239/240	KH199-1604-09	0.042	0.058	0.059	0.078
ACW03	AM-241	KH199-1604-09	-0.011	0.021	0.021	0.127

Quality Control Samples

Radionuclide	Laboratory Control Sample (LC)	Laboratory Duplicate Analysis (LD)	Preparation Blank (PB)
U	SCAQC-1604-LC1	SCAQC-1604-LD1	SCAQC-1604-PB
Pu	SCAQC-1604-LC1	SCAQC-1604-LD1	SCAQC-1604-PB
Am	SCAQC-1604-LC1	SCAQC-1604-LD1	SCAQC-1604-PB

1000 Montlosito Court * Montgomery, Alabama * 36117 * 334 272.2234 * FAX 334.213.0407

B3-11

100

Sanford Cohen & Associates
Southeastern Environmental Laboratory

Radioanalytical Results

Report Identification Number 99A8058

Project Name	Kaiser-Hill	Chain-of-Custody Number	99A8058#003	Matrix.	Soil
Site Sample ID	010.004				
Other Sample ID	BORING 9905 S-10	Collection Date:	6/11/99	Date Received	6/18/99
		Batch Number	1604	Laboratory Code	SCA

Method Number	Radionuclide	Laboratory Sample ID	Activity (pCi/g)	2 σ Counting Error (pCi/g)	Total Error (pCi/g)	MDA (pCi/g)
ACW03	U-233/234	KH199-1604-10	1.26	0.291	0.385	0.067
ACW03	U-235	KH199-1604-10	0.087	0.078	0.082	0.047
ACW03	U-238	KH199-1604-10	1.43	0.312	0.423	0.038
ACW03	PU-239/240	KH199-1604-10	-0.014	0.020	0.020	0.096
ACW03	AM-241	KH199-1604-10	0.043	0.062	0.062	0.059

Quality Control Samples

Radionuclide	Laboratory Control Sample (LC)	Laboratory Duplicate Analysis (LD)	Preparation Blank (PB)
U	SCAQC-1604-LC1	SCAQC-1604-LD1	SCAQC-1604-PB
Pu	SCAQC-1604-LC1	SCAQC-1604-LD1	SCAQC-1604-PB
Am	SCAQC-1604-LC1	SCAQC-1604-LD1	SCAQC-1604-PB

1000 Montclair Court • Montgomery, Alabama • 36117 • 334.272.2234 • FAX 334.213.0407

B3-12

101

Sanford Cohen & Associates
Southeastern Environmental Laboratory

Radioanalytical Results

Report Identification Number 99A8058

Project Name	Kaiser-Hill	Chain-of-Custody Number	99S8058#003	Matrix.	Soil
Site Sample ID	011.004				
Other Sample ID	BORING 9905 S-11	Collection Date:	6/11/99	Date Received	6/18/99
		Batch Number	1605	Laboratory Code	SCA

Method Number	Radionuclide	Laboratory Sample ID	Activity (pCi/g)	2 σ Counting Error (pCi/g)	Total Error (pCi/g)	MDA (pCi/g)
ACW03	U-233/234	KH199-1605-01	1 36	0.297	0 403	0 076
ACW03	U-235	KH199-1605-01	0 100	0 062	0 067	0 046
ACW03	U-238	KH199-1605-01	1 36	0 296	0 402	0 064
ACW03	PU-239/240	KH199-1605-01	0 026	0 049	0 049	0 079
ACW03	AM-241	KH199-1605-01	0 059	0 068	0 069	0 053

Quality Control Samples

Radionuclide	Laboratory Control Sample (LC)	Laboratory Duplicate Analysis (LD)	Preparation Blank (PB)
U	SCAQC-1604-LC1	SCAQC-1604-LD1	SCAQC-1604-PB
Pu	SCAQC-1604-LC1	SCAQC-1604-LD1	SCAQC-1604-PB
Am	SCAQC-1604-LC1	SCAQC-1604-LD1	SCAQC-1604-PB

1000 Monticello Court * Montgomery Alabama * 36117 * 334.272.2234 * FAX 334.213.0407

B3-13

102

Sanford Cohen & Associates
Southeastern Environmental Laboratory

Radioanalytical Results

Report Identification Number 99A8058

Project Name	Kaiser-Hill	Chain-of-Custody Number	99S8058#003	Matrix	Soil
Site Sample ID	012.004				
Other Sample ID	BORING 9908 S-12	Collection Date	6/11/99	Date Received:	6/18/99
		Batch Number	1605	Laboratory Code	SCA

Method Number	Radionuclide	Laboratory Sample ID	Activity (pCi/g)	2 σ Counting Error (pCi/g)	Total Error (pCi/g)	MDA (pCi/g)
ACW03	U-233/234	KH199-1605-02	1 18	0.286	0 370	0 040
ACW03	U-235	KH199-1605-02	0 029	0 054	0 056	0 088
ACW03	U-238	KH199-1605-02	1 28	0.296	0 393	0 040
ACW03	PU-239/240	KH199-1605-02	0 058	0 056	0 057	0 038
ACW03	AM-241	KH199-1605-02	0.019	0.038	0 038	0 061

Quality Control Samples

Radionuclide	Laboratory Control Sample (LC)	Laboratory Duplicate Analysis (LD)	Preparation Blank (PB)
U	SCAQC-1604-LC1	SCAQC-1604-LD1	SCAQC-1604-PB
Pu	SCAQC-1604-LC1	SCAQC-1604-LD1	SCAQC-1604-PB
Am	SCAQC-1604-LC1	SCAQC-1604-LD1	SCAQC-1604-PB

1000 Monticello Court * Montgomery Alabama * 36117 * 334.272.2234 * FAX 334.213.0407

B3-14

103

Sanford Cohen & Associates
Southeastern Environmental Laboratory

Radioanalytical Results

Report Identification Number 99A8058

Project Name	Kaiser-Hill	Chain-of-Custody Number	99S8C58#003	Matrix	Soil
Site Sample ID	013.004				
Other Sample ID	BORING 9906 S-13	Collection Date	6/11/99	Date Received	6/18/99
		Batch Number	1605	Laboratory Code	SCA

Method Number	Radionuclide	Laboratory Sample ID	Activity (pCi/g)	2 σ Counting Error (pCi/g)	Total Error (pCi/g)	MDA (pCi/g)
ACW03	U-233/234	KH199-1605-03	1 03	0.267	0 338	0 041
ACW03	U-235	KH199-1605-03	0 037	0 053	0 054	0 061
ACW03	U-238	KH199-1605-03	1 10	0 279	0.366	0 096
ACW03	PU-239/240	KH199-1605-03	0 020	0 051	0 051	0 095
ACW03	AM-241	KH199-1605-03	0 046	0 065	0 066	0 062

Quality Control Samples

Radionuclide	Laboratory Control Sample (LC)	Laboratory Duplicate Analysis (LD)	Preparation Blank (PB)
U	SCAQC-1604-LC1	SCAQC-1604-LD1	SCAQC-1604-PB
Pu	SCAQC-1604-LC1	SCAQC-1604-LD1	SCAQC-1604-PB
Am	SCAQC-1604-LC1	SCAQC-1604-LD1	SCAQC-1604-PB

1000 Montecello Court * Montgomery Alabama * 36117 * 334.272.2234 * FAX 334.213.0407

B3-15

104

Sanford Cohen & Associates
Southeastern Environmental Laboratory

Radioanalytical Results

Quality Control Sample
Preparation Blank (PB)

Report Identification Number 99A8058

Project Name	Kaiser-Hill	Chain-of-Custody Number	None	Matrix	Water
Site Sample ID	BLANK1				
Other Sample ID	BLANK1	Collection Date	6/18/99	Date Received	6/18/99
				Laboratory Code:	SCA

Method Number	Radionuclide	Laboratory Sample ID	Activity (dpm)	2 σ Counting Error (dpm)	Total Error (dpm)	MDA (dpm)
ACW03	U-233/234	SCAQC-1604-PB	0 044	0 057	0 057	0 077
ACW03	U-235	SCAQC-1604-PB	0 017	0 034	0 034	0 045
ACW03	U-238	SCAQC-1604-PB	0 006	0 029	0 029	0 065
ACW03	PU-239/240	SCAQC-1604-PB	-0 007	0 013	0 014	0 060
ACW03	AM-241	SCAQC-1604-PB	0 034	0 048	0 049	0 046

	Quality Control Samples		
Radionuclide	Laboratory Control Sample (LC)	Laboratory Duplicate Analysis (LD)	Preparation Blank (PB)
U	SCAQC-1604-LC1	SCAQC-1604-LD1	SCAQC-1604-PB
Pu	SCAQC-1604-LC1	SCAQC-1604-LD1	SCAQC-1604-PB
Am	SCAQC-1604-LC1	SCAQC-1604-LD1	SCAQC-1604-PB

1000 Monticello Court * Montgomery, Alabama * 36117 * 334.272.2234 * FAX 334.213.0407

B3-16

105

Sanford Cohen & Associates
Southeastern Environmental Laboratory

Radioanalytical Results

Quality Control Sample
Laboratory Control (LC1)

Report Identification Number 99A8056

Project Name	Kaiser-Hill	Chain-of-Custody Number	None	Matrix	Water
Site Sample ID	CONTROL1				
Other Sample ID	CONTROL1	Collection Date	6/18/99	Date Received	6/18/99
				Laboratory Code	SCA

Method Number	Radionuclide	Laboratory Sample ID	Activity (dpm)	2 σ Counting Error (dpm)	Total Error (dpm)	MDA (dpm)
ACW03	U-233/234	SCAQC-1604-LC1	8.37	1 06	1 98	0 076
ACW03	U-238	SCAQC-1604-LC1	8 43	1 07	2 00	0 043
ACW03	PU-239/240	SCAQC-1604-LC1	5 60	0 941	1 46	0 044
ACW03	AM-241	SCAQC-1604-LC1	3.69	0 687	1 01	0 080

Quality Control Samples			
Radionuclide	Laboratory Control Sample (LC)	Laboratory Duplicate Analysis (LD)	Preparation Blank (PB)
U	SCAQC-1604-LC1	SCAQC-1604-LD1	SCAQC-1604-PB
Pu	SCAQC-1604-LC1	SCAQC-1604-LD1	SCAQC-1604-PB
Am	SCAQC-1604-LC1	SCAQC-1604-LD1	SCAQC-1604-PB

1000 Monticello Court * Montgomery, Alabama * 36117 * 334.272.2224 * FAX 334.213.0407

B3-17

10

Sanford Cohen & Associates
Southeastern Environmental Laboratory

Radioanalytical Results

Quality Control Sample
Preparation Blank (PB)

Report Identification Number 99A8058

Project Name	Kaiser-Hill	Chain-of-Custody Number	None	Matrix	Water
Site Sample ID	BLANK2				
Other Sample ID	BLANK2	Collection Date	6/14/99	Date Received	6/18/99
				Laboratory Code.	SCA

Method Number	Radionuclide	Laboratory Sample ID	Activity (pCi/L)	2 σ Counting Error (pCi/L)	Total Error (pCi/L)	MDA (pCi/L)
ACW03	U-233/234	SCAQC-1599-PB	0.024	0.024	0 025	0.025
ACW03	U-235	SCAQC-1599-PB	0 046	0.035	0 037	0 018
ACW03	U-238	SCAQC-1599-PB	0 029	0.026	0 027	0 025
ACW03	PU-239/240	SCAQC-1599-PB	0.000	0.000	0 000	0 020
ACW03	AM-241	SCAQC-1599-PB	0 000	0 000	0 000	0 017

Quality Control Samples			
Radionuclide	Laboratory Control Sample (LC)	Laboratory Duplicate Analysis (LD)	Preparation Blank (PB)
U	SCAQC-1599-LC1	SCAQC-1599-LD1	SCAQC-1599-PB
Pu	SCAQC-1599-LC1	SCAQC-1599-LD1	SCAQC-1599-PB
Am	SCAQC-1599-LC1	SCAQC-1599-LD1	SCAQC-1599-PB

1000 Montiselo Court * Montgomery, Alabama * 36117 * 334.272.2234 * FAX 334.213.0407

B3-18

107

Sanford Cohen & Associates
Southeastern Environmental Laboratory

Radioanalytical Results

Quality Control Sample
Laboratory Control (LC1)

Report Identification Number 99A5068

Project Name:	Kaiser-Hill	Chain-of-Custody Number	None	Matrix.	Water
Site Sample ID:	CONTROL2				
Other Sample ID	CONTROL2	Collection Date	6/14/99	Date Received.	6/18/99
				Laboratory Code.	SCA

Method Number	Radionuclide	Laboratory Sample ID	Activity (pCi/L)	2 σ Counting Error (pCi/L)	Total Error (pCi/L)	MDA (pCi/L)
ACW03	U-233/234	SCAQC-1599-LC1	3.46	0 554	0 886	0 032
ACW03	U-238	SCAQC-1599-LC1	4.21	0 642	1 06	0 056
ACW03	PU-239/240	SCAQC-1599-LC1	2.55	0.496	0 712	0 027
ACW03	AM-241	SCAQC-1599-LC1	1 61	0 310	0.448	0 021

Quality Control Samples			
Radionuclide	Laboratory Control Sample (LC)	Laboratory Duplicate Analysis (LD)	Preparation Blank (PB)
U	SCAQC-1599-LC1	SCAQC-1599-LD1	SCAQC-1599-PB
Pu	SCAQC-1599-LC1	SCAQC-1599-LD1	SCAQC-1599-PB
Am	SCAQC-1599-LC1	SCAQC-1599-LD1	SCAQC-1599-PB

1000 Monticello Court * Montgomery Alabama * 36117 * 334.272.2234 * FAX 334.213.0407

83-19

108

Sanford Cohen & Associates
Southeastern Environmental Laboratory

Radioanalytical Results

Quality Control Sample
Duplicate (LD1)

Report Identification Number 99A8058

Project Name	Kaiser-Hill	Chain-of-Custody Number	99A8058/003	Matrix	Water
Site Sample ID	99A7799-007.005				
Other Sample ID	25.0 8H95998	Collection Date	6/8/99	Date Received	6/18/99
				Laboratory Code	SCA

Method Number	Radionuclide	Laboratory Sample ID	Activity (pCi/L)	2 σ Counting Error (pCi/L)	Total Error (pCi/L)	MDA (pCi/L)
ACW03	U-233/234	SCAQC-1599-LD1	0.014	0 019	0 020	0 026
ACW03	U-235	SCAQC-1599-LD1	0 054	0 036	0 042	0 018
ACW03	U-238	SCAQC-1599-LD1	0 014	0 019	0 020	0 026
ACW03	PU-239/240	SCAQC-1599-LD1	0 011	0 015	0 016	0 015
ACW03	AM-241	SCAQC-1599-LD1	0.006	0 011	0 011	0 014

Laboratory Samples for Duplicates

Radionuclide	Laboratory Sample ID	Duplicate of Sample ID
U-233/234	SCAQC-1599-LD1	KH199-1599-01
U-235	SCAQC-1599-LD1	KH199-1599-01
U-238	SCAQC-1599-LD1	KH199-1599-01
PU-239/240	SCAQC-1599-LD1	KH199-1599-01
AM-241	SCAQC-1599-LD1	KH199-1599-01

Quality Control Samples

Radionuclide	Laboratory Control Sample (LC)	Laboratory Duplicate Analysis (LD)	Preparation Blank (PB)
U	SCAQC-1599-LC1	SCAQC-1599-LD1	SCAQC-1599-PB
Pu	SCAQC-1599-LC1	SCAQC-1599-LD1	SCAQC-1599-PB
Am	SCAQC-1599-LC1	SCAQC-1599-LD1	SCAQC-1599-PB

B3-20

1000 Monticello Court * Montgomery Alabama * 36117 * 334 272.2234 * FAX 334 213 0407

109

Sanford Cohen & Associates
Southeastern Environmental Laboratory

Radioanalytical Results

Report Identification Number 99A8058

Project Name: Kaiser-Hill
Chain-of-Custody Number: 99A8058#003
Matrix: Water
Site Sample ID: 99A7799-007.005
Other Sample ID: 25.0 8H95998
Collection Date: 6/8/99
Date Received: 6/18/99
Batch Number: 1599
Laboratory Code: SCA

Method Number	Radionuclide	Laboratory Sample ID	Activity (pCi/L)	2 σ Counting Error (pCi/L)	Total Error (pCi/L)	MDA (pCi/L)
ACW03	U-233/234	KH199-1599-01	0 023	0 026	0 026	0 031
ACW03	U-235	KH199-1599-01	-0 003	0 005	0 006	0 033
ACW03	U-238	KH199-1599-01	0.033	0 027	0 028	0 015
ACW03	PU-239/240	KH199-1599-01	0 000	0 000	0 000	0 016
ACW03	AM-241	KH199-1599-01	0 005	0 011	0.011	0 015

Quality Control Samples

Radionuclide	Laboratory Control Sample (LC)	Laboratory Duplicate Analysis (LD)	Preparation Blank (PB)
U	SCAQC-1599-LC1	SCAQC-1599-LD1	SCAQC-1599-PB
Pu	SCAQC-1599-LC1	SCAQC-1599-LD1	SCAQC-1599-PB
Am	SCAQC-1599-LC1	SCAQC-1599-LD1	SCAQC-1599-PB

B3-21

1000 Monticello Court * Montgomery Alabama * 36117 * 334.272.2234 * FAX 334.213 0407

110

Sanford Cohen & Associates
Southeastern Environmental Laboratory

Radioanalytical Results

Quality Control Sample Evaluation

Report Identification Number 99A8058

Project Name Kaiser-Hill Laboratory Code: SCA

Laboratory Contol Sample (LC1) Evaluation

Method Number	Radionuclide	Laboratory Sample ID	(CV) Decay Corrected Activity of Spike Added (pCi/L)	(OV) Laboratory Control Sample Activity (pCi/L)	Laboratory Control Sample % Recovery (Accuracy)	Number of σ Between CV and OV
ACW03	AM-241	SCAQC-1599-LC1	1 91 ∓ 0 053	1 61 ∓ 0 448	84 5	1 05
ACW03	PU-239/240	SCAQC-1599-LC1	2 05 ∓ 0 045	2.55 ∓ 0 712	125	1 14
ACW03	U-233/234	SCAQC-1599-LC1	3 61 ∓ 0 145	3 46 ∓ 0 886	95.7	0.268
ACW03	U-238	SCAQC-1599-LC1	3.61 ∓ 0 145	4.21 ∓ 1 06	117	0 564
ACW03	AM-241	SCAQC-1604-LC1	4.24 ∓ 0 117	3 69 ∓ 1 01	87 0	0.870
ACW03	PU-239/240	SCAQC-1604-LC1	4 55 ∓ 0 100	5 60 ∓ 1 46	123	1 13
ACW03	U-233/234	SCAQC-1604-LC1	8.02 ∓ 0 321	8 37 ∓ 1 96	104	0.257
ACW03	U-238	SCAQC-1604-LC1	8 02 ∓ 0 321	8.43 ∓ 2 00	105	0 303

Laboratory Duplicate Sample (LD1) Evaluation

Method Number	Radionuclide	Laboratory Sample ID	Original Sample Activity (pCi/L)	Duplicate Sample Activity (pCi/L)	Difference Between Original Activity and Duplicate Sample Activity (F)	Ratio of the Difference Between the Sample Activities and the Propagated Measurement Original Activity and Uncertainty of the Difference at 2 σ (F/E)
ACW03	U-233/234	SCAQC-1599-LD1	0 023 ∓ 0 026	0 014 ∓ 0 020	0 009	0.278
ACW03	U-235	SCAQC-1599-LD1	-0 003 ∓ 0 006	0 054 ∓ 0 042	0.057	1 34
ACW03	U-238	SCAQC-1599-LD1	0 033 ∓ 0 028	0.014 ∓ 0.020	0 019	0 554
ACW03	PU-239/240	SCAQC-1599-LD1	0 000 ∓ 0 000	0 011 ∓ 0 016	0 011	0 696
ACW03	AM-241	SCAQC-1599-LD1	0 005 ∓ 0 011	0 005 ∓ 0 011	0 000	0 008
ACW03	U-233/234	SCAQC-1604-LD1	0.811 ∓ 0.280	0 900 ∓ 0 302	0 090	0.218
ACW03	U-235	SCAQC-1604-LD1	0 017 ∓ 0 035	0 035 ∓ 0.051	0 018	0 288
ACW03	U-238	SCAQC-1604-LD1	0.835 ∓ 0.285	0 794 ∓ 0.278	0 041	0 104
ACW03	PU-239/240	SCAQC-1604-LD1	0 087 ∓ 0 060	0 016 ∓ 0.042	0 071	0 767
ACW03	AM-241	SCAQC-1604-LD1	0 041 ∓ 0.059	0 036 ∓ 0 051	0 005	0 066

B3-22

1000 Monticello Court * Montgomery Alabama * 36117 * 334.272.2234 * FAX 334.213.0407

111

Sanford Cohen & Associates
Southeastern Environmental Laboratory

Radioanalytical Results

Quality Control Tracer Yield

Report Identification Number 99A8058

Project Name: Kaiser-Hill Laboratory Code. SCA

Laboratory Sample ID	Am-243	Pu-242	U-232
KH199-1599-01	64 57	60.14	61 86
KH199-1604-01	64 97	78 79	91.26
KH199-1604-02	81 05	78 61	94 01
KH199-1604-03	76 05	85 14	89 9
KH199-1604-04	77 4	78.25	95.8
KH199-1604-05	81 47	58 88	83 4
KH199-1604-06	83 18	61.47	88 11
KH199-1604-07	92.75	82.87	84 49
KH199-1604-08	80 83	68 45	88 04
KH199-1604-09	50.38	69 49	87 04
KH199-1604-10	61 17	69.07	85.7
KH199-1605-01	67.27	74.65	87 13
KH199-1605-02	71 66	86 44	76 82
KH199-1605-03	58.75	73.95	79 54
KH199-1606-01	71 92	62.72	
KH199-1606-02			69 77
SCAQC-1599-LC1	85.24	68 05	50 84
SCAQC-1599-LD1	70 84	68.93	59.96
SCAQC-1599-PB	57.76	45 11	59.68
SCAQC-1604-LC1	88 49	81 61	80 49
SCAQC-1604-LD1	74 36	91 04	84 42
SCAQC-1604-PB	82 72	81.25	95 81

B3-73

1000 Montticello Court • Montgomery Alabama • 36117 • 334.272.2734 • FAX 334.213.0407

112/112