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Justification for Class III Permit Modification January 2008 SWMU 105 Operable Unit 1306 Mercury Spill (Building 6536)

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United States Department of Energy

under contract DE-AC04-94L85000



SWMU 105 Mercury Spill (Building 6536)





Environmental Restoration Project

Site History

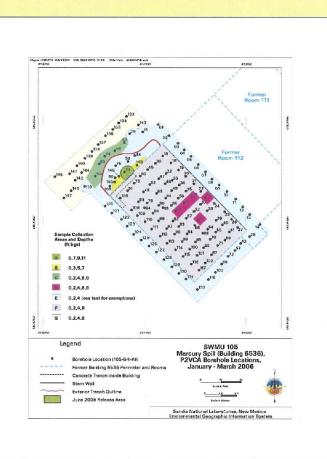
- The Mercury Spill (Building 6536), SWMU 105, is an approximately 3,600 square feet site located in Technical Area-III.
- The main part of Building 6536 was built in 1967. Room 113 was added in 1983. The facility was used to simulate many types of high-heat environments. Several releases of mercury from equipment inside the building were reported in the 1970s and 1980s. Mercury was found in Room 113 during the building demolition activities. In June 2005, a subsurface release of mercury to the environment was found outside the foundation wall of Room 113. The outside area had been trenched to remove utilities servicing the building; it was during the trenching activities that the release was discovered

Depth to Groundwater

The regional aquifer is approximately 500 ft bgs.

Constituents of Concern

Mercury



Summary of Investigations

- In the early 1990s, the initial investigation determined that the mercury releases at SWMU 105 did not impact the environment, that all releases had been within the building and were cleaned up at the time. In 1995, an administrative no further action was issued for SWMU 105. In June 2005, the discovery of the subsurface release to the environment prompted a VCA in order to characterize the release and remove the contaminated soil.
- In September 2005, a Phase 1 VCA was initiated. Six discrete subsurface soil samples collected from the release area for metals analysis revealed mercury contamination at a maximum of 39.6 mg/kg. Following the complete removal of Building 6536, a mercury soil-vapor survey beneath the former Room 113 slab indicated that contamination may have been more widespread than expected. Areas with positive vapor readings were found in the soil beneath the former Room 113 slab. Due to the results of the soil-vapor survey, the P1VCA was suspended and a Phase 2 VCA plan was developed to address the new concerns. Mercury-contaminated soil was removed from the trench area during the P1VCA and disposed of according to SNL/NM policy.
- In January to March 2006, the P2VCA activities included the collection of 574 discrete soil samples in order to characterize the vertical and horizontal extent of contamination. The sampling area included the footprint of Room 113, the perimeter of Room 113, and the trench area. Samples were collected at approximately 2 ft depth intervals: maximum depth in the trench area was approximately 11 ft, maximum depth under the Room 113 slab was approximately 8 ft, and maximum depth around the perimeter of Room 113 was approximately 4 ft. The sampling area was extended northwest of the trench in order to define the horizontal extent of contamination, as elevated mercury results were revealed in that area. The mercury contamination was found predominantly at and northwest of the release point in the trench area.
- The analytical results of the P2VCA sampling effort revealed 38 samples that exceeded the mercury background value of less than 0.25 mg/kg for surface samples with a maximum of 339 mg/kg, and 73 samples that exceeded the mercury background value less than 0.1 mg/kg for subsurface samples with a maximum value of 342 mg/kg. With the exception of the two samples with the maximum values, the remainder of the sample results ranged from no detection above the MDL to 147 mg/kg.
- Approximately 1 cy of mercury-contaminated soil was removed during the P2VCA and disposed of according to SNL/NM policy.

Summary of Data Used for NFA Justification

- All soil analysis data collected from the P1VCA and the P2VCA were used in the characterization of SWMU 105 and in the risk analyses.
- The distribution of mercury contamination at SWMU 105 could be divided into two sections of the site: the
 entire site with very little contamination (entire data set), and the trench and adjacent area with mercury
 contamination (limited data set). As a result, SNL/NM decided to perform two risk analyses. This provided
 an overall assessment for the entire site, and a conservative assessment for the portion of the site with the
 highest levels.

Recommended Future Land Use

Industrial land use is established for this site.



Photograph showing soil sample collection with the Geoprobe at SWMU 105. (Workers are in level C personal protection equipment and monitoring with the MVA.)



Photograph showing exterior trench at Bluilding 6536.

Results of Risk Analysis

- Risk assessment results for the residential scenario are calculated per NMED risk assessment guidance in 2003 as presented in the "Supplemental Risk Document Supporting Class 3 Permit Modification Process" (SNL/NM October 2004).
- Because mercury was present in concentrations greater than background-screening levels, it was
 necessary to perform a risk assessment for the site. The risk assessment analysis evaluated the potential
 for adverse health effects for the residential land-use scenario.
- The total human health HI was 1.19 for the industrial land-use scenario, which is above the NMED guideline of 1. There is no quantified estimated excess cancer risk for mercury in an industrial land-use scenario. There is no quantified HI or estimated excess cancer risk for the associated background constituent under an industrial land-use scenario.
- The total human health HI was 15 for the residential land-use scenario, which is above the NMED guideline of 1. There is no quantified estimated excess cancer risk for mercury in a residential land-use scenario.

 There is no quantified HI or estimated excess cancer risk for the associated background constituent under a residential land-use scenario.

Entire Data Set

Although the total HI was above the NMED guideline, using the UCL of the mean concentration for mercury for the entire data reduces the total HI to 0.34 for the residential land-use scenario, which is below the NMED guideline of 1.

Limited Data Set

Using the UCL of the mean concentration for mercury for the limited data set reduces the total HI to 1.34 for the residential land-use scenario, which is above the NMED guideline of 1.

- Using SNL/NM ecological risk assessment methodology, the ecological risk for SWMU 105 is expected to be low.
- In conclusion, human health and ecological risk are acceptable per NMED guidance under an industrial land-use scenario. Thus, the entire site within the boundary of SWMU 105 is proposed for CAC with institutional controls.

Risk Assessment Values for SWMU 105 Nonradiological COCs Entire Data Set

	Maximum Concentration/UCL		Land-Use nario ^b	Residential Land-Use Scenariob	
COC*	(All Samples) (mg/kg)	Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Inorganic					
Mercury	342/7.8	1.19/0.03	_	15.0/0.34	
•	Total	1,19/0.03		15.0/0.34	_

Bold values represent UCLs and Calculations with UCLs.

Maximum concentration excee

bEPA 1989.

- Information not quantified

Risk Assessment Values for SWMU 105 Nonradiological COCs Limited Data Set

	Maximum	Industrial Land-Use		Residentia	l Land-Use
	Concentration/UCL	Scenario ^b		Scer	ario ^b
COCª	(Limited Set)	Hazard	Cancer	Hazard	Cancer
	(mg/kg)	Index	Risk	Index	Risk
Mercury	342/30.5	1.19/0.11	_	15.0/1.34	_
	Total	1.19/0.11	_	15.0/1.34	_

Bold values represent UCLs and Calculations with UCLs.
^aMaximum concentration exceeded background value.

bEPA 1989.

- Information not quantified.

For More Information Contact

U.S. Department of Energy Sandia Site Office Environmental Restoration Mr. John Gould Telephone (505) 845-6089 Sandia National Laboratories Environmental Restoration Project Task Leader: Brenda Langkopf Telephone (505) 284-3272



Sandia National Laboratories

Justification for Class III Permit Modification January 2008

SWMU 105 Operable Unit 1306 Mercury Spill (Building 6536)

NFA Submitted September 1994 Comment Responses Submitted May 1995 CAC Submitted July 2006

Environmental Restoration Project



United States Department of Energy Sandia Site Office



Department of Energy

Albuquerque Operations Office Kirlland Area Office P. O. Box 5400 Albuquerque, New Mexico 87185-5400

OCT 0.3 1994

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Allyn M. Davis, Director Hazardous Waste Management Division U.S. Environmental Protection Agency, Region 6 1445 Ross Avenue, Suite 1200 Dallas, TX 75202-2733

Dear Mr. Davis:

The purpose of this letter is to resubmit officially and supersede a letter covering the same topic, dated September 28, 1994. The replacement is required to correct information contained on the enclosed public notice and due to the uncertainty of correct distribution. We apologize for the inconvenience of this resubmittal.

The Department of Energy (DOE) is requesting a Class 3 permit modification to remove a total of 22 solid waste management units (SWMUs) from the Resource Conservation and Recovery Act (RCRA) Hazardous and Solid Waste Amendments (HSWA) Final Permit for Sandia National Laboratories/New Mexico (SNL/NM) (EPA ID No. NM5890110518).

In accordance with 270.42(c)(1) and Section IV.B.3.b of the above referenced permit, the following information is provided.

DOE requests that the following SWMUs be removed from Table 2 of the HSWA module:

OU 1295 Site 139	Building 9964 Septic System
OU 1302 Site 25 Site 32	Burial site (South of TA-1) Steam Plant Oil Spill (TA-1)
Site 41	Building 838 Mercury Spill (TA-1)
Site 73 Site 104	Hazardous Waste Repackaging/Storage (Bldg 895) PCB Spill, Computer Facility

Allyn M. Davis	2
OU 1303 Site 3	Chemical Disposal Pit (TA-2)
Site 43	Radioactive Material Storage Yard (TA-2)
Site 44	
Site 113	
Site 135	Building 906 Septic System
Site 165	
OU 1306 Site 105	-
Site 188	-
Site 195	
OU 1334 Site 20	Schoolhouse Mesa Burn Site
Site 21	Metal Scrap
Site 47	Unmanned Seismic Observatory
Site 62	•
Site 69	•
Site 71	Moonlight Shot Area

This permit modification is needed to terminate the schedule of compliance for the identified SWMUs; this will be accomplished by an EPA determination that no further action is needed. Each of these SWMUs has been investigated and the investigations are documented in no further action (NFA) proposals. Two copies of each NFA proposal are enclosed. As required by Section IV.M of the RCRA permit, each NFA proposal contains information demonstrating that "there are no releases of hazardous waste including hazardous constituents from a particular SWMU at the facility that pose a threat to human health and/or the environment..."

Firing Site: Ranchhouse

Site 88a

The requested modification, asking that a no further action (NFA) determination be made for each of the identified SWMUs, is a Class 3 permit modification.

Approval of this request would result in changes only to the HSWA module of the RCRA permit; there would be no changes to the information required by 40 CFR 270.13 through 270.21, 270.62, or 270.63.

A notice about the permit modification request, enclosed, will be mailed to all persons on the facility mailing list and will be published in the Albuquerque Tribune and the Albuquerque Journal. The notice will be mailed and published within seven days of the date of this modification request. The notice will contain all information required by 40 CFR 270.42(c)(2).

As required by 40 CFR 270.42(c)(3)-(5), DOE will: make available copies of the permit modification request and supporting documents in the public reading rooms, host a public meeting in Albuquerque within the allotted time frame, and provide a 60-day comment period for public input.

If you have any questions, please contact John Gould of my staff at (505) 845-6089.

Sincerely,

Kathleen A. Carlso

Area Manager

Enclosures

cc w/enclosures:

- J. Johnsen, KAO-AIP (two copies)
- T. Trujillo, DOE/AL, ERPO

cc w/o enclosures:

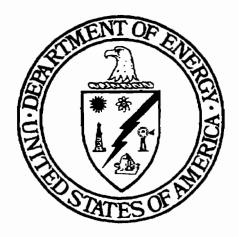
- D. Neleigh, EPA, Region VI
- N. Morlock, EPA, Region VI
- C. Soden, DOE/AL:EPD
- B. Garcia, NMED
- W. Cox, MS 1347, SNL
- B. Doremus, MS 1347, SNL
- J. A. Roybal, MS 1347, SNL
- M. J. Davis, MS 1347, SNL
- S. Smith, MS 1347, SNL
- T. Vandenberg, MS 0141, SNL
- E. Krauss, MS 0141, SNL



PROPOSAL FOR ADMINISTRATIVE NO FURTHER ACTION ENVIRONMENTAL RESTORATION SITE 105, MERCURY SPILL (BLDG. 6536) (TA-III) OPERABLE UNIT 1306

August 1994

Environmental Restoration Project



United States Department of Energy Albuquerque Operations Office

PROPOSAL FOR ADMINISTRATIVE NO FURTHER ACTION

SITE 105, Mercury Spill (Bldg. 6536) (TA-III) OU 1306

SANDIA NATIONAL LABORATORIES/NEW MEXICO

1.0 INTRODUCTION

Sandia National Laboratories/New Mexico (SNL/NM) is proposing an administrative No Further Action (NFA) decision for Environmental Restoration (ER) Site 105, Mercury Spill at Building 6536 Technical Area (TA)-III, Operable Unit (OU) 1306.

In 1972, discrepancies between the design capacity of a mercury bath and the actual contents indicated that mercury might have spilled from the bath. In addition, an explosion involving tubes containing mercury might have occurred and a small spill may have occurred in 1977 and 1982, respectively. Information is conflicting as to whether a mercury bath existed. Mercury-detection equipment was brought in but no traces of mercury were found. Therefore, Site 105 is being proposed for NFA.

2.0 HISTORY OF UNIT

Building 6536 (Attachment 1) formerly was used for testing aerospace nuclear safety systems. According to personnel interviews conducted during the Comprehensive Environmental Assessment and Response Program (CEARP) Phase 1 Assessment (DOE 1987), the pressure in the system was measured using a mercury bath. In 1972 the bath was examined and appeared to have between 11 and 13 pounds less mercury than its design capacity. Mercury-detection equipment (a mercury vapor detector) was brought in but no traces of mercury were found. It is possible that the bath was never filled to design capacity. The mercury bath was later removed (DOE 1987).

Interviews conducted for the RCRA Facility Investigation (RFI) indicate that the mercury bath may never have existed in Building 6536 (Confidential Personnel Interviews 1990, 1992). Interviewees explained that there had been an explosion of some tubes containing mercury. At some later date, the tubes, associated equipment, and concrete pad on which the experiment was placed were reportedly torn up and removed to an unknown location (Confidential Personnel Interviews 1990, 1992).

Additional interviews were conducted in 1992 to clarify the information previously collected. According to an interviewee, there are two areas of concern at the site. One area is within the building where, in 1982, a mercury bath (a 6 inch by 1/6 inch glass tube of mercury) broke. The accident occurred inside the building, was immediately cleaned up, and there was no mechanism by which the mercury could have escaped the area and entered the environment (i.e., through a drain). The second area of concern was an apparent "explosion" of some tubes containing mercury that occurred in 1977. This accident took place outside, the area was completely cleaned up, and the tubes, associated equipment, and impacted soils were removed and taken to an unknown location. The area is now covered by a concrete pad and a system of tanks and piping. Furthermore, according to the 1987 CEARP, previous surveys have found no residual contaminants at the site.

3.0 EVALUATION OF RELEVANT EVIDENCE

In the CEARP document (DOE 1987) this site is listed as a candidate for NFA, and is

described on page V-22 as follows:

Building 6536 was formerly used for testing aerospace nuclear safety systems. A 5-MW plasma torch was located in a steel tank inside the building. The pressure in the system was measured using a mercury bath. In 1972, the bath was examined and found to contain about 11 to 13 pounds less than the design capacity of mercury. Mercury detection equipment was brought in but no traces of spilled mercury were ever found. The mercury bath was later removed (Site 105).

CERCLA Finding-Negative for Federal Facility Site Discovery and Identification Findings, Preliminary Assessment, and Preliminary Site Inspection; therefore, no Hazard Ranking System migration mode score was calculated.

The potential contaminant of concern is mercury associated with either the mercury bath, or an explosion of mercury filled tubes. In either case, the equipment was subsequently removed. Previous surveys have reportedly found no residual contaminants (DOE 1987).

4.0 CONCLUSION

Under both scenarios, the presence of residual mercury was investigated and the source, associated equipment, and concrete pad were removed. Also, previous surveys have found no residual contaminants (McKelvey 1982). Based on this information, SNL/NM proposes that an NFA determination be granted for ER Site 105.

5.0 REFERENCES

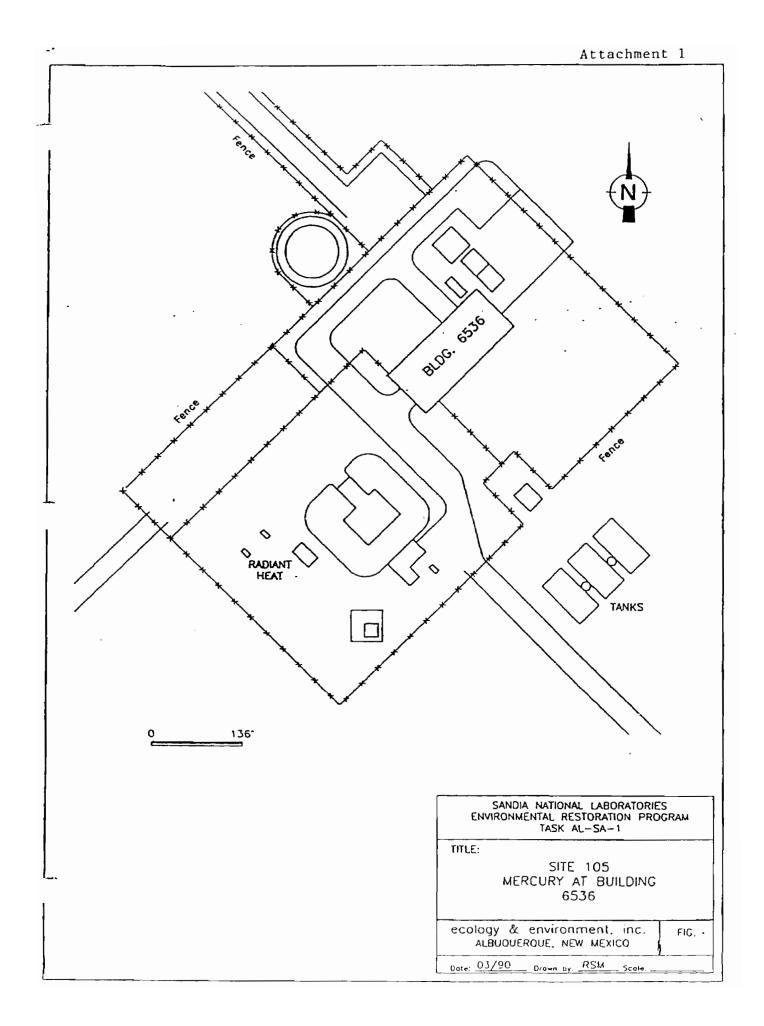
Interviews. 1990, 1992. Interviews with current and retired Sandia Corporation personnel.

McKelvey 1982. Industrial Hygiene Services Investigation Report. Mercury Spill, Building 6536.

U.S. Department of Energy (DOE) 1987. "Draft Comprehensive Environmental Assessment And Response Program (CEARP), Phase 1: Installation Assessment," September 1987.

6.0 LIST OF ATTACHMENTS

Attachment 1
Site map of Building 6536





Department of Energy

Field Office, Albuquerque
Kirtland Area Office
P.O. Box 5400
Albuquerque, New Mexico 87115

MAY 1 2 1995

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr., William K. Honker RCRA Permits Branch Hazardous Waste Management Division U.S. Environmental Protection Agency Region VI 1445 Ross Avenue, Suite 1200 Dallas, TX 75202-2733

Dear Mr. Honker,

Enclosed are two copies of the Sandia National Laboratories, New Mexico, responses to the EPA comments on the submission of 22 "Proposals for Administrative No Further Action, Environmental Restoration, FY94".

If you have any questions, please contact John Gould at (505) 845-6089.

Sincerely,

Michael J. Zamorski Acting Area Manager

Sandia National Laboratories Albuquerque, New Mexico

Proposals for Administrative No Further Action Environmental Restoration FY94

Comment Responses to USEPA May 1995

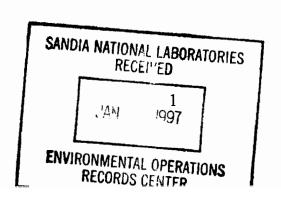
INTRODUCTION

This document responds to comments received in a letter from USEPA to DOE (Carlson, April 7, 1995) documenting the review of twenty two No Further Action (NFA) proposals. These NFA proposals were submitted as part of a Class III Modification to the Hazardous Waste Permit (Permit No. NM5890110518) for Sandia National Laboratories/New Mexico (SNL/NM).

This response document is organized as follows. A table summarizing the applicable NFA criteria (as described in Section 4.5.3.2.2 of SNL's Program Implementation Plan) for each site is found on the page 2 of the report. Next, on page 3, responses to the general comments are provided.

The remainder of the document is organized in numerical order by Operable Unit (OU) number and subdivided in numerical order by Site number. Each OU section provides responses to the specific comments by site number and, further, by comment number and letter as provided in the call for response to comments. Each OU section also provides clarifying information regarding sources of supporting information used in the development of each NFA proposal. This clarifying information is designated "Sources of Supporting Information" and will be an integral part of future NFA submissions.

Sandia National Laboratories New Mexico



Proposals for No Further Action, FY94 Comment Responses

Summary Table of Applicable NFA Criteria for 22 Sites Submitted for NFA Approval

OU No.	ER Site No.	Site Name	Criteria for NFA
1295	139	Bidg. 9964 Septic System	The unit has never contained constituents of concern; and 2) The unit has not released hazardous waste or constituents into the environment
1302	25	Burial Site (South of TA-I)	The unit has never contained constituents of concern
1302	32	Steam Plant Oil Spill (TA-I)	The unit clearly has not released hazardous waste or constituents into the environment ^a
1302	41	Building 838 Mercury Spill (TA-I)	The unit clearly has not released hazardous waste or constituents into the environment
1302	73	Hazardous Waste Repackaging /Storage (Building 895)	The unit has design and/or operating characteristics that effectively prevent releases to the environment
1302	104	PCB Spill, Computer Facility	The unit clearly has not released hazardous waste or constituents into the environment
1303	3	Chemical Disposal Pit (TA-II)	Will be submitted for name change
1303	43	Radioactive Material Storage Yard (TA-II)	The unit clearly has not released hazardous waste or constituents into the environment
1303	44	Uranium Calibration Pits and Decontamination Area	The unit clearly has not released hazardous waste or constituents into the environment ^b
1303	113	Area II Firing Sites (Active)	The unit clearly has not released hazardous waste or constituents into the environment
1303	135	Building 906 Septic System	The unit clearly has not released hazardous waste or constituents into the environment
1303	165	Building 901 Septic System	The unit clearly has not released hazardous waste or constituents into the environment
1306	105	Mercury Spill (Building 6536)	The unit has design and/or operating characteristics that effectively prevent releases to the environment and 2) the unit clearly has not released hazardous waste or constituents into the environment
1306	188	Building 6597 Above Ground Containment Spill Tank	The unit clearly has not released hazardous waste or constituents into the environment
1306	195	Experimental Test Pit	The unit has design and/or operating characteristics that effectively prevent releases to the environment and 2) the unit clearly has not released hazardous waste or constituents into the environment
1334	20	Schoolhouse Mesa Burn Site	The unit has design and/or operating characteristics that effectively prevent releases to the environment
1334	21	Metal Scrap (Coyote Springs)	The unit has never contained constituents of concern
1334	47	Unmanned Seismic Observatory	The unit has never contained constituents of concern
1334	62	Greystone Manor Site	The unit has design and/or operating characteristics that effectively prevent releases to the environment
1334	69	Old Borrow Pit	The unit has never contained constituents of concern
1334	71	Moonlight Shot Area	The unit has never contained constituents of concern
1334	A88	Firing Site: Ranch House	The unit has never contained constituents of concern

a: Because the contaminant of concern at Site 32 is a petroleum product, this criterion is used based on UST regulations, for which "the environment" is assumed to be the water table rather than the overlying soil. See the NFA proposal and comment responses for Site 32 for additional discussion.

b: A Voluntary Corrective Action was performed on the Uranium Calibration Pits (44a) to removed contaminated soil in the vicinity of the pits. Thus, for Site 44a, "the unit" should be construed to be the pits themselves plus the volume of soil removed.

GENERAL COMMENTS

 Comment. Any sources cited in the NFA proposal should be documented and referenced. The source documents should be readily available to the public and reviewers.

Response. Agreed. All sources used in the development of these NFA proposals are cited in the proposals and are available for inspection in the ER Records Center. Included in this response, with each site's specific comments, is an addendum that provides "Sources of Supporting Information".

2. Comment. Many of the proposals discuss field screening for radioactive materials. What were the detection limits for the instruments used? What was the basis for the background investigation levels discussed? How do the background levels, and the measured levels, compare to risk-based levels.

Response. All work conducted at ER sites which have been designated as Radioactive Material Management Areas (RMMA) must comply with Section 19D of the SNL/NM ES&H manual. Additionally, a copy of the December, 1994 Final Report for the Surface Gamma Radiation Surveys conducted by Geotech at Sandia ER sites has been sent to EPA and NMED under separate cover. All information regarding the field screening for radioactive materials is discussed in this report.

3. Comment. Interviews alone are not sufficient documentation to make an NFA determination. Site history and interviews can be used to guide an investigation or confirm other evidence, but are not sufficient by themselves. In the absence of any other supporting information, screening sampling should be conducted to further corroborate the interview and site history data.

Response. For those proposals relying primarily upon information gathered through interviews, additional information was located and is provided in the responses to site-specific comments. Additionally, an addendum is included with the specific comments for each site that provides clarifying information regarding sources of supporting information used in the development of each NFA proposal. This subsection is designated "Sources of Supporting Information" and will be an integral part of future NFA submissions.

4. **Comment.** A sampling and analysis plan or RFI Work Plan should be submitted to the EPA and NMED prior to the start of any sampling activities conducted as a result of this NOD.

Response. Agreed. Sampling and analysis plans will be provided for any sampling activities needed as a result of these comments. Additionally, for future confirmatory sampling NFA proposal submissions, sampling and analysis plans will be provided for review prior to sampling.

OU 1306 Site 105, Mercury Spill (Building 6536)

SPECIFIC COMMENTS

10. Site 105, Mercury Spill at Building 6536, OU 1306 (TA-III)

Comment (a). Sandia mentions that "mercury-detection equipment was brought in but no traces of mercury were found" but does not state what tests were conducted and when they were conducted. Please describe.

Comment (b). According to the proposal, "previous surveys have found no residual contaminants" (DOE 1987, McKelvey 1982). Please provide additional details on the previous surveys, including sample locations, analytical methods, practical quantitation limits, and analytical results.

Response (a and b). Three SNL/NM Industrial Hygiene (IH) survey reports detail small spills of mercury within Building 6536 and the actions taken after these incidents:

- The first incident occurred in the office area of the building on February 24, 1977: a "mercury vacuum tube blew up [and] no mercury vapor was detected by the mercury sniffer." Attached to this incident report is a request for analysis of mercury in urine for five individuals, but the results of the analyses are not available.
- The second report, dated February 22, 1982, states that "two small (approximately 10 cc) quantities of mercury were spilled a) on a lab bench and b) on a desktop. Visible mercury was picked up with the mercury vacuum cleaner. Mercury vapor was not detected with the portable monitor either before or after clean up." It further notes that the investigator recommended a thorough cleaning of the desktop.
- The third incident, on May 22, 1985 in the high-bay area of the building, was a spill of "a minor amount of mercury and [they] measured the mercury concentration near the location of the spill. The level was within acceptable limits." The report notes that the reporting person was "given some mercury decontaminant that he [used] to decon [sic] any contaminated surface."

No further information regarding the exact location of any samples that might have been taken, or any analytical methods and results, is available. It is clear from the IH reports that the IH technicians used mercury vapor detectors to "sniff" for mercury and used a specialized vacuum to pick up and remove any residual contamination, and that IH was satisfied that the appropriate actions were taken regarding personnel and the environment. No IH reports listed any spills outside of Building 6536.



National Nuclear Security Administration

Sandia Site Office P.O. Box 5400 Albuquerque, New Mexico 87185-5400



CERTIFIED MAIL - RETURN RECEIPT REQUESTED

JUL 2 0 2006

Mr. James Bearzi, Chief Hazardous Waste Bureau New Mexico Environment Department 2905 Rodeo Park Road East Building 1 Santa Fe, NM 87505

Dear Mr. Bearzi:

On behalf of the Department of Energy (DOE) and Sandia Corporation, DOE is submitting the enclosed proposal for Corrective Action Complete (CAC) for Solid Waste Management Unit 105 (SWMU 105) at Sandia National Laboratories/New Mexico (SNL/NM) (EPA ID No. NM5890110518).

This submittal includes descriptions of site characterization work completed as part of two Voluntary Correction Actions (VCAs): the VCA [now referenced as Phase 1 (P1VCA)] of September 2005, and the Phase 2 VCA Plan (P2VCA) of February 2006. It includes a risk assessment that concludes there is low ecological risk for this site, and that the site as a whole meets risk requirements for residential land use. However, the northwest portion of the site has higher mercury concentrations and meets the risk requirements for industrial land use. As a result, DOE and Sandia are requesting a determination of Corrective Action Complete with controls for this site.

If you have any questions or concerns regarding these changes, please contact me at (505)845-6036, or John Gould at (505) 845-6089.

Sincerely,

Patty Wagner

Manager

Enclosure



Sandia National Laboratories/New Mexico Environmental Restoration Project

PROPOSAL FOR CORRECTIVE ACTION COMPLETE SOLID WASTE MANAGEMENT UNIT 105, MERCURY SPILL (BUILDING 6536)

July 2006



United States Department of Energy Sandia Site Office

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ACRONYMS AND ABBREVIATIONS

AR/COC Analysis Request/Chain of Custody

bgs below ground surface
CAC Corrective Action Complete
COC constituent of concern

cy cubic yard(s)

D&D decontamination and demolition DOE U.S. Department of Energy

EB equipment blank

EPA U.S. Environmental Protection Agency

ER Environmental Restoration

HI hazard index

HWB Hazardous Waste Bureau

IH Industrial Hygiene

kg kilogram(s)
m³ cubic meter(s)
mg milligram(s)

MVA mercury vapor analyzer

ND no detection NFA no further action

NMED New Mexico Environment Department
P1VCA Phase I Voluntary Corrective Action
P2VCA Phase II Voluntary Corrective Action

QA quality assurance QC quality control

RCRA Resource Conservation and Recovery Act

RPD relative percent difference

SNL/NM Sandia National Laboratories/New Mexico

SWMU Solid Waste Management Unit

UCL upper confidence limit
VCA Voluntary Corrective Action

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EXECUTIVE SUMMARY

A release of mercury to the environment was discovered in June 2005 in soil adjacent to Building 6536, Solid Waste Management Unit (SWMU) 105, located in Technical Area III at Sandia National Laboratories/New Mexico (SNL/NM). A Voluntary Corrective Action (VCA) was conducted by SNL/NM at SWMU 105 to address the mercury spill. The VCA activities included excavation and off-site disposal of mercury-contaminated soil, collection of confirmatory soil samples, and characterization of the extent of mercury contamination. Both human health and ecological risk assessments were performed using the analytical results of the confirmatory soil samples. The activities of the VCA are consistent with the overall corrective action objectives set forth in Section VI of the Compliance Order on Consent from the New Mexico Environment Department (NMED April 2004). SWMU 105 is being proposed for Corrective Action Complete with Controls.

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1.0 INTRODUCTION

The Solid Waste Management Unit (SWMU) 105 is located in Technical Area III at the U.S. Department of Energy (DOE) Sandia National Laboratories/New Mexico (SNL/NM) facility, which is located on the federally owned Kirtland Air Force Base and permitted to the DOE (Figure 1-1). In August 1994, an administrative no further action (NFA) proposal was submitted to the U.S. Environmental Protection Agency (EPA) (the regulatory authority at the time), which included SWMU 105 (SNL/NM August 1994). In July 1995, SWMU 105 was determined to be appropriate for NFA, and the site was removed from the DOE/Sandia Corporation Resource Conservation and Recovery Act (RCRA) Permit in December 1995 (Davis December 1995). Written notification of a newly discovered subsurface release at SWMU 105 was transmitted to the New Mexico Environment Department (NMED) Hazardous Waste Bureau (HWB) on July 13, 2005 (Wagner July 2005). Due to the nature of the subsurface release, any surface investigation prior to July 2005 would not have detected the contamination. Table 1-1 presents a chronology of events for SWMU 105.

The Environmental Restoration (ER) Project at SNL/NM completed a Voluntary Corrective Action (VCA) at SWMU 105 in order to characterize the extent of mercury contamination in the soil adjacent to Building 6536 and to conduct an expedited remediation of the contamination (Figure 1-2). A Phase I VCA (P1VCA), limited to a portion of the site, was conducted in September 2005 (SNL/NM September 2005). However, mercury contamination was found to be more extensive than initially anticipated, and a second phase was necessary to address the entire site.

1.1 Description and History of Building 6536

Building 6536, the Radiant Heat Facility, was originally constructed as the Re-Entry Burn-Up Facility but has also been used to simulate many types of high-heat environments (Shaw October 2004). The main part of Building 6536 was built in 1967, a mezzanine was added in 1980, and the two westernmost rooms (112 and 113, also known as 6536A and 6536B, respectively) were added in 1983. Room 113 was also known as the Equipment Room. An SNL/NM Industrial Hygiene (IH) report in 1977 states that a mercury vacuum tube exploded (location not specified), but no mercury vapor was detected (SNL/NM February 1977). A 1982 investigation report indicated that approximately 10 cubic centimeters of visible mercury had been spilled on a lab bench (location not specified) and on a desktop (SNL/NM February 1982). The visible mercury was picked up with a mercury vacuum cleaner and no mercury vapor was detected after the cleanup. A third IH report in 1985 states that a minor amount of mercury was spilled in the high bay of Building 6536 (Room 111) and that the level of mercury contamination was within acceptable limits (units of measure or methods of measurement not described) (SNL/NM May 1985). The report states that a mercury decontaminant was used to decontaminate surfaces. Personnel interviews conducted in 1985 during the Comprehensive Environmental Assessment and Response Program indicated that a mercury bath used to measure pressure in equipment was examined in 1972, and it was determined that the bath contained 10 to 13 pounds less mercury than the full volume capacity (DOE September 1987, SNL/NM March 1990). It was unknown whether the bath had ever been at full capacity. At a later, unknown date, the mercury bath was removed. Personnel interviews conducted in 1990 in an attempt to clarify the use and release(s) of mercury in Building 6536 mention the 1977 mercury tube explosion, but stated that the mercury bath referenced never

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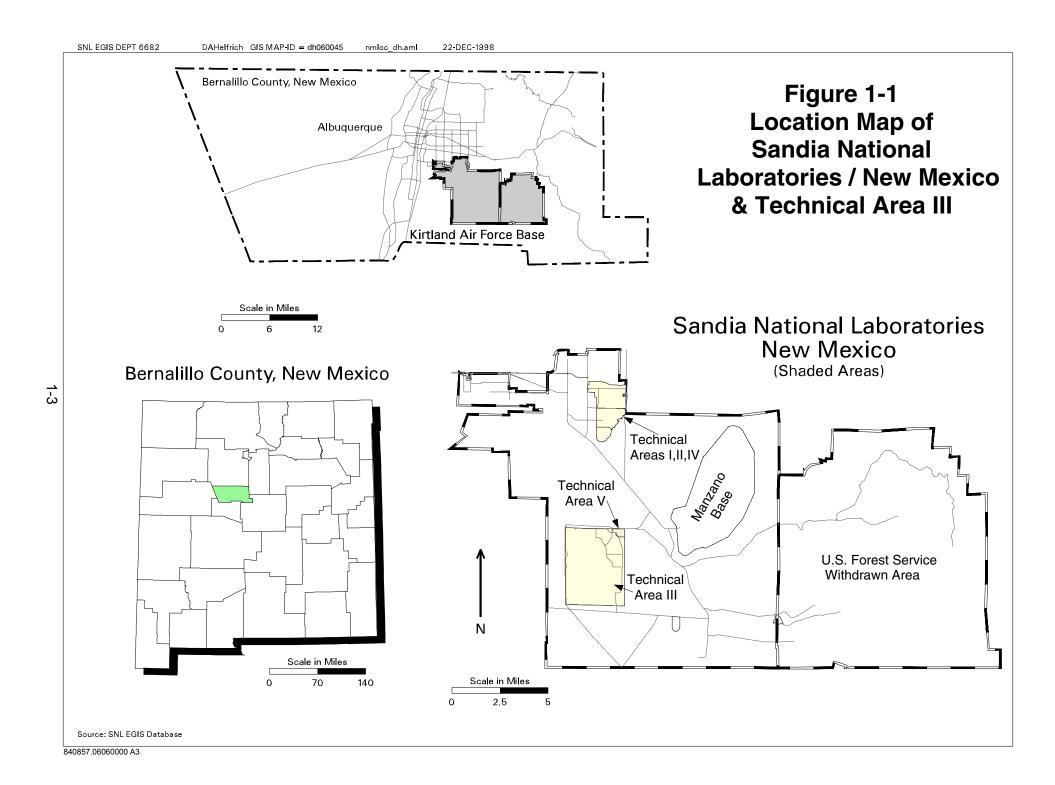


Table 1-1 SWMU 105, Mercury Spill (Building 6536) Chronology of Events and Documentation

Date	Event	Reference Document
1967	entry vehicles. Over time, testing was expanded to simulate other types of heat environments (such as gasoline fuel fires and solar heat).	"Comprehensive Environmental Assessment and Response Program CEARP Phase 1 Installation Assessment" (DOE September 1987)
1972	A mercury bath used to measure pressure was examined, and it was determined that 10–13 pounds less mercury was present than was expected. The mercury bath was later removed (date not specified).	
February 1977	Investigation report documented the "blow-up of mercury vacuum tube" in Building 6536. No mercury vapor was detected. Affected personnel were tested for mercury in their urine.	"Investigation Report" (SNL/NM February 1977)
February 1982	Industrial Hygiene Services Investigation Report documented "two small (approximately 10 cubic centimeters) quantities of mercury" in Building 6536. Visible mercury was picked up and no mercury vapor was detected.	
May 1985	Industrial Hygiene Services Investigation Report documented that an employee "spilled a minor amount of mercury" in the high bay (Room 111) of Building 6536. The report states "the mercury contamination was measured near the location of the spill and the level was within acceptable limits."	"Industrial Hygiene Services Investigation Report" (SNL/NM May 1985)
March 1990	Personnel interviews conducted to clarify mercury use in Building 6536 and verify reported incidences of spills.	"Personnel Interviews" (SNL/NM March 1990)
October 1990	Personnel interviews conducted pertaining to SWMU 105 document the 1972 event listed above.	"Interview Notes, 1990 Memorandum attachment to CEARP Interview Notes/Crosswalk 1985" (SNL/NM October 1990)
November 1993	SWMU 105 added to the RCRA Part B HSWA permit.	"Proposed List of Solid Waste Management Units Table 2 Module IV RCRA Part B Permit (HSWA Module) and Supporting Information" (SNL/NM November 1993)
August 1994	SWMU 105 NFA proposal submitted to NMED.	"Proposals for Administrative No Further Action Environmental Restoration FY94" (SNL/NM August 1994)
September 1994	Letter from DOE submitted to EPA and NMED requesting Class 3 Permit Modification to remove 22 SWMUs from list, including SWMU 105.	"Class 3 Permit Modification to Remove a Total of 22 Solid Waste Management Units (SWMUs) from the RCRA HSWA Permit" (Carlson September 1994a and September 1994b)

Refer to footnotes at end of table.

Table 1-1 (Continued) SWMU 105, Mercury Spill (Building 6536) Chronology of Events and Documentation

Date	Event	Reference Document
October 1994	Letter from DOE submitted to EPA and NMED supersedes September 1994 letter (makes a correction to original letter).	"Resubmission of September 28, 1994 Letter Requesting a Class 3 Permit Modification to Remove 22 Solid Waste Management Units (SWMUs) from the RCRA HSWA Permit" (Carlson October 1994a and October 1994b)
March 1995	NMED comments received on NFA proposal. Request for identification of the mercury detection equipment and details of previous sampling events as to location, methods of analysis, and results.	"Review Comments for the Proposals for Administrative No Further Action Environmental Restoration Fiscal Year 1994" (Garcia March 1995)
April 1995	The EPA requests additional information regarding previous mercury detection tests, including locations of tests, dates, types of equipment used, and results.	"Review of 22 Proposals for Administrative No Further Action Environmental Restoration FY 94 Submitted to the EPA on October 3, 1994, Class 3 Permit Modification" (Honker April 1995)
May 1995	SNL/NM submitted response to EPA request. However, specific details of the requested information were not available.	"Proposals for Administrative No Further Action Environmental Restoration FY94 Comment Responses to USEPA May 1995" (SNL/NM May 1995)
July 1995	Notification received from EPA that SWMU 105 is appropriate for NFA.	"First Submission NFA Final EPA Determinations Enclosed Copies of Fact Sheet Public Notice and Revised Table 2 Pursuant to Your Class 3 Permit Modification Request for 22 NFA Determination" (Morlock July 1995)
December 1995	Final permit decision issued by EPA.	"Statement Of Basis Final Decision and Response to Comments Summary– Class 3 Permit Modification" (Davis December 1995)
October 2004	Investigative report detailed the history of the facility and provided an assessment of the potential for contamination. This report was completed by SNL/NM Facilities prior to the decontamination and demolition activities.	"Site Information Assessment Report for Building 6536 Radiant Heat Facility" (Shaw October 2004)
June 2005	Mercury release to the environment discovered during Building 6536 demolition.	"SWMU 105, Mercury Spill, Building 6536" (Wagner July 2005)
July 2005	Letter of notification submitted to NMED from DOE regarding previously unknown release at Building 6536.	

Refer to footnotes at end of table.

Table 1-1 (Concluded) SWMU 105, Mercury Spill (Building 6536) Chronology of Events and Documentation

Date	Event	Reference Document
		"Voluntary Corrective Action Plan, SWMU 105" (SNL/NM September 2005)
	DOE submitted a modified work plan to NMED for the P2VCA to be conducted at SWMU 105.	"Phase Two Voluntary Corrective Action Plan for Solid Waste Management Unit 105, Building 6536" (SNL/NM December 2005)
January 2006	P2VCA activities begin at SWMU 105.	
February 2006 Final	Final report completed of the chemical characterization, contamination removal, and waste management at Building 6536 during P1VCA.	"Building 6536 Radiant Heat Facility, Characterization and Removal Project Report" (Shaw February 2006)

CEARP = Comprehensive Environmental Assessment and Response Program.

DOE = U.S. Department of Energy.

EPA = U.S. Environmental Protection Agency.

ER = Environmental Restoration.

FY = Fiscal year.

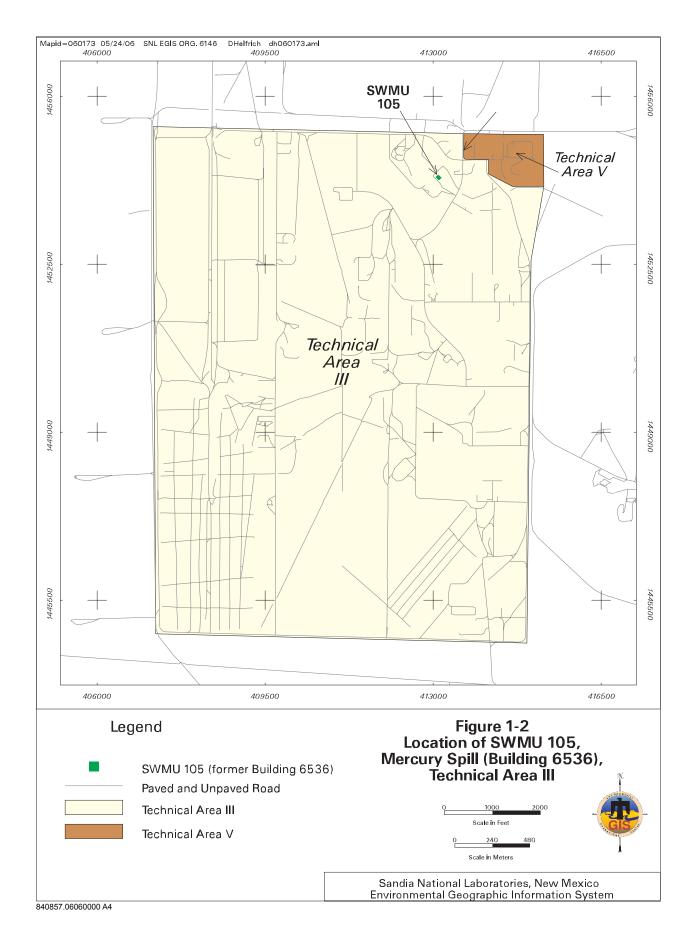
HSWA = Hazardous and Solid Waste Amendments.

NFA = No Further Action.

NMED = New Mexico Environment Department.
 P1VCA = Phase I Voluntary Corrective Action.
 P2VCA = Phase II Voluntary Corrective Action.
 RCRA = Resource Conservation and Recovery Act.
 SNL/NM = Sandia National Laboratories/New Mexico.

SWMU = Solid Waste Management Unit.

-- = Not applicable.



existed (SNL/NM October 1990). Two of the three documented events occurred within Building 6536 prior to the addition of Room 113 in 1983; however, no documentation exists pertaining to the use of instrumentation containing mercury in Room 113.

1.2 History of Release

On May 9, 2005, during decontamination and demolition (D&D) activities at Building 6536, mercury contamination was found inside the building within a concrete trench, located along the northwest wall of Room 113 (Figures 1.2-1 and 1.2-2). On June 29, 2005, elemental mercury was found in soil outside the building when an exterior trench was excavated along the northwest wall of the building (Figure 1.2-3). The release probably originated from a crack in the building foundation adjacent to the interior concrete trench. Soil excavated from the trench was placed alongside the trench into spoils piles. Elemental mercury was visible in the soil remaining in the trench and in large pores in a subsurface concrete block adjacent to the building.

1.3 2005 Soil Sampling and Additional Investigation

After discovery of the mercury release in June 2005, soil samples were collected and analyzed for mercury, and some remediation was conducted. This initial effort is referred to as the P1VCA. The P1VCA was performed by the SNL/NM Facilities D&D personnel with involvement of ER Project personnel and input from NMED HWB personnel. The plan for this effort was documented and submitted in a VCA Plan (SNL/NM September 2005).

Six discrete soil samples were collected from the exterior trench on July 6 and 21, 2005 (Figure 1.3-1). Soil samples were submitted to an off-site laboratory, Severn Trent, for analysis of RCRA metals by EPA Method 6010B and 7471A (EPA November 1986). Samples were recorded on Analysis Request/Chain of Custody (AR/COC) forms, provided in Annex A. The analytical results for the soil samples indicated mercury concentrations ranging from 0.17 milligrams (mg)/kilogram (kg) (near the building foundation) to 39.6 mg/kg (next to the exposed concrete block in the trench) (Table 1.3-1). Four of the six soil samples collected were analyzed for the other RCRA metals. There were no detections of any metals at concentrations above the NMED-approved background values (Dinwiddie September 1997), other than the detections of mercury. All the mercury results exceeded the subsurface background value of less than 0.1 mg/kg. Documentation for the P1VCA soil samples is provided in Annex A (AR/COC forms) and Annex B (data validation reports).

During the week of September 6, 2005, SNL/NM D&D personnel removed the concrete block located adjacent to the northwest wall of Building 6536, and collected residual elemental mercury from both the concrete block surface and the soil surrounding the block. The mercury-contaminated soil was excavated to 4 feet below ground surface (bgs) in the area of the June 2005 release, but more mercury-contaminated soil remained. Despite careful hand-digging to avoid transferring mercury contamination deeper, visible mercury and elevated mercury soil-vapor meter readings still persisted.

Table 1.3-1 SWMU 105, Mercury Spill (Building 6536) Summary of P1VCA Soil Sampling Analytical Results for Metals July 2005

Sample Attributes					Metals (EP/	A Method 60	10B/74	71A) ^a (mg/k	g)		
Record Number ^b	Sample Number	Sample Location	Approximate Sample Depth (ft bgs)	Arsenic	Barium	Cadmium	Chromium (total)	Lead	Selenium	Silver	Mercury
608793	067822-001	Trench Floor	3	NA	NA	NA	NA	NA	NA	NA	39.6
608793	067822-002	Trench Floor	3	NA	NA	NA	NA	NA	NA	NA	20.9
608793	069601-001	SW Corner #1	3	2.9	95.4	ND (0.061)	6.6	5.2	ND (0.23)	ND (0.043)	4.7
608793	069601-002	SW Corner #2	3	3.7	93.0	ND (0.038)	8.8	8.2	ND (0.22)	ND (0.041)	0.17
608793	069601-003	Bottom Trench #1	3	3.5	104	ND (0.063)	5.7	4.0	ND (0.25)	ND (0.044)	1.9
608793	069601-004	Bottom Trench #2	3	2.6	82.3	0.055	5.7	4.2	ND (0.22)	ND (0.042)	0.62
Backgroun	d Soil Concentra	ations—Southwest Ar	ea Supergroup ^c	4.4	214	0.9	15.9	11.8	<1	<1	<0.1

Note: Values in **bold** exceed background soil concentration.

^aEPA November 1986.

^bAnalysis request/chain-of-custody record.

^cDinwiddie September 1997.

bgs = Below ground surface.

EPA = U.S. Environmental Protection Agency.

ft = Foot (feet)

mg/kg = Milligram(s) per kilogram.

NA = Not analyzed.

ND () = Not detected above method detection limit (shown in parentheses).

SW = Southwest.

SWMU = Solid Waste Management Unit.



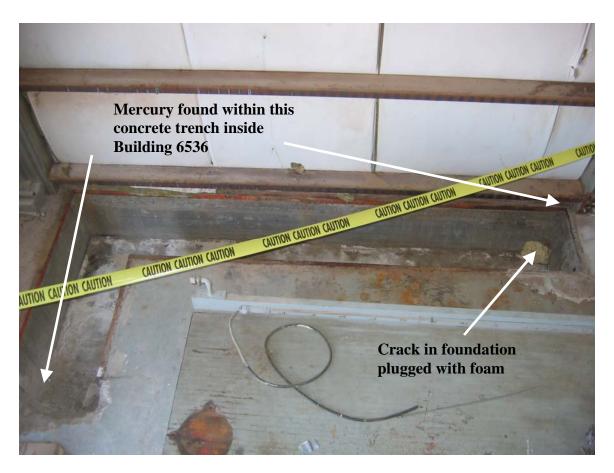


Figure 1.2-2 Photograph showing trench inside Building 6536, July 2005.

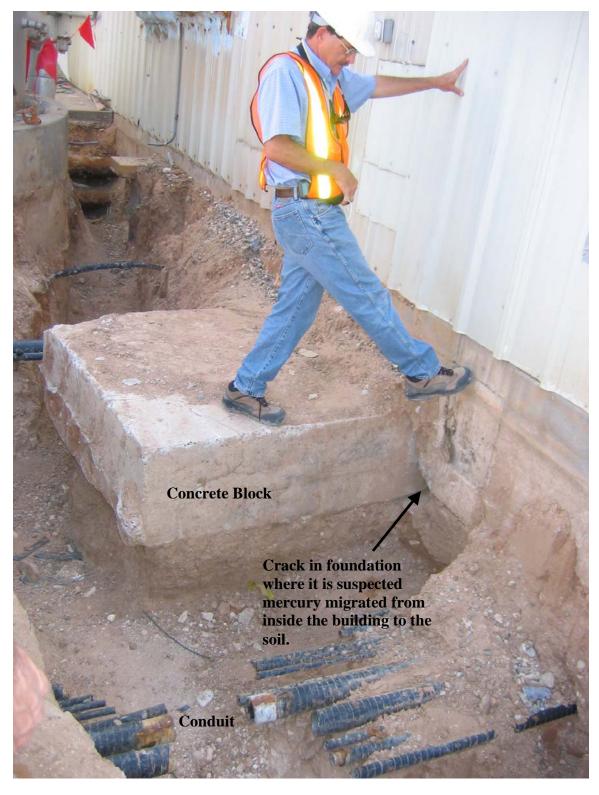
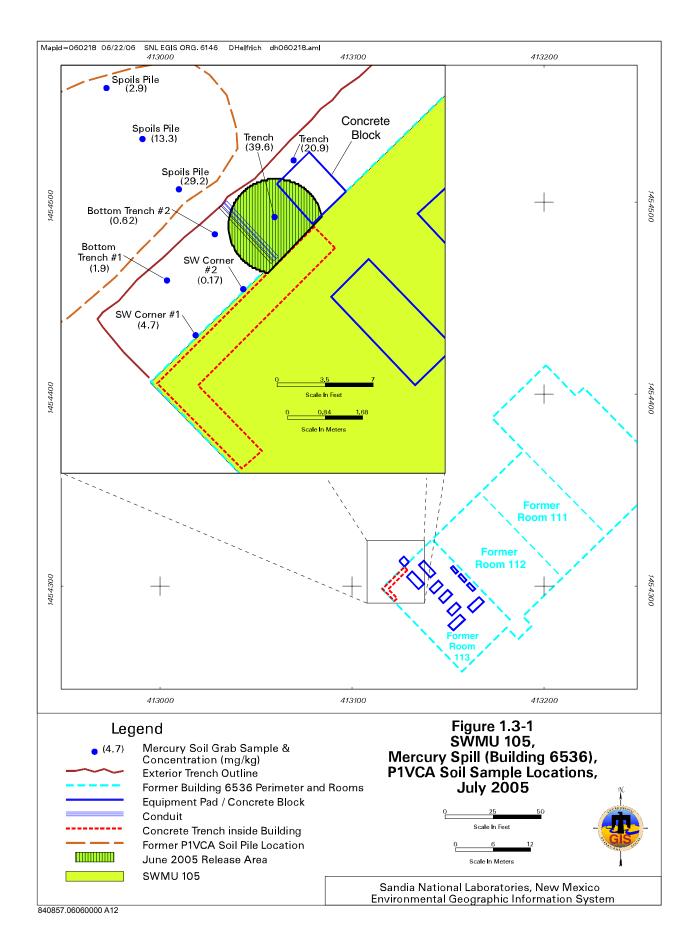


Figure 1.2-3
Photograph showing exterior trench on the northwest wall of Building 6536, July 2005 (view to the northeast).

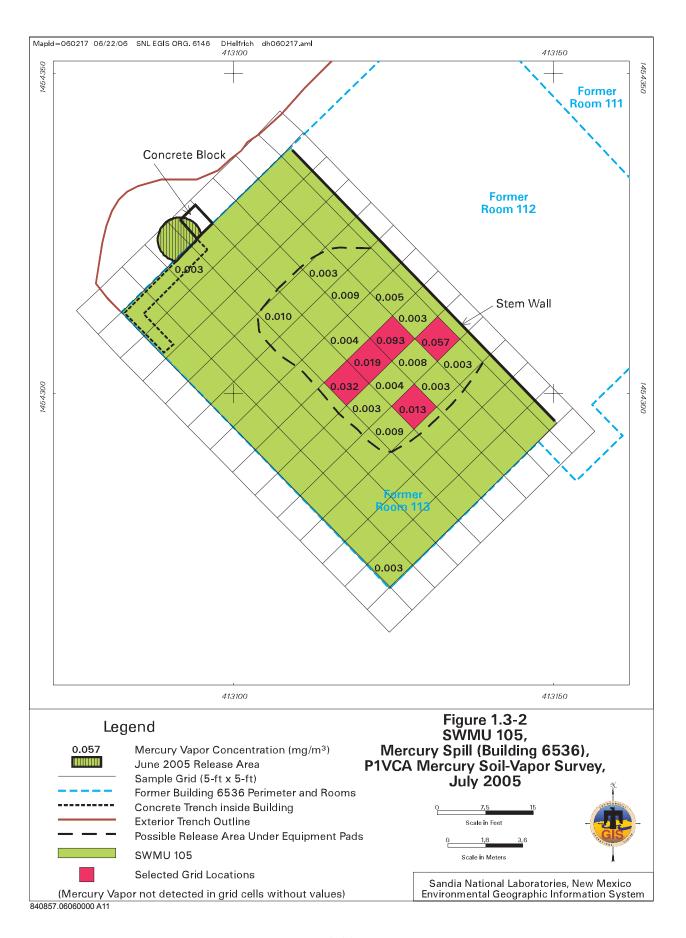


On October 6, 2005, removal of the Building 6536 Room 113 concrete foundation began at the northwestern corner of the building. After approximately 15 feet of concrete foundation along the southwestern side of the building was removed, in situ soil-vapor readings were taken with a mercury vapor analyzer (MVA). Initial readings indicated nondetections. However, as the foundation removal continued to the south-southeast, positive MVA readings were detected in the soil beneath the foundation. After removal of the building foundation, a 5- by 5-foot grid was established in the area of the former building footprint. In situ soil-vapor readings were collected from the surface in each grid square in an attempt to better define the area and extent of the positive MVA readings (Figure 1.3-2). Positive MVA readings ranging from 0.003 to 0.093 mg/cubic meter (m³) were detected along the northeastern side of the grid area.

The survey points with the five highest positive MVA readings ranging from 0.013 to 0.093 mg/m³ were flagged for future investigation activities. All construction debris, concrete rubble, and the mercury-contaminated spoils pile (from the trench excavation) were removed from the site. These waste streams were managed by D&D personnel and disposed of in accordance with SNL/NM waste management policy. Waste disposal documentation is provided in Annex C.

The positive MVA readings beneath the former Room 113 foundation resulted in modification of the original VCA plan into the Phase II VCA (P2VCA) Plan (SNL/NM December 2005). The P2VCA activities began in January 2006 and are described in Chapter 2.0 of this proposal.

The activities and analytical results presented in this section represent a summary of the investigations, evaluations of existing data, and site assessments completed during the P1VCA that are presented in the "Building 6536 Radiant Heat Facility Characterization and Removal Project Report" (Shaw February 2006).



2.0 2006 PHASE TWO VOLUNTARY CORRECTIVE ACTION

Based upon the extent of mercury contamination found in the soil during the initial P1VCA activities at SWMU 105, it was necessary for ER Project personnel to conduct further VCA activities as part of the P2VCA (SNL/NM December 2005). The purpose of the P2VCA was to determine the extent of contamination, remove mercury-contaminated soil from the release area, and containerize and prepare the excavated soil for waste disposal. The analytical results were evaluated to determine whether mercury was present in the soil at levels considered hazardous to human health for either the industrial or residential land-use risk scenarios. The primary field activities of the P2VCA were conducted from January through March 2006.

2.1 Confirmatory Soil Sampling and Analysis

The 5- by 5-foot grid that had been established during the D&D activities was used for the P2VCA sampling. Soil samples were collected from varying depths (Table 2.1-1) at boreholes located within each grid square (Figure 2.1-1). Sample locations were selected based upon the results of the D&D investigation and discussions with the NMED. Geoprobe® sampling equipment was used to collect most of the samples from each grid area. All references to the trench area in the following sections refer to the exterior trench excavated outside Room 113 during the D&D activities. Table 2.1-1 provides the number of primary soil samples collected from each area. Duplicate soil samples are discussed in Section 2.4. The site was divided into the following sampling areas based upon the locations of site features as shown in Figure 2.1-1:

- A the release point in the exterior trench area
- B the area adjacent to the original release point
- C the area in which the spoils pile was located during the P1VCA activities (The spoils pile consisted of material excavated from the trench. It was disposed of as part of the P1VCA.)
- D selected grid locations within the footprint of Room 113 where P1VCA MVA readings were higher than those from adjacent areas (Figure 1.3-2)
- E locations representing the perimeter of the former Room 113 foundation
- F the grid area locations within the footprint of Room 113
- G an area to the northwest of the trench and spoils pile area

In order to avoid confusion, all of the sample depths are expressed as feet bgs as measured from the original ground surface at the site. The collection of soil samples was performed by several methods. The majority of soil samples were collected using a Geoprobe® with a split-spoon sampler lined with a butyl acetate sleeve (Figure 2.1-2). Soil duplicate samples were also collected from soil in the acetate sleeve immediately following the collection of the primary soil sample and placed into a separate sample container.

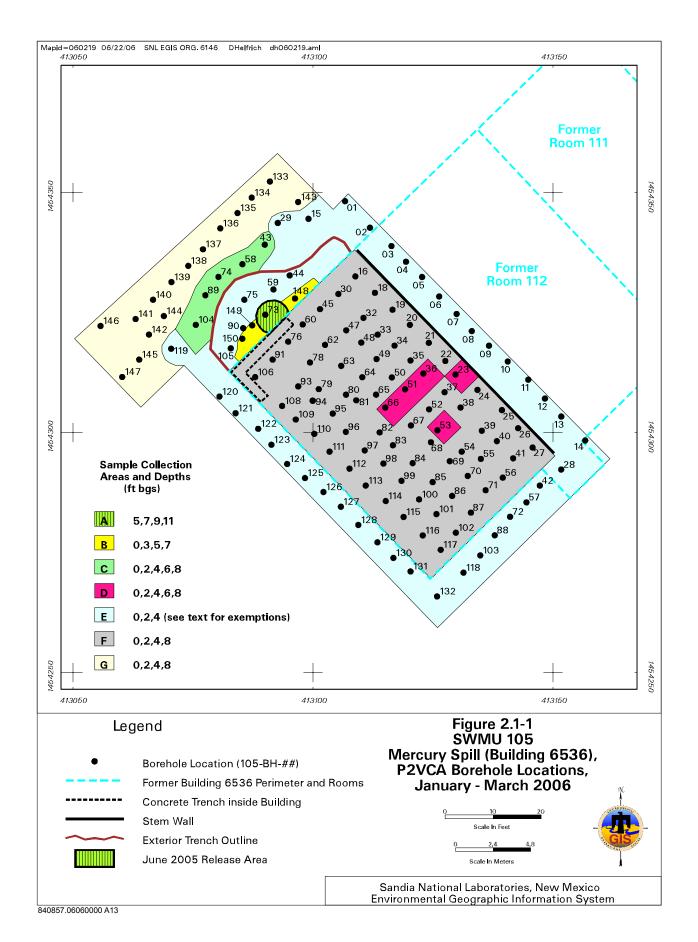


Table 2.1-1 SWMU 105, Mercury Spill (Building 6536) Specifications of Primary Soil Sampling

Area (as designated in Figure 2.1-1)	Number of Sample Locations in Area	Target Depths (ft bgs)	Number of Primary ^a Soil Samples
A (green striped)	1	7, 9, 11 ^b	3
B (yellow)	3	3, 5, 7	9
C (green)	5	0, 2, 4, 6, 8	25
D (pink)	5	0, 2, 4, 6, 8	25
E (blue)	42	0, 2, 4	132°
F (gray)	72	0, 2, 4, 8	286 ^d
G (pale yellow)	15	0, 2, 4, 8	60
Total	143		540

^aSample count does not include duplicate soil samples.

bgs = Below ground surface.

ft = Foot (feet).

SWMU = Solid Waste Management Unit.

-- = Not applicable.

^bTarget depths are expressed as feet below the original ground surface at this site.

^cSamples also collected at 9 and 11 ft bgs at two locations and 8 ft bgs at two locations.

^dThere were originally 84 soil sample locations within Area F. Five locations were separated into Area D. Seven locations were eliminated from the grid due to space constraints of the actual area in the field. The resulting number of sample locations for Area F was 72. Samples recovered from only two depths at one location due to subsurface obstruction.



Figure 2.1-2
Photograph showing soil sample collection with the Geoprobe® at SWMU 105, January 2006 (view to the southeast). Workers are wearing Level C personal protective equipment and monitoring with the MVA.

Boreholes located in the trench area include 105-BH-44, -59, -73, -75, -90, -105, -148, -149, and -150. Soil samples from these locations were collected beginning at the surface of the trench (approximately 3 feet bgs) and continuing at 2-foot intervals.

In the trench area, soil samples were collected using the bucket of a backhoe. The steep walls of the trench created a confined space condition and were not suitable for entrance by workers. Soil from a designated sample location and depth was brought to the surface with the bucket and placed on a clean tarp. A soil sample was collected from this material and placed into the sample container (Figure 2.1-3). This process was used to collect samples from all of the designated target depths and locations in the trench. Duplicate soil sample sets were prepared by mixing soil collected from the same bucket in a bowl and then transferring aliquots of the mixed soil into separate sample containers. The unused material was placed back into the excavation and gently tamped with the bucket. Samples from Boreholes 105-BH-44, -59, -75, -90, and -105 were collected in this manner.

Following sampling activities in the trench with the backhoe, the sides and bottom of the trench were smoothed out and conditions in the trench no longer posed a concern as a confined space. Workers were then able to access the borehole locations 105-BH-148, -149, and -150, although the Geoprobe® equipment still could not be maneuvered into the area. The 3-foot samples were collected from the surface of the trench using a hand spade and bowl. The 5-and 7-foot samples were collected using a hand auger (Figure 2.1-4), except in Borehole 105-BH-150 at a depth of 7 feet bgs, where auger refusal was encountered due to a subsurface obstruction. The sample at this location was collected using the backhoe. Primary and duplicate soil sample sets were prepared by mixing soil collected from the hand auger (or backhoe bucket) in a bowl and placing it into separate sample containers. The surface of the trench area was leveled following collection of samples from the 3-, 5-, and 7-foot depths. It was then possible to maneuver the Geoprobe® into position and push through the overburden to collected samples from 9 and 11 feet at Boreholes 105-BH-44, -73, and -75.

Soil samples were recorded on AR/COC forms (Annex A) and submitted to an off-site laboratory, General Engineering Laboratories, Inc., for analysis of total mercury by EPA Method 7471A (EPA November 1986). This method is approved for measuring total mercury (organic and inorganic) in soil samples. Samples A total of 540 discrete confirmatory soil samples and an additional 34 duplicate soil samples were collected and analyzed. The analytical results are discussed in Section 2.3.

2.2 Excavation of Mercury-Contaminated Soil in the Trench Area

After the topography of the trench was reworked so that workers and the Geoprobe® sampling equipment could safely enter the trench area, samples were collected at designated locations surrounding the original release point. A tarp, placed over this area during the P1VCA investigation (Figure 2.2-1), was removed and disposed of, and approximately 1 cubic yard (cy) of soil was excavated and placed onto a clean tarp. The soil on the tarp represented material from Borehole 105-BH-73 at depths of 3 and 5 feet bgs. The soil was spread out onto the tarp and inspected for visible mercury, scanned for mercury vapor using the MVA, and soil samples were collected for analyses. No visible mercury or mercury vapor was detected. This material was later placed into drums and sampled for waste characterization.

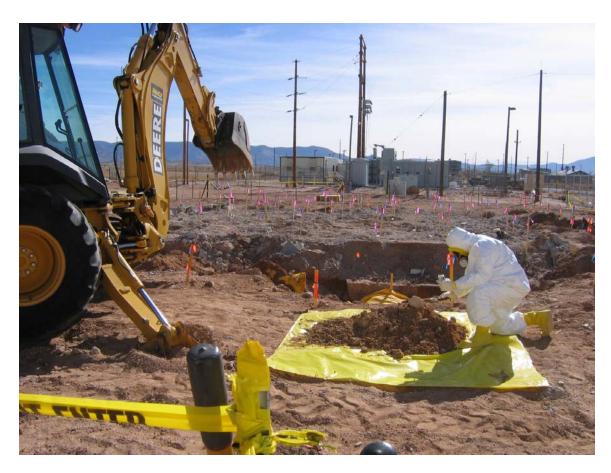


Figure 2.1-3
Photograph showing collection of soil sample at SWMU 105,
February 2006 (view to the east). Soil collected from trench using backhoe.



Figure 2.1-4
Photograph showing soil sample collection with hand augers at
Boreholes 105-BH-148 and -149 at SWMU 105, February 2006 (view to the south).



Figure 2.2-1
Photograph showing trench area following the P1VCA at SWMU 105, November 2005 (view to the northeast). Release area is underneath the yellow tarp in the foreground.

2.3 Confirmatory Soil Sample Analytical Results

The results of the laboratory analyses from the P2VCA are presented in Table 2.3-1. The results table and the discussion in this section include primary and duplicate soil samples. The analytical results for total mercury in the soil samples range from no detection (ND) above the method detection limit to 342 mg/kg. Sample depths in Table 2.3-1 are measured from the original ground surface. Sample depths embedded in the ER Sample Identification number differ from the depths at which samples were collected from the trench areas as described in Section 2.1.

The soil sample results were compared to the NMED-approved surface and subsurface background values for mercury (Dinwiddie September 1997). Figure 2.3-1 shows the surface-soil sample results that exceed the background value of less than 0.25 mg/kg. Figure 2.3-2 shows the subsurface-soil sample results that exceed the background value of less than 0.1 mg/kg.

Samples collected from Area A (green striped) in Figure 2.1-1 represent soil from the original release point and are labeled 105-BH-73. The sample collected from the surface of the trench, at 3 feet bgs, contained 318 J mg/kg of mercury. This material was placed on a tarp for waste characterization and disposal. The sample from 5 feet bgs contained 90.3 J mg/kg of mercury; this material was also placed on the tarp. These sample results do not appear in Table 2.3-1, as they were from material designated as waste and do not represent site confirmatory samples. The 7-foot-bgs confirmatory sample contained 27.5 J mg/kg of mercury, and a duplicate of this sample contained 137 J mg/kg of mercury. These samples exceed the subsurface background value for mercury of less than 0.1 mg/kg. This material was left in place. The samples from 9 and 11 feet bgs contained 0.679 and 0.0574 mg/kg of mercury, respectively. The primary sample from 9 feet bgs and the duplicate sample from 11 feet bgs (0.75 mg/kg of mercury) both had concentrations of mercury that exceed the subsurface background value. SNL/NM and the NMED determined that the vertical extent of mercury contamination had been defined in this area.

Samples collected from Area B (yellow) in Figure 2.1-1 represent soil from areas adjacent to the original release point. These samples are labeled 105-BH-148, -149, and -150. Samples were collected from 3, 5, and 7 feet bgs. The sample results from these three boreholes range from a single ND to 66.9 J mg/kg of mercury. All results, except the one ND, exceed the subsurface background value.

Area C (green) in Figure 2.2-1 represents the ground surface where the spoils pile from the trench excavation was placed during the P1VCA. The spoils pile was removed and disposed of following the P1VCA, and samples were collected from the ground surface and below. There are five boreholes in this area: 105-BH-43, -58, -74, -89, and -104. The results of the surface samples (0 feet bgs) from these locations range from 2.45 J mg/kg at 105-BH-43 to 339 mg/kg of mercury at 105-BH-58. All surface sample concentrations exceed the surface background value for mercury. The subsurface sample results for these boreholes range from ND to 342 mg/kg of mercury from the 8- and 2-foot-bgs samples, respectively, at Borehole 105-BH-43. Of the 27 samples, 18 exceed either the surface or subsurface background value for mercury.

				Metals (EPA Method 7471A) ^a
	Sample Attrib	(mg/kg)		
Record Number ^b	ER Sample ID	Sample Collection Area	Sample Depth (ft bgs)	Mercury
609353	105-BH-1-0-S	E	0	0.412
609353	105-BH-1-2-S	E	2	4.7
609353	105-BH-1-4-S	E	4	0.0477
609353	105-BH-2-0-S	E	0	0.132
609353	105-BH-2-2-S	E	2	0.274
609353	105-BH-2-4-S	E	4	0.00687
609353	105-BH-3-0-S	E	0	0.0157
609353	105-BH-3-2-S	E	2	0.00788
609353	105-BH-3-4-S	E	4	ND (0.00247)
609353	105-BH-3-4-SD	E	4	ND (0.0025)
609353	105-BH-4-0-S	E	0	0.0109
609353	105-BH-4-2-S	E	2	ND (0.00239)
609353	105-BH-4-4-S	E	4	ND (0.00243)
609353	105-BH-5-0-S	E	0	0.021
609353	105-BH-5-2-S	E	2	0.00609
609353	105-BH-5-4-S	E	4	0.0281
609353	105-BH-6-0-S	E	0	0.0261
609353	105-BH-6-2-S	E	2	0.00699
609353	105-BH-6-4-S	E	4	ND (0.00245)
609352	105-BH-7-0-S	E	0	0.012
609352	105-BH-7-2-S	E	2	0.00822
609352	105-BH-7-4-S	E	4	ND (0.00248)
609352	105-BH-8-0-S	E	0	0.0116
609352	105-BH-8-2-S	E	2	0.0295
609352	105-BH-8-4-S	E	4	0.0293
609352	105-BH-9-0-S	E	0	0.00307
609352	105-BH-9-2-S	E	2	0.0132
609352	105-BH-9-4-S	E	4	
609352	105-BH-9-4-SD	E	4	ND (0.00241)
609352	105-BH-10-0-S	E	0	ND (0.00244) 0.0114
		E	2	
609352 609352	105-BH-10-2-S 105-BH-10-4-S	E	4	0.00876 0.00298
		E	0	
609352	105-BH-11-0-S	E	2	0.0117
609352	105-BH-11-2-S			0.00259
609352	105-BH-11-4-S	E	4	0.0028
609352	105-BH-12-0-S	E	0	0.0129
609352	105-BH-12-2-S	E	2	0.00807
609352	105-BH-12-4-S	E	4	0.00359
609354	105-BH-13-0-S	E	0	0.01
609354	105-BH-13-2-S	E	2	0.0141
609354	105-BH-13-4-S	E	4	ND (0.00241)
609354	105-BH-14-0-S	E	0	0.007
Background	d concentration (surface	<0.25/<0.1		

				Metals
	Camanda Attuila			(EPA Method 7471A ^a)
	Sample Attrib		Camania	(mg/kg)
Record		Sample	Sample	
Number ^b	ER Sample ID	Collection Area	Depth (ft bgs)	Mercury
609354	105-BH-14-2-S	E	2	0.0055
609354	105-BH-14-2-S	E	4	0.00341
609370	105-BH-15-0-S	E		
		E	<u>0</u> 2	0.0864 J
609370	105-BH-15-2-S	E		0.0187
609370	105-BH-15-4-S	E	4	ND (0.00246)
609370	105-BH-15-8-S	F	8	ND (0.00248)
609358	105-BH-16-0-S		0	0.0228
609358	105-BH-16-2-S	F	2	0.0216
609358	105-BH-16-4-S	F	4	0.00684
609358	105-BH-16-8-S	F	8	0.00296
609360	105-BH-18-0-S	F	0	0.0371
609360	105-BH-18-2-S	F	2	0.00527
609360	105-BH-18-4-S	F	4	0.00393
609360	105-BH-18-8-S	F	8	ND (0.00248)
609362	105-BH-19-0-S	F	0	0.0201
609362	105-BH-19-2-S	F	2	0.00333
609362	105-BH-19-4-S	F	4	ND (0.00246)
609362	105-BH-19-8-S	F	8	0.17
609365	105-BH-20-0-S	F	0	0.0161
609365	105-BH-20-2-S	F	2	0.00316
609365	105-BH-20-4-S	F	4	0.011
609365	105-BH-20-8-S	F	8	0.00299
609371	105-BH-21-0-S	F	0	0.125
609371	105-BH-21-2-S	F	2	ND (0.00235)
609371	105-BH-21-2-SD	F	2	0.0163
609371	105-BH-21-4-S	F	8	0.0039
609371	105-BH-21-8-S	F	8	0.00631
609373	105-BH-22-0-S	F	0	0.0119
609373	105-BH-22-2-S	F	2	0.0178
609373	105-BH-22-4-S	F	4	0.00341
609373	105-BH-22-8-S	F	8	0.00341
609351	105-BH-23-0-S	D D	0	6.8
609351	105-BH-23-2-S	D	2	0.0172
609351	105-BH-23-4-S	D	4	0.0172
609351	105-BH-23-6-S	D	6	0.029
609351	105-BH-23-8-S	D	8	0.0163
		F	0	
609375	105-BH-24-0-S	F	2	0.0335
609375	105-BH-24-2-S			0.012 J
609375	105-BH-24-4-S	F F	4	0.00371 J
609375	105-BH-24-8-S		8	0.00578 J
609377	105-BH-25-0-S	F	0	0.00636 J
609377	105-BH-25-2-S	F	2	ND (0.00245)
Background	d concentration (surface	ce/subsurface)6	<0.25/<0.1

				Metals (EPA Method 7471Aa)
	Sample Attrib	outes		(mg/kg)
	·	Sample	Sample	
Record		Collection	Depth	
Number ^b	ER Sample ID	Area	(ft bgs)	Mercury
609377	105-BH-25-4-S	F	4	0.00577 J
609377	105-BH-25-8-S	F	8	ND (0.00247)
609379	105-BH-26-0-S	F	0	0.00671
609379	105-BH-26-2-S	F	2	0.0134
609379	105-BH-26-4-S	F	4	ND (0.00242)
609379	105-BH-26-4-SD	F	4	ND (0.0024)
609379	105-BH-26-8-S	F	8	ND (0.00249)
609381	105-BH-27-0-S	F	0	0.0168
609381	105-BH-27-2-S	F	2	0.00601
609381	105-BH-27-4-S	F	4	ND (0.00247)
609381	105-BH-27-8-S	F	8	0.00318
609354	105-BH-28-0-S	Е	0	0.0113
609354	105-BH-28-2-S	Е	2	0.00642
609354	105-BH-28-4-S	Е	4	0.00857
609370	105-BH-29-0-S	Е	0	0.59
609370	105-BH-29-2-S	Е	2	0.0195
609370	105-BH-29-4-S	E	4	0.00427
609370	105-BH-29-8-S	E	8	ND (0.00245)
609358	105-BH-30-0-S	F	0	0.0232
609358	105-BH-30-2-S	F	2	0.0182
609358	105-BH-30-4-S	F	4	0.0142
609358	105-BH-30-4-SD	F	4	0.00552
609358	105-BH-30-8-S	F	8	ND (0.00234)
609360	105-BH-32-0-S	F F	0	0.2
609360	105-BH-32-2-S	F	2	0.0196
609360	105-BH-32-4-S	F	4	0.0104
609360	105-BH-32-8-S	F	8	0.00721
609362	105-BH-33-0-S	F	0	0.0185
609362	105-BH-33-2-S	F	2	0.0103
609362	105-BH-33-4-S	F	4	ND (0.00244)
609362	105-BH-33-8-S	F	8	ND (0.00244)
609365	105-BH-34-0-S	F	0	0.128
		F	2	
609365	105-BH-34-2-S	F		0.0544
609365	105-BH-34-4-S		4	0.00307
609365	105-BH-34-4-SD	F	4	0.0116
609365	105-BH-34-8-S	F	8	0.00314
609371	105-BH-35-0-S			1.0
609371	105-BH-35-2-S	F	2	0.0115
609371	105-BH-35-4-S	F	4	0.00666
609371	105-BH-35-8-S	F	8	ND (0.00233)
609351	105-BH-36-0-S	D	0	0.59
609351	105-BH-36-2-S	D	2	0.0345
Background	d concentration (surface	ce/subsurface	:) ^c	<0.25/<0.1

				Metals
				(EPA Method 7471Aa)
	Sample Attrib	(mg/kg)		
		Sample	Sample	
Record		Collection	Depth	
Numberb	ER Sample ID	Area	(ft bgs)	Mercury
609351	105-BH-36-4-S	D	4	0.0194
609351	105-BH-36-6-S	D	6	0.0322
609351	105-BH-36-8-S	D	8	0.0264
609374	105-BH-37-0-S	F	0	0.935
609374	105-BH-37-2-S	F	2	0.015
609374	105-BH-37-4-S	F	4	0.00942
609374	105-BH-37-8-S	F	8	ND (0.00231)
609375	105-BH-38-0-S	F	0	0.0897
609375	105-BH-38-2-S	F	2	0.0115 J
609375	105-BH-38-4-S	F	4	0.0058 J
609375	105-BH-38-4-SD	F	4	0.0042 J
609375	105-BH-38-8-S	F	8	0.0117 J
609377	105-BH-39-0-S	F	0	0.00659 J
609377	105-BH-39-2-S	F	2	0.00289 J
609377	105-BH-39-4-S	F	4	ND (0.00243)
609377	105-BH-39-8-S	F	8	0.00367 J
609379	105-BH-40-0-S	F	0	0.00415 J
609379	105-BH-40-2-S	F	2	0.0107
609379	105-BH-40-4-S	F	4	0.00303
609379	105-BH-40-8-S	F	8	ND (0.00237)
609381	105-BH-41-0-S	F	0	0.028
609381	105-BH-41-2-S	F	2	0.00364
609381	105-BH-41-4-S	F	4	0.003
		F	8	
609381	105-BH-41-8-S	E		0.00305
609354	105-BH-42-0-S		0	0.0156
609354	105-BH-42-2-S	E	2	0.00589
609354	105-BH-42-4-S	E	4	ND (0.00236)
609349	105-BH-43-0-S	С	0	2.45
609349	105-BH-43-2-S	С	2	342
609366	105-BH-43-4-S	С	4	0.00538
609366	105-BH-43-6-S	С	6	0.0195
609366	105-BH-43-6-SD	С	6	0.00946
609366	105-BH-43-8-S	С	8	ND (0.00241)
609383	105-BH-44-0-S	E	3	16.5
609383	105-BH-44-2-S	E	5	0.972
609383	105-BH-44-4-S	Е	7	28.3
609383	105-BH-44-4-SD	Е	7	18.3
609567	105-BH-44-6-S	Е	9	ND (0.00243)
609567	105-BH-44-8-S	Е	11	0.00295
609358	105-BH-45-0-S	F	0	0.767
609358	105-BH-45-2-S	F	2	0.0239
609358	105-BH-45-4-S	F	4	0.00988
	concentration (surface	-	<0.25/<0.1	

				Metals		
				(EPA Method 7471)	۹ ^a)	
	Sample Attrib			(mg/kg)		
		Sample	Sample			
Record		Collection	Depth			
Number ^b	ER Sample ID	Area	(ft bgs)	Mercury		
609358	105-BH-45-8-S	F	8	0.00575		
609360	105-BH-47-0-S	F	0		4.15	
609360	105-BH-47-2-S	F	2	0.0156		
609360	105-BH-47-4-S	F	4	0.00493		
609360	105-BH-47-8-S	F	8	0.00818		
609362	105-BH-48-0-S	F	0	0.0488		
609362	105-BH-48-2-S	F	2	0.0107		
609362	105-BH-48-2-SD	F	2	0.0117		
609362	105-BH-48-4-S	F	4	0.00724		
609362	105-BH-48-8-S	F	8	ND (0.00241)		
609365	105-BH-49-0-S	F	0		0.36	
609365	105-BH-49-2-S	F	2	0.0151		
609365	105-BH-49-4-S	F	4	0.00607		
609365	105-BH-49-8-S	F	8	ND (0.00238)		
609371	105-BH-50-0-S	F	0	0.00894		
609371	105-BH-50-2-S	F F	2	0.0184		
609371	105-BH-50-4-S	F	4	0.00436		
609371	105-BH-50-8-S	F	8	0.00430		
609351	105-BH-51-0-S	D	0	0.00337	3.95	
609351	105-BH-51-2-S	D	2	0.0824	3.30	
609351	105-BH-51-4-S	D	4	0.0624		
609351	105-BH-51-6-S	D	6	0.0178		
	105-BH-51-8-S	D	8			
609351		F		0.0874	0.01	
609374	105-BH-52-0-S	F	0	0.0404	0.85	
609374	105-BH-52-2-S		2	0.0124		
609374	105-BH-52-4-S	F	4	0.0044		
609374	105-BH-52-8-S	F	8	ND (0.00235)		
609351	105-BH-53-0-S	D	0	0.0341		
609351	105-BH-53-2-S	D	2	0.0166		
609351	105-BH-53-4-S	D	4	0.0237		
609351	105-BH-53-6-S	D	6	0.014		
609351	105-BH-53-8-S	D	8	0.0155		
609377	105-BH-54-0-S	F	0	0.00877 J		
609377	105-BH-54-2-S	F	2	0.00746 J		
609377	105-BH-54-4-S	F	4	0.00587 J		
609377	105-BH-54-8-S	F	8	0.00252 J	·	
609379	105-BH-55-0-S	F	0	0.00633		
609379	105-BH-55-2-S	F	2	0.0136		
609379	105-BH-55-4-S	F	4	ND (0.00242)		
609379	105-BH-55-8-S	F	8	0.00498		
609381	105-BH-56-0-S	F	0	0.0253		
609381	105-BH-56-2-S	F	2	0.0196		
	Background concentration (surface/subsurface) ^c <0					

				Metals (EPA Method 7471A ^a)
	Sample Attrib			(mg/kg)
		Sample	Sample	
Record	500	Collection	Depth	
Numberb	ER Sample ID	Area	(ft bgs)	Mercury
609381	105-BH-56-4-S	F	4	ND (0.00241)
609381	105-BH-56-8-S	F	8	ND (0.0025)
609354	105-BH-57-0-S	Е	0	0.0328
609354	105-BH-57-2-S	E	2	0.0106
609354	105-BH-57-4-S	E	4	0.0035
609349	105-BH-58-0-S	С	0	339
609349	105-BH-58-2-S	С	2	125
609366	105-BH-58-4-S	С	4	0.8
609366	105-BH-58-6-S	С	6	7.53
609366	105-BH-58-8-S	С	8	0.00269
609383	105-BH-59-0-S	E	3	6.4
609383	105-BH-59-2-S	Е	5	1.4
609383	105-BH-59-2-SD	Е	5	1.15
609383	105-BH-59-4-S	Е	7	0.90
609358	105-BH-60-0-S	F	0	0.40
609358	105-BH-60-2-S	F	2	0.15
609358	105-BH-60-4-S	F	4	0.00535
609358	105-BH-60-8-S	F	8	ND (0.00242)
609360	105-BH-62-0-S	F	0	3.62
609360	105-BH-62-2-S	F	2	0.0128
609360	105-BH-62-4-S	F	4	0.0120
609360	105-BH-62-8-S	F	8	ND (0.00243)
609362	105-BH-63-0-S	F	0	0.0262
	105-BH-63-2-S	F	2	
609362		F	<u> </u>	0.0129
609362	105-BH-63-4-S	F F	4 8	0.00797 0.00458
609362	105-BH-63-8-S	F		0.00456
609364	105-BH-64-0-S	F	0 2	
609364	105-BH-64-2-S			0.0106
609364	105-BH-64-4-S	F	4	0.00884
609364	105-BH-64-4-SD	F	4	0.0168
609364	105-BH-64-8-S	F	8	0.00323
609371	105-BH-65-0-S	F	0	0.162
609371	105-BH-65-2-S	F	2	0.0114
609371	105-BH-65-4-S	F	4	ND (0.00242)
609371	105-BH-65-8-S	F	8	0.00434
609349	105-BH-66-0-S	D	0	0.144 J
609349	105-BH-66-2-S	D	2	0.0143 J
609349	105-BH-66-4-S	D	4	0.0487
609349	105-BH-66-4-SD	D	4	0.00464 J
609349	105-BH-66-6-S	D	6	ND (0.00237)
609349	105-BH-66-8-S	D	8	ND (0.00243)
609374	105-BH-67-0-S	F	0	0.0377
	concentration (surface	ce/subsurface	/c	<0.25/<0.1

	Comple Attrib	uutoo		Metals (EPA Method 7471A ^a)
	Sample Attrib		Comple	(mg/kg)
Doord		Sample	Sample	
Record Number ^b	ED Comple ID	Collection Area	Depth	Morount
	ER Sample ID	F	(ft bgs) 2	Mercury
609374	105-BH-67-2-S	F		0.0135
609374	105-BH-67-4-S		4	0.00601
609374	105-BH-67-8-S	F F	8	0.00383
609375	105-BH-68-0-S		0	0.0118 J
609375	105-BH-68-2-S	F	2	ND (0.00236)
609375	105-BH-68-4-S	F	4	0.0142
609375	105-BH-68-8-S	F	8	ND (0.00236)
609377	105-BH-69-0-S	F	0	0.0404 J
609377	105-BH-69-2-S	F	2	0.00879 J
609377	105-BH-69-2-SD	F	2	0.0241 J
609377	105-BH-69-4-S	F	4	0.00781
609377	105-BH-69-8-S	F	8	ND (0.00243)
609379	105-BH-70-0-S	F	0	0.0133
609379	105-BH-70-2-S	F	2	0.0137
609379	105-BH-70-4-S	F	4	ND (0.00238)
609379	105-BH-70-8-S	F	8	0.00259
609381	105-BH-71-0-S	F	0	0.0216
609381	105-BH-71-2-S	F	2	0.00265
609381	105-BH-71-4-S	F	4	0.00388
609381	105-BH-71-8-S	F	8	0.00322
609354	105-BH-72-0-S	E	0	0.0914
609354	105-BH-72-2-S	E	2	0.0284
609354	105-BH-72-2-SD	E	2	0.0122
609354	105-BH-72-4-S	E	4	0.00311
609522	105-BH-73-4-S	Α	7	27.5
609522	105-BH-73-4-SD	Α	7	137 .
609567	105-BH-73-6-S	Α	9	0.679
609567	105-BH-73-8-S	Α	11	0.0574
609567	105-BH-73-8-SD	Α	11	0.75
609349	105-BH-74-0-S	С	0	11.8
609349	105-BH-74-2-S	С	2	147
609349	105-BH-74-2-SD	С	2	75.4
609366	105-BH-74-4-S	С	4	0.327
609366	105-BH-74-6-S	С	6	4.4
609366	105-BH-74-8-S	С	8	0.0106
609383	105-BH-75-0-S	E	3	14.8
609383	105-BH-75-2-S	Е	5	18.8
609383	105-BH-75-4-S	E	7	24.1
609567	105-BH-75-6-S	Е	9	0.00272
609567	105-BH-75-8-S	Е	11	0.448
609359	105-BH-76-0-S	F	0	0.0102
609359	105-BH-76-2-S	F	2	ND (0.00237)
Backgroung	concentration (surface	ce/subsurface)c	<0.25/<0.1

	Compale Attrib	too		Metals (EPA Method 7471A ^a)
	Sample Attrib	Sample	(mg/kg)	
Record		Sample Collection	Depth	
Number ^b	ER Sample ID	Area	(ft bgs)	Mercury
609359	105-BH-76-4-S	F	(11 bgs) 4	0.00887
609359	105-BH-76-8-S	F	8	0.00435
609361	105-BH-78-0-S	F	0	0.00433
609361	105-BH-78-2-S	F	2	0.0234
609361	105-BH-78-2-SD	F	2	0.0051
609361	105-BH-78-4-S	F	4	0.0031
609361	105-BH-78-8-S	F	8	0.00439
609363	105-BH-79-0-S	F	0	0.0077
		F	2	
609363	105-BH-79-2-S	F	0	0.014
609364 609364	105-BH-80-0-S 105-BH-80-2-S	F	2	0.0185 0.0168
	105-BH-80-4-S	F	4	
609364	105-BH-80-8-S	F	8	0.00524
609364	105-BH-81-0-S	F		0.00528
609372		F	0	0.00677
609372	105-BH-81-2-S		2	0.00951
609372	105-BH-81-4-S	F	4	0.00708
609372	105-BH-81-8-S	F	8	0.00338
609373	105-BH-82-0-S	F	0	0.013
609373	105-BH-82-2-S	F	2	0.0125
609373	105-BH-82-4-S	F	4	0.0116
609373	105-BH-82-8-S	F	8	0.00258
609374	105-BH-83-0-S	F	0	0.0159
609374	105-BH-83-2-S	F	2	0.0137
609374	105-BH-83-4-S	F	4	0.0128
609374	105-BH-83-4-SD	F	4	0.0164
609374	105-BH-83-8-S	F	8	ND (0.00241)
609376	105-BH-84-0-S	F	0	0.00714 J
609376	105-BH-84-2-S	F	2	0.0161
609376	105-BH-84-4-S	F	4	0.0132
609376	105-BH-84-8-S	F	8	ND (0.0025)
609378	105-BH-85-0-S	F	0	0.0102 J
609378	105-BH-85-2-S	F	2	0.0242
609378	105-BH-85-4-S	F	4	0.00721 J
609378	105-BH-85-8-S	F	8	ND (0.00232)
609380	105-BH-86-0-S	F	0	0.00616
609380	105-BH-86-2-S	F	2	0.0153
609380	105-BH-86-2-SD	F	2	0.00725
609380	105-BH-86-4-S	F	4	0.00435
609380	105-BH-86-8-S	F	8	ND (0.00238)
609382	105-BH-87-0-S	F	0	0.00599
609382	105-BH-87-2-S	F	2	0.00571
609382	105-BH-87-4-S	F	4	ND (0.00234)
Background	d concentration (surfa-	ce/subsurface)c	<0.25/<0.1

Sample Attributes					Metals (EPA Method 7471A ^a)
Record Number		Sample Attrib	outes		
Numberb ER Sample ID Area (ft bgs) Mercury 609382 105-BH-87-8-S F 8 0.0234 609355 105-BH-88-0-S E 0 0.126 609355 105-BH-88-2-S E 2 0.0174 609355 105-BH-88-4-S E 4 0.00485 609349 105-BH-89-0-S C 0 0 609349 105-BH-89-4-S C 4 0.00485 609366 105-BH-89-4-S C 4 0.00384 609366 105-BH-89-6-S C 6 0.00384 609383 105-BH-89-6-S C 6 0.00384 609383 105-BH-90-0-S E 3 0.00384 609383 105-BH-90-2-S E 5 5 609383 105-BH-91-S F 0 0.013 609359 105-BH-91-S F 0 0.00312 609359 105-BH-91-8-S F 8 ND (0.00244) </td <td></td> <td></td> <td>Sample</td> <td>Sample</td> <td></td>			Sample	Sample	
609382 105-BH-87-8-S F 8 0.0234 609355 105-BH-88-0-S E 0 0.126 609355 105-BH-88-2-S E 2 0.0174 609355 105-BH-88-2-S E 4 0.00485 609349 105-BH-89-0-S C 0 609349 105-BH-89-0-S C 0 609349 105-BH-89-1-S C 2 609366 105-BH-89-4-S C 4 609366 105-BH-89-4-S C 6 609366 105-BH-89-8-S C 8 0.00384 609383 105-BH-90-0-S E 3 609383 105-BH-90-2-S E 5 609383 105-BH-90-1-S E 7 609359 105-BH-91-2-S F 0 0.013 609359 105-BH-91-4-S F 4 0.00312 609359 105-BH-91-8-S F 8 ND (0.00244) 609361 105-BH-93-2-S F 2 0.0206 609361 105-BH-93-4-S F 4 0.00616 609361 105-BH-93-4-S F 4 0.00616 609361 105-BH-93-4-S F 4 0.00362 609363 105-BH-94-2-S F 2 0.0144 609363 105-BH-94-2-S F 2 0.0206 609364 105-BH-93-4-S F 4 0.00616 609363 105-BH-94-8-S F 8 0.00362 609363 105-BH-94-8-S F 9 0 0.0144 609363 105-BH-94-8-S F 9 0 0.0144 609363 105-BH-94-8-S F 9 0 0.0142 609363 105-BH-94-8-S F 9 0 0.00362 609363 105-BH-94-8-S F 9 0 0.00362 609364 105-BH-95-8-S F 9 0 0.00362 609365 105-BH-94-8-S F 9 0 0.00362 609366 105-BH-95-8-S F 9 0 0.00362 609367 105-BH-98-8-S F 9 0 0.00362 609368 105-BH-98-8-S F 9 0 0.0044 609369 105-BH-98-8-S F 9 0 0.00424 609372 105-BH-96-8-S F 9 0 0.00424 609373 105-BH-96-8-S F 9 0 0.00424 609373 105-BH-97-8-S F 9 0 0.00424 609373 105-BH-97-8-S F 9 0 0.00424 609373 105-BH-97-8-S F 9 0 0.00424 609374 105-BH-98-8-S F 8 0.00246 609374 105-BH-98-8-S F 8 0.00246 609374 105-BH-98-8-S F 9 0 0.00444 609374 105-BH-98-8-S F 9 0 0.00444 609374 105-BH-98-8-S F 9 0 0.00446 609374 105-BH-98-8-S F 9 0 0.00446 609374 105-BH-98-8-S F 9 0 0.00446 609374 105-BH-98-8-S F 9 0 0.00464 609374 105-BH-98-8-S F 9 0 0.00464 609374 105-BH-98-8-S F 9 0 0.00466 609374 105-BH-98-8-S F 9 0 0.00466 609374 105-BH-98-8-S F 9 0 0.00466			Collection		
609355 105-BH-88-0-S E	Numberb	ER Sample ID		(ft bgs)	Mercury
609355	609382	105-BH-87-8-S		8	0.0234
609355 105-BH-88-4-S E 4 0.00485 609349 105-BH-89-0-S C 0 609349 105-BH-89-2-S C 2 609366 105-BH-89-6-S C 4 609366 105-BH-89-6-S C 6 609361 105-BH-89-8-S C 8 0.00384 609383 105-BH-90-0-S E 3 609383 105-BH-90-2-S E 5 609383 105-BH-91-90-S F 0 0.013 609359 105-BH-91-S F 0 0.013 609359 105-BH-91-S F 2 0.00312 609359 105-BH-91-8-S F 8 ND (0.00244) 609361 105-BH-93-0-S F 0 0.0276 609361 105-BH-93-2-S F 2 0.0206 609361 105-BH-93-4-S F 4 0.00616 609363 105-BH-94-0-S F 0 0.0144 <tr< td=""><td>609355</td><td>105-BH-88-0-S</td><td></td><td></td><td>0.126</td></tr<>	609355	105-BH-88-0-S			0.126
609349 105-BH-89-2-S C 0 609349 105-BH-89-4-S C 2 609366 105-BH-89-6-S C 6 609366 105-BH-89-8-S C 8 0.00384 609383 105-BH-90-0-S E 3 609383 105-BH-90-2-S E 5 609359 105-BH-91-0-S F 0 0.013 609359 105-BH-91-2-S F 2 0.00315 609359 105-BH-91-8-S F 8 ND (0.00244) 609359 105-BH-91-8-S F 8 ND (0.00244) 609359 105-BH-91-8-S F 8 ND (0.00244) 609361 105-BH-91-8-S F 8 ND (0.00244) 609361 105-BH-93-8-S F 8	609355	105-BH-88-2-S			0.0174
609349 105-BH-89-2-S C 2 609366 105-BH-89-6-S C 4 609366 105-BH-99-6-S C 6 609366 105-BH-99-0-S E 3 609383 105-BH-90-0-S E 3 609383 105-BH-90-4-S E 7 609359 105-BH-91-0-S F 0 0.013 609359 105-BH-91-2-S F 2 0.00312 609359 105-BH-91-8-S F 4 0.00312 609359 105-BH-91-8-S F 8 ND (0.00244) 609361 105-BH-93-0-S F 0 0.0276 609361 105-BH-93-2-S F 2 0.0206 609361 105-BH-93-2-S F 2 0.0206 609361 105-BH-94-8-S F 8 0.0036 609361 105-BH-94-8-S F 8 0.0036 609363 105-BH-95-8-S F 2 0.0142 <	609355				
609366 105-BH-89-4-S C 4 609366 105-BH-89-6-S C 6 609361 105-BH-90-0-S E 3 609383 105-BH-90-2-S E 5 609383 105-BH-90-4-S E 7 609359 105-BH-91-0-S F 0 0.013 609359 105-BH-91-2-S F 2 0.00315 609359 105-BH-91-4-S F 4 0.00315 609359 105-BH-91-8-S F 4 0.00315 609359 105-BH-91-8-S F 8 ND (0.00244) 609359 105-BH-91-8-S F 8 ND (0.00244) 609359 105-BH-93-8-S F 0 0.0276 609361 105-BH-93-8-S F 2 0.0206 609361 105-BH-93-4-S F 4 0.00616 609361 105-BH-93-4-S F 8 0.00362 609363 105-BH-94-0-S F 0					40
609366 105-BH-89-6-S C 6 609366 105-BH-90-0-S E 3 609383 105-BH-90-2-S E 5 609383 105-BH-90-4-S E 7 609359 105-BH-91-0-S F 0 0.013 609359 105-BH-91-2-S F 2 0.00315 609359 105-BH-91-8-S F 4 0.00312 609359 105-BH-91-8-S F 8 ND (0.00244) 609361 105-BH-91-8-S F 2 0.0276 609361 105-BH-93-8-S F 8 0.00362 609363 105-BH-94-8-S F 8 0.00362 609363 105-BH-94-8-S F 4 0.0142 609363 105-BH-95-0-S <					92
609366 105-BH-89-8-S C 8 0.00384 609383 105-BH-90-0-S E 3 609383 105-BH-90-4-S E 5 609359 105-BH-91-0-S F 0 0.013 609359 105-BH-91-2-S F 2 0.00315 609359 105-BH-91-4-S F 4 0.00312 609359 105-BH-91-4-S F 4 0.00312 609359 105-BH-91-8-S F 8 ND (0.00244) 609361 105-BH-91-8-S F 2 0.0276 609361 105-BH-93-8-S F 8 0.00362 609363 105-BH-94-2-S F 2 0.0142 609363 105-BH-94-8-S F 8 ND (0.00247) <	609366				5.9
609383 105-BH-90-0-S E 3 609383 105-BH-90-2-S E 5 609383 105-BH-91-0-S F 0 0.013 609359 105-BH-91-2-S F 0 0.00315 609359 105-BH-91-2-S F 2 0.00315 609359 105-BH-91-8-S F 4 0.00312 609359 105-BH-91-8-S F 8 ND (0.00244) 609361 105-BH-91-8-S F 8 ND (0.00244) 609361 105-BH-93-2-S F 0 0.0276 609361 105-BH-93-2-S F 2 0.0206 609361 105-BH-93-2-S F 2 0.0206 609361 105-BH-93-8-S F 8 0.00362 609363 105-BH-94-S F 0 0.0142 609363 105-BH-94-S F 2 0.0142 609363 105-BH-95-S-S F 8 ND (0.00247) 609364	609366	105-BH-89-6-S		6	1.9
609383 105-BH-90-2-S E 5 609389 105-BH-90-4-S E 7 609359 105-BH-91-0-S F 0 0.013 609359 105-BH-91-2-S F 2 0.00315 609359 105-BH-91-8-S F 4 0.00312 609359 105-BH-91-8-S F 8 ND (0.00244) 609359 105-BH-91-8-S F 8 ND (0.00244) 609359 105-BH-91-8-S F 8 ND (0.00244) 609361 105-BH-93-S-S F 0 0.0276 609361 105-BH-93-2-S F 2 0.0206 609361 105-BH-93-8-S F 8 0.00362 609361 105-BH-93-8-S F 8 0.00362 609363 105-BH-94-S F 0 0.0144 609363 105-BH-94-S-S F 2 0.0142 609363 105-BH-95-S-S F 8 ND (0.00247) 609364	609366	105-BH-89-8-S	C	8	0.00384
609383 105-BH-90-4-S E 7 609359 105-BH-91-0-S F 0 0.013 609359 105-BH-91-2-S F 2 0.00315 609359 105-BH-91-4-S F 4 0.00312 609359 105-BH-91-8-S F 8 ND (0.00244) 609361 105-BH-93-0-S F 0 0.0276 609361 105-BH-93-2-S F 2 0.0206 609361 105-BH-93-2-S F 2 0.0206 609361 105-BH-93-2-S F 4 0.00616 609361 105-BH-93-2-S F 8 0.00362 609363 105-BH-94-0-S F 0 0.0144 609363 105-BH-94-2-S F 2 0.0142 609363 105-BH-95-0-S F 0 0.0396 609363 105-BH-95-0-S F 0 0.0396 609364 105-BH-95-0-S F 0 0.0396 <t< td=""><td>609383</td><td>105-BH-90-0-S</td><td></td><td></td><td>8.2</td></t<>	609383	105-BH-90-0-S			8.2
609359 105-BH-91-0-S F 0 0.013 609359 105-BH-91-2-S F 2 0.00315 609359 105-BH-91-4-S F 4 0.00312 609359 105-BH-91-8-S F 8 ND (0.00244) 609361 105-BH-93-0-S F 0 0.0276 609361 105-BH-93-2-S F 2 0.0206 609361 105-BH-93-4-S F 4 0.00616 609361 105-BH-93-4-S F 8 0.00362 609363 105-BH-94-0-S F 0 0.0144 609363 105-BH-94-2-S F 2 0.0142 609363 105-BH-94-2-S F 4 0.0132 609363 105-BH-94-8-S F 8 ND (0.00247) 609364 105-BH-95-0-S F 0 0.0396 609364 105-BH-96-2-S F 2 0.0082 609372 105-BH-96-0-S F 0 0.0083	609383	105-BH-90-2-S	Е	5	4
609359 105-BH-91-2-S F 2 0.00315 609359 105-BH-91-4-S F 4 0.00312 609359 105-BH-91-8-S F 8 ND (0.00244) 609361 105-BH-93-0-S F 0 0.0276 609361 105-BH-93-2-S F 2 0.0206 609361 105-BH-93-4-S F 4 0.00616 609361 105-BH-93-8-S F 8 0.00362 609363 105-BH-94-0-S F 0 0.0144 609363 105-BH-94-0-S F 0 0.0142 609363 105-BH-94-2-S F 2 0.0142 609363 105-BH-94-8-S F 8 ND (0.00247) 609363 105-BH-94-8-S F 8 ND (0.00247) 609364 105-BH-95-0-S F 0 0.0396 609364 105-BH-95-4-S F 4 0.00283 609372 105-BH-96-8-S F 8 ND	609383	105-BH-90-4-S	Е	7	2.0
609359 105-BH-91-4-S F 4 0.00312 609359 105-BH-91-8-S F 8 ND (0.00244) 609361 105-BH-93-0-S F 0 0.0276 609361 105-BH-93-2-S F 2 0.0206 609361 105-BH-93-4-S F 4 0.00616 609361 105-BH-93-8-S F 8 0.00362 609363 105-BH-94-0-S F 0 0.0144 609363 105-BH-94-2-S F 2 0.0142 609363 105-BH-94-8-S F 8 ND (0.00247) 609363 105-BH-94-8-S F 8 ND (0.00247) 609364 105-BH-95-0-S F 0 0.0396 609364 105-BH-95-4-S F 4 0.00283 609372 105-BH-96-0-S F 0 0.00883 609372 105-BH-96-2-S F 2 0.0175 609372 105-BH-96-8-S F 8 0.0	609359	105-BH-91-0-S	F	0	0.013
609359 105-BH-91-4-S F 4 0.00312 609359 105-BH-91-8-S F 8 ND (0.00244) 609361 105-BH-93-0-S F 0 0.0276 609361 105-BH-93-2-S F 2 0.0206 609361 105-BH-93-4-S F 4 0.00616 609361 105-BH-93-8-S F 8 0.00362 609363 105-BH-94-0-S F 0 0.0144 609363 105-BH-94-2-S F 2 0.0142 609363 105-BH-94-8-S F 8 ND (0.00247) 609363 105-BH-95-0-S F 0 0.0396 609364 105-BH-95-0-S F 0 0.0396 609364 105-BH-95-4-S F 4 0.00283 609364 105-BH-96-0-S F 0 0.00882 609372 105-BH-96-0-S F 0 0.00883 609372 105-BH-96-2-S F 2 0.0175 </td <td>609359</td> <td>105-BH-91-2-S</td> <td>F</td> <td>2</td> <td></td>	609359	105-BH-91-2-S	F	2	
609361 105-BH-93-0-S F 0 0.0276 609361 105-BH-93-2-S F 2 0.0206 609361 105-BH-93-4-S F 4 0.00616 609361 105-BH-93-8-S F 8 0.00362 609363 105-BH-94-0-S F 0 0.0144 609363 105-BH-94-2-S F 2 0.0142 609363 105-BH-94-8-S F 4 0.0132 609363 105-BH-94-8-S F 8 ND (0.00247) 609364 105-BH-95-0-S F 0 0.0396 609364 105-BH-95-2-S F 2 0.00882 609364 105-BH-95-8-S F 8 ND (0.00241) 609372 105-BH-96-0-S F 0 0.00883 609372 105-BH-96-4-S F 4 0.00436 609372 105-BH-96-8-S F 8 0.00261 609373 105-BH-97-0-S F 0 0.00451<	609359	105-BH-91-4-S	F	4	0.00312
609361 105-BH-93-2-S F 2 0.0206 609361 105-BH-93-4-S F 4 0.00616 609361 105-BH-93-8-S F 8 0.00362 609363 105-BH-94-0-S F 0 0.0144 609363 105-BH-94-2-S F 2 0.0142 609363 105-BH-94-4-S F 4 0.0132 609363 105-BH-94-8-S F 8 ND (0.00247) 609364 105-BH-95-0-S F 0 0.0396 609364 105-BH-95-2-S F 2 0.00882 609364 105-BH-95-8-S F 4 0.00283 609364 105-BH-95-8-S F 8 ND (0.00241) 609372 105-BH-96-0-S F 0 0.00883 609372 105-BH-96-4-S F 4 0.00436 609373 105-BH-97-0-S F 0 0.00954 609373 105-BH-97-2-S F 2 0.0146<	609359	105-BH-91-8-S	F	8	ND (0.00244)
609361 105-BH-93-2-S F 2 0.0206 609361 105-BH-93-4-S F 4 0.00616 609361 105-BH-93-8-S F 8 0.00362 609363 105-BH-94-0-S F 0 0.0144 609363 105-BH-94-2-S F 2 0.0142 609363 105-BH-94-4-S F 4 0.0132 609363 105-BH-94-8-S F 8 ND (0.00247) 609364 105-BH-95-0-S F 0 0.0396 609364 105-BH-95-2-S F 2 0.00882 609364 105-BH-95-3-S F 4 0.00283 609364 105-BH-95-3-S F 8 ND (0.00241) 609372 105-BH-96-0-S F 0 0.00883 609372 105-BH-96-3-S F 4 0.00436 609372 105-BH-96-8-S F 8 0.00261 609373 105-BH-97-0-S F 0 0.00451		105-BH-93-0-S	F	0	1
609361 105-BH-93-4-S F 4 0.00616 609361 105-BH-93-8-S F 8 0.00362 609363 105-BH-94-0-S F 0 0.0144 609363 105-BH-94-2-S F 2 0.0142 609363 105-BH-94-4-S F 4 0.0132 609363 105-BH-94-8-S F 8 ND (0.00247) 609364 105-BH-95-0-S F 0 0.0396 609364 105-BH-95-2-S F 2 0.00882 609364 105-BH-95-4-S F 4 0.00283 609364 105-BH-95-8-S F 8 ND (0.00241) 609372 105-BH-96-0-S F 0 0.00883 609372 105-BH-96-4-S F 4 0.00436 609372 105-BH-96-8-S F 8 0.00261 609373 105-BH-97-0-S F 0 0.00451 609373 105-BH-98-9-S F 8 ND (0.	609361		F	2	0.0206
609361 105-BH-93-8-S F 8 0.00362 609363 105-BH-94-0-S F 0 0.0144 609363 105-BH-94-2-S F 2 0.0142 609363 105-BH-94-4-S F 4 0.0132 609363 105-BH-94-8-S F 8 ND (0.00247) 609364 105-BH-95-0-S F 0 0.0396 609364 105-BH-95-2-S F 2 0.00882 609364 105-BH-95-4-S F 4 0.00283 609364 105-BH-95-8-S F 8 ND (0.00241) 609372 105-BH-96-0-S F 0 0.00883 609372 105-BH-96-2-S F 2 0.0175 609372 105-BH-96-8-S F 8 0.00261 609373 105-BH-97-0-S F 0 0.00954 609373 105-BH-97-4-S F 4 0.00451 609373 105-BH-97-8-S F 8 ND (0.0			F	4	
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609374 105-BH-98-2-SD F 2 0.0246 609374 105-BH-98-4-S F 4 ND (0.0025)					
609374 105-BH-98-4-S F 4 ND (0.0025)					
600374 105_BU_08_8_C	609374		F	8	,
					,
609376 105-BH-99-0-S F 0 0.0219 Background concentration (surface/subsurface) ^c <0.25/<0.1				_	

	Sample Attrib	uites		Metals (EPA Method 7471A ^a) (mg/kg)
	Jampie Attiib	(Hig/kg)		
Record		Sample Collection	Sample Depth	
Number ^b	ER Sample ID	Area	(ft bgs)	Mercury
609376	105-BH-99-2-S	F	2	0.00874 J
609376	105-BH-99-4-S	F	4	0.0123 J
609376	105-BH-99-8-S	F	8	ND (0.00234)
609378	105-BH-100-0-S	F	0	0.00646 J
609378	105-BH-100-2-S	F	2	0.00475 J
609378	105-BH-100-4-S	F	4	0.0393
609378	105-BH-100-4-SD	F	4	0.00624 J
609378	105-BH-100-8-S	F	8	ND (0.00243)
609380	105-BH-101-0-S	F	0	0.00429
609380	105-BH-101-2-S	F	2	ND (0.00242)
609380	105-BH-101-4-S	F	4	0.00654
609380	105-BH-101-8-S	F	8	0.00484
609382	105-BH-102-0-S	F	0	0.0128
609382	105-BH-102-2-S	F	2	0.00524
609382	105-BH-102-4-S	F	4	0.00829
609382	105-BH-102-8-S	F	8	0.0052
609355	105-BH-103-0-S	E	0	0.117
609355	105-BH-103-0-S	E	2	0.0133
609355	105-BH-103-4-S	E	4	0.0133
	105-BH-103-4-SD	E	4	0.00954
609355 609349	105-BH-104-0-S	C	0	
		C		9.45
609349	105-BH-104-2-S	C	2 4	89.0
609366	105-BH-104-4-S	C		0.0256
609366	105-BH-104-6-S	C	6	1.22
609366	105-BH-104-8-S	E	8	0.00238
609383	105-BH-105-0-S		3	24
609383	105-BH-105-2-S	Е	5	3.22
609383	105-BH-105-4-S	E	7	0.0116
609359	105-BH-106-0-S	F	0	0.04
609359	105-BH-106-2-S	F	2	0.13
609359	105-BH-106-4-S	F	4	0.00459
609359	105-BH-106-8-S	F	8	ND (0.00248)
609361	105-BH-108-0-S	F	0	0.0418
609361	105-BH-108-2-S	F	2	0.014
609361	105-BH-108-4-S	F	4	0.0105
609361	105-BH-108-8-S	F	8	ND (0.00236)
609363	105-BH-109-0-S	F	0	0.0584
609363	105-BH-109-2-S	F	2	ND (0.00244)
609363	105-BH-109-2-SD	F	2	ND (0.0025)
609363	105-BH-109-4-S	F	4	ND (0.00244)
609363	105-BH-109-8-S	F	8	ND (0.00246)
609364	105-BH-110-0-S	F	0	0.0552
Background	d concentration (surface	ce/subsurface	e)c	<0.25/<0.1

Sample Attributes					Metals
Record Number		Comple Attrib	(EPA Method 7471A ^a)		
Record Number		Sample Auribi	(mg/kg)		
Number Dec D	Popord				
609364 105-BH-110-2-S F 2 0.0105 609364 105-BH-110-4-S F 4 0.00518 609364 105-BH-110-8-S F 8 0.00639 609372 105-BH-111-0-S F 0 0.009867 609372 105-BH-111-4-S F 2 0.00887 609372 105-BH-111-8-S F 4 0.0153 609372 105-BH-111-8-S F 4 0.0153 609373 105-BH-112-0-S F 0 0.0115 609373 105-BH-112-4-S F 4 0.00255 609373 105-BH-112-8-S F 4 0.00255 609373 105-BH-113-0-S F 0 0.024 609373 105-BH-113-0-S F 0 0.024 609373 105-BH-113-2-S F 2 0.0166 609373 105-BH-113-8-S F 4 0.00479 609376 105-BH-114-2-S F 2 0.016		ED Sample ID			Moroury
609364 105-BH-110-4-S F 4 0.00518 609364 105-BH-1110-8-S F 8 0.00639 609372 105-BH-111-0-S F 0 0.00967 609372 105-BH-111-2-S F 2 0.00887 609372 105-BH-111-8-S F 4 0.0153 609373 105-BH-1112-0-S F 0 0.0115 609373 105-BH-112-0-S F 0 0.0115 609373 105-BH-112-4-S F 2 0.0105 609373 105-BH-113-0-S F 2 0.0105 609373 105-BH-113-0-S F 8 ND (0.00235) 609373 105-BH-113-0-S F 0 0.024 609373 105-BH-113-0-S F 2 0.0166 609373 105-BH-113-0-S F 2 0.0166 609373 105-BH-114-0-S F 2 0.0166 609373 105-BH-114-0-S F 2					
609364 105-BH-110-B-S F 8 0.00639 609372 105-BH-111-0-S F 0 0.00967 609372 105-BH-111-2-S F 2 0.00887 609372 105-BH-111-8-S F 4 0.0153 609372 105-BH-111-8-S F 8 ND (0.00244) 609373 105-BH-112-0-S F 0 0.0115 609373 105-BH-112-S F 2 0.0105 609373 105-BH-112-S F 4 0.00255 609373 105-BH-112-S F 8 ND (0.00235) 609373 105-BH-113-O-S F 0 0.024 609373 105-BH-113-S-S F 2 0.0166 609373 105-BH-113-S-S F 8 ND (0.00245) 609373 105-BH-114-S-S F 8 ND (0.00245) 609373 105-BH-114-S-S F 8 ND (0.00245) 609376 105-BH-114-S-S F 8 </td <td></td> <td></td> <td></td> <td></td> <td></td>					
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609373 105-BH-113-8-S F 8 ND (0.00245) 609376 105-BH-114-0-S F 0 0.0433 609376 105-BH-114-2-S F 2 ND (0.00232) 609376 105-BH-114-2-SD F 2 0.00264 609376 105-BH-114-4-S F 4 0.0108 J 609376 105-BH-114-8-S F 8 0.00334 J 609376 105-BH-115-0-S F 0 0.00249 J 609378 105-BH-115-0-S F 0 0.00249 J 609378 105-BH-115-2-S F 2 0.00956 J 609378 105-BH-115-4-S F 4 0.00716 J 609378 105-BH-115-8-S F 8 ND (0.00245) 609380 105-BH-116-0-S F 0 0.0496 609380 105-BH-116-2-S F 2 0.0126 609380 105-BH-116-8-S F 8 ND (0.00243) 609382 105-BH-117-0-S F	609373	105-BH-113-4-S	F	4	0.00479
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609349 105-BH-119-0-S E 0 9 609349 105-BH-119-2-S E 2 0.0416 609349 105-BH-119-4-S E 4 0.0466 609357 105-BH-120-0-S E 0 0 609357 105-BH-120-2-S E 2 0 609357 105-BH-120-2-SD E 2 0	609355	105-BH-118-2-S	E	2	0.0198
609349 105-BH-119-0-S E 0 9 609349 105-BH-119-2-S E 2 0.0416 609349 105-BH-119-4-S E 4 0.0466 609357 105-BH-120-0-S E 0 0 609357 105-BH-120-2-S E 2 0 609357 105-BH-120-2-SD E 2 0	609355	105-BH-118-4-S	Е	4	0.00574
609349 105-BH-119-2-S E 2 0.0416 609349 105-BH-119-4-S E 4 0.0466 609357 105-BH-120-0-S E 0 0. 609357 105-BH-120-2-S E 2 0. 609357 105-BH-120-2-SD E 2 0.	609349			0	9.2
609349 105-BH-119-4-S E 4 0.0466 609357 105-BH-120-0-S E 0 0.0466 609357 105-BH-120-2-S E 2 0.0466 609357 105-BH-120-2-S E 2 0.0466					
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609357 105-BH-120-2-S E 2 0. 609357 105-BH-120-2-SD E 2					0.40
609357 105-BH-120-2-SD E 2					0.36
					8.
Background concentration (surface/subsurface) ^c <0.25/<0.1		•		<u> </u>	

				Metals (EPA Method 7471	Λα\
	Sample Attrib	Itas		(EPA Method 747 i (mg/kg)	A-)
	Cample 7 tunio	Sample	Sample	(mg/kg)	
Record		Collection	Depth		
Numberb	ER Sample ID	Area	(ft bgs)	Mercury	
609357	105-BH-121-0-S	E	0	0.155	
609357	105-BH-121-2-S	Ē	2	0.00958	
609357	105-BH-121-4-S	E	4	0.00274	
609355	105-BH-131-4-S	Ē	4	ND (0.00234)	
609357	105-BH-122-0-S	E	0	0.0973	
609357	105-BH-122-2-S	Ē	2	0.0089	
609357	105-BH-122-4-S	E	4	0.00479	
609356	105-BH-123-0-S	Ē	0	0.0575	
609356	105-BH-123-2-S	E	2	0.00988	
609356	105-BH-123-4-S	E	4	0.00826	
609356	105-BH-124-0-S	Ē	0	0.0227	
609356	105-BH-124-2-S	E	2	0.0101	
609356	105-BH-124-4-S	Ē	4	0.00807	
609356	105-BH-125-0-S	E	0	0.00296	
609356	105-BH-125-2-S	Ē	2	0.00801	
609356	105-BH-125-4-S	E	4	0.0252	
609356	105-BH-126-0-S	Ē	0	0.0202	2.39
609356	105-BH-126-2-S	E	2	0.0501	
609356	105-BH-126-4-S	Ē	4	0.0114	
609356	105-BH-127-0-S	E	0	0.0111	6.97
609356	105-BH-127-2-S	Ē	2		1.53
609356	105-BH-127-4-S	Ē	4	0.0122	
609356	105-BH-127-4-SD	Ē	4	0.0122	0.89
609356	105-BH-128-0-S	Ē	0		0.371
609356	105-BH-128-2-S	Ē	2		0.16
609356	105-BH-128-4-S	Ē	4	0.026	0
609356	105-BH-129-0-S	E	0	0.0631	
609356	105-BH-129-2-S	Ē	2	0.054	
609356	105-BH-129-4-S	E	4	0.00481	
609355	105-BH-130-0-S	Ē	0	0.138	
609355	105-BH-130-2-S	E	2	0.100	0.832
609355	105-BH-130-4-S	E	4	0.00603	0.002
609355	105-BH-131-0-S	E	0	0.0843	
609355	105-BH-131-2-S	E	2	0.0184	
609355	105-BH-131-2-SD	E	2	0.00963	
609355	105-BH-132-0-S	E	0	0.129	
609355	105-BH-132-2-S	E	2	0.123	1.77
609355	105-BH-132-4-S	E	4	0.00738	
609367	105-BH-133-0-S	G	0	0.00730	8.09
609367	105-BH-133-2-S	G	2		0.16
609367	105-BH-133-4-S	G	4	0.00769	0.10
	105-BH-133-8-S	G	8	0.00769	
609367	1 1115-BH-1 4 4-X-X				

				Metals
	Commin Attrib	(EPA Method 7471Aa)		
	Sample Attrib	(mg/kg)		
Record		Sample Collection	Sample Depth	
Number ^b	ER Sample ID	Area	(ft bgs)	Mercury
609367	105-BH-134-0-S	G	(11 bys) 0	0.0142
609367	105-BH-134-2-S	G	2	0.0173
		G	4	
609367 609367	105-BH-134-4-S 105-BH-134-4-SD	G	4	0.00337 0.00346
	105-BH-134-8-S	G	8	
609367	105-BH-135-0-S	G	0	ND (0.00247)
609367				5.05
609367	105-BH-135-2-S	G	2	0.019
609367	105-BH-135-4-S	G	4	0.00399
609367	105-BH-135-8-S	G	8	0.0031
609367	105-BH-136-0-S	G	0	7.93
609367	105-BH-136-2-S	G	2	0.0455
609367	105-BH-136-4-S	G	4	0.0515
609367	105-BH-136-8-S	G	8	0.00864
609367	105-BH-137-0-S	G	0	13.5
609367	105-BH-137-2-S	G	2	5.14
609367	105-BH-137-4-S	G	4	3.33
609367	105-BH-137-8-S	G	8	0.00455 J
609368	105-BH-138-0-S	G	0	6.05
609368	105-BH-138-2-S	G	2	16.3
609368	105-BH-138-4-S	G	4	4.28
609368	105-BH-138-8-S	G	8	0.0177
609368	105-BH-139-0-S	G	0	5.74
609368	105-BH-139-2-S	G	2	0.078
609368	105-BH-139-4-S	G	4	3.6
609368	105-BH-139-8-S	G	8	0.00686 J
609368	105-BH-140-0-S	G	0	12.6
609368	105-BH-140-2-S	G	2	0.0201
609368	105-BH-140-2-SD	G	2	2.66
609368	105-BH-140-4-S	G	4	0.0205
609368	105-BH-140-8-S	G	8	0.631
609368	105-BH-141-0-S	G	0	3.36
609368	105-BH-141-2-S	G	2	0.869
609368	105-BH-141-4-S	G	4	0.006 J
609368	105-BH-141-8-S	G	8	0.0763
609369	105-BH-142-0-S	G	0	26.4
609369	105-BH-142-2-S	G	2	0.459
609369	105-BH-142-4-S	G	4	0.102
609369	105-BH-142-8-S	G	8	0.124
609369	105-BH-143-0-S	G	0	0.316
609369	105-BH-143-2-S	G	2	0.0112 J
609369	105-BH-143-4-S	G	4	0.0112 J 0.0095 J
609369		G	8	
	105-BH-143-8-S			ND (0.00246) R
background	d concentration (surfac	e/subsurface	!)~	<0.25/<0.1

				Metals
				(EPA Method 7471Aa)
	Sample Attribu	(mg/kg)		
	Sample Sample			(mg/kg)
Record		Collection	Depth	
Numberb	ER Sample ID	Area	(ft bgs)	Mercury
609369	105-BH-144-0-S	G	0	9.16 J
609369	105-BH-144-2-S	G	2	0.00387 J
609369	105-BH-144-4-S	G	4	0.147 J
609369	105-BH-144-8-S	G	8	4.46 J
609370	105-BH-145-0-S	G	0	26.3 J
609370	105-BH-145-2-S	G	2	0.278 J
609370	105-BH-145-4-S	G	4	0.0325 J
609370	105-BH-145-8-S	G	8	0.113 J
609370	105-BH-146-0-S	G	0	7.79 J
609370	105-BH-146-2-S	G	2	0.807 J
609370	105-BH-146-4-S	G	4	0.0264 J
609370	105-BH-146-8-S	G	8	0.0829 J
609370	105-BH-146-8-SD	G	8	0.11 J
609521	105-BH-147-0-S	G	0	3.61
609521	105-BH-147-2-S	G	2	0.0115
609521	105-BH-147-2-SD	G	2	0.0154
609521	105-BH-147-4-S	G	4	ND (0.119)
609521	105-BH-147-8-S	G	8	0.0697
609523	105-BH-148-0-S	В	3	66.9 J
609523	105-BH-148-2-S	В	5	0.238 J
609523	105-BH-148-4-S	В	7	ND (0.00241 J)
609523	105-BH-149-0-S	В	3	1.47 J
609523	105-BH-149-2-S	В	5	0.255 J
609523	105-BH-149-2-SD	В	5	0.963 J
609523	105-BH-149-4-S	В	7	1.93 J
609523	105-BH-150-0-S	В	3	3.07 J
609523	105-BH-150-2-S	В	5	0.216 J
609523	105-BH-150-4-S	В	7	0.167 J
Background	concentration (surface	e/subsurface) ^c	<0.25/<0.1
Quality Assi	urance/Quality Control	Samples (El	PA Method 7	7470A ^a) (mg/L)
609349	105-EB-1	N	A	0.000148 J
609351	105-EB-2	N		ND (0.00005)
609354	105-EB-3	N	A	ND (0.00005)
609357	105-EB-4	NA		ND (0.00005)
609358	105-EB-5	N	Α	ND (0.00005
609366	105-EB-6	NA		ND (0.00005 J)
609370	105-EB-7	NA		ND (0.00005)
609371	105-EB-8	NA		ND (0.00005 J)
609374	105-EB-9	N	A	ND (0.00005 J)

		Metals		
		(EPA Method 7471Aa)		
	Sample Attribu	(mg/kg)		
		Sample	Sample	
Record		Collection	Depth	
Number ^b	ER Sample ID	Area	(ft bgs)	Mercury
Quality Ass	Quality Assurance/Quality Control Samples (EPA Method 7			7470A ^a) (mg/L)
609378	105-EB-10	NA	NA	0.000052
609381	105-EB-11	NA	NA	ND (0.00005)
609383	105-EB-12	NA	NA	ND (0.00005 J)
609522	105-EB-13	NA	NA	ND (0.00005)
609567	105-EB-14	NA	NA	ND (0.00005)

Note: Values in **bold** exceed background soil concentration.

^cDinwiddie September 1997.

bgs = Below ground surface.

BH = Borehole.

EB = Equipment blank.

EPA = U.S. Environmental Protection Agency.

ER = Environmental Restoration.

ft = Foot (feet). ID = Identification.

J = Estimated concentration.

MDL = Method detection limit.

mg/kg = Milligram(s) per kilogram.

mg/L = Milligram(s) per liter.

NA = Not applicable.

ND () = Not detected above the MDL, shown in parentheses.

ND (J) = Not detected, uncertainty in the detection limit shown in parentheses, see Data

Validation Report (Annex B).

R = Value is unusable, see Data Validation Report (Annex B).

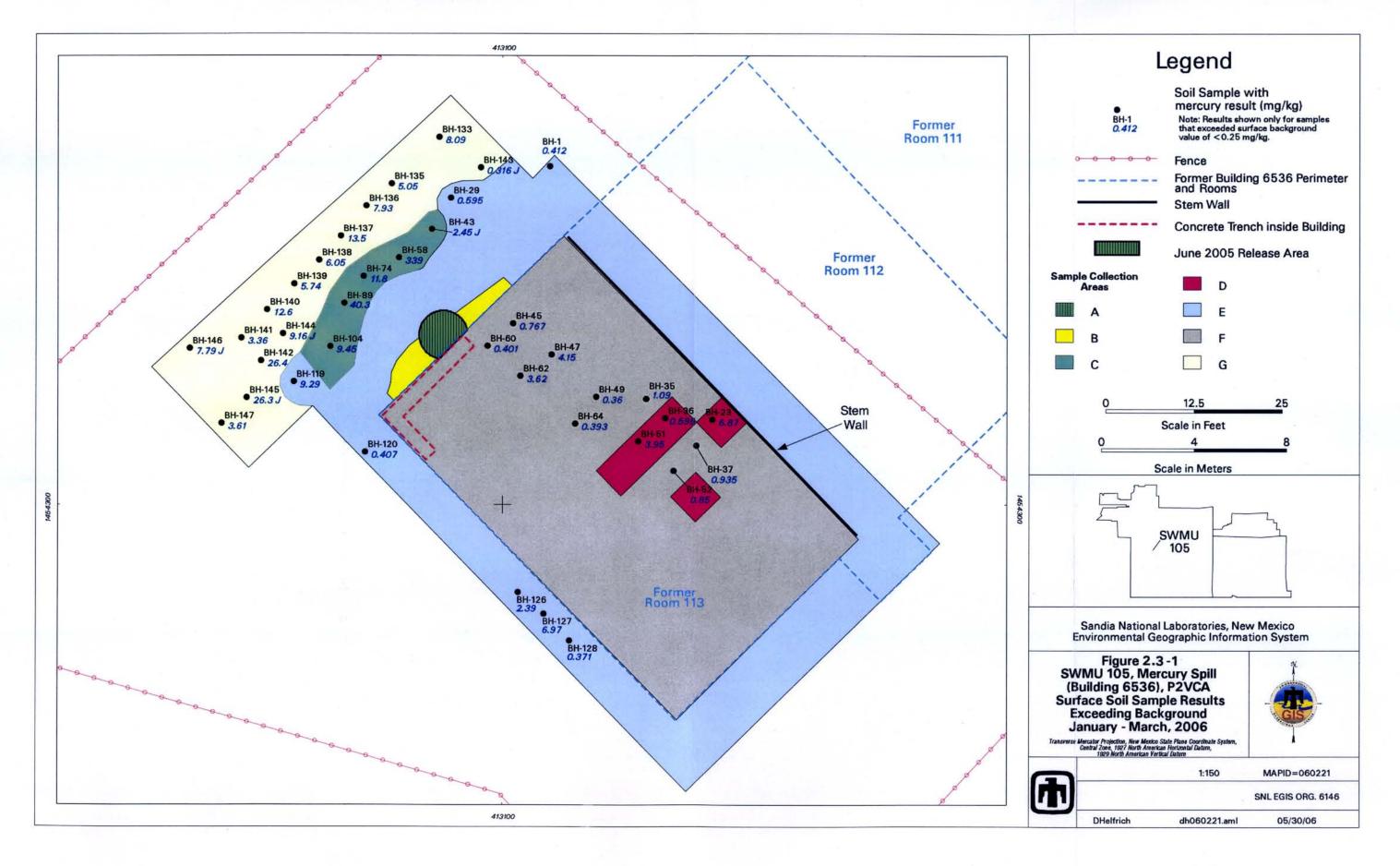
S = Soil sample.

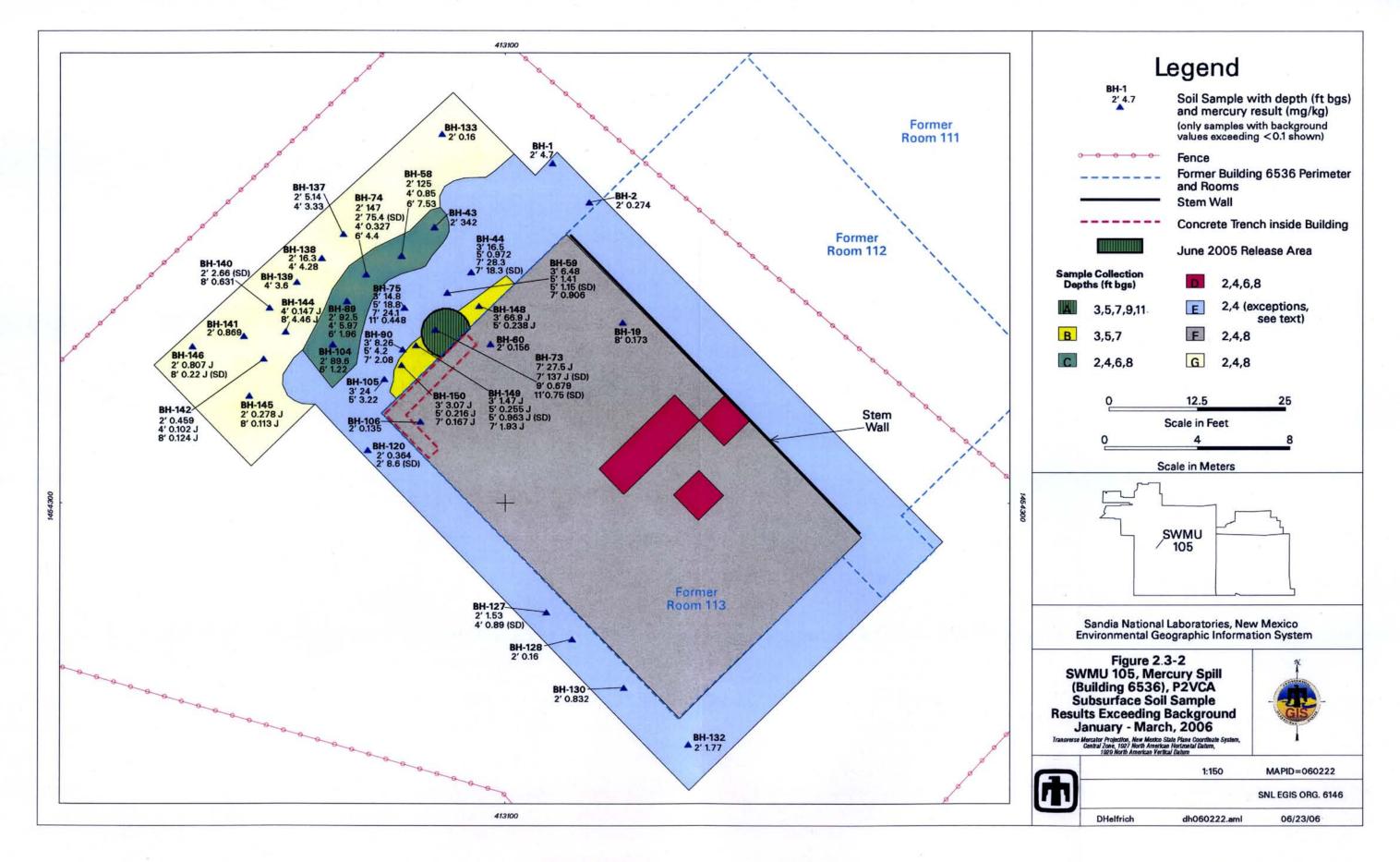
SD = Soil sample duplicate.

SWMU = Solid Waste Management Unit.

^aEPA November 1986.

^bAnalysis request/chain-of-custody record.





Area D (pink) in Figure 2.2-1 represents locations where P1VCA soil-vapor detections were higher than those from adjacent areas. Five boreholes, 105-BH-23, -36, -51, -53, and -66, were sampled at 0, 2, 4, 6, and 8 feet bgs. The analytical results for surface samples at 105-BH-23, -36, and -51 exceed the background value. No subsurface sample results for mercury exceed the background value.

The former footprint of Room 113 was surrounded with a row of sample locations representing the perimeter of Room 113 (Area E [blue] in Figure 2.1-1). There are 42 borehole locations in this area, and samples were collected at 0, 2, and 4 feet bgs in most locations. The perimeter borehole locations that were within, or nearby, the trench area include 105-BH-15, -29, -44, -59, -75, -90, -105, and -119. Boreholes 105-BH-15 and -29 also included a soil sample from 8 feet bgs; both results were ND. The remaining boreholes were sampled at 3, 5, and 7 feet bgs, with Boreholes 105-BH-44 and -75 also sampled at 9 and 11 feet bgs. The results for the surface samples range from 0.00296 to 24 mg/kg of mercury, with 12 of 42 samples exceeding the background value. The subsurface sample results range from ND to 28.3 mg/kg of mercury, with 21 of 93 samples exceeding the background value.

Sample locations within the footprint of Room 113 are designated as area F (gray) in Figure 2.1-1. There were 79 proposed borehole locations, but that number was reduced to 72. The grid row of borehole locations 105-BH-17, -31, -46, -61, -77, -92, and -107 was eliminated as the actual spacing on the ground had to be adjusted to accommodate the topography. This row of locations was not needed. Samples were collected at 0, 2, 4, and 8 feet bgs in this area. The results of the surface samples range from 0.00249 J to 4.15 mg/kg of mercury, with 9 of 72 samples exceeding the background value. The subsurface sample results range from ND to 0.173 mg/kg of mercury, with only 3 of 229 samples exceeding the background value.

After reviewing the preliminary analytical results from the trench and spoils pile areas, an additional 15 borehole locations (105-BH-133 through -147) were added to the northwest of the trench area (Area G [pale yellow] in Figure 2.1-1). Soil samples were collected from 0, 2, 4, and 8 feet bgs. Results from the surface samples range from 0.0142 to 26.4 mg/kg of mercury, with 14 of 15 samples exceeding the background value. The subsurface sample results from this area range from ND to 16.3 mg/kg of mercury, with 15 of 49 samples exceeding the background value.

2.4 Quality Assurance/Quality Control

Field quality control (QC) samples were collected as specified in the Quality Assurance (QA) Plan (SNL/NM April 1996) and in the P2VCA Plan (SNL/NM December 2005). Table 2.4-1 presents the QC requirements for the SWMU 105 P2VCA. As part of the QA requirements, all of the data were validated according to current SNL/NM data validation procedures. The field QC sample results are presented in Section 2.5.

The results of the soil duplicate samples are presented in Table 2.3-1 and have been included in the data set of confirmatory soil samples discussed in Section 2.3.

Equipment blank (EB) sample results are also presented in Table 2.3-1. The EB samples were analyzed by EPA Method 7470A (EPA November 1986). The results for the EB samples range from ND to 0.000148 J mg/liter of mercury.

Table 2.4-1 SWMU 105, Mercury Spill (Building 6536), Field Quality Control Sample Requirements for January–March 2006 Confirmatory Soil Samples

Sample Type	Frequency	Total Number of Samples	Matrix
Duplicate Soil Samples	~5%	34	Soil
Equipment Blank Samples	1 per day	14	Aqueous

SWMU = Solid Waste Management Unit.

To assess the variability of the sample matrix, a calculation of relative percent difference (RPD) between the result of a soil sample and the duplicate of that sample is performed as a demonstration of the accuracy. RPDs cannot be calculated for ND results or those that are estimated with a J qualifier. There were 34 sets of soil samples and duplicates that were analyzed for mercury and 21 sets of results were suitable for calculating RPDs (Table 2.4-2). The RPD values ranged from 3 to 197. This wide range demonstrates the variability of a soil matrix and the heterogeneity of mercury contamination.

2.5 Data Validation

All of the sample results (soil and EB) were verified/validated according to "Data Validation Procedure for Chemical and Radiochemical Data," Rev. 01 (SNL/NM December 2003). Reviews confirmed that all the data results from the analytical laboratory, except for one sample, are defensible and therefore acceptable for use in this Corrective Action Complete (CAC) proposal, fulfilling the data quality objective requirements. Some of the sample results have been qualified with a J, defined as an estimated value. The data validation reports are provided in Annex B. One sample result, 105-BH-143 at 8 feet bgs, received an R qualifier. This rejected determination was due to failure in meeting the laboratory QA/QC requirements (Annex B).

2.6 Waste Management

Mercury-contaminated soil was excavated from the original release point and containerized into 55-gallon, steel drums. Approximately 1 cy of soil was disposed of as hazardous waste according to SNL/NM policy. The waste disposal request forms are provided in Annex C.

Table 2.4-2 SWMU 105, Mercury Spill (Building 6536), Relative Percent Difference Calculations

	Mercury		
	Primary	Duplicate	
ER Sample ID	Sample	Sample	RPD
105-BH-3-4-S	ND	ND	
105-BH-9-4-S	ND	ND	
105-BH-21-2-S	ND	0.0163	
105-BH-26-4-S	ND	ND	
105-BH-30-4-S	0.0142	0.00552	88
105-BH-34-4-S	0.00307	0.0116	116
105-BH-38-4-S	0.0058 J	0.0042 J	
105-BH-43-6-S	0.0195	0.00946	69
105-BH-44-4-S	28.3	18.3	43
105-BH-48-2-S	0.0107	0.0117	9
105-BH-59-2-S	1.41	1.15	20
105-BH-64-4-S	0.00884	0.0168	62
105-BH-66-4-S	0.0487	0.00464 J	
105-BH-69-2-S	0.00879 J	0.0241 J	
105-BH-72-2-S	0.0284	0.0122	80
105-BH-73-4-S	27.5 J	137 J	
105-BH-73-8-S	0.0574	0.75	172
105-BH-74-2-S	147	75.4	64
105-BH-78-2-S	0.0198	0.0051	118
105-BH-83-4-S	0.0128	0.0164	25
105-BH-86-2-S	0.0153	0.00725	71
105-BH-98-2-S	0.00843	0.0246	98
105-BH-100-4-S	0.0393	0.00624 J	
105-BH-103-4-S	0.00954	0.006	46
105-BH-109-2-S	ND	ND	
105-BH-114-2-S	ND	0.00264 J	
105-BH-120-2-S	0.364	8.6	184
105-BH-127-4-S	0.0122	0.89	195
105-BH-131-2-S	0.0184	0.00963	63
105-BH-134-4-S	0.00337	0.00346	3
105-BH-140-2-S	0.0201	2.66	197
105-BH-146-8-S	0.0829 J	0.11 J	
105-BH-147-2-S	0.0115	0.0154	29
105-BH-149-2-S	0.255 J	0.963 J	

BH = Borehole.

ER = Environmental Restoration.

ID = Identification.
J = Estimated value.
mg/kg = Milligrams per kilogram.

ND = Not detected above method detection limit.

RPD = Relative percent difference is calculated with the following equation and rounded to nearest whole number:

$$RPD = \frac{|R_1 - R_2|}{[(R_1 - R_2)/2]} \times 100$$

where: R_1 = Analysis result.

R₂ = Duplicate analysis result.

S = Soil (matrix).

SWMU = Solid Waste Management Unit.

-- = Not calculated.

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3.0 CONCEPTUAL SITE MODEL

The conceptual site model for SWMU 105 is based upon the constituents of concern (COCs) identified from operational history information, process knowledge, and previous investigations. This chapter summarizes the nature and extent of the contamination and the environmental fate of the COCs. Figure 3-1 illustrates the conceptual site model for SWMU 105.

3.1 Nature and Extent of Contamination

The only COC for SWMU 105 has been identified as elemental mercury. The operational history of the site provided evidence that equipment containing mercury had been used inside Building 6536 and that there had been releases of mercury within the building. Other potential types and sources of contamination were identified and eliminated from consideration during the P1VCA (Shaw February 2006). The only COC identified as released to the environment was elemental mercury. The analytical methods used are appropriate for characterizing the identified COC.

The sampling activities conducted during the P2VCA are considered to have resulted in soil samples that adequately represent the soil beneath the foundation of Room 113, as well as the immediate surrounding area. The sampling target depths are sufficient to determine the vertical extent of mercury contamination.

The highest levels of mercury in the soil were present in the uppermost portion of the soil column (typically within the 0- to 2-foot depths). Samples were collected to a depth of 8 feet bgs across the site, except in the trench area where the maximum sample depth was 11 feet bgs. A discussion that took place on March 6, 2006, with the NMED during the sampling event prompted the collection of additional samples from three locations (105-BH-44, -73, and -75) at 9 and 11 feet bgs. The vertical and horizontal extent of contamination has therefore been defined by the sampling and analyses.

SWMU 105 is currently an inactive site at which the building has been demolished, and the primary source of contamination has been eliminated. As a result, migration of any residual mercury in the soil is predominately dependent upon precipitation and occasional surface-water flow. The borehole data collected are adequate for characterizing the migration of mercury in the subsurface.

3.2 Environmental Fate and Transport

The primary release(s) of mercury to the environment at SWMU 105 was to the soil along the northwest foundation wall of Building 6536, Room 113. It is neither clear nor documented as to how or why mercury was present in Room 113. All documentation indicates that two of the three reported incidences of mercury releases in the building occurred prior to the construction of Room 113. Wind, water, and biota are natural mechanisms of COC transport from the primary release point; however, because the area of the release point is relatively small and the source has been removed, these are not considered to be of potential significance. Infiltration of precipitation is also considered to be low at SWMU 105. Because groundwater at the site is

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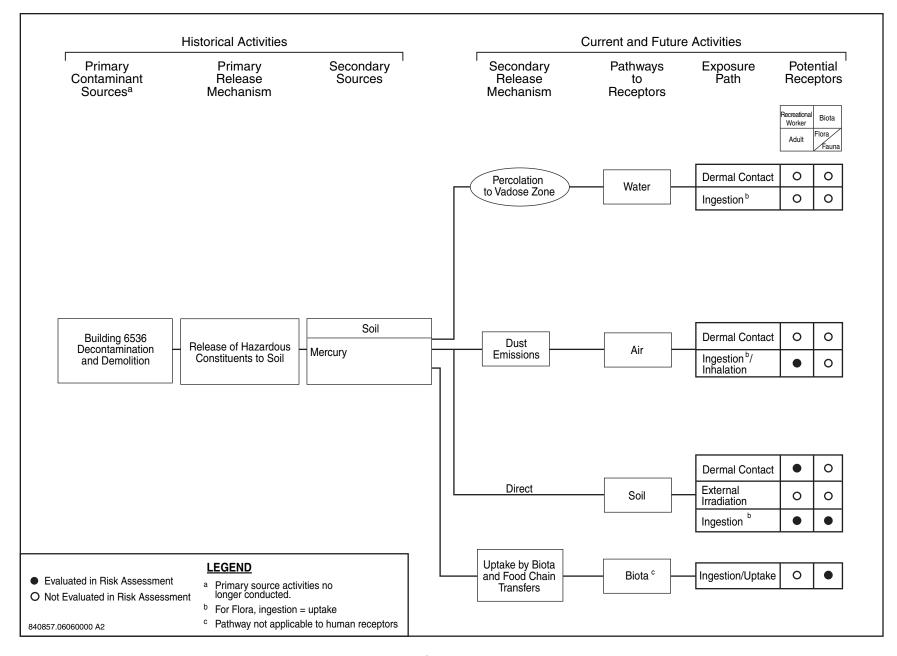


Figure 3-1 SWMU 105, Mercury Spill (Building 6536), Conceptual Site Model Flow Diagram

497 feet bgs (SNL/NM April 2004), the potential for COCs to reach groundwater through the unsaturated zone above the water table is extremely low.

The COCs at SWMU 105 are limited to a single constituent, elemental mercury.

Wind, water, and biota are considered to be of low significance as potential transport mechanisms at this site. Significant leaching into the subsurface soil is unlikely, and leaching into the groundwater at this site is highly unlikely. The potential for transformation of the COC is low

In summary, the design and execution of the confirmatory soil sampling for SWMU 105 was appropriate and adequate to determine the nature and extent of the residual mercury in the soil at the site.

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4.0 SITE ASSESSMENTS

The site assessments for SWMU 105 include risk assessment analyses for human health and ecological risks. Complete details of the human health and ecological risk assessments and uncertainties are provided in Annex D. All data collected for the P1VCA and the P2VCA (except one sample result with an R qualification) are suitable for use in the human health and ecological risk assessments. Two risk assessments were performed for SWMU 105. The first assessment used the data collected from the entire site (Table 1.3-1, mercury only, and Table 2.3-1). For conservatism, a second assessment was performed using a limited data set that included the P1VCA mercury results and results from only those P2VCA boreholes located northwest of the Room 113 foundation (Figure 4-1). This included the six samples collected from the trench area locations during the P1VCA and during the P2VCA, the spoils pile area, and the additional row added at the very northwestern edge of boreholes. The majority of the sample results that exceeded either the surface or the subsurface background values are in these areas. Of the 31 surface samples, 29 sample results exceeded the background value, and of the 113 subsurface samples, 59 sample results exceeded the background value. Using this limited data set provides a representative distribution of residual mercury contamination in the area of primary concern, which exhibited the highest concentrations of mercury in the soil. Six sample locations from the P1VCA, 32 borehole locations from the P2VCA, and a total of 144 soil sample analyses are represented in this data set. The limited data set used in the second risk assessment is provided in Table E-1 in Annex E, and the data set excluded from the second risk assessment is provided in Table E-2.

4.1 Human Health Risk Assessments

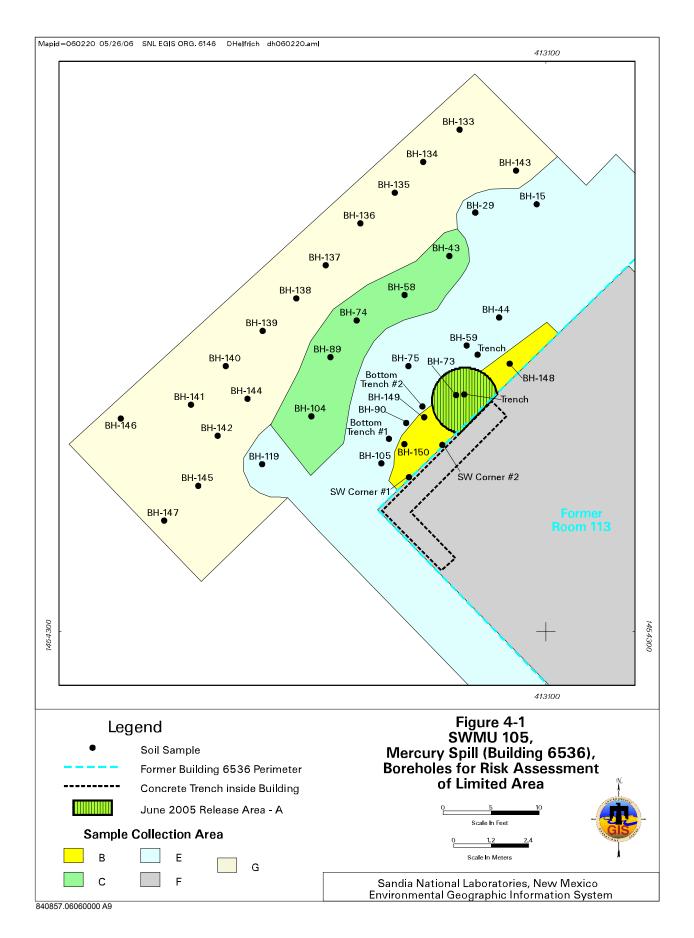
SWMU 105 has been recommended for an industrial land-use scenario (DOE et al. September 1995). Because the soil at the site contains an inorganic COC at levels above the background values, it was necessary to perform a human health risk assessment for the site. Section 4.1.1 presents the results of the human health risk assessment for the entire data set and Section 4.1.2 presents the results for the limited data set.

SWMU 105 contains an identified inorganic COC. Because of the location of the site, the designated industrial land-use scenario, and the nature of contamination, potential exposure pathways identified for the site include soil ingestion, dermal contact, and dust and volatile inhalation for the chemical COC. The same exposure pathways are applied to the residential land-use scenario.

4.1.1 Human Health Risk Assessment for Entire Data Set

Using conservative assumptions and a reasonable maximum exposure approach to risk assessment, calculations for the nonradiological COC (mercury) show that for the industrial land-use scenario the hazard index (HI) (1.19) is slightly greater than the accepted numerical guidance from the NMED. The HI for the residential land-use scenario is 15.0, which is also above the accepted numerical guidance. There was no quantified estimated excess cancer risk; thus, excess cancer risk is below the acceptable risk value provided by the NMED for both

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the industrial and residential land-use scenarios (Bearzi January 2001). No quantified HI or estimated excess cancer risk are associated with the background constituent under either the industrial or residential land-use scenarios for SWMU 105.

Although the HIs for mercury were above the NMED guidelines for the industrial and residential land-use scenarios, the maximum concentration of mercury was used in the risk calculation. Because the site has been adequately characterized, the average concentration is more representative of actual conditions for the entire site. Using the 95% upper confidence limit (UCL) of the mean concentration of mercury for the entire data set (7.7 mg/kg, summarized in Annex D) reduces the total HIs to 0.03 and 0.34 for the industrial and residential land-use scenarios, respectively. Thus, by using a realistic concentration in the risk calculations that more accurately depicts conditions for the entire site, the total HIs are below NMED guidelines. Table 4.1-1 summarizes the HIs and the excess cancer risk calculated using the entire data set from SWMU 105.

Table 4.1-1 SWMU 105, Mercury Spill (Building 6536) Summation of Risks Using the Entire Data Set

	Hazard Index	Hazard Index	
Land-Use	(using maximum	(using UCL of the mean	
Scenario	concentration of mercury)	concentration of mercury)	Excess Cancer Risk
Industrial	1.19	0.03	
Residential	15.0	0.34	
NMED Guidance	<1	<1	<1E-5

Note: Values in **bold** exceed the NMED guidance.

NMED = New Mexico Environment Department.

SWMU = Solid Waste Management Unit.

UCL = Upper Confidence Limit.

-- = Not quantified.

4.1.2 Human Health Risk Assessment for Limited Data Set

Performing the same human health risk assessment for SWMU 105 using the limited data set, the maximum concentration for mercury remains the same as do the calculations for the HIs for both the industrial and residential land-use scenarios. There was no quantified estimated excess cancer risk; thus, excess cancer risk is below the acceptable risk value provided by the NMED for both the industrial and residential land-use scenarios (Bearzi January 2001). No quantified HI or estimated excess cancer risk are associated with the background constituent under either the industrial or residential land-use scenarios for SWMU 105.

Although the HIs were above the NMED guidelines for the industrial and residential land-use scenarios, the maximum concentration was used in the risk calculation. Using the 95% UCL of the mean concentration of mercury (30.5 mg/kg, summarized in Annex D) for the limited data set reduces the total HIs to 0.11 and 1.34 for the industrial and residential land-use scenarios, respectively. The HI for the industrial land-use scenario is below the NMED guidance, but the HI for the residential land-use scenario is above the guidance value. Table 4.1-2 summarizes the HIs and the excess cancer risk calculated using the limited data set from SWMU 105.

Table 4.1-2 SWMU 105, Mercury Spill (Building 6536), Summation of Risks Using the Limited Data Set

Land-Use Scenario	Hazard Index (using maximum concentration of mercury	Hazard Index (using UCL of the mean concentration of mercury)	Excess Cancer Risk
Industrial	1.19	0.11	
Residential	15	1.34	
NMED Guidance	<1	<1	<1E-5

Note: Values in **bold** exceed the NMED guidance.

NMED = New Mexico Environment Department.

SWMU = Solid Waste Management Unit.

UCL = Upper Confidence Limit.

-- = Not quantified.

4.2 Ecological Risk Assessments

Ecological risks associated with SWMU 105 were estimated through a risk assessment that incorporated site-specific information, when available. Hazard quotients greater than unity were initially predicted; however, closer examination of the exposure assumptions revealed an overestimation of risk primarily due to conservative toxicity benchmarks; the use of the maximum concentration, maximum bioavailability, and maximum area use to estimate exposure. Based upon this final analysis, the potential for ecological risks associated with SWMU 105 is expected to be low.

5.0 RECOMMENDATION FOR CORRECTIVE ACTION COMPLETE WITH CONTROLS DETERMINATION

5.1 Rationale

Based upon field data and the human and ecological risk assessment analyses, a determination of CAC with controls (NMED April 2004) is recommended for SWMU 105 for the following reasons:

- The soil has been sampled and adequately characterized for mercury, the COC present at SWMU 105.
- No mercury contamination is present in the soil at levels considered hazardous to human health for the industrial land-use scenario.
- The potential for ecological risks associated with SWMU 105 is expected to be low.

5.2 Criterion

The evidence provided in Section 5.1 supports the recommendation for a determination of CAC with controls (NMED April 2004) for SWMU 105. This is consistent with the NMED NFA Criterion 5, which states, "the SWMU/AOC [Area of Concern] has been characterized or remediated in accordance with current applicable state or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use" (NMED March 1998).

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6.0 REFERENCES

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ANNEX A SWMU 105, Mercury Spill (Building 6536) Analysis Request/Chain-of-Custody Forms

ANALYSIS REQUEST AND CHAIN OF CUSTODY

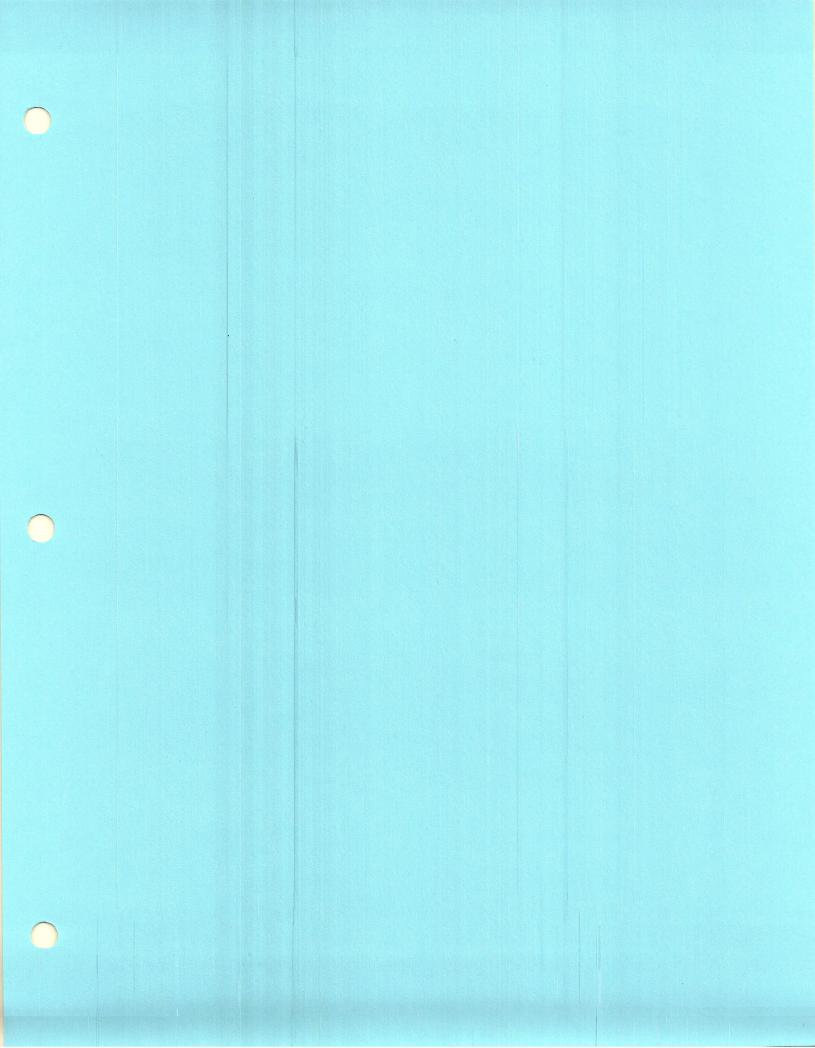
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067822-004	spoils pile	1'	NA	7/6/05 @ 1430	s	AG	250ml	None	G	5.4	Hg.composite with 385	fer-TCLP	
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CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Page 1 of 2 Internal Lab 609349 AR/COC SMO Use Batch No. Prolect/Task No.: 98046,02.02.09 Waste Characterization Date Samples Shipped: / 1-75-00 Dept. No./Mail Stop: 6146/1087 SMO Authorization: Ota fan -Send preliminary/copy report to: 59712 Carrier/Waybill No. Project/Task Manager: Brenda Langkopf Edie Kent 803/556-8171 Contract #: PO 21671 P2VCA@SWMU105 Lab Contact: Project Name: Released by COC No.: Lab Destination: Record Center Code: 988 BOTTO ORDA ☑ Validation Required Pam Puissant/505-284-3124 ER047 SMO Contact/Phone: Logbook Ref. No.: Bill To:Sandia National Labs (Accounts Payable) Lorraine Herrera/505-844-3199 Service Order No. CFO56-06 Send Report to SMO: P.O. Box 5800 MS 0154 Location Tech Area 1545367 Reference LOV(available at SMO) Albuquerque, NM 87185-0154 Buildina Room Lab Sample Parameter & Method Collection Sample ER Site Date/Time(hr) Sample Container Preserv-ER Sample ID or Pump ID Method Type Requested ative Collected Matrix Type | Volume Sample No.-Fraction Sample Location Detail Depth (ft) No. Mercury (EPA 7471A) G SA S G 125 ml 4C 001 012406/1140 074114-002 105-BH-43-0-S 0 105 Mercury (EPA 7471A) 002 S G 4C G SA 125 ml 074115-002 105-BH-43-2-S 2 105 012406/1145 003 G SA Mercury (EPA 7471A) 0 012406/1132 S G 125 ml 4C 074174-002 105-BH-58-0-S 105 004 S G 4C G Mercury (EPA 7471A) 2 105 012406/1135 125 ml 074175-002 105-BH-58-2-S SA Mercury (EPA 7471A) 005 S G 4C G 074236-002 105-BH-74-0-S 0 105 012406/1115 125 ml 006 4C G SA Mercury (EPA 7471A) S G 125 ml 074237-002 105-BH-74-2-S 2 105 012406/1124 s G 125 ml 4C G DU Mercury (EPA 7471A) 60 T 074238-002 105-BH-74-2-SD 2 105 012406/1124 008 105-BH-89-0-S 0 012406/1103 s G 125 mì 4C G SA Mercury (EPA 7471A) 074296-002 105 S G 125 ml 4C G Mercury (EPA 7471A) 009 2 012406/1113 074297-002 105-BH-89-2-S 105 s G 125 ml 4C G SA Mercury (EPA 7471A) 010 105-BH-104-0-S 0 012406/1050 074355-002 105 011 s 125 ml 4C G SA Mercury (EPA 7471A) 074356-002 105-BH-104-2-S 105 012406/1100 G Special Instructions/QC Requirements Abnormal RMMA Yes ~ NO Ref. No. Sample Tracking Smo Use ☑ Yes ☐ No Conditions on ✓ Disposal by lab EDD Sample Disposal Return to Client Date Entered(mm/dd/yy) **Turnaround Time** ✓ Yes No Receipt 7 Day 30 Day Level D Package 15 Day Entered by: Return Samples By: 3 DAY 2 **Negotiated TAT** *Send report to: QC inits. Name Init Company/Organization/Phone/Cellular Preliminary report (.pdf) to srgriff@sandia.gov + blangk@sandia.gov Signature Sample William Gibson Weston/6146/284-5232/239-7367 Final report to Stacey Griffith MS1087/Org 6146 Lab Use Team Jeff Lee Stone Lion/6146/284-3309/228-9598 (505) 284-2588/ (505) 379-7588 Members Robert Lynch Weston/6146/250-7090 3 day turnaround time Stacy Griffith Gram/6146/284-2588/379-7588 *Please list as separate report. .Relinquished by Org. 64 9 Date 128 106 Time 0840 4.Relinquished by Org. Date Time Date 1/25/06Time 0840 . Received by 4. Received by Org. Date Time Org. 1/2// Date / ZC/// Time 2.Relinguished by Date Time 5.Relinquished by Org. ノロサビ Date 4/26/ok Time 0920 5. Received by Ora, Date Time . Received by Org. 3.Relinguished by Org. Date / Time 6.Relinquished by Org. Date Time

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Abnormal Conditions on Receipt

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Recipient Initials

CONTRACT LABORATORY

ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Page 1 of 2

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Location	Tech Area							,				
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Sample No-	ER Sample ID or	Pump	ER		Sample		ntainer	Preserv-	Collection		l .	Lab Sample
Fraction	Sample Location detail	Depth (ft)		Collected	Matrix	туре	Volume	ative	Method	Туре	Requested	ID
074146-002	105-BH-51-2-S	2	105	012506/0920	S	G	125 ml	4C	G	SA	Mercury (EPA 7471A)	012
074147-002	105-BH-51-4-S	4	105	012506/09181	s	G	125 ml	4C	G	SA	Mercury (EPA 7471A)	0/3
074148-002	105-BH-51-6-S	6	105	012506/0925	s	G	125 ml	4C	G	SA	Mercury (EPA 7471A)	014
074149-002	105-BH-51-8-S	8	105	012506/0930	S	G	125 ml	4C	G	SA	Mercury (EPA 7471A)	0/5
074154-002	105-BH-53-0-S	0	105	012506/0954	S	G	125 ml	4C	G	SA	Mercury (EPA 7471A)	016
074155-002	105-BH-53-2-S	2	105	012506/1005 \	s	G	125 ml	4C	G	SA	Mercury (EPA 7471A)	017
074156-002	105-BH-53-4-S	4	105	012506/1002	S	G	125 ml	4C	G	SA	Mercury (EPA 7471A)	0/8
.074157-002	105-BH-53-6-S	6	105	012506/1018	S	G	125 ml	4C	G	SA	Mercury (EPA 7471A)	019
074158-002	105-BH-53-8-S	8	105	012506/1017	s	G	125 ml	4C	G	SA	Mercury (EPA 7471A)	020
074456-002	105-EB-2	NA	105	012506/1456	S	Pg	250 ml	HNO3	G	EB	Mercury (EPA 7470A)	15463100
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Abnormal Cond Recipient Initial	itions on Receipt s M			LAB USE								

CONTRACT SORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

internal Lab	/ ^	~	INWL	SIS INEQUI		יטאוו		I OF C	03101	J 1		Page_1 0	1 2
Batch No.	11			SMQ Use /							AR/COC	60	9352
Dept. No./Mail Stop:	6146/1087	Date Samp	es Shipp	ed: 1/30/00		Project/	Task No.:	98046.02.02	2.09	_	Waste Characterization	on	
Project/Task Manager:	Brenda Langkopf	Carrier/Way	bill No.	59863	2	SMO A	uthorizatio	n: <i>Off</i>	yn-		-Send preliminary/copy	y report to:	
Project Name:	P2VCA@SWMU105	Lab Contac	t:	Edie Kent 803/556-8	3171	Contrac	t #: <u>PO 21</u>	1671				·	
Record Center Code:	NA	Lab Destina	ation:	Gel		1					Released by COC No	.:	
Logbook Ref. No.:	ER047	SMO Contac	VPhone:	Pam Puissant/505-2	84-3124						✓ Validation Required		
Service Order No.	CFO56-06	Send Report	to SMO:	Lorraine Herrera/505	5-844-3199	9					Bill To:Sandia National Labs	(Accounts Payr	able)
Location	Tech Area										P.O. Box 5800 MS 01	54	
Building	Room			Reference			ble at SI	MO)			Albuquerque, NM 8718	85-0154	
Sample NoFraction	ER Sample ID or Sample Location De	Pump tail Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Type	ntainer Volume	Preserv- ative	Collection Method	Sample Type	Parameter & Me Requested		Lab Sample ID
4 073973-002	105-BH-7-0-S	0	105	12606/0905	s	G	125 ml	4C	G	SA	Mercury (EPA 7471A)		154847
9 073974-002	105-BH-7-2-S	2	105	12606/0922	s	G	125 ml	4C	G	SA	Mercury (EPA 7471A)		002
• 073975-002	105-BH-7-4-S	4	105	12606/0920	s	G	125 ml	4C	G	SA	Mercury (EPA 7471A)		003
• 073976-002	105-BH-8-0-S	0	105	12606/0917	S	G	125 ml	4C	G	SA	Mercury (EPA 7471A)		004
073977-002	105-BH-8-2-S	2	105	12606/0927	s	G	125 ml	4C	G	SA	Mercury (EPA 7471A)		005
¢ 073978-002	105-BH-8-4-S	4	105	12606/0925	s	G	125 ml	4C	G	ŞA	Mercury (EPA 7471A)		006
• 073979-002	105-BH-9-0-S	0	105	12606/0924	S	G	125 ml	4C	G	SA	Mercury (EPA 7471A)		007
073980-002	105-BH-9-2-S	2	105	12606/0937	s	G	125 ml	4C	G	SA	Mercury (EPA 7471A)		208
• 073981-002	105-BH-9-4-S	4	105	12606/0935	s	G	125 ml	4C	G	SA	Mercury (EPA 7471A)		009
073982-002	105-BH-9-4-SD	4	105	12606/0935	s	G	125 ml	4C	G	DU	Mercury (EPA 7471A)		010
073983-002	105-BH-10-0-S	0	105	12606/0933	s	G	125 ml	4C	G	SA	Mercury (EPA 7471A)		011:
RMMA	_Yes _√No	Ref. No.		Sample Tracking		Sma U	se	Special Ins			rements	Abnorm	
Sample Disposal	Return to Client	Disposal by la		Date Entered(mm/d	ld/ <u>yy)</u>		<u> </u>	-		No		Condition	*
Turnaround Tin	ne 7 Day	15 Day 3	0 Day	Entered by:	<u>::::::::::::::::::::::::::::::::::</u>	<u> </u>	. :	Level D Pa	ckage	_ ✓ Ye	s No	Receipt	•
Return Samples By	:		Negotia	ited TAT	QC inits		<u> </u>	*Send repo	ort to:				
	Name	Signature	Init	Company/Orga			ellular	Preliminary	report (.pdf) to srgriff(@sandia.gov + blangk@san	dia.gov	Carried With
Sample		Villian & S.		Weston/6146/284-5	232/239-7	367		Final repor	rt to Stacy	Griffith MS	S1087/Org 6146		Lab Use
Team	Robert Lynch	affice	ar	Weston/6146/250-7	7090			(505) 284	-2588/ (505)	379-7588	3	· · · · · · · · · · · · · · · · · · ·	
Members			<u> </u>					_					
				15 day turnaround				ound	time				
	1 000								t as separa	te report.			
1.Relinquished by	taller						quished b	y		Org.	Date	Tin	ne
1. Received by				te 1/30 00 Time 0940 4. Receiv						Org.	Date	Tin	
2.Relinquished by		No Org. 114	6 Date	Time /	30	_	iquished b	у		Org.	Date	· Tin	
2. Received by	Adelli	Org,		310 de Timesa	10		elved by			Org.	Date	Tin	
3.Relinquished by		Org.	Date	Time			nquished b	у		Org.	Date	Tin	
3. Received by		Org.	Date	Time		6. Rec	eived by			Org.	Date	Tin	ne

Page_2_ of 2 AR/COC-609352 98046,02,03,01 Project/Task No.: Project Name: P2VCA@SWMU105 Project/Task Manger: Brenda Langkopf Location Tech Area Reference LOV (available at SMO) Lab use Building Room Parameter & Method ER Date/Time (hr) Sample Container Preserv-Collection Sample Lab Sample ER Sample ID or Pump Sample No-Collected Matrix Type Volume ative Method Type Requested ID Depth (ft) Site No. Fraction Sample Location detail 012 G 125 ml G Mercury (EPA 7471A) 12606/0941 4C SA **9073984-002** 105-BH-10-2-S 105 du_{S} 12606/094 G 125 ml 4C G SA Mercury (EPA 7471A) 4 105 073985-002 105-BH-10-4-S 12606/0946 S G 125 ml 4C G SA Mercury (EPA 7471A) 105 073986-002 105-BH-11-0-S G G 2 105 12606/0951 S 125 ml 4C Mercury (EPA 7471A) 073987-002 105-BH-11-2-S S 125 ml 4C G Mercury (EPA 7471A) 4 12606/0950 • 073988-002 105-BH-11-4-S 105 S G 4C G 073989-002 105-BH-12-0-S 0 105 12606/0947 125 ml Mercury (EPA 7471A) S 4C G Mercury (EPA 7471A) 2 12606/0955 G 125 ml 105-BH-12-2-S 105 073990-002 S 4C G G 125 ml Mercury (EPA 7471A) 073991-002 105-BH-12-4-S 4 105 12606/0954 LAB USE Abnormal Conditions on Receipt Recipient Initials

CONTRACT LABORATORY

Internal Lab	ANALYSIS REQUEST AND CHAIN OF CUSTODY												2
Batch No.	4			SMO Use							AR/COC	609	9353
Dept. No./Mail Stop:	6146/1087	Date Samp	oles Snipp	ed: 1-26-4	0/2	Project	Task No.:	98046.02.02	.09/ /		Waste Characterization		
Project/Task Manager.	Brenda Langkopf	Carrier/Wa		597526			uthorizatio		4 4 1	SASTE	-Send preliminary/copy re	eport to:	
Project Name:	P2VCA@SWMU105	Lab Contac	-	Edie Kent 803/556-8			rt #: PO 21		1/0				
Record Center Code:	NA	Lab Destin	ation:	Gel 5.C.		i					Released by COC No.:_		_
Logbook Ref. No.:	ER047	SMO Contac	ct/Phone:	Pam Pulssant/505-28	84-3124	1					☑ Validation Required		
Service Order No.	CFO56-06	Send Report	t to SMO:	Lorraine Herrera/505	-844-3199	•			•		Bill To:Sandia National Labs (Ad	counts Payat	ole)
Location	Tech Area								- ,	_ 0/	P.O. Box 5800 MS 0154		
Building	Room			Reference	e LOV(availa	ble at Si	ио) / С	5466	9/0	Albuquerque, NM 87185-	0154	
	ER Sample ID or	Pump	ER Site		Sample		ntainer	Preserv-	Collection		Parameter & Meth	od	Lab Sample
Sample NoFraction	Sample Location Det	ail Depth (ft)	No.	Collected	Matrix	Туре	Volume	ative	Method	Туре	Requested		ID.
• 073954-002	105-BH-1-0-S	0	105	012506/1327	S	G	125 ml	4C	G.	SA	Mercury (EPA 7471A)		001
3 073955-002	105-BH-1-2-S	2	105	012506/1341	s	G	125 ml	4C	G	SA	Mercury (EPA 7471A)		02
. 073956-002	105-BH-1-4-S	4	- 105	012506/1350	s	G	125 mi	4C	G	SA	Mercury (EPA 7471A)		103
1 073957-002	105-BH-2-0-S	0	105	012506/1354	s	G	125 ml	4C	G	SA	Mercury (EPA 7471A)		004
~ 073958-002	105-BH-2-2-S	2	105	012506/1404	s	G	125 ml	4C	G	SA	Mercury (EPA 7471A)		005
<u>> 073959-002</u>	105-BH-2-4-S	4	105	012506/1400	s	G	125 ml	4C	G	SA	Mercury (EPA 7471A)		006
1 073960-002	105-BH-3-0-S	0	105	012506/1402	s	G	125 ml	4C	G	SA	Mercury (EPA 7471A)		w7
073961-002	105-BH-3-2-S	2	105	012506/1414	s	G	125 ml	4C	G	SA	Mercury (EPA 7471A)		w8
073962-002	105-BH-3-4-S	4	105	012506/1412	S	G	125 ml	4C	G	SA	Mercury (EPA 7471A)		wg
- 073963-002	105-BH-3-4-SD	4	105	012506/1412	s	G	125 ml	4C	G	DU	Mercury (EPA 7471A) 🚜	ald OK	010
\ 073964-002	105-BH-4-0-S	0	105	012506/1415	s	G	125 ml	4C	G	SA	Mercury (EPA 7471A)	ŕ	011
RMMA	☐Yes ☑No	Ref. No.		Sample Tracking		Smo U	se	Special Inst	tructions/C	C Require	ements	Abnorma	ıl
Sample Disposal	Return to Client	Disposal by la	ab	Date Entered(mm/dd	l/yy)			EDD 🖸	Yes 🗌			Condition	ns on
Turnaround Tim	e 7 Day 🗸	15 Day 🔲 3	30 Day	Entered by:				Level D Pac	kage	✓ Yes	No 🗌 No	Receipt	
Return Samples By:	,		Negotia	ted TAT	QC inits			*Send repo	rt to:				
	Name	Signature o	Init	Company/Organ	nization/P	hone/Ce	ellular	Preliminary	report (.pdf)	to srgriff@)sandia.gov + blangk@sandia	.gov	
Sample	William Gibson	Jebleed Sel	12/14	Weston/6146/284-52				•		-	S1087/Org 6146		ab Useعلر
Team	Jeff Lee	Les House		Stone Lion/6146/284	-3309/220	3-9598		(505) 284-2	2588/ (505)	379-7588			0.03
Members	Gilbert Quintana	selet 24 mily										-	ery -
	Stacy Griffith	CHA	SPG	Gram/6146/284-258	8/ 379-75	88		15 day	turnar	ound f	time	,	v
		baltinel.	RC	Weston/6146/250-70	090			*Please list	as separa	te report.			
1.Relinquished by	Willend			1-26-05 Time 08	545	4.Relin	quished b	у		Org.	Date	Tim	е
1. Received by	Sanfizer al				45	4. Rec	eived by			Org.	Date	Tim	
2.Relinquished by	Sat Byen			ate 1-21-& Time 1230 5.Relinquished by				у		Org.	Date	Tim	
2. Received by	Me John	org. Gel								Org.	Date	Tim	
3.Relinquished by	,	Org.	Date	Time	_	6.Relin	quished b	У		Org.	Date	Tim	е

6. Received by

Org.

Date

Time

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Org.

Date

Time

Page_2_ of _2 AR/COC-60935 Project Name: P2VCA@SWMU105 Project/Task Manger: Brenda Langkopf Project/Task No.: 98046.02.03.01 Location Tech Area Building Reference LOV (available at SMO) Room Lab use Sample No-ER Sample ID or Container Pump ER Date/Time (hr) Preserv-Collection Sample Parameter & Method Lab Sample Fraction Sample Location detail Depth (ft) Site No. Collected Matrix Type Volume Method ative Type Requested lD 073965-002 105-BH-4-2-S 105 012506/1423 s G 125 ml 4Ç G Mercury (EPA 7471A) SA 073966-002 105-BH-4-4-S 4 G 4C 105 012506/1421 S 125 ml G Mercury (EPA 7471A) 073967-002 105-BH-5-0-S 0 105 012506/1425` S G 125 ml 4C G Mercury (EPA 7471A) 073968-002 105-BH-5-2-S 2 s 105 012506/1432 G 125 ml 4C G Mercury (EPA 7471A) 073969-002 105-BH-5-4-S 4 105 012506/1436 S G 125 ml 4C G Mercury (EPA 7471A) 073970-002 105-BH-6-0-S 0 105 012506/1434 S G 125 ml 4C G Mercury (EPA 7471A) 073971-002 105-BH-6-2-S 2 105 012506/1445 S G 125 ml 4C Mercury (EPA 7471A) G 073972-002 105-BH-6-4-S 4 012506/1444 105 S 125 ml 4C G Mercury (EPA 7471A) Abnormal Conditions on Receipt LAB USE Recipient Initials



CONTRACT . .3ORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab		Α	NALY	ΣY		Page 1 of	2						
Batch No.	iA			SMO Use							AR/COC	609	9354
	6146/1087	Date Samo	les Shipp	ed: /- 30- C	7	Project/	Task No.:	98046.02.02	.09_7		Waste Characterization		
Project/Task Manager:	Brenda Langkopf	Carrier/Wa		59863		SMO A	uthorization	n: 04	Un	GNID	-Send preliminary/copy re	eport to:	1
Project Name:	P2VCA@SWMU105	Lab Contac	,	Edie Kent 803/556-81	171	Contrac	t #: PO 21	671		-		•	
Record Center Code:	NA	Lab Destina	ation:	Gel		1			-		Released by COC No.:		
Logbook Ref. No.:	ER047	SMO Contac	t/Phone:	Pam Puissant/505-28	34-3124	ĺ					✓ Validation Required		
Service Order No.	CFO56-06	Send Report	to SMO:	Lorraine Herrera/505	-844-3199	9					Bill To:Sandia National Labs (A	ccounts Payat	ole)
Location	Tech Area										P.O. Box 5800 MS 0154		
Building	Room			Referenc	e LOV(availal	ole at SN	MO)			Albuquerque, NM 87185-	-0154	
	ER Sample ID or	Pump	ER Site	Date/Time(hr)	Sample	Co	ntainer	Preserv-	Collection	Sample	Parameter & Meth	od	Lab Sample
Sample NoFraction	Sample Location Deta	il Depth (ft)	No.	Collected	Matrix	Type	Volume	ative	Method	Туре	Requested		ID
073992-002	105-BH-13-0-S	0	105	012606/1001	s	G	125 ml	4C	G	SA	Mercury (7471A)		15484702
o 073993-002	105-BH-13-2-S	2	105	012606/1006	_ s	G	125 ml	4C	G	SA	Mercury (7471A)		1548600
073994-002	105-BH-13-4-S	• 4	105	012606/1005	S	Ğ	125 ml	4C	G	ŞA	Mercury (7471A)		002
073995-002	105-BH-14-0-S	· o	105	012606/1002	s	G ·	125 ml	4C	G	ŞA	Mercury (7471A)		003
073996-002	105-BH-14-2-S	2	105	012606/1010	s	G	125 ml	4C	G	SA	Mercury (7471A)		004
073997-002	105-BH-14-4-S	4	105	012606/1008	s	G	125 ml	4C	G	SA	Mercury (7471A)		005
ø 074053-002	105-BH-28-0-S	0	105	012606/13363	# s	G	125 ml	4C	G	SA	Mercury (7471A)		006
● 074054-002	105-BH-28-2-S	2	105	012606/1390	W/s	G	125 ml	4C	G	SA	Mercury (7471A)		007
• 074055-002	105-BH-28-4-S	4	105	012606/1355	W/s	G	125 ml	4C	G	SA	Mercury (7471A)		008
074111-002	105-BH-42-0-S	0	105	012606/13	alls	G	125 ml	4C	G	SA	Mercury (7471A)		009
<i>•</i> 074112-002	105-BH-42-2-S	2	105	012606/1352	s	G	125 ml	4C	G	SA	Mercury (7471A)		010
RMMA		Ref. No.		Sample Tracking		Smo U	șe · · · ·	Special Ins			ements	Abnorma	
Sample Disposal	Return to Client	Disposal by I	ab	Date Entered(mm/do	1/ <u>yy)</u>		<u> </u>	EDD L	Yes			Condition	1
Turnaround Tin	ne 🗌 7 Day 🗹 1	.5 Day :	30 Day	Entered by:				Level D Pa	ckage	✓ Yes	No	Receipt	
Return Samples By	:		Negotia	ated TAT	QC inits		<u> </u>	*Send repo					* . * *
	Name	Signature	Init	Company/Orga			ellular	Preliminary	report (.pd	f) to srgriff@	sandia.gov + blangk@sandi	a.gov	a natifica a air a
Sample	William Gibson W	Mian Buch		Weston/6146/284-52				Final repor	t to Stacey	Griffith M	S1087/Org 6146		Lab Use
Team wy	Jeff-Lee		+ 4,	Stone-Lion/6146/28/	1-3300/22	8 0508	<u> </u>	(505) 284-	·2588 / (505) 379 - 7588			4-11-11-11-4
Members ₩ 🕅	Gilbert Quintana			Shaw/6146/284-330	9/238-94	47							
	Stacy Griffith	Drafth	36	Gram/6146/284-258	8/379-75	88]15 day	/ turna	round 1	time		
	Robert Lynch	Hurl	Ri	Weston/6146/250-7		*Please lis	t as separa	te report.					
1.Relinquished by		Org. 614	Date		nquished b	у		Org.	Date	Tim	e		
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Page_2_ of _2 AR/COC-609354 P2VCA@SWMU105 Brenda Langkopf Project/Task No.: 98046.02.02.09 Project Name: Project/Task Manger: Location Tech Area Reference LOV (available at SMO) Lab use Building Room ER Sample ID or ER Date/Time (hr) Sample Container Preserv-Collection Sample Parameter & Method Lab Sample Sample No-Pump Depth (ft) | Site No. Collected Matrix Type Volume ative Method Type Requested ID Fraction Sample Location detail 012606/1345 S G 125 ml G Mercury (7471A) 105-BH-42-4-S 105 4C SA **4** 074113-002 4 012 0 105 012606/1350 S G 125 ml 4C G Mercury (7471A) ***** 074171-002 105-BH-57-0-S 0/2 2 012606/1355 S G 125 ml 4C G Mercury (7471A) 105 074172-002 105-BH-57-2-S 012606/1354 S G 125 ml 4C G Mercury (7471A) 4 • 074173-002 105-BH-57-4-S 105 SA Mercury (7471A) S 4C G 074230-002 105-BH-72-0-S 0 105 012606/1352 G 125 ml SA Mercury (7471A) 2 012606/1359 S G 125 ml 4C G 105-BH-72-2-S 105 • 074231-002 DU Mercury (7471A) S G 4C G 125 ml ● 074232-002 105-BH-72-2-SD 2 105 012606/1359 4 012606/1358 S G 125 ml 4C G SA Mercury (7471A) 105-BH-72-4-S 105 074233-002 5491400 DIW 250 ml HNO3 C EB Mercury (7470A) 105 012606/1440 ø 074457-002 105-EB-3 NA LAB USE Abnormal Conditions on Receipt Recipient Initials

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Internal Lab	() 1	Α	NAL	SIS REQUE	YC		Page 1 o	f 2					
Batch No.	IA.			SMO Use							AR/COC	60	9355
Dept. No./Mail Stop:	6146/1087	Date Samp	les Shipp	ed: /- 30.0	06	Project/	Task No.:	98046.02,02	2.09		Waste Characterizati	on	
Project/Task Manager:	Brenda Langkopf	Carrier/Wa	ybill No.	5986	3	SMO A	uthorizatio	n:_ <i>Olfg-</i>	for "	mu	-Send preliminary/copy	y report to:	
Project Name:	P2VCA@SWMU105	Lab Contac	t:	Edie Kent 803/556-8			t #: <u>PO 21</u>						
Record Center Code:	NA	Lab Destina	ation:	Gel							Released by COC No	:	
Logbook Ref. No.:	ER047	SMO Contac	t/Phone:	Pam Puissant/505-28	34-3124						✓ Validation Required		
Service Order No.	CFO56-06	Send Report	to SMO:	Lorraine Herrera/505	-844-3199	•					Bill To:Sandia National Labs	(Accounts Paya	able)
Location	Tech Area										P.O. Box 5800 MS 01	54	
Building	Room			Reference	e LOV(availai	ble at Si	MO)			Albuquerque, NM 871	85-0154	
	ER Sample ID or	Pump	ER Site	Date/Time(hr)	Sample		ntainer	Preserv-	Collection	Sample	Parameter & Me	ethod	Lab Sample
Sample NoFraction	Sample Location De	tail Depth (ft)	No.	Collected	Matrix	Туре	Volume	ative	Method	Туре	Requested	<u> </u>	ID
074293-002	105-BH-88-0-S	0	105	012606/1407	s	G	125 ml	4C	G	SA	Mercury (7471A)		154879
074294-002	105-BH-88-2-S	2	105	012606/1411	S	G	125 ml	4C	G	SA	Mercury (7471A)		010
074295-002	105-BH-88-4-S	4	105	012606/1410	s	G	125 ml	, 4C	G	SA	Mercury (7471A)		01/
074351-002	105-BH-103-0-S	0	105	012606/1408	s	G	125 ml	4C	G	SA	Mercury (7471A)		012
074352-002	105-BH-103-2-S	2	105	012606/1415	S	G	125 ml	4C	G	SA	Mercury (7471A)		013
074353-002	105-BH-103-4-S	4	105	012606/1413	s	G	125 ml	4C	G	SA	Mercury (7471A)		014
074354-002	105-BH-103-4-SD	4	105	012606/1413	s	G	125 ml	4C	G	DU	Mercury (7471A)		015
074410-002	105-BH-118-0-S	. 0	105	012606/1417	s	G	125 ml	4C	G	SA	Mercury (7471A)		016
074411-002	105-BH-118-2-S	2	105	012606/1421	s	G	125 ml	4C	G	SA	Mercury (7471A)		017
074412-002	105-BH-118-4-S	4	105	012606/1419	S	G	125 ml	4C	G	SA	Mercury (7471A)		018
074452-002	105-BH-132-0-S	0	105	012606/1432	du/s	G	125 ml	4C	G	SA	Mercury (7471A)		019
RMMA	YesNo	Ref. No.		Sample Tracking		Smo U	se ·	Special Ins	structions/	QC Requir	ements	Abnorm	nal
Sample Disposal	Return to Client	✓ Disposal by I	ab	Date Entered(mm/de	d/yy)			EDD [✓ Yes 🗌	No		Condition	ons on
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	Name	Signature	Init	Company/Orga	nization/P	hone/C	ellular	Preliminary	report (.pd	f) to srgriff@	@sandia.gov + blangk@san	idia.gov	
Sample	William Gibson			Weston/6146/284-5	232/239-7	367		-			1087/Org 6146	1	Lab Use
Team	Jeff Lee			Stone Lion/6146/28	4-3309/22	8-9598		- '	-2588/ (505		-	: *	
Members	Gilbert Quintana	Welton I	1116					1 ```		,		i	
	Stacy Griffith	DONVAL.	816							around	time		
	Robert Lynch	White	ZL	Weston/6146/250-7090					t as separ				
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Page_2_ of _2 AR/COC-6093 P2VCA@SWMU105 Project/Task No.: 98046.02.03.01 Project Name: Project/Task Manger: Brenda Langkopf Location Tech Area Reference LOV (available at SMO) Building Room Lab use ER Sample ID or Date/Time (hr) Container Parameter & Method Sample No-Pump ER Sample Preserv-Collection Sample Lab Sample Type Volume Depth (ft) Site No. Collected Method D Fraction Sample Location detail Matrix Type Requested 020 074453-002 105-BH-132-2-S 105 012606/1427 S G 125 ml 4C G Mercury (7471A) 15489300 S G 125 ml 074454-002 105-BH-132-4-S 4 105 012606/1425 4C G Mercury (7471A) 002 074448-002 105-BH-131-0-S 0 012706/1010 S G 125 ml 4C G 105 Mercury (7471A) 003 074449-002 2 012706/1109 S 125 ml 4C G 105-BH-131-2-S 105 SA Mercury (7471A) s 004 2 012706/1109 G 125 ml G 074450-002 105-BH-131-2-SD 105 4C Mercury (7471A) 005 S 074451-002 105-BH-131-4-S 4 105 012706/1108 125 ml 4C G SA Mercury (7471A) 006 0 S 4C G 074445-002 105-BH-130-0-S 105 012706/1011 125 ml SA Mercury (7471A) 2 S 125 ml G 074446-002 105-BH-130-2-S 105 012706/1113 Mercury (7471A) 008 074447-002 105-BH-130-4-S 4 105 012706/1112 S G 125 ml 4C G Mercury (7471A) LAB USE Abnormal Conditions on Receipt Recipient Initials

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ANALYSIS REQUEST AND CHAIN OF CUSTODY Page 1 of 2 Internal Lab 609356 AR/COC Batch No. SMO Use Date Samples Shipped: 1-30 - 06 Project/Task No.: 98046,02.02.09 Waste Characterization Dept. No./Mail Stop: 6146/1087 5986 SMO Authorization:__ -Send preliminary/copy report to: Brenda Langkopf Carrier/Waybill No. Project/Task Manager; Edie Kent 803/556-8171 Contract #: PO 21671 Project Name: P2VCA@SWMU105 Lab Contact: Released by COC No.: Lab Destination: Gel Record Center Code: ✓ Validation Required Pam Puissant/505-284-3124 ER047 SMO Contact/Phone: Logbook Ref. No.: CFO56-06 Lorraine Herrera/505-844-3199 Bill To:Sandia National Labs (Accounts Payable) Service Order No. Send Report to SMO: Location Tech Area P.O. Box 5800 MS 0154 Reference LOV(available at SMO) Buildina Albuquerque, NM 87185-0154 Room ER Sample ID or Pump ER Site Date/Time(hr) Sample Container Preserv-Collection Sample Parameter & Method Lab Sample Volume Method D Sample No.-Fraction Sample Location Detail Depth (ft) No. Collected Matrix Type ative Type Requested G 4C SA Mercury (7471A) 074442-002 105-BH-129-0-S 105 012706/1012 S G 125 ml 010 G S G 125 ml 4C SA Mercury (7471A) 074443-002 105-BH-129-2-S 2 105 012706/1116 105 G G 012706/1115. S 125 ml 4C DU Mercury (7471A) 074444-002 105-BH-129-4-S 4 0 105 S G 125 ml 4C G SA Mercury (7471A) 074439-002 105-BH-128-0-S 012706/1013 4C G S G 125 ml SA 074440-002 2 105 012706/1120 Mercury (7471A) 105-BH-128-2-S G 4C G 074441-002 105-BH-128-4-S 4 105 012706/1118 S 125 ml SA Mercury (7471A) 105 s G 125 ml 4C G SA Mercury (7471A) 012706/1014 074435-002 105-BH-127-0-S 0 G 2 105 012706/1125 S G 125 ml 4C SA Mercury (7471A) 074436-002 105-BH-127-2-S G S G 125 ml 4C 074437-002 4 105 012706/1123 SA Mercury (7471A) 105-BH-127-4-S DU 154905001 4 105 012706/1123 S G 125 ml 4C G Mercury (7471A) 074438-002 105-BH-127-4-SD 4C 105 G 125 ml 074432-002 105-BH-126-0-S 012706/1015 Mercury (7471A) Special Instructions/QC Requirements Abnormal RMMA Ref. No. Sample Tracking Smo Use Yes ☑ Yes ☐ No EDD Conditions on Sample Disposal Return to Client ✓ Disposal by lab Date Entered(mm/dd/yy) Yes No **Turnaround Time** X 15 Day 30 Day Entered by: Level D Package Receipt 7 Day *Send report to: **Negotlated TAT** QC inits. Return Samples By: Preliminary report (.pdf) to srgriff@sandia.gov + blangk@sandia.gov Company/Organization/Phone/Cellular Name W12 | Weston/6146/284-5232/239-7367 Lab Use Final report to Stacy Griffith MS1087/Org 6146 Sample William Gibson Stone Lion/6146/284-3309/228-9598 (505) 284-2588/ (505) 379-7588 Team Jeff Lee Members Shaw/6146/284-3309/238-9417 Gilbert Quintana 15 day turn around time Gram/6146/284-2588/ 379 7588 Stacy Griffith Weston/6146/250-7090 *Please list as separate report. Robert Lynch Org. 1/46 Date 1/2018 Time 6.840 4.Relinquished by Org. Date Time 1.Relinguished by Org. V. 46 Date 130106 Time 0840 4. Received by Org. Date Time 1. Received by 2.Relinguished b Org. Date Date / 50 / Co Time // O/ 5.Relinguished by Time Date 1/3 406 Time 0910 5. Received by Org. Org. Date Time 2. Received by Galbour Time Date 6.Relinguished by Ora. Date Time 3.Relinguished by Org. Time Org. Date Received by Date Time 3. Received by Org.

Page_2_ of _ AR/COC-98046.02.03.01 Project Name: P2VCA@SWMU105 Project/Task Manger: Brenda Langkopf Project/Task No .: Location Tech Area Reference LOV (available at SMO) Lab use Building Room Container Date/Time (hr) Collection Sample Parameter & Method Sample No-ER Sample ID or Pump ER Sample Preserv-Lab Sample Method Fraction Sample Location detail Depth (ft) Site No. Collected Matrix Type Volume ative Type Requested 154893019 G 4C G Mercury (7471A) 074433-002 105-BH-126-2-S 105 012706/1131 S 125 ml S G 125 ml 4C G Mercury (7471A) 154893020 074434-002 105-BH-126-4-S 105 012706/1129 154905002 S 4C 074429-002 105-BH-125-0-S 012706/1016 G 125 ml G Mercury (7471A) 105 012706/1135 S G 125 ml 4C G Mercury (7471A) 003 074430-002 105-BH-125-2-S 105 S 4C G 012706/1133 125 ml Mercury (7471A) 074431-002 105-BH-125-4-S 105 00.4 4C G 074426-002 105-BH-124-0-S 0 105 012706/1017 S G 125 ml Mercury (7471A) 005 S G 4C G 006 2 012706/1140 125 ml Mercury (7471A) 074427-002 105-BH-124-2-S 105 4C G 012706/1139 S G Mercury (7471A) 007 074428-002 105-BH-124-4-S 4 105 125 ml 008 105-BH-123-0-S 012706/1410 S G 125 ml 4C G Mercury (7471A) 073938-002 0 105 009 4C 012706/1416 S G 125 ml G Mercury (7471A) 073939-002 105-BH-123-2-S 2. 105 010 Mercury (7471A) 073940-002 105-BH-123-4-S 105 012706/1415 G 125 ml 4C G SA Abnormal Conditions on Receipt LAB USE Recipient Initials_

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ANALYSIS REQUEST AND CHAIN OF CUSTODY Page_1 of 1 Internal Lab 609357 AR/COC Batch No. SMO Use Date Samples Shipped: 1-30-06 Project/Task No.: 98046.02.02.09 Dept. No./Mail Stop: 6146/1087 Waste Characterization CMO SMO Authorization: Why 59863 Project/Task Manager. Brenda Langkopf Carrier/Waybill No. -Send preliminary/copy report to: Contract #: PO 21671 / P2VCA@SWMU105 Lab Contact: Edie Kent 803/556-8171 Project Name: NA Get Released by COC No.: Record Center Code: Lab Destination: ☑ Validation Required **ER047** SMO Contact/Phone: Pam Puissant/505-284-3124 Logbook Ref. No.: Service Order No. CFO56-06 Lorraine Herrera/505-844-3199 Bill To:Sandia National Labs (Accounts Payable) Send Report to SMO: Location Tech Area P.O. Box 5800 MS 0154 Reference LOV(available at SMO) Building Room Albuquerque, NM 87185-0154 ER Sample ID or Pump ER Site Date/Time(hr) Sample Container Preserv-Collection Sample Parameter & Method Lab Sample Sample No.-Fraction Sample Location Detail Depth (ft) No. Collected Matrix Type Volume ative Method Type Requested ID 154860019 **₽** 074416-002 105-BH-120-0-S 0 105 012706/1413 G 125 ml 4C G SA Mercury (7471A) 012706/1432 44 S 120 105-BH-120-2-S 2 105 G 125 ml 4C G SA 074417-002 Mercury (7471A) 012706/1432 4 S 154879001 2 105 G 125 ml 4C G DU Mercury (7471A) 074418-002 105-BH-120-2-SD 002 4 105 012706/1430 S G 125 ml 4C G SA Mercury (7471A) **▶** 074419-002 105-BH-120-4-S 007 0 105 S G 4C G SA 012706/1412 125 ml 074420-002 105-BH-121-0-S Mercury (7471A) 004 2 S G 4C G SA 074421-002 105-BH-121-2-S 105 012706/1426 125 ml Mercury (7471A) 005 S G 125 ml 4C G SA 4 105 012706/1425 Mercury (7471A) 074422-002 105-BH-121-4-S 006 074423-002 0 105 012706/1411 S G 125 ml 4C G SA Mercury (7471A) 105-BH-122-0-S 007 S 4C G 074424-002 105-BH-122-2-S 2 105 012706/1421 G 125 ml SA Mercury (7471A) 008 s G 4C G 074425-002 105-BH-122-4-S 105 012706/1420 125 ml SA Mercury (7471A) 154914002 @ 07458-002 NA 105 012706/1440 DIW 250 ml 4C EB Mercury (7470A) 105-EB-4 Special Instructions/QC Requirements RMMA Yes - No Ref. No. Sample Tracking Smo Use Abnorma Yes No Disposal by lab EDD Conditions on Return to Client Date Entered(mm/dd/yy) Sample Disposal Yes No Receipt 30 Day **Turnaround Time** 7 Day 15 Day Entered by: Level D Package QC inits. **Negotiated TAT** *Send report to: Return Samples By: Company/Organization/Phone/Cellular Preliminary report (.pdf) to srgriff@sandia.gov + blangk@sandia.gov Name William Bull W12 Weston/6146/284-5232/239-7367 Lab Use Sample William Gibson Final report to Stacy Griffith MS1087/Org 6146 Stone Lion/6146/284-3309/228-9598 Team (505) 284-2588/ (505) 379-7588 Jeff Lee Shaw/6146/284-3309/238-9417 Members Gilbert Quintana 15 day turn around time Gram/6146/284-2588/ 379 7588 Stacy Griffith Weston/6146/250-7090 *Please list as separate report. Robert Lynch, 1.Relinguished by Date 1/30/66 Time 0830 4.Relinquished by Org. Date Time Date 1/20106 Time 0 830 1. Received by 4. Received by Org. Date Time 2.Relinquished by Org 4/ Date / 10 06 Time // 00 5.Relinguished by Org. Date Time Date 131/04 Time 910 5. Received by 2. Received by Org! Org. Date Time Date / Time 6.Relinguished by Org. Relinquished by Org. Date Time Time Org. Date Received by Org. Date Received by Time

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Batch No. W	7			SMO Use							AR/COC	609	358
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074002-002	105-BH-16-0-S	0	105	013006/1339	s	G	125 ml	4C	G	SA	Mercury (7471A)		15497
074003-002	105-BH-16-2-S	2	105	013006/1407	\$	G	125 ml	4C	G	SA	Mercury (7471A)		154974
074004-002	105 -BH-16-4-S	4	105	013006/1405	s	G	125 ml	4C	G	SA	Mercury (7471A)		154976
074005-002	105-BH-16-8-S	. 8	105	013006/1410	s	G	125 ml	4C	G	SA	Mercury (7471A)		154974
074059-002	105-BH-30-0-S	0	105	013006/1338	s.	G	125 ml	4C	G	SA	Mercury (7471A)		15497
074060-002	105-BH-30-2-S	2					125 ml	4C	G	SA	Mercury (7471A)		154476
074061-002	105-BH-30-4-S	4	105	013006/1355	s	G	125 ml	4C	G	SA	Mercury (7471A)		154976
074062-002	105-BH-30-4-SD	4	105	013006/1355	s	G	125 ml	4C	G	DU	Mercury (7471A)	ed GC	154976
074063-002	105-BH-30-8-S	. 8	105	013006/1359	s	G	125 ml	4C	G	SA	Mercury (7471A)		154976
074120-002	105-BH-45-0-S	0	105	013006/1123	<u>s</u>	G	125 ml	4C	G	SA	Mercury (7471A)		154976-
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	Batch No. Dept. No./Mail Stop: Project No./Mail Stop: Project Name: Record Center Code: Logbook Ref. No.: Service Order No. Location Building Sample NoFraction 074002-002 074003-002 074005-002 074060-002 074061-002 074063-002 074120-002 074121-002 RMMA Sample Disposal Turnaround Time Return Samples By: Sample Team Members	Batch No.	Dept. No./Mail Stop: Erolect/Task Manager: Brenda Langkopf Pz/CA@SWMU105 Lab Con Lab Des Lab	Dept. No./Mail Stop: 6146/1087 Date Samples Shipper	SMO Use Dept. No./Mail Stop: 6146/1087 Date Samples Shipped: 7-3 / - 0	SMO Use	Satch No. SMO Use	Sanch No. Sample Sample	Satch No. Short Use Short No. Shor	Sanch No. Sample No. Sample Samples Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Shippies Ship	Sample No. Sample No. Sample No. Sample No. Sample No. S	Sanch No. Mark Sanch No. Sanch No.	Sample No. SMO Use

Page_2_ of _2 AR/COC-609358 Project Name: P2VCA@SWMU105 Project/Task Manger: 98046.02.02.09 Brenda Langkopf Project/Task No.: Location Tech Area Reference LOV (available at SMO) Building Room Lab use Sample No-ER Sample ID or ER Date/Time (hr) Container Lab Sample Pump Sample Preserv-Collection Sample Parameter & Method Fraction Matrix Sample Location detail Depth (ft) | Site No. Collected Type Volume ative Method Type Requested 154976-105-BH-45-4-S 074122-002 105 013006/1347 S G 125 ml 4C G SA Mercury (7471A) 074123-002 105-BH-45-8-S 8 105 013006/1353 S G 125 ml 4C G Mercury (7471A) 074180-002 105-BH-60-0-S 0 105 013006/1103 S 125 ml 4C Mercury (7471A) 074181-002 105-BH-60-2-S 2 105 013006/1118 S 125 ml 4C G Mercury (7471A) 074182-002 105-BH-60-4-S 013006/1116 Mercury (7471A) 105 S G 125 ml 4C G 074183-002 Mercury (7471A) 105-BH-60-8-S 8 105 013006/1122 S G 125 ml 4C G Pg 074459-002 105-EB-5 013006/1510 NA 105 250 ml HNO₃ G Mercury (7470A) 6) 06 Abnormal Conditions on Receipt

CONTRACT LABORATORY

ANALYSIS REQUEST AND CHAIN OF CUSTODY Internal Lab Page 1 of 2 Batch No. 609359 AR/COC **SMO Use** Dept. No./Mail Stop: 6146/1087 Date Samples Shipped: 1-31-06 Project/Task No.: 98046.02.02.09 Waste Characterization Project/Task Manager: Brenda Langkopf Carrier/Waybill No. SMO Authorization: -Send preliminary/copy report to: Project Name: P2VCA@SWMU105 Edie Kent 803/556-8171 Lab Contact: Contract #: PO 21671 Record Center Code: Lab Destination: Gel Released by COC No.: Logbook Ref. No.: ✓ Validation Required **ER047** SMO Contact/Phone: Pam Pulssant/505-284-3124 Service Order No. CFO56-06 Send Report to SMO: Lorraine Herrera/505-844-3199 Bill To:Sandia National Labs (Accounts Payable) Location Tech Area P.O. Box 5800 MS 0154 Building Room Reference LOV(available at SMO) Albuquerque, NM 87185-0154 ER Sample ID or Pump **ER Site** Date/Time(hr) Sample Container Collection Sample Preserv-Parameter & Method Lab Sample Sample No.-Fraction Sample Location Detail Depth (ft) No. Collected Matrix Туре Volume ative Method Requested Type ID o 074242-002 105-BH-76-0-S 0 105 013006/1056 G 154984-011 S 125 ml 4C G SA Mercury (7471A) 074243-002 105-BH-76-2-S 2 105 013006/1101 154981-01 S G 125 ml 4C G SA Mercury (7471A) 074244-002 105-BH-76-4-S 15498401F 4 105 013006/1100 S G 125 ml 4C G SA Mercury (7471A) 074245-002 105-BH-76-8-S 8 105 1549BI-014 013006/1105 * S G 125 ml 4C G SA Mercury (7471A) 074301-002 105-BH-91-0-S 0 105 013006/1045 154981015 S G 125 ml 4C G SA Mercury (7471A) 074302-002 105-BH-91-2-S 2 15498ANL 105 013006/1051 S G 125 ml 4C G SA Mercury (7471A) 074303-002 105-BH-91-4-S 154981-017 4 105 013006/1049 S G 125 ml 4C G SA Mercury, (7471A) Mercury (7471A) 074304-002 105-BH-91-8-S 8 105 013006/1054 S G 125 ml 4C G 074360-002 105-BH-106-0-S 0 105 013006/1037 S G 125 ml 4C G SA Mercury (7471A) 074361-002 105-BH-106-2-S 2 105 013006/1038 S G 125 ml 4C G SA Mercury (7471A) 074362-002 105-BH-106-4-S 105 013006/1036 S G 125 ml 4C G 154903-01 Mercury (7471A) RMMA Yes 7No Ref. No. Sample Tracking Smo Use Special Instructions/QC Requirements Abnormal Sample Disposal Return to Client Disposal by lab Date Entered (mm/dd/yy) ✓ Yes □ No Conditions on EDD **Turnaround Time** 7 Day 15 Day 30 Day ✓ Yes Entered by: ☐ No Level D Package Receipt Return Samples By: **Negotlated TAT** QC inits. Send report to: Name Signature Company/Organization/Phone/Cellular Preliminary report (.pdf) to srgriff@sandla.gov + blangk@sandla.gov Sample William Gibson William 121,611W15 Weston/6146/284-5232/239-7367 Final report to Stacy Griffith MS1087/Org 6146 Lab Use Team Jeff Lee Stone Lion/6146/284-3309/228-9598 (505) 284-2588/ (505) 379-7588 Members Gilbert Quintana Shaw/6146/284-3309/238-9417 15 day turn around time Stacy Griffith Gram/6146/284-2588/ 379 7588 Robert Lynch Weston/6146/250-7090 *Please list as separate report. 1.Relinquished by Org. Of U/ Date 3, 06Time 0900 4.Relinguished by Org. Date Time 1. Received by Date //3//06 Time 0900 4. Received by Date Org. Time 2.Relinguished by Date /-3/1-06 Time 5.Relinquished by Org. Date Time 2. Received by Org. Date 7/1/00 Time 5. Received by Org. Date Time 3.Relinguished by Org. Date Time 6.Relinquished by Org. Date Time 3. Received by Org. Date Time 6. Received by Org. Date Time

Page_2_ of _2 AR/COC-609359 Project Name: P2VCA@SWMU105 Project/Task Manger: Brenda Langkopf Project/Task No.: 98046.02.02.09 Location Tech Area Reference LOV (available at SMO) Building Room Lab use Sample No-ER Sample ID or Pump ER Date/Time (hr) Sample Container Collection Sample Parameter & Method Lab Sample Fraction Matrix Type Sample Location detail Depth (ft) Site No. Collected Volume Method Type Requested 074363-002 105-BH-106-8-S 125 ml 105 013006/1041 S G 4C G Mercury (7471A) Abnormal Conditions on Receipt Recipient Initials

CONTRACT LABORATORY

Internal Lab		Α	'NAL	YSIS REQUE	ST A	ND (SHAIR	NOF CL	JS 1 OL	JY .	•	Page 1 of	2
Batch No. N/	A			SMO Use							AR/COC	609	9360
Dept. No./Mail Stop:	6146/1087	Date Samp	les Shipp	ed 2-1-01	0	Project/	Task No.:	98046,02.02	.09		Waste Characterization	n	
Project/Task Manager:	Brenda Langkopf	Carrier/Way		60018		SMO A	uthorizatio	on:	4 tim	-GMD	-Send preliminary/copy r	report to:	
Project Name:	P2VCA@SWMU105	Lab Contac	it:	Edie Kent 803/556-81	171	Contrac	t#: <u>PO 2</u>	1671					
Record Center Code:	NA	Lab Destina	ation:	Gel							Released by COC No.:		_
Logbook Ref. No.:	ER047	SMO Contac	t/Phone:	Pam Puissant/505-28							✓ Validation Required		
Service Order No.	CFO56-06	Send Report	to SMO:	Lorraine Herrera/505-	844-3199	9					Bill To:Sandia National Labs (A	ccounts Payab	ile)
Location	Tech Area]						. 14	واسمه	-/0/	P.O. Box 5800 MS 0154	ţ	
Building	Room			Referenc					55/3		Albuquerque, NM 87185		
Sample NoFraction	ER Sample ID or Sample Location Detail	Pump Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Со Туре	ntainer Volume	Preserv- ative	Collection Method	Sample Type	Parameter & Met Requested	hod	Lab Sample ID
074010-002	105-BH-18-0-S	0	105	013106/0909	S	G	125 ml	4C	G	SA	Mercury (7471A)	· ·	001
074011-002	105-BH-18-2-S	2	105	013106/0943	s	G	125 ml	4C	G	SA	Mercury (7471A)		002
074012-002	105-BH-18-4-S	4	105	013106/0942	s	G	125 ml	4C	G	SA	Mercury (7471A)		003
074013-002	105-BH-18-8-S	8	105	013106/0946	s	G	125 ml	4C	G	SA	Mercury (7471A)		off
074068-002	105-BH-32-0-S	0	105	013106/0908	s	G	125 ml	4C	G	SA ·	Mercury (7471A)		105
074069-002	105-BH-32-2-S	2	105	013106/0932	s	G	125 ml	4C	G	SA	Mercury (7471A)		106
074070-002	105-BH-32-4-S	4	105	013106/0931	013106/0931 S			4C	G	SA	Mercury (7471A)		<i>ω</i> 7
074071-002	105-BH-32-8-S	8	105	013106/0935	S	G	125 ml	4C	G	SA	Mercury (7471A)		008
074128-002	105-BH-47-0-S	0	105	013106/0907	s	G	125 ml	4C	Ġ	SA	Mercury (7471A)		009
074129-002	105-BH-47-2-S	2	105	013106/0919	s	G	125 ml	4C	G	SA	Mercury (7471A)		010
074130-002	105-BH-47-4-S	4	105	013106/0917	s	G	125 ml		G	SA	Mercury (7471A)	Taren and and	DIS
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Team	Jeff Lee	minus.		Stone Lion/6146/284				-	2588/ (505 <u>)</u>		10011019 0140	1	
Members	Gilbert Quintana	10 1 -A	11 21	Shaw/6146/284-330				(303) 204-	23007 (303)	37 3-7 300	·	10	M
Members	Stacy Griffith	ANDE	80	Gram/6146/284-258		_		15 day	turn a	round	time	3	
	Robert Lynch 12	UTILIS	100	Weston/6146/250-70			*Please IIst	_					
1.Relinquished by	White	Ørg.6146	Date				quished b			Org.	Date	Time	e
1. Received by	196 Jun 5mg						eived by			Org.	Date	Time	е
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3.Relinquished by	<i>y</i>	Org.	Date	Time 6.Relinqu				ру		Org.	Date	Time	
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AR/COC-609360 Project Name: P2VCA@SWMU105 Project/Task Manger: Brenda Langkopf Project/Task No.: 98046.02.02.09 Location Tech Area Reference LOV (available at SMO) Building Room Lab use Sample No-ER Sample ID or Pump ER Date/Time (hr) Sample Container Preserv-Collection Sample Parameter & Method Lab Sample Fraction Sample Location detail Depth (ft) Site No. Collected Matrix Туре Volume ative Method Type Requested ID 0/2 074131-002 105-BH-47-8-S 013106/0925 S G 125 ml 4C SA Mercury (7471A) 074187-002 105-BH-62-0-S 0 S Mercury (7471A) 105 013006/1447 G 125 ml 4C G 074188-002 105-BH-62-2-S 2 105 013006/1455 S G G Mercury (7471A) 125 ml 4C 074189-002 105-BH-62-4-S 105 013006/1453 S G 125 ml 4C G Mercury (7471A) 074190-002 105-BH-62-8-S 8 013006/1457 S G 125 ml G Mercury (7471A) 105 4C Abnormal Conditions on Receipt LAB USE Recipient Initials WK

CONTRACT LABORATORY

074252-002 105-BH-78-2-SD 2 105 013006/1444 S G 125 ml 4C G SA Mercury (7471A) 154784-		Internal Lab	1.		Α	NALY	SIS REQUE	EST A	ND (CHAIN	OF CL	JSTO	YC			Page_1 of	Page 1 of 2	
Project Name PayCASSWMUIUS Lab Contact: Lab		Batch No.		SMO Use									AR/COC		609	609361		
Project Names Project Name Pro		Dept. No./Mail Stop:	6146/1087						Project/Task No.: 98046.02.02.09					Waste	Characteria	zation		
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074368-002 105-BH-108-0-S 0 105 013006/1415 S G 125 ml 4C G SA Mercury (7471A)	•	074311-002	105-BH-93-4-S		4	105	013006/1431	s	G	125 ml	4C	G	SA	Mercury	(7471A)			
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RMMA	X	074368-002	105-BH-108-0-S		0	105	013006/1415	S	G	125 ml	4C	G	SA	Mercury	(7471A)			
Return to Client Disposal by lab Date Entered (mm/dd/yy) EDD Yes No Conditions on Receipt Return to Client Disposal by lab Date Entered (mm/dd/yy) EDD Yes No Conditions on Receipt Return Samples By: Negotiated TAT QC inits. Send report to: Name Signature Init Company/Organization/Phone/Cellular Preliminary report (.pdf) to srgriff@sandia.gov + blangk@sandia.gov Sample William Gibson Stone Lion/6146/284-5232/239-7367 Final report to Stacy Griffith MS1087/Org 6146 Lab Use Stone Quintana Stacy Griffith Stacy Griffith Shaw/6146/284-3309/238-9417 Stacy Griffith Stacy Griffith Shaw/6146/284-2588/ 379 7588 15 day turn around time Weston/6146/284-2588/ 379 7588 15 day turn around time Please list as separate report. Name Org. Club Date Meston/6146/284-2588/ 379 7588 Shaw/6146/250-7090 Please list as separate report. Name Org. Club Date Meston/6146/284-2588/ 379 7588 Shaw/6146/250-7090 Please list as separate report. Name Org. Club Date Meston/6146/250-7090 Shaw/6146/250-7090 Org. Date Time Org. Club Org. Date Time Org. Date Tim	0	074369-002				105	013006/1420	s	G	125 mi	4C	G	SA	Mercury	(7471A)		154484	
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Name Signature Init Company/Organization/Phone/Cellular Preliminary report (.pdf) to srgriff@sandia.gov + blangk@sandia.gov		Turnaround Time	e 🗌 7 Day 🗞	15 Da	y 3	30 Day	Entered by:			1.1.54	Level D Pag	ckage	✓ Yes	5	☐ No	Receipt	· . ::	
Sample William Gibson William Gibson Jeff Lee Stone Lion/6146/284-5232/239-7367 Final report to Stacy Griffith MS1087/Org 6146 Lab Use Team Jeff Lee Stone Lion/6146/284-3309/228-9598 (505) 284-2588/ (505) 379-7588 Members Gilbert Quintana Stacy Griffith MS1087/Org 6146 Lab Use Stone Lion/6146/284-3309/228-9598 (505) 379-7588 Shaw/6146/284-2588/ 379 7588 15 day turn around time Please IIst as separate report. 1. Received by Org. Date Time 1. Received by Org. Date Time 2. Received by Org. Date Time 2. Received by Org. Date Time 3. Relinquished by Org. Date Time 3. Relinquished by Org. Date Time 6. Relinquished by Org. Date Time 3. Relinquished by Org. Date Time		Return Samples By:			Negotia	ited TAT			*Send repo	rt to:				· · · · · · · · ;				
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Robert Lynch 1. Relinquished by Leff Lynch Org. L/Y Date / // Time 6900 4. Relinquished by Org. Date Time 1. Received by Org. Ly Date / // Date // Da		4.								15 day turn around			timo					
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Page_2_ of _2 AR/COC-609361 Project Name: P2VCA@SWMU105 Project/Task Manger: Brenda Langkopf Project/Task No.: 98046.02.02.09 Location **Tech Area** Reference LOV (available at SMO) Building Room Lab use ER Sample ID or Sample No-Container Pump ER Date/Time (hr) Sample Preserv-Collection Sample Parameter & Method Lab Sample Fraction Sample Location detail Depth (ft) Site No. Collected Matrix Type Volume ative Method Type Requested 074370-002 105-BH-108-4-S 105 013006/1417 S G 125 ml G Mercury (7471A) 074372-002 105-BH-108-8-S 105 013006/1426 S G 125 ml 4C G Mercury (7471A) Abnormal Conditions on Receipt Recipient Initials

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab		P	NAL	YSIS REQUE	ST A	ND (CHAIN	I OF CI	JSTOD	ΣY		Page 1 of	2
Batch No. N/	A			SMO Use							AR/COC	609	9362
Dept. No./Mail Stop:	6146/1087	Date Samp	oles Shipp	ed: 2 -) - 0	0	Project/	Task No.:	98046 <u>.02.02</u>	.09		Waste Characterization		
Project/Task Manager:	Brenda Langkopf	Carrier/Wa		60018	?		uthorizatio	n:	den	mo	-Send preliminary/copy re	eport to:	
Project Name:	P2VCA@SWMU105	Lab Conta	ct:	Edie Kent 803/556-81	171	Contrac	t #: <u>PO 21</u>						
Record Center Code:	NA	Lab Destin	ation:	Gel							Released by COC No.:		
Logbook Ref. No.:	ER047 ·	SMO Contac	ct/Phone:	Pam Puissant/505-28	4-3124						Validation Required		
Service Order No.	CFO56-06	Send Repor	t to SMO:	Lorraine Herrera/505-	844-319	è					Bill To:Sandia National Labs (A	ccounts Payab	ole)
	Tech Area										P.O. Box 5800 MS 0154		
Building	Room			Referenc	e LOV(availai	ole at SI	MO)			Albuquerque, NM 87185	0154	
	ER Sample ID o	r Pump	ER Site	Date/Time(hr)	Sample		ntainer	Preserv-	Collection	Sample	Parameter & Meth	od	Lab Sample
Sample NoFraction	Sample Location D	etail Depth (ft)	No.	Collected	Matrix	Type	Volume	ative	Method	Туре	Requested		ID
074014-002	105-BH-19-0-S	0	105	013106/0954	S	G	125 ml	4C	G	SA	Mercury (7471A) _		017
074015-002	105-BH-19-2-S	2	105	013106/1000	S	G	125 ml	4C	G	SA	Mercury (7471A)		018
074016-002	105-BH-19-4-S	4	105	013106/0959	s	G	125 ml	4C	G	SA	Mercury (7471A)		019
074017-002	105-BH-19-8-S	88	105	013106/1004	s	G	125 ml	4C	G	SA	Mercury (7471A)		020
074072-002	105-BH-33-0-S	0	105	013106/0955	s	G	125 ml	4C	G	SA	Mercury (7471A)		01
074073-002	105-BH-33-2-S	. 2	105	013106/1024	s	G	125 ml	4C	G	SA	Mercury (7471A)		OZ
074074-002	105-BH-33-4-S	4	105.	013106/1023	s	G	125 ml	4C	G	SA	Mercury (7471A)	,.	03
074075-002	105-BH-33-8-S	8	105	013106/1026	s	G	125 ml	4C	G	SA	Mercury (7471A)		04
074132-002	105-BH-48-0-S	0	105	013106/0956	s	G	125 ml	4C	G	SA	Mercury (7471A)		05
074133-002	105-BH-48-2-S	2	105	013106/1032	s	G	125 ml	4C	G	SA	Mercury (7471A)		06
074134-002	105-BH-48-2-SD	2	105	013106/1032	s	G	125 ml	4C	G	DU		ed ex	07
RMMA	☐Yes ✓No	Ref. No.		Sample Tracking		Smo U	se	Special Ins			ements ()	Abnorma	
Sample Disposal	Return to Client	✓ Disposal by		Date Entered(mm/dd	/ <u>yy)</u>	· 	<u> 48.81.81</u>	EDD 🗠	Yes 🗌			Condition	ns on
Turnaround Tim	e 🗌 7 Day 🔀	15 Day	30 Day	Entered by:				Level D Pag	kage	✓ Yes	No 🗌 No	Receipt	
Return Samples By:			Negotia	ated TAT	QC inits	<u> </u>		*Send repo	rt to:				
	Name	Signature,	Init	Company/Organ			ellular	Preliminary	report (.pdf	to srgriff@)sandla.gov + blangk@sandl	a.gov	
Sample	William Gibson	William I Dat 1		Weston/6146/284-52				Final repor	t to Stacy (Griffith MS	1087/Org 6146		Lab Use:
Team	Jeff Lee	Callet	- //	Gtone Lion/6146/284	-3309/22	8-9598		(505) 284-	2588/ (505)	379-7588			· · · · · · · · · · · · · · · · · · ·
Members	Gilbert Quintana	Colophiting.	Bus	Shaw/6146/284-3309	9/238-941	7						10	M
	Stacy Griffith	HOWAL.	880	Gram/6146/284-2588		88			turn a		time	-Z	٤
	Robert Lynch	Without	The	Weston/6146/250-70		_		*Please list	as separa	te report.		1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	
	William	Org. A4			350		quished b	<u>y</u>		Org.	Date	Time	
1. Received by	the firm	TWO Org. KY			850		eived by			Org.	Date	Time	
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o. Received by		Org.	Date	Time		ID. KEC	eived by			Org.	Date	Time	8

Page_2_ of _2 AR/COC-609362 Project Name: P2VCA@SWMU105 Project/Task Manger: Brenda Langkopf Project/Task No.: 98046,02,02,09 Location Tech Area Building Room Reference LOV (available at SMO) Lab use Sample No-ER Sample ID or Pump ER Date/Time (hr) Sample Container Preserv-Collection Sample Parameter & Method Lab Sample Fraction Sample Location detail Depth (ft) Site No. Matrix Type Volume Collected ative Method Type Requested 074135-002 105-BH-48-4-S Mercury (7471A) 105 013106/1030 G 125 ml 4C G 074136-002 105-BH-48-8-S 8 4C 105 013106/1035 G 125 ml G Mercury (7471A) 074191-002 105-BH-63-0-S 105 S 125 ml 013106/1031 G 4C Mercury (7471A) G 074192-002 105-BH-63-2-S 105 013106/1041 S G 4C Mercury (7471A) 125 ml G 074193-002 105-BH-63-4-S 013106/1040 105 S Mercury (7471A) G 125 ml 4C G 074195-002 105-BH-63-8-S 105 013106/1044 S G 125 ml 4C G Mercury (7471A) LAB USE Abnormal Conditions on Receipt Recipient Initials M/C

Internal Lab	/\ ^		Α	NAL	SIS REQUE	EST A	ND (CHAIN	NOF C	USTO	Υ		Page 1 of	1_
Batch No.	V 1/+				SMO Use						•	AR/COC	609	9363
Dept. No./Mail Stop:	6146/1087		Date Samo	les Shipp	ed: 2-1-0	o	Project	Task No.:	98046.02.02	2.09		Waste Characterizatio		
Project/Task Manager:	Brenda Langkopf				60018			uthorization		2	SMD	-Send preliminary/copy		
Project Name:	P2VCA@SWMU105		Lab Contac		Edie Kent 803/556-8			t#: <u>PO 2</u>	1671		<i></i>			
Record Center Code:	NA		Lab Destina	ation:	Gel							Released by COC No.:		
Logbook Ref. No.:	ER047		SMO Contac	/Phone:	Pam Puissant/505-28	34-3124	1					☑ Validation Required		
Service Order No.	CFO56-06		Send Report	to SMO:	Lorraine Herrera/505	-844-3199	9					Bill To:Sandla National Labs (A	Accounts Paval	ble)
Location	Tech Area				. //							P.O. Box 5800 MS 015	•	
Building	Room	_	155	739	- Reference	e LOV	availal	ble at S	MO) /	5514	9	Albuquerque, NM 8718		•
	ER Sample ID	or	Pump	ER Site	Date/Time(hr)	Sample		ntainer	Preserv-	Collection		Parameter & Met		Lab Sample
Sample NoFraction	Sample Location D	Detail	Depth (ft)	No.	Collected	Matrix	Туре	Volume	ative	Method	Туре	Requested		ID
074255-002	105-BH-79-0-S		0	105	013106/1033	s	G	125 ml	4C	G	SA	Mercury (7471A)		14
074256-002	105-BH-79-2-S		2	105	013106/1102	S	G	125 ml	4C	G	SA	Mercury (7471A)		15
074314-002	105-BH-94-0-S		0	105	013106/1034	s	G	125 ml	4C	G	SA	Mercury (7471A)		16
074315-002	105-BH-94-2-S		2	105	013106/1111	s	G	125 ml	4C	G	SA	Mercury (7471A)		17
074316-002	105-BH-94-4-S		4	105	013106/1110	s	G	125 ml	4C	G	SA	Mercury (7471A)		18
074317-002	105-BH-94-8-S		8	105	013106/1113	s	G	125 ml	4C	G	SA	Mercury (7471A)		19
074373-002	105-BH-109-0-S		0	105	013106/1045	s	G	125 ml	4C	G	SA	Mercury (7471A)		20
074374-002	105-BH-109-2-S		2	105	013106/1120	s	G	125 ml	4C	G	SA	Mercury (7471A)		201
074371-002	105-BH-109-2-SD		2	105	013106/1120	s	G	125 ml	4C	G	DU		ورما حات	or Z
074375-002	105-BH-109-4-S		4	105	013106/1118	s	G	125 ml	4C	G	SA	Mercury (7471A)	·	<i>w3</i>
074376-002	105-BH-109-8-S		8	105	013106/1128	S	G	125 ml	4C	G	SA	Mercury (7471A)		1004
RMMA_	☐Yes ✓No	Ref.	No.		Sample Tracking	7	Smo U	se	Special Ins	structions/C	C Require		Abnorma	al
Sample Disposal	Return to Client	☑ Di	sposal by la	b	Date Entered(mm/dd	l/yy)			EDD 5	🛚 Yes 🔲	No		Conditio	ns on:
Turnaround Tim	le 7 Day	15 Day	/ 🔲 3		Entered by:				Level D Pa		☑ Ye	s 🗌 No	Receipt	
Return Samples By:	7			Negotia	ted TAT	QC inits.			*Send repo					
	Name	Sig	nature .	Init	Company/Organ		-	llular	Preliminary	report (.pdf	to srariff@	@sandia.gov + blangk@sand	ia.gov	
Sample	William Gibson	With	419061	2043	Weston/6146/284-52	_						61087/Org 6146		Lab Use
Team	Jeff Lee	ZI	MA		Stone Lion/6146/284			_		-2588/ (505)			-	- D
Members	Gilbert Quintana	Lille	Minter		Shaw/6146/284-3309				1				7	eng
	Stacy Griffith	21	14/1	20					15 do	, turn o	round	time		2 6
					Gram/6146/284-2588	_	88			/ turn a		unie		.
1 Polinguished by	Robert Lynch	YUL	gran		Weston/6146/250-70		1. =			t as separa				
1.Relinquished by	Water Re		Org. 6146		1/06 Time 09			quished b	<u> </u>		Org.	Date	Tim	
2.Relinquished by			Org. 6141		2/1/06 Time 09			elved by			Org.	Date	Tim	
2. Received by	My Juny	nn	Org. 6/4/		11/06Time 10			quished b	у		Org.	Date	Tim	
3.Relinguished by	mejann		Org. GAL Org.	_ Date _	1-2-06Time 09	<u> </u>		eived by			Org.	Date	Tim	
3. Received by			Org.	Date	Time			quished by	y .		Org.	Date Date	Tim	

	Internal Lab	11		А	NAL)	YSIS REQUE	EST A	ND (CHAIN	NOF C	JSTO	ΣY		Page 1 of	2
	Batch No. //	4				SMO Use							AR/COC	60	9364
	Dept. No./Mail Stop:	6146/1087		Date Samp	les Ship	ped: 2 - 6 - 6	260	Project	Task No.:	98046.02.02	.09_		Waste Characteriz	ration	
	Project/Task Manager:	Brenda Langkopf		camer/Wa		60172				on: 06)		SMO	-Send preliminary/o	copy report to:	
	Project Name:	P2VCA@SWMU105		ab Contac		Edie Kent 803/556-8			t#: <u>PO 2</u>				1		
	Record Center Code:	NA		ab Destina	ation:	Gel							Released by COC	No.:	
	Logbook Ref. No.:	ER047		SMO Contac	t/Phone:	Pam Puissant/505-28	34-3124						☑ Validation Require		
	Service Order No.	CFO56-06		Send Report	to SMO:	Lorraine Herrera/505	-844-3199						Bill To:Sandia National L		ble)
	Location	Tech Area											P.O. Box 5800 MS	0154	·
		Room				Referenc	e LOV	availa	ble at Si	MO)			Albuquerque, NM	87185-0154	
		ER Sample ID	or	Pump	ER Site		Sample		ntainer	Preserv-	Collection	Sample	Parameter &		Lab Sample
	Sample NoFraction	Sample Location [Detail	Depth (ft)	No.	Collected	Matrix	Туре	Volume	ative	Method	Туре	Reques	ted	ID .
	074377-002	105-BH-110-0-S		0	105	020206/1000	s	G	125 ml	4C	G	SA	Mercury (7471A)	15541	8-001
,	074378-002	105-BH-110-2-S		2	105	020206/1021	s	G	125 ml	4C	G	SA	Mercury (7471A)		-002
	074379-002	105-BH-110-4-S	· .	4	105	020206/1020	s_	G	125 ml	4C	G	SA	Mercury (7471A)		- 003
	074380-002	105-BH-110-8-S		8	105	020206/1024	S	G	125 ml	4C	G	SA	Mercury (7471A)		-004
	074318-002	105-BH-95-0-S		0	105	020206/0958	s	G	125 ml	4C	G	SA	Mercury (7471A)		- 005
,	074319-002	105-BH-95-2-S		2	105	020206/1015	S	G	125 ml	4C	G	SA	Mercury (7471A)		-006
	074320-002	105-BH-95-4-S		4	105	020206/1014	s	G	125 ml	4C	G	SA	Mercury (7471A)		- 007
	074321-002	105-BH-95-8-S		8	105	020206/1017	s	G	125 ml	4C	G	SA	Mercury (7471A)		-008
	074259-002	105-BH-80-0-S		0	105	020206/0945	S	G	125 ml	4C	G	SA	Mercury (7471A)		-009
	074260-002	105-BH-80-2-S		2	105	020206/1005	s	G	125 ml	4C	G	SA	Mercury (7471A)		-010
١		105-BH-80-4-S		4	105	020206/1004	s	G	125 ml	4C	G	. SA	Mercury (7471A)	155418	-011
I	RMMA	☐Yes ✓No	Ref. N	No.		Sample Tracking		Smo Us	e	Special Inst	ructions/C	C Require	ments	Abnorma	al : : : : : : : : : : : : : : : : : : :
ı	Sample Disposal	Return to Client	✓ Dis	posal by la	b	Date Entered(mm/dd.	/yy)			EDD Z	Yes 🗌	No		Conditio	ns on
	Turnaround Time	7 Day	15 Day	3	Day	Entered by:				Level D Pac	kage	✓ Yes	☐ No	Receipt	
	Return Samples By:					ted TAT	QC inits.			*Send repor	t to:				
		Name	8ign	ature .	Init	Company/Organ	nization/Pi	none/Ce	llular	Preliminary r	eport (.pdf)	to srgriff@	sandia.gov + blangk@s	sandia.gov	
ı	Sample	William Gibson	William	13/11		Weston/6146/284-52	32/239-73	367		Final report	to Stacy (Sriffith MS	1087/Org 6146		Lab Use
ı	Team	Jeff Lee	111		Des	Stone Lion/6146/284-	-3309/228	-9598		(505) 284-2	2588/ (505)	3 7 9-7588	-	F 10 . 20	
ı	Members	Gilbert Quintana	USTAI.	that	Lul	Shaw/6146/284-3309					<u> </u>			4-18-10	
ľ		Stacy Griffith	Show		Ole	Gram/6146/284-2588			7	15 day	turn a	round	time		
		Robert Lynch	6112	1 delle	Re	Weston/6146/250-70	90			Please list	as separa	te report.			
	1.Relinquished by W	ulilon boxx 2		org. 6/46			100	4.Reline	quished by	y		Org.	Date	Tim	e
	1. Received by	49 all	and c	org. 6141		2/b/06 Time 09	100	4. Rece	ived by			Org.	Date	Tim	е
L	2.Relinquished by	209 has	TINA	org ta YW	Date	2-606 Time //	30	5.Relin	quished by	у		Org.	Date	Tim	e
Ŀ	2. Received by 1/1/19	nathrus		org.		2-7-01, Time 93	0	5. Rece	ived by			Org.	Date	Tim	е
	3.Relinquished by			Org.	Date	Time			quished by	у		Org.	Date	Tim	
-13	3 Received by .		٠.	ra .	Date	Time		A Pose	ived by			Ora	Data	Tim	•

Page_2_ of _2 AR/COC-609364 Project Name: P2VCA@SWMU105 Project/Task Manger: 98046.02.02.09 Brenda Langkopf Project/Task No.: Location Tech Area Building Room Reference LOV (available at SMO) Lab use Sample No-ER Sample ID or ER Date/Time (hr) Sample Container Pump Preserv-Collection Sample Parameter & Method Lab Sample Fraction Sample Location detail Depth (ft) Site No. Collected Matrix Type Volume Method Requested ative Type ID 155418-074262-002 012 105-BH-80-8-S 105 020206/1007 G 125 ml 4C G SA Mercury (7471A) -013 074196-002 105-BH-64-0-S 105 020206/0922 S G 125 ml 4C G Mercury (7471A) -014 074197-002 105-BH-64-2-S 2 105 020206/0941 S G 125 ml 4C G SA Mercury (7471A) -015 074198-002 105-BH-64-4-S S 105 020206/0940 G 4C G 125 ml SA Mercury (7471A) 074194-002 105-BH-64-4-SD G 4 105 020206/0940 S G 125 ml 4C DU Mercury (7471A) Lield dun 074199-002 105-BH-64-8-S 8 105 020206/0944 S G 125 ml 4C G SA Mercury (7471A) Abnormal Conditions on Receipt LAB USE Recipient Initials

ANALYSIS REQUEST AND CHAIN OF CUSTODY Internal Lab Page 1 of 2 609365 Batch No. AR/COC SMO Use Dept. No./Mail Stop: 6146/1087 Date Samples Shipped: 2 - 6 - 06 Project/Task No.: 98046.02.02.09 Waste Characterization Project/Task Manager: Brenda Langkopf SMO Authorization: Carrier/Waybill No. 60172 Edie Kent 803/556-8171 -Send preliminary/copy report to: Project Name: P2VCA@SWMU105 Lab Contact: Contract #: PO 21671 Record Center Code: Lab Destination: Released by COC No.: ER047 Logbook Ref. No.: SMO Contact/Phone: Pam Puissant/505-284-3124 ✓ Validation Required Service Order No. CFO56-06 Send Report to SMO: Lorraine Herrera/505-844-3199 Bill To:Sandia National Labs (Accounts Payable) Location Tech Area P.O. Box 5800 MS 0154 Building Room Reference LOV(available at SMO) Albuquerque, NM 87185-0154 ER Sample ID or Pump ER Site Date/Time(hr) Sample Container Collection Parameter & Method Preserv-Sample Lab Sample Sample No.-Fraction Sample Location Detail Depth (ft) No. Collected Matrix Type Volume ative Method Requested Type 155418-074137-002 105-BH-49-0-S 0 105 020206/0923 S G 125 ml 4C G SA Mercury (7471A) 074138-002 2 105-BH-49-2-S 105 020206/0930 S G 125 ml 4C G SA Mercury (7471A) 074139-002 105-BH-49-4-S 105 020206/0929 s G 125 ml 4C G SA Mercury (7471A) 074140-002 105-BH-49-8-S 8 105 020206/0932 S G 125 ml 4C G Mercury (7471A) SA 074076-002 105-BH-34-0-S ٥ 105 020206/0914 S G 125 ml 4C G SA Mercury (7471A) 02 074077-002 105-BH-34-2-S 2 105 020206/0924 S G 125 ml 4C G SA Mercury (7471A) 074078-002 04 105-BH-34-4-S 4 105 020206/0923 s G 125 ml 4C G SA Mercury (7471A) 05 074079-002 105-BH-34-4-SD 4 105 020206/0923 s G 125 ml 4C G DU Mercury (7471A) 074080-002 105-BH-34-8-S 8 s 105 020206/0926 G 125 ml 4C G Mercury (7471A) SA 06 074018-002 105-BH-20-0-S 0 105 .020206/0913 s G 125 ml 4C G SA **6** = Mercury (7471A) 55439 074019-002 68 105-BH-20-2-S 105 020206/0917 S G 125 ml 4C G Mercury (7471A) RMMA Yes Ref. No. Special Instructions/QC Regulrements Sample Tracking Smo Use Abnormal Sample Disposal Return to Client Disposal by lab Date Entered(mm/dd/yy) EDD Yes No Conditions on Turnaround Time ☐ 7 Day X)15 Day 30 Day ✓ Yes ☐ No Entered by: Level D Package Receipt Return Samples By: **Negotiated TAT** QC inits. "Send report to: Name Signature Company/Organization/Phone/Cellular Preliminary report (.pdf) to srgriff@sandia.gov + blangk@sandia.gov Sample William Gibson Weston/6146/284-5232/239-7367 Final report to Stacy Griffith MS1087/Org 6146 Lab Use Team Jeff Lee Stone Lion/6146/284-3309/228-9598 (505) 284-2588/ (505) 379-7588 Members Glibert Quintana Shaw/6146/284-3309/238-9417 15 day turn around time Stacy Grimin Gram/6146/284-2588/ 379 7588 C Robert Lynch Weston/6146/250-7090 Please list as separate report. 1.Relinguished by Date Z/b/06 Time 0845 4.Relinquished by Org. Date Time Received by Fre Org. WUh Date 2 6 06 Time 0 RU 4. Received by Org. Date Time 2.Relinguished Chup Org. Tol U Date 2 -6-06 Time 1/50 5.Relinguished by Org. Date Time Received by Org. Date 7-7-06 Time 930 5. Received by Org. Date Time .Relinquished by Org. Date Time 6.Relinguished by Time Org. Date 3. Received by Org. Date Time 6. Received by Org. Date Time

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OFF-SITE LABORATORY Analysis Request And Chain Of Custody (Continuation)

AR/COC-609365 Project Name: P2VCA@SWMU105 Project/Task Manger: Brenda Langkopf Project/Task No.: 98046.02.02.09 Location Tech Area Reference LOV (available at SMO) / Building Room Lab use Sample No-ER Sample ID or Pump ER Date/Time (hr) Sample Container Preserv-Parameter & Method Lab Sample Collection Sample Fraction Sample Location detail Depth (ft) Site No. Collected Matrix Type Volume ative Method Type Requested ID 074020-002 105-BH-20-4-S 09 105 020206/0916 S G 125 ml 4C G Mercury (7471A) 074022-002 105-BH-20-8-S 105 020206/0920 S 125 ml 4C G SA Mercury (7471A) G Abnormal Conditions on Receipt LAB USE Recipient Initials

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

internal Lab	1.0	, ,		0.0							17/000	600	9366
Batch No. /	1/4			SMO Use	.,						AR/COC	יטס	2000
Dept. No./Mail Stop:	6146/1087			ed: 2 - 1 ~ 0				98046 <u>.02.02</u>	.09	A	Waste Characterization		
Project/Task Manager:	Brenda Langkopf	Camer/Way		60018			uthorizatio		Lan-	greed	-Send preliminary/copy re	eport to:	
Project Name:	P2VCA@SWMU105	Lab Contac	•	Edie Kent 803/556-81	171	Contrac	t #: <u>PO 21</u>	671			Delegand by COC No.		
Record Center Code:	NA	Lab Destina		Gel							Released by COC No.:_ Validation Required		_
Logbook Ref. No.:	ER047	SMO Contac		Pam Pulssant/505-28							Bill To:Sandia National Labs (Ad	counte Pavel	nia\
Service Order No.	CFO56-06	Send Report	to SMO:	Lorraine Herrera/505	<u>-844-3199</u>						P.O. Box 5800 MS 0154	counts rayar	ole)
Location	Tech Area	1		-			-i4 OI	40)				0154	155040
Building	Room		T == 011	Referenc				Preserv-	Collection	Sample	Albuquerque, NM 87185- Parameter & Meth		Lab Sample
Sample NoFraction	ER Sample ID or Sample Location Detail	Pump Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Туре	Volume	ative	Method	Type	Requested		ID
073938-002	105-BH-43-4-S	4	105	013106/1512	s	G	125 ml	4C	G	SA	Mercury (EPA 7471A)		001
073939-002	105-BH-43-6-S	6	105	013106/1513	s	G	125 ml	4C	G	SA	Mercury (EPA 7471A)		002
073940-002	105-BH-43-6-SD	6	105	013106/1513	s	G	125 ml	4C	G	DU	Mercury (EPA 7471A)		003
073941-002	105-BH-43-8-S	8	105	013106/1525	s	G	125 ml	4C	G	SA	Mercury (EPA 7471A)		004
073942-002	105-BH-58-4-S	4	105	013106/1451	s	G	125 ml	4C	G	SA	Mercury (EPA 7471A)		005
073943-002	105-BH-58-6-S	6	105	013106/1453	8_	G	125 ml	4C	G	SA	Mercury (EPA 7471A)		006
073944-002	105-BH-58-8-S	8	105	013106/1508	S	G	125 ml	4C	G	SA	Mercury (EPA 7471A)	_	007
073945-002	105-BH-74-4-S	4	105	013106/1432	s	G	125 ml	4C	G	SA	Mercury (EPA 7471A)		008
073946-002	105-BH-74-6-S	6	105	013106/1447	S	· G	125 ml	4C	G	SA	Mercury (EPA 7471A)	_	009
073947-002	105-BH-74-8-S	8	105	013106/1446	S	G	125 ml	4C	G	SA	Mercury (EPA 7471A)		010
073948-002	105-BH-89-4-S	4	105	013106/1413	<u>s</u>	G	125 ml	4C	G	SA	Mercury (EPA 7471A)	1902 ()	011
RMMA		. No.		Sample Tracking		Smo U		Special Ins			ements .	Abnorm	
Sample Disposal		Disposal by la		Date Entered(mm/do	J/ <u>yy)</u>		<u> 1444 .</u>	-1		No		Conditio	
Turnaround Tim			0 Day	Entered by:				Level D Pa		✓ Ye	s	Receipt	
Return Samples By:				ted TAT 3-PA4				*Send repo				Ι	
		ignature,	Init	Company/Orga			ellular				@sandia.gov + blangk@sandia	a.gov	
Sample		graffith)		Weston/6146/284-52				-	-		\$1087/Org 6146	:::::	Lab Use
Team	Jeff Lee	22	4-16-	Stone Lion/6146/284		8-9598		(505) 284-	2588/ (505) 379-7588		1	ر سر
Members	Robert Lynch	HIND.	100	Weston/6146/250-70	090			<u></u>			100	100	1
	Stacy Griffith	Sue///	180	Gram/6146/284-258			_ (3 day			me	3	0
72	Gilbert Quintana	Meritun		Shaw/6146/238-941				*Please lis	t as separ			<u> </u>	
1.Relinquished by	Catton	Org. 614	Date :	2/1/06Time @		_	iquished b	y		Org.	Date	Tim	
1. Received by					900	_	eived by			Org.	Date Date	Tim	
2.Relinquished by	2119 Jany GNO		// 		200		iquished b elved by	<u> </u>		Org.	Date	Tin Tin	
3.Relinquished by	71/1 - WIW	Org. Greek	Date	<i>1-1-06</i> Time <i>O</i> " Time	104)		quished by)V		Org.	Date	Tim	
3. Received by		Org.	Date	Time			eived by	·,		Org.	Date	Tim	
5.11000.110d by		<u></u>	20.0	11110		10.1100				~·9·	2000	- 101	

Page_2_ of _2 AR/COC-98046.02.02.09 Project Name: P2VCA@SWMU105 Project/Task No.: Project/Task Manger: Brenda Langkopf Location Tech Area Reference LOV (available at SMO) Lab use Building Collection Sample Sample No-ER Sample ID or Date/Time (hr) Sample Container Parameter & Method Lab Sample Pump ER Preserv-Fraction Sample Location detail Depth (ft) Site No. Collected Matrix Type Volume ative Method Type Requested ID 012 073949-002 105-BH-89-6-S 013106/1416 G 125ml 4C SA Mercury (EPA 7471A) 013 073950-002 Mercury (EPA 7471A) 105-BH-89-8-S 8 105 013106/1428 S G 125ml 4C G 073951-002 105-BH-104-4-S S G G 105 013106/1356 125ml 4C Mercury (EPA 7471A) 073952-002 105-BH-104-6-S 6 013106/1400 S Mercury (EPA 7471A) 105 G 125ml 4C G 073953-002 105-BH-104-8-S 105 013106/1359 S G 125ml 4C G Mercury (EPA 7471A) 074460-002 105-EB-6 NA 013106/1530 DIW P HNO3 105 250 ml Mercury (EPA 7470A) 15505000 105 DIW 250 ml Abnormal Conditions on Receipt LAB USE Recipient initials M

Internal Lab

CONTRAC. LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Batch No.				SMO Use				_			AR/COC	609	3367
Dept. No./Mall Stop:	6146/1087	Date Samp	les Shipp					98046.02.02			Waste Characterization		
Project/Task Manager:	Brenda Langkopf	Carrier/Way	ybill No.	60048		SMO A	uthorizatio	n: <u></u>	3		-Send preliminary/copy re	eport to:	
Project Name:	P2VCA@SWMU105 /	Lab Contac	:t:	Edie Kent 803/556-81	71	Contrac	:l #: <u>PO 2</u>	1671					
Record Center Code:	NA	Lab Destina	ation:	Gel							Released by COC No.:_		
Logbook Ref. Nc.:	ER047	SMO Contac	t/Phone:	Pam Puissant/505-28	4-3124						☑ Validation Required		
Service Order No.	CF()56-06 /	Send Report	to SMO:	Lorraine Herrera/505-	844-3199)					Bill To:Sandia National Labs (Ad	counts Payab	ole)
Location	Tech Area										P.O. Box 5800 MS 0154		
Bullding	Room			Referenc	e LOV(availal	ole at SI	MO) /	5516	8	Albuquerque, NM 87185-	0154	
	ER Sample ID or	Pump	ER Site	Date/Time(hr)	Sample	Co	ntainer	Preserv-	Collection	Sample	Parameter & Meth	od	Lab Sample
Sample NoFraction	Sample Location Detail	Depth (ft)	No.	Collected	Matrix	Туре	Volume	ative	Method	Туре	Requested		ID
5526 073954-002	105-BH-133-0-S	0	105	020106/0855	S	G	125 ml	4C	G	SA_	Mercury (7471A)		
ໂ 07 3955 -0ປະ	105-BH-133-2-S	2	105	020106/0905	S	G	125 ml	4C	G	SA	Mercury (7471A)		
07 3956 -042	105-BH-133-4-S	4	105	020106/0904	S	G	125 ml	4C	G	SA	Mercury (7471A)		
973 957 -002	105-BH-133-8-S	8	105	020106/0910	s	G	125 ml	4C	G	SA	Mercury (7471A)		
07 3058 -00?	105-BH-134-0-S	0	105	020106/0856	S	G	125 ml	4C	G	SA	Mercury (7471A)		
* 07 305 9-002	105-BH-134-2-S	2	105	020106/0916	S	G	125 ml	4C	G		Mercury (7471A)		
√ 07 3960 -00Ω	105-BH-134-4-S	4	105	020106/0915	s	G	125 ml	4C	G		Mercury (7471A)		
6 073 061 -002	105-BH-134-4-SD	4	105	020106/0915	S	G	125 ml	4C	G	P'SA FA	Mercury (7471A)		
5534 * 07 3962 -002	105-BH-134-8-S	8	105	020106/0920	S	G	125 ml	4C	G	SA	Mercury (7471A)		
073 963 -002	105-BH-135-0-S	0	105	020106/0923	S	G	125 ml	4C	G	SA	Mercury (7471A)		
073 964 -002	10U-BH-135-2-S	2	105	020106/0930	S	G	125 ml	4C	G		Mercury (7471A)	141	ļ
RMMA	Yes No Ref.			Sample Tracking		Smo Us		Special Inst			ments	Abnorma	•
Sample Disposa		isposal by la		Date Entered(mm/dd/		106/1	06		Yes 🗌		_	Condition	is on
Turnaround in		/ 30		Entered by: RK				Level D Pac		✓ Yes	No	Receipt	
Return Sample Ey:			Negotia		QC inits.		6	*Send repo					
		nature,	Init	Company/Organ			llular				sandia.gov + blangk@sandia	.gov	
Sample	William Gibson 4////		10/12/	Weston/6146/284-52	32/239-73	367			-		087/Org 6146		Lab Use
Team		11-12-12	2	Stone Lion/6146/284-	3309/228	3-9598		(505) 284-2	2588 <i>l</i> (505)	379-7588			
Members	Gilbert Quintana	2/1:55	115%	Shaw/6146/284-3309	/238-941	7						ł	
	Stary Griffith	MAR	325	Gram/6146/284-2588	/ 379 758	18		3 day t	urn ard	ound ti	me		
	Robert Lynch	100		Weston/6146/250-709			~	*Please list				ĺ	
1.Relinquished by	Colore Cylich (North	Org. 6 146		2-2-06 Time 08		4.Reline	quished by		ao separa	Org.	Date	Time)
		Org. 6 / 46		2.2.06 Time (28)		4. Rece				Org.	Date	Time	
	The Mark Sugar Sugar	Org. 196		2 0 Time /1 9			quished by	v		Org.	Date	Time	
2. Received by	71.5	Org.	Date	Time		5. Rece				Org.	Date	Time	
3.Relinquished by		Org.	Date	Time			quished by	у		Org.	Date	Time	
3. Received by		Org.	Date	Time			elved by		,	Org.	Date	Time	

Page_2_ of _2 AR/COC-60936 F2VCA@SWMU105 Project/Task No.: 98046.02.02.09 Project Name: Project/Task Manger: Brenda Langkopf Location 7 ech Area Reference LOV (available at SMO) Lab use Building Room ER Parameter & Method Lab Sample Sample No-ER Sample ID or Date/Time (hr) Sample Container Preserv-Collection Sample Pump Fraction Sample Location detail Depth (ft) Site No. Collected Matrix Type Volume Method Type Requested ID ative 073965-002 Mercury (7471A) 105-BH-135-4-S 105 020106/0929 S G 125 ml 4C G SA 073966-002 105-BH-135-8-S G Mercury (7471A) 105 020106/0935 125 ml 4C G 073967-002 Mercury (7471A) S G 4C G 105-BH-136-0-S 0 105 020106/0924 125 ml 073068-002 Mercury (7471A) 105-BH-136-2-S 2 105 020106/0942 S G 125 ml 4C G 073969-002 Mercury (7471A) 105-BH-136-4-S 105 020106/0941 S G 125 mi 4C G 073070-002 Mercury (7471A) 105-Bil-136-8-S 105 020106/0946 S G 125 ml 4C G 073974-002 105 3 I-137-0-S 0 105 020106/0950 S G 125 ml 4C G Mercury (7471A) 105-EH-137-2-S 105 020106/0958 G 125 ml 4C G Mercury (7471A) 073573-002 020106/0956 105-BH-137-4-S 4 105 G 125 ml 4C G Mercury (7471A) 973974-002 4C SA Mercury (7471A) 105-5H-137-8-S 8 020106/1001 S G 125 ml G 105 KK DON B G Abnormal Conditions on Receipt LAB USE Recipient Initials

Internal Lab

CONTRAC. LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Batch No.				SMO Use							AR/COC	60'	9368
Dept. No./Mail Stop:	6146/1087	Date Samp	les Shipp	ed: 2-2-06		Project	Task No.	98046.02.02	2.09 ~		Waste Characterization	n ·	
Project/Task Manager	Branda Langkopf 🗸	Carrier/Wa	ybill No.	60048		SMO A	ulhorizatio	on:			-Send preliminary/copy i	report to:	
Project Name:	P2VCA@SWMU105 >	Lab Contac	ot:	Edie Kent 803/556-8	171	Contrac	ct #: <u>PO 2</u>	1671	-				
Record Center Corie:	NA	Lab Destina		Gel]					Released by COC No.:		
Logbook Ref. No.	ER047	SMO Contac	∜Phone:	Pam Puissant/505-28	34-3124						∠ Validation Required		
Service Order 1 o	CFO56-06 V	Send Report	lo SMO:	Lorraine Herrera/505	-844-3199	9					Bill To:Sandia National Labs (A	sccounts Payal	ple)
Location	Tech Area							_		,	P.O. Box 5800 MS 0154	ı	
Building	Room			Referenc					5/68		Albuquerque, NM 87185		
	ER Sample ID or	Pump	ER Site	Date/Time(hr)	Sample		ntainer	Preserv-	Collection		Parameter & Met	hod	Lab Sample
Sample NoFraction	Sample Location Detail	Depth (ft)	No.	Collected	Matrix	Туре	Volume	ative	Method	Туре	Requested		. ID
5547 073975-002	105-BH-138-0-S	0	105	020106/0951	s	G	125 ml	4C	G	SA	Mercury (7471A)		
5349 073976-(0.)	105-BH-138-2-S	2	105	020106/1009	S	G	125 ml	4C	G	SA	Mercury (7471A)		
5549 07 3077 -00?	105-BH-138-4-S	4	105	020106/1008	S	G	125 ml	4C	G	SA	Mercury (7471A)		
55.50 073 078 -002	105-BH-138-8-S	8	105	020106/1013	s	G	125 ml	4C	G	SA	Mercury (7471A)		
\$ 557 073 979 -002	105-BH-139-0-S	0	105	020106/1015	S	G	125 ml	4C	G	SA	Mercury (7471A)		
073 989 -00;	105-BH-139-2-S	2	105	020106/1024	s	G	125 ml	4C	G	SA	Mercury (7471A)		
\$ 553 \ 073084-00;	105-BH-139-4-S	4	105	020106/1023	s	G	125 ml	4C	G	SA	Mercury (7471A)		
073 982 -002	105-BH-139-8-S	8	105	020106/1026	S	G	125 ml	4C '	G	SA	Mercury (7471A)		
073083-002	10 j-BH-140-0-S	0	105	020106/1016	s	G	125 ml	4C	G	SA	Mercury (7471A)		
073 384 -002	105-BH-140-2-S	2	105	020106/1032	s	G	125 ml	4C	G	SA	Mercury (7471A)		
5557 \ 07 3985 -00;	105-BH-140-2-SD	2 .	105	020106/1032.	s	G	125 ml	4C	G	DŲ	Mercury (7471A)		
RMMA	LiYes LiNo Ref.	No.		Sample Tracking		Smo y		Special inst		C Require	ments	Abnorma	
Sample Disposal		isposal by la	b	Date Entered(mm/dd.	(yy) 021	06/0	06	EDD 🖸	Yes 🗌			Condition	ns on
Turnaround Tim	e 7 Day 15 Day	у 🔲 3	0 Day	Entered by: R				Level D Pac	kage	✓ Yes	□ No	Receipt	
Return Samples Ey:			Negotia	ted TAT	QC inits.	3	?	*Send repor	rt to:				
		gnature	Init	Company/Organ	ization/Pi	hone/Ce	llular	Preliminary r	report (.pdf)	to srgriff@	sandia.gov + blangk@sandia	a.gov	
Sample	William Gibson (A) Min		WYA	Weston/6146/284-52	32/239-73	367		Final report	to Stacy 0	Friffith MS	1087/Org 6146		Lab Use
Team	Jeff Lee			Stone Lion/6146/284	-3309/228	3-9598		(505) 284-2	2588/ (505)	379-7588			
Members	Gilbert Quintana Riller	La ruce		Shaw/6146/284-3309	/238-941	7						ł	
	Stacy Griffith	NASA	82	Gram/6146/284-2588	/ 379 758	18		3 day t	urn ard	ound ti	me	ļ	
	Robert Lynch	Mineally		Weston/6146/250-70				*Please list			,		
1.Relinguished by	That Zearing	Org. 1.14		1/2/06 Time 08		4.Relin	quished b		as separa	Org.	Date	Time	
	3 - 283 - col 2	Org. 6146		2 6 6 Time 2 5			eived by			Org.	Date	Time	
	But the first of t	Organic		2 - 6 Time 114		-	gulshed b	У		Org.	Date	Time	
2. Received by		Org.	Date	Time			elved by			Org.	Date	Time	
3.Relinquished by		Org.	Date	Time			quished b	у		Org.	Date	Time	9 ,
3. Received by		Org.	Date	Time			eived by			Org.	Date	Time	9

Page_2_ of _2_ AR/COC-IP2VCA@SWMU105 Project Name: Project/Task Manger: Brenda Langkopf Project/Task No.: 98046.02,02.09 Location Tech Area Building Reference LOV (available at SMO) Floom Lab use Sample No-ER Sample ID or Container Sample Pump Date/Time (hr) Preserv-Collection Sample Parameter & Method Lab Sample Fraction Sample Location detail Depth (ft) Site No. Collected Matrix Type Volume ative Method Type Requested 5558 073986-002 105-BH-140-4-S 105 020106/1031 G 125 ml 4C G Mercury (7471A) 073987-002 105-EH-140-8-S 105 020106/1037 125 ml G Mercury (7471A) 073988-002 105-BH-141-0-S 105 020106/1030 4C G Mercury (7471A) 125 mi 073589-002 105-BH-141-2-S 105 020106/1044 G 125 ml 4C Mercury (7471A) 073550-002 105-BH-141-4-S 020106/1043 S 105 G 125 ml 4C G Mercury (7471A) 073091-002 105-BH-141-8-S 8 105 020106/1048 G 125 ml 4C G Mercury (7471A) LAB USE Abnormal Conditions on Receipt Recipient Initials

Internal Lab

CONTRAC. LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Batch No.				SMO Use							AR/COC	609	9369
Dept. No./Mail 3tup;	6146/1087	Date Samp	les Shipp			Project	Task No.:	98046,02.02			Waste Characterization	1	
Project/Task Manager:	Brenda Langkopf	Carrier/Wa	ybill No.	60048		SMO A	uthorizatio	n:	200		-Send preliminary/copy r	eport to:	
Project Name:	P2VCA@SWMU105	Lab Contac	:t:	Edie Kent 803/556-8	171	Contrac	t#: PO 2	1671	-		<u> </u>		
Record Center Code:	NA	Lab Destina	ation:	Gel]					Released by COC No.:		
Logbook Ref. He.:	ER047	SMO Contac	f/Phone:	Pam Pulssant/505-28	34-3124]					Validation Required		The second second
Service Order (40	CFO56-06	Send Report	to SMO:	Lorraine Herrera/505-	-844-319	9					Bill To:Sandia National Labs (A	ccounts Payat	ole)
Location_	Tech Area								_ // ~/	,	P.O. Box 5800 MS 0154		
Building	Room			Referenc	e LOV(availal	ole at S	MO) 155	5/68		Albuquerque, NM 87185	-0154	
	ER Sample ID or	Pump	ER Site	Date/ (Ime(nr)	Sample	C0	ntainer	Preserv-	Collection	Sample	Parameter & Meth	od	Lab Sample
Sample NoFraction	Sample Location Detail	Depth (ft)	No.	Collected	Matrix	Туре	Volume	ative	Method	Туре	Requested		ID
5564 07 3992 -002	105-BH-142-0-S	0	105	020106/1053	s	G	125 ml	4C	G	SA	Mercury (7471A)		
97 3093 -000	105-BH-142-2-S	2	105	020106/1126	s	G	125 mi	4C	G	SA	Mercury (7471A)		
5566 073 094 -00::	105-BH-142-4-S	4	105	020106/1125	s	G	125 ml	4C	G	SA	Mercury (7471A)		
073 996 -00;	105-BH-142-8-S	8	105	020106/1129	S	G	125 ml	4C	G	SA	Mercury (7471A)		
073996-002	105-BH-143-0-S	0	105	020106/1400	s	G	125 ml	4C	G	SA	Mercury (7471A)		
073997-002	105-BH-143-2-S	2	105	020106/1408	s	G	125 ml	4C	G	SA	Mercury (7471A)		
073 998 -00	105-BH-143-4-S	4	105	020106/1407	s	G	125 ml	4C	G	SA	Mercury (7471A)		
073 099 -002	105-в H-143-8- S	8	105	020106/1413	s	G	125 ml	4C	G	SA	Mercury (7471A)		
97 4000 -092	105 BH-144-0-S	0	105	020106/1054	s	G	125 ml	4C	G	SA	Mercury (7471A)		
97 400 1-002	105-BH-144-2-S	2	105	020106/1105	s	G	125 ml	4C	G	SA	Mercury (7471A)		
074 002 -002	105-BH-144-4-S	4	105	020106/1116	s	G	125 ml	4C	G	SA	Mercury (7471A)		Ĺ,
RMMA	Yes ✓No Ref.	No.		Sample Tracking		Smo Us		Special Inst			ments	Abnorma	1
Sample Dispona	Return to Client D	sposal by la	b	Date Entered(mm/dd/	(yy) 0Z	106/0	06	EDD 🗹] Yes 🔲			Condition	ns on
Turnaround "I'm	e 7 Day 15 Day	/ 🛄 3		Entered by:	212			Level D Pac	kage	✓ Yes	□ No	Receipt	
Return Samples By:			Negotia	ted TAT	QC inits.	WF)	*Send repor	rt to:			7	
	Name Sig	nature	Inlt	Company/Organ	ization/P	hone/Ce	llular	Preliminary r	report (.pdf)	to srgriff@	sandia.gov + blangk@sandia	a.gov	
Sample	William Gibson	100 J. J. J.	加爾	Weston/6146/284-52	32/239-7	367		Final report	to Stacy G	irlffith MS	1087/Org 6146		Lab Use
Team	Jeif Lee	يالية الم	13	Stone Lion/6146/284-	3309/228	3-9598		(505) 284-2	2588/ (505)	379-7588			
Members	Gilbert Quintana	The rate water	1-1-26	Shaw/6146/284-3309	/238-941	7						<u> </u>	
	Stacy Griffith	-101X	501°	Gram/6146/284-2588	/ 270 750	10		3 day t	urn arc	und fi	me		
		10 10									1110	1	
1.Relinquished by /	Robert Lynch	Org. 6 146		Weston/6146/250-709		A Delle	quished by	*Please list	as separat		Dele	Time	
	May Burn more Emma	Org. C. M.		2 - 2 - 2 7 Time () ()		4. Rece				Org. Org.	Date	Time	
	Mary of the control o	Org. / 16			00 C		quished by	,		Org.	Date Date	Time	
2. Received by	The state of the s	Org.	Date	Time		5. Rece				Org.	Date	Time	
3.Relinquished by		Org.	Date	Time			quished by	, .		Org.	Date	Time	
3. Received by		Org.	Date	Time		6. Rece			,	Org.	Date	Time	
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											AR/COC-	609369
Project Name:	F2VCA@SWMU105	Project/Task M	langer:	Brenda Langkopf			Project/Task	No.:	98046.02.02.0	9		The second secon
Location	Tech Area										·	•
Building	Room			Reference	LOV (a	vaila	ble at S	(OM			e general de la companya de la comp	Lab use
Sample No-	ER Sample ID or	Pump	ER	Date/Time (hr)	Sample		ntainer	Preserv-	Collection	Sample		Lab Sample
Fraction	Sample Location detail	Depth (ft)		Collected			Volume	ative	Method	Type	Requested	DI D
i 07 4003 -002	105-BH-144-8-S	8	105	020106/1115	S	G	125 ml	4C	G	SA	Mercury (7471A)	
	1 419-44-4-44-4-4-4-4-4-4-4-4-4-4-4-4-4-4-											
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Abnormal Cond	Itions on Receipt	L		LAB USE						L		
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Recipient Initials	5											
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Internal Lab

CONTRAC: LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Batch No.				SMO Use							AR/COC	60'	9370
Dept. No./Mail Stop:	6146/1087	Date Samp	les Shipp		6	Project	Task No.:	98046,02.02			Waste Characterizatio	n	
Project/Task Mana-p:r:	Brenda Langkopf /	Carrier/Way	ybill No.	60048		SMO A	uthorizatio	on:	623		-Send preliminary/copy	report to:	
Project Name:	P2VCA@SWMU105/	Lab Contac	ct:	Edie Kent 803/556-8	171	Contrac	ct #: PO 2	1671					
Record Center Code:	NA.	Lab Destina	ation:	Gel		}					Released by COC No.:		
Logbook Ref. No.:	ER047	SMO Contac	t/Phone;	Pam Puissant/505-28	34-3124						✓ Validation Required		and the Calendary form the second species of the San
Service Order No.	CFC)56-06 /	Send Report	to SMO:	Lorraine Herrera/505	-844-319	9					Bill To:Sandia National Labs (A	Accounts Payal	ole)
Location	Tech Area							1	م / ا سوم	_/	P.O. Box 5800 MS 0154	‡	
Building	Room			Referenc					5/68		Albuquerque, NM 87185		·/
	ER Sample ID or	Pump	ER Site	Date/Time(hr)	Sample		ntainer	Preserv-	Collection		Parameter & Met	hod	Lab Sample
Sample NoFraction	Sample Location Detail	Depth (ft)	No.	Collected	Matrix	Туре	Volume	ative	Method	Туре	Requested		ID
07 4004 -002	105-BH-145-0-S	0	105	020106/1335	s	G	125 ml	4C	G	SA	Mercury (7471A)		
074 005 -002	105-BH-145-2-S	2	105	020106/1340	S	G	125 ml	4C	G	SA	Mercury (7471A)		
5578 074006-002	105-BH-145-4-S	4	105	020106/1339	s	G	125 ml	4C	G	SA	Mercury (7471A)		
074007-007	105-BH-145-8-S	88	105	020106/1345	s	G	125 ml	4C	G	SA	Mercury (7471A)		
074008-002	105-BH-146-0-S	0	105	020106/1336	S	G	125 ml	4C	G	SA	Mercury (7471A)		
558/ 5 074 009 -002	105-BH-146-2-S	2	105	020106/1350	s	G	125 ml	4C	G	SA	Mercury (7471A)		
5582 074 010 -002	105-BH-146-4-S	4	105	020106/1349	s	G	125 ml	4C	G	SA	Mercury (7471A)		
97 4011 -002	105-BH-146-8-S	8	105	020106/1355	s	G	125 ml	4C	G	SA	Mercury (7471A)		
074 012 -002	105-BH-146-8-SD	8	105	020106/1355	s	G	125 ml	4C	G	DU	Mercury (7471A)		
5585 073 998 -002	105-BH-15-0-S	0	105	020106/1404	s	G	125 ml	4C	G	SA	Mercury (7471A)		
<u>\$55%</u> 073 999 -00≥	105-BH-15-2-S	2.	105	020106/1420	s	G	125 ml	4C	G	SA	Mercury (7471A)		
RMMA	∐y'es _No Ref.	No.		Sample Tracking		Smo Us	se	Special Inst			ments	Abnorma	
Sample Disposal		sposal by la		Date Entered(mm/dd/	(yy)02/	06/8	16	EDD 🖸	Yes 🗌			Condition	ns on
Turnaround 11m	e 7 Day 15 Day	/ 30	0 Day	Entered by:	Z/L	/		Level D Pac	kage	✓ Yes	No	Receipt	
Return Samples By:			Negotia		QC inits.			*Send repor	rt to:				
	Name Sig	gnature /	Init	Company/Organ	ization/Pl	hone/Ce	llular	Preliminary r	eport (.pdf)	to srgriff@	sandia.gov + blangk@sandi	a.gov	
Sample	William Gibson	1/3/1/20	WYZ	Weston/6146/284-52	32/239-73	367		Final report	to Stacy G	Griffith MS	1087/Org 6146		Lab Use
Team	Jeff Lee	1/1-1-1		Stone Lion/6146/284	-3309/228	3-9598		(505) 284-2	2588/ (505)	379-7588			
Members	Gilbert Quintana	2 harter		Shaw/6146/284-3309	9/238-941	7							
	Stacy Griffith	SIA .	SKI	Gram/6146/284-2588	3/ 379 758	88		3 day t	urn ard	ound ti	me		
	Robert Lynch	Nucl		Weston/6146/250-70				*Please list			,		
1.Relinquished by		Org.6:14/6		Z=Z-C & Time U 9		4.Reline	quished by			Org.	Date	Time	}
	A Commence of the Commence of	Org (146		2. 2. 6 Time 09		4. Rece				Org.	Date	Time	
2.Relinquished by	Sand Sugar Burgar	Org. 146			والم الم		quished by	/		Org.	Date	Time	
2. Received by		Org.	Date	Time		5. Rece	ived by			Org.	Date	Time	3
3.Relinquished by		Org.	Date	Time			quished by	/		Org.	Dale	Time)
3. Received by		Org.	Date	Time		6. Rece	eived by		-	Org.	Date	Time	9

AR/COC-Project Name: F2VCA@SWMU105 Project/Task Manger: 98046.02.02.09 Brenda Langkopf Project/Task No.: Location Tech Area Reference LOV (available at SMO) Building Room Lab use Sample No-ER Sample ID or ER Date/Time (hr) Sample Collection Sample Parameter & Method Pump Container Lab Sample Fraction Sample Location detail Depth (ft) Site No. Collected Matrix Type Volume ative Method Type Requested ID 074000-002 105-BH-15-4-S 105 020106/1418 S G 125 ml 4C G Mercury (7471A) 074001-002 105-BH-15-8-S 020106/1423 125 ml 105 4C Mercury (7471A) 07**4056**-002 105-BH-29-0-S 020106/1402 125 ml Mercury (7471A) 105 4C G 074057-002 105-BH-29-2-S 2 020106/1430 S Mercury (7471A) 105 125 ml 4C G **559/** 074058-002 105-BH-29-4-S 4 S Mercury (7471A) 105 020106/1428 125 ml 4C G 074013-002 105-3H-29-8-S 020106/1435 8 105 S G Mercury (7471A) 125 ml 4C SA 074461-002 105-EB-7 NA 105 020106/1437 DIW 250 ml HNO3 Mercury (7470A) Abnormal Conditions on Receipt LAB USE Recipient Initials____

Internal Lab	/		A	NAL'	YSIS REQUE	EST A	ND (CHAI	N OF C	USTO	ΣY		Page 1 of	2
Batch No.	A				SMO Use							AR/COC	609	371
Dept. No./Mail Stop:	6146/1087		Date Samo	les Shipp	ed: 2-6-0	10	Project	Task No.:	98046.02.02	2.09		Waste Character	rization	
Project/Task Manager:	Brenda Langkopf				60172	<u> </u>	SMO A	uthorizatio	on: 06	m	Corne	-Send preliminary		
Project Name:	P2VCA@SWMU105		Lab Contac		Edle Kent 803/556-8	171	Contra	t#: PO 2	1671	/		1	,	
Record Center Code:	NA NA		Lab Destina		Gel		100	<u> </u>	1071			Released by CO	C No.:	
Logbook Ref. No.:	ER047		SMO Contac		Pam Puissant/505-28	14-3124	i					☑ Validation Requi		-
Service Order No.	CF056-06		-		Lorraine Herrera/505		D]					Bill To:Sandia National		le)
Location	Tech Area		Sent Nepon	W SHIQ.	LONAIRE HEHERASOS	-0-1-0-10-						P.O. Box 5800 N		·~'
Building	Room		1		Referenc	~ I OV/	o coile	hia at C	MO			Albuquerque, NA		
Dunung	ER Sample ID	or	Pump	ER Site	Date/Time(hr)	Sample		ntainer	Preserv-	Collection	Sample	Parameter		Lab Sample
Sample NoFraction			Depth (ft)	No.	Collected	Matrix	Type	Volume	ative	Method	Type	Reque		ID Sample
		D C (CAI)									· ·			
074023-002	105-BH-21-0-S		0	105	020206/1130	S	G	125 ml	4C	G	SA	Mercury (7471A)	15543	7-011
074024-002	105-BH-21-2-S		2	105	020206/1132	S	G	125 ml	4C	G	SA	Mercury (7471A)		-012
074021-002	105-BH-21-2-SD		2	105	020206/1132	s	G	125 ml	4C	G	DU	Mercury (7471A)	field OC	-0/3
074025-002	105-BH-21-4-S		4	105	020206/1131	S	G	125 ml	4C	G	SA	Mercury (7471A)		-014
074026-002	105-BH-21-8-S		8	105	020206/1135	s	G	125 ml	4C	G	SA	Mercury (7471A)		-015
074081-002	105-BH-35-0-S		0	105	020206/1107	s	G	125 ml	4C	G	SA	Mercury (7471A)		-016
074082-002	105-BH-35-2-S		2	105	020206/1126	s	G	125 ml	4C	G	SA	Mercury (7471A)		-017
074083-002	105-BH-35-4-S	_	4	105	020206/1125	s	G	125 ml	4C	G	SA	Mercury (7471A)		-018
074084-002	105-BH-35-8-S		8	105	020206/1127	s	G	125 ml	4C	G	SA	Mercury (7471A)		-019
074141-002	105-BH-50-0-S		0	105	A.C.	щs	G	125 ml	4C	G	SA		15543 Q -	
					77							Mercury (7471A)	•	
074142-002	105-BH-50-2-S	m .	2	105	020206/1106	W S	G	125 ml	4C	G	SA	Mercury (7471A)	15544	
RMMA	Yes (No	Ref.			Sample Tracking		Smo U	se: : : : :	Special Ins			ements	Abnorma	
Sample Disposal	Return to Client		isposal by la		Date Entered(mm/dd		 		-	Yes 🗌			Condition	is on
Turnaround Tim		15 Da	y 3		Entered by:				Level D Pac		✓ Yes	s No	Receipt	
Return Samples By:				Negotia	ted TAT .	QC inits.			*Send repo	rt to:				
	Name	Sig	gnature 1	Init	Company/Organ	rization/P	hone/Ce	llular	Preliminary	report (.pdf) to srgriff@	gsandia.gov + blangk@	gsandia.gov	
Sample .	William Gibson	Willia	whall		Weston/6146/284-52	32/239-7	367		Final report	t to Stacy (3riffith MS	1087/Org 6146		Lab Use
Team	Jeff Lee	Lit	195	12	Stone Lion/6146/284	-3309/228	3-9598		(505) 284-	2588/ (505)	379-7588			
Members	Gilbert Quintana	with	John Tue		Shaw/6146/284-3309	/238-941	7							
	Stacy Griffith	Son	4 COM	ole	Gram/6146/284-2588	3/ 379 75	38	. (15 day	turn a	round	time		
	Robert Lynch A	Will	mile		Weston/6146/250-70				'Please list	as separa	te report.			
	Villian Col	ni	Org <i>U140</i>		Z/6/06 Time 09			quished b	у		Org.	Date	Time	
1. Received by	19-1	Tress	Org//4/		16106 Time 09	00	4. Rece	eived by			Org.	Date	Time	
2.Relinquished by	W. G. Red	ENID	Org. 644	Date	16/06 Time //	35	5.Relin	quished b	у		Org.	Date	Time	
2. Received by	Ballon		Org.	Date 2	11/06 Time 93	2	5. Rece	eived by			Org.	Date	Time	
3.Relinquished by			Org.	Date	Time			quished b	у		Org.	Date	Time	
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Page_2_ of _2

AR/COC-60937 Project Name: P2VCA@SWMU105 Project/Task Manger: Brenda Langkopf Project/Task No,: 98046.02.02.09 Location Tech Area Reference LOV (available at SMO) Building Room Lab use Sample No-ER Sample ID or ER Date/Time (hr) Sample Container Collection Sample Parameter & Method Lab Sample Pump Preserv-Fraction Sample Location detail Depth (ft) Site No. Collected Matrix Type Volume ative Method Type Requested 55443-02 074143-002 105-BH-50-4-S 020206/1120 105 S G 125 ml 4C G SA Mercury (7471A) 074144-002 03 105-BH-50-8-S 020206/1123 s G 4C G Mercury (7471A) 8 105 125 ml SA 55448 -04 074200-002 105-BH-65-0-S 0 105 020206/1105 S G 125 ml G Mercury (7471A) 55443-05 074201-002 105-BH-65-2-S 2 105 020206/1110 s G 125 ml 4C G SA Mercury (7471A) 074202-002 105-BH-65-4-S SA 105 020206/1108 S G 125 ml 4C G Mercury (7471A) 074203-002 105-BH-65-8-S S G 4C Mercury (7471A) 8 105 020206/1111 125 ml G SA 074462-002 105-EB-8 105 020206/1425 DIW Ρ 250 ml HNO3 С Mercury (7470A) NA Abnormal Conditions on Receipt Recipient Initials_______

ANALYSIS REQUEST AND CHAIN OF CUSTODY Page 1 of 2 Internal Lab 609372 AR/COC Batch No. Dept. No./Mail Stop: 6146/1087 Project/Task No.: 98046.02.02.09 Waste Characterization Date Samples Shipped: 2/ Project/Task Manager: Brenda Langkopf Carrier/Waybill No. SMO Authorization:__ -Send preliminary/copy report to: Project Name: P2VCA@SWMU105 Edie Kent 803/556-8171 Contract #: PO 21671 Lab Contact: Record Center Code: Released by COC No.: Lab Destination: Gel Logbook Ref. No.: ER047 ✓ Validation Required Pam Puissant/505-284-3124 SMO Contact/Phone: Service Order No. CFO56-06 Lorraine Herrera/505-844-3199 Bill To:Sandia National Labs (Accounts Payable) Send Report to SMO: Location Tech Area P.O. Box 5800 MS 0154 55443 Building Room Reference LOV(available at SMO) Albuquerque, NM 87185-0154 ER Sample ID or Pump **ER Site** Date/Time(hr) Sample Container Preserv-Parameter & Method Lab Sample Sample No.-Fraction Sample Location Detail Depth (ft) No. Collected Matrix Type Volume ative Method Type Requested 155443-00 074263-002 105-BH-81-0-S Mercury (7471A) 0 105 020206/1029 S G 125 ml 4C G SA 00 074264-002 105-BH-81-2-S 2 S G 4C G 105 020206/1051 125 ml Mercury (7471A) 074265-002 105-BH-81-4-S 4 105 020206/1056 s G 125 ml 4C G SA Mercury (7471A) 074266-002 105-BH-81-8-S 8 s 105 020206/1102 G 125 ml 4C G SA Mercury (7471A) 074322-002 105-BH-96-0-S 0 020206/1028 S G 125 ml 4C G 105 SA Mercury (7471A) 074323-002 105-BH-96-2-S 2 S 4C G 105 020206/1045 G 125 ml SA Mercury (7471A) 074324-002 105-BH-96-4-S S G 125 ml 4C G 4 105 020206/1044 SA Mercury (7471A) 074325-002 S G G 105-BH-96-8-S 8 020206/1049 125 ml 4C Mercury (7471A) 105 SA 074381-002 S G G 105-BH-111-0-S 0 105 020206/1027 125 ml 4C SA Mercury (7471A) 074382-002 105-BH-111-2-S 2 105 020206/1038 S G 125 ml 4C G SA Mercury (7471A) 074383-002 105-BH-111-4-S 4 G 125 ml 4C G Mercury (7471A) 4000 CC 105 020206/1036 DU RMMA Yes √ No Ref. No. Abnormal Sample Tracking Smo Use Special Instructions/QC Requirements ☑ Yes ☐ No Sample Disposal Disposal by lab EDD Return to Client Date Entered(mm/dd/yy) Conditions on **Turnaround Time** ✓ Yes No 7 Day 15 Day 30 Day Entered by: Receipt Level D Package Return Samples By: QC inits. Negotiated TAT *Send report to: Name Signature Company/Organization/Phone/Cellular Preliminary report (.pdf) to srgnff@sandia.gov + blangk@sandia.gov Sample | Weston/6146/284-5232/239-7367 Final report to Stacy Griffith MS1087/Org 6146 Lab Use William Gibson Team Jeff Lee Stone Lion/6146/284-3309/228-9598 (505) 284-2588/ (505) 379-7588 Members Gilbert Quintana Shaw/6146/284-3309/238-9417 15 day turn around time Stacy Griffith Gram/6146/284-2588/ 379 7588 Weston/6146/250-7090 *Please list as separate report. Relinquished by 4.Relinguished by Date 2/6/06 Time 0844 Org. Date Time 1. Received by Date 2/6/06 Time 0 84% 4. Received by Time Org. Date Relinquished by Org. Date 2-6-00 Time 5.Relinguished by Org. Date Time Sun . Received by Date 2-7-06 Time 430 5. Received by Org. Date Time Relinquished by Ora. Date Time 6.Relinquished by Org. Date Time 3. Received by 6. Received by Org. Date Time Org. Date Time

AR/COC- 609372

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Project Na			Project/Task M	anger:	Brenda Langkopf			Project/Task	No.:	98046,02.02,0	9			
	cation	Tech Area												
Building		Room			Reference	LOV (a	ıvaila	ble at	SMO)			•		Lab use
Sam	nple No-	ER Sample ID or	Pump	ER	Date/Time (hr)	Sample		ntainer		Collection	Sample	Parameter 8	k Method	Lab Sample
Fr	action	Sample Location detail	Depth (ft)	Site No.	Collected	Matrix	Туре	Volume	ative	Method	Туре	Reque	sted	S · ID
0743	384-002	105-BH-111-8-S	8	105	020206/1040	s	O	125 ml	4C	G	SA	Mercury (7471A)	155443	20 19
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Internal Lab	j		Α	NAL	YSIS REQUE	:SI A	AND (CHAII	NOF C	JSTOL	JΥ		Page 1 of	2
Batch No.	1A				SMO Use							AR/COC	609	9373
Dept. No/Mail Stop:	6146/1087		Date Samp	es Shipp	ed 2-6-01	10	Project	Task No.:	98046,02.02	.09 _		Waste Character	ization	
Project/Task Manager:	Brenda Langkopf		Carrier/Way		60 72				on: 00		ans	-Send preliminary	copy report to:	
Project Name:	P2VCA@SWMU105		Lab Contac		Edie Kent 803/556-8			t #: PO 2				,	,	
Record Center Code:	NA		_ab Destina	ition:	Gel		1					Released by CO	C No.:	
Logbook Ref. No.:	ER047		SMO Contact		Pam Puissant/505-28	34-3124	1					☑ Validation Requi		_
Service Order No.	CFO56-06	_	Send Report		Lorraine Herrera/505		9					Bill To:Sandia National		
Location	Tech Area											P.O. Box 5800 M	IS 0154	•
Building	Room	\neg			Referenc	e LOV	availal	ble at S	MO)			Albuquerque, NA	187185-0154	
	ER Sample ID o	or I	Pump	ER Site	Date/Time(hr)	Sample	_	ntainer	Preserv-	Collection	Sample	Parameter		Lab Sample
Sample NoFraction	Sample Location D		Depth (ft)	No.	Collected	Matrix	Туре	Volume	ative	Method	Туре	Reque	sted	ID
074027-002	105-BH-22-0-S		0	105	020306/0955	s	G	125 m!	4C	G	SA	Mercury (7471A)	155443	20
074028-002	105-BH-22-2-S		2	105	020306/1007	S	G	125 ml	4C	G	SA	Mercury (7471A)	155447-	001
074029-002	105-BH-22-4-S		_ 4	105	020306/1006	S	G	125 ml	4C	G	SA	Mercury (7471A)		002
074030-002	105-BH-22-8-S		8	105	020306/1011	s	G	125 mi	4C	G	SA	Mercury (7471A)		003
074267-002	105-BH-82-0-S		0	105	020306/0850	s	G	125 ml	4C	G ·	SA	Mercury (7471A)		004
074268-002	105-BH-82-2-S		2_	105	020306/0933	s	G	125 mi	4C	G	SA	Mercury (7471A)		WS.
074269-002	105-BH-82-4-S		4	105	020306/0932	s	G	125 ml	4C	G	SA	Mercury (7471A)	•	006
074270-002	105-BH-82-8-S		8	105	020306/0938	s	G	125 ml	4C	G	SA	Mercury (7471A)		107
074326-002	105-BH-97-0-S		0	105	020306/0848	S	G	125 ml	4C	G	SA	Mercury (7471A)		พ8
074327-002	105-BH-97-2-S		2	105	020306/0914	s	G	125 ml	4C	O	SA	Mercury (7471A)		wg
074328-002	105-BH-97-4-S		4	105	020306/0913	s	G	125 ml	4C	G	SA	Mercury (7471A)		010
RMMA	☐Yes ✓No	Ref.	No.		Sample Tracking		Smo Us	se · · · ·	Special Inst	ructions/Q	C Require	ments	Abnorma	
Sample Disposal	Return to Client	√ Dis	posal by la		Date Entered(mm/dd	/vv)			EDD 🖸	Yes 🗌	No		Condition	s on
Turnaround Time		15 Day	30		Entered by:	1000			Level D Pac		✓ Yes	□ No	Receipt	
Return Samples By:				Negotia		QC inits			*Send repor					
	Name	Sign	nature _	Init	Company/Organ			Hular	4 .		to smriff@	sandia.gov + blangk@	sandia dov	
Sample	William Gibson	41.11.	19284		Weston/6146/284-52				1			1087/Org 6146		Lab Use
Геат	Jeff Lee	11.13		_	Stone Lion/6146/284				(505) 284-2	-		1001701g 0140		
Members	Gilbert Quintana		711	Lud	Shaw/6146/284-3309				(000) 2042		313-1300			
monipors		KALL.		/0%					4- 1	4				
	Stacy Griffith				Gram/6146/284-2588		38		15 day			time		
	Robert Lynch	MI	GALL		Weston/6146/250-70				*Please list	as separat	e report.			
Relinquished by	William In		org. 6141		1 00 Time 09			quished b	у		Org.	Date	Time	
. Received by	4 Textes 9	nis (Org. KY b	Datez		05	4. Rece				Org.	Date	Time	
2.Relinquished by	2 MGV Her		Org. 6/4/	Date 2		30		quished b	у		Org.	Date	Time	
	Sather		Org.	Date 2	-7-06 Time 436	5		eived by			Org.	Date	Time	
Relinquished by			Org.	Date	Time			quished b	у		Org.	Date	Time	
3 Received by		(nra .	Date	Time		6 Rece	eived by			Ora	Date	Time	

Page_2_ of _2 AR/COC-609373 Project Name: P2VCA@SWMU105 Project/Task Manger: 98046.02.02.09 Brenda Langkopf Project/Task No.: Location Tech Area 155447/ Reference LOV (available at SMO) Building Room Lab use Sample No-ER Sample ID or Date/Time (hr) Pump ER Sample Container Preserv-Collection Sample Parameter & Method Lab Sample Fraction Sample Location detail Method Depth (ft) Site No. Collected Matrix Volume ative Type Requested Type 011 074329-002 105-BH-97-8-S 105 020306/0918 S G 125 ml 4C G SA Mercury (7471A) 012 074385-002 105-BH-112-0-S 020306/0845 0 105 S G 125 ml 4C G SA Mercury (7471A) 013 074386-002 105-BH-112-2-S 105 020306/0857 S G 125 ml 4C G SA Mercury (7471A) 074387-002 105-BH-112-4-S 105 020306/0856 G 4C G 014 4 125 ml Mercury (7471A) 074388-002 105-BH-112-8-S 8 105 020306/0859 s G 125 ml 4C G Mercury (7471A) 016 074389-002 105-BH-113-0-S 0 105 020306/0846 S G 125 ml 4C G SA Mercury (7471A) カノス 074390-002 105-BH-113-2-S 2 . 105 020306/0905 S G 4C G SA 125 ml Mercury (7471A) 074391-002 105-BH-113-4-\$ 4 105 020306/0904 S G 125 ml 4C G Mercury (7471A) 019 074392-002 105-BH-113-8-S 8 105 020306/0909 S 4C G G 125 ml Mercury (7471A) LABUSE Abnormal Conditions on Receipt Recipient Initials /UK

Internal Lab			Α	NAL'	YSIS REQUE	ST A	ND (CHAI	NOF C	JSTO	OY .		Page 1 of	2
Batch No.	2				SMO Use							AR/COC	609	9374
Dept. No./Mail Stop:	6146/1087	C	ate Samp	les Shipp	ed: 2-6-0	26	Project/	Task No.:	98046.02.02	.09 _		Waste Characte	rization	
Project/Task Manager:	Brenda Langkopf		Carrier/Wa	bill No.	60172			uthorizatio			CON	-Send preliminary	/copy report to:	
Project Name:	P2VCA@SWMU105		ab Contac		Edie Kent 803/556-8			t #: PO 2						
Record Center Code:	NA	L	ab Destina	ation:	Gel		1					Released by COC No.:		
Logbook Ref. No.:	ER047	s	MO Contac	t/Phone:	Pam Puissant/505-28	4-3124	ĺ					☑ Validation Requ	ired	_
Service Order No.	CFO56-06	s	end Report	to SMO:	Lorraine Herrera/505	844-319						Bill To:Sandia National		ole)
Location	Tech Area											P.O. Box 5800 I		
Building	Room				Referenc	e LOV(availal	ble at S	MO)			Albuquerque, Ni	M 87185-0154	1
	ER Sample ID	or	Pump	ER Site	Date/Time(hr)	Sample	Co	ntainer	Preserv-	Collection	Sample	Parameter	& Method	Lab Sample
Sample NoFraction	Sample Location D	Detail	Depth (ft)	No.	Collected	Matrix	Туре	Volume	ative	Method	Type	Requ	ested	ID
074090-002	105-BH-37-0-S		0	105	020306/0956	S	G	125 ml	4C	G	SA	Mercury (7471A)	155447 -	020
074091-002	105-BH-37-2-S		2	105	020306/1017	s	G	125 ml	4C	G	SA	Mercury (7471A)	155452	61
074092-002	105-BH-37-4-S		4	105	020306/1016	S	G	125 ml	4C	G	SA	Mercury (7471A)		02
074093-002	105-BH-37-8-S		8_	105	020306/1024	s	G	125 ml	4C	G	SA	Mercury (7471A)		03
074150-002	105-BH-52-0-S		0	105	020306/0957	s	G	125 ml	4C	G	SA	Mercury (7471A)		04
074151-002	105-BH-52-2-S		2	105	020306/1031	G	125 ml	4C	G	SA	Mercury (7471A)		25	
074152-002	105-BH-52-4-S		· 4	105	020306/1030	G	125 ml	4C	G	SA	Mercury (7471A)		06	
074153-002	105-BH-52-8-S		8	105	020306/1035	s	G	125 ml	4C	G	SA	Mercury (7471A)		07
074210-002	105-BH-67-0-S		0	105	020306/0958	\$	G	125 ml	4C	G	SA	Mercury (7471A)		08
074211-002	105-BH-67-2-S		2	105	020306/1043	s	G	125 ml	4C	G	SA	Mercury (7471A)		89
074212-002	105-BH-67-4-S		4	105	020306/1042	s	G	125 ml	4C	G	SA	Mercury (7471A)	155452-	
RMMA	_Yes ∠No	Ref. N			Sample Tracking		Smo Us	se :::	Special inst			ements	Abnorma	
Sample Disposal	Return to Client	✓ Disp	posal by la	b	Date Entered(mm/dd.	(yy)			EDD -	Yes 🗌			Condition	is on
Turnaround Time	e 🗌 7 Day 🕟	15 Day	→ 3	0 Day	Entered by:				Level D Pac	kage	✓ Yes	No 🗆 No	Receipt	
Return Samples By:				Negotia	ted TAT	QC inits.			*Send repo	rt to:				
	Name		ature	init	Company/Organ			Hular	Preliminary (report (.pdf)	to srgriff@	sandia.gov + blangk@	gsandia.gov	
Sample	William Gibson	William	19141	W135	Weston/6146/284-52	32/239-7	367		Final report	to Stacy (Sriffith MS	1087/Org 6146		Lab Use
Team	Jeff Lee	all	1	12	Stone Lion/6146/284	3309/228	3-9598		(505) 284-2	2588/ (505)	379-7588			
Members	Gilbert Quintana	61142	Frules	201	Shaw/6146/284-3309	/238-941	7]				5.45.31	
	Stacy Griffith	HAM!	A K	586	Gram/6146/284-2588	/ 379 758	38	•	15 day	turn a	round	time)		
	Robert Lynch	Jaliz	Mel	RC	Weston/6146/250-70	*Please list as separa			te report.					
1.Relinquished by	When &il	1/2	rg. 614	Date	e 2/6/06Time 09/15 4			4.Relinquished by			Org.	Date	Time	,
1. Received by		mo		6 Date 2				ived by Org.			Org.	Date Time		
2.Relinquished by	Will Grand	Dry O	0196196	Date:	16/06 Time //	30	5.Reline	quished b	у		Org.	Date	Time	;
2. Received by	Ballon		rg.	Date	2/7/06 Time 93	0	5. Rece				Org.	Date	Time	
3.Relinquished by	-,		org.	Date	Time 6.F			quished b	у		Org.	Date Time		
3. Received by		0	Ora.	Date	Time		6. Rece	ived by			Ora.	. Date	Time	3

@SWMU105 Area 1 ER Sample ID or ple Location detail 05-BH-67-8-S 05-BH-83-0-S 05-BH-83-2-S	Pump Depth (ft) 8	ER	Reference Date/Time (hr) Collected	Sample	vaila	Project/Task ble at s		98046.02.02.0	9			Lab use
ER Sample ID or ple Location detail 05-BH-67-8-S 05-BH-83-0-S	Depth (ft)	Site No.	Date/Time (hr)	Sample			SMO)					l shuce
ER Sample ID or ple Location detail 05-BH-67-8-S 05-BH-83-0-S	Depth (ft)	Site No.	Date/Time (hr)	Sample			SMO)					1 ah uga
ple Location detail 05-BH-67-8-S 05-BH-83-0-S	Depth (ft)	Site No.			Co	ntainer						
05-BH-67-8-S 05-BH-83-0-S	8		Collected				Preserv-	Collection			r & Method	Lab Sample
05-BH-83-0-S		105		Matrix	Туре	Volume	ative	Method	Туре	Requ	uested	ID
	•		020306/1053	s	G	125 ml	4C	G	SA	Mercury (7471A)	155452	- 11
05-BH-83-2-S	U	105	020306/08	w/s	G	125 ml	4C	G	SA	Mercury (7471A)		12
	2	105	020306/0946	s	G	125 ml	4C	G	SA	Mercury (7471A)		13
05-BH-83-4-S	4	105	020306/0945	s	G	125 mi	4C	G	SA	Mercury (7471A)		14
5-BH-83-4-SD	4	105	020306/0945	s	G	125 ml	4C	G	DŲ	Mercury (7471A)	field QC	15
05-BH-83-8-S	8	105	020306/0949	s	G	125 ml	4C	G	SA	Mercury (7471A)	0	16
05-BH-98-0-S	0	105	020306/0849	s	G	125 ml	4C	G	SA	Mercury (7471A)		17
05-BH-98-2-S	2	105	020306/0923	S	G	125 ml	4C	G ·	SA	Mercury (7471A)		18
5-BH-98-2-SD	2	105	020306/0923	s	O	125 ml	4C	G	DU	Mercury (7471A)	yield QC	19
05-BH-98-4-S	4	105	020306/0922	\$	G	125 ml	4C	G	SA	Mercury (7471A)		20
05-BH-98-8-S	8	105	020306/0926	S	O	.125 ml	4C	G	SA	Mercury (7471A)	155436	- 001
105-EB-9	NA	_105	020306/1115	s	Р	250 ml	4C	С	EB	Mercury (7470A)		
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ANALYSIS REQUEST AND CHAIN OF CUSTODY Page 1 of 2 Internal Lab 609375 AR/COC Batch No. Dept. No./Mail Stop: 6146/1087 Date Samples Shipped: Z-1-06 Project/Task No.: 98046.02,02.09 Waste Characterization Project/Task Manager: Brenda Langkopf Carrier/Waybill No. 600292 SMO Authorization: -Send preliminary/copy report to: Project Name: P2VCA@SWMU105 Lab Contact: Edie Kent 803/556-8171 Contract #: PO 21671 Record Center Code: Lab Destination: Released by COC No.: ✓ Validation Required ER047 Logbook Ref. No.: Pam Puissant/505-284-3124 SMO Contact/Phone: Service Order No. CFO56-06 Send Report to SMO: Lorraine Herrera/505-844-3199 Bill To:Sandia National Labs (Accounts Payable) Location Tech Area P.O. Box 5800 MS 0154 Building Room Reference LOV(available at SMO) Albuquerque, NM 87185-0154 ER Sample ID or Collection Sample Parameter & Method Lab Sample Pump **ER Site** Date/Time(hr) Sample Container Preserv-Sample No.-Fraction ID Sample Location Detail Depth (ft) No. Collected Matrix Type Volume ative Method Type Requested 55670-001 074036-002 4C SA Mercury (7471A) 105-BH-24-0-S 0 105 020706/0906 S G 125 ml G 002 9 074037-002 105-BH-24-2-S 2 105 020706/0920 S G 125 ml 4C G SA Mercury (7471A) 003 9 074038-002 105-BH-24-4-S 020706/0918 125 ml G 4 105 S G 4C SA Mercury (7471A) 804 074039-002 105-BH-24-8-S 8 105 S 4C G Mercury (7471A) 020706/0926 G 125 ml SA **074094-002** 105-BH-38-0-S 0 105 020706/0910 S G 125 ml 4C G SA Mercury (7471A) G 3 074095-002 105-BH-38-2-S 2 105 020706/0933 S G 125 ml 4C SA Mercury (7471A) **\$** 074096-002 00 105-BH-38-4-S 4 020706/0931 S G 4C G Mercury (7471A) 105 125 ml SA 009 074097-002 105-BH-38-4-SD 4 S G 125 ml 4C G DU Mercury (7471A) Lind OC 105 020706/0931 009 ⁶ 074098-002 105-BH-38-8-S 8 105 S G 125 ml 4C G SA Mercury (7471A) 020706/0937 010 • 074214-002 105-BH-68-0-S 0 105 S G 4C G SA Mercury (7471A) 020706/1020 125 ml 011 074215-002 105-BH-68-2-S 105 020706/1025 S G 125 ml 4C G SA Mercury (7471A) RMMA Yes √ No Ref. No. Smo Use Special Instructions/QC Requirements Abnormal Sample Tracking EDD Yes No Sample Disposal Return to Client ✓ Disposal by lab Date Entered (mm/dd/yy) Conditions on Yes **Turnaround Time** 7 Day X 15 Day Entered by: Level D Package ☐ No Receipt 30 Day Return Samples By: **Negotlated TAT** QC inits. *Send report to: Name Signature Company/Organization/Phone/Cellular Preliminary report (.pdf) to srgriff@sandia.gov + blangk@sandia.gov Sample William Gibson Weston/6146/284-5232/239-7367 Final report to Stacy Griffith MS1087/Org 6146 Lab Use Team مملكاما Stone Lion/6146/284-3300/228-0508 (505) 284-2588/ (505) 379-7588 Members Gilbert Quintana Shaw/6146/284-3309/238-9417 Stacy Griffith Gram/6146/284-2588/ 379 7588 Robert Lynch Weston/6146/250-7090 *Please list as separate report. .Relinguished by Date 2/4/06 Time C830 4.Relinguished by Org. Date Time . Received by Date 3 8 06 Time 0 830 Time C.MA Org. 10146 4. Received by Org. Date 2.Relinguished by Date 2 Kill Time 1100 Org. 5.Relinguished by Org. Date Time 2. Received by Org. Date 2/9/06 Time : 0930 5. Received by Org. Time Date

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AR/COC-Project Name: P2VCA@SWMU105 Project/Task Manger: Brenda Langkopf Project/Task No.: 98046.02.02.09 Location Tech Area Reference LOV (available at SMO) Building Room Lab use Sample No-ER Sample ID or Date/Time (hr) Sample Parameter & Method Pump ER Container Lab Sample Fraction Sample Location detail Depth (ft) Site No. Collected Matrix Type Volume ative Method Type Requested a074217-002 105-BH-68-4-S 105 020706/1023 S G 125 ml 4C G Mercury (7471A) **♥ 074218-002** 105-BH-68-8-S 105 020706/1029 S G 125 ml 4C G Mercury (7471A) Abnormal Conditions on Receipt LAB USE Recipient Initials

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

_		-	'			`							
Batch No.	4			SMO Use							AR/COC	609	376
Dept. No./Mail Stop:	6146/1087	Date Samp	les Shipp	ed: 2 - 8-64	::::::::::::::::::::::::::::::::::::::			98046 <u>.02.02</u>			Waste Characterization	<u> </u>	
Project/Task Manager:	Brenda Langkopf	Carrier/Wa		6020	いユ	SMO A	uthorizatio	n: 10 69 4	m	GMW.	-Send preliminary/copy re	eport to:	
Project Name:	P2VCA@SWMU105	Lab Contac	ot:	Edie Kent 803/556-81			t#: <u>PO 21</u>			•			
Record Center Code:	NA	Lab Destin	ation:	Gel							Released by COC No.:_		_
Logbook Ref. No.:	ER047	SMO Contac	t/Phone:	Pam Puissant/505-28	4-3124						☑ Validation Required		
Service Order No.	CFO56-06	Send Report	to SMO:	Lorraine Herrera/505-	844-3199	9					Bill To:Sandia National Labs (A	-	e)
Location	Tech Area							, ,	2617	1,0/	P.O. Box 5800 MS 0154	•	
Building	Room			Reference					5567	0/	Albuquerque, NM 87185		
Sample NoFraction	ER Sample ID or Sample Location Deta	Pump Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Type	ntainer Volume	Preserv- ative	Collection Method	Sample Type	Parameter & Meth Requested	nod	Lab Sample ID
• 074276-002	105-BH-84-0-S	0	105	020706/1046	s	G	125 ml	4C	G	SA	Mercury (7471A)		014
9 074277-002	105-BH-84-2-S	2	105	020706/1058	S	G	125 ml	4C	G	SA	Mercury (7471A)		015
• 074278-002	105-BH-84-4-S	4	105	020706/1057	s	G	125 ml	4C	G	SA	Mercury (7471A)		016
• 074279-002	105-BH-84-8-S	8	105	020706/1102	S	G	125 ml	4C	G	SA	Mercury (7471A)		017
9 074335-002	105-BH-99-0-S	0	105	020706/1104	s	G	125 ml	4C	G	SA	Mercury (7471A)	_	018
074336-002	105-BH-99-2-S	2	105	020706/1107	S	G	125 ml	4C	G	SA	Mercury (7471A)		019
074337-002	105-BH-99-4-S	4	105	020706/1106	s	G	125 ml	4C	G	SA	Mercury (7471A) /	55670	- 020
[©] 074338-002	105-BH-99-8-S	8	105	020706/1111	S	G	125 mi	4C	G	SA	Mercury (7471A)	55672	5
074393-002	105-BH-114-0-S	0	105	020706/1133	s	G	125 ml	4C	G	SA	Mercury (7471A)		02
074394-002	105-BH-114-2-S	2	105	020706/1131	S	G	125 ml	4C	G	SA	Mercury (7471A)		03
● 074395-002	105-BH-114-2-SD	2	105	.020706/1131	s	G	125 ml	4C	G	DU	Mercury (7471A) 火ぬん		04
RMMA		Ref. No.		Sample Tracking		Smo U	se	Special inst			ements 0	Abnorma	
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Return Samples By:		<u>. </u>	Negotia	ted TAT	QC inits			*Send repo					
	Name	Signature	Init	Company/Organ			ellular	4			gsandia.gov + blangk@sandi	a.gov	
Sample		went A.S.	WY	Weston/6146/284-52				4 · · ·	•		1087/Org 6146		Lab Use
Team W/5	Jeff Lee	4/		Stone Lion/6146/284				(505) 284-	2588/ (505)	379-7588			
Members	Gilbert Quintana	Hill reting	MX	Shaw/6146/284-3309	9/238-941	17		1					
	Stacy Griffith	2001/1K	SU	Gram/6146/284-2588	3/ 379 75	88	4	√15 day	turn a	round	time		
	Robert Lynch	Turkle	Rel	Weston/6146/250-70	90		-	*Please list					
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Page_2_ of _2 AR/COC-609376 Project Name: P2VCA@SWMU105 Project/Task Manger: Brenda Langkopf Project/Task No.: 98046.02.02.09 Location Tech Area Reference LOV (available at SMO) Building Room Lab use Sample No-ER Sample ID or Date/Time (hr) Sample ER Pump Container Preserv-Collection Sample Parameter & Method Lab Sample Fraction Туре Sample Location detail Type Volume Depth (ft) Site No. Collected Matrix ative Method Requested 65 074396-002 105-BH-114-4-S 020706/1130 105 S G 125 ml 4C G Mercury (7471A) **074397-002** 105-BH-114-8-S 8 105 020706/1149 Mercury (7471A) 125 ml 4C LAB USE Abnormal Conditions on Receipt

ANALYSIS REQUEST AND CHAIN OF CUSTODY Page 1 of 2 Internal Lab 609377 AR/COC Batch No. SMO Use Dept. No./Mail Stop: 6146/1087 Date Samples Shipped: 2 - 8-06 Waste Characterization Project/Task No.: 98046.02.02.09 Project/Task Manager: Brenda Langkopf SMO Authorization: Of 43 Gruss Camer/Waybill No. 60292 -Send preliminary/copy report to: Project Name: P2VCA@SWMU105 Contract #: PO 21671 Lab Contact: Edie Kent 803/556-8171 Record Center Code: Released by COC No.: .ab Destination: Gel Logbook Ref. No.: ER047 SMO Contact/Phone: Pam Pulssant/505-284-3124 ✓ Validation Required Service Order No. CFO56-06 Lorraine Herrera/505-844-3199 Bill To:Sandia National Labs (Accounts Payable) Send Report to SMO: Location Tech Area P.O. Box 5800 MS 0154 55672 Building Room Reference LOV(available at SMO) Albuquerque, NM 87185-0154 ER Sample ID or Date/Time(hr) Parameter & Method Lab Sample Pump ER Site Sample Container Preserv-Collection Sample No.-Fraction Sample Location Detail Requested ID Depth (ft) Collected Matrix Type Volume Method No. ative Type 155672-67 074040-002 105-BH-25-0-S 0 4C G SA Mercury (7471A) 105 020706/0907 S G 125 ml 08 074041-002 105-BH-25-2-S 2 105 020706/0949 S G 125 ml 4C G SA Mercury (7471A) 074042-002 4C 105-BH-25-4-S 4 105 020706/0947 S G 125 ml G SA Mercury (7471A) 074043-002 105-BH-25-8-S 8 S 4C 105 020706/0952 G 125 mi G SA Mercury (7471A) 074099-002 105-BH-39-0-S 0 105 020706/0941 S G 125 ml 4C G SA Mercury (7471A) 074100-002 105-BH-39-2-S 2 S G 4C G 105 020706/0957 125 ml SA Mercury (7471A) 074101-002 105-BH-39-4-S 4 S G 4C G 105 020706/0955 125 ml SA Mercury (7471A) G 074102-002 105-BH-39-8-S 8 105 S G 125 ml 4C 020706/1001 SA Mercury (7471A) 074159-002 105-BH-54-0-S n S 4C G 105 020706/0911 G 125 ml Mercury (7471A) *****074160-002 105-BH-54-2-S 2 105 020706/1006 S G 125 ml 4C G SA Mercury (7471A) 156672-074161-002 4 S G 4C G 105-BH-54-4-S 105 020706/1005 125 ml Mercury (7471A) RMMA Yes √ No Ref. No. Special Instructions/QC Requirements Abnormal Sample Tracking Smo Use Yes No Conditions on Sample Disposal Return to Client Disposal by lab Date Entered(mm/dd/yy) EDD ✓ Yes **Turnaround Time** 7 Day Entered by: ☐ No Receipt 15 Day 30 Day Level D Package Return Samples By: QC inits. *Send report to: **Negotiated TAT** Name Signature Company/Organization/Phone/Cellular Preliminary report (.pdf) to srgnff@sandia.gov + blangk@sandia.gov Lab Use Sample William Gibson Weston/6146/284-5232/239-7367 Final report to Stacy Griffith MS1087/Org 6146 Team Jeff-Lee Stone Lion/6146/284-3309/228-9598 (505) 284-2588/ (505) 379-7588 Members Gilbert Quintana Shaw/6146/284-3309/238-9417 #15 day turn around time Stacy Griffith Gram/6146/284-2588/ 379 7588 Robert Lynch Weston/6146/250-7090 *Please list as separate report. 1.Relinquished by 21896 Time 0830 4. Relinquished by Date Time Org. Org. 1.14 Date 218 7 Time 08.30 4. Received by 1. Received by Time Org. Date 2.Relinguished by 5.Relinguished by Time Date 2/8/1/2 Time Org. Date Received by TXGOGO Org. Org. Date > MALO TIMEU93() Received by Date Time 3.Relinguished by Time Org. Date Time 6.Relinguished by Org. Date

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Project Name:	P2VCA@SWMU105	Project/Task M	anger:	Brenda Langkopf			Project/Task	No.:	98046.02.02.0	9		
Location Building	Tech Area Room			Reference					556	72%		Lab use
Sample No- Fraction	ER Sample ID or Sample Location detail	Pump Depth (ft)	ER Site No.	Date/Time (hr) Collected	Sample Matrix		ntainer Volume	Preserv- ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
6 074162-002	105-BH-54-8-S	8	105	020706/1010	s	G	125 ml	4C	G	SA	Mercury (7471A)	1.8
074219-002	105-BH-69-0-S	0	105	020706/1037	S	G	125 ml	4C	G	SA	Mercury (7471A)	19
074220-002	105-BH-69-2-S	2	105	020706/1040	s	G	125 ml	4C	G	SA .	Mercury (7471A) /556.	42- 20
074216-002	105-BH-69-2-SD	2	105	020706/1040	s	G	125 ml	4C	G	DU	Mercury (7471A) years 155	473-00
*07559 %- 002	105-BH-69-4-S	4	105	020706/1039	s	G	125 ml	4C	G		Mercury (7471A)	-002
2 074221-002	105-BH-69-8-S	8	105	020706/1044	s	G	125 ml	4C	G		Mercury (7471A)	- 003
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Internal Lab		Α	NAL	YSIS REQUE	EST A	ND (CHAIN	1 OF Cl	JSTOI	ΣY	•	Page 1 of	2
Batch No.	\mathcal{A}			SMO Use							AR/COC	609	9378
Dept. No./Mail Stop:	6146/1087	Date Samp	les Shipp	ed: 2-8-06	3	Project/	Task No.:	98046.02.02	,09		Waste Characterization	n	
Project/Task Manager:	Brenda Langkopf	Carrier/Wa		60293		SMO A	uthorizatio	n: O	9 Km	SMO	-Send preliminary/copy	report to:	
Project Name:	P2VCA@SWMU105	Lab Conta	ct:	Edie Kent 803/556-81			t #: <u>PO 21</u>		00 7	•		·	
Record Center Code:	NA	Lab Destin	ation:	Gel							Released by COC No.:		
Logbook Ref. No.:	ER047	SMO Contac	t/Phone:	Pam Pulssant/505-28	34-3124						☑ Validation Required		_
Service Order No. ~	CFO56-06	Send Repor	to SMO:	Lorraine Herrera/505	-844-3199						Bill To:Sandla National Labs (/	Accounts Payat	ole)
Location	Tech Area									•	P.O. Box 5800 MS 0154		·
Building	Room			Referenc	e LOV	availal	ble at Si	MO) 15	567	3 /	Albuquerque, NM 87185	5-0154	
	ER Sample ID or	Pump	ER Site	Date/Time(hr)	Sample		ntainer	Preserv-	Collection	Sample	Parameter & Met		Lab Sample
Sample NoFraction	Sample Location De	tail Depth (ft)	No.	Collected	Matrix	Туре	Volume	ative	Method	Туре	Requested		ID .
o74280-002	105-BH-85-0-S	0	105	020706/1045	s	G	125 ml	4C	G	SA	Mercury (7471A)		604
• 074281-002	105-BH-85-2-S	2	105	020706/1050	s	G	125 ml	4C	G	SA	Mercury (7471A)		005
074282-002	105-BH-85-4-S	4	105	020706/1049	s	G	125 ml	4C	G	SA	Mercury (7471A)		006
© 074283-002	105-BH-85-8-S	8	105	020706/1055	s	G	125 ml	4C	G	SA	Mercury (7471A)		007
• 074339-002	105-BH-100-0-S	0	105	020706/1105	s	G	125 ml	4C	G	SA	Mercury (7471A)		008
• 074340-002	105-BH-100-2-S	2	105	020706/1116	s	G	125 ml	4C	G .	SA	Mercury (7471A)		009
• 074341-002	105-BH-100-4-S	4	105	020706/1115	s	G	125 ml	4C	G.	SA	Mercury (7471A)		010
• 074312-002	105-BH-100-4-SD	4	105	020706/1115	s	G	125 ml	4C	G	DŲ	Mercury (7471A) 🗸	ed QC	011
° 074342-002	105-BH-100-8-S	8	105	020706/1121	s	G	125 mi	4C	G	SA	Mercury (7471A)		012
6 074398-002	105-BH-115-0-S	0	105	020706/1153	s	G	125 ml	4C	G	SA	Mercury (7471A)		013
074399-002	105-BH-115-2-S	2	105	020706/1156	s	G	125 ml	4C	G	SA	Mercury (7471A)		014
RMMA	☐Yes ☑No	Ref. No.		Sample Tracking		Smo U	se	Special Ins		C Require	ements	Abnorma	al 💛 🐪
Sample Disposal	Return to Client	☑ Disposal by I	ab	Date Entered(mm/dd	/yy): :::			EDD 🖸	Yes 🗀	No		Condition	ns on
Turnaround Tim	e 7 Day	15 Day :	30 Day	Entered by:				Level D Pac	kage	✓ Yes	s 🔲 No	Receipt	
Return Samples By:			Negotla	ited TAT	QC inits			*Send repo	rt to:			7:::::::	
	Name	Signature	Init	Company/Organ	nization/P	hone/Ce	ellular	Preliminary	report (.pdf) to smriff@	sandia.gov + blangk@sand	ia.gov	
Sample	William Gibson	Villien VIV	TOB	Weston/6146/284-52	32/239-7	367					1087/Org 6146	Ĭ	Lab Use
Team WA	Jeff Lee		177	Stone Lion/6146/284				1 .	2588/ (505				
Members "	Gilbert Quintana	THE HISTON	27%	Shaw/6146/284-3309				, , , , , , , ,					
	Stacy Griffith	HORAN!	B	Gram/6146/284-258		88		15 day			time		
450	Robert Lynch	WITHAL	The second	Weston/6146/250-70		1		*Please list	as separa				<u> 15 [[[14], []], 1</u>
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Date

Time

Page_2_ of _2_ AR/COC-Project Name: P2VCA@SWMU105 Project/Task Manger: Brenda Langkopf Project/Task No.: 98046.02.02.09 Location Tech Area Building Reference LOV (available at SMO) Room Lab use Sample No-ER Sample ID or Date/Time (hr) Sample Pump ER Container Lab Sample Preserv-Collection Sample Parameter & Method Fraction Sample Location detail Depth (ft) Site No. Collected Matrix Type Volume ative Method Туре Requested 7074400-002 105-BH-115-4-S Mercury (7471A) 105 020706/1155 S G 125 ml 4C G 074401-002 55673-105-BH-115-8-S 105 020706/1200 S G 125 ml 4C G Mercury (7471A) 073914-002 020706/1405 Mercury (7470A) Waster De-105-EB-10 NA 105 Р DIW 250 ml HNO₃ С Abnormal Conditions on Receipt LAB USE

Internal Lab

ANALYSIS REQUEST AND CHAIN OF CUSTODY

Sample NoFraction Sample Location Detail Depth (ft) No. Collected Matrix Type Volume attive Method Type Requested ID	Batch No. N	W.			SMO Use							AR/COC	609	9379
Project Name Proj	Dept. No./Mail Stop:	6146/1087	Date Samp	les Shipp	ed: 2-9-8	6	Project/	Task No.:	98046.02.02	.09		Waste Characterization	1	
Released by COC No.	Project/Task Manager:	Brenda Langkopf							n: <i>BM</i>	Men	Graz	-Send preliminary/copy r	eport to:	
Logbook Ref. No. ER047	Project Name:	P2VCA@SWMU105	Lab Contac	rt:					671	70-				
Service Order No. CFC96-96 Send Report to SMC Lorraine Herrera/505-544-3199 Elli To:Sandia National Labe (Accounts Psymble)	Record Center Code:	NA	Lab Destin	atlon:	Gel							Released by COC No.:		
Service Order No. CFC96-96 Send Report to SMC Lorraine Herrera/505-544-3199 Elli To:Sandia National Labe (Accounts Psymble)	Logbook Ref. No.:	ER047	SMO Contac	t/Phone:	Pam Puissant/505-28	4-3124						✓ Validation Required		
Reference LOV(available at SMO) Abuquowque, NM 87185-0154 Abuquowque, NM 87185-0	Service Order No.	CFO56-06	Send Report	to SMO:	Lorraine Herrera/505	844-3199	þ						ccounts Payat	ole)
Sample NoFredicion Sample Dorth (R) ER Single Dorth (R) No. Collected Matrix Type Volume Preservation	Location	Tech Area						,				P.O. Box 5800 MS 0154	j	
Sample NoFredicion Sample Dorth (R) ER Single Dorth (R) No. Collected Matrix Type Volume Preservation	Building	Room			Referenc	e LOV(availal	ole at SI	MO)	•		Albuquerque, NM 87185	-0154	,
© 074044-002 105-BH-26-Q-S 0 105 020806/0909 S G 125 ml 4C G SA Mercury (7471A) 1957186 © 074045-002 105-BH-26-Q-S 2 105 020806/0909 S G 125 ml 4C G SA Mercury (7471A) 000 © 074045-002 105-BH-26-Q-S 4 105 020806/0907 S G 125 ml 4C G SA Mercury (7471A) 000 © 074048-002 105-BH-26-Q-S 8 105 020806/0907 S G 125 ml 4C G DU Mercury (7471A) 000 © 074048-002 105-BH-26-Q-S 8 105 020806/0907 S G 125 ml 4C G DU Mercury (7471A) 000 © 074103-002 105-BH-40-Q-S 0 105 020806/0918 S G 125 ml 4C G SA Mercury (7471A) 000 © 074103-002 105-BH-40-Q-S 2 105 020806/0918 S G 125 ml 4C G SA Mercury (7471A) 000 © 074103-002 105-BH-40-Q-S 2 105 020806/0918 S G 125 ml 4C G SA Mercury (7471A) 000 © 074103-002 105-BH-40-Q-S 2 105 020806/0918 S G 125 ml 4C G SA Mercury (7471A) 000 © 074103-002 105-BH-40-Q-S 3 8 105 020806/0917 S G 125 ml 4C G SA Mercury (7471A) 000 © 074103-002 105-BH-40-Q-S 8 105 020806/0918 S G 125 ml 4C G SA Mercury (7471A) 000 © 074103-002 105-BH-40-Q-S 8 105 020806/0918 S G 125 ml 4C G SA Mercury (7471A) 000 © 074103-002 105-BH-40-Q-S 8 105 020806/0918 S G 125 ml 4C G SA Mercury (7471A) 000 © 074103-002 105-BH-50-S 0 105 020806/0918 S G 125 ml 4C G SA Mercury (7471A) 000 © 074103-002 105-BH-50-S 0 105 020806/0931 S G 125 ml 4C G SA Mercury (7471A) 000 © 074103-002 105-BH-50-S 0 105 020806/0931 S G 125 ml 4C G SA Mercury (7471A) 000 © 074103-002 105-BH-50-S 0 105 020806/0931 S G 125 ml 4C G SA Mercury (7471A) 000 © 074103-002 105-BH-50-S 0 105 020806/0931 S G 125 ml 4C G SA Mercury (7471A) 000 © 074103-002 105-BH-50-S 0 105 020806/0931 S G 125 ml 4C G SA Mercury (7471A) 000 © 074103-002 105-BH-50-S 0 105 020806/0931 S G 125 ml 4C G SA Mercury (7471A) 000 © 074103-002 105-BH-50-S 0 105 020806/0931 S G 125 ml 4C G SA Mercury (7471A) 000 © 074103-002 105-BH-50-S 0 105 020806/0931 S G 125 ml 4C G SA Mercury (7471A) 000 © 074103-002 105-BH-50-S 0 105 020806/0931 S G 125 ml 4C G SA Mercury (7471A) 000 © 074103-002 105-BH-50-S 0 105 020806/0931 S G 125 ml 4C G SA Mercury (7471A) 000 © 074103-002 105-BH-5		ER Sample ID or	Pump	ER Site	Date/Time(hr)	Sample	Co	ntainer	Preserv-	Collection	Sample	Parameter & Meth	hod	Lab Sample
# 074045-002 105-BH-26-2-S 2 105 020806/0907 S G 125 ml 4C G SA Mercury (7471A)	Sample NoFraction	Sample Location Detail	Depth (ft)	No.	Collected		Type	Volume	ative	Method	Type	Requested		ID
# 074046-002 105-BH-26-4-S	\$ 074044-002	105-BH-26-0-S	0	105	020806/0856	S	G	125 ml	4C	G	SA	Mercury (7471A)		155718001
▼ 074047-002 105-BH-26-4-SD 4 105 020806/0907 S G 125 ml 4C G DU Mercury (7471A) 00 ● 074048-002 105-BH-26-8-S 8 105 020806/0951 S G 125 ml 4C G SA Mercury (7471A) 00 © 074103-002 105-BH-40-2-S 2 105 020806/0918 S G 125 ml 4C G SA Mercury (7471A) 00 © 074105-002 105-BH-40-4-S 4 105 020806/0917 S G 125 ml 4C G SA Mercury (7471A) 00 © 074108-002 105-BH-40-8-S 8 105 020806/0921 S G 125 ml 4C G SA Mercury (7471A) 00 © 074163-002 105-BH-55-0-S 0 105 020806/0931 S G 125 ml 4C G SA Mercury (7471A) 00 RMMMA Yes Yes Yes <	<u>№ 074045-002</u>	105-BH-26-2-S	2	105	020806/0909	s	G	125 ml	4C	G	SA	Mercury (7471A)		002
074048-002	# 074046-002	105-BH-26-4-S	4 .	105	020806/0907	s	G.	125 ml	4Ç	G	SA	Mercury (7471A)		003
© 074103-002 105-BH-40-0-S 0 105 020806/0855 S G 125 ml 4C G SA Mercury (7471A)	* 074047-002	105-BH-26-4-SD	4	105	020806/0907	s	G	125 ml	4C	G	DU	Mercury (7471A)		004
© 074104-002 105-BH-40-2-S 2 105 020806/0918 S G 125 ml 4C G SA Mercury (7471A)	9 074048-002	105-BH-26-8-S	8	105	020806/0911	s	G	125 ml	4C	G	SA	Mercury (7471A)		005
	© 074103-002	105-BH-40-0-S	· 0	105	020806/0855	S	G	125 ml	4C	G	SA	Mercury (7471A)		006
\$ 074106-002 105-BH-40-8-S 8 105 020806/0921 S G 125 ml 4C G SA Mercury (7471A) C • 074163-002 105-BH-55-0-S 0 105 020806/0854 S G 125 ml 4C G SA Mercury (7471A) C • 074164-002 105-BH-55-2-S 2 105 020806/0931 S G 125 ml 4C G SA Mercury (7471A) C • 074164-002 105-BH-55-2-S 2 105 020806/0931 S G 125 ml 4C G SA Mercury (7471A) C • 074164-002 105-BH-55-2-S 2 105 020806/0931 S G 125 ml 4C G SA Mercury (7471A) C • 074164-002 105-BH-55-2-S 2 105 020806/0931 S G 125 ml 4C G SA Mercury (7471A) C • 074164-002 105-BH-55-2-S 2 105 020806/0931 S G 125 ml 4C G SA Mercury (7471A) C • 074164-002 105-BH-55-2-S 2 105 020806/0931 S G 125 ml 4C G SA Mercury (7471A) C • 074164-002 105-BH-55-2-S 2 105 020806/0931 S G 125 ml 4C G SA Mercury (7471A) C • 074164-002 105-BH-55-2-S 2 105 020806/0931 S G 125 ml 4C G SA Mercury (7471A) C • 074164-002 105-BH-55-2-S 2 105 020806/0931 S G 125 ml 4C G SA Mercury (7471A) C • 074164-002 105-BH-55-2-S 2 105 020806/0931 S G 125 ml 4C G SA Mercury (7471A) C • 074164-002 105-BH-55-2-S 2 105 020806/0931 S G 125 ml 4C G SA Mercury (7471A) C • 074164-002 105-BH-55-2-S 2 105 020806/0931 S G 125 ml 4C G SA Mercury (7471A) C • 074164-002 105-BH-55-2-S 2 105 020806/0931 S G 125 ml 4C G SA Mercury (7471A) C • 074164-002 105-BH-55-2-S 2 105 020806/0931 S G 125 ml 4C G SA Mercury (7471A) C • 074164-002 105-BH-55-2-S 2 105 020806/0931 S G 125 ml 4C G SA Mercury (7471A) C • 074164-002 105-BH-55-2-S 2 105 020806/0931 S G 125 ml 4C G SA Mercury (7471A) C • 074164-002 105-BH-55-2-S 2 105 020806/0931 S G 125 ml 4C G SA Mercury (7471A) C • 074164-002 105-BH-55-2-S 2 105 020806/0931 S G 125 ml 4C G SA Mercury (7471A) C • 074164-002 105-BH-55-2-S 2 105 020806/0931 S G 125 ml 4C G SA Mercury (7471A) C • 074164-002 105-BH-55-2-S 2 105 020806/0931 S G 125 ml 4C G SA Mercury (7471A) C • 074164-002 105-BH-55-2-S	0 074104-002	105-BH-40-2-S	2	105	020806/0918	s	G	125 ml	4C	G	SA	Mercury (7471A)	_	∞7
© 074163-002 105-BH-55-0-S	₹ 074105-002	105-BH-40-4-S	4	105	020806/0917	s	G	125 ml	4C	G	SA	Mercury (7471A)		008
Some Signature Init Company/Organization/Phone/Cellular Stample Signature Init In	4 074106-002	105-BH-40-8-S	8	105	020806/0921	s	G	125 ml	4C	G	SA	Mercury (7471A)		009
RMMA	0 074163-002	105-BH-55-0-S	0	105	020806/0854	s	G	125 ml	4C	G	SA	Mercury (7471A)		0.00
Sample Disposal				105										011
Turnaround Time 7 Day 15 Day 30 Day Entered by: Level D Package Yes No Receipt Return Samples By: Negotiated TAT QC inits: *Send report to: Name	RMMA						Smo U	se				ements		
Return Samples By: Name Signature Init Company/Organization/Phone/Cellular William Gibson Willi					Date Entered(mm/dd	/ <u>yy)</u>	·		EDD L	∐Yes L		_		
Name Signature Init Company/Organization/Phone/Cellular William Gibson Jeff Lee Gilbert Quintana Steey Criffith Robert Lynch 1. Received by 1. Received by Org. 1/1/6 Date 2-7-1/6 Time 2. Received by Org. Date Time Time Org. Date Time Org. Date Time Org. Date Time Time Org. Date Time Org. Date Time Time Time Org. Date Time	Turnaround Tim	ie 💹 7 Day 🔀 15	Day 3	30 Day	Entered by:						<u></u> ✓ Ye	s L No	Receipt	
Sample William Gibson William Gibson William Gibson William Gibson William Gibson William Gibson Weston/6146/284-5232/239-7367 Team Jeff Lee Stone Lion/6146/284-3309/228-9598 Members Gilbert Quintana Gibson Weston/6146/284-3309/228-9598 Gilbert Quintana Gibson Weston/6146/284-3309/238-9417 Stoay Gibson Weston/6146/284-3309/238-9417 Final report to Stacy Griffith MS1087/Org 6146 (505) 284-2588/ (505) 379-7588 To day turn around time Please list as separate report. 1.Relinquished by Grand Gibson Weston/6146/250-7090 2.Relinquished by Grand Gibson Weston/6146/250-7090 Grand Gibson Weston/6146/250-7090 1.Relinquished by Grand Gibson Weston/6146/250-7090 2.Relinquished by Grand Gibson Weston/6146/250-7090 3.Relinquished by Grand Gibson Weston/6146/250-7090 3.Relinquished by Grand Gibson Weston/6146/250-7090 4.Relinquished by	Return Samples By:			Negotia	ited TAT	QC inits			*Send repo	ort to:				
Team Jeff Lee Stone Lion/6146/284-3309/228-9598 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-2588/ (505) 379-7588 (505) 284-								ellular	Preliminary	report (.pdf) to srgriff@	@sandia.gov + blangk@sandi	ia.gov	
Members Gilbert Quintana Shart Lifette Lifet Shaw/6146/284-3309/238-9417 Steey Criffith Gram/6146/284-2388/379 7588 To day turn around time To day turn ar	Sample	William Gibson	Gera The	12014	Weston/6146/284-52	32/239-7	367		Final repor	t to Stacy	Griffith MS	S1087/Org 6146		Lab Use
Steey Criffith Gram/6 146/284-2886/ 379 7888 15 day turn around time Robert Lynch Vol. Medicon/6146/250-7090 Please list as separate report.	Team	Jeff Lee	Mel		Stone Lion/6146/284	-3309/22	8-9598		(505) 284-	2588/ (505	379-7588	3		
Robert Lynch Note Weston/6146/250-7090 Please list as separate report.	Members	Gilbert Quintana	& Elette.	4181	Shaw/6146/284-3309	9/238-941	7]					
Robert Lynch Robert Lynch Weston/6146/250-7090 *Please list as separate report. 1.Relinquished by Org. 146 Date 2-9-26 Time 0750 4.Relinquished by Org. Date Time 1. Received by Org. with	Stony Criffith	/	7	Gram/61/16/28/1-288	R/ 170 74		Y	15 dav	turn a	round	time 4			
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Location	P2VCA@swMU105 Tech Area	Project/Task M	anger:	Brenda Langkopf			Project/Task	No.:	98046.02.02.0	9		
uilding	Room			Reference	OV (2	vaila	hle at 9	(OM2				Lab use
Sample No-	ER Sample ID or	Pump	ER	Date/Time (hr)	Sample		ntainer	Preserv-	Collection	Sample	Parameter & Method	Lab Sample
Fraction	Sample Location detail	Depth (ft)	Site No.	Collected	Matrix			ative	Method	Туре	Requested	ID.
074165-002	105-BH-55-4-S	4	105	020806/0930	S	G	125 ml	4C	G	SA	Mercury (7471A)	012
074166-002	105-BH-55-8-S	8	105	020806/0936	S	G	125 mi	4C	G	SA	Mercury (7471A)	اه
074222-002	105-BH-70-0-S	0	105	020806/0853	s	G	125 ml	4C	G		Mercury (7471A)	Oli
074223-002	105-BH-70-2-S	2	105	020806/0946	s	G	125 ml	4C	G		Mercury (7471A)	013
074224-002	105-BH-70-4-S	4	105	020806/0945	s	G	125 ml	4C	G		Mercury (7471A)	010
074225-002	105-BH-70-8-S	8	105	020806/0951	s	G	125 ml	4C	G		Mercury (7471A)	01
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bnormal Cond	litions on Receipt			LABUSE								

Internal Lab

ANALYSIS REQUEST AND CHAIN OF CUSTODY

Batch No.	A			SMO Use							AR/COC 60		9380
Dept. No./Mail Stop:	6146/1087	Date Samp	les Shipp	ed: 2-9-0	6	Project/	Task No.:	98046 <u>.02.02</u>	.09		Waste Characterizatio	n	
Project/Task Manager:	Brenda Langkopf	Carrier/Wa		6034		SMO Authorization:					-Send preliminary/copy	report to:	
Project Name:	P2VCA@SWMU105	Lab Contac	t:	Edie Kent 803/556-81		Contract #: PO 21671							
Record Center Code:	NA	Lab Destina		Gel							Released by COC No.:		
Logbook Ref. No.:	ER047	SMO Contac		Pam Puissant/505-28		· ·					✓ Validation Required		
Service Order No.	CFO56-06	Send Report	to SMO:	Lorraine Herrera/505	844-3199	•	_				Bill To:Sandia National Labs (•	ble)
Location	Tech Area	 `		5.6							P.O. Box 5800 MS 015		
Building	Room ER Sample ID or	Pump	ER Site	Reference Date/Time(hr)	Sample		ntainer	Preserv-	Collection	Comple	Albuquerque, NM 8718 Parameter & Met		Lab Sample
Sample NoFraction	Sample Location Deta	1	No.	Collected	Matrix	Туре	Volume	ative	Method	Туре	Requested		ID
9 074284-002	105-BH-86-0-S	0	105	020806/0852	s	G	125 ml	4C	G	SA	Mercury (7471A)		155718018
Ø 074285-002	105-BH-86-2-S	2	105	020806/1001	S	G	125 mi	4C	G	SA	Mercury (7471A)		019
₹ 074286-002	105-BH-86-2-SD	2	105	020806/1001	s	G	125 ml	4C	G	DU	Mercury (7471A)		020
₹ 074287-002	105-BH-86-4-S	4	105	020806/1000	s	G	125 ml	4C	G	SA	Mercury (7471A)		15572200
№ 074288-002	105-BH-86-8-S	8	105	020806/1004	s	G	125 ml	4C	G	SA	Mercury (7471A)		002
♥ 074343-002	105-BH-101-0-S	0	105	020806/0851	s	G	125 ml	4C	G	SA	Mercury (7471A)		003
₽ 074344-002	105-BH-101-2-S	2	105	020806/1025	s	G	125 ml	4C	G	SA	Mercury (7471A)	•	004
074345-002	105-BH-101-4-S	4	105	020806/1024	s	G	125 ml	4C	G	SA	Mercury (7471A)		005
074346-002	105-BH-101-8-S	8	105	020806/1031	s	G	125 ml	4C	G	SA	Mercury (7471A)		006
074402-002	105-BH-116-0-S	0	105	020806/0850	S.	G	125 ml	4C	G	. SA	Mercury (7471A)		00
074403-002	105-BH-116-2-S	2	105	020806/1015	s	G	125 ml	4C	G	SA	Mercury (7471A)	later to a	008
RMMA		Ref. No.		Sample Tracking		Smo U	se	Special Ins			ements	Abnorm	
Sample Disposal		✓ Disposal by la		Date Entered(mm/dd		·	<u>:</u>			No		Conditio	
Turnaround Tim		5 Day 3	0 Day	Entered by:			.i : ;	Level D Pa		✓ Yes	No No	Receipt	
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Sample	Name	Signature	Init	Company/Organ Weston/6146/284-52			nular	4 .			@sandia.gov + blangk@sand	ia.gov	Lab Use
Team	William Gibson Jeff Lee	LILLY PUST	1	Stone Lion/6146/284				1 .	-		1087/Org 6146	.:	Lan Use
Members		Vir skalus	Gal	Shaw/6146/284-330				(303) 284-	2588/ (505)	313-1208	·	· :· :	
- 11 C		My Thanks	7774				1£	AF AL	. 4		4!		
70177	Stocy Griffith	0 11		Gram/6146/284-258		58		15 day			ume		
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OFF-SITE LABORATORY Analysis Request And Chain Of Custody (Continuation)

Page_2_ of _2

AR/COC-609380 Project Name: P2VCA@SWMU105 Project/Task Manger: Brenda Langkoof Prolect/Task No.: 98046.02.02.09 Location Tech Area Reference LOV (available at SMO) Building Room Lab use Sample No-ER Sample ID or Sample Pump ER Date/Time (hr) Container Preserv- Collection Sample Parameter & Method Lab Sample Fraction Depth (ft) Site No. Sample Location detail Collected Matrix Type Volume Requested ative Method Type ₹074404-002 155722009: 105-BH-116-4-S 105 020806/1014 G Mercury (7471A) S 125 ml 4C G **№** 074405-002 105-BH-116-8-S G Mercury (7471A) 105 020806/1020 125 ml 4C Abnormal Conditions on Receipt LAB USE Recipient Initials

CONTRACT LABORATORY

Internal Lab		4	ANAL'	YSIS REQUE	:SIA	ND (CHAIN	IOF CL	JSTOL	JΥ		Page 1 of	2_
Batch No.	2			SMO Use							AR/COC	609	381
Dept. No./Mail Stop:	6146/1087	Date San	iples Shipp	ed: 7 - 9 - (C	26	Project/	Task No.:	98046.02.02	.09 🙍		Waste Characterization	n	
Project/Task Manager:	Brenda Langkopf			6034		SMO A	uthorizatio	n: 04	Maria	nin	-Send preliminary/copy r	report to:	
Project Name:	P2VCA@SWMU105	Lab Cont		Edie Kent 803/556-8			t #: <u>PO 21</u>				, , , , ,		
Record Center Code:	NA	Lab Dest	ination;	Gel							Released by COC No.:		
Logbook Ref. No.:	ER047	SMO Cont	act/Phone:	Pam Pulssant/505-28	34-3124						✓ Validation Required •		
Service Order No.	CFO56-06	Send Repo	ort to SMO:	Lorraine Herrera/505	-844-3199	<u> </u>					Bill To:Sandia National Labs (A	Accounts Payab	le)
Location	Tech Area		-								P.O. Box 5800 MS 0154	ļ.	
Building	Room			Reference	e LOV(avallai	ble at Si	MO)			Albuquerque, NM 87185	i-0154	
Sample NoFraction	ER Sample ID o Sample Location De		ER Site t) No.	Date/Time(hr) Collected	Sample Matrix	Type	ntainer Volume	Preserv- ative	Collection Method	Sample Type	Parameter & Met Requested	hod	Lab Sample ID
¢ 074049-002	105-BH-27-0-S	0	105	020806/0903	s	G	125 ml	4C	G	SA	Mercury (7471A)		155725003
ಶೆ 074050-002	105-BH-27-2-S	2	105	020806/1141	s	G	125 ml	4C	G	SA	Mercury (7471A)		004
Ø 074051-002	105-BH-27-4-S	4	105	020806/1140	s	G	125 ml	4C	G	SA	Mercury (7471A)		005
	105-BH-27-8-S	8	105	020806/1143	s	G	125 ml	4C	G	SA	Mercury (7471A)		006
¢ 074107-002	105-BH-41-0-S	0	105	020806/0902	s	G	125 ml	4C	G	SA	Mercury (7471A)		007
© 074108-002	105-BH-41-2-S	2	105	020806/1133	S	G	125 ml	4C	G	SA	Mercury (7471A)		∞8
e 074109-002	105-BH-41-4-S	4	105	020806/1132	s	G	125 ml	4C	G	SA	Mercury (7471A)		્ર∞૧
⁶ 074110-002	105-BH-41-8-S	8	105	020806/1135	s	G	125 ml	4C	G	SA	Mercury (7471A)		0.10
9 074167-002	105-BH-56-0-S	0	105	020806/0901	s	G	125 ml	4C	G	SA	Mercury (7471A)		011
© 074168-002	105-BH-56-2-S	2	105	020806/1118	s	G	125 ml	4C ·	G	SA	Mercury (7471A)		012
• 074169-002	105-BH-56-4-S	4	105	020806/1117	s	G	125 ml	4C	G	SA	Mercury (7471A)		013
RMMA	☐Yes ✓No	Ref. No.		Sample Tracking		Smo U	se	Special ins			ements	Abnorma	
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Return Samples By:		<u> </u>	Negotia	ated TAT	QC inits			*Send repo	rt to:				
	Name	Signature	Init	Company/Organ			ellular	- '		-, -	gsandia.gov + blangk@sand	ia.gov	
Sample	William Gibson	William D.	KI WB	Weston/6146/284-52				- ·	-		1087/Org 6146	Sec. 11.	: Lab Use:
Team	Jeff Lee	Litte	2/1/2	Stone Lion/6146/284	-3309/22	8-9598		(505) 284-	2588/ (50 5)	379-7588			
Members	Gilbert Quintana	sala contra	1779	Shaw/6146/284-330	9/238-941	7							
(W)X)	Stacy Griffith		 -	Gram/ 0140/284-258	8/ 379 75	88	-	1 15 day	turn a	round	time ·	1,	
"	Robert Lynch	VA Long	h	Weston/6146/250-70	090		- 7 F	*Please list					
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OFF-SITE LABORATORY Analysis Request And Chain Of Custody (Continuation)

Page 2 of 2

AR/COC-60938 Project Name: P2VCA@SWMU105 Project/Task Manger: Brenda Langkopf Project/Task No.: 98046.02.02.09 Location Tech Area Reference LOV (available at SMO) Building Room Lab use Sample No-ER Sample ID or ER Date/Time (hr) Parameter & Method Lab Sample Pump Container Preserv-Collection Sample Fraction Sample Location detail Collected Depth (ft) Site No. Matrix Volume Requested Type ative Method Type € 074170-002 105-BH-56-8-S 020806/1172 155725014 105 S G 125 ml 4C G SA Mercury (7471A) 074226-002 105-BH-71-0-S 8 020806/0900 s Mercury (7471A) 105 G 125 ml 4C G SA ₹ 074227-002 105-BH-71-2-S Mercury (7471A) OK. 0 105 020806/1111 S 125 ml 4C G SA ♥ 074228-002 Mercury (7471A) OCT. 105-BH-71-4-S 2 105 020806/1110 S G 4C G 125 ml ◆ 074229-002 018 105-BH-71-8-S Mercury (7471A) 105 020806/1113 S 125 ml 4C G SA 5 073915-002 155 733001 105-EB-11 NA 105 020806/1131 DIW 250 ml HNO3 C EB Mercury (7470A) Abnormal Conditions on Receipt LAB USE Recipient initials

CONTRACT LABORATORY

ANALYSIS REQUEST AND CHAIN OF CUSTODY Page 1 of 2 Internal Lab 609382 AR/COC Batch No. **SMO Use** Dept. No./Mail Stop: 6146/1087 Date Samples Shipped: 2 - 9 - 00 Project/Task No.: 98046,02.02.09 Waste Characterization Project/Task Manager: SMO Authorization: Brenda Langkopf Carrier/Waybill No. 60347 -Send preliminary/copy report to: Project Name: P2VCA@SWMU105 Edie Kent 803/556-8171 Contract #: PO 21671 Lab Contact: Record Center Code: Released by COC No.: Lab Destination: Gel Logbook Ref. No.: ER047 ✓ Validation Required SMO Contact/Phone: Pam Puissant/505-284-3124 Service Order No. CFO56-06 Bill To:Sandia National Labs (Accounts Payable) Send Report to SMO: Lorraine Herrera/505-844-3199 Location Tech Area P.O. Box 5800 MS 0154 Room Building Reference LOV(available at SMO) Albuquerque, NM 87185-0154 Lab Sample ER Sample ID or Parameter & Method Pump **ER Site** Date/Time(hr) Sample Container Preserv-Collection Sample Sample No.-Fraction Sample Location Detail Depth (ft) Requested ID No. Collected Matrix Volume ative Method Type Type 074289-002 S 155722011 105-BH-87-0-S 0 105 20806/0859 G 125 mi 4C G SA Mercury (7471A) 074290-002 2 S G OIZ 105-BH-87-2-S 105 20806/1101 125 ml 4C G SA Mercury (7471A) © 074291-002 105-BH-87-4-S 013 4 105 20806/1100 S G 125 ml 4C G SA Mercury (7471A) ¢ 074292-002 105-BH-87-8-S 8 4C 014 105 S G G SA Mercury (7471A) 20806/1105 125 ml 9 074347-002 105-BH-102-0-S 0 105 20806/0858 S G 125 ml 4C G SA Mercury (7471A) 015 016 **9** 074348-002 2 S 4C G 105-BH-102-2-S 105 20806/1046 G 125 ml Mercury (7471A) 017 6 074349-002 4 S 4C 105-BH-102-4-S 105 20806/1045 G 125 ml G SA Mercury (7471A) 018 **©** 074350-002 105-BH-102-8-S 8 s 4C 105 20806/1053 G 125 ml G SA Mercury (7471A) 019 € 074406-002 0 S 4C G 105-BH-117-0-S 105 20806/0857 G 125 ml SA Mercury (7471A) 020 **074407-002** 105-BH-117-2-S 2 105 20806/1038 S G 125 ml 4C G Mercury (7471A) **•** 074408-002 155725001 105-BH-117-4-S S G 4C G 105 20806/1037 125 ml Mercury (7471A) RMMA √ No Special Instructions/QC Requirements Abnormal Yes Ref. No. Smo Use Sample Tracking Sample Disposal ✓ Disposal by lab ☑ Yes ☐ No Return to Client Date Entered(mm/dd/yy) EDD Conditions on **Turnaround Time** ✓ Yes 7 Day 15 Day 30 Day Entered by: Level D Package ☐ No Receipt Return Samples By: **Negotiated TAT** QC inits. *Send report to: Name Signature Company/Organization/Phone/Cellular Preliminary report (.pdf) to srgnff@sandia.gov + blangk@sandia.gov Sample Lab Use William Gibson Weston/6146/284-5232/239-7367 Final report to Stacy Griffith MS1087/Org 6146 Team Jeff Lee Stone Llon/6146/284-3309/228-9598 (505) 284-2588/ (505) 379-7588 Members Gilbert Quintana Shaw/6146/284-3309/238-9417 **⊯**15 day turn around time Stacy Griffith Gram/6146/284-2566/ 379 7566 Robert Lynch Weston/6146/250-7090 *Please list as separate report. 2/9/66 Time 0815 4.Relinguished by Relinguished by Date Torg of Ula Org. Date Time 1. Received by Date 2/9/06 Time 0 8/5 Time 4. Received by Org. Date 2.Relinguished Org/a Date 2/9/06 Time Crie 5.Relinguished by Org. Date Time Received by Mr. S DEN Org. Time Date 2110 104 5. Received by Ora. Date Time Sout 3.Relinquished by Date Ora. Time Time 6.Relinguished by Org. Date Received by Org. Date Time Org. Time Received by Date

OFF-SITE LABORATORY Analysis Request And Chain Of Custody (Continuation)

Page_2_ of _2

AR/COC-Project Name: P2VCA@SWMU105 Project/Task Manger: Project/Task No.: Brenda Langkopf 98046.02.02.09 Location Tech Area Reference LOV (available at SMO) Building Room Lab use ER Sample ID or Sample No-Pump ER Date/Time (hr) Sample Container Collection Sample Parameter & Method Lab Sample Preserv-Fraction Sample Location detail Depth (ft) Site No. Collected Matrix Type Volume Method Requested ative Type **©074409-002** 105-BH-117-8-S 20806/1040 105 Mercury (7471A) 125 ml 4C LABUSE Abnormal Conditions on Receipt Recipient Initials

CONTRACT 3ORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Page_1 of 2 Internal Lab 609383 AR/COC Batch No. SMO Use Date Samples Shipped: 2 - 14 - 06 Project/Task No.: 98046,02,02,09 Dept. No./Mail Stop: 6146/1087 Waste Characterization Project/Task Manager: Brenda Langkopf Carrier/Waybill No. 1.0591 -Send preliminary/copy report to: Edie Kent 803/556-8171 Contract #: PO 21671 Project Name: P2VCA@SWMU105 Lab Contact: Record Center Code: Lab Destination: Gel Released by COC No.: ✓ Validation Required Logbook Ref. No.: ER047 SMO Contact/Phone: Pam Pulssant/505-284-3124 Service Order No. CFO56-06 Send Report to SMO: Lorraine Herrera/505-844-3199 Bill To:Sandia National Labs (Accounts Payable) Location Tech Area P.O. Box 5800 MS 0154 56189% Reference LOV(available at SMO) Room Building Albuquerque, NM 87185-0154 ER Sample ID or **ER Site** Date/Time(hr) Sample Collection Pumo Container Preserv-Sample Parameter & Method Lab Sample Depth (ft) No. Collected Matrix Туре Volume Method Sample No.-Fraction Sample Location Detail ative Type Requested 1D s G G 074116-002 105-BH-44-0-S 0 105 021406/0958 125 ml 4C SA Mercury (7471A) G 102 074117-002 105-BH-44-2-S 2 105 021406/1015 S 125 ml 4C G SA Mercury (7471A) G G 105-BH-44-4-S 4 105 021406/1020 S 125 ml 4C SA 074118-002 Mercury (7471A) Mercury (7471A) field GC 4 105 021406/1020 S G 125 ml 4C G DU 004 074119-002 105-BH-44-4-SD w5 s G G 4C Mercury (7471A) 074176-002 105-BH-59-0-S 0 105 021406/1005 125 ml SA s G 2 G 4C 106 074177-002 105-BH-59-2-S 105 021406/1040 125 ml SA Mercury (7471A) Lield DC 2 S G 4C G 105-BH-59-2-SD 105 021406/1040 125 ml DU Mercury (7471A) 074178-002 മ്പട്ട s G G 105-BH-59-4-S 4 105 021406/1045 125 m 4C SA Mercury (7471A) 074179-002 259 G 074239-002 105-BH-75-0-S 0 105 021406/1009 S G 125 ml 4C SA Mercury (7471A) 010 S G G 2 021406/1103 125 ml 4C SA 074240-002 105-BH-75-2-S 105 Mercury (7471A) 011 105 021406/1108 G 125 ml 4C G SA Mercury (7471A) 074241-002 105-BH-75-4-S Special Instructions/QC Requirements **RMMA** Yes V NO Ref. No. Sample Tracking Smo Use Abnormal ☑ Yes ☐ No ✓ Disposal by lab Conditions on Date Entered(mm/dd/yy) Sample Disposal Return to Client √ Yes ☐ No 30 Day Receipt **Turnaround Time** 7 Day 15 Day Entered by: Level D Package Return Samples By: DAY 20 **Negotiated TAT** QC inits. *Send report to: Company/Organization/Phone/Cellular Preliminary report (.pdf) to srgriff@sandia.gov + blangk@sandia.gov Name Signature Weston/6146/284-5232/239-7367 Final report to Stacy Griffith MS1087/Org 6146 l ab Use Sample William Gibson Team (505) 284-2588/ (505) 379-7588 Members 3 day turn around time *Please list as separate report. Weston/6146/250-7090 4.Relinquished by Org. Date Z// QL Time Date 1.Relinguished by Org. Time 4. Received by Org. Date 2 15 02 Time Ora. Date Time 1. Received by Date 2 / 57 00 Time 5.Relinguished by 200 Org. Date 2.Relinguished by Org. Time 16/06 Time Org. 5. Received by Date Time Org. Received by Date Time 6.Relinquished by Org. Date 3.Relinguished by Org Time 6. Received by Time Org. Time Received by Org. Date Date

OFF-SITE L ORATORY Analysis Request And Chain Of Custody (Continuation)

Page_2_ of _2

AR/COC-98046.02.03.01 P2VCA@SWMU105 Project/Task No.: Project Name: Project/Task Manger: Brenda Langkopf Location Tech Area Reference LOV (available at SMO) Lab use Room Building Lab Sample ER Date/Time (hr) Sample Container Preserv-Collection Sample Parameter & Method ER Sample ID or Pump Sample No-ID Depth (ft) Site No. Collected Matrix Туре Volume ative Method Type Requested Sample Location detail Fraction 012 S G 4C G SA Mercury (7471A) 021406/1115 125 ml 074298-002 105-BH-90-0-S 105 013 021406/1124 G 125 ml 4C G SA Mercury (7471A) 105 S 074299-002 105-BH-90-2-S S G 125 ml 4C G SA Mercury (7471A) 074300-002 105 021406/1131 105-BH-90-4-S 4 0 105 021406/1118 S G 125 ml 4C G Mercury (7471A) 074357-002 105-BH-105-0-S S G G 021406/1144 125 ml 4C Mercury (7471A) 2 105 074358-002 105-BH-105-2-S Mercury (7471A) 105-BH-105-4-S 105 021406/1150 S G 125 mi 4C G SA 074359-002 DIW P 250 ml HNO3 G Mercury (7470A) 105 021406/1436 073916-002 105-EB-12 NA LAB USE Abnormal Conditions on Receipt Recipient Initials______

CONTRACT BORATORY

ANALYSIS REQUEST AND CHAIN OF CUSTODY Page_1 of 1 Internal Lab 609521 AR/COC SMO Use Batch No. Date Samples Shipped: 15-06 Project/Task No.: 98046,02.02.09 Waste Characterization 6146/1087 Dept. No./Mail Stop: SMO Authorization: Carrier/Waybill No. 005 9 1 -Send preliminary/copy report to: Project/Task Manager: Brenda Langkopf Edie Kent 803/556-8171 Contract #: PO 21671 Lab Contact: Project Name: P2VCA@SWMU105 Released by COC No.: Gel Record Center Code: Lab Destination: NA ✓ Validation Required SMO Contact/Phone: Pam Pulssant/505-284-3124 **ER047** Logbook Ref. No.: Send Report to SMO: Lorraine Herrera/505-844-3199 Bill To:Sandia National Labs (Accounts Payable) CFO56-06 Service Order No. P.O. Box 5800 MS 0154 Location Tech Area Reference LOV(available at SMO) Albuquerque, NM 87185-0154 Building Room ER Sample ID or **ER Site** Date/Time(hr) Sample Container Preserv-Collection Sample Parameter & Method Lab Sample Pump Method Sample No.-Fraction Sample Location Detail Depth (ft) No. Collected Matrix Type Volume ative Type Requested ID 105 021406/1406 S G 125 m 4C G SA Mercury (7471A) 075599-002 105-BH-147-0-S 0 075600-002 2 105 021406/1421 S G 125 ml 4C G SA Mercury (7471A) 105-BH-147-2-S G 105 S G 125 ml 4C DU Mercury (7471A) 2 021406/1421 075601-002 105-BH-147-2-SD 105 021406/1423 s G 125 ml 4C G SA Mercury (7471A) 105-BH-147-4-S 075602-002 156194-00 4C 8 S G 125 ml G SA Mercury (7471A) 075603-002 105-BH-147-8-S 105 021406/1426 Special Instructions/QC Requirements RMMA Yes √ No Ref. No. Sample Tracking Smo Use Abnormal ☑ Yes ☐ No Disposal by lab EDD Conditions on Return to Client Date Entered(mm/dd/yy) : Sample Disposal 30 Day ✓ Yes ☐ No Receipt Entered by: Level D Package **Turnaround Time** 7 Day 15 Day **Negotiated TAT** QC inits. Send report to: MAN Return Samples By: Company/Organization/Phone/Cellular Preliminary report (.pdf) to srgriff@sandia.gov + blangk@sandia.gov. Name Signature William 5, 91 2015 Weston/6146/284-5232/239-7367 Final report to Stacy Griffith MS1087/Org 6146 Lab Use Sample William Gibson (505) 284-2588/ (505) 379-7588 Team Members 3 day turn around time *Please list as separate report. 1. Relinquished by William Wal Org. bill/ Date 2 / 10h Time 4.Relinguished by Org. Date Time Date 211/0 Time 04.00 Org. 4. Received by Date Time Org. ELUB . Received by Org. Date 2//5/6 Time 2.Relinguished 5.Relinguished by Date Time Org. II In Time Time 2. Received by Org. Date 2 5. Received by Date 6.Relinquished by Org. Date Time 3.Relinguished by Org. Date Time

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ANALYSIS REQUEST AND CHAIN OF CUSTODY Page 1 of 1 Internal Lab 609522 AR/COC Batch No. Date Samples Shipped: 2 - 21 - 66 Dept. No./Mall Stop: Project/Task No.: 98046.02.02.09 6146/1087 Waste Characterization SMO Authorization: Project/Task Manager; Brenda Langkopf Carrier/Waybill No. -Send preliminary/copy report to: Project Name: P2VCA@SWMU105 Lab Contact: Edle Kent 803/556-8171 Contract #: PO 21671 Record Center Code: Released by COC No.: Lab Destination: Gel ☑ Validation Required Logbook Ref. No.: ER047 SMO Contact/Phone: Pam Pulssant/505-284-3124 Service Order No CFO56-06 Bill To:Sandia National Labs (Accounts Payable) Lorraine Herrera/505-844-3199 Send Report to SMO: Location Tech Area P.O. Box 5800 MS 0154 Building Room Reference LOV(available at SMO) Albuquerque, NM 87185-0154 ER Sample ID or Pump ER Site Date/Time(hr) Sample Container Preserv-Collection Sample Parameter & Method Lab Sample Sample No.-Fraction Sample Location Detail Depth (ft) Collected No. Matrix Type | Volume ative Method Type Requested ID 074234-002 105-BH-73-0-S 0 105 022006/1050 S G 125 mi 4C G Mercury (7471A) 074235-002 105-BH-73-2-S 2 105 s G 022006/1055 G 125 ml 4C Mercury (7471A) 075604-002 105-BH-73-4-S s G 4 105 022006/1100 G 125 ml 4C SA Mercury (7471A) 075605-002 105-BH-73-4-SD S 4C G 4 105 022006/1100 G 125 ml DU Mercury (7471A) 073917-002 105-EB-13 С NA 105 022006/1105 DIW 250 ml HNO3 Mercury (7470A) RMMA No Yes Ref. No. Sample Tracking Smo Use Special Instructions/QC Requirements Abnormal Sample Disposa Return to Client ✓ Disposal by lab Date Entered(mm/dd/yy) 02-EDD Yes No Conditions on 30 Day ✓ Yes ☐ No Turnaround 17me Entered by: 12/C Receipt 7 Day 15 Day Level D Package 3 DAY Return Samples By: **Negotiated TAT** QC inits. *Send report to: Name Signature Company/Organization/Phone/Cellular Preliminary report (.pdf) to srgriff@sandia.gov + blangk@sandia.gov Sample William Gibson Weston/6146/284-5232/239-7367 Final report to Stacy Griffith MS1087/Org 6146 Lab Use Team Gilbert Quintana Shaw/6146/284-3309/850-8524 (505) 284-2588/ (505) 379-7588 Members Robert Lynch Weston/6146/250-7090 3 day turn around time *Please list as separate report. 1. Relinguished by Org 6/46 Date 2-2/-06 Time 0545 4.Relinquished by Date Time 1. Received by Org. 6/4/2 Date 2-2/-26 Time 08 45 Date Time 4. Received by Org. 2.Relinquished by Org. 1614/4 Date 2-21-06-Time 1001 5.Relinguished by Time Org. Date 2. Received by Org. Date Time 5. Received by Org. Date Time Time 3.Relinguished by Org. Date Time 6.Relinguished by Org. Date 3. Received by Date Time Time

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Page 1 of 1

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Time

ANALYSIS REQUEST AND CHAIN OF CUSTODY

609523 AR/COC Batch No. Project/Task No.: 98046,02.02.09 Waste Characterization Dept. No./Mail Stop: 6146/1087 Date Samples Shipped: 12 - 21 - 66 Project/Task Manager: Brenda Langkopf Carrier/Waybill No. 6501 SMO Authorization: -Send preliminary/copy report to: Project Name: P2VCA@SWMU105 Lab Contact: Edle Kent 803/556-8171 Contract #: PO 21671 Record Center Code: Lab Destination: Released by COC No .:_ Gel ✓ Validation Required Logbook Ref. No.: **ER047** SMO Contact/Phone: Pam Pulssant/505-284-3124 Service Order No. CFO56-06 Lorraine Herrera/505-844-3199 Bill To:Sandia National Labs (Accounts Payable) Send Report to SMO: Location Tech Area P.O. Box 5800 MS 0154 Reference LOV(available at SMO) Building Room Albuquerque, NM 87185-0154 ER Sample ID or Collection Sample Parameter & Method Lab Sample Pump **ER Site** Date/Time(hr) Sample Container Preserv-Sample No.-Fraction Sample Location Detail Depth (ft) Collected Matrix Type Volume ative Method Type Requested No. 075606-002 105-BH-148-0-S 105 4C SA Mercury (7471A) 0 022006/1310 S G 125 ml G 075607-002 105-BH-148-2-S 2 105 S G 125 ml 4C G SA Mercury (7471A) 022006/1333 075608-002 105-3H-148-4-S 4 105 S G 4C G Mercury (7471A) 022006/1338 125 ml SA 4C G 075609-002 105-BH-149-0-S 0 105 022006/1315 S G 125 ml SA Mercury (7471A) 075610-002 105-BH-149-2-S 2 105 022006/1341 125 ml 4C G SA Mercury (7471A) 2 4C G 075611-002 105-BH-149-2-SD 105 022006/1341 S G 125 ml DU Mercury (7471A) 4 105 s G 125 ml 4C G SA 075612-002 105-BH-149-4-S 022006/1407 Mercury (7471A) 105-BH-150-0-S 0 105 022006/1320 S G 125 ml 4C G SA 075613-002 Mercury (7471A) 4C G ŜΑ 075614-002 105-BH-150-2-S 2 105 022006/1349 G 125 ml Mercury (7471A) 075615-002 105-BH-150-4-S 4 105 022006/1430 G 125 ml 4C G SA Mercury (7471A) Yes Abnormal RMMA ~ No Ref. No. Sample Tracking Special Instructions/QC Requirements Return to Client Disposal by lab Date Entered(mm/dd/yy) 02 EDD ✓ Yes No Conditions on Sample Disposal ✓ Yes Receipt **Turnaround Time** Level D Package No 7 Day 15 Day 30 Day Entered by: 3 DAY QC inits. *Send report to: Return Samples By: Negotlated TAT Name Company/Organization/Phone/Cellular Preliminary report (.pdf) to srgrlff@sandla.gov + blangk@sandla.gov Signature Sample Lab Use William Gibson Weston/6146/284-5232/239-7367 Final report to Stacy Griffith MS1087/Org 6146 (505) 284-2588/ (505) 379-7588 Team Shaw/6146/284-3309/850-8524 Gilbert Quintana Members Weston/6146/250-7090 Robert Lynch 3 day turn around time Weston/6146/250-7090 Please list as separate report. 1. Relinguished by Walkers 1 21/3 Org. 2146 Date 2 - 2/-06 Time 0845 4.Relinquished by Date Time Time Date 2-21-06 Time 0845 Date 1. Received by - Org. 6/46 4. Received by Org. Time 2.Relinquished by 1 46 Org. 1614 Date 12-71-67 Ime 1000 5.Relinquished by Org. Date 2. Received by Org. Time Date Org. Date Time (5. Received by

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ANALYSIS REQUEST AND CHAIN OF CUSTODY Page 1 of 1 Internal Lab 609567 AR/COC Batch No. Date Samples Shipped: 3 - 8 - 06 Waste Characterization Project/Task No.: 98046.02.02.09 Dept. No./Mail Stop: 6146/1087 SMO Authorization: My Long Green -Send preliminary/copy report to: Project/Task Manager: Brenda Langkopf Carrier/Waybill No. Contract #: PO 21671 Edie Kent 803/556-8171 Project Name: P2VCA@SWMU105 Lab Contact: Released by COC No.: Record Center Code: Lab Destination: Gel SUE BOTTHE ORDER ✓ Validation Required Pam Puissant/505-284-3124 Logbook Ref. No.: ER047 SMO Contact/Phone: Bill To:Sandia National Labs (Accounts Payable) Service Order No. CFO56-06 Send Report to SMO: Lorraine Herrera/505-844-3199 Location Tech Area P.O. Box 5800 MS 0154 Reference LOV(available at SMO) Albuquerque, NM 87185-0154 Building Room Collection Sample Parameter & Method Lab Sample ER Sample ID or Pump ER Site Date/Time(hr) Sample Container Preserv-Collected Matrix Type Volume ative Method Type Requested Sample No.-Fraction Sample Location Detail Depth (ft) No. 00 105 030706/1510 S G 125 ml 4C G Mercury (7471A) 075651-002 105-BH-44-6-S 6 Mercury (7471A) 244 00 002 S G 4C G 8 125 ml 075652-002 105-BH-44-8-S 105 030706/1517 002 6 030706/1443 S G 125 mi 4C G SA Mercury (7471A) 075653-002 105-BH-73-6-S 105 Ġ 004 S 4C Mercury (7471A) 8 105 030706/1454 G 125 ml SA 075654-002 105-BH-73-8-S 005 S G 125 ml 4C G Mercury (7471A) 8 105 030706/1454 DU 075655-002 105-BH-73-8-SD 006 s G 4C G Mercury (7471A) 125 ml SA 075656-002 105-BH-75-6-S 6 105 030706/1415 007 S 4C G 8 105 030706/1425 G 125 ml Mercury (7471A) 075657-002 105-BH-75-8-S 1576480 DIW 250 ml HNO3 Mercury (7470A) 075658-002 105-EB-14 NA 105 030706/1525 Special Instructions/QC Requirements Abnormal RMMA Yes √No Ref. No. Sample Tracking Smo Use ☑ Yes ☐ No Conditions on FDD Disposal by lab Date Entered(mm/dd/yy) Sample Disposal Return to Client ✓ Yes ☐ No Entered by: Level D Package Receipt **Turnaround Time** 15 Day 30 Day 7 Day 3 DAY QC inits. *Send report to: Negotiated TAT Return Samples By: Preliminary report (.pdf) to srgriff@sandia.gov + blangk@sandia.gov Company/Organization/Phone/Cellular Name Signature Miller DI WIN Weston/6146/284-5232/239-7367 Lab Use Final report to Stacy Griffith MS1087/Org 6146 Sample William Gibson Team Shaw/6146/284-3309/850-8524 (505) 284-2588/ (505) 379-7588 Gilbert Quintana Weston/6146/250-7090 Members Robert Lynch 3 day turn around time *Please list as separate report. Date Date 3/8/H xime (08 4.Relinquished by Org. Time .Relinquished by SMORG. 6/4 Date 3/8/06Time 0 95 5 4. Received by Org. Date Time . Received by Date 2/8/06 Time 110 5.Relinguished by Org. Date Time 2.Relinguished by on Org. li Wh Date 3 4 Time 5. Received by Org. Date Time 2. Received by Org.

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ANNEX B SWMU 105, Mercury Spill (Building 6536) Data Validation Reports

Site: Site		The state of the s		M	ethod	/CAS	Numl	ber (A	793 nalve	ie/An:	lytal	 	 Inorga	anic	=
Ormania ID	EPA6010B (ICP):	EPA7471A (CVAA):					Numi	Der (A	idiys	IS/Alle	ilyte)				
Sample ID												 			1
111	All Acceptance	All Acceptance										 	 		Ŧ
	criteria met.	criteria met.										 	 		+
	No sample	No sample										 		-	t
	data will be qualified.	data will be qualified.													1
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Mr. David Schwent

Analytical Quality Associates, Inc.



616 Maxine NE Albuquerque, NM 87123 Phone: 505-299-5201

Fax: 505-299-6744 Email: minteer@aol.com

Memorandum

DATE:

June 1, 2006

TO:

File

FROM:

David Schwent

SUBJECT:

Inorganic Data Review and Validation - SNL

Site: Site 105 AR/COC: 608793

SDG (Lot#): F5G260245

Laboratory: STSL

Project/Task: 98046.02.02.09

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 1.

Summary

The samples were prepared and analyzed with accepted procedures using methods EPA6010B (ICP) and EPA7471A (CVAA). No problems were identified with the data package that result in the qualification of data.

Data are acceptable. QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times/Preservation

All Analyses: All samples were analyzed within the prescribed holding times and properly preserved.

Calibration

All Analyses: All initial and continuing calibration QC acceptance criteria were met.

Blanks

<u>ICP Analysis</u>: No target analytes were detected in the blanks, except the following. As and Pb were detected in the continuing calibration blank (CCB) and Cr was detected in the method blank (MB) at concentrations < the reporting limit (RL). However, all associated sample results were detects > 5X the blank concentration and will not be qualified.

CVAA Analysis: No target analytes were detected in the blanks, except the following. Hg was detected in the CCB at a negative concentration with an absolute value > the detection limit (DL) but < the RL. However, all associated sample results were detects >5X the DL and will not be qualified.

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)

All Analyses: All LCS QC acceptance criteria were met.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

<u>ICP Analysis</u>: All MS QC acceptance criteria were met. No MSD analysis was performed. The laboratory replicate analysis was used as measure of precision. No sample data will be qualified as a result.

CVAA Analysis: All MS QC acceptance criteria were met. It should be noted that the MS analysis for Hg was not applied to sample results because the parent sample concentration was >4X the MS spike concentration. No sample data will be qualified as a result. No MSD analysis was performed. The laboratory replicate analysis was used as measure of precision. No sample data will be qualified as a result.

Replicates

All Analyses: All laboratory replicate QC acceptance criteria were met.

ICP Serial Dilution

ICP Analysis: All serial dilution QC acceptance criteria were met.

CVAA Analysis: No serial dilution analysis was required by this method.

ICP Interference Check Sample (ICS)

ICP Analysis: All ICS-AB QC acceptance criteria were met.

CVAA Analysis: No ICS analysis was required by this method.

Detection Limits/Dilutions

ICP Analysis: All detection limits were properly reported. No samples required dilution.

<u>CVAA Analysis</u>: All detection limits were properly reported. Sample F5G260245-001 was diluted 10X. No other samples required dilution.

Other QC

<u>CVAA Analysis (All Batches)</u>: No field duplicates (FDs), field blanks (FBs), or equipment blanks (EBs) were submitted on the ARCOCs.

No other specific issues were identified which affect data quality.

Bldg Data Validat	ion Summary
Site/Project: 5NV-6536 Project/Task #: 98046.02.02.09	# of Samples: Matrix: Salid (Sall)
AR/COC #: 608793	Laboratory Sample IDs: F5 G 260 245-001 and -004.
Laboratory: 5754	
SDG #: (Lot #): F5 6260245	

		Analysis									
QC Element		Organics				Inorg	ganics				
	voc svoc P		Pesticide/ PCB			GFAA/ AA	CVAA (Hg)	CN	RAD	Other	
1. Holding Times/Preservation					1		Vi				
2. Calibrations											
3. Method Blanks											
4. MS/MSD											
5. Laboratory Control Samples						12		1	1		
6. Replicates			Y			IV					
7. Surrogates		\\					V				
8. Internal Standards											
9. TCL Compound Identification											
10. ICP Interference Check Sample									1		
11. ICP Serial Dilution											
12. Carrier/Chemical Tracer Recoveries											
13. Other QC					NA		NA				

ſ	=	Estimated	
τ	_	Not Detected	

Check $(\sqrt{})$ = Acceptable

U = Not Detected

Shaded Cells = Not Applicable (also "NA")

UJ = Not Detected, Estimated
R = Unusable

NP = Not Provided
Other:

Reviewed By: Navio Schwont

Date: 5-31-06

Inorganic Metals Site/Project: <u>SNL</u>/<u>Bldg 6536</u> AR/COC#: <u>608793</u>

Laboratory: <u>ST5L</u>

Methods: <u>FPA 6008 (TCP)</u>; 7471A (CVAA)

Laboratory Sample IDs: <u>F56260245-001</u> Hry -004. Batch #s: 5208087; 5208172 # of Samples: **QC Element CAS #/** Serial Field **Analyte** Method LCSD MSD **ICS** Rep. Equip. Field LCCB TAL **ICV** CCV ICB LCS LCSD MS MSD Dilu-Dup. Blanks RPD RPD RPD AB Blanks Blanks RPD 7429-90-5 Al 7440-39-3 Ba NA NA NA NA 7440-41-7 Be NA NA NA 7440-43-9 Cd MA NA NA 7440-70-2 Ca 0.20 NA NA NA NA NA 7440-47-3 Cr 1/R 7440-48-4 Co 7440-50-8 Cu 7439-89-6 Fe 7439-95-4 Mg 7439-96-5 Mn 7440-02-0 Ni 7440-09-7 K 1/4 V NA NA 7440-22-4 Ag 7440-23-5 Na 7440-62-2 V 7440-66-6 Zn NA VA NA 7439-92-1 Pb NA NA 7782-49-2 Se 7440-38-2 As 7440-36-0 Sb 7440-28-0 Tl NA MA MA NA NA MA 7439-97-6 Hg Cyanide CN

Notes: Shaded rows are RCRA metals. Solids-to-aqueous conversion: mg/kg = \mug/g: [(\mug/g) x (sample mass \{g\} / sample vol. \{ml\}) x (1000 ml/1 liter)] / Dilution Factor = \mug/l

*XX MS doesn't pass 4x rule -> Not applied to Reviewed By: <u>Sawid Schwart</u> Date: <u>5-31-86</u>
Sample results.

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab											And the Annual Contract of the	-
Batch No.			SMO Use	9			1			AR/COC	60879	3
Dept. No./Mail Stop:	10826	Date Samples Ship	ped: 7-25-05		Project/7	ask No.:	83916 4.5	5.1 ~	***************************************	✓ Waste Characterization		
Project/Task Manager:	Nick Durand	Carrier/Waybill No.	52921	~	SMO Au					Send Preliminary/Copy Repor	f to:	
Project Name:	TO 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		Ed Keo		Contract			<u> </u>		Larry Ring and Brenda Langk		
Record Center Code		Lab Destination:	Severn Trent St. Louis		1					Validation Required	Opening a subsecued? → Pade Che () : E*(W. diputtiff a E → Pake	See of Production
Logbook Ref. No.:	A CONTRACT OF THE PARTY OF THE	SMO Contact/Phon			1					Released by COC No.:		
Service Order No.	CFO 163-05 J	Send Report to SM	O: L. Herrera 844-3199		1					Bill To: Sandia National Labs	(Accounts Paya	iple)
Location	Tech Area III									P.O. Box 5800, MS-		
Building 6536	Room		Referenc	e LOV(avallabi	e at Si	40) <i>F5</i>	G260.	245	Albuquerque, NM.,	87185-0154	
<i>Y</i> .	ER Sample ID or	Beginning ER S	ite Date/Time(hr)	Sample	Con	tainer	Preserva	Collection	Sample	Parameter & Metho	d Lab	Sample
Sample NoFraction	Sample Location Detail	Depth (ft) No	. Collected	Matrix	Type	Volume	tive	Method	Type	Requested		ID
+ 069601-001	Swcorner #1	NAN	12/05 1353	soil	Р	500ML	4° C	G	SA	Total RCRA Metals		
+ 069601-002	Sw. corner # 2	NA N	7/21/06 1357	soil	. Р	500ML	4° C	G	SA	Total RCRA Metals		
/ 069601-003	Bottom tranch #			soil	P	500ML	4° C	G	SA	Total RCRA Metals		
		140	, , ,				4" C	-				
# 069601-00-1	Battom transh #	2 /1/4 N	7/6/00 1403	soil	P	500ML	4.0	G	SA	Total RCRA Metals		
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RMMA		ef. No.	Sample Tracking		SMO Us		Special I	nstructions	QC Requ		Abnormal Condi	tions
Sample Disposal	Return to Client	Disposal by lab	Date Entered(mm/d	d/yy) 67	1261	05	EDD		☐ Yet		on Receipt	
Turnaround Time	√ 7 Day * 15	Day * 30 Da	ay Entered by:	RIL	, , , , ,		Level D	Package	Yes	No ·		
Return Samples I	By:	☐ Neg	otlated TAT	QC inits	WP		*Send/e-	mail report	to:			
	Name	Signature in		nization/F	hone/Cel	lular]	'		,		
Sample	Larry Ring	らい。	- Shaw 252-8930]					
Team	Don //atenpaugh	JUE D	Shaw 262-8912]			•		
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3.Relinquished by		Org. Da			6.Relino		y		Org.	Date	Time	
3. Received by		Org. Da	te Time		6. Rece	ived by			Org.	Date	Time	

Contract Verification Review (Concluded)

5.0 Problem Resolution

Summarize the findings in the table below. List only samples/fractions for which deficiencies have been noted.

Sample/Fraction No.	Analysis	Problems/Comments/Resolutions
		·
	,	
Were deficiencies unresolved? Yes	®	
Based on the review, this data package is con	mplete. Yes	No
If no, provide: nonconformance report or co	errection request number	and date correction request was submitted:
Reviewed by: W. Palenc	Date: 8	2-10-05 Closed by:Date:

Contract Verification Review (Continued)

4.0 Calibration and Validation Documentation		Astrict.	
ltem	Yes	No	Comments
4.1 GC/MS (8260, 8270, etc.)			
a) 12-hour tune check provided	N/A		
b) Initial calibration provided	N/A		
c) Continuing calibration provided	N/A		
	·		
d) Internal standard performance data provided	N/A		
e) Instrument run logs provided	N/A		
4,2 GC/HPLC (8330 and 8010 and 8082)			
a) Initial calibration provided	N/A		
•			
b) Continuing calibration provided	N/A		
,			
c) Instrument run logs provided	N/A		
,			
4.3 Inorganics (metals)			
a) Initial calibration provided	x	ļ	
b) Continuing calibration provided	х		
c) ICP interference check sample data provided	X	, , , , , , , , , , , , , , , , , , ,	
O TOY, WHELTOLOGICO CHICAN WHITIPIE GREE PROAIGOR	•		
d) ICP serial dilution provided	х		
Total and the second day	x		
e) Instrument run logs provided	A		
4.4 Radiochemistry	N/A		
a) Instrument run logs provided	IVA.		

Contract Verification Review (Continued)

3.0 Data Quality Evaluation

5.0 Data Quarry Evandation	177	3.7-	To a County ID No. (County and Association)
Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
3.1 Are reporting units appropriate for the matrix and meet contract specified or project-specific requirements? Inorganics and metals reported as ppm (mg/liter or mg/Kg)? Tritium reported in picocuries per liter with percent moisture for soil samples? Units consistent between QC samples and sample data	Х		
3.2 Quantitation limit met for all samples	Х		
Accuracy a) Laboratory control samples accuracy reported and met for all samples	х		
 Surrogate data reported and met for all organic samples analyzed by a gas chromatography technique 	N/A		
c) Matrix spike recovery data reported and met		Х	MERCURY FAILED RECOVERY LIMITS FOR MATRIX SPIKE
3.4 Precision a) Replicate sample precision reported and met for all inorganic and radiochemistry samples	х		
b) Matrix spike duplicate RPD data reported and met for all organic samples	N/A		
3.5 Blank data a) Method or reagent blank data reported and met for all samples		Х	CHROMIUM DETECTED IN BLANK
b) Sampling blank (e.g., field, trip, and equipment) data reported and met	N/A		
3.6 Contractual qualifiers provided: "I"- estimated quantity; "B"-analyte found in method blank above the MDL for organic or above the PQL for inorganic; "U"- analyte undetected (results are below the MDL, IDL, or MDA (radiochemical)); "H"-analysis done beyond the holding time	X		
3.7 Narrative addresses planchet flaming for gross alpha/beta	N/A		
3.8 Narrative included, correct, and complete	x		
3.9 Second column confirmation data provided for methods 8330 (high explosives) and 8082 (pesticides/PCBs)	N/A		

Contract Verification Review (CVR)

Project Leader DURAND	Project Name	BLDG, 6536 CHARACTERIZATION	Case No.	83916_4.5.1
AR/COC No. 608793	Analytical Lab	SEVERN TRENT	SDG No.	F5G260245
In the tables below, mark any information tha	t is missing or inc	correct and give an explanation.		

1.0 Analysis Request and Chain of Custody Record and Log-In Information

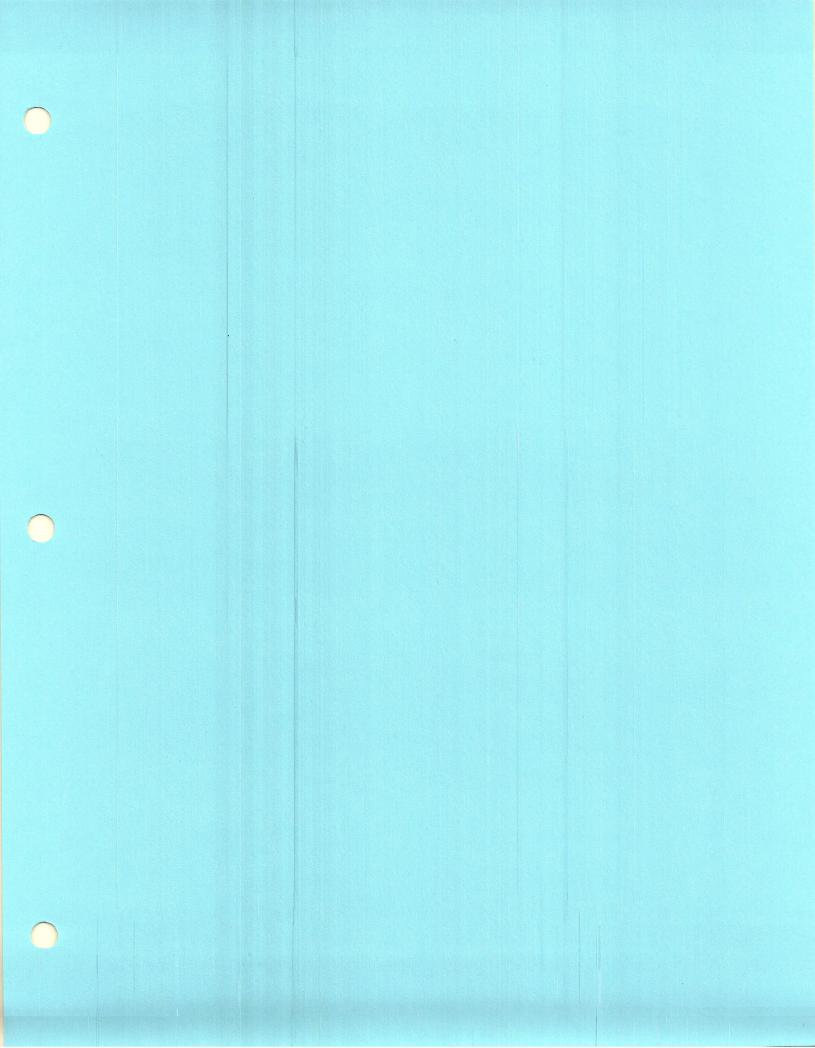
Line		Com	plete?		Resc	olved?
No.	item	Yes	No	If no, explain	Yes	No
1.1	All items on COC complete - data entry clerk initialed and dated	X				
1,2	Container type(s) correct for analyses requested	X				
1.3	Sample volume adequate for # and types of analyses requested	X				
1,4	Preservative correct for analyses requested	X				
1.5	Custody records continuous and complete	X				
1.6	Lab sample number(s) provided and SNL sample number(s) cross referenced and correct	X				
1.7	Date samples received	X				
1.8	Condition upon receipt information provided	X				

2.0 Analytical Laboratory Report

Line	All Filling seem algorithms (Approx	Com	olete?		Resc	lved?
No.	Item	Yes	No	If no, explain	Yes	No
2.1	Data reviewed, signature	X				
2.2	Method reference number(s) complete and correct	X				
2.3	QC analysis and acceptance limits provided (MB, LCS, Replicate)	X				
2.4	Matrix spike/matrix spike duplicate data provided (if requested)	X				
2.5	Detection limits provided; PQL and MDL (or IDL), MDA and L.	X				
2.6	QC batch numbers provided	X				
2.7	Dilution factors provided and all dilution levels reported	X				
2.8	Data reported in appropriate units and using correct significant figures	X				
2.9	Radiochemistry analysis uncertainty (2 sigma error) and tracer recovery (if applicable) reported.	N/A				
2.10	Narrative provided	X		•		
2.11	TAT met	X				
2.12	Hold times met	X				
2.13	Contractual qualifiers provided	X		·		
2.14	All requested result and TIC (if requested) data provided	X				

			RECORE	S CE	NTER CODE:				
		SMO ANA	ALYTICAL DA	TA R	OUTING FORM				
PROJE	CT NAME:	Bldg. 6536 Ch	aracterization		PROJECT/TASK:	83916	4,5,1		
SNL TASK L		Durand			ORG/MS/CF0#:			F0163-	05
SMO PROJE	ECT LEAD:	Palencia			SAMPLE SHIP DATE:	1/31/20	05		
							EDD		
							ON	Cust	RC
ARCOC	LAB	LAB ID	PRELIM D	ATE	FINAL DATE	EDD	Q	CD	CD
608793	STSL	F5G260245	7/31/200	5	8/8/2005	X	X	X	X
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PRO	BLEM #/DAT	E CORRECTION	RECEIVED:						
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o: Site 105			 <u></u>					49 Re						inorga	anic
		EPA7470A/7471A (CVAA):		M	ethod	CAS	Numi	ber (A	nalysi	s/Ana	llyte)				
Sample ID 074114-002 105-BH-43-0-S															
074204-002 105-BH-66-0-S		J,B2 J,B2	 	-			ļ	-				ļ			
074204-002 105-BH-66-2-S		J,B2	 				ļ	ļ							
074207-002 105-BH-66-4-SD		J,B2	 			<u> </u>									
074455-002 105-EB-1		J,B,B3	 	-		<u> </u>	ļ	-							
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Mr. David Schwent

Analytical Quality Associates, Inc.



616 Maxine NE Albuquerque, NM 87123 Phone: 505-299-5201

Fax: 505-299-6744 Email: minteer@aol.com

Memorandum -- Second Revision

DATE:

March 16, 2006

TO:

File

FROM:

David Schwent

SUBJECT:

Inorganic Data Review and Validation - SNL

Site: Site 105 AR/COC: 609349

SDG: 154536 and 154540

Laboratory: GEL

Project/Task: 98046.02.02.09

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 1.

Summary

The samples were prepared and analyzed with accepted procedures using method EPA7470A/7471A (CVAA). Problems were identified with the data package that result in the qualification of data.

CVAA Analysis (Batch 497927):

Blanks: In the equipment blank (EB) (Sample 154540-001), Hg was detected at a concentration < reporting limit (RL). The associated results of Samples 154536-001, -015, -016, and -018 were detects <5X the EB concentration and will be qualified "J,B2."

CVAA Analysis (Batch 497929):

Blanks: In the continuing calibration blank (CCB), Hg was detected at a negative concentration with an absolute value > the detection limit (DL) but less < the RL, and in the method blank (MB), Hg was detected at a concentration < the RL. The associated Hg result of Sample 154540-001 was a detect <5X the DL and <5X the MB concentration and will be qualified "J,B,B3."

Data are acceptable. QC measures appear to be adequate. The following sections discuss the data review and validation. Due to the matrix, an LCSD analysis was performed instead of MS/MSD and laboratory replicate analyses (see e-mail, dated 1-20-06). Later, MS/MSD and laboratory replicate analyses were performed on a sample from the COC and original soil field sample batch of this package. The MS/MSD and laboratory replicate analyses were performed on the sample beyond the method specified holding time, but within 2X the holding time, and no sample data will be qualified as a result, based on professional judgment. The MS/MSD and laboratory replicate analyses performed on Sample 157006-001 of SDG 157006 apply to the soil field samples of this package.

Holding Times/Preservation

<u>CVAA Analysis (All Batches)</u>: All samples were analyzed within the prescribed holding times and properly preserved.

Calibration

CVAA Analysis (All Batches): All initial and continuing calibration QC acceptance criteria were met.

<u>Blanks</u>

CVAA Analysis (Batch 497927): No target analytes were detected in the blanks, except as noted above in the summary section and the following. Hg was detected in the EB at a concentration < the RL. However, all associated sample results, except the results of Samples 154536-001, -015, -016, and -018, were detects >5X the EB concentration and will not be qualified.

<u>CVAA Analysis (Batch 497929)</u>: No target analytes were detected in the blanks, except as noted above in the summary section.

<u>Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)</u>

<u>CVAA Analysis (Batch 497927)</u>: All LCS/LCSD QC acceptance criteria were met. It should be noted that, the MSD analysis was used as a measure of laboratory precision due to low indigenous concentration of the target analyte in the sample used for the QC analyses.

CVAA Analysis (Batch 497929): All LCS/LCSD QC acceptance criteria were met.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

CVAA Analysis (Batch 497927): All MS/MSD OC acceptance criteria were met.

<u>CVAA Analysis (Batch 497929)</u>: No MS/MSD analyses were performed. No sample data should be qualified as a result.

Replicates

<u>CVAA Analysis (Batch 497927)</u>: All laboratory replicate QC acceptance criteria were met. It should be noted that the MSD analysis was used as a measure of laboratory precision due to low indigenous concentration of the target analyte in the sample used for the QC analyses.

<u>CVAA Analysis (Batch 497929)</u>: No laboratory replicate analysis was performed. No sample data should be qualified as a result.

ICP Serial Dilution

CVAA Analysis (Batch 497927): All serial dilution QC acceptance criteria were met.

<u>CVAA Analysis (Batch 497929)</u>: No serial dilution analysis was performed. No sample data will be qualified as a result.

ICP Interference Check Sample (ICS)

CVAA Analysis (All Batches): No ICS analysis was required by this method.

Detection Limits/Dilutions

<u>CVAA Analysis (Batch 497927)</u>: All detection limits were properly reported. Samples 154536-001, -005, -007, -008, -009, and -011 were diluted 200X; Samples -002, -003, and -006 were diluted 2000X; Sample -004 was diluted 400X; Sample -010 was diluted 100X, Sample -012 was diluted 20X; and Sample -015 was diluted 10X due to over-range concentrations of the target analyte. No other samples required dilution.

CVAA Analysis (Batch 497929): All detection limits were properly reported. No samples required dilution.

Other QC

CVAA Analysis (All Batches): No field blanks (FBs) were submitted on the ARCOC. All field duplicate (FD) relative percent differences (RPDs) were >35%. No specific FD QC acceptance criteria are currently in place.

No other specific issues were identified which affect data quality.

Data Validation Summary - rensel

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Situ/Project: SNL/ 5; te 105 Project/Task #: 93046.03.02.09	# of Samples: 2/ Matrix: Soil / agueous (EB)
AR/COC #: 609349	Laboratory Sample IDs: 154536-00/ thra -000
Laboratory: GEL	154540-001 (EB).
SDG#: 154536/154540	

					Analy	sis				
QC Element		Org	anics			Inor	ganics			
	VOC	SVOC	Pesticide/ PCB	HPLC (HE)	ICP/AES	GFAA/ AA	CVAA (Hg)	CN	RAD	Other
I. Holding Times/Preservation							~	<u> </u>		
2. Calibrations							/			
3. Method Blanks							J			
4. MS/MSD							3,00	05. 20. de.	1	
5. Laboratory Control Samples			1					\	4	
6. Replicates			1/	/			-	05 13/20ml.		
7. Surrogates					-			<u> </u>		
8. Internal Standards										
9. TCL Compound Identification										
10. ICP Interference Check Sample							<u> </u>		. "	\
11. ICP Serial Dilution										,
12. Carrier/Chemical Tracer Recoveries										
13. Other QC				,			NA			

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UJ =	Not Detected, Estimated	NP =	Not Provided	1.101 -	Dala: 2-15-06
R =	Unusable	Other:		Reviewed By: Lavi Schwat	Dale: 273-36
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Site/Project:	NL/	Site	105	A	R/COC #	1: 609	349			_ La	boratory	Sample	IDs:	154	536.	-00/	the	n -02	6	
Laboratory: 6	EL_	-		S	DG #:	1545	16							545	40 -	00/	(EB)			
Methods: ED	n 76	7/4/	747	01/	CIMA)														
# of Samples;		1		Matrix:	Sail	/ april	mus ((EB)		B	atch #s:	49	927		497	929.				
							-		(a)		leme			~/~~			154540	-		
CAS#						24.4					,				Serial	Field				
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7440-39-3 Ba																				
7440-41-7 Be																				
7440-43-9 Cd																				
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7440-47-3 Cr																				
7440-48-4 Co																				
7440-50-8 Cu																				
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Site: Site 105						OC:								norga	nic	_
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	EPA7470A/7471A (CVAA):															
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Mr. David Schwent

Analytical Quality Associates, Inc.

616 Maxine NE

Albuquerque, NM 87123 Phone: 505-299-5201 Fax: 505-299-6744 Email: minteer@aol.com

Memorandum - Second Revision

DATE:

March 16, 2006

TO:

File

FROM:

David Schwent

SUBJECT:

Inorganic Data Review and Validation - SNL

Site: Site 105 AR/COC: 609353 SDG: 154669 Laboratory: GEL

Project/Task: 98046.02.02.09

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 1.

Summary

The samples were prepared and analyzed with accepted procedures using method EPA7471A (CVAA). No problems were identified with the data package that result in the qualification of data.

Data are acceptable. QC measures appear to be adequate. The following sections discuss the data review and validation. Due to the matrix, an LCSD analysis was performed instead of MS/MSD and laboratory replicate analyses (see e-mail, dated 1-20-06). Later, MS/MSD and laboratory replicate analyses were performed on a sample from the COC and original soil field sample batch of this package. The MS/MSD and laboratory replicate analyses were performed on the sample beyond the method specified holding time, but within 2X the holding time, and no sample data will be qualified as a result, based on professional judgment. The MS/MSD and laboratory replicate analyses performed on Sample 157006-003 of SDG 157006 apply to the soil field samples of this package.

Holding Times/Preservation

CVAA Analysis: All samples were analyzed within the prescribed holding times and properly preserved.

Calibration

CVAA Analysis: All initial and continuing calibration QC acceptance criteria were met.

Blanks

CVAA Analysis: No target analytes were detected in the blanks.

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)

<u>CVAA Analysis</u>: All LCS/LCSD QC acceptance criteria were met. It should be noted that, the laboratory replicate analysis was used as a measure of laboratory precision due to the relatively high indigenous concentration of the target analyte in the sample used for the QC analyses.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

<u>CVAA Analysis</u>: All MS/MSD QC acceptance criteria were met, except the following. The MSD percent recovery (%R) (134%) was >125%. However, the MS %R and MS/MSD relative percent difference (RPD) were well within QC acceptance criteria. Therefore, based on professional judgment, no sample data will be qualified as result.

Replicates

CVAA Analysis: All laboratory replicate QC acceptance criteria were met.

ICP Serial Dilution

CVAA Analysis: All serial dilution QC acceptance criteria were met.

ICP Interference Check Sample (ICS)

CVAA Analysis: No ICS analysis was required by this method.

Detection Limits/Dilutions

<u>CVAA Analysis</u>: All detection limits were properly reported. Sample 154669-002 was diluted 20X due to over-range concentration of the target analyte. No other samples required dilution.

Other QC

<u>CVAA Analysis</u>: No field blanks (FBs) or equipment blanks (EBs) were submitted on the ARCOC. The field duplicate (FD) (Sample 154669-010) RPD was <35%. No specific FD QC acceptance criteria are currently in place.

No other specific issues were identified which affect data quality.

te: Site 105				=	N.O Al	AR/C	COC:	6093	51 Re	vised					Inorga	nic
Sample ID		EPA7470A/7471A (CVAA):			Wet	loure	AS N		r (Alla	alysis	Analy					
Cample 15		All								1		 				
		Acceptance														
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Mr. David Schwent

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Phone: 505-299-5201 Fax: 505-299-6744 Email: minteer@aol.com

Memorandum - Second Revision

DATE:

March 16, 2006

TO:

File

FROM:

David Schwent

SUBJECT:

Inorganic Data Review and Validation - SNL

Site: Site 105 AR/COC: 609351

SDG: 154631 and 154633

Laboratory: GEL

Project/Task: 98046.02.02.09

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 1.

Summary

The samples were prepared and analyzed with accepted procedures using method EPA7470A/7471A (CVAA). No problems were identified with the data package that result in the qualification of data.

Data are acceptable. QC measures appear to be adequate. The following sections discuss the data review and validation. Due to the matrix, an LCSD analysis was performed instead of MS/MSD and laboratory replicate analyses (see e-mail, dated 1-20-06). Later, MS/MSD and laboratory replicate analyses were performed on a sample from the COC and original soil field sample batch of this package. The MS/MSD and laboratory replicate analyses were performed on the sample beyond the method specified holding time, but within 2X the holding time, and no sample data will be qualified as a result, based on professional judgment. The MS/MSD and laboratory replicate analyses performed on Sample 157006-002 of SDG 157006 apply to the soil field samples of this package.

Holding Times/Preservation

<u>CVAA Analysis (All Batches)</u>: All samples were analyzed within the prescribed holding times and properly preserved.

Calibration

CVAA Analysis (All Batches): All initial and continuing calibration QC acceptance criteria were met.

Blanks

CVAA Analysis (All Batches): No target analytes were detected in the blanks.

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)

<u>CVAA Analysis (Batch 498333)</u>: All LCS/LCSD QC acceptance criteria were met. It should be noted that, the MSD analysis was used as a measure of laboratory precision due to low indigenous concentration of the target analyte in the sample used for the QC analyses.

CVAA Analysis (Batch 498336): All LCS/LCSD QC acceptance criteria were met.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

CVAA Analysis (Batch 498333): All MS/MSD QC acceptance criteria were met.

<u>CVAA Analysis (Batch 498336)</u>: No MS/MSD analyses were performed. No sample data should be qualified as a result.

Replicates

<u>CVAA Analysis (Batch 498333)</u>: All laboratory replicate QC acceptance criteria were met. It should be noted that the MSD analysis was used as a measure of laboratory precision due to low indigenous concentration of the target analyte in the sample used for the QC analyses.

<u>CVAA Analysis (Batch 498336)</u>: No laboratory replicate analysis was performed. No sample data should be qualified as a result.

ICP Serial Dilution

CVAA Analysis (Batch 498333): All serial dilution QC acceptance criteria were met.

<u>CVAA Analysis (Batch 498336)</u>: No serial dilution analysis was performed. No sample data will be qualified as a result.

ICP Interference Check Sample (ICS)

CVAA Analysis (All Batches): No ICS analysis was required by this method.

Detection Limits/Dilutions

<u>CVAA Analysis (Batch 498333)</u>: All detection limits were properly reported. Sample 154633-006 was diluted 2X and Samples -001 and -011 were diluted 200X due to over-range concentration of the target analyte. No other samples required dilution.

<u>CVAA Analysis (Batch 498336)</u>: All detection limits were properly reported. No samples required dilution.

Other QC

CVAA Analysis: No field blanks (FBs) or field duplicates (FDs) were submitted on the ARCOC.

No other specific issues were identified which affect data quality.

Site: Site 105			AR	VCOC	: 609	352, 6	<u> 309354</u>	4, <u>60</u> 9	355 <u>,</u> 6	09356	6, 609	357			inorg	<u>anic</u>	
					Meti	rod/C	AS Ni	ımbeı	(Ana	lysis/	Analy	te)					
Sample ID	EPA7470A/7471A (CVAA):																
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Mr. David Schwent

Analytical Quality Associates, Inc.



616 Maxine NE Albuquerque, NM 87123 Phone: 505-299-5201

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Memorandum

DATE:

March 9, 2006

TO:

File

FROM:

David Schwent

SUBJECT:

Inorganic Data Review and Validation - SNL

Site: Site 105

AR/COC: 609352, 609354, 609355, 609356, and 609357 SDG: 154847, 154860, 154879, 154893, 154905, and 154914

Laboratory: GEL

Project/Task: 98046.02.02.09

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 1.

Summary

The samples were prepared and analyzed with accepted procedures using method EPA7470A/7470A (CVAA). No problems were identified with the data package that result in the qualification of data.

Data are acceptable. QC measures appear to be adequate. The following sections discuss the data review and validation. Due to the matrix, an LCSD analysis was performed instead of MS/MSD and laboratory replicate analyses (see e-mail, dated 1-20-06). Later, MS/MSD and laboratory replicate analyses were performed on samples from the COCs and original soil field sample batches of this package. The MS/MSD and laboratory replicate analyses were performed on the samples beyond the method specified holding time, but within 2X the holding time, and no sample data will be qualified as a result, based on professional judgment. The MS/MSD and laboratory replicate analyses performed on Samples 157005-001, -002, and -003 of SDG 157005 and Samples 157006-004 and -005 of SDG 157006 apply to the soil field samples of this package.

Holding Times/Preservation

<u>CVAA Analysis (All Batches)</u>: All samples were analyzed within the prescribed holding times and properly preserved.

Calibration

CVAA Analysis (All Batches): All initial and continuing calibration QC acceptance criteria were met.

<u>Blanks</u>

CVAA Analysis (All Batches): No target analytes were detected in the blanks.

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)

CVAA Analysis (Batch 499595): All LCS/LCSD QC acceptance criteria were met.

<u>CVAA Analysis (All Other Batches)</u>: All LCS/LCSD QC acceptance criteria were met. It should be noted that the MSD analyses were used as measures of laboratory precision due to low indigenous concentration of the target analyte in the sample used for the QC analyses.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

<u>CVAA Analysis (Batch 499595)</u>: No MS/MSD analyses were performed. No sample data will be qualified as a result.

CVAA Analysis (All Other Batches): All MS/MSD QC acceptance criteria were met.

Replicates

<u>CVAA Analysis (Batch 499595)</u>: No laboratory replicate analysis was performed. The LCSD analysis was used as a measure of precision. No sample data will be qualified as a result.

<u>CVAA Analysis (All Other Batches)</u>: All laboratory replicate QC acceptance criteria were met. It should be noted that the MSD analyses were used as measures of laboratory precision due to low indigenous concentration of the target analyte in the sample used for the QC analyses.

ICP Serial Dilution

<u>CVAA Analysis (Batch 499595)</u>: No serial dilution analysis was performed. No sample data will be qualified as a result.

CVAA Analysis (All Other Batches): All serial dilution QC acceptance criteria were met.

ICP Interference Check Sample (ICS)

CVAA Analysis (All Batches): No ICS analysis was required by this method.

Detection Limits/Dilutions

CVAA Analysis (Batch 499571): All detection limits were properly reported. Sample 154879-001 was diluted 20X and Sample -020 was diluted 10X due to over-range concentrations of the target analyte. No other samples required dilution.

CVAA Analysis (Batch 499577): All detection limits were properly reported. Samples 154893-007, -016, and -018 were diluted 10X and Sample -015 was diluted 20X due to over-range concentration of the target analyte. No other samples required dilution.

CVAA Analysis (Batch 499583): All detection limits were properly reported. Sample 154905-001 was diluted 10X due to over-range concentration of the target analyte. No other samples required dilution.

CVAA Analysis (All Other Batches): All detection limits were properly reported. No samples required dilution.

Other OC

<u>CVAA Analysis (All Batches)</u>: No field blanks (FBs) were submitted on the ARCOCs. It should be noted that several field duplicate (FD) relative percent differences (RPDs) were >35%. No specific FD QC acceptance criteria are currently in place. No sample data will be qualified as a result.

No other specific issues were identified which affect data quality.

			Data Vali	idation Su	ımmary			,		
te/Project: SNL/5; te 05	Project/Ta	sk #: 980	46.02.02.	09 # of Sa	mples: 92	<u> </u>	Matrix: 5	oil/ qqu	eouse (1	ies)
R/COC#: <u>609352,354,355</u> ,	<u>, 356, 35</u>	57		Labora	tory Sample IDs	:154847	7-00/ th	<u>ru - 020</u>	: 1541	360-00
aboratory: GEL				/h v	u -020	, 15487	9-001 th	ru -020	1248	9_7 - 007
te/Project: SNL /5; te 05 R/COC #: 609352, 354, 355, aboratory: GEL DG #: 154847, 860, 879,	893,905	5,9/4		- thron	- 020	154905	5-00/ f/	hru-010	: 15491	4-001
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QC Element		Org	ganics		1		ganics			
	voc	svoc	Pesticide/ PCB	HPLC (HE)	ICP/AES	GFAA/ AA	CVAA (Hg)	CN	RAD	Other
1. Holding Times/Preservation						,				
2. Calibrations										
3. Method Blanks										
4. MS/MSD									1	
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12. Carrier/Chemical Tracer Recoveries										
13. Other QC							NA			1

J = Estimated

Check (√) = Acceptable

Other:

U = Not Detected

Shaded Cells = Not Applicable (also "NA")

UJ = Not Detected, Estimated

NP = Not Provided

R = Unusable

Reviewed By: Sand Sohwent

									Ino	rgani	c Met	als								
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7440-41-7 Be																				
7440-43-9 Cd																,				
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7440-66-6 Zn	-	_					-			 		-	 							-
# 420 00 1 Th	-	 		 		 											<u> </u>			
7439-92-1 Pb 7782-49-2 Se	 	 	ļ	 			ļ													-
7/82-49-2 Se 7440-38-2 As	 		· · · · · · · · · · · · · · · · · · ·					-							· · · · ·					
7440-36-0 Sb				-	-		 			-						-				
7440-38-0 Tl		-	-		+		 			 					-					
7440-28-0 11	 	ļ	 	 						 								ļ		
7439-97-6 Hg	V	 	1	 	 	1		X	X	AA	1/2	in	- 60-	NA	 	tar		NA	 -	 -
/439-9/-0 Hg	+-		\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	1	1	<u> </u>	-	1	~	7	70/1	3-9-01		107	<u> </u>	-/-	- <i>V</i>	NA		
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Cyanide CN		-	 	 																+
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	+				+		-				 						 		 	
1		_										1								

Notes: Shaded rows are RCRA metals. Solids-to-aqueous conversion: mg/kg=\mug/g: [(\mug/g) x (sample mass \{g\} / sample vol. \{ml\}) x (1000 ml/1 liter)] / Dilution Factor = \mug/1 Comments: \(\mu \) FP RPP < 35%.

Reviewed By: Americ Schusef Date: 2-16-6

CAS #/										QC E	Elemer	nt							
CAS #/ Analyte	TAL	ICV	CCV	ICB	ССВ	Method Blanks	LCs	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilu- tion	Field Dup. RPD	Equip. Blanks	Field Blanks	
7429-90-5 Al																			
7440-39-3 Ba																			
7440-41-7 Be																			
7440-43-9 Cd									:										
7440-70-2 Ca																			
7440-47-3 Cr																			
7440-48-4 Co																			
7440-50-8 Cu																			
7439-89-6 Fe																			
7439-95-4 Mg																			
7439-96-5 Mn																			
7440-02-0 Ni																			
7440-09-7 K																			
7440-22-4 Ag	1																		
7440-23-5 Na																			
7440-62-2 V																			
7440-66-6 Zn																			
7439-92-1 Pb																			
7782-49-2 Se																			
7440-38-2 As																			
7440-36-0 Sb																			
7440-28-0 TI																			
7439-97-6 Hg	Z	V	0		0		V			AA	NA OS	NA 3-9-	A/A	NA	~	×		NA	
Cyanide CN											-								
									-										

Notes: Shaded rows are RCRA metals. Solids-to-aqueous conversion: mg/kg = \mu g/g: [(\mu g/g) x (sample mass {g} / sample vol. {mi}) x (1000 ml / 1 liter)] / Dilution Factor = \mu g/!

Comments: A FO RPP 735%.

Reviewed By: Savid Schront

Date: 2-14-06

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Site/Project:	SNL,	1514	<u> 105</u>	A	R/COC #	60935	2,350	1,355,	326,3	57. La	boratory	Sample	IDs: 🗸	548	79-	00/	+hr	n -0	ره 2	
Laboratory: <u>C</u>	<u>EL</u>			SI) G#: ∠	54879	7													
Methods: <u>E</u>	PA-	247/	AC	CVAA)	<u> </u>														
Site/Project:	2	0		Matrix:	<u> Soil</u>					Ba	tch #s:	499	571							
CAS#/										QC E	lemer	nt								
Analyte	TAL	ICV	ccv	ICB	ССВ	Method Blanks	LCS	LCSD	LCSD RPD	Ms	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilu- tion	Field Dup. RPD	Equip. Blanks	Field Blanks		
7429-90-5 AI																				
7440-39-3 Ba																				
7440-41-7 Be																				
7440-43-9 Cd																				
7440-70-2 Ca																				
7440-47-3 Cr																				
7440-48-4 Co																				
7440-50-8 Cu																				
7439-89-6 Fe																				
7439-95-4 Mg																				
7439-96-5 Mn																				
7440-02-0 Ni																				
7440-09-7 K																				
7440-22-4 Ag																				
7440-23-5 Na																				
7440-62-2 V																				
7440-66-6 Zn																				
7439-92-1 Pb																				
7782-49-2 Se									ļ	-										
7440-38-2 As	ļ		1				ļ													
7440-36-0 Sb	ļ	ļ						ļ —	-											
7440-28-0 TI			ļ																	
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7439-97-6 Hg	\ <u>\</u>		1	V	V	- V	1/	 / 	 -	7047	1111	70/	1017	/V.A		*	 ~ _	NA		
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Notes: Shade					queous co	nversion: n	ng ∖ kg ≃ h	rg/g: [(με	(/g) x (sam	pie mass	{g} / sam	pie voi. {i	ш}) х (10	o mi/ i i	ner)] / Dil	uuon racto	r = μg / ι			
Comments:	A A	DRO.	0 🚜 3.	5%									1							

D_1/

Reviewed By: Navil Schraft Date: 2-18-66

		1							Ino	rgani	c Met	als								
Site/Project: Laboratory: _(Methods: # of Samples:	SWL /	5 te	105	A	R/COC	#: <u>60935</u>	2354	1,355,	356 3	57 L	boratory	Sample	IDs:	154	893	<u>~08</u>	1 thru	1-02	o,	
Laboratory:(SE	_		S	DG #:	154	299	,												
Methods:	PA	747	MA	CCVA	99)							,								
# of Samples:	2	0		Matrix:	رنەگ					В	atch #s:	499	157	7						
CAS #/											leme							······································		
Analyte	TAL	ICV	CCV	ICB	ССВ	Method Blanks	LCS	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilu- tion	Field Dup. RPD	Equip. Blanks	Field Blanks		
7429-90-5 Al																				
7440-39-3 Ba					,															
7440-41-7 Be																				
7440-43-9 Cd																				
7440-70-2 Ca																				
7440-47-3 Cr																				
7440-48-4 Co					ļ															
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7439-96-5 Mn																				
7440-02-0 Ni					1															
7440-09-7 K	<u> </u>		ļ	-																<u> </u>
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7440-66-6 Z.II				 			 													-
7439-92-1 Pb	-								-											
7782-49-2 Se					 	 		_						 				 	 	
7440-38-2 As	 			 		<u> </u>			 		-	-		-					-	-
7440-36-0 Sb	1		 	-	 	 	-	 		-	-								 	
7440-28-0 TI	 	-		 						-										
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Notes: Shaded rows are RCRA metals. Solids-to-aqueous conversion: mg/kg = \mug/g: [(\mug/g) x (sample mass {g} / sample vol. {ml}) x (1000 ml / 1 liter)] / Dilution Factor = \mug/l

Comments: * FO RPD 735%

Reviewed By: David Schwent Date: 2-16-06

of Samples:	10			Matrix:	Soil	:60935 54905				Ba	itch #s:	49	958	3					
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CAS #/ Analyte	TAL	ICV	CCV	ICB	ССВ	Method Blanks	LCS	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilu- tion	Field Dup. RPD	Equip. Blanks	Field Blanks	
29-90-5 Al																			Ţ
40-39-3 Ba 40-41-7 Be																			 +
10-43-9 Cd																			 +
10-70-2 Ca				-															\dagger
10-47-3 Cr																			I
10-48-4 Co																			\perp
10-50-8 Cu																			 4
9-89-6 Fe																			 +
9-95-4 Mg 9-96-5 Mn																			 +
10-02-0 Ni																		 	+
40-09-7 K					 														 十
40-22-4 Ag																			†
40-23-5 Na																			Ī
40-62-2 V																			\prod
40-66-6 Zn																			 4
39-92-1 Pb			 	-	-	· · · · · · · · · · · · · · · · · · ·			-										+
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140-36-0 <u>S</u> b																			\perp
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Laboratory:	CE			si	OG#:	5491	ij_		, ,											_
Methods: _E	PA	74	704	10	VAA) ''										•	· · · · · · · · · · · · · · · · · · ·			
# of Samples:	2			Matrix:	agi	ceous				Ba	tch #s: _	49	959	5						
										QC E	lemen	ıt								
CAS #/ Analyte	TAL	ICV	CCV	ICB	ССВ	Method Blanks	LCS	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilu- tion	Field Dup. RPD	Equip. Blanks	Field Blanks		
7429-90-5 AI																				
7440-39-3 Ba																				
7440-41-7 Be																				
7440-43-9 Cd																				
7440-70-2 Ca																				
7440-47-3 Cr																				
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7439-97-6 Hg		V	V	~			V	0		MA	NA	TVA	MA	NA	NA	M	M	1/17		
Cyanide CN																				
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Notes: Shade	od rows a	e RCRA	metals. So	lids-to-ac	meons co	nversion: m	g/kg=u	g/g: [(ug	/g) x (sam	nle mass	{g} / sam	nle vol. {r	nl}) x (10	00 ml / 1 l	ter)] / Dil	ution Facto	r = ug/1			

Comments:

Reviewed By: Savid Date: 2-16-06

Contract Verification Review (CVR)

Project Leader	LANGKOPF	Project Name	SITE 105	Case No.	98046_02.02.09
AR/COC No.	609352, 609354, 609355, 609356 & 609357	Analytical Lab	GEL	SDG No.	154847

In the tables below, mark any information that is missing or incorrect and give an explanation.

1.0 Analysis Request and Chain of Custody Record and Log-In Information

Line		Comp	lete?			lved?
No.	Item	Yes	No	If no, explain	Yes	No
1.1	All items on COC complete - data entry clerk initialed and dated	Х				
1.2	Container type(s) correct for analyses requested	Х				
1.3	Sample volume adequate for # and types of analyses requested	Х				
1.4	Preservative correct for analyses requested	X				
1.5	Custody records continuous and complete	Х				
1.6	Lab sample number(s) provided and SNL sample number(s) cross referenced and correct	Х				
1.7	Date samples received	Х				
1.8	Condition upon receipt information provided	Х				

2.0 Analytical Laboratory Report

Line		Com	olete?		Reso	lved?
No.	<u></u> Item	Yes	No	If no, explain	Yes	No
2.1	Data reviewed, signature	X				
2.2	Method reference number(s) complete and correct	X				
2.3	QC analysis and acceptance limits provided (MB, LCS, Replicate)	X				
2.4	Matrix spike/matrix spike duplicate data provided (if requested)	N/A				
2.5	Detection limits provided; PQL and MDL (or IDL), MDA and L _o	X				
2.6	QC batch numbers provided	X				
2.7	Dilution factors provided and all dilution levels reported	Х				
2.8	Data reported in appropriate units and using correct significant figures	X				
2.9	Radiochemistry analysis uncertainty (2 sigma error) and tracer recovery (if	N/A				
	applicable) reported					i l
2.10	Narrative provided	X				
2.11	TAT met	X				
2.12	Hold times met	X				
2.13	Contractual qualifiers provided	X				
2.14	All requested result and TIC (if requested) data provided	X				

Contract Verification Review (Continued)

3.0 Data Quality Evaluation

3.0 Data Quality Evaluation			
Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
3.1 Are reporting units appropriate for the matrix and meet contract specified or project-specific requirements? Inorganics and metals reported as ppm (mg/liter or mg/Kg)? Tritium reported in picocuries per liter with percent moisture for soil samples? Units consistent between QC samples and sample data	х		
3.2 Quantitation limit met for all samples	X		
3.3 Accuracy a) Laboratory control samples accuracy reported and met for all samples	Х		
b) Surrogate data reported and met for all organic samples analyzed by a gas chromatography technique	N/A		
c) Matrix spike recovery data reported and met	N/A		
3.4 Precision a) Replicate sample precision reported and met for all inorganic and radiochemistry samples	N/A		
b) Matrix spike duplicate RPD data reported and met for all organic samples	N/A		
3.5 Blank data a) Method or reagent blank data reported and met for all samples	х		
b) Sampling blank (e.g., field, trip, and equipment) data reported and met	Х		
3.6 Contractual qualifiers provided: "J"- estimated quantity; "B"-analyte found in method blank above the MDL for organic or above the PQL for inorganic; "U"- analyte undetected (results are below the MDL, IDL, or MDA (radiochemical)); "H"-analysis done beyond the holding time	Х		
3.7 Narrative addresses planchet flaming for gross alpha/beta	N/A		
3.8 Narrative included, correct, and complete	X		
 Second column confirmation data provided for methods 8330 (high explosives) and 8082 (pesticides/PCBs) 	N/A		

Contract Verification Review (Continued)

4.0 Calibration and Validation Documentation

4.0 Calibration and Validation Documentation	Yes	No	Comments
Item	168	140	Vinition(s)
1.1 GC/MS (8260, 8270, etc.)			
a) 12-hour tune check provided	N/A		
b) Initial calibration provided	N/A		
c) Continuing calibration provided	N/A		
c) Comming canonauon provides			
d) Internal standard performance data provided	N/A		
d) Internal standard performance data provided			
	N/A		
e) Instrument run logs provided	IVA.		
4.2 GC/HPLC (8330 and 8010 and 8082)			
a) Initial calibration provided	N/A		
			·
b) Continuing calibration provided	N/A		
•			
c) Instrument run logs provided	N/A		
o) manufacture same sopo providence			
4.3 Inorganics (metals)			
	x	1	
a) Initial calibration provided	"		
b) Continuing calibration provided	Х		
c) ICP interference check sample data provided	x		
	N/A		
d) ICP serial dilution provided	11/13		
e) Instrument run logs provided	X		
4.4 Radiochemistry			
a) Instrument run logs provided	N/A		
a) manager inn 1080 brossess			

Contract Verification Review (Concluded)

5.0 Problem Resolution

Summarize the findings in the table below. List only samples/fractions for which deficiencies have been noted.

Sample/Fraction No.	Analysis	Problems/Comments/Resolutions
-		
Were deficiencies unresolved? Yes	No	
Based on the review, this data package is co	omplete. Yes	No
f no, provide: nonconformance report or c	correction request number	and date correction request was submitted:
Reviewed by: W. Palm	Cia Date:	2-14-06 Closed by:Date:

Site: Site 105	AR/COC: 609358, 609359, 609361 Method/CAS Number (Analysis/Analyte)												inorganic				
					Meti	od/C	AS Nu	mber	(Ana	lysis//	Analy	te)					
Sample ID	EPA7470A/7471A (CVAA):																
- 3	All																
	Acceptance																
	criteria met. No sample												ļ <u>.</u>				_
	data will be													_			_
	qualified.		-									 -	-	-			├
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Validated By: Savid	Schwon	f	_											Da	te: 03	3/09/06	== 6

Mr. David Schwent

Analytical Quality Associates, Inc.



616 Maxine NE Albuquerque, NM 87123 Phone: 505-299-5201

Fax: 505-299-6744 Email: minteer@aol.com

Memorandum

DATE:

March 9, 2006

TO:

File

FROM:

David Schwent

SUBJECT:

Inorganic Data Review and Validation - SNL

Site: Site 105

AR/COC: 609358, 609359, and 609361 SDG: 154976, 154981, 154983, and 154984

Laboratory: GEL

Project/Task: 98046.02.02.09

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 1.

Summary

The samples were prepared and analyzed with accepted procedures using method EPA7470A/7471A (CVAA). No problems were identified with the data package that result in the qualification of data.

Data are acceptable. QC measures appear to be adequate. The following sections discuss the data review and validation. Due to the matrix, an LCSD analysis was performed instead of MS/MSD and laboratory replicate analyses (see e-mail, dated 1-20-06). Later, MS/MSD and laboratory replicate analyses were performed on samples from the COCs and original soil field sample batches of this package. The MS/MSD and laboratory replicate analyses were performed on the samples beyond the method specified holding time, but within 2X the holding time, and no sample data will be qualified as a result, based on professional judgment. The MS/MSD and laboratory replicate analyses performed on Samples 157005-004, and -005 of SDG 157005 and Sample 157008-001 of SDG 157008 apply to the soil field samples of this package.

Holding Times/Preservation

<u>CVAA Analysis (All Batches)</u>: All samples were analyzed within the prescribed holding times and properly preserved.

Calibration

CVAA Analysis (All Batches): All initial and continuing calibration QC acceptance criteria were met.

<u>Blanks</u>

CVAA Analysis (All Batches): No target analytes were detected in the blanks.

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)

CVAA Analysis (Batch 500039): All LCS/LCSD QC acceptance criteria were met.

CVAA Analysis (All Other Batches): All LCS/LCSD QC acceptance criteria were met. It should be noted that the MSD analyses were used as measures of laboratory precision due to low indigenous concentration of the target analyte in the sample used for the QC analyses.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

CVAA Analysis (Batch 500039): No MS/MSD analyses were performed. No sample data will be qualified as a result.

CVAA Analysis (All Other Batches): All MS/MSD QC acceptance criteria were met.

<u>Replicates</u>

CVAA Analysis (Batch 500039): No laboratory replicate analysis was performed. The LCSD was used as a measure of precision. No sample data will be qualified as a result.

CVAA Analysis (All Other Batches): All laboratory replicate QC acceptance criteria were met. It should be noted that the MSD analyses were used as measures of laboratory precision due to low indigenous concentration of the target analyte in the sample used for the QC analyses.

ICP Serial Dilution

<u>CVAA Analysis (Batch 500039)</u>: No serial dilution analysis was performed. No sample data will be qualified as a result.

CVAA Analysis (All Other Batches): All serial dilution QC acceptance criteria were met.

ICP Interference Check Sample (ICS)

CVAA Analysis (All batches): No ICS analysis was required by this method.

Detection Limits/Dilutions

<u>CVAA Analysis (Batch 500024)</u>: All detection limits were properly reported. Sample 154976-010 was diluted 10X due to over-range concentration of the target analyte. No other samples required dilution.

<u>CVAA Analysis (All Other Batches)</u>: All detection limits were properly reported. No samples required dilution.

Other OC

CVAA Analysis (All Batches): No field blanks (FBs) were submitted on the ARCOCs. It should be noted that the field duplicate (FD) relative percent differences (RPDs) were >35%. No specific FD QC acceptance criteria are currently in place. No sample data will be qualified as a result.

No other specific issues were identified which affect data quality.

Data Validatio. Summary

Site/Project: SNL/ Site 105 Project/Task #: 98046.02.02.09	# of Samples: 43 Matrix: Sil / agusous (ES)
AR/COC#: 609358, 359, 36/.	Laboratory Sample IDs: 154976-01 thru -000;
Laboratory: GEL	154981-001 Horn-020; 154983-001 and -002
sdg #: 154976	154984-00/ (ER)

					Analy	/sis			_	
QC Element		Org	anics			Inorg	anics			
	VOC	svoc	Pesticide/ PCB	HPLC (HE)	ICP/AES	GFAA/ AA	CVAA (Hg)	CN	RAD	Other
1. Holding Times/Preservation				,						
2. Calibrations										
3. Method Blanks									1	
4. MS/MSD			1							
5. Laboratory Control Samples										7
6. Replicates									X	
7. Surrogates										
8. Internal Standards										
9. TCL Compound Identification										
10. ICP Interference Check Sample										
11. ICP Serial Dilution										
12. Carrier/Chemical Tracer Recoveries										
13. Other QC							NA			

) =	Estimated	Check (V)	=	Acceptable			
U =	Not Detected	Shaded Cells	=	Not Applicable (also "NA")			
UJ =	Not Detected, Estimated	NP	=	Not Provided	1/2/0/1		_
R =	Unusable	Other:			Reviewed By: Naved Sakrand	Date: 7-20-	<u>a5</u>
					7		

Site/Project: S Laboratory: (2) Methods: Ef	WL/	Site /	05	A	R/COC #	: 609	358,7	59,	361	_ La	iboratory	Sample	IDs: <u>15</u>	497	6-a	& the	n -02	.ه.	_
Laboratory:	EL			SI	DG #: 25	54976	* / -	- Q 7-1							,				
Methods: E	2A 7	4711	CCV	AA)			-												
# of Samples:		حر		Matrix:	50:	<u> </u>				Ba	atch #s:	5∞0	24						
										QC F	Elemer	nt							
CAS #/			1	I								-							 · · · · · · ·
Analyte	TAL	ICV	ccv	ICB	CCB	Method Blanks	LCS	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilu- tion	Field Dup. RPD	Equip. Blanks	Field Blanks	
7429-90-5 Al																			
7440-39-3 Ba																		:	
7440-41-7 Be								, , , , , , , , , , , , , , , , , , , ,											
7440-43-9 Cd																			
7440-70-2 Ca																			
7440-47-3 Cr				l									:						
7440-48-4 Co																			
7440-50-8 Cu																			
7439-89-6 Fe																			
7439-95-4 Mg							1												
7439-96-5 Mn																			
7440-02-0 Ni																			
7440-09-7 K																			
7440-22-4 Ag																			
7440-23-5 Na																			
7440-62-2 V																			
7440-66-6 Zn																			
								<u> </u>			Ĺ								
7439-92-1 Pb		<u> </u>	ļ																
7782-49-2 Se																			
7440-38-2 As		ļ							<u> </u>										
7440-36-0 Sb	-																		
7440-28-0 Tl								 					ļ						
	 	 	+	-						- AX	MA	20	144	4/4		- 17 -	<u></u>	777	
7439-97-6 Hg	+ -	1 ~	-	-	-		-	_		44.6				70/4	1	Na	1/	114	
Consideration (Const		-	-								03	3-9-0	6	<u> </u>					
Cyanide CN	-	-	-	-	 -			-			-								
	-		+		 					-									
	 	 					 												
	+	 													 				
		1					ľ		1			ł	1					l	

Notes: Shaded rows are RCRA metals. Solids-to-aqueous conversion: mg/kg = µg/g: [(µg/g) x(sample mass {g} / sample vol. {mi}) x (1000 mi / 1 liter)] / Dilution Factor = µg/l

Comments:

Reviewed By: Navel Schwart Date: 2-20-00

Site/Project:	Site/Project: St1/Sita 105 AR/COC#: 609358,369,361 Laboratory Sample IDs: 154983 -6th and -602 Laboratory: (-EL SDG#: 154983																			
Laboratory:	تكئى	<u></u>		SI	DG #:	5498	3													
Methods:	OA	747	/A	(CVA	CAP		-													
# of Samples:	2			Matrix:	Ş	1				Ba	tch #s:	500	532							
CAS #/										QC E	lemer	t								
Analyte	TAL	ICV	ccv	ICB	ССВ	Method Blanks	LCS	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilu- tion	Field Dup. RPD	Equip. Blanks	Field Blanks		
7429-90-5 Al																				
7440-39-3 Ba							_										,			
7440-41-7 Be 7440-43-9 Cd																				
7440-70-2 Ca	-																			-
7440-47-3 Cr																				
7440-48-4 Co																		····		
7440-50-8 Cu																				
7439-89-6 Fe																				
7439-95-4 Mg								•												
7439-96-5 Mn																				
7440-02-0 Ni 7440-09-7 K														-				<u> </u>		
7440-22-4 Ag																	-			
7440-23-5 Na																				
7440-62-2 V											,									
7440-66-6 Zn																				
7439-92-1 Pb																				
7782-49-2 Se					<u> </u>															
7440-38-2 As									<u> </u>											
7440-36-0 Sb 7440-28-0 Tl	 			 																
/440-20-0 11				-						- , ,	. 7				-					$\vdash \vdash \vdash$
7439-97-6 Hg	V		V	7	/		~		· ·	AZ/A	105 OS	10A 3-	9-06	NA				NA		
Cyanide CN																				
							ļ													
N-4-c Ob 1	d ====================================	n DCD 4	medal- C	WJ- 4			- /k ··	alas Viii	/ m) vs /ss=	nla #****	(a) /	ala val 👉	-D) = (10)	00 m2 / 1 1	itaali / Dii	udan E	115 /1			
Notes: Shade	E rows as	e KCKA 1	metais, So	DB45-10-80	drieors co	nvermon: M	g/kg≖μ	g/g: [(μg	/g/x(sam								ı ≖hā∖ı			
Comments:													n .	1						
										R	eviewed	By: 1	are	الصر ال	Jum	1		Date:	2-2	00

Site/Project: Staboratory:	/بداء	site	105	A	R/COC #	1:6092	358,	<u>359, 8</u>	3 =1	La	boratory	Sample	IDs: 1	549	<u> </u>	et a	wd_	582		
Laboratory:	تعکش	<u> </u>		SI	DG #:	5498	3													
Methods: E	OA	747	/A	(CVA	CAP															
# of Samples:	2	-		Matrix:	<u></u>	:]				Ba	tch #s:	500	232							
											lemer				_					
CAS #/			F				Γ								Cardal	Field			——Т	
Analyte	TAL	ICV	CCV	ICB	CCB	Method Blanks	LCS	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilu- tion	Dup. RPD	Equip. Blanks	Field Blanks		
7429-90-5 Al																				
7440-39-3 Ba																				
7440-41-7 Be									Ļ											
7440-43-9 Cd																				
7440-70-2 Ca									 											
7440-47-3 Cr 7440-48-4 Co	-				-						-									
7440-50-8 Cu	-				-															
7439-89-6 Fe																				
7439-95-4 Mg																				
7439-96-5 Mn			-																	
7440-02-0 Ni																				
7440-09-7 K																				
7440-22-4 Ag																				
7440-23-5 Na																				
7440-62-2 V	<u> </u>																			
7440-66-6 Zn								<u> </u>												
7439-92-1 Pb				<u> </u>																
7782-49-2 Se		f -																		
7440-38-2 As																				
7440-36-0 Sb														_						
7440-28-0 TI																				
		<u> </u>							-	 		-								
7439-97-6 Hg	1-1/-	\vdash	1 0	1	/_			1		12/3		NA.	70/1	NA	1			NA		
Compide Oil	-	-	 	 	 				 		OS	-3-	9-06.				ļ			
Cyanide CN			 	 	 		-		-											
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	 		-				 	-					-		-					
	1		<u> </u>	†	1	 	1		·		1	1						 		
Notes: Shade	ed rows a	e RCRA	metals. S	olids-to-a	queous co	nversion: n	ıg/kg=μ	g/g: [(µg	/g) x (san	ple mass	{g} / sam	ple vol. {n	nl}) x (10	00 ml / 1	liter)] / Dil	ution Facto	r = μg/1			
Comments:																				
										_		A				1		_	7-7	_ /
										R	eviewed	l By: 🖊	wil		your	/		Date:		Co

			RECORDS CEI	NTER CODE:								
		SMO AN	ALYTICAL DATA RO	DUTING FORM								
PROJE	CT NAME:	Site 105		PROJECT/TASK:	98046_0	02.02.0	9					
SNL TASK LE		Langkopf		ORG/MS/CF0#:	6146/10	87/CF	056-06					
SMO PROJE	CT LEAD:	Herrera		SAMPLE SHIP DATE:	1/31/2006							
						EDD						
						ON	Cust	RC				
ARCOC	LAB	LABID	PRELIM DATE	FINAL DATE	EDD	Q IUI	CD V	CD U				
609358	GEL	154976	2/14/2006	2/15/2006	. X	X	X	X				
609359	GEL.	154976	2/14/2006	2/15/2006	X	X	X	×				
609361	GEL	154976	2/14/2006	2/15/2006	X		_^_	^_				
		<u> </u>										
	The second second second											
			-									
				5.00 page 1981.								
		DATA P	ACKAGE TAT: X	RUSH (15 day)		NOR	MAL					
	CORRECTI	ONS REQUEST	TED BY/DATE:									
PRO	BLEM #/DAT	TE CORRECTIO	N RECEIVED:									
		CVR COMPLET	red by/date: 🕠	Palencia	<u></u>	-61°	5= 0!	<u>د</u>				
	FIN	IAL TRANSMIT	TED TO/DATE: S.	Geillith	<u>, </u>	-15	-06	2				
	SEN	NT TO VALIDAT	ION BY/DATE: R.	Kavanaud	. 02	2-16	-06					
REVISIONS	REQUESTED	VREVISIONS RE	CEIVED (DATE):									
	Color Substantional Metaller (Cr. State)	TION COMPLET		Schwent	63	-09	6					
		To Mintel States and States and States and	WM BY/DATE:									
			TED BY/DATE									
			VED BY/DATE	R. Kavanaugh		2/15	/2006					
TOE	RDMS OR R	ECORDS CEN										
Thirtee HANG San Street												
COMMENT	S: Val	idation	could not b	e complet	e.J.	un	1:1					
NO C	Cama	& vesu	Its were vo	eceimed wh	uch.	1/4	cn	g#				
[IAA FI	9-	/-0b.		kanda elihiridik pilitari pananaksista perikantuan	4,000,000,000,000		egger eggessen er Geografie	Frame Land				
	<u> </u>	/-0b.										

| Site/Project: SNL | 5ite | 105 | AR/COC #: 609358 | 359, 36 | Laboratory Sample IDs: 154984 - 001 |
| Laboratory: 6-EL | SDG #: 154984 | Methods: EPA 7470A (CVAA) Batch #s: 50039 # of Samples: **QC Element** CAS #/ Serial Field **Analyte** Method LCSD MSD **ICS** Rep. Equip. Field **ICV** TAL CCV CCB LCS LCSD MS MSD Dilu-**ICB** Dup. Blanks RPD RPD RPD AB Blanks Blanks tion RPD 7429-90-5 Al 7440-39-3 Ba 7440-41-7 Be 7440-43-9 Cd 7440-70-2 Ca 7440-47-3 Cr 7440-48-4 Co 7440-50-8 Cu 7439-89-6 Fe 7439-95-4 Mg 7439-96-5 Mn 7440-02-0 Ni 7440-09-7 K 7440-22-4 Ag 7440-23-5 Na 7440-62-2 V 7440-66-6 Zn 7439-92-1 Pb 7782-49-2 Se 7440-38-2 As 7440-36-0 Sb 7440-28-0 TI NA NA NA NA NA NA NA 7439-97-6 Hg Cyanide CN

Notes: Shaded rows are RCRA metals. Solids-to-aqueous conversion: mg/kg = µg/g: [(µg/g) x (sample mass {g} / sample vol. {mi}) x (1000 ml / 1 liter)] / Dilution Factor = µg/1

Comments:

Reviewed By: Save Savar Date: 2-20

Contract Verification Review (CVR)

Project Leader	LANGKOPF	Project Name	SITE 105	Case No.	98046_02.02.09
AR/COC No.	609358, 609359 & 609361	Analytical Lab	GEL	SDG No.	154976

In the tables below, mark any information that is missing or incorrect and give an explanation.

1.0 Analysis Request and Chain of Custody Record and Log-In Information

Line		Comp	olete?		Resc	lved?
No.	Item	Yes	No	If no, explain	Yes	No
1.1	All items on COC complete - data entry clerk initialed and dated	X				
1.2	Container type(s) correct for analyses requested	X				
1.3	Sample volume adequate for # and types of analyses requested	X				
1.4	Preservative correct for analyses requested	X		·		
1.5	Custody records continuous and complete	X				
1.6	Lab sample number(s) provided and SNL sample number(s) cross referenced and	X				
	correct					<u> </u>
1.7	Date samples received	X				
1.8	Condition upon receipt information provided	X		·		

2.0 Analytical Laboratory Report

Line		Comp	lete?		Reso	lved?
No.	Item	Yes	No	If no, explain	Yes	No
2.1	Data reviewed, signature	X				
2,2	Method reference number(s) complete and correct	X				
2.3	QC analysis and acceptance limits provided (MB, LCS, Replicate)	X				
2.4	Matrix spike/matrix spike duplicate data provided (if requested)	N/A				
2.5	Detection limits provided; PQL and MDL (or IDL), MDA and Lo	X				
2.6	QC batch numbers provided	X				
2.7	Dilution factors provided and all dilution levels reported	X				
2.8	Data reported in appropriate units and using correct significant figures	X				
2.9	Radiochemistry analysis uncertainty (2 sigma error) and tracer recovery (if	N/A				
	applicable) reported					
2.10	Narrative provided	X				
2.11	TAT met	X				
2.12	Hold times met	X				
2.13	Contractual qualifiers provided	Х				
2.14	All requested result and TIC (if requested) data provided	X				

Contract Verification Review (Continued)

3.0 Data Quality Evaluation			
Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
3.1 Are reporting units appropriate for the matrix and meet contract specified or project-specific requirements? Inorganics and metals reported as ppm (mg/liter or mg/Kg)? Tritium reported in picocuries per liter with percent moisture for soil samples? Units consistent between QC samples and sample data	X		
3.2 Quantitation limit met for all samples	X		
3.3 Accuracy a) Laboratory control samples accuracy reported and met for all samples	Х		
 Surrogate data reported and met for all organic samples analyzed by a gas chromatography technique 	N/A		
c) Matrix spike recovery data reported and met	N/A		
3.4 Precision a) Replicate sample precision reported and met for all inorganic and radiochemistry samples	N/A		
b) Matrix spike duplicate RPD data reported and met for all organic samples	N/A		
Blank data a) Method or reagent blank data reported and met for all samples	Х		
b) Sampling blank (e.g., field, trip, and equipment) data reported and met	Х		
3.6 Contractual qualifiers provided: "J"- estimated quantity; "B"-analyte found in method blank above the MDL for organic or above the PQL for inorganic; "U"- analyte undetected (results are below the MDL, IDL, or MDA (radiochemical)); "H"-analysis done beyond the holding time	Х		
3.7 Narrative addresses planchet flaming for gross alpha/beta	N/A		
3.8 Narrative included, correct, and complete	Х		
3.9 Second column confirmation data provided for methods 8330 (high explosives) and 8082 (pesticides/PCBs)	N/A		

Contract Verification Review (Continued)

4.0 Calibration and Validation Documentation

4.0 Canoranon and Vandadon Documentation			
Item	Yes	No	Comments
4.1 GC/MS (8260, 8270, etc.)			
a) 12-hour tune check provided	N/A	:	
• • • • • • • • • • • • • • • • • • • •		i	
b) Initial calibration provided	N/A		
b) Titual Cantilation provided			
·			
c) Continuing calibration provided	N/A		
d) Internal standard performance data provided	N/A		
,			
e) Instrument run logs provided	N/A		
e) manufert im logs provided			
4.2 GC/HPLC (8330 and 8010 and 8082)			
a) Initial calibration provided	N/A		
b) Continuing calibration provided	N/A		
,			
N. V. dansard and J. C.	N/A		
c) Instrument run logs provided	1977		
4.3 Inorganics (metals)			
a) Initial calibration provided	x		
b) Continuing calibration provided	х		
	N/A		
c) ICP interference check sample data provided	N/A		
d) ICP serial dilution provided	N/A		
d) ICF serial dilution provided	****		
e) Instrument run logs provided	х		
4.4 Radiochemistry			
a) Instrument run logs provided	N/A		
a) mstrument tun togs provided	11123		·

Contract Verification Review (Concluded)

5.0 Problem Resolution

Summarize the findings in the table below. List only samples/fractions for which deficiencies have been noted.

Sample/Fraction No.	Analysis	Problems/Comments/Resolutions											
Were deficiencies unresolved? Yes	No												
Based on the review, this data package is c	omplete. Yes	No											
	no, provide: nonconformance report or correction request number and date correction request was submitted:												
Reviewed by: W. Palen	Cia Date:	2-15-06 Closed by:Date:											

te: Site 105	AR/COC: 609360, 609362, 609363 Method/CAS Number (Analysis/Analyte)														inorganic			
Comple ID	EPA7471A (CVAA):				Metr	ioaici	AS NU	imber	Апа	ysis//	Analy							
Sample ID		1											ļ	ļ				
	All											-						
	Acceptance criteria met.	*																
	No sample												 					
	data will be qualified.																	
	quaimou,																	
		ļ <u>.</u>		ļ									ļ	ļ				
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				!							<u> </u>							

Mr. David Schwent

Analytical Quality Associates, Inc.



616 Maxine NE Albuquerque, NM 87123 Phone: 505-299-5201

Fax: 505-299-6744 Email: minteer@aol.com

Memorandum

DATE:

March 8, 2006

TO:

File

FROM:

David Schwent

SUBJECT:

Inorganic Data Review and Validation - SNL

Site: Site 105

AR/COC: 609360, 609362, and 609363 SDG: 155136, 155139, and 155140

Laboratory: GEL

Project/Task: 98046.02.02.09

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 1.

Summary

The samples were prepared and analyzed with accepted procedures using method EPA7471A (CVAA). No problems were identified with the data package that result in the qualification of data.

Data are acceptable. QC measures appear to be adequate. The following sections discuss the data review and validation. Due to the matrix, an LCSD analysis was performed instead of MS/MSD and laboratory replicate analyses (see e-mail, dated 1-20-06). Later, MS/MSD and laboratory replicate analyses were performed on samples from the COCs and original soil field sample batches of this package. The MS/MSD and laboratory replicate analyses were performed on the samples beyond the method specified holding time, but within 2X the holding time, and no sample data will be qualified as a result, based on professional judgment. The MS/MSD and laboratory replicate analyses performed on Samples 157008-003, -004, and -005, of SDG 157008, apply to the soil field samples of this package.

Holding Times/Preservation

<u>CVAA Analysis (All Batches)</u>: All samples were analyzed within the prescribed holding times and properly preserved.

Calibration

CVAA Analysis (All Batches): All initial and continuing calibration QC acceptance criteria were met.

Blanks

CVAA Analysis (All Batches): No target analytes were detected in the blanks.

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)

<u>CVAA Analysis (All Batches)</u>: All LCS/LCSD QC acceptance criteria were met. It should be noted that the MSD analyses were used as measures of laboratory precision due to low indigenous concentration of the target analyte in the sample used for the QC analyses.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

CVAA Analysis (Batch 500439): All MS/MSD QC acceptance criteria were met, except the following. The MSD percent recovery (%R) was < QC acceptance criteria. However, the MS %R and the MS/MSD relative percent difference (RPD) were well within QC acceptance criteria. Therefore, based on professional judgment, no sample data will be qualified as a result.

CVAA Analysis (All Other Batches): All MS/MSD QC acceptance criteria were met.

Replicates 1 4 1

<u>CVAA Analysis (All Batches)</u>: All laboratory replicate QC acceptance criteria were met. It should be noted that the MSD analyses were used as measures of laboratory precision due to low indigenous concentration of the target analyte in the sample used for the QC analyses.

ICP Serial Dilution

CVAA Analysis (All Batches): All serial dilution QC acceptance criteria were met.

ICP Interference Check Sample (ICS)

CVAA Analysis (All Batches): No ICS analysis was required by this method.

Detection Limits/Dilutions

<u>CVAA Analysis (Batch 500436)</u>: All detection limits were properly reported. Samples 155136-009 and -013 were diluted 20X due to over-range concentrations of the target analyte. No other samples required dilution.

CVAA Analysis (All Other Batches): All detection limits were properly reported. No samples required dilution.

Other QC

CVAA Analysis (All Batches): No field blanks (FBs) were submitted on the ARCOCs. It should be noted that the field duplicate (FD) relative percent differences (RPDs) were <35%. No specific FD QC acceptance criteria are currently in place. No sample data will be qualified as a result.

No other specific issues were identified which affect data quality.

Data Validation. Jummary

Site/Project: SNY Site 105 Project/	Task #: <u>98046, 02, 02, 09</u> # of Samples: <u>44</u>	Matrix:
AR/COC#: 609360, 362, 363	Laboratory Sample IDs:	155136-001 Hory-020; 155139.00
Laboratory: G-EL	thru-ozo	: 155140-001 thry -004
SDG#: 155136,139,140		

		Analysis														
QC	Element		Org	anics			Inorg	ganics								
		voc svoc		Pesticide/ PCB	HPLC (HE)	ICP/AES	GFAA/ AA	CVAA (Hg)	CN	RAD	Other					
1. Holding Tir	1. Holding Times/Preservation															
2. Calibrations	8															
3. Method Bla	nks															
4. MS/MSD				1						1						
5. Laboratory	Control Samples				1											
6. Replicates					Y					Y						
7. Surrogates																
8. Internal Sta	ndards															
9. TCL Comp	ound Identification															
10. ICP Interfer	rence Check Sample										\					
11. ICP Serial I	Dilution															
12. Carrier/Che Recoveries	emical Tracer															
13. Other QC								NA								

J	=	Estimated	Check (v)	=	Acceptable			
U	=	Not Detected	Shaded Cells	=	Not Applicable (also "NA")	4		
U	J =	Not Detected, Estimated	NP	=	Not Provided			
R	=	Unusable	Other:			Reviewed By: Navil Schuat	Date: _	7-23-06

Site/Project: SNL/SH2 105 AR/COC #: 609360,362,363 Laboratory Sample IDs: 155/36-08/ Hyru -020.

Methods: 200 747/A (CVA) **Inorganic Metals** Batch #s: 500 436 # of Samples: **QC** Element CAS #/ Serial Field **Analyte** Method LCSD MSD **ICS** Equip. Field Rep. CCV **ICB** CCB LCS LCSD MSD **ICV** MS Dilu-Dup. Blanks RPD RPD RPD AB Blanks Blanks RPD tion 7429-90-5 Al 7440-39-3 Ba 7440-41-7 Be 7440-43-9 Cd 7440-70-2 Ca 7440-47-3 Cr 7440-48-4 Co 7440-50-8 Cu 7439-89-6 Fe 7439-95-4 Mg 7439-96-5 Mn 7440-02-0 Ni 7440-09-7 K 7440-22-4 Ag 7440-23-5 Na 7440-62-2 V 7440-66-6 Zn 7439-92-1 Pb 7782-49-2 Se 7440-38-2 As 7440-36-0 Sb 7440-28-0 T1 TOP AIR NA 7439-97-6 Hg 05 3-8-06 Cyanide CN

Notes: Shaded rows are RCRA metals. Solids-to-aqueous conversion: mg/kg = \mug/g: [(\mug/g) x (sample mass {g} / sample vol. {ml}) x (1000 ml / 1 liter)] / Dilution Factor = \mug/l

Comments:

Reviewed By: Navid Schwest 1	Date:	2-23-6
------------------------------	-------	--------

	Inorganic Metals roject: SNL/ Site / 05 AR/COC #: 609360, 362, 363 Laboratory Sample IDs: 185/39 - 00/ Hny - 520. atory: 6-EL SDG #: 155/39 ods: 60A 747/A (CVAA) amples: 20 Matrix: 50i/ Batch #s: 500439																			
Site/Project:	w/	Sits	2/05	<u> </u>	R/COC	#: <u>6093</u>	60, 3	62,3	263	_ La	boratory	Sample	1Ds:	551	39.	-@/	thru	-070.		
Laboratory:	OEL	_		SI	DG #: /	5513	9													
	DA		710 1	CURCA	1		/													
Methods:		77/	//	سر (۱۰ سب	1/															
# of Samples:	<u>20</u>			Matrix:	Soi					Ba	atch #s:	50	043	9						
CAS #/										QC E	lemer	nt								
Analyte	TAL	ICV	ccv	ICB	ССВ	Method Blanks	LCS	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilu- tion	Field Dup. RPD	Equip. Blanks	Field Blanks		
7429-90-5 Al																				
7440-39-3 Ba																				
7440-41-7 Be																				
7440-43-9 Cd																				
7440-70-2 Ca																				
7440-47-3 Cr																				
7440-48-4 Co																				
7440-50-8 Cu																				
7439-89-6 Fe																				
7439-95-4 Mg																				
7439-96-5 Mn																				
7440-02-0 Ni					ļ			·												
7440-09-7 K	-																			
7440-22-4 Ag	ļ				-														 	
7440-23-5 Na																			 	
7440-62-2 V					 															
7440-66-6 Zn				-															 	
7439-92-1 Pb	-																			
7782-49-2 Se																				
7440-38-2 As					-														 	
7440-36-0 Sb	 				-															
7440-28-0 TI	 																			
7440-20-0 11	 			1	/	11		-	_	- 1										
7439-97-6 Hg	1	1	V		10	1	1	1			119	111111	de	111		*		NA		
	 					 	<u> </u>			7.77	5 5 17	10 E	3-8-06	(org	_					
Cyanide CN												- 12.0							1	
															1					
	T	——		l	1															

Notes: Shaded rows are RCRA metals. Solids-to-aqueous conversion: mg/kg = \mu g/g: [(\mu g/g) x (sample mass {g} / sample vol. {ml}) x (1000 ml / 1 liter)] / Dilution Factor = \mu g/1

Comments: \(\text{PD PPD} \) \(\text{\infty} \) \(\text{\infty} \).

	Inorganic Metals																			
Site/Project: _	SNL	157	205	A	R/COC #	:609	<u> 360,</u>	<u> 362, 3</u>	<u> 263 </u>	_ La	boratory	Sample	IDs:	<u> 185</u>	140	-501	161	<u>ر – د</u>	<u>04</u>	
Laboratory: _(SEL	_		SI	og #: <u>/ </u>	5514	<u>o</u>													
Methods:	PA -	471	9 (VAA)															
# -601	, , ,	\dot{U}		Moteley	<u> </u>	1					tch #c:	550	44	2						
# of Samples:				MIRGIX:	20/															
CAS #/										QC E	lemer	nt								
Analyte	TAL	ICV	ccv	ICB	ССВ	Method Blanks	LCS	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilu- tion	Field Dup. RPD	Equip. Blanks	Field Blanks		
7429-90-5 Al																				
7440-39-3 Ba																				
7440-41-7 Be	<u> </u>																			
7440-43-9 Cd	ļ									-										
7440-70-2 Ca 7440-47-3 Cr	-																			
7440-47-3 CF 7440-48-4 Co										-										
7440-50-8 Cu																				
7439-89-6 Fe	 																			
7439-95-4 Mg																				
7439-96-5 Mn																				
7440-02-0 Ni																				
7440-09-7 K																				
7440-22-4 Ag								-				<u> </u>						ļ. — —		-
7440-23-5 Na	-							 	<u> </u>				-							
7440-62-2 V 7440-66-6 Zn	-									 			+							
/440-00-0 Z.fl	-			 			-													
7439-92-1 Pb	-			 						 										
7782-49-2 Se	+		 	 				· ·					· · · · · · · · · · · · · · · · · · ·							
7440-38-2 As																				
7440-36-0 Sb																				
7440-28-0 TI																				
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7439-97-6 Hg				<u></u>						14	M	1017	NA	NA	1	*	NA	NA		
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Cyanide CN		ļ					ļ	-			-	-	-							
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	-	 	-	-				+		+	-		-		-				 	-
	_	_					 	-		-									-	
Notes: Shad	ed rows a	re RCRA	metals. S	olids-to-ac	neons co	nversion: n	ıg/kg≖ µ	ig/g: [(με	/g) x (san	pie mass	{g} / san	ple vol. {	nl}) x (10	00 ml / l l	iter)] / Dil	ution Factor	r = μg/l			
Comments:	A	FD	RPD	<38	\$ 80.				3	-		•		•	_					

B-14

Reviewed By: Date: 2-23-06

Contract Verification Review (CVR)

Project Leader	Langkopf	Project Name	Site 105	Case No.	98046_02.02.09
AR/COC No.	609360, 609362, 609363	Analytical Lab	GEL	SDG No.	155136

In the tables below, mark any information that is missing or incorrect and give an explanation.

1.0 Analysis Request and Chain of Custody Record and Log-In Information

Line		Comp	lete?			olved?
N₀.	<u> </u>	Yes	≫	If no, explain	Yes	No.
1,1	All items on COC complete - data entry clerk initialed and dated	X				
1.2	Container type(s) correct for analyses requested	×		•		
1.3	Sample volume adequate for # and types of analyses requested	X			[
1.4	Preservative correct for analyses requested	×				
1.5	Custody records continuous and complete	×				
1.6	Lab sample number(s) provided and SNL sample number(s) cross referenced and correct	×		,		
1.7	Date samples received	×				
1.8	Condition upon receipt information provided	×				

2.0 Analytical Laboratory Report

Line		Com	lete?		Res	olved?
No.	Item	Yes	N ₀	If no, explain	Yes	No.
2,1	Data reviewed, signature	· X	•			
2,2	Method reference number(s) complete and correct	X				
2,3	QC analysis and acceptance limits provided (MB, LCS, Replicate)	X				
2.4	Matrix spike/matrix spike duplicate data provided (if requested)	N/A				
2.5	Detection limits provided; PQL and MDL (or IDL), MDA and Lc	X				
2.6	QC batch numbers provided	X				
2.7	Dilution factors provided and all dilution levels reported	X				
2,8	Data reported in appropriate units and using correct significant figures	X				
2,9	Radiochemistry analysis uncertainty (2 sigma error) and tracer recovery (if applicable) reported	N/A				
2,10	Narrative provided	Х				
2,11	TAT met	х				
2,12	Hold times met	X				
2.13	Contractual qualifiers provided	×				
2.14	All requested result and TIC (if requested) data provided	×			_	

Contract Verification Review (Continued)

3.0 Data Quality Evaluation

S.O Data Quality Evaluation Item	Yes	Nlo	Time Completty No / Frankland A and Analysis
	yes	No.	If no, Sample ID No./Fraction(s) and Analysis
3.1 Are reporting units appropriate for the matrix and meet contract specified or project-specific requirements? Inorganics and metals reported as ppm (mg/liter or mg/Kg)? Tritium reported in picocuries per liter with percent moisture for soil samples? Units consistent between QC samples and sample data	×		
3.2 Quantitation limit met for all samples	X		
Accuracy a) Laboratory control samples accuracy reported and met for all samples	×		
 Surrogate data reported and met for all organic samples analyzed by a gas chromatography technique 	N/A		
c) Matrix spike recovery data reported and met	N/A		
3.4 Precision a) Replicate sample precision reported and met for all inorganic and radiochemistry samples	N/A		
b) Matrix spike duplicate RPD data reported and met for all organic samples	N/A		
3.5 Blank data a) Method or reagent blank data reported and met for all samples	×		
b) Sampling blank (e.g., field, trip, and equipment) data reported and met	N/A		
3.6 Contractual qualifiers provided: "J"- estimated quantity; "B"-analyte found in method blank above the MDL for organic or above the PQL for inorganic; "U"- analyte undetected (results are below the MDL, IDL, or MDA (radiochemical)); "H"-analysis done beyond the holding time	×		
3.7 Narrative addresses planchet flaming for gross alpha/beta	N/A		
3.8 Narrative included, correct, and complete	×		
3.9 Second column confirmation data provided for methods 8330 (high explosives) and 8082 (pesticides/PCBs)	N/A		

Contract Verification Review (Continued)

4.0 Calibration and Validation Documentation

Yes	No.	Comments
NA		
N/A		
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N/A		
		·
N/A		
N/A		·
N/A		
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X		
N/A		
N/A		
X		
		· · · · · · · · · · · · · · · · · · ·
	N/A N/A N/A N/A N/A X X N/A	N/A N/A N/A N/A N/A N/A N/A X N/A N/A

Contract Verification Review (Concluded)

5.0 Problem Resolution Summarize the findings in the table below. List only samples/fractions for which deficiencies have been noted.

Sample/Fraction No.	Analysis	Problems/Comments/Resolutions									
·											
		·									
		·									
	/es No										
Based on the review, this data package is a	complete, (Yes) No	·									
If no, provide: nonconformance report or	If no, provide: nonconformance report or correction request number and date correction request was submitted										
Reviewed by:	$1/\lambda_{-}$										

te: Site 105	AR/COC: 609364, 609365, 609371, 609372, 609373, 609374 Inorganic Method/CAS Number (Analysis/Analyte)															
	EPA7470A/7471A (CVAA):	7439-97-6 (Hg)														
Sample ID		111.00			<u> </u>											
074462-002 105-EB-8 074463-002 105-EB-9	-	UJ,B3 UJ,B3				<u> </u>		-								
074403-002 103-25-8		03,53		-		-				 	<u> </u>					
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Mr. David Schwent

Analytical Quality Associates, Inc.



616 Maxine NE Albuquerque, NM 87123 Phone: 505-299-5201

Fax: 505-299-6744 Email: minteer@aol.com

Memorandum

DATE:

March 10, 2006

TO:

File

FROM:

David Schwent

SUBJECT:

Inorganic Data Review and Validation - SNL

Site: Site 105

AR/COC: 609364, 609365, 609371, 609372, 609373, and 609374 SDG: 155418, 155439, 155443, 155447, 155452, 155456, and 155458

Laboratory: GEL

Project/Task: 98046.02.02.09

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 1.

Summary

The samples were prepared and analyzed with accepted procedures using method EPA7470A/7471A (CVAA). Problems were identified with the data package that result in the qualification of data.

CVAA Analysis (Batch 501846):

<u>Blanks</u>: Hg was detected in the continuing calibration blanks (CCBs) at negative concentrations with absolute values > the detection limit (DL) but < the reporting limit (RL). The associated results of Sample 155458-001 and -002 were non-detects (NDs) and will be qualified "UJ,B3."

Data are acceptable. QC measures appear to be adequate. The following sections discuss the data review and validation. Due to the matrix, an LCSD analysis was performed instead of MS/MSD and laboratory replicate analyses (see e-mail, dated 1-20-06). Later, MS/MSD and laboratory replicate analyses were performed on samples from the COCs and original soil field sample batches of this package. The MS/MSD and laboratory replicate analyses were performed on the samples beyond the method specified holding time, but within 2X the holding time, and no sample data will be qualified as a result, based on professional judgment. The MS/MSD and laboratory replicate analyses performed on Sample 157007-005 of SDG 157007 and Samples 157010-001, -002, -003, -004, and -005 of SDG 157010 apply to the soil field samples of this package.

Holding Times/Preservation

<u>CVAA Analysis (All Batches)</u>: All samples were analyzed within the prescribed holding times and properly preserved.

Calibration

CVAA Analysis (All Batches): All initial and continuing calibration QC acceptance criteria were met.

Blanks

<u>CVAA Analysis (Batch 501846)</u>: No target analytes were detected in the blanks, except as noted above in the summary section.

CVAA Analysis (All Other Batches): No target analytes were detected in the blanks.

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)

CVAA Analysis (Batch 501846): All LCS/LCSD QC acceptance criteria were met.

<u>CVAA Analysis (All Other Batches)</u>: All LCS/LCSD QC acceptance criteria were met. It should be noted that the MSD analyses were used as measures of laboratory precision due to low indigenous concentration of the target analyte in the sample used for the QC analyses.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

CVAA Analysis (Batch 501846): No MS/MSD analyses were performed. No sample data will be qualified as a result.

CVAA Analysis (All Other Batches): All MS/MSD QC acceptance criteria were met.

Replicates

<u>CVAA Analysis (Batch 501846)</u>: No laboratory replicate analysis was performed. The LCSD analysis was used as a measure of precision. No sample data will be qualified as a result.

<u>CVAA Analysis (All Other Batches)</u>: All laboratory replicate QC acceptance criteria were met. It should be noted that the MSD analyses were used as measures of laboratory precision due to low indigenous concentration of the target analyte in the sample used for the QC analyses.

ICP Serial Dilution

<u>CVAA Analysis (Batch 501846)</u>: No serial dilution analysis was performed. No sample data will be qualified as a result.

CVAA Analysis (All Other Batches): All serial dilution QC acceptance criteria were met.

ICP Interference Check Sample (ICS)

CVAA Analysis (All Batches): No ICS analysis was required by this method.

Detection Limits/Dilutions

<u>CVAA Analysis (Batch 501857)</u>: All detection limits were properly reported. Sample 155439-016 was diluted 10X due to over-range concentrations of the target analyte. No other samples required dilution.

<u>CVAA Analysis (Batch 501864)</u>: All detection limits were properly reported. Sample 155447-020 was diluted 10X due to over-range concentration of the target analyte. No other samples required dilution.

<u>CVAA Analysis (Batch 501867)</u>: All detection limits were properly reported. Sample 155452-004 was diluted 10X due to over-range concentration of the target analyte. No other samples required dilution.

<u>CVAA Analysis (All Other Batches)</u>: All detection limits were properly reported. No samples required dilution.

Other QC

CVAA Analysis (All Batches): No field blanks (FBs) were submitted on the ARCOCs. It should be noted that several field duplicate (FD) relative percent differences (RPDs) were >35%. No specific FD QC acceptance criteria are currently in place. No sample data will be qualified as a result.

No other specific issues were identified which affect data quality.

Data Validation Summary

Site/Project: SNL/5 ite 105 Project/Task #: 98046.02.02.09	# of Samples: Matrix:
	Laboratory Sample IDs: 1.559/8
Laboratory: G-EL	
SDG #: 1554/8	

		Analysis														
QC Element		Org	anics			Inorg	ganics									
	voc svoc		Pesticide/ PCB	HPLC (HE)	ICP/AES	GFAA/ AA	CVAA (Hg)	CN	RAD	Other						
1. Holding Times/Preservation							/									
2. Calibrations			÷.				₩									
3. Method Blanks			1				45,63		1							
4. MS/MSD																
5. Laboratory Control Samples																
6. Replicates				1			1									
7. Surrogates			~						\mathcal{N}							
8. Internal Standards																
9. TCL Compound Identification									λ							
10. ICP Interference Check Sample																
11. ICP Serial Dilution																
12. Carrier/Chemical Tracer Recoveries																
13. Other QC							NΑ									

J =	Esumated	Cneck (V)	=	Acceptable			
U =	Not Detected	Shaded Cells	=	Not Applicable (also "NA")			
UJ =	Not Detected, Estimated	NP	=	Not Provided	1 111		
R =	Unusable	Other:			Reviewed By: Navid Saluant	Date:	Z-Z8-06

Inorganic Metals

Site/Project: S Laboratory: C Methods: E	,NL/	site	105	A	R/COC i	#:6093	364,	365,37	11,372	L	aboratory	Sample	IDs: 15	541	8-00	thru	-026			
Laboratory: <u>C</u>	EL			S	DG #:	554/8			373,	<i>594</i>										
Methods: E	PA T	47/	A CCI	VAA)		,,,,,														
										— —	otah #a	60	1854	,						
# of Samples: 20 Matrix: Soil Batch #s: 50/854																				
CAS#/	QC Element																			
•							Ī			<u> </u>			I		Serial	Field				
Analyte	TAL	ICV	CCV	ICB	CCB	Method Blanks	LCS	LCSD	RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Dilu- tion	Dup. RPD	Equip. Blanks	Field Blanks		
7429-90-5 AI																				
7440-39-3 Ba	ļ																			
7440-41-7 Be	ļ																			
7440-43-9 Cd																				
7440-70-2 Ca 7440-47-3 Cr			-																	
7440-47-3 CF 7440-48-4 Co			1									 								
7440-50-8 Cu	<u> </u>									1					-					
7439-89-6 Fe												 			 					
7439-95-4 Mg			-																	
7439-96-5 Mn	·									 					 					
7440-02-0 Ni																			i	
7440-09-7 K					•															
7440-22-4 Ag																				
7440-23-5 Na																				
7440-62-2 V																				
7440-66-6 Zn			1																	
7420 02 4 DV			ļ																	
7439-92-1 Pb 7782-49-2 Se			-									<u> </u>		ļ						
7440-38-2 As	 								_											L
7440-36-0 Sb	 									-	ļ <u>.</u>		-	 						
7440-28-0 TI																				
																				\vdash
7439-97-6 Hg									~	No.		V	1	NR		*		NA		
										7.5	<u> </u>	Ť	<u> </u>	· · · · · ·				70		
Cyanide CN																				
			لــبــا		l					<u>. </u>	<u> </u>	L	<u></u>		l					
Notes: Shade	d rows ar	e RCRA	netals. So	Hds-to-aq	ueous cor	nversion: m	g / kg = µլ	g/g: [(µg	/g) x (sam	pie mass	{g} / sam	ple vol. {r	nl}) x (10	00 ml / 1 l	iter)] / Dil	ution Factor	r = μg/l			
Comments:	* 6	U KI	ツフ	55%	-															

R_11

Reviewed By: Navid Schwent Date: 2-23-06

QC Element CAS #/ Field Serial Analyte LCSD Rep. **ICS** Field Method MSD Equip. **ICV** CCV **ICB** CCB LCS LCSD MS MSD Dilu-Dup. RPD RPD RPD AB Blanks Blanks Blanks tion RPD 7429-90-5 Al 7440-39-3 Ba 7440-41-7 Be 7440-43-9 Cd 7440-70-2 Ca 7440-47-3 Cr 7440-48-4 Co 7440-50-8 Cu 7439-89-6 Fe 7439-95-4 Mg 7439-96-5 Mn 7440-02-0 Ni 7440-09-7 K 7440-22-4 Ag 7440-23-5 Na 7440-62-2 V 7440-66-6 Zn 7439-92-1 Pb

Notes: Shaded rows are RCRA metals. Solids-to-aqueous conversion: mg/kg = \mu g/g: [(\mu g/g) x (sample mass {g} / sample voi. {mi}) x (1000 mi / 1 liter)] / Dilution Factor = \mu g/1

Comments: / of 2 FD RPOs > 35%.

7782-49-2 Se 7440-38-2 As 7440-36-0 Sb 7440-28-0 Tl

7439-97-6 Hg

Cyanide CN

Reviewed By: Navid Schwent	Date:	2-28-4
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NA

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Inorganic Metals

Site/Project: 2	SNL/	<u>site</u>	105	A	R/COC	#:6093	64,36	5,37/	, 372, 3	32 <i>3,</i> La	boratory	Sample	IDs: 14	544	3-00	× A	hru -o	20		
Laboratory: _(<u>مانتل</u> ى			S	DG #: _/	55443	?		3	74.										
Methods: £	PA -	747/	ATO	VAA)																
# of Samples:				Matrix:	301					— — Ва	atch #s:	501	860							
CAC #/											- Elemer	-								
CAS #/ Analyte	TAL	ICV	ccv	ICB	ССВ	Method Blanks	LCS	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilu- tion	Field Dup. RPD	Equip. Blanks	Field Blanks		
7429-90-5 Al																			_	
7440-39-3 Ba																				
7440-41-7 Be																				
7440-43-9 Cd	ļ																			
7440-70-2 Ca	 -														-					
7440-47-3 Cr	ļ																			
7440-48-4 Co 7440-50-8 Cu			-																	
7439-89-6 Fe																	_			-
7439-95-4 Mg			 				_													
7439-96-5 Mn	 																			
7440-02-0 Ni					-							-				-				$\vdash \vdash$
7440-09-7 K	1											 								
7440-22-4 Ag																				
7440-23-5 Na		<u> </u>																		
7440-62-2 V																				
7440-66-6 Zn																				
7439-92-1 Pb																				
7782-49-2 Se																				
7440-38-2 As																				
7440-36-0 Sb	ļ																			
7440-28-0 TI	├																			
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7439-97-6 Hg	V		1							1	1			14		NA		M		\vdash
Cyanide CN																				
																				ļ
	├																			
L. C. C.	<u> </u>	202:					<u> </u>			<u> </u>			455							
Notes: Shade	d rows as	e RCRA i	netals. So	uds-to-aq	ueous cor	iversion: m	g / kg = μį	g/g: [(µg	/g) x (sam	ple mass	{g} / sam	ple vol. {n	nl}) x (10	00 ml / 1 i	iter)] / Dil	ution Factor	r = μg/l			
Comments:													Λ							

Reviewed By: Marie Shrent Date: 2-28-06.

		۵.۲		_					IIIO	yanı	c Mer	ais							
Site/Project:	NL/	5,4	e /o.	<u>5</u> A	R/COC i	#: <u>60936</u>	4,365	<u> </u>	373,3	24 La	boratory	Sample	IDs: <u>[</u>	544	7-00	1 +1)ru - 02	.0	
Laboratory:	GE	<u></u>		S	DG #: <u>/ \$</u>	55447													
Methods: E	PA 7	471	ACC	VAA)														
# of Samples:	2 4	2		Matrix:	2-11				_	Ba	atch #s:	501	864						
											lemer								
CAS #/										QC E	-ieitiei	16							
Analyte						Method	·		LCSD			MSD	Rep.	ICS	Serial	Field	Equip.	Field	
,,	TAL	ICV	CCV	ICB	ССВ	Blanks	LCS	LCSD	RPD	MS	MSD	RPD	RPD	AB	Dilu- tion	Dup. RPD	Blanks	Blanks	
7429-90-5 Al																			
7440-39-3 Ba																			
7440-41-7 Be																			
7440-43-9 Cd																			
7440-70-2 Ca																			
7440-47-3 Cr																			
7440-48-4 Co																			
7440-50-8 Cu																			
7439-89-6 Fe																			
7439-95-4 Mg																			
7439-96-5 Mn																			
7440-02-0 Ni																			
7440-09-7 K										<u></u> i									
7440-22-4 Ag																			
7440-23-5 Na																			
7440-62-2 V				ļ															
7440-66-6 Zn																			
7439-92-1 РЬ																			
7782-49-2 Se																			
7440-38-2 As																			
7440-36-0 Sb				ļ															
7440-28-0 Ti																			
						·													
7439-97-6 Hg			<u> </u>						1	-	//			MA	/	NA	1	NA	
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Cyanide CN																			
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Notes: Shaded rows are RCRA metals. Solids-to-aqueous conversion: mg/kg = µg/g: [(µg/g) x (sample mass {g} / sample vol. {mi}) x (1000 ml/1 liter)] / Dilution Factor = µg/1

Comments:

Inorganic Metals

Site/Project:	SNI	15%	te/	<u>05</u> A	R/COC #	60936	4,365,	371,37	2,373,	<u>37</u> 4La	boratory	Sample	IDs: 15	545	1-001	thre	1-00			
Laboratory:(G-EL			Si	DG #: 上	55452.	<u>- 05 -</u>	thru -	<u> </u>											
Methods: Æ	PA	74	7/1	(Cu	(AA)		_													
Laboratory:		Ro		Matrix:		Soil				Ba	tch #s:	50	186	7						
CAS #/											lemer									
Analyte	TAL	ICV	ccv	ICB	ССВ	Method Blanks	LCS	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilu- tion	Field Dup. RPD	Equip. Blanks	Field Blanks		
7429-90-5 Al																				
7440-39-3 Ba																				$ldsymbol{eta}$
7440-41-7 Be																				
7440-43-9 Cd																				
7440-70-2 Ca																				─ ─
7440-47-3 Cr																				
7440-48-4 Co				_																
7440-50-8 Cu 7439-89-6 Fe		├								-										+
7439-89-6 Fe 7439-95-4 Mg		 																		
7439-96-5 Mn	-			_														711		
7440-02-0 Ni																				
7440-09-7 K		 																		+
7440-22-4 Ag		 								-										+
7440-23-5 Na																				
7440-62-2 V																				1
7440-66-6 Zn																				
7439-92-1 Pb																				
7782-49-2 Se																				
7440-38-2 As																				
7440-36-0 Sb																				
7440-28-0 TI																				
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7439-97-6 Hg	1	V	V				1			\ \bar{\bar{\bar{\bar{\bar{\bar{\bar{\bar	/			NA	1/	*	/	NA	<u> </u>	
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Cyanide CN																				-
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Reviewed By: Saved Schuent Date: 2-23-6.

Inorganic Metals

Site/Project: _	SNL	1 50	te 10	<u>5</u> A	R/COC	#: 6093C	4,365	37/32	2,3737	74, La	boratory	Sample	IDs: _	559	156-	00/				
Laboratory:	GEL	<u> </u>		SI	DG #: <u>/</u>	55456	9		,	_										
Methods: _E	PAT	471	4 /CV	MA)																
# of Samples:		1			5.	<i>i</i> /				Ba	tch #s:	501	1870					_		
CAS#/						'				QC E	lemer	t								
Analyte						16-42-1			Y COD			2402		100	Serial	Field		-		
Analyte	TAL	ICV	CCV	ICB	CCB	Method Blanks	LCS	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Dilu- tion	Dup. RPD	Equip. Blanks	Field Blanks		
7429-90-5 Al																				
7440-39-3 Ba																				
7440-41-7 Be																				
7440-43-9 Cd																				
7440-70-2 Ca																				
7440-47-3 Cr																				
7440-48-4 Co																				
7440-50-8 Cu																				
7439-89-6 Fe																·				
7439-95-4 Mg			<u> </u>																	
7439-96-5 Mn																				
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7440-09-7 K																				
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7439-97-6 Hg	<u></u>							<u></u>		<u> </u>				NA	/	NA	<u> </u>	NA		
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Notes: Shade	d rows ar	e KCRA i	netals. So	uds-to-aq	пеопа сол	iversion: m	g / kg = μί	3/g: [(μg	/g) x (sam	pie mass	{g} / sam	ole vol. {n	ni}) x (100)() mi / 1 i	tter)] / Dil	ution Factor	r=μg/l			

Comments:

Reviewed By: Savid School Date: 2-28-56

CAS #/										QC E	Elemer	nt							
Analyte	TAL	ICV	ccv	ICB	CCB	Method Blanks	LCS	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilu- tion	Field Dup. RPD	Equip. Blanks	Field Blanks	
7429-90-5 Al																			
7440-39-3 Ba																			
7440-41-7 Be																			
7440-43-9 Cd												, ,							
7440-70-2 Ca																			,
7440-47-3 Cr																			
7440-48-4 Co									·-										
7440-50-8 Cu													1						
7439-89-6 Fe																			
7439-95-4 Mg							-												
7439-96-5 Mn										_									
7440-02-0 Ni																		1	
7440-09-7 K				, , , , , , , , , , , , , , , , , , , ,															
7440-22-4 Ag																		1	
7440-23-5 Na																		-	
7440-62-2 V																			
7440-66-6 Zn																			
7439-92-1 Pb				_					-	_	 		-					 	
7782-49-2 Se																			
7440-38-2 As																			
7440-36-0 Sb																			
7440-28-0 TI																			
7439-97-6 Hg	V		-	U	-052				~	NA	NA	NA	1/19	NA	MA	NA	NA	NA	
Cyanide CN																			
																		-	-
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Notes: Shaded rows are RCRA metals. Solids-to-aqueous conversion: mg/kg = \mug/g: [(\mug/g) x (sample mass {g} / sample vol. {ml}) x (1000 ml/1 liter)] / Dilution Factor = \mug/l

Comments:

Reviewed By: David Schurt	Date:	2-28-06
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SMO ANALYTICAL DATA ROUTING FORM

PROJE	CT NAME:	Site 105		PROJECT/TASK:	98046_(02.02.0)9	
SNL TASK LE	ADER:	Langkopf		ORG/MS/CF0#:	6146/10	87/CF	056-06	
SMO PROJE	CT LEAD:	Herrera		SAMPLE SHIP DATE:	2/6/200	3		
ARCOC	LAB	LAB ID	PRELIM DATE	FINAL DATE	EDD	EDD ON Q	Cust CD	RC CD
609364	GEL	155418	2/16/2006	2/21/2006	\mathbf{x}	X	\mathbf{x}	x
609365	GEL	155418	2/16/2006	2/21/2006	X	X	X	x
609371	GEL	155418	2/16/2006	2/21/2006	X	х	X	×
609372	GEL	155418	2/16/2006	2/21/2006	X	X	X	X
609373	GEL	155418	2/16/2006	2/21/2006	Х	X	X	Х
609374	GEL	155418	2/16/2006	2/21/2006	Х	X	X	X
		ΠΔΤΔ Ρ	ACKAGE TAT: X	RUSH (3 day)		NOE	RMAL	
	CORRECTA	ONS REQUES	erangagargaran kananggagaragan Balasi Lasa Tandi kananggagaragan	KOON (O day)	- 4200 W			
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Contract Verification Review (CVR)

Project Leader	LANGKOPF	Project Name	SITE 105	Case No.	98046_02.02.09
AR/COC No.	609364, 609365, 609371, 609372, 609373 & 609374	Analytical Lab	GEL	SDG No.	155168

In the tables below, mark any information that is missing or incorrect and give an explanation.

1.0 Analysis Request and Chain of Custody Record and Log-In Information

Line		Com	lete?		Reso	lved?
No.	Item	Yes	No	If no, explain	Yes	No
1.1	All items on COC complete - data entry clerk initialed and dated	X	70-70-1-1-1			
1.2	Container type(s) correct for analyses requested	X				
1.3	Sample volume adequate for # and types of analyses requested	X				
1.4	Preservative correct for analyses requested	X				
1.5	Custody records continuous and complete	X				
1.6	Lab sample number(s) provided and SNL sample number(s) cross referenced and correct	Х				
1.7	Date samples received	X				
1.8	Condition upon receipt information provided	X				

2.0 Analytical Laboratory Report

Line	are campasa acostus, acopto	Com	lete?		Reso	lved?
No.	Item	Yes	No	If no, explain	Yes	No
2.1	Data reviewed, signature	X				
2.2	Method reference number(s) complete and correct	X				
2.3	QC analysis and acceptance limits provided (MB, LCS, Replicate)	X				
2.4	Matrix spike/matrix spike duplicate data provided (if requested)	N/A				
2.5	Detection limits provided; PQL and MDL (or IDL), MDA and L _c	X				
2.6	QC batch numbers provided	X				
2.7	Dilution factors provided and all dilution levels reported	X				
2.8	Data reported in appropriate units and using correct significant figures	X				
2.9	Radiochemistry analysis uncertainty (2 sigma error) and tracer recovery (if applicable) reported	N/A				
2.10	Narrative provided	X				
2.11	TAT met	X				
2.12	Hold times met	X				
2.13	Contractual qualifiers provided	X				
2.14	All requested result and TIC (if requested) data provided	Х				

Contract Verification Review (Continued)

3.0 Data Quality Evaluation

3.0 Data Quality Evaluation			
Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
3.1 Are reporting units appropriate for the matrix and meet contract specified or project-specific requirements? Inorganics and metals reported as ppm (mg/liter or mg/Kg)? Tritium reported in picocuries per liter with percent moisture for soil samples? Units consistent between QC samples and sample data	X		
3.2 Quantitation limit met for all samples	X		,
3.3 Accuracy a) Laboratory control samples accuracy reported and met for all samples	X		
 Surrogate data reported and met for all organic samples analyzed by a gas chromatography technique 	N/A		
c) Matrix spike recovery data reported and met	N/A		
3.4 Precision a) Replicate sample precision reported and met for all inorganic and radiochemistry samples	N/A		
b) Matrix spike duplicate RPD data reported and met for all organic samples	N/A		
Blank data a) Method or reagent blank data reported and met for all samples	X		
b) Sampling blank (e.g., field, trip, and equipment) data reported and met	х		
3.6 Contractual qualifiers provided: "J"- estimated quantity; "B"-analyte found in method blank above the MDL for organic or above the PQL for inorganic; "U"- analyte undetected (results are below the MDL, IDL, or MDA (radiochemical)); "H"-analysis done beyond the holding time	х		
3.7 Narrative addresses planchet flaming for gross alpha/beta	N/A		
3.8 Narrative included, correct, and complete	Х		
Second column confirmation data provided for methods 8330 (high explosives) and 8082 (pesticides/PCBs)	N/A		

Contract Verification Review (Continued)

4.0 Calibration and Validation Documentation

4.0 Calibration and Validation Documentation Item	Yes	No	Comments
4.1 GC/MS (8260, 8270, etc.)			
a) 12-hour tune check provided	N/A		·
•			
b) Initial calibration provided	N/A		
			·
c) Continuing calibration provided	N/A		
d) Internal standard performance data provided	N/A		
e) Instrument run logs provided	N/A		
4.2 GC/HPLC (8330 and 8010 and 8082)			
a) Initial calibration provided	N/A		
b) Continuing calibration provided	N/A		
c) Instrument run logs provided	N/A		
4.3 Inorganics (metals)			
a) Initial calibration provided	x		•
b) Continuing calibration provided	x		***************************************
Continuing Cantriation provided			
c) ICP interference check sample data provided	N/A		
	27/4		
d) ICP serial dilution provided	N/A		
e) Instrument run logs provided	х		
4.4 Radiochemistry			
a) Instrument run logs provided	N/A		

Contract Verification Review (Concluded)

5.0 Problem Resolution

Summarize the findings in the table below. List only samples/fractions for which deficiencies have been noted.

Sample/Fraction No.	Analysis	Problems/Comments/Resolutions
·		
Were deficiencies unresolved? Yes	©	
Based on the review, this data package is co	mplete.	No
If no, provide: nonconformance report or co	orrection request number	and date correction request was submitted:
Reviewed by: W. Palon	cla Date:	2-21-06 Closed by:Date:

ite: Site 105	Γ-				М			OC: 6	50936 ber (A		e/And	hto)		 Inorg	anic
	EPA7470/7471A (CVAA):	7439-97-6 (Hg)				etriod	ICAS	Nami	Der (A	naiys	IS/Ana	uyte)			
Sample ID															
074460-002 105-EB-6		UJ,B3													
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Mr. David Schwent

Analytical Quality Associates, Inc.



616 Maxine NE Albuquerque, NM 87123 Phone: 505-299-5201

Fax: 505-299-6744 Email: minteer@aol.com

Memorandum

DATE:

March 8, 2006

TO:

File

FROM:

David Schwent

SUBJECT:

Inorganic Data Review and Validation - SNL

Site: Site 105 AR/COC: 609366

SDGs: 155046 and 155050

Laboratory: GEL

Project/Task: 98046.02.02.09

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 1.

Summary

The samples were prepared and analyzed with accepted procedures using method EPA7470A/7471A (CVAA). Problems were identified with the data package that result in the qualification of data.

CVAA Analysis (Batch 500209):

<u>Blanks</u>: Hg was detected in the continuing calibration blank (CCB) at a negative concentration with an absolute value > the detection limit (DL) but < the reporting limit (RL). The associated result of Sample 155050-001 was a non-detect (ND) and will be qualified "UJ,B3."

Data are acceptable. QC measures appear to be adequate. The following sections discuss the data review and validation. Due to the matrix, an LCSD analysis was performed instead of MS/MSD and laboratory replicate analyses (see e-mail, dated 1-20-06). Later, MS/MSD and laboratory replicate analyses were performed on a sample from the COC and original soil field sample batch of this package. The MS/MSD and laboratory replicate analyses were performed on the sample beyond the method specified holding time, but within 2X the holding time, and no sample data will be qualified as a result, based on professional judgment. The MS/MSD and laboratory replicate analyses performed on Sample 157008-002, of SDG 157008, apply to the soil field samples of this package.

Holding Times/Preservation

<u>CVAA Analysis (All Batches)</u>: All samples were analyzed within the prescribed holding times and properly preserved.

Calibration

CVAA Analysis (All Batches): All initial and continuing calibration QC acceptance criteria were met.

Blanks

CVAA Analysis (Batch 500206): No target analytes were detected in the blanks.

<u>CVAA Analysis (Batch 500209)</u>: No target analytes were detected in the blanks, except as noted above in the summary section.

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)

CVAA Analysis (Batch 500206): All LCS/LCSD QC acceptance criteria were met. It should be noted that, the MSD analysis was used as a measure of laboratory precision due to low indigenous concentration of the target analyte in the sample used for the QC analyses.

CVAA Analysis (Batch 500209): All LCS/LCSD QC acceptance criteria were met.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

CVAA Analysis (Batch 500206): All MS/MSD QC acceptance criteria were met.

CVAA Analysis (Batch 500209): No MS/MSD analyses were performed. No sample data should be qualified as a result.

Replicates

<u>CVAA Analysis (Batch 500206)</u>: All laboratory replicate QC acceptance criteria were met. It should be noted that the MSD analysis was used as a measure of laboratory precision due to low indigenous concentration of the target analyte in the sample used for the QC analyses.

<u>CVAA Analysis (Batch 500209)</u>: No laboratory replicate analysis was performed. No sample data should be qualified as a result.

ICP Serial Dilution

CVAA Analysis (Batch 500206): All serial dilution QC acceptance criteria were met.

<u>CVAA Analysis (Batch 500209)</u>: No serial dilution analysis was performed. No sample data will be qualified as a result.

ICP Interference Check Sample (ICS)

CVAA Analysis (All Batches): No ICS analysis was required by this method.

Detection Limits/Dilutions

CVAA Analysis (Batch 500206): All detection limits were properly reported. Samples 155046-005, -012, and -015 were diluted 10X and Samples -006, -009, and -011 were diluted 20X due to over-range concentrations of the target analyte. No other samples required dilution.

CVAA Analysis (Batch 500209): All detection limits were properly reported. No samples required dilution.

Other QC

<u>CVAA Analysis (All Batches)</u>: No field blanks (FBs) were submitted on the ARCOCs. It should be noted that the field duplicate (FD) relative percent difference (RPD) was >35%. No specific FD QC acceptance criteria are currently in place. No sample data will be qualified as a result.

No other specific issues were identified which affect data quality.

Data Validation Summary

	,
Site/Project: 5NL/5/te/05 Project/Task #: 98046.02.02.09	# of Samples: // Matrix: So, / Aquers (EB)
AR/COC #: 609366	Laboratory Sample IDs: 155046-501 thru - 016;
Laboratory: C-EC	155050-66/
SDG#: 155046,050	

					Analy	/sis				
QC Element		Orga	anics			Inorg	ganics		-4-	
	voc	svoc	Pesticide/ PCB	HPLC (HE)	ICP/AES	GFAA/ AA	CVAA (Hg)	CN	RAD	Other
1. Holding Times/Preservation							/			
2. Calibrations										
3. Method Blanks							UJ,83			
4. MS/MSD				1			1			
5. Laboratory Control Samples									1	
6. Replicates		\$ 22.2	$\mathcal{N}^{\mathcal{U}}$		7		\downarrow			1
7. Surrogates				7						
8. Internal Standards										
9. TCL Compound Identification										
10. ICP Interference Check Sample										
11. ICP Serial Dilution										
12. Carrier/Chemical Tracer Recoveries										
13. Other QC							NA			

J = Estimated	Check $()$ = Acceptable		
U = Not Detected	Shaded Cells = Not Applicable (also "NA")	_	
UJ = Not Detected, Estimated	NP = Not Provided	$\theta \wedge 0 \wedge 1$	
R = Unusable	Other:	Reviewed By: Marie Shuart	Date: 2-24-06

Inorganic Metals Laboratory Sample IDs: 155046-001 thra -016 Site/Project: 5NL / 5, te 105 AR/COC #: 609 366 Laboratory: _______ SDG #: _ 1 5 5 0 4 6 Methods: EPA 747/A (CVAA) Batch #s: 500206 Soil # of Samples: 155050-001 **QC** Element **CAS #/** Serial Field **Analyte ICS** Equip. Field Method LCSD MSD Rep. LCS LCSD M8 MSD TAL **ICV** CCV ICB CCB Dilu-Dup. RPD RPD AB Blanks Blanks Blenks tion RPD 7429-90-5 Al 7440-39-3 Ba 7440-41-7 Be 7440-43-9 Cd 7440-70-2 Ca 7440-47-3 Cr 7440-48-4 Co 7440-50-8 Cu 7439-89-6 Fe 7439-95-4 Mg 7439-96-5 Mn 7440-02-0 Ni 7440-09-7 K 7440-22-4 Ag 7440-23-5 Na 7440-62-2 V 7440-66-6 Zn 7439-92-1 Pb 7782-49-2 Se 7440-38-2 As 7440-36-0 Sb 7440-28-0 TI 7439-97-6 Hg Cyanide CN Notes: Shaded rows are RCRA metals. Solids-to-aqueous conversion: mg/kg = µg/g: [(µg/g) x(sample mass {g} / sample vol. {ml}) x (1000 ml / 1 liter)] / Dilution Factor = µg/1

B-14

MSD USE as measure of precision for sal sands. Reviewed By: Slaved Schwent Date: 2-24-06

Comments: A FO RPD >35%.

CAS #/										QC E	lemer	nt							
Analyte	TAL	ICV	CCV	ICB	CCB Ma/L	Method Blanks	LCS	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilu- tion	Field Dup. RPD	Equip. Blanks	Field Blanks	
7429-90-5 Al																			
7440-39-3 Ba																			
7440-41-7 Be																			
7440-43-9 Cd																			
7440-70-2 Ca												*							
7440-47-3 Cr																			
7440-48-4 Co																			
7440-50-8 Cu																			
7439-89-6 Fe				1															
7439-95-4 Mg																			T
7439-96-5 Mn																			
7440-02-0 Ni																			
7440-09-7 K																			
7440-22-4 Ag												7							 1
7440-23-5 Na																			
7440-62-2 V																			
7440-66-6 Zn				1	<u> </u>														
777.000	 																		 1
7439-92-1 Pb																			 1
7782-49-2 Se				ļ —															
7440-38-2 As																			
7440-36-0 Sb																			
7440-28-0 TI										1						-			
7110 00 7 00																			
7439-97-6 Hg				V	-0.064		V		1	NA	Ma	MA	NA	Na	M	MA	NA	NA	
Cyanide CN				-					_				ļ		ļ				
	-									-	ļ						· .		
				1	1					-				-	-				 -
				1															

Notes: Shaded rows are RCRA metals. Solids-to-aqueous conversion: mg/kg = µg/g: [(µg/g) x (sample mass {g} / sample vol. {ml}) x (1000 ml / 1 liter)] / Dilution Factor = µg/l

Comments:

Reviewed By: Navid Chart		Date:	2-24-0x
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Contract Verification Review (CVR)

Project Leader Langkopf	Project Name	Site 105	Case No.	98046_02.02.09
AR/COC No. 609366	Analytical Lab	GEL	SDG No.	155046

In the tables below, mark any information that is missing or incorrect and give an explanation.

1.0 Analysis Request and Chain of Custody Record and Log-In Information

Line		Comp	lete?		Reso	lved?
No.	Item	Yes	No	If no, explain	Yes	No
1.1	All items on COC complete - data entry clerk initialed and dated	×				
1,2	Container type(s) correct for analyses requested	X				
1.3	Sample volume adequate for # and types of analyses requested	X				
1,4	Preservative correct for analyses requested	X				
1.5	Custody records continuous and complete	X				
1,6	Lab sample number(s) provided and SNL sample number(s) cross referenced and	×				
	correct				[.	1 1
1.7	Date samples received	X				
1,8	Condition upon receipt information provided	X				

2.0 Analytical Laboratory Report

Line		Comp	lete?	,	Res	olved?
No.	Item	Yes	No	If no, explain	Yes	№
2.1	Data reviewed, signature	_ X				
2,2	Method reference number(s) complete and correct	X				
2,3	QC analysis and acceptance limits provided (MB, LCS, Replicate)	· X				
2.4	Matrix spike/matrix spike duplicate data provided (if requested)	N/A				
2.5	Detection limits provided; PQL and MDL (or IDL), MDA and Lc	X				[
2.6	QC batch numbers provided	X				
2.7	Dilution factors provided and all dilution levels reported	X				
2.8	Data reported in appropriate units and using correct significant figures	X				
2.9	Radiochemistry analysis uncertainty (2 sigma error) and tracer recovery (if applicable) reported	N/A				
2,10	Narrative provided	X				
2.11	TAT met	X				
2,12	Hold times met	X				
2,13	Contractual qualifiers provided	X				
2.14	All requested result and TIC (if requested) data provided	X				

Contract Verification Review (Continued)

3.0 Data Quality Evaluation

Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
3.1 Are reporting units appropriate for the matrix and meet contract specified or project- specific requirements? Inorganics and metals reported as ppm (mg/liter or mg/Kg)? Tritium reported in picocuries per liter with percent moisture for soil samples? Units consistent between QC samples and sample data	×		
3.2 Quantitation limit met for all samples	X		
3.3 Accuracy a) Laboratory control samples accuracy reported and met for all samples	×		
 Surrogate data reported and met for all organic samples analyzed by a gas chromatography technique 	N/A		
c) Matrix spike recovery data reported and met	N/A		
3.4 Precision a) Replicate sample precision reported and met for all inorganic and radiochemistry samples	N/A		
b) Matrix spike duplicate RPD data reported and met for all organic samples	N/A		
3.5 Blank data a) Method or reagent blank data reported and met for all samples	×		
b) Sampling blank (e.g., field, trip, and equipment) data reported and met	×		
3.6 Contractual qualifiers provided: "J"- estimated quantity; "B"-analyte found in method blank above the MDL for organic or above the PQL for inorganic; "U"- analyte undetected (results are below the MDL, IDL, or MDA (radiochemical)); "H"-analysis done beyond the holding time	×		
3.7 Narrative addresses planchet flaming for gross alpha/beta	N/A		
3.8 Narrative included, correct, and complete	×		
3.9 Second column confirmation data provided for methods 8330 (high explosives) and 8082 (pesticides/PCBs)	N/A		

Contract Verification Review (Continued)

4.0 Calibration and Validation Documentation

Item	Yes	No	Comments
4.1 GC/MS (8260, 8270, etc.)	NA		
a) 12-hour tune check provided			
b) Initial calibration provided	N/A		
c) Continuing calibration provided	N/A		
d) Internal standard performance data provided	N/A		
e) Instrument run logs provided	N/A		
4.2 GC/HPLC (8330 and 8010 and 8082)	N/A		
a) Initial calibration provided			
b) Continuing calibration provided	N/A		
c) Instrument run logs provided	N/A		
4.3 Inorganics (metals)	×		
a) Initial calibration provided			
b) Continuing calibration provided	×		,
c) ICP interference check sample data provided	N/A		
d) ICP serial dilution provided	N/A		
e) Instrument run logs provided	X		
4.4 Radiochemistry	N/A		
a) Instrument run logs provided			

Contract Verification Review (Concluded)

5.0 Problem Resolution Summarize the findings in the table below. List only samples/fractions for which deficiencies have been noted.

Sample/Fraction No.	Analysis	Problems/Comments/Resolutions
		·
Were deficiencies unresolved?	les No	
Based on the review, this data package is c	complete. (Yes No	
If no, provide: nonconformance report or $\frac{1}{1}$ $\frac{1}{1}$	correction request number	and date correction request was submitted
Reviewed by:	Date: _02/17/	06_ Closed by:Date:

		AR/COC: 609367, 609368, 609369, 609370 Method/CAS Number (Analysis/Analyte)												1511.000.E
Sample ID	EPA7470A/7471A (CVAA):	7439-97-6 (Hg)	The state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the s		And the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of t					COMMON				
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075554-002 105-BH-139-8-S		J,83				-		·	~~~			-		
075562-002 105-BH-141-4-S		J,B3				-	-	·}~·	··········	-	<u> </u>			
075568-002 105-BH-142-4-S		J,A2					-	-	-		·		-	
075567-002 105-BH-142-8-S		J,/12						***********		-	·			
075568-002 105-BH-143-0-S		J,A2				A STATE OF THE PERSON NAMED OF	-	***************************************		-	 			-
075569-002 105-BH-143-2-S		J,A2				11-3440		- palar na nasah tanan		·		**********	41	-
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075575-002 105-BH-144-8-S		J,A2									***************************************		,	-
075576-002 105-BH-145-0-S		J,A2								*1*	-	-	***	7.*
075577-002 105-BH-145-2-S		J,A2								h1.	71-14-14-14-14-14-14-14-14-14-14-14-14-14		-111	777
075578-002 105-BH-145-4-S		J,A2											***	474
075579-002 105-BH-145-8-S		J,A2										41'49059471	***********	
075580-002 105-BH-148-0-S		J _. A2						1						7.7
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075582-002 105-BH-146-4-S		J,A2												
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075585-002 105-BH-15-0-S		J,A2										200 At - 100 At 0 200 \$ At 1	47:44	,
ated By: Savid														

Mr. David Schwent

Analytical Quality Associates, Inc.



616 Maxine NE Albuquerque, NM 87123

Phone: 505-299-5201 Fax: 505-299-6744

Email: minteer@aol.com

Memorandum

DATE:

March 10, 2006

TO:

File

FROM:

David Schwent

SUBJECT:

Inorganic Data Review and Validation - SNL

Site: Site 105

AR/COC: 609367, 609368, 609369, and 609370 SDG: 155168, 155170, 155180, 155196, and 155197

Laboratory: GEL

Project/Task: 98046.02.02.09

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 1.

Summary

The samples were prepared and analyzed with accepted procedures using method EPA7470A/7471A (CVAA). Problems were identified with the data package that result in the qualification of data.

CVAA Analysis (Batch 500628):

<u>Blanks</u>: Hg was detected in the continuing calibration blanks (CCBs) at concentrations < the reporting limit (RL). The associated results of Samples 155170-001, -009, and -017 were detects <5X the highest CCB concentration and will be qualified "J,B3."

CVAA Analysis (Batch 500632):

MS/MSD: For Hg, the MS percent recovery (%R) (0%) and MSD %R (0%) were <30%. All associated sample results, except the result for Sample 155180-006, were detects and will be qualified "J,A2"; the result for -006 was a non-detect (ND) and will be qualified "R,A2."

<u>Replicates</u>: For Hg, the laboratory replicate relative percent difference (RPD) (106%) was >35%. All associated sample results, except the result for Sample 155180-006, were detects and will be qualified "J"; the result for -006 was a non-detect (ND) and will be qualified "UJ."

Data are acceptable. QC measures appear to be adequate. The following sections discuss the data review and validation. Due to the matrix, an LCSD analysis was performed instead of MS/MSD and laboratory replicate analyses (see e-mail, dated 1-20-06). Later, MS/MSD and laboratory replicate analyses were performed on samples from the COCs and original soil field sample batches of this package. The MS/MSD and laboratory replicate analyses were performed on the samples beyond the method specified holding time, but within 2X the holding time, and no sample data will be qualified as a result, based on professional judgment. The MS/MSD and laboratory replicate analyses performed on Samples 157007-001, -002, -003, and -004 of SDG 157007 apply to the soil field samples of this package.

Holding Times/Preservation

<u>CVAA Analysis (All Batches)</u>: All samples were analyzed within the prescribed holding times and properly preserved.

Calibration

CVAA Analysis (All Batches): All initial and continuing calibration QC acceptance criteria were met.

Blanks

CVAA Analysis (Batch 500628): No target analytes were detected in the blanks, except as noted above in the summary section and the following. Hg was detected in the CCBs at concentrations < the RL. However, all associated sample results, except the results of Samples 155170-001, -009, and -017, were detects >5X the highest CCB concentration and will not be qualified.

CVAA Analysis (All Other Batches): No target analytes were detected in the blanks.

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)

CVAA Analysis (Batch 500743): All LCS/LCSD QC acceptance criteria were met.

<u>CVAA Analysis (All Other Batches)</u>: All LCS/LCSD QC acceptance criteria were met. It should be noted that the MSD or laboratory replicate analyses were used as measures of laboratory precision.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

CVAA Analysis (Batch 500628): All MS/MSD QC acceptance criteria were met, except as noted above in the summary section.

CVAA Analysis (Batch 500743): No MS/MSD analyses were performed. No sample data will be qualified as a result.

CVAA Analysis (All Other Batches): All MS/MSD QC acceptance criteria were met.

Replicates

CVAA Analysis (Batch 500628): All laboratory replicate QC acceptance criteria were met, except as noted above in the summary section.

CVAA Analysis (Batch 500743): No laboratory replicate analysis was performed. The LCSD was used as a measure of precision. No sample data will be qualified as a result.

CVAA Analysis (All Other Batches): All laboratory replicate QC acceptance criteria were mot. It should be noted that the MSD analyses were used as measures of laboratory precision due to low indigenous concentration of the target analyte in the sample used for the QC analyses.

ICP Serial Dilution

CVAA Analysis (Batch 500743): No serial dilution analysis was performed. No sample data will be qualified as a result.

CVAA Analysis (All Other Batches): All serial dilution QC acceptance criteria were met.

ICP Interference Check Sample (ICS)

CVAA Analysis (All Batches): No ICS analysis was required by this method.

Detection Limits/Dilutions

CVAA Analysis (Batch 500626): All detection limits were properly reported. Samples 155168-001, -010, -014, -019, and -020 were diluted 20X and Sample -018 was diluted 50X due to over-range concentrations of the target analyte. No other samples required dilution.

CVAA Analysis (Batch 500628): All detection limits were properly reported. Samples 155170-002, -004, -006, -008, -012, and -015 were diluted 20X; Samples -003 and -010 were diluted 50X; Sample -016 was diluted 10X; Sample -014 was diluted 2X; and Sample -019 was diluted 100X due to over-range concentrations of the target analyte. No other samples required dilution.

CVAA Analysis (Batch 500632): All detection limits were properly reported. Samples 155180-007, -010, and -015 were diluted 20X; Sample -016 was diluted 10X; and Sample -011 was diluted 100X due to over-range concentrations of the target analyte. No other samples required dilution.

<u>CVAA Analysis (Batch 500740)</u>: All detection limits were properly reported. Sample 155196-004 was diluted 2X due to over-range concentration of the target analyte. No other samples required dilution.

CVAA Analysis (Batch 500743): All detection limits were properly reported. No samples required dilution.

Other QC

CVAA Analysis (All Batches): No field blanks (FBs) were submitted on the ARCOCs. It should be noted that one or more field duplicate (FD) relative percent differences (RPDs) were >35%. No specific FD QC acceptance criteria are currently in place. No sample data will be qualified as a result.

No other specific issues were identified which affect data quality.

Data Validation Summary

Site/Project: 5NL/5/to 105 Project/Task #: 98046.02.02.09	# of Samples: 68 Matrix: 50il / agueous (ER	1
AR/COC #: 609367,368,369, 370	Laboratory Sample IDs: 155/68-00/ thou-020; 155/70-00/	the
Laboratory: OFL	-020; 185/80-501 thru -00; 155/96-001	they
SDG #: 155/68, 170, 180, 196, 197	-007; 1857.97-001 (FB)	

					Analy	/sis				
QC Element		Org	anics			Inorg	ganics			
	VOC	svoc	Pesticide/ PCB	HPLC (HE)	ICP/AES	GFAA/ AA	CVAA (Hg)	CN	RAD	Other
Holding Times/Preservation										
2. Calibrations							1			
3. Method Blanks							J, B3			
4. MS/MSD			11				丁, R, A2		1	
5. Laboratory Control Samples							/	7		
6. Replicates							J		7	
7. Surrogates										
8. Internal Standards									$\sim \lambda$	
9. TCL Compound Identification									\sim	
10. ICP Interference Check Sample										
11. ICP Serial Dilution										
12. Carrier/Chemical Tracer Recoveries										
13. Other QC							NA			/

J ≈	Estimated	Check (\checkmark)	#	Acceptable			
U =	Not Detected	Shaded Cells	=	Not Applicable (also "NA")			
UJ =	Not Detected, Estimated	NP	=	Not Provided	Reviewed By: Navid Schunt		
R =	Unusable	Other:			Reviewed By: Ward Church	Date: 2-	-22-06

Inorganic Metals

Site/Project: ≤ Laboratory: ∠ Methods: E	w/s	ite 1	05	A	R/COC #	60936	7,368	369	370	_ La	boratory	Sample	IDs: 🟒	55/6	8-00	>/ HA	ry -)JO.		
Laboratory:	TEL	•		SI	ک ے:# COG	06-155	168,17	20,/80	196./9	'Z _						•	· · · · · · · · · · · · · · · · · · ·			
Methods: _E	PA	7471	A CC	V44)		رح/ج	5/68													
# of Samples:	2	2		Matrix:	_5,	:/				Ba	tch #s:	500	626						,	
										QC E	lemer	nt								
CAS#/												··							——-Т	
Analyte	TAL	ICV	ccv	ICB	ССВ	Method Blanks	LCS	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilu- tion	Field Dup. RPD	Equip. Blanks	Field Blanks		egy men
7429-90-5 Al																				
7440-39-3 Ba																				
7440-41-7 Be																				
7440-43-9 Cd																				
7440-70-2 Ca																				
7440-47-3 Cr								:					,							
7440-48-4 Co																				
7440-50-8 Cu																				
7439-89-6 Fe																				
7439-95-4 Mg																				
7439-96-5 Mn																				
7440-02-0 Ni																				
7440-09-7 K																				
7440-22-4 Ag				1																
7440-23-5 Na				i.																
7440-62-2 V																				
7440-66-6 Zn																				
7439-92-1 Pb	_																			
7782-49-2 Se						:														
7440-38-2 As																				
7440-36-0 Sb																				
7440-28-0 T1																				
		1				_					/	. /	. /							
7439-97-6 Hg	V	V V V V M M M V M V M V M V M V M V M V																		
											DC	3-9-	06							
Cyanide CN																				
			-																	
Notes: Shade	d rows ar	e RCRA 1	netals. So	lids-to-aq	neons col	rversion; m	g/kg = με	g/g: [(μg	/g) x (sam	ple mass	{g} / sam	ple vol. {n	nl}) x (100	00 ml / 1 l	iter)] / Dil	ution Factor	r = μg/1			

Comments: * FD RPD <382.

Reviewed By: Navril Schwart 1

Date: 2-22-6

Inorganic Metals

Disc Municipal	-4-1	· / 1	20		D/000		7-1-		- M	gain		uis	/	د د مسدست		11	/			
Site/Project: 5		ite /	05	A	R/COC	1004.56	1,260	369	510	_ L	aboratory	Sample	IDs: 🖊	55/6	28-60	3/ HA	ry -	220.		
Laboratory:	TEL			SI	<u>کے</u> :# DG	06-65	168.17	10,/80	196.19	フ _										
Site/Project: \(\) Laboratory: \(\) Methods: \(\) # of Samples:	PA	1471	A CC	V44)		رح/ج	5/68													
# of Samples:	_2	>		Matrix:	_\$:/				B	atch #s:	500	626	<u> </u>				_		
CAS#/											Elemer									
															Cardol	Field				
Analyte	TAL	ICV	ccv	ICB	CCB	Method Blanks	LCS	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilu- tion	Dup. RPD	Equip. Blanks	Field Blanks		
7429-90-5 Al																				
7440-39-3 Ba																				
7440-41-7 Be																				
7440-43-9 Cd																				
7440-70-2 Ca 7440-47-3 Cr																				
7440-48-4 Co																				
7440-50-8 Cu																				
7439-89-6 Fe																				
7439-95-4 Mg				-	-					-										
7439-96-5 Mn																				
7440-02-0 Ni															-					
7440-09-7 K																				
7440-22-4 Ag																				
7440-23-5 Na				Ž.							-									
7440-62-2 V																				
7440-66-6 Zn																				
7439-92-1 Pb																				
7782-49-2 Se																				
7440-38-2 As																				
7440-36-0 Sb																				
7440-28-0 Tl																				
7430 07 € H-		-	1	-		-				-			1							
7439-97-6 Hg	-		-							1017	N			NA	1	m/	V	ANG		
Cyanide CN											20	3-9-	P(m		ļ					
Cyantos Cia								· · · · · · · · · · · · · · · · · · ·												
	-																		-	
		_			-															
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															1					

Notes: Shaded rows are RCRA metals. Solids-to-aqueous conversion: mg/kg = \mu g/g: [(\mu g/g) x (sample mass {g} / sample vol. {ml}) x (1000 ml/1 liter)] / Dilution Factor = \mu g/1 Comments: \(\pi \) FO RPO <386.

Reviewed By: Naval Solvent

Inorganic Metals

 Site/Project:
 SDL / 5. te /05
 AR/COC #: 609367,368,369,370
 Laboratory Sample IDs: /55/70-00/ Have -030.

 Laboratory:
 C-EL
 SDG #: /56/70

 Methods:
 EDA 7471 A (CVAA)

 # of Samples:
 70
 Matrix:

 SSIte/Project:
 Batch #s:
 500688

 QC Element CAS #/ Serial Field **Analyte** Method LCSD MSD **ICS** Field Rep. Equip. LCSD MSD TAL **ICV** CCV ICB CCB LCS MS Dilu-Dup. Blanks RPD RPD RPD AB Blanks Blanks tion RPD 7429-90-5 Al 7440-39-3 Ba 7440-41-7 Be 7440-43-9 Cd 7440-70-2 Ca 7440-47-3 Cr 7440-48-4 Co 7440-50-8 Cu 7439-89-6 Fe 7439-95-4 Mg 7439-96-5 Mn 7440-02-0 Ni 7440-09-7 K 7440-22-4 Ag 7440-23-5 Na 7440-62-2 V 7440-66-6 Zn 7439-92-1 Pb 7782-49-2 Se 7440-38-2 As 7440-36-0 Sb 7440-28-0 TI NA NA NA 0.056 7439-97-6 Hg AS J-9-06 Cyanide CN

Notes: Shaded rows are RCRA metals. Solids-to-aqueous conversion: mg/kg = µg/g: [(µg/g) x (sample mass {g} / sample vol. {ml}) x (1000 ml / 1 liter)] / Dilution Factor = µg/1

Comments: A FD RFD 735%.

Reviewed By: Navil Schwent Date: 2-22-06

Inorganic Metals Site/Project | 105 AR/COC #: 609367368, 369, 370 Laboratory Sample IDs: 155/80-58/ +hru -020

Laboratory: 661 SDG #: 155/80 Methods: BLA 747/A (CVAA) Batch #s: 50063 2 # of Samples: ______ Matrix: ______ **QC Element CAS #/** Serial Field **Analyte** Method LCSD MSD Rep. ICS Equip. Field LCSD MSD TAL CCV CCB LCS MS Dilu-Dup. ICV ICB RPD RPD AB Blanks Blanks RPD Blanks tion RPD 7429-90-5 Al 7440-39-3 Ba 7440-41-7 Be 7440-43-9 Cd 7440-70-2 Ca 7440-47-3 Cr 7440-48-4 Co 7440-50-8 Cu 7439-89-6 Fe 7439-95-4 Mg 7439-96-5 Mn 7440-02-0 Ni 7440-09-7 K 7440-22-4 Ag 7440-23-5 Na 7440-62-2 V 7440-66-6 Zn 7439-92-1 РЬ 7782-49-2 Se 7440-38-2 As 7440-36-0 Sb 7440-28-0 TI 0. 0 Vina 106 7439-97-6 Hg 05 2-0-6 Cyanide CN

Notes: Shaded rows are RCRA metals. Solids-to-aqueous conversion: mg/kg = µg/g: [(µg/g) x (sample mass {g} / sample vol. {mi}) x (1000 ml / 1 liter)] / Dilution Factor = µg/1

Comments: A FO RPD <35%

Reviewed By: Navel Schwent	Date:	2-22-06
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Site/Project: 5NL / 5; +e 105 AR/COC #: 609367.368,369,370 Laboratory: GEL SDG #: 155196

Methods: EPA 7471A (CVA4) Batch #s: 500740 7 Matrix: 31/ # of Samples: **QC Element** CAS #/ Serial Field **Analyte ICS** Equip. Field Method LCSD MSD Rep. TAL ICV CCV ICB CCB LCS LCSD MS MSD Dilu-Dup. Blenks RPD RPD RPD AB Blanks Blanks RPD tion 7429-90-5 AI 7440-39-3 Ba 7440-41-7 Be 7440-43-9 Cd 7440-70-2 Ca 7440-47-3 Cr 7440-48-4 Co 7440-50-8 Cu 7439-89-6 Fe 7439-95-4 Mg 7439-96-5 Mn 7440-02-0 Ni 7440-09-7 K 7440-22-4 Ag 7440-23-5 Na 7440-62-2 V 7440-66-6 Zn 7439-92-1 Pb 7782-49-2 Se 7440-38-2 As 7440-36-0 8b 7440-28-0 Tl 7439-97-6 Hg D-1-9-01 Cyanide CN

Notes: Shaded rows are RCRA metals. Solids-to-aqueous conversion: mg/kg = µg/g: [(µg/g) x(sample mass {g} / sample vol. {ml}) x(1000 ml / 1 liter)] / Dilution Factor = µg/1

Comments:

Reviewed By: Lavid	Schwart	 Date: _	ź

Site/Project: <u>SNL/Site 105</u> AR/COC #: <u>609367, 368, 369, 370</u> Laboratory Sample IDs: <u>155/97-00/ [68]</u>

Laboratory: <u>CEL</u> SDG #: <u>155/97</u>

Methods: <u>EPA 7470A (CVAA)</u> **Inorganic Metals** | Matrix: aqueou | Batch #s: 500743 # of Samples: QC Element CAS #/ Serial Field **Analyte** Method LCSD MSD **ICS** Field Rep. Equip. LCS LCSD MSD TAL **ICV** CCV **ICB** CCB MS Dilu-Dup. Blanks RPD RPD RPD AB Blanks Blanks RPD tion 7429-90-5 Al 7440-39-3 Ba 7440-41-7 Be 7440-43-9 Cd 7440-70-2 Ca 7440-47-3 Cr 7440-48-4 Co 7440-50-8 Cu 7439-89-6 Fe 7439-95-4 Mg 7439-96-5 Mn 7440-02-0 Ni 7440-09-7 K 7440-22-4 Ag 7440-23-5 Na

Notes: Shaded rows are RCRA metals. Solids-to-aqueous conversion: mg/kg = \mu g/g: [(\mu g/g) x (sample mass {g} / sample vol. {ml}) x (1000 ml / 1 liter)] / Dilution Factor = \mu g/l

Comments:

Reviewed By: Land Shurent D	Date:	2-22-0	۵.
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Contract Verification Review (CVR)

Project Leader	LANGKOPF	Project Name	SITE 105	Case No.	98046_02.02.09
AR/COC No.	609367, 609368, 609369 & 609370	Analytical Lab	GEL	SDG No.	155168

In the tables below, mark any information that is missing or incorrect and give an explanation.

1.0 Analysis Request and Chain of Custody Record and Log-In Information

Line		Com	olete?		Reso	lved?
No.	Item	Yes	No	If no, explain	Yes	No
1.1	All items on COC complete - data entry clerk initialed and dated	X				
1.2	Container type(s) correct for analyses requested	X				
1.3	Sample volume adequate for # and types of analyses requested	X				
1,4	Preservative correct for analyses requested	X				
1.5	Custody records continuous and complete	X		·		
1.6	Lab sample number(s) provided and SNL sample number(s) cross referenced and correct	X				
1.7	Date samples received	X				
1.8	Condition upon receipt information provided	X				

2.0 Analytical Laboratory Report

Line		Comp	lete?		Reso	lved?
No.	Item	Yes	No	If no, explain	Yes	No
2.1	Data reviewed, signature	X				
2,2	Method reference number(s) complete and correct	X				
2.3	QC analysis and acceptance limits provided (MB, LCS, Replicate)	X				
2.4	Matrix spike/matrix spike duplicate data provided (if requested)	N/A				
2.5	Detection limits provided; PQL and MDL (or IDL), MDA and L _c	X				
2.6	QC batch numbers provided	X				
2.7	Dilution factors provided and all dilution levels reported	X				
2.8	Data reported in appropriate units and using correct significant figures	X				
2.9	Radiochemistry analysis uncertainty (2 sigma error) and tracer recovery (if	N/A				
	applicable) reported				<u> </u>	
2.10	Narrative provided	X				
2,11	TAT met	X				
2.12	Hold times met	X				
2,13	Contractual qualifiers provided	X				
2.14	All requested result and TIC (if requested) data provided	X				

Contract Verification Review (Continued)

3.0 Data Quality Evaluation

4 * * * * * * * * * * * * * * * * * * *		
Yes	No	If no, Sample ID No./Fraction(s) and Analysis
X		
X		
Х		
N/A		
х		
х		
х		
N/A		
Х		
N/A		
	X X X N/A N/A N/A X X X X	X X X X N/A N/A N/A X X X X X X X X X X X X X X X X X X X

Contract Verification Review (Concluded)

5.0 Problem Resolution

Summarize the findings in the table below. List only samples/fractions for which deficiencies have been noted.

Sample/Fraction No.	Analysis	Problems/Comments/Resolutions							
	,								
Were deficiencies unresolved? Yes	No								
Based on the review, this data package is co	sased on the review, this data package is complete.								
If no, provide: nonconformance report or o	If no, provide: nonconformance report or correction request number and date correction request was submitted:								
Reviewed by: W, Palence	Date:	2-20-06 Closed by:Date:							

ite: Site 105	AR/COC: 609379, 609380, 609381, 609382 Inorganic Method/CAS Number (Analysis/Analyte)															
Sample iD	EPA7470A77471A (CVAA):									yoldi	·					
	All												1			
	Acceptance															
	criteria met.															
	No sample data will be									ļ		ļ				
	qualified.	· ·				-							-			
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Mr. David Schwent

Analytical Quality Associates, Inc.



616 Maxine NE Albuquerque, NM 87123 Phone: 505-299-5201

Fax: 505-299-6744 Email: minteer@aol.com

Memorandum

DATE:

March 13, 2006

TO:

File

FROM:

David Schwent

SUBJECT:

Inorganic Data Review and Validation - SNL

Site: Site 105

AR/COC: 609379, 609380, 609381, and 609382 SDG: 155718, 155722, 155725, and 15733

Laboratory: GEL

Project/Task: 98046.02.02.09

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 1.

Summary

The samples were prepared and analyzed with accepted procedures using method EPA7470A/7471A (CVAA). No problems were identified with the data package that result in the qualification of data.

Data are acceptable. QC measures appear to be adequate. The following sections discuss the data review and validation. Due to the matrix, an LCSD analysis was performed instead of MS/MSD and laboratory replicate analyses (see e-mail, dated 1-20-06). Later, MS/MSD and laboratory replicate analyses were performed on samples from the COCs and original soil field sample batches of this package. The MS/MSD and laboratory replicate analyses were performed on the samples beyond the method specified holding time, but within 2X the holding time, and no sample data will be qualified as a result, based on professional judgment. The MS/MSD and laboratory replicate analyses performed on Samples 157012-004, and -005 of SDG 157012 and Sample 157013-001 of SDG 157013 apply to the soil field samples of this package.

Holding Times/Preservation

<u>CVAA Analysis (All Batches)</u>: All samples were analyzed within the prescribed holding times and properly preserved.

Calibration

CVAA Analysis (All Batches): All initial and continuing calibration OC acceptance criteria were met.

Blanks

<u>CVAA Analysis (Batch 503247)</u>: No target analytes were detected in the blanks, except the following. In the initial calibration blank (ICB) Hg was detected at a concentration < the reporting limit (RL). However, the associated sample result was a non-detect (ND) and will not be qualified.

CVAA Analysis (All Other Batches): No target analytes were detected in the blanks.

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)

CVAA Analysis (Batch 503247): All LCS/LCSD QC acceptance criteria were met.

<u>CVAA Analysis (All Other Batches)</u>: All LCS/LCSD QC acceptance criteria were met. It should be noted that the MSD analyses were used as measures of laboratory precision due to low indigenous concentration of the target analyte in the sample used for the QC analyses.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

<u>CVAA Analysis (Batch 503247)</u>: No MS/MSD analyses were performed. No sample data will be qualified as a result.

CVAA Analysis (All Other Batches): All MS/MSD QC acceptance criteria were met.

Replicates

<u>CVAA Analysis (Batch 503247)</u>: No laboratory replicate analysis was performed. No sample data will be qualified as a result.

CVAA Analysis (All Other Batches): All laboratory replicate QC acceptance criteria were met. It should be noted that the MSD analyses were used as measures of laboratory precision due to low indigenous concentration of the target analyte in the sample used for the QC analyses.

ICP Serial Dilution

<u>CVAA Analysis (Batch 503247)</u>: No serial dilution analysis was performed. No sample data will be qualified as a result.

CVAA Analysis (All Batches): All serial dilution QC acceptance criteria were met.

ICP Interference Check Sample (ICS)

CVAA Analysis (All Batches): No ICS analysis was required by this method.

Detection Limits/Dilutions

<u>CVAA Analysis (All Batches)</u>: All detection limits were properly reported. No samples required dilution.

Other QC

<u>CVAA Analysis (All Batches)</u>: No field blanks (FBs) were submitted on the ARCOCs. It should be noted that the field duplicate (FD) relative percent difference (RPD) was >35%. No specific FD QC acceptance criteria are currently in place. No sample data will be qualified as a result.

No other specific issues were identified which affect data quality.

Data Validation Summary

Bata Tanaan	, our currency
Site/Project: 506/5: te/05 Project/Task #: 98046.02. Q. Q.	# of Samples: 59 Matrix: Soil/agueus/ER)
AR/COC #:609379, 386, 381, 382	Laboratory Sample IDs: 1557/8-04 Horn - 020; 155722-
Laboratory: GEL	001 Haru -020; 155 725-00) thru - 48;
SDG#: 1 55718	155733-001 (EB).

		Analysis												
QC Element		Org	anics	14		Inorg	ganics							
	voc svoc		Pesticide/ HPLC PCB (HE)		ICP/AES GFAA/ AA		CVAA (Hg) CN		RAD	Other				
1. Holding Times/Preservation														
2. Calibrations														
3. Method Blanks		į	1						_					
4. MS/MSD				A				-						
5. Laboratory Control Samples					•					7				
6. Replicates				}			V							
7. Surrogates														
8. Internal Standards														
9. TCL Compound Identification				. /					\					
10. ICP Interference Check Sample														
11. ICP Serial Dilution														
12. Carrier/Chemical Tracer Recoveries														
13. Other QC							NA							

J =	Estimated	Check (√)	=	Acceptable			·
ប =	Not Detected	Shaded Cells	=	Not Applicable (also "NA")			
UJ =	Not Detected, Estimated	NP	=	Not Provided			
R =	Unusable	Other:			Reviewed By: Name Solvent	Date: _	3-26

Inorganic Metals

Site/Project:	m/	sife	105	A	R/COC i	693	79,30	80, 38	, 382	La	boratory	Sample	IDs:	55	7/8 -	/	thru	-626		
Laboratory:	LEL.			SI	OG #: <u>/</u>	557/8	•													
Methods: EE	797	47/ 1	g (CV	44)																
# of Samples:	20			Matrix:	Soil					Ba	atch #s:	503	137							
CAS #/			Site OS AR/COC #:6 9379, 380, 381, 382 Laboratory Sample IDs: 557/8 Hru - 626																	
Analyte	TAL	ICV	CCV	ICB	ССВ	Method Blanks	LCS	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilu- tion	Field Dup. RPD	Equip. Blanks	Field Blanks		
7429-90-5 Al																				
7440-39-3 Ba																				
7440-41-7 Be																				
7440-43-9 Cd 7440-70-2 Ca	-														_					
7440-47-3 Cr										-		-								
7440-48-4 Co																				
7440-50-8 Cu																				
7439-89-6 Fe		-																		
7439-95-4 Mg																				
7439-96-5 Mn							ļ													
7440-02-0 Ni 7440-09-7 K				 								<u> </u>								
7440-09-7 K					 														 	
7440-23-5 Na							1			<u> </u>										
7440-62-2 V																				
7440-66-6 Zn																				
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7439-92-1 Pb					-	:	-			 			 							
7782-49-2 Se 7440-38-2 As							-		 	 				<u> </u>	-					
7440-36-0 Sb	_			+						 				·				<u> </u>		
7440-28-0 TI																				
									_				/					-		
7439-97-6 Hg	~						<u> </u>			1	LV.			NA		×		NA		
Cyanide CN							 	1		<u> </u>		<u> </u>								
	 																			
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		1	<u> </u>							<u> </u>		1	155 22 2							
Notes: Shade Comments:	od rows a	re RCRA	metals. S	olidis-to-ad RPD	SS S	nversion: m	ıg/kgr≃μ	g4)]:g/g	(/g) x (sam											
	K	p(~	4) K	PD <	35%	(NA)	-			R	eviewed	1 By: 💋	e/m	ref e	Sal	mas		Date	3-	2-9

B-14

Inorganic Metals

 Site/Project: SNX/Site 195
 AR/COC #: 69371380, 381, 382 Laboratory Sample IDs: 155728-001
 Heru -02.

 Laboratory: 6-FC
 SDG #: 155728

 Methods: 69371380, 381, 382 Laboratory Sample IDs: 155728-001
 Heru -02.

 # of Samples: 20 Matrix: Soil Batch #s: 5-3143 QC Element CAS #/ Serial Field **Analyte** Rep. ICS Equip. Field Method LCSD MSD MSD TAL CCB LCS LCSD MS Dilu-**ICV** CCV ICB Dup. RPD RPD RPD AB Blanks Blanks Blanks RPD tion 7429-90-5 Al 7440-39-3 Ba 7440-41-7 Be 7440-43-9 Cd 7440-70-2 Ca 7440-47-3 Cr 7440-48-4 Co 7440-50-8 Cu 7439-89-6 Fe 7439-95-4 Mg 7439-96-5 Mn 7440-02-0 Ni 7440-09-7 K 7440-22-4 Ag 7440-23-5 Na 7440-62-2 V 7440-66-6 Zn 7439-92-1 Pb 7782-49-2 Se 7440-38-2 As 7440-36-0 Sb 7440-28-0 TI 7439-97-6 Hg Cvanide CN

Notes: Shaded rows are RCRA metals. Solids-to-aqueous conversion: mg/kg = \mug/g: [(\mug/g) x (sample mass {g} / sample vol. {ml}) x (1000 ml / 1 liter)] / Dilution Factor = \mug/1

Comments:

Reviewed By Date: 32-4

Inorganic Metals Site/Project: SNL/Site/OS AR/COC #: 64379, 380, 381, 382. Laboratory Sample IDs: 155725-651 Hru -48.

Laboratory: (-EL SDG #: /55725

Methods: FPA 747/A (CVAA)

of Samples: 18 Matrix: 5-:/

Batch #s: 563/48 QC Element CAS #/ Serial Field **Analyte** LCSD ICS Method MSD Rep. Equip. Field TAL LCS LCSD MSD **ICV** CCV **ICB** CCB MS Dilu-Dup. RPD RPD Blanks RPD AB Blanks Blanks RPD tion 7429-90-5 Al 7440-39-3 Ba 7440-41-7 Be 7440-43-9 Cd 7440-70-2 Ca 7440-47-3 Cr 7440-48-4 Co 7440-50-8 Cu 7439-89-6 Fe 7439-95-4 Mg 7439-96-5 Mn 7440-02-0 Ni 7440-09-7 K 7440-22-4 Ag 7440-23-5 Na 7440-62-2 V 7440-66-6 Zn 7439-92-1 Pb 7782-49-2 Se 7440-38-2 As 7440-36-0 Sb 7440-28-0 TI NA 7439-97-6 Hg Cyanide CN Notes: Shaded rows are RCRA metals. Solids-to-aqueous conversion: mg/kg = \mu g/g: [(\mu g/g) x (sample mass {g} / sample vol. {ml}) x (1000 ml/1 liter)] / Dilution Factor = \mu g/l

Reviewed By: David Schwert Date: 3-2-06

Inorganic Metals Site/Project: SNL / Site / 05 AR/COC #: 6 9 77 9 , 3 80 , 381 , 382 Laboratory Sample IDs: 1 5 5 7 3 3 - cus / [EB]

Laboratory: CEL SDG #: 1 5 5 7 3 3

Methods: EPA 747 0 A (CV4A) Batch #s: 503247 # of Samples: **QC** Element CAS #/ Serial Field Analyte LCSD MSD Rep. ICS Equip. Field Method LCSD MSD TAL CCB LCS MS Dilu-**ICV** CCV ICB Dup. RPD RPD RPD **Blanks** AB Rlanks Blanks tion RPD 7429-90-5 Al 7440-39-3 Ba 7440-41-7 Be 7440-43-9 Cd 7440-70-2 Ca 7440-47-3 Cr 7440-48-4 Co 7440-50-8 Cu 7439-89-6 Fe 7439-95-4 Mg 7439-96-5 Mn 7440-02-0 Ni 7440-09-7 K 7440-22-4 Ag 7440-23-5 Na 7440-62-2 V 7440-66-6 Zn 7439-92-1 Pb 7782-49-2 Se 7440-38-2 As 7440-36-0 Sb 7440-28-0 TI 7439-97-6 Hg Cvanide CN

Notes: Shaded rows are RCRA metals. Solids-to-aqueous conversion: mg/kg = \mug/g: [(\mug/g) x (sample mass {g} / sample vol. {ml}) x (1000 ml/1 liter)] / Dilution Factor = \mug/l

Comments:

Reviewed By: Selvent Date: 3-2-06

Contract Verification Review (CVR)

Project Leader	LANGKOPF	Project Name	SITE 105	Case No.	98046_02.02.09
AR/COC No.	609379, 609380, 609381 & 609382	Analytical Lab	GEL	SDG No.	155718

In the tables below, mark any information that is missing or incorrect and give an explanation.

1.0 Analysis Request and Chain of Custody Record and Log-In Information

Line		Com	olete?		Reso	lved?
No.	Item	Yes	No	If no, explain	Yes	No
1.1	All items on COC complete - data entry clerk initialed and dated	X				
1.2	Container type(s) correct for analyses requested	X				
1.3	Sample volume adequate for # and types of analyses requested	Х				
1,4	Preservative correct for analyses requested	X				
1.5	Custody records continuous and complete	X	,			
1,6	Lab sample number(s) provided and SNL sample number(s) cross referenced and correct	X				
1.7		X				
1.7	Date samples received Condition upon receipt information provided	X				

2.0 Analytical Laboratory Report

Line		Com	olete?		Reso	lved?
No.	Item	Yes	No	If no, explain	Yes	No
2.1	Data reviewed, signature	X				
2.2	Method reference number(s) complete and correct	X		·		
2.3	QC analysis and acceptance limits provided (MB, LCS, Replicate)	X				
2.4	Matrix spike/matrix spike duplicate data provided (if requested)	N/A				
2,5	Detection limits provided; PQL and MDL (or IDL), MDA and Lo	X				
2.6	QC batch numbers provided	X				
2.7	Dilution factors provided and all dilution levels reported	X				
2.8	Data reported in appropriate units and using correct significant figures	X				
2.9	Radiochemistry analysis uncertainty (2 sigma error) and tracer recovery (if	N/A				
	applicable) reported					
2.10	Narrative provided	X				
2.11	TAT met	X				
2.12	Hold times met	X				
2,13	Contractual qualifiers provided	X				
2.14	All requested result and TIC (if requested) data provided	X				

Contract Verification Review (Continued)

3.0 Data Quality Evaluation

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Yes	No	If no, Sample ID No./Fraction(s) and Analysis
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N/A		
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Contract Verification Review (Continued)

4.0 Calibration and Validation Documentation

4.0 Calibration and Validation Documentation			
Item	Yes	No	Comments
4.1 GC/MS (8260, 8270, etc.)	-		
a) 12-hour tune check provided	N/A		
a, is available brought from			
	ļ		
b) Initial calibration provided	N/A	ļ	
c) Continuing calibration provided	N/A		
	37/4	ļ	
d) Internal standard performance data provided	N/A		
		İ	
e) Instrument run logs provided	N/A		
4.2 GC/HPLC (8330 and 8010 and 8082)		1	,
a) Initial calibration provided	· N/A		
b) Continuing calibration provided	N/A		
o) Community contractor provided			
c) Instrument run logs provided	N/A		
	1		
4.3 Inorganics (metals)			
a) Initial calibration provided	x		
a) initial canoration provided	_ ^		
b) Continuing calibration provided	х		
o) Commany canonauou province			
c) ICP interference check sample data provided	N/A		
o) 101 million value ampro ama province			
d) ICP serial dilution provided	N/A		
e) Instrument run logs provided	х		
4.4 Radiochemistry	<u> </u>		
·	N/A		
a) Instrument run logs provided	INA		

Contract Verification Review (Concluded)

5.0 Problem Resolution

Summarize the findings in the table below. List only samples/fractions for which deficiencies have been noted.

Sample/Fraction No.	Analysis	Problems/Comments/Resolutions
·		
·		
		·· .
Were deficiencies unresolved? Yes	No	
Based on the review, this data package is	complete. Yes	No
If no, provide: nonconformance report of	r correction request number	and date correction request was submitted:
Reviewed by: 1) , Palex	Date:_	<u>2-27-06</u> Closed by:Date:

Site: Site 105						AR/C	OC: 6	<u>09383</u>	,521						Inorg	anic	
					M	ethod	/CAS	Numi	oer (A	nalys	s/Ana	alyte)					
Sample ID	EPA7470A/7471A (CVAA):	7439-97-6 (Hg)															
Sample ID 073916-002 105-EB-12	 	UJ,B3	!		-	-			}		 			ļ			
0/39/0-002 100-65-12		00,00			-		-	 				-					╁
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Validated By:

Mr. David Schwent

Date: 03/10/06

Analytical Quality Associates, Inc.



616 Maxine NE Albuquerque, NM 87123 Phone: 505-299-5201

Fax: 505-299-6744 Email: minteer@aol.com

Memorandum

DATE:

March 10, 2006

TO:

File

FROM:

David Schwent

SUBJECT:

Inorganic Data Review and Validation - SNL

Site: Site 105

AR/COC: 609383 and 609521 SDG: 156189, 156194, and 156195

Laboratory: GEL

Project/Task: 98046.02.02.09

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 1.

Summary

The samples were prepared and analyzed with accepted procedures using method EPA7470A/7471A (CVAA). Problems were identified with the data package that result in the qualification of data.

CVAA Analysis (Batch 504383):

<u>Blanks</u>: Hg was detected in the continuing calibration blanks (CCBs) at negative concentrations with absolute values > the detection limit (DL) but < the reporting limit (RL). The associated result of Sample 156195-001 was a non-detects (ND) and will be qualified "UJ,B3."

Data are acceptable. QC measures appear to be adequate. The following sections discuss the data review and validation. Due to the matrix, an LCSD analysis was performed instead of MS/MSD and laboratory replicate analyses (see e-mail, dated 1-20-06). Later, MS/MSD and laboratory replicate analyses were performed on samples from the COCs and original soil field sample batches of this package. The MS/MSD and laboratory replicate analyses were performed on the samples beyond the method specified holding time, but within 2X the holding time, and no sample data will be qualified as a result, based on professional judgment. The MS/MSD and laboratory replicate analyses performed on Samples 157013-002 and -003 of SDG 157013 apply to the soil field samples of this package.

Holding Times/Preservation

<u>CVAA Analysis (All Batches)</u>: All samples were analyzed within the prescribed holding times and properly preserved.

Calibration

CVAA Analysis (All Batches): All initial and continuing calibration QC acceptance criteria were met.

Blanks

<u>CVAA Analysis (Batch 504383)</u>: No target analytes were detected in the blanks, except as noted above in the summary section.

CVAA Analysis (All Other Batches): No target analytes were detected in the blanks.

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)

CVAA Analysis (Batch 504383): All LCS/LCSD OC acceptance criteria were met.

<u>CVAA Analysis (All Other Batches)</u>: All LCS/LCSD QC acceptance criteria were met. It should be noted that the MSD analyses were used as measures of laboratory precision due to low indigenous concentration of the target analyte in the sample used for the QC analyses.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

<u>CVAA Analysis (Batch 504383)</u>: No MS/MSD analyses were performed. No sample data will be qualified as a result.

CVAA Analysis (All Other Batches): All MS/MSD QC acceptance criteria were met.

Replicates

<u>CVAA Analysis (Batch 504838)</u>: No laboratory replicate analysis was performed. The LCSD analysis was used as a measure of precision. No sample data will be qualified as a result.

<u>CVAA Analysis (All Other Batches)</u>: All laboratory replicate QC acceptance criteria were met. It should be noted that the MSD analyses were used as measures of laboratory precision due to low indigenous concentration of the target analyte in the sample used for the OC analyses.

ICP Serial Dilution

CVAA Analysis (Batch 504838): No serial dilution analysis was performed. No sample data will be qualified as a result.

CVAA Analysis (All Other Batches): All serial dilution QC acceptance criteria were met,

ICP Interference Check Sample (ICS)

CVAA Analysis (All Batches): No ICS analysis was required by this method.

Detection Limits/Dilutions

CVAA Analysis (Batch 504377): All detection limits were properly reported. Sample 156189-002 was diluted 10X; Samples -001, -004 thru -010, -012 thru -016, -018, and -020 were diluted 50X, and Samples -003 and -011 were diluted 100X due to over-range concentrations of the target analyte. No other samples required dilution.

CVAA Analysis (All Other Batches): All detection limits were properly reported. No samples required dilution.

Other QC

<u>CVAA Analysis (All Batches)</u>: No field blanks (FBs) were submitted on the ARCOCs. It should be noted that the field duplicate (FD) relative percent differences (RPDs) were <35%. No specific FD QC acceptance criteria are currently in place. No sample data will be qualified as a result.

No other specific issues were identified which affect data quality.

Data Validation Summary

Site/Project: SNL /5/72 105 Project/Task #: 98046.62.02.02	7.40
AR/COC #: 609 383, 521	I showstone Commiss IDes
	SB/9U-1201
Laboratory: GEL	15017 com 186195-00)
SDG #: 156189	
550 11.	

					Analy	ysis				
QC Element		Org	anics			Inor	ganics			
40 2 .0	voc	svoc	Pesticide/ PCB	HPLC (HE)	ICP/AES	GFAA/ AA	CVAA (Hg)	CN	RAD	Other
. Holding Times/Preservation										
2. Calibrations							l			
3. Method Blanks							UJ, B3			
4. MS/MSD				1			/		1	
5. Laboratory Control Samples										7
6. Replicates			\\ <u>'</u>		Marka er 1775 bereiture	Paratestas in a complete com			Y	
7. Surrogates			33.55 YA VA	J-					\ /	
8. Internal Standards										
9. TCL Compound Identification										
10. ICP Interference Check Sample										
11. ICP Serial Dilution										1
12. Carrier/Chemical Tracer Recoveries										
13. Other QC							NA			1

= Estimated	Check (√) =	Acceptable						
Other QC						NΆ		1
Carrier/Chemical Tracer Recoveries								
CP Serial Dilution		STATE AND COME	1078275.A.T. 3-A	PASSES A CONTRA		W. N. W. W. W. W.	- Устройом этаргар градов. И И 4-гийн этарган тагаалга	

B-12

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Site/Project: Staboratory:(Methods: # of Samples:	SNL	/sit	2 10	5 A	R/COC i	<u>: 609</u>	383	, 52	/	La	boratory	Sample	IDs:/	56	189	-00/	/ H)	ru - c	320	
Laboratory: _/	3E	<u> </u>		SI	OG #:	1561	89													
Mathada: 6	DA	74	17//	4	1/4	4).	,													
Methods:	7/1		///			1):							. 1 4-	,						
# of Samples:		<u> </u>		Matrix:	، کے	<u>>i/</u>				Ba	atch #s:	5	07_	//						
CAS #/											Elemer						,			
						30.451			T CCD			1460	D.,	100	Serial	Field	Wanda.	Field		
Analyte	TAL	icv	CCV	ICB	CCB	Method Blanks	LCS	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Dilu- tion	Dup. RPD	Equip. Blanks	Blanks		
7429-90-5 Al																				
7440-39-3 Ba													,							
7440-41-7 Be																				
7440-43-9 Cd																				
7440-70-2 Ca																		ļ		ļ
7440-47-3 Cr												ļ								 -
7440-48-4 Co	ļ											 								
7440-50-8 Cu	 						}					 								
7439-89-6 Fe	<u> </u>						 				ļ									
7439-95-4 Mg	-		1						 -											
7439-96-5 Mn	 						 				-									
7440-02-0 Ni 7440-09-7 K	 																			
7440-09-7 K 7440-22-4 Ag				_					- -									 		-
7440-22-4 Ag 7440-23-5 Na	1																			
7440-62-2 V	-	 					-				_							 		
7440-66-6 Zn	 								1			1								
7410-00-0 222	-	 																		
7439-92-1 Pb	-		1		·															
7782-49-2 Se																				
7440-38-2 As																				
7440-36-0 Sb																				
7440-28-0 TI																				
		_		<u> </u>								**					,			
7439-97-6 Hg							<u>س</u>			V		#2	<u></u>	NA		X	/	NA		
Cyanide CN																				
										<u> </u>							ļ			
						<u> </u>	<u> </u>			ļ									ļ	
	1		ļ								ļ	-	-						 	
				<u> </u>									100 455				<u></u>			
Notes: Shad	ed rows a	re RCRA	metals. Se	olids-to-ac	queous co	nversion: n	ıg / kg ≖ μ	g/g: [(µg	;/g) x (sam	iple mass	; {g} / sam	mpie vol. {i	ml}) x (10	00 ml / 1 l	iter)] / Dil	ution Facto	r=μg/l			

Comments: # FD (007) RPD >35%.

*** MS (M6D RPD word as measure of procision.

Reviewed By: Award Comments: 3-10-06

Inorganic Metals Site/Project: <u>Stx / 5: to 105</u> AR/COC #: <u>659383, 521</u> Laboratory Sample IDs: <u>156194-001</u> and -002

Laboratory: <u>CEL</u> SDG #: <u>156194</u>

Methods: <u>EPA 7471A (CVAA)</u> Batch #s: 534380 # of Samples: QC Element CAS #/ Field Serial Analyte Method LCSD MSD Rep. **ICS** Equip. Field TAL **ICV** CCV **ICB** CCB LCS LCSD MS MSD Dilu-Dup. RPD Blanks RPD RPD AB Blanks Blanks tion RPD 7429-90-5 AI 7440-39-3 Ba 7440-41-7 Be 7440-43-9 Cd 7440-70-2 Ca 7440-47-3 Cr 7440-48-4 Co 7440-50-8 Cu 7439-89-6 Fe 7439-95-4 Mg 7439-96-5 Mn 7440-02-0 Ni 7440-09-7 K 7440-22-4 Ag 7440-23-5 Na 7440-62-2 V 7440-66-6 Zn 7439-92-1 Pb 7782-49-2 Se 7440-38-2 As 7440-36-0 Sb 7440-28-0 T1 1/4 NA 7439-97-6 Hg Cyanide CN Notes: Shaded rows are RCRA metals. Solids-to-aqueous conversion: mg/kg = \mug/g: [(\mug/g) x (sample mass {g} / sample vol. {ml}) x (1000 ml / 1 liter)] / Dilution Factor = \mug/l Comments: \$ =0 (001) RPD < 35% (NA) ments: * FD (001) RPD < 35% (NA),

** MOTMOD RPD Used as a nessure & policies, Reviewed By: Navel Schwart Date: 3-16-06.

		,							Ino	rgani	c Meta	als							
Site/Project:	SNL	Site	2 10	<u>5</u> A	R/COC #	609	383	50	!	_ La	boratory	Sample :	IDs:/	156	19	5-0	207 (ER)	
Laboratory:(SEL	· 		SI	DG #:	156	195						_						
Methods:	PA	747	DA	(CV	MA)														
# of Samples:				Matrix:						Be	tch #s:	50	>4.	38	?				
# Of Gampies.																			
CAS #/										QC E	lemen	ıt							
													_		Serial	Field	- .		
Analyte	TAL	ICV	CCV	ICB	CCB	Method Blanks	LCS	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Dilu- tion	Dup. RPD	Equip. Blanks	Fleld Blanks	
7429-90-5 Al																			
7440-39-3 Ba																			
7440-41-7 Be					1														
7440-43-9 Cd																			
7440-70-2 Ca																			
7440-47-3 Cr																			
7440-48-4 Co																			
7440-50-8 Cu																			
7439-89-6 Fe							1												
7439-95-4 Mg																			
7439-96-5 Mn				<u> </u>															
7440-02-0 Ni																			
7440-09-7 K																			
7440-22-4 Ag																			
7440-23-5 Na																			
7440-62-2 V																			
7440-66-6 Zn																			
7439-92-1 Pb																			
7782-49-2 Se																			
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7439-97-6 Hg	V	1 0	V	V	-0.06			1	V	NA	/ //न	1/1	NA	NA	MA	NX	NA	NA	
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Cyanide CN																			
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Notes Chad		- DODA		NJ- 40 O		nuce-lone of	a/kanu	a / a · I/ua	/ m) w (com	mle mass	Set / sam	nle vol. Je	133 v (10)	00 ml / 1 1	terl / Dil	stion Rado	= 110/1		

Comments:

Contract Verification Review (CVR)

Project Leader Langkopf	Project Name Site 105	Case No. 98046_02.02.09
AR/COC No. 609383, 609521	Analytical Lab <u>GEL</u>	SDG No. 156189

In the tables below, mark any information that is missing or incorrect and give an explanation.

1.0 Analysis Request and Chain of Custody Record and Log-In Information

Line		Comp	lete?			lved?
No.	Item	Yes	No	If no, explain	Yes	No .
1,1	All items on COC complete - data entry clerk initialed and dated	X				
1,2	Container type(s) correct for analyses requested	X				
1,3	Sample volume adequate for # and types of analyses requested	X				
1.4	Preservative correct for analyses requested	X				
1,5	Custody records continuous and complete	×				
1.6	Lab sample number(s) provided and SNL sample number(s) cross referenced and	×				
	correct					<u> </u>
1.7	Date samples received	X				
1.8	Condition upon receipt information provided	X				

2.0 Analytical Laboratory Report

Line		Comp	lete?		Resc	Sbevio
No.	Item	Yes	No	If no, explain	Yes	No
2.1	Data reviewed, signature	X				
2,2	Method reference number(s) complete and correct	X				
2.3	QC analysis and acceptance limits provided (MB, LCS, Replicate)	X				
2.4	Matrix spike/matrix spike duplicate data provided (if requested)	N/A		Batch QC is LCS/LCS Dup rather than MS/Dup. Re- analysis of one non-diluted sample will be performed.		
2.5	Detection limits provided; PQL and MDL (or IDL), MDA and Lo	X				
2,6	QC batch numbers provided	X				
2.7	Dilution factors provided and all dilution levels reported	X				
2.8	Data reported in appropriate units and using correct significant figures	X		·		
2.9	Radiochemistry analysis uncertainty (2 sigma error) and tracer recovery (if applicable) reported	NA				
2,10	Narrative provided	X				
2,11	TAT met	X				
2.12	Hold times met	X				
2.13	Contractual qualifiers provided	X				
2.14	All requested result and TIC (if requested) data provided	X				

Contract Verification Review (Continued)

4.0 Calibration and Validation Documentation

Item	Yes	No	Comments
4.1 GC/MS (8260, 8270, etc.)	N/A	-	
a) 12-hour tune check provided			
			•
b) Initial calibration provided	N/A		
c) Continuing calibration provided	N/A		
d) Internal standard performance data provided	N/A		
e) Instrument run logs provided	N/A		
4.2 GC/HPLC (8330 and 8010 and 8082)	N/A		
a) Initial calibration provided			
b) Continuing calibration provided	N/A		
c) Instrument run logs provided	N/A		
4.3 Inorganics (metals)	×		
a) Initial calibration provided			
b) Continuing calibration provided	×		
c) ICP interference check sample data provided	N/A		
d) ICP serial dilution provided	N/A	· ·	
e) Instrument run logs provided	X		
4.4 Radiochemistry	NA	·	
a) Instrument run logs provided			

					M	AR/ethod	Numl			s/Ana	alyte)		-	inorg	
Sample ID	EPA7470A/7471A (CVAA):	7439-97-6 (Hg)													
074234-002 105-BH-73-0-S		J							-			_			
074235-002 105-BH-73-2-S		J				-	 					-			-
075604-002 105-BH-73-4-S		J	·							-	-	 	 		
075605-002 105-BH-73-4-SD		J					 		-			-			
075606-002 105-BH-148-0-S		J					 1						-		
075607-002 105-BH-148-2-S		J					 		·					†	-
075608-002 105-BH-148-4-S		UJ,B3									ļ	-		-	-
075609-002 105-BH-149-0-S		J													
075610-002 105-BH-149-2-S		J													
075611-002 105-BH-149-2-SD		J										 		-	
075612-002 105-BH-149-4-S		J									-		·		
075613-002 105-BH-150-0-S		J													<u> </u>
075614-002 105-BH-150-2-S		J									1				-
075616-002 105-BH-150-4-S		J													
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Mr. David Schwent

Analytical Quality Associates, Inc.



616 Maxine NE Albuquerque, NM 87123 Phone: 505-299-5201

Fax: 505-299-6744 Email: minteer@aol.com

Memorandum

DATE:

March 11, 2006

TO:

File

FROM:

David Schwent

SUBJECT:

Inorganic Data Review and Validation - SNL

Site: Site 105

AR/COC: 609522 and 609523 SDG: 156573 and 156578

Laboratory: GEL

Project/Task: 98046.02.02.09

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 1.

Summary

The samples were prepared and analyzed with accepted procedures using method EPA7470A/7471A (CVAA). Problems were identified with the data package that result in the qualification of data.

CVAA Analysis (Batch 505972):

<u>Blanks</u>: Hg was detected in the continuing calibration blanks (CCBs) at negative concentrations with absolute values > the detection limit (DL) but < the reporting limit (RL). The associated result of Sample 156573-007 was a non-detect (ND) and will be qualified "UJ,B3."

CVAA Analysis (Batch 505972):

<u>Replicates</u>: For Hg, the laboratory replicate relative percent difference (RPD) (76%) was >35%. All associated sample results, except the result for Sample 156573-007, were detects and will be qualified "J"; the result for -007 was a ND and will be qualified "UJ."

Data are acceptable. QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times/Preservation

<u>CVAA Analysis (All Batches)</u>: All samples were analyzed within the prescribed holding times and properly preserved.

Calibration

CVAA Analysis (All Batches): All initial and continuing calibration QC acceptance criteria were met.

<u>Blanks</u>

CVAA Analysis (Batch 505972): No target analytes were detected in the blanks, except as noted above in the summary section and the following. Hg was detected in the CCBs at negative concentrations with absolute values > the DL but < the RL. However, all associated sample results, except for the result of Sample 156573-007, were detects > the 5X the DL and will not be qualified.

CVAA Analysis (Batch 505975): No target analytes were detected in the blanks.

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)

CVAA Analysis (Batch 505972): All LCS QC acceptance criteria were met.

CVAA Analysis (Batch 505975): All LCS/LCSD QC acceptance criteria were met.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

CVAA Analysis (Batch 505972): All MS/MSD QC acceptance criteria were met, except the following. The MS/MSD RPD was >35%. However, the laboratory replicate RPD was used as a measure of precision due to the relatively high concentrations of the target analyte in the samples used QC. No sample data will be qualified as a result.

<u>CVAA Analysis (Batch 505975)</u>: No MS/MSD analyses were performed. No sample data will be qualified as a result.

Replicates

<u>CVAA Analysis (Batch 505972)</u>: All laboratory replicate QC acceptance criteria were met, except as noted above in the summary section.

<u>CVAA Analysis (Batch 505975)</u>: No laboratory replicate analysis was performed. The LCSD was used as a measure of precision. No sample data will be qualified as a result.

ICP Serial Dilution

CVAA Analysis (505972): All serial dilution QC acceptance criteria were met.

<u>CVAA Analysis (Batch 505975)</u>: No serial dilution analysis was performed. No sample data will be qualified as a result.

ICP Interference Check Sample (ICS)

CVAA Analysis (All Batches): No ICS analysis was required by this method.

Detection Limits/Dilutions

CVAA Analysis (Batch 505972): All detection limits were properly reported. Samples 156573-008 and -010 were diluted 10X, Sample -011 was diluted 100X, Samples -002, -003, -005, and -012 were diluted 200X, Sample -004 was diluted 400X, and Sample -001 was diluted 2000X due to over-range concentrations of the target analyte. No other samples required dilution.

<u>CVAA Analysis (Batch 505975)</u>: All detection limits were properly reported. No samples required dilution.

Other QC

CVAA Analysis (All Batches): No field blanks (FBs) were submitted on the ARCOCs. It should be noted that one or more field duplicate (FD) relative percent differences (RPDs) were >35%. No specific FD QC acceptance criteria are currently in place. No sample data will be qualified as a result.

No other specific issues were identified which affect data quality.

Site/Project: SNL / 5: to 105 Project/Task #: 98046.62.02.09 # of Samples: 15 Matrix: 507 / aqueous (EB)

AR/COC #: 609522, 523

Laboratory: (-EL
SDG #: 156573

	Analysis													
QC Element		Org	anics			Inor	D.D	0.1						
	voc	SVOC	Pesticide/ PCB	HPLC (HE)	ICP/AES	GFAA/ AA	CVAA (Hg)	CN	RAD	Other				
1. Holding Times/Preservation							/							
2. Calibrations							4							
3. Method Blanks							UJ,83							
4. MS/MSD			1				<i>'</i> .		1/					
5. Laboratory Control Samples				7			1							
6. Replicates			\parallel \times 7				2,112		\ \					
7. Surrogates										e.				
8. Internal Standards									\setminus					
9. TCL Compound Identification									\					
10. ICP Interference Check Sample									\	\				
11. ICP Serial Dilution														
12. Carrier/Chemical Tracer Recoveries														
13. Other QC														

J :	= Estima	ited	Check $()$	=	Acceptable				
U:	= Not Do	etected	Shaded Cells	=	Not Applicable (also "NA")		_		
UJ	= Not De	etected, Estimated	NP	=	Not Provided		// -//	Chwent	- 11
R	= Unusa	ble	Other:			Reviewed By:	daved	chwent	Date: 5-1/-06

_	SNL Inor Site/Project: Site 65 AR/COC #: 609 522, 523 aboratory: SDG #: 156573								rganic Metals											
Site/Project:	Soft	- 10	55	A	R/COC #	:60	75	22,	523	L	boratory	Sample	Ds:] _	565	57.	3 -0	ol to	hru-	014	
Laboratory.	()	51		Sī	OG #:	1560	772					•								
2.6-di - de	S M		471	1		1)				_										
Methods:	VA	441	7//	40	مهرس	·														
# of Samples:		14_		Matrix:	Soi	<u> </u>				B	atch #s:	50	59	72						
										QC F	Elemer	nt								
CAS #/			1					т	1 .			16								
Analyte		Y C. T.		YCTD	CCD	Method	1.00	I COD	LCSD	140	Men	MSD	Rep.	ICS	Serial	Field	Equip.	Field		
	TAL	ICV	CCV	ICB	CCB	Blanks	LCS	LCSD	RPD	MS	MSD	RPD	RPD	AB	Dilu- tion	Dup. RPD	Blanks	Blanks		
7429-90-5 Al																				
7440-39-3 Ba																				
7440-41-7 Be																				
7440-43-9 Cd	-																			
7440-70-2 Ca 7440-47-3 Cr																				
7440-48-4 Co	+									 										
7440-50-8 Cu	 							 			 -									
7439-89-6 Fe																				
7439-95-4 Mg																				
7439-96-5 Mn																				
7440-02-0 Ni																				
7440-09-7 K	·	ļ																		
7440-22-4 Ag 7440-23-5 Na										 	·						-			
7440-23-3 N8 7440-62-2 V	 							 		 	-			ļ			 			
7440-66-6 Zn	+	-						 		 										
7439-92-1 Pb																				
7782-49-2 Se									ļ											
7440-38-2 As			ļ					ļ	 	ļ				ļ						
7440-36-0 Sb				1				-		1				ļ						
7440-28-0 TI	 						 	-	ļ	 			,							
7439-97-6 Hg	V		V	1600	-0103	/	V	WA.	1/2	/		99	76	NA		XX		NA		
Cyanide CN			 																	
					1															
					ļ															
27	. 1	DOD :		11.3 - 4			- /lea ··	7/24 ((:::	(=) = (===		(=> /====	mla mal. Co	-133 (10)	001 / 1 1	March 1 (172"	odina Ta di				
Notes: Shad Comments:	ed rows a ** E	m RCRA MP V Jgl	metais. Se Used (Hy	oiids-to-ac QS M OMC	opera Approximate of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the secon	of produced some source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the source of the	unple wyle	g/g; l(µg	(/g) X(san	apie mass R	e (g) / sam	ipie vol. {n l By: <u>/</u>	lav	W m1/11	ner)j / Dil Schi	weri	r = μg/1	Date:	3-	-//-at

Migh Hy and of the sample.

** FD (oot; 010) RPDS 735%.

Inorganic Metals Site/Project: SUL / Site / 65 AR/COC #: 609512, 523 Laboratory Sample IDs: 156578-001 [EB]

Laboratory: GEC SDG #: 156578 578 8

Methods: EPR 7470A (CVAA) Batch #s: 505975 # of Samples: **QC Element CAS #/** Serial Field Analyte Method LCSD MSD Rep. ICS Equip. Field LCSD MS MSD **ICV** CCV **ICB** CCB LCS Dilu-Dup. RPD RPD RPD AB Blanks Blanks Blanks RPD tion 7429-90-5 Al 7440-39-3 Ba 7440-41-7 Be 7440-43-9 Cd 7440-70-2 Ca 7440-47-3 Cr 7440-48-4 Co 7440-50-8 Cu 7439-89-6 Fe 7439-95-4 Mg 7439-96-5 Mn 7440-02-0 Ni 7440-09-7 K 7440-22-4 Ag 7440-23-5 Na 7440-62-2 V 7440-66-6 Zn 7439-92-1 Pb 7782-49-2 Se 7440-38-2 As 7440-36-0 Sb 7440-28-0 TI NA NA MA MA WA NA MA 7439-97-6 Hg Cyanide CN

Notes: Shaded rows are RCRA metals. Solids-to-aqueous conversion: mg/kg = µg/g: [(µg/g) x(sample mass {g} / sample vol. {ml}) x (1000 ml/1 liter)] / Dilution Factor = µg/1

Comments:

Reviewed By: Navil Schwart Date: 3-1/-06

Contract Verification Review (CVR)

Project Leader	LANGKOPF	Project Name	SITE 105	Case No.	98046_02.02.09
AR/COC No.	609522 & 609523	Analytical Lab	GEL	SDG No.	156573

In the tables below, mark any information that is missing or incorrect and give an explanation.

1.0 Analysis Request and Chain of Custody Record and Log-In Information

Line		Com	olete?	·	Reso	lved?
No.	Item	Yes	No	If no, explain	Yes	No
1.1	All items on COC complete - data entry clerk initialed and dated	Х				
1,2	Container type(s) correct for analyses requested	X				
1,3	Sample volume adequate for # and types of analyses requested	X				
1.4	Preservative correct for analyses requested	X				
1.5	Custody records continuous and complete	X				
1.6	Lab sample number(s) provided and SNL sample number(s) cross referenced and	X				
	correct		_			
1,7	Date samples received	X				
1.8	Condition upon receipt information provided	X				

2.0 Analytical Laboratory Report

Line		Comp	lete?		Resolve		
No.	Item	Yes	No	If no, explain	Yes	No	
2.1	Data reviewed, signature	X					
2,2	Method reference number(s) complete and correct	X					
2,3	QC analysis and acceptance limits provided (MB, LCS, Replicate)	X					
2.4	Matrix spike/matrix spike duplicate data provided (if requested)	N/A					
2.5	Detection limits provided; PQL and MDL (or IDL), MDA and L _o	X					
2.6	QC batch numbers provided	X				<u> </u>	
2,7	Dilution factors provided and all dilution levels reported	X					
2.8	Data reported in appropriate units and using correct significant figures	X					
2.9	Radiochemistry analysis uncertainty (2 sigma error) and tracer recovery (if applicable) reported	N/A					
2.10	Narrative provided	X					
2.11	TAT met	X					
2,12	Hold times met	X					
2.13	Contractual qualifiers provided	X					
2.14	All requested result and TIC (if requested) data provided	X		ļ .	<u> </u>		

Contract Verification Review (Continued)

3.0 Data Quality Evaluation

3.0 Data Quality Evaluation			
Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
3.1 Are reporting units appropriate for the matrix and meet contract specified or project-specific requirements? Inorganics and metals reported as ppm (mg/liter or mg/Kg)? Tritium reported in picocuries per liter with percent moisture for soil samples? Units consistent between QC samples and sample data	X		
3.2 Quantitation limit met for all samples	X		
Accuracy a) Laboratory control samples accuracy reported and met for all samples	X		
 Surrogate data reported and met for all organic samples analyzed by a gas chromatography technique 	N/A		
c) Matrix spike recovery data reported and met	Х		
3.4 Precision a) Replicate sample precision reported and met for all inorganic and radiochemistry samples		Х	RPD OUTSIDE ACCEPTANCE RANGE FOR SAMPLE REPLICATE
b) Matrix spike duplicate RPD data reported and met for all organic samples	N/A		
3.5 Blank data a) Method or reagent blank data reported and met for all samples	Х		
b) Sampling blank (e.g., field, trip, and equipment) data reported and met	Х		
3.6 Contractual qualifiers provided: "J"- estimated quantity; "B"-analyte found in method blank above the MDL for organic or above the PQL for inorganic; "U"- analyte undetected (results are below the MDL, IDL, or MDA (radiochemical)); "H"-analysis done beyond the holding time	Х		
3.7 Narrative addresses planchet flaming for gross alpha/beta	N/A		
3.8 Narrative included, correct, and complete	Х		
3.9 Second column confirmation data provided for methods 8330 (high explosives) and 8082 (pesticides/PCBs)	N/A		

Contract Verification Review (Continued)

4.0 Calibration and Validation Documentation

### Item 4.1 GC/MS (8260, 8270, etc.) a) 12-hour tune check provided	Yes N/A	No	Comments
	N/A		
a) 12-hour tune check provided	N/A		
b) Initial calibration provided	N/A		
c) Continuing calibration provided	N/A		
d) Internal standard performance data provided	N/A		
e) Instrument run logs provided	N/A		
4.2 GC/HPLC (8330 and 8010 and 8082)			
a) Initial calibration provided	N/A		
•			'
b) Continuing calibration provided	N/A		
c) Instrument run logs provided	N/A		
4.3 Inorganics (metals)			
a) Initial calibration provided	x		
b) Continuing calibration provided	X		
c) ICP interference check sample data provided	N/A		
c) 10. miesterence eneck sample data provided	1412		
d) ICP serial dilution provided	N/A		
	**		
e) Instrument run logs provided	Х		
4.4 Radiochemistry	27/4		
a) Instrument run logs provided	N/A		

Contract Verification Review (Concluded)

5.0 Problem Resolution

Summarize the findings in the table below. List only samples/fractions for which deficiencies have been noted.

Sample/Fraction No.	Analysis	Problems/Comments/Resolutions
_		
Were deficiencies unresolved? Yes	No.	
Based on the review, this data package is co	omplete. Yes	No ·
If no, provide: nonconformance report or c	orrection request number	and date correction request was submitted:
Reviewed by: W. Palon	Date:	3-8-06 Closed by:Date:

Site: Site 105			 			6098							norga	nic	
		 	 Meth	od/C/	AS Nu	mber	(Ana	ysis/ <i>F</i>	nalyt	e)					
Sample ID	EPA7470A/7471A (CVAA):														
Campio is			 												_
	All Acceptance														
	criteria met.														
	No sample data will be														
	qualified.	 													L_
	·	 													-
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Validated By:

Mr. David Schwent

Date: 03/23/06

Analytical Quality Associates, Inc.

616 Maxine NE

Albuquerque, NM 87123 Phone: 505-299-5201 Fax: 505-299-6744 Email: minteer@aol.com

Memorandum

DATE:

March 23, 2006

TO:

File

FROM:

David Schwent

SUBJECT:

Inorganic Data Review and Validation - SNL

Site: Site 105 AR/COC: 609567

SDG: 157647 and 157648

Laboratory: GEL

Project/Task: 98046.02.02.09

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 1.

Summary

The samples were prepared and analyzed with accepted procedures using method EPA7470A/7471A (CVAA). No problems were identified with the data package that result in the qualification of data.

Data are acceptable. QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times/Preservation

<u>CVAA Analysis (All Batches)</u>: All samples were analyzed within the prescribed holding times and properly preserved.

Calibration

CVAA Analysis (All Batches): All initial and continuing calibration QC acceptance criteria were met.

Blanks

CVAA Analysis (All Batches): No target analytes were detected in the blanks.

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)

CVAA Analysis (Batch 510230): All LCS QC acceptance criteria were met.

CVAA Analysis (Batch 510233): All LCS/LCSD QC acceptance criteria were met.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

CVAA Analysis (Batch 510230): All MS/MSD QC acceptance criteria were met.

<u>CVAA Analysis (Batch 510233)</u>: No MS/MSD analyses were performed. No sample data will be qualified as a result.

Replicates

CVAA Analysis (Batch 510230): All laboratory replicate QC acceptance criteria were met, except as noted above in the summary section.

<u>CVAA Analysis (Batch 510233)</u>: No laboratory replicate analysis was performed. The LCSD was used as a measure of precision. No sample data will be qualified as a result.

ICP Serial Dilution

CVAA Analysis (510230): All serial dilution QC acceptance criteria were met.

<u>CVAA Analysis (Batch 510233)</u>: No serial dilution analysis was performed. No sample data will be qualified as a result.

ICP Interference Check Sample (ICS)

CVAA Analysis (All Batches): No ICS analysis was required by this method.

Detection Limits/Dilutions

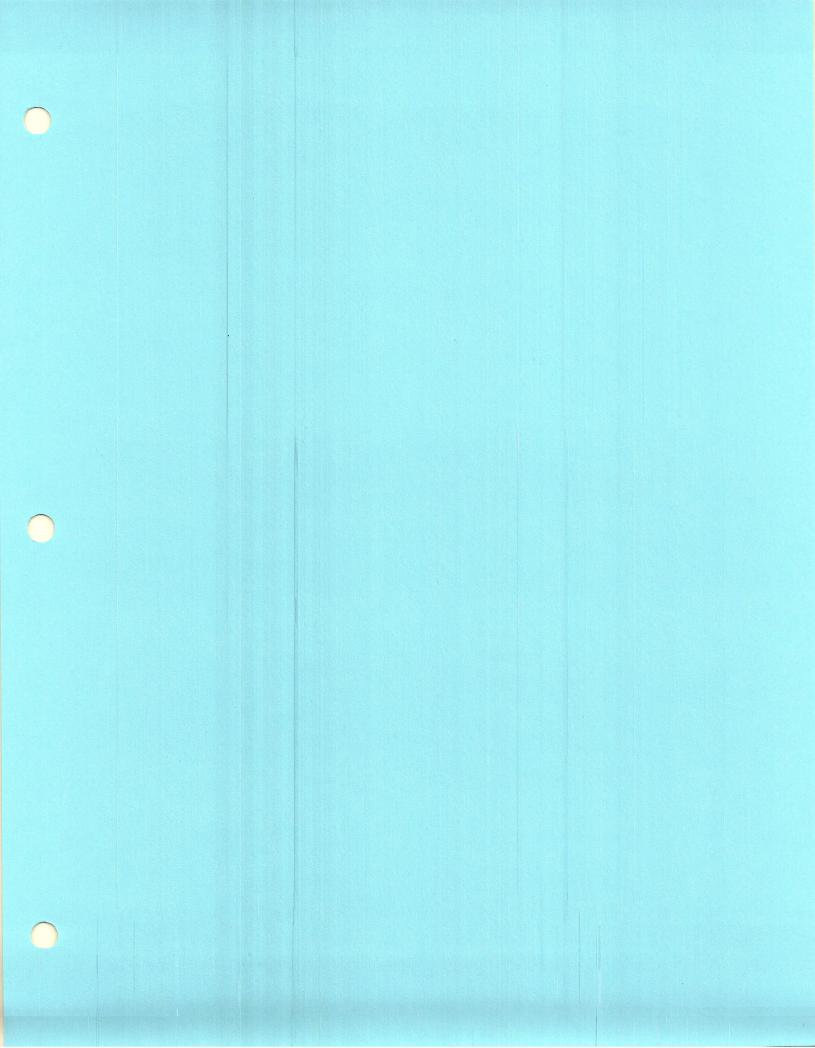
<u>CVAA Analysis (Batch 510230)</u>: All detection limits were properly reported. Samples 157647-003 and -005 were diluted 20X due to over-range concentrations of the target analyte. No other samples required dilution.

<u>CVAA Analysis (Batch 510233)</u>: All detection limits were properly reported. No samples required dilution.

Other QC

CVAA Analysis (All Batches): No field blanks (FBs) were submitted on the ARCOCs. It should be noted that the field duplicate (FD) relative percent difference (RPD) was >35%. No specific FD QC acceptance criteria are currently in place. No sample data will be qualified as a result.

No other specific issues were identified which affect data quality.



Site: BLDG 6536 Characterization	n					T. LIMAN.		COC							Inorg	anic	
				Meth	od/CA	S Nu	mber	(Anal	ysis//	halyt	e)		1	T			
	Metals (EPA6010B):	CVAA (EPA7470A):	CVAA (EPA7471A):													:	
Sample ID																	
	All	All	All										-				
	Acceptance criteria met.	Acceptance criteria met.	Acceptance criteria met.												-		
	No sample data will be	No sample data will be	No sample data will be														
	qualified.	qualified.	qualified.		ļ						ļ		ļ				
										 	<u> </u>		 		 		-
				,									-				
					 							 					
											-			 	†		

Validated By:

Mr. David Schwent

Date: 07/28/05

Analytical Quality Associates, Inc.



616 Maxine NE

Albuquerque, NM 87123 Phone: 505-299-5201 Fax: 505-299-6744

Email: minteer@aol.com

Memorandum

DATE:

July 28, 2005

TO:

File

FROM:

David Schwent

SUBJECT:

Inorganic Data Review and Validation - SNL

Site: BLDG 6536 Characterization

AR/COC: 608368

SDG (LOT) #: F5G080171

Laboratory: STL

Project/Task: 83916.4.5.1

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 1.

Summary

The samples were prepared and analyzed with accepted procedures using method EPA6010B (ICP), EPA7470A (CVAA), and EPA7471A (CVAA). No problems were identified with the data package that result in the qualification of data.

Data are acceptable. QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times/Preservation

All Analyses: All samples were analyzed within the prescribed holding times and properly preserved.

Calibration

All Analyses: All initial and continuing calibration QC acceptance criteria were met.

Blanks

CVAA Analysis (Batch 5192089): No target analytes were detected in the blanks, except the following. Hg was detected in the continuing calibration blank (CCB) at a negative concentration with an absolute value > the detection limit (DL) but < the reporting limit (RL). However, all associated sample results were detects >5X the DL and will not be qualified.

All Other Analyses: No target analytes were detected in the blanks.

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)

All Analyses: All LCS QC acceptance criteria were met. No LCSD analyses were performed. No sample data will be qualified as a result.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

CVAA Analysis (Batch 5192089): All MS QC acceptance criteria were met. It should be noted that the sample concentration was >4X the spike concentration in the MS analysis and, therefore, the MS analysis was not used to evaluate field sample data. No sample data will be qualified as a result. No MSD analyses were performed. The replicate analyses were used as measures of laboratory precision. No sample data will be qualified as a result.

All Other Analyses: All MS QC acceptance criteria were met. No MSD analyses were performed. The replicate analyses were used as measures of laboratory precision. No sample data will be qualified as a result.

Replicates

All Analyses: All replicate QC acceptance criteria were met.

ICP Serial Dilution

CVAA Analysis (Batch 5192089): All serial dilution QC acceptance criteria were met. It should be noted that the serial dilution concentration was <50X the RL in the serial dilution analysis. No sample data will be qualified as a result.

All Other Analyses: All serial dilution QC acceptance criteria were met.

ICP Interference Check Sample (ICS)

ICP Analysis: All ICS AB QC acceptance criteria were met.

All Other Analyses: No ICS analyses were required for these methods.

Detection Limits/Dilutions

All Analyses: All detection limits were properly reported. All samples of all batches were diluted due to high target analyte concentration and/or the nature of the matrix (see sample result forms in package for specific dilution factors).

Other QC

All Analyses: No field duplicates (FDs), field blanks (FBs), or equipment blanks (EBs) were submitted on the ARCOC.

No other specific issues were identified which affect data quality.

Data Validation Summary

Site/Project: SuL/0106. 6536 Charact Project/Task #: 839/6.45./	# of Samples: 5	Matrix: Soil	; water ; wite
AR/COC #: 608368	Laboratory Sample IDs:	F5G080171-001	thru -005
Laboratory: STL			
SDG#: (L.+)# F54080(71			

		Analysis									
	QC Element		Org	anics			Inorg	anics			
		voc	SVOC	Pesticide/ PCB	HPLC (HE)	ICP/AES	GFAA/ AA	CVAA (Hg)	CN	RAD	Other
1.	Holding Times/Preservation										
2.	Calibrations					\$ 1		1			
3.	Method Blanks					4					
4.	MS/MSD		\	-		a a					
5.	Laboratory Control Samples					188	Z				
6.	Replicates			7		E-V	V	1		V	
7.	Surrogates			17		d				Y	
8.	Internal Standards					8					
9,	TCL Compound Identification					200					
10.	ICP Interference Check Sample										
11.	ICP Serial Dilution		,			1					
12.	Carrier/Chemical Tracer Recoveries					4 2 3					
13.	Other QC	Ţ.				NA		NA			\

	=	Unusable	Other:			Reviewed By: Lawid Schwent	Date: 7-27-05
U	J =	Not Detected, Estimated	NP	=	Not Provided		
U	=	Not Detected	Shaded Cells	=	Not Applicable (also "NA")	<u></u>	
J	=	Esumated	Check (V)	=	Acceptable		

ANNEX C SWMU 105, Mercury Spill (Building 6536) Waste Disposal Documentation From: Ring, Larry

Sent: Thursday, December 29, 2005 9:40 AM

To: Tso, Dezbah

Subject: WDDR 2029949

Dezbah,

I submitted WDDR 2029949 for the last of the 6536 waste yesterday. It included two roll offs of soil, 2- five gallon buckets of water and a 55 gallon drum of soil.

Larry G. Ring Scientist Shaw Environmental & Infrastructure 5301 Central NE Suite 700 Albuquerque, New Mexico 87108 505.262.8930 direct 505.220.6512 cell 505.262.8855 fax www.shawgrp.com

Jun 18,2006

COPY

WASTE DISPOSAL REQUEST Sandia National Lab ies / New Mexico

2024227

Current Status: 21-JUL-2005

CLUSED

Owner / Requestor	Owner: RING, LAR	RY GENE		Org: 108261									
Folder: LGRING FO	DLDER				_	Three D	ay: N				F	RMMA:	N
Req: RING, LAR	RY GENE					W	/hy:						
Phone: 505262893	Mail Stop: 0908	Org:108261	Login: LGRING	PersID: 235255		Status	History						
Location of Waste	T Area:	TA 3	Building: 6536	Room: OUTSIDE			Initiated: (06-JUL-2005	Reviewed: (06-JUL-2005	Closed:	21-JUL	-2005
Comm: SOUTH EAST O	F BUILDING 6536					S	Submitted: (6-JUL-2005	Approved: (06-JUL-2005	Void:		
										Work-Da	ays To Pro	cess:	11
Line Item Descriptio	n			Container Type	N	lum. of		Ssc				WID	Return
Num / Package # -	Status					Cont	Quantity	Name	Proj	ect Num: Task	Num:		
1 MERCURY				OVER 30 TO 85 GAL-STEEL-D	DRUM,	2	250 LB	(8) CORROSI	/E- LIQUID, ACI	D, INORGANIC		A42447	N
User's Info: MERCURY				OPEN HEAD				SOLID		83916 4.5.3			
P1333050_ CL	P1333051_ CL												
2 USED TRANSFO	RMER OIL			OVER 30 TO 85 GAL-STEEL-D	DRUM,	13	300 LB	NON-REGULA	ATED- LIQUID			A41844	N
User's Info: TRANSFOR	MER OIL NON PCB			CLOSED HEAD				LIQUID		83916 4.5.3			
P1333052_ CL	P1333053_ CL	P1333054_ CL	P1333055_ CL	P1333056_ CL P	P1333057.	CL	P133305	B_ CL I	21333059_ CL	P1333060_	CL	P133306	1 1₋
CL	P1333062_ CL	P1333063_ CL	P1333064_ CL			_							
3 USED TRANSFO				OVER 30 TO 85 GAL-STEEL-DOPEN HEAD	DRUM,	16	300 LB	NON-REGULA	ATED- LIQUID			A41844	N
User's Info: TRANSFOR								LIQUID		83916 4.5.3			
P1333065_ CL	P1333066_ CL	P1333067_ CL	P1333068_ CL		P1333070.		P133307		P1333072_ CL	P1333073.	CL	P133307	4_
CL	P1333075_ CL	P1333076_ CL	P1333077_ CL		1333079.		P133308						
4 PCB CONTAMIN User's Info: PCB CONT.	ATED MATERIAL (NO LIC	(מוט)		OVER 30 TO 85 GAL-STEEL-E OPEN HEAD	ЭКОМ,	15	350 LB	***	NEOUS- SOLID			A40045	5 N
P1333081_ CL	P1333082_ CL	P1333083_ CL	P1333084_ CL		21333086	CI	P133308	SOLID	P1333088_ CL	83916 4.5.3 P1333089	CI	P133309	
CL	P1333091_ CL	P1333092_ CL	P1333093_ CL		- 1333000 - 1333095		F 133300	7_ 0L	- 1333000_ OL	F 1333069.	_ 01	F133308	, o
5 FLUORESCENT		11000002		OVER 5 TO 30 GAL-FIBERBO		2	90 LB	NON-REGUL	ATED- SOLID			A40017	7 N
User's Info: FLOURESC				(CARDBOARD)-BOX, UN-LINE	ΞD	_		SOLID		83916 4.5.3			
P1333096_ CL	P1333097_ CL									00010 4.0.0			
6 FLUORESCENT	LIGHTS			OVER 5 TO 30 GAL-FIBERBO	ARD	1	10 LB	NON-REGUL	ATED- SOLID			A40017	7 N
User's Info: FLOURESC				(CARDBOARD)-BOX, UN-LINE	ED			SOLID		83916 4.5.3			
P1333098_ CL										33010 1.0.0			
7 NON-PCB BALL	ASTS (NON-LEAKING/LE	AKING)		OVER 5 TO 30 GAL-STEEL-D	RUM.	1	25 LB	NON-REGUL	ATED- LIQUID			A40584	4 N
User's Info: NON PCB I	•	· · · · · · · · · · · · · · · · · · ·		OPEN HEAD	,			LIQUID		83916 4.5.3			
P1333099. CL													
R PCB BALLASTS	(NON-LEAKING)			OVER 5 TO 30 GAL-PLASTIC	-DRUM.	1	25 LB	(9) MISCELL	ANEOUS- LIQUI			A40030	0 N
•	AINING LIGHT BALLAST			OPEN HEAD				LIQUID		83916 4.5.3			
P1333100_ CL													

WASTE DISPOSAL REQUEST Sandia National Lab ies / New Mexico

DR # 2024227

ADDITIONAL INFORMATION REPORT

LINE #	Mark Brown of the Adults and Information (1.5 and 1.5
1	Waste Description Additional Information (Information/Precautions About This Waste Description)
	SPECIAL HANDLING: IRRI. TO EYES/SKIN/RESP. TRACT; USER INFO: MERCURY WASTE GENERATED FROM CLEANUP OF FREE MERCURY
	USER INFO. MERCURT WASTE GENERATED FROM CLEANOF OF FREE MERCORT
LINE#	
2	Waste Description Additional Information (Information/Precautions About This Waste Description)
-	SPECIAL HANDLING: AVOID OPEN FLAME;
LINE#	
3	Waste Description Additional Information (Information/Precautions About This Waste Description)
	SPECIAL HANDLING: AVOID OPEN FLAME;
	Line Item Additional Information (Generator's Info Pertaining To This Line Only)
LINE#	70 FLOURESCENT LIGHT BULBS(8 FOOT)
5	Waste Description Additional Information (Information/Precautions About This Waste Description)
	SPECIAL HANDLING: AVOID DUST;
	Line Item Additional Information (Generator's Info Pertaining To This Line Only)
LINE#	22- 4 FOOT FLOURESCENT LIGHT BULBS
6	Waste Description Additional Information (Information/Precautions About This Waste Description)
	SPECIAL HANDLING: AVOID DUST;
	Line Item Additional Information (Generator's Info Pertaining To This Line Only)
LINE#	9- NON PCB LIGHT BALLAST
7	Waste Description Additional Information (Information/Precautions About This Waste Description)
	SPECIAL HANDLING: AVOID CONTACT;
	Line Item Additional Information (Generator's Info Pertaining To This Line Only)
LINE#	9- PCB CONTAINING LIGHT BALLAST
8	Waste Description Additional Information (Information/Precautions About This Waste Description)
	SPECIAL HANDLING: AVOID CONTACT;

Hazardous Waste Comments Report

Action Comment Date Commented By
DR_LINE 06-JUL-2005 MUXWORTHY,TYLER JACOB

Comment

USE THE SECOND P# FOR THE INNER CONTAINER OF ELEMENTAL MERCURY.

WASTE DISPOSAL REQUEST Sandia National Lab 'es / New Mexico

2026333

Current Status: 05-DEC-2005

CLUGED

Owner: RING, LARRY GENE Folder: LGRING FOLDER	Org: 10826	Three [Day: N	** NO HW COMMENTS PAGE **	RMMA: I	N
Req: DURAND, NICHOLAS Phone: 5058449361 Mail Stop: 0908 Org: 10826 Login: NADUR	RAN PersiD:103155		Vhy:	·		
Location of Waste T Area: TA 3 Building: 6536 Comm:	Room: ALL	;		25-AUG-2005 Reviewed: 27-OCT-2005 Closed: 26-OCT-2005 Approved: 15-NOV-2005 Void: Work-Days To Province Work-Days To Province	05-DEC	28
Line Item Description Num / Package # - Status	Container Type	Num. of Cont	Quanti	Ssc Y Name Project Num: Task Num:	WID	Return
1 MERCURY CONTAINING ARTICLES (THERMOMETER, SWITCHES, LAMP, ETC.) User's Info: MERCURY VAPOR LIGHT BULBS P1342113. CL	OVER 30 TO 85 GAL-STEEL-DRUM, OPEN HEAD	1	75 LB	(8) CORROSIVE- LIQUID, ACID, INORGANIC SOLID 83916 4.5.3	A54639	N
2 MERCURY CONTAMINATED MATERIAL/SPILL CLEAN UP (> 10Z) User's Info: MERCURY CONTAMINATED SOIL WITH FREE HG P1342114_ CL	OVER 30 TO 85 GAL-STEEL-DRUM, OPEN HEAD	4	2800 LB	(9) MISCELLANEOUS- SOLID SOLID 83916 4.5.3	A44497	N
3 MERCURY CONTAMINATED MATERIAL/SPILL CLEAN UP (> 10Z) User's Info: MERCURY CONTAMINATED CAST IRON DRAIN PIPE P1342118_ CL	OVER 30 TO 85 GAL-STEEL-DRUM, OPEN HEAD P1342122. CL P13421	7 23 CL	650 LB	(9) MISCELLANEOUS- SOLID SOLID 83916 4.5.3 24 CL	A44497	N
4 INCANDESCENT LIGHT BULBS W/LEAD SOLDER User's Info: 42 INCANDESCENT LIGHT BULBS P1342125_ CL	OVER 5 TO 30 GAL-PLASTIC-DRUM OPEN HEAD		30 LB	(9) MISCELLANEOUS- SOLID SOLID 83916 4.5.3	A40022	2 N
5 LEAD ACID BATTERY, WET (FOR RECYCLE ONLY) User's Info: LEAD ACID BATTERIES P1342126. CL	OVER 5 TO 30 GAL-PLASTIC-DRUM OPEN HEAD	, 1	60 LB	(8) CORROSIVE- LIQUID, ACID, INORGANIC SOLID 83916 4.5.3	A40004	N I
7 USED TRANSFORMER OIL User's Info: NON PCB TRANSFORMER OIL (NOS) P1342127_ CL	OVER 30 TO 85 GAL-STEEL-DRUM, OPEN HEAD	1	500 LB	NON-REGULATED- LIQUID LIQUID 83916 4.5.3	A41844	N
8 OIL & WATER User's Info: WATER AND NON PCB TRANSFORMER OIL FROM EQUIPMENT RINSE P1342128_ CL	OVER 30 TO 85 GAL-STEEL-DRUM, OPEN HEAD	1	100 LB	NON-REGULATED- LIQUID LIQUID 83916 4.5.3	A40327	7 N

WASTE DISPOSAL REQUEST Sandia National Lab ies / New Mexico

DR # 2026333

ADDITIONAL INFORMATION REPORT

	Line Item Additional Information (Generator's Info Pertaining To This Line Only)
LINE#	HG VAPOR LIGHT BULBS
1	Waste Description Additional Information (Information/Precautions About This Waste Description)
	SPECIAL HANDLING: AVOID CONTACT;
	Line Item Additional Information (Generator's Info Pertaining To This Line Only)
LINE #	SOIL WITH FREE HG
2	
	Line Item Additional Information (Generator's Info Pertaining To This Line Only)
LINE #	HTG CONTAMINATED CAST IRON DRAIN PIPE
3	
LINE#	
4	Waste Description Additional Information (Information/Precautions About This Waste Description)
	SPECIAL HANDLING: AVOID CONTACT;
	Line Item Additional Information (Generator's Info Pertaining To This Line Only)
LINE #	5 EMERGENCY LIGHT BATTERIES FOR RECYCLE
5	
	Line Item Additional Information (Generator's Info Pertaining To This Line Only)
LINE#	LEAD FOR RECYCLE
6	
	Line Item Additional Information (Generator's Info Pertaining To This Line Only)
LINE #	TRANSFORMER OIL
7	Waste Description Additional Information (Information/Precautions About This Waste Description)
	SPECIAL HANDLING: AVOID OPEN FLAME:

WASTE DISPOSAL REQUEST es / New Mexico Sandia National Lab

2031898

Current Status: 19-JUN-2006

CLUSED

RMMA: N

Closed: 19-JUN-2006

19

Owner / Requestor Owner: CREECH, MARY NELL	Org: 06141	7					
Folder: MNCREEC FOLDER			Three Day: N				RMMA:
Req: CREECH, MARY NELL			Why:	•			
Phone: 5058458045 Mail Stop:1088 Org:06141 Login: MNCREEC	PersID:166326		Status History				
Location of Waste T Area: CTF Building: 9925	Room: OUTSIDE		Initiated:	11-APR-2006	Reviewed: 23-MAY-2006	Closed:	19-JU
Comm: 90-DAY ACCUMULATION AREA AT ERFO. PLEASE CALL BILL GIBSON PRIOR TO PICK-U	JP		Submitted:	23-MAY-2006	Approved: 31-MAY-2006	Void:	
					Work-	Days To Pro	ocess:

Line Item Description Num / Package # - Status	Container Type	Num. of Cont	Quantity	Ssc Name	Project Num: Task Num:	WID	Return
1 SOIL CONTAMINATED WITH TRACE METALS (< REGULATORY) User's Info: NON-REGULATED SOIL P1353926_ CL	OVER 30 TO 85 GAL-STEEL-DRUM, OPEN HEAD	1	700 LB	NON-REGULATED- SOLI SOLID	98046 02.02.09	A5943	9 N
2 SOIL CONTAMINATED WITH TRACE METALS (< REGULATORY) User's Info: NON-REGULATED SOIL P1353927_ CL	OVER 30 TO 85 GAL-STEEL-DRUM, OPEN HEAD	1	700 LB	NON-REGULATED- SOLI SOLID	98046 02.02.09	A5943	9 N
3 SOIL CONTAMINATED WITH TRACE METALS (< REGULATORY) User's Info: NON-REGULATED SOIL P1353928_ CL	OVER 30 TO 85 GAL-STEEL-DRUM, OPEN HEAD	1 -	700 LB	NON-REGULATED- SOL SOLID	98046 02.02.09	A5943	9 N
4 SOIL CONTAMINATED WITH TRACE METALS (< REGULATORY) User's Info: NON-REGULATED SOIL P1353929_ CL	OVER 30 TO 85 GAL-STEEL-DRUM, OPEN HEAD	1	700 LB	NON-REGULATED- SOLID	98046 02.02.09	A5943	9 N

WASTE DISPOSAL REQUEST Sandia National Lab ies / New Mexico

DR # 2031898

ADDITIONAL INFORMATION REPORT

Disposal Request Additional	Information (Generator	's Info Pertaining T	o The Whole DR)
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ERWM MEMO# ERWM-06-017

START DATE: 3/21/06

90-DAY EXPIRATION DATE: 6/18/06

4 55-GALLON DRUMS OF NON-REGULATED SOIL FROM SWMU 105

Line Item Additional Information (Generator's Info Pertaining To This Line Only)

LINE # 105-032106-01

1 Waste Description Additional Information (Information/Precautions About This Waste Description)

USER INFO; SEE ATTACHED ANALYTICAL RESULTS. MERCURY ONLY COC FOR THIS SITE

Line Item Additional Information (Generator's Info Pertaining To This Line Only)

LINE # 105-032106-02

2 Waste Description Additional Information (Information/Precautions About This Waste Description)

USER INFO: SEE ATTACHED ANALYTICAL RESULTS. MERCURY ONLY COC FOR THIS SITE

Line Item Additional Information (Generator's Info Pertaining To This Line Only)

LINE # 105-032106-03

3 Waste Description Additional Information (Information/Precautions About This Waste Description)

USER INFO: SEE ATTACHED ANALYTICAL RESULTS. MERCURY ONLY COC FOR THIS SITE

Line Item Additional Information (Generator's Info Pertaining To This Line Only)

LINE # 105-032106-04

4 Waste Description Additional Information (Information/Precautions About This Waste Description)

USER INFO: SEE ATTACHED ANALYTICAL RESULTS. MERCURY ONLY COC FOR THIS SITE

Hazardous Waste Comments Report

Action Comment Date

Commented By

DR_ACTION 31-MAY-2006

WAGNER.POLLY JO

Comment

WILL YOU PLEASE E-MAIL OR FAX THE ANALYTICAL FOR THIS DR TO 505-244-3473. THANK YOU.

Action

Comment Date

Commented By

DR_EMAIL_ACTION

31-MAY-2006

WAGNER, POLLY JO

Comment

WDDR_EMAIL_31MAY2006_1028.TXT WILL YOU PLEASE E-MAIL OR FAX THE ANALYTICAL FOR THIS DR TO 505-244-3473. THANK YOU.

CERTIFICATION FORM FOR HAZARDOUS WASTE

Chemical Waste Disposal Request no.: 2031989 2031898 24 6/28/06
PROCESS KNOWLEDGE
a) This waste was generated in: Location: SWMU 105
Room no.: NA
b) Does the waste contain radioactive components?
c) Was the waste in contact with any operation that could have produced radioactive contamination? ☐ Yes ☐ No
d) Was the waste exposed to particle beams capable of inducing radioactivity by activation? ☐ Yes ☐ No
Describe other controls used to prevent contamination: This soil was removed from an area that has
not been on the DOE RMMA listing
· · · · · · · · · · · · · · · · · · ·
If process knowledge is inadequate to certify waste as nonradioactive, complete the next section.
SAMPLING AND ANALYSIS
Sampling and Analysis Request No.: N/A
Do the results from the analysis of the waste items verify the absence of radioactive components above background? Attach data validation
The undersigned certifies that, to the best of his/her knowledge, the information provided on this requisition is correct and the identified waste contained within the container conform to the performance objective established by DOE for the removal of hazardous waste from a Radioactive Material Management Area (RMMA). Based upon process knowledge and operational procedures or radiological analysis, this waste meets all release criteria for certifying the waste as containing no DOE-added radioactivity (see MN471016, Radiological Protection Procedures Manual, Chapter 6, Attachment 6-1).
Generator Signature:
Generator Name (Print): Craig Wood
Date: 5/30/0¢

WASTE DISPOSAL REQUEST Sandia National Labo ss / New Mexico

~ 2028338

Current Status: 21-NOV-2005

CLOSED

_ocation of Waste T Area: TA 1 Building: 7500SY	Org: 10826	Three Day: N	** NO HW COMMENTS PAGE **			RMMA:	N	
Phone: 5058449361 Mail Stop: 0908 Org: 1082		PersID:103155 Room: OUTSIDE		: 25-OCT-2005 : 26-OCT-2005	Approved: 15-NOV-2005	Closed: Void: Days To Pro		V-2005 18
Line Item Description Num / Package # - Status	Conta	ainer Type	Num. of Cont Quan	Ssc tity Name	Project Num: Task	Num:	WID	Return

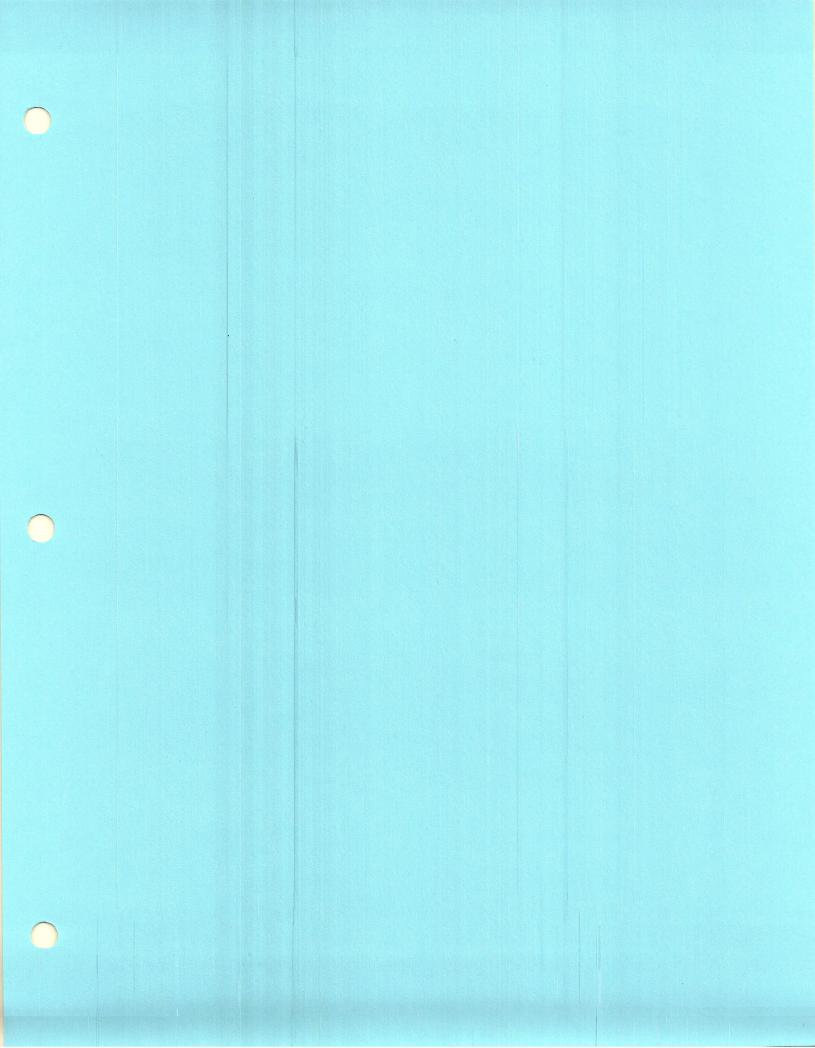
Line Item Description Num / Package # - Status	Container Type	Num. of Cont	Quantity	Ssc Name Pr	oject Num: Task Num:	WID	Return
1 FLUORESCENT LIGHTS User's Info: 1 BOX 27 EA. 4 FOOT FLOURESCENT LIGHT BULBS P1342108_ CL	OVER 5 TO 30 GAL-FIBERBOARD (CARDBOARD)-BOX	1	20 LB	NON-REGULATED- SOLID SOLID	83916 4.5.3	A40017	N
2 FLUORESCENT LIGHTS User's Info: 1 BOX 30EA, 54 FOOT FLOURESCENT LIGHT BULBS P1342109_ CL	OVER 5 TO 30 GAL-FIBERBOARD (CARDBOARD)-BOX	1	15 LB	NON-REGULATED- SOLID SOLID	83916 4.5.3	A40017	N
3 MERCURY CONTAMINATED MATERIAL/SPILL CLEAN UP (> 10Z) User's Info: HG CONTAMINATED P-TRAPS P1342110_ CL	1 TO 5 GAL-PLASTIC-DRUM, OPEN HEAD	1	15 LB	(9) MISCELLANEOUS- SOLID	83916 4.5.3	A44497	N
4 FLUORESCENT LIGHTS User's Info: 1 BOX 15 EA 10 FOOT FLOURESCENT LIGHT BULBS P1342111_ CL	OVER 5 TO 30 GAL-FIBERBOARD (CARDBOARD)-BOX	1	40 LB	NON-REGULATED- SOLID SOLID	83916 4.5.3	A40017	N
5 FLUORESCENT LIGHTS User's Info: 1 BOX 10 EA 10 FOOT FLOURESCENT LIGHT BULBS P1342112_ CL	OVER 5 TO 30 GAL-FIBERBOARD (CARDBOARD)-BOX	1	15 LB	NON-REGULATED- SOLID SOLID	83916 4.5.3	A40017	N

WASTE DISPOSAL REQUEST Sandia National Labo es / New Mexico

DR # 2028338

ADDITIONAL INFORMATION REPORT

LINE #	·
1	Waste Description Additional Information (Information/Precautions About This Waste Description)
·	SPECIAL HANDLING: AVOID DUST;
LINE#	
2	Waste Description Additional Information (Information/Precautions About This Waste Description)
	SPECIAL HANDLING: AVOID DUST;
LINE#	
4	Waste Description Additional Information (Information/Precautions About This Waste Description)
	SPECIAL HANDLING: AVOID DUST;
LINE#	
5	Waste Description Additional Information (Information/Precautions About This Waste Description)
	SPECIAL HANDLING: AVOID DUST;





Operated for the U.S. Department of Energy by Sandia Corporation Albuquerque, New Mexico 87185-1087

date:

May 30, 2006

to:

Craig Wood, MS-1087 (10333)

from:

Mary Creech, MS-1088 (6141) work 5 30 old

subject:

Waste Characterization and Disposal Request: ERWM Memo 06-016

Hazard Class: Mercury Contaminated Respirator Cartridges and Air Filter

Solid Waste Management Unit (SWMU) 105

Task leader: Brenda Langkopf

Attached please find the following:

Hazardous Waste Certification Form

WDDRs 2031900

This memo details the RCRA waste characterization of respirator cartridges and one equipment air filter used during remediation at SWMU 105. The remediation at SWMU 105 included sampling and removal of soil containing elemental mercury. Based on "Building 6536 Radiant Heat Facility, Characterization and Removal Project Report" finalized in February 2004, the only contaminant of concern at this site was elemental mercury. This material can not be sampled; therefore, has been characterized as hazardous waste by default, as a best management practice. Additionally, during all work at SWMU 105, air monitoring for mercury vapor was conducted. At no point during the work, were elevated high mercury vapor levels indicated. Based on this process knowledge, this material has been characterized as containing mercury greater than regulatory limits, however, not exceeding 260 ppm. This material was not removed from an RMMA; therefore, no radiological data is necessary for disposal. Final accumulation of this material was completed and the waste was placed into the accumulation area on March 21, 2006; therefore, the 90-day expiration date for these items is **June 18, 2006**.

WASTE DISPOSAL REQUEST Sandia National Lab es / New Mexico

2031900

Current Status:16-JUN-2006

CLUSED

Owner / Requestor Owner: CREECH, MARY NELL Folder: MNCREEC FOLDER Req: CREECH, MARY NELL Phone: 5058458045 Mail Stop: 1088 Org: 06141 Login: MNCREI	Org: 06141 EC PersID: 166326	Three Day: N Why:	** NO HW CC	MMENTS PAGE *'	RMMA: N
Location of Waste T Area: CTF Building: 9925 Comm: 90-DAY ACCUMULATION AREA AT ERFO. PLEASE CALL BILL GIBSON PRIOR 1	Room: OUTSIDE			ed: 23-MAY-2006 Closed: ed: 31-MAY-2006 Void: Work-Days To Pr	
Line Item Description Num / Package # - Status	Container Type	Num. of Cont Quanti	Ssc ty Name_	Project Num: Task Num:	WID Retu
1 MERCURY LAB TRASH/SPILL DEBRIS >1 OZ User's Info: RESPIRATOR CARTRIDGES WITH ACTIVATED CARBON/USED AT MERCURY CONTAMINATION LEVELS BELOW 260 PPM BASED ON AIR MONITORING PE P1353924. CL			(9) MISCELLANEOUS- SOLID	98046 02.02.09	A41869 N
MERCURY LAB TRASH/SPILL DEBRIS >1 OZ User's Info: AIR FILTER FROM HEAVY EQUIPMENT USED DURING MERCURY CLEAN-UP BELOW 260 PPM BASED ON AIR MONITORING PERFORMED DURING WORK			(9) MISCELLANEOUS- Se SOLID	98046 02.02.09	A41869 N

WASTE DISPOSAL REQUEST Sandia National Labrasia (es./ New Mexico)

DR # 2031900

ADDITIONAL INFORMATION REPORT

ERWM MEMO# ERWM-06-016

START DATE: 3/21/06

90-DAY EXPIRATION DATE: 6/18/06

5-GALLON BUCKER OF RESPIRATOR CARTRIDGES AND 1 EQUIPMENT AIR FILTER FROM SWMU 105

Line Item Additional Information (Generator's Info Pertaining To This Line Only)

LINE # 105-012406-02

1 Waste Description Additional Information (Information/Precautions About This Waste Description)

SPECIAL HANDLING: CAUTION! FREE MERCURY ENTRAPED-SOLID WIPES/ABSORBN;

USER INFO: AIR MONITORING DURING WORK DID NOT INDICATE MERCURY VAPORS, CARTRIDGES USED AS BMP ONLY

Line Item Additional Information (Generator's Info Pertaining To This Line Only)

LINE # ????

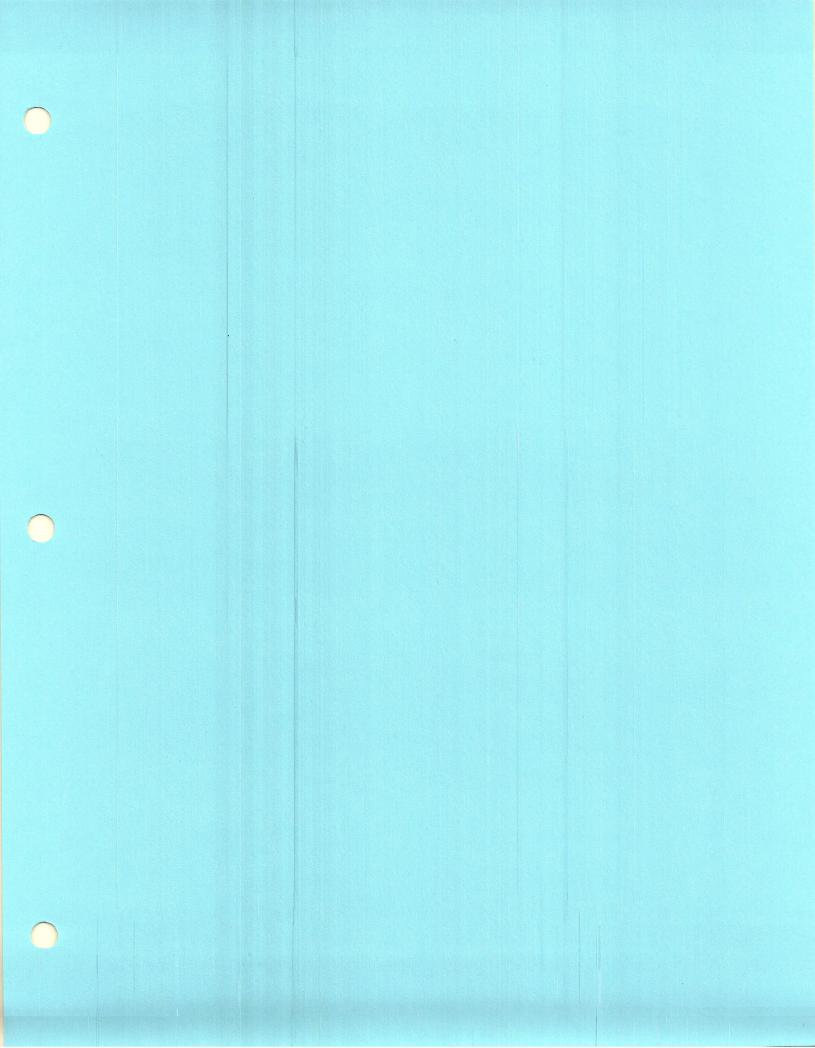
2 Waste Description Additional Information (Information/Precautions About This Waste Description)

SPECIAL HANDLING: CAUTION! FREE MERCURY ENTRAPED-SOLID WIPES/ABSORBN;

USER INFO: AIR MONITORING DURING WORK DID NOT INDICATE MERCURY VAPORS, FILTER REMOVED AND DISPOSED OF AS BMP ONLY

CERTIFICATION FORM FOR HAZARDOUS WASTE

Chemical Waste Disposal Request no.: 2031900				
PROCESS KNOWLEDGE				
a) This waste was generated in: Location: <u>SWMU 105</u>				
Room no.: NA				
b) Does the waste contain radioactive components? ☐ Yes ☒ No				
c) Was the waste in contact with any operation that could have produced radioactive contamination? ☐ Yes ☒ No				
d) Was the waste exposed to particle beams capable of inducing radioactivity by activation? ☐ Yes ☒ No				
Describe other controls used to prevent contamination: This soil was removed from an area that has				
not been on the DOE RMMA listing				
If process knowledge is inadequate to certify waste as nonradioactive, complete the next section.				
SAMPLING AND ANALYSIS				
Sampling and Analysis Request No.: N/A				
Do the results from the analysis of the waste items verify the absence of radioactive components above background? Attach data validation Yes \(\subseteq \text{No} \)				
The undersigned certifies that, to the best of his/her knowledge, the information provided on this requisition is correct and the identified waste contained within the container conform to the performance objective established by DOE for the removal of hazardous waste from a Radioactive Material Management Area (RMMA). Based upon process knowledge and operational procedures or radiological analysis, this waste meets all release criteria for certifying the waste as containing no DOE-added radioactivity (see MN471016, Radiological Protection Procedures Manual, Chapter 6, Attachment 6-1).				
Generator Signature: Way Word				
Generator Name (Print): Craig Wood				
Date: 5/30/06				





Operated for the U.S. Department of Energy by **Sandia Corporation** Albuquerque, New Mexico 87185-1087

date:

May 30, 2006

to:

Craig Wood, MS-1087 (10333)

from:

Mary Creech, MS-1088 (6141) 5 30 06

subject:

Waste Characterization and Disposal Request: ERWM Memo 06-017

Hazard Class: Non-regulated soil

Solid Waste Management Unit (SWMU) 105

Task leader: Brenda Langkopf

Attached please find the following:

• Hazardous Waste Certification Form

WDDRs 2031898

Analytical data report

This memo details the RCRA waste characterization of soil removed during the remediation at SWMU 105. The remediation at SWMU 105 included sampling and removal of soil containing elemental mercury. Based on "Building 6536 Radiant Heat Facility, Characterization and Removal Project Report" finalized in February 2004, the only contaminant of concern at this site was elemental mercury. WDDR 2031989 includes 4 55-gallon drums of soil removed from SWMU 105. The drums are approximately 1/3 full and weigh less than 700 lbs. Soil samples were taken after the drums were packaged. Sampling included using an auger to remove soil aliquots from 3 random locations within the each drum. The aliquots were compiled, per drum, and analyzed for mercury by TCLP. The results for each drum is presented in Table 1 below. As you can see each result is below 0.2 ppm; therefore, this soil can be sent for off-site disposal as non-regulated waste. This material was not removed from an RMMA; therefore, no radiological data is necessary for disposal.

Due to the final determination that this soil is non-regulated waste, no 90-day expiration date is applicable.

Table 1. Container Summary

Container ID	Line	Container Type	Mercury
	Item#		Concentration
			(mg/L)
105-032106-01	1	55-gallon drum	0.0769
105-032106-02	2	55-gallon drum	0.0553
105-032106-03	3	55-gallon drum	0.0737
105-032106-04	4	55-gallon drum	0.0572

GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company:

Sandia National Laboratories

Address:

MS-0756, Org. 7578, Bldg. 823/Rm. 4276

1515 Eubank SE

Albuquerque, New Mexico 87123

Contact:

Ms. Pamela M. Puissant

Report Date: May 2, 2006

Project:

Level C without EDD

Client Sample ID:

077306-009

Project:

SNLS00102

Sample ID:

161479001

Client ID:

SNLS002

AnalystDate

Matrix:

Soil

Collect Date: Receive Date:

Qualifier

Collector:

21-APR-06 09:05 25-APR-06

Client

Client Desc.: 105-032106-01-S

DF

Mercury Analysis-CVAA

TCLP Hg in Solid

Mercury

Parameter

0.0769

Result

0.0005

DL

0.002

RL

mg/L

Units

1 ETL 05/01/06 1408 524829

Time Batch Method

The following Pren Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 1311	SW846 1311 TCLP Leaching -FEDERAL	MXW3	04/26/06	1600	524166
SW846 7470A Prep	EPA 7470A Mercury Prep TCLP Liquid	RDD1	04/28/06	1130	524828

The following Analytical Methods were performed					
Method	Description	Analyst Comments			
1	SW846 7470A				

Notes:

The Qualifiers in this report are defined as follows:

- Recovery or %RPD not within acceptance limits and/or spike amount not compatible with the sample or the duplicate RPD's are not applicable where the concentration falls below the effective PQL.
- Indicates analyte is a surrogate compound.
- \mathbf{B} The analyte was found in the blank above the effective MDL.
- Η Analytical holding time was exceeded
- Estimated value, the analyte concentration fell above the effective MDL and below the effective PQL
- The analyte was analyzed for but not detected below this concentration. For Organic and Inorganic analytes the result is less than the effective MDL. For radiochemical analytes the result is less than the Decision Level
- Presumptive evidence that the analyte is not present. Please see narrative for further information.
- d The 2:1 depletion requirement was not met for this sample
- Prep holding time exceeded

The above sample is reported on an "as received" basis.

GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company:

Sandia National Laboratories

Address:

MS-0756, Org. 7578, Bldg. 823/Rm. 4276

1515 Eubank SE

Albuquerque, New Mexico 87123

Contact:

Ms. Pamela M. Puissant

Project:

Level C without EDD

Report Date: May 2, 2006

2

Page

of 2

Client Sample ID:

Sample ID:

077306-009 161479001

Project: Client ID: SNLS00102

SNLS002

Parameter

Qualifier

Result

 \mathbf{DL}

RL

Units

DF

AnalystDate

Time Batch Method

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories, LLC standard operating procedures. Please direct any questions to your Project Manager, Edith Kent.

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company:

Sandia National Laboratories

Address:

MS-0756, Org. 7578, Bldg. 823/Rm. 4276

1515 Eubank SE

Albuquerque, New Mexico 87123

Contact:

Ms. Pamela M. Puissant

Project:

Level C without EDD

Report Date: May 2, 2006

Page

SNLS00102

of 2

Client Sample ID:

Sample ID: Matrix: Collect Date:

Receive Date:

077307-009 161479002

Soil

21-APR-06 09:08 25-APR-06

Client ID: SNLS002

Project:

Client Desc.: 105-032106-02-S

Collector:

Client

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time Batch	Method
Mercury Analysis-CVAA									
TCLP Hg in Solid									
Mercury		0.0553	0.0005	0.002	mø/L	1	ETL 05/01/0	5 1416 524829	1

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 1311	SW846 1311 TCLP Leaching -FEDERAL	MXW3	04/26/06	1600	524166
SW846 7470A Prep	EPA 7470A Mercury Prep TCLP Liquid	RDD1	04/28/06	1130	524828

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 7470A	

Notes:

The Qualifiers in this report are defined as follows:

- Recovery or %RPD not within acceptance limits and/or spike amount not compatible with the sample or the duplicate RPD's are not applicable where the concentration falls below the effective PQL.
- Indicates analyte is a surrogate compound.
- В The analyte was found in the blank above the effective MDL.
- Η Analytical holding time was exceeded
- Estimated value, the analyte concentration fell above the effective MDL and below the effective PQL
- The analyte was analyzed for but not detected below this concentration. For Organic and Inorganic analytes the result is less than the effective MDL. For radiochemical analytes the result is less than the Decision Level
- Presumptive evidence that the analyte is not present. Please see narrative for further information.
- The 2:1 depletion requirement was not met for this sample d
- Prep holding time exceeded

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Albuquerque, New Mexico 87123

Contact:

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Project:

Level C without EDD

Report Date: May 2, 2006

2 \mathbf{of}

Client Sample ID:

Sample ID:

077307-009 161479002

Project: Client ID:

SNLS00102 SNLS002

Parameter

Qualifier

Result

DL

RL

Units

DF AnalystDate Time Batch Method

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Project:

Level C without EDD

Report Date: May 2, 2006

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of

Time Batch Method

Client Sample ID:

077308-009 161479003

Project:

DF

SNLS00102

Sample ID:

Collector:

Client

Client ID:

SNLS002

Matrix: Collect Date: Receive Date:

Qualifier

Soil

21-APR-06 09:11

25-APR-06

Client Desc.: 105-032106-03-S

AnalystDate

Parameter Mercury Analysis-CVAA

TCLP Hg in Solid

Mercury

0.0737

Result

0.0005

DL

0.002

RL

mg/L

Units

1 ETL 05/01/06 1418 524829

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch	
SW846 1311	SW846 1311 TCLP Leaching -FEDERAL	MXW3	04/26/06	1600	524166	
SW846 7470A Prep	EPA 7470A Mercury Prep TCLP Liquid	RDD1	04/28/06	1130	524828	•

The following Analytical Methods were perform

Method	Description	Analyst Comments	
		· · · · · · · · · · · · · · · · · · ·	
1	SW846 7470A		

Notes:

The Qualifiers in this report are defined as follows:

- Recovery or %RPD not within acceptance limits and/or spike amount not compatible with the sample or the duplicate RPD's are not applicable where the concentration falls below the effective PQL.
- Indicates analyte is a surrogate compound.
- В The analyte was found in the blank above the effective MDL.
- Analytical holding time was exceeded Η
- Estimated value, the analyte concentration fell above the effective MDL and below the effective PQL
- U The analyte was analyzed for but not detected below this concentration. For Organic and Inorganic analytes the result is less than the effective MDL. For radiochemical analytes the result is less than the Decision Level
- Presumptive evidence that the analyte is not present. Please see narrative for further information.
- d The 2:1 depletion requirement was not met for this sample
- Prep holding time exceeded

The above sample is reported on an "as received" basis.

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1515 Eubank SE

Albuquerque, New Mexico 87123

Contact:

Ms. Pamela M. Puissant

Project:

Level C without EDD

Report Date: May 2, 2006

of 2

Client Sample ID:

Sample ID:

077308-009 161479003

Project: Client ID:

SNLS00102

SNLS002

Parameter

Qualifier Result DL

RL

Units

AnalystDate

Time Batch Method

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Report Date: May 2, 2006

Project:

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Time Batch Method

Client Sample ID:

Receive Date:

Qualifier

Sample ID:

077309-009 161479004

Project: Client ID:

SNLS00102 SNLS002

AnalystDate

Matrix: Collect Date:

Collector:

Soil

Client

21-APR-06 09:14

25-APR-06

DL

DF

Client Desc.: 105-032106-04-S

Parameter Mercury Analysis-CVAA

TCLP Hg in Solid

Mercury

0.0572

Result

0.0005

0.002

RL

mg/L

Units

1 ETL 05/01/06 1420 524829

The following Pren Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 1311	SW846 1311 TCLP Leaching -FEDERAL	MXW3	04/26/06	1600	524166
SW846 7470A Prep	EPA 7470A Mercury Prep TCLP Liquid	. RDD1	04/28/06	1130	524828

The following A	analytical Methods were performed		
Method	Description	Analyst Comments	
1	SW846 7470A		

Notes:

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- Indicates analyte is a surrogate compound.
- The analyte was found in the blank above the effective MDL. \mathbf{B}
- Analytical holding time was exceeded Η
- Estimated value, the analyte concentration fell above the effective MDL and below the effective PQL
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- Presumptive evidence that the analyte is not present. Please see narrative for further information.
- The 2:1 depletion requirement was not met for this sample đ
- Prep holding time exceeded h

The above sample is reported on an "as received" basis.

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Albuquerque, New Mexico 87123

Contact:

Ms. Pamela M. Puissant

Project:

Level C without EDD

Report Date: May 2, 2006

Page

Client Sample ID:

Sample ID:

077309-009 161479004

Project: Client ID:

SNLS00102

SNLS002

Parameter

Qualifier

Result

DL

RL

Units

AnalystDate

Time Batch Method

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories, LLC standard operating procedures. Please direct any questions to your Project Manager, Edith Kent.

ANNEX D SWMU 105, Mercury Spill (Building 6536) Risk Assessment Report

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SWMU 105: RISK ASSESSMENT REPORT

I. Introduction

Sandia National Laboratories/New Mexico (SNL/NM) completed a site investigation at Solid Waste Management Unit (SWMU) 105, Building 6536, located in Technical Area III. An administrative No Further Action (NFA) proposal was submitted to the U.S. Environmental Protection Agency (EPA) (the regulatory authority at the time) in August 1994 (SNL/NM August 1994). In July 1995, SWMU 105 was determined to be appropriate for NFA and was removed from the U.S. Department of Energy (DOE)/Sandia Corporation Resource Conservation and Recovery Act Permit in December 1995 (Davis December 1995). During decontamination and demolition (D&D) activities at Building 6536, a subsurface release of mercury to the environment at SWMU 105 was discovered, and written notification was transmitted to the New Mexico Environment Department (NMED) Hazardous Waste Bureau on July 13, 2005 (Wagner July 2005). Due to the nature of the subsurface release, any surface investigation prior to July 2005 would not have detected the contamination.

The release of mercury to the environment was discovered at SWMU 105 in June 2005 in soil adjacent to Building 6536. A Voluntary Corrective Action (VCA) was planned and performed. The VCA activities included excavation and off-site disposal of mercury-contaminated soil and comprehensive collection of confirmatory soil samples that determined the horizontal and vertical extent of mercury contamination. A human health and ecological risk assessment were performed using the analytical results of the confirmatory soil samples. The activities of the VCA are consistent with the overall corrective action objectives set forth in Section VI of the Compliance Order on Consent from the NMED (NMED April 2004).

The risk assessments performed for SWMU 105 include analyses for human health and ecological risks. All data collected for the Phase 1 VCA (P1VCA) (SNL/NM September 2005) and the Phase 2 VCA (P2VCA) (SNL/NM December 2005) (except one sample result with an R qualification) are suitable for use in the human health and ecological risk assessments. Two risk assessments were performed for SWMU 105. The first assessment used the data collected from the entire site. For conservatism, a second assessment was performed that used a limited data set that included the P1VCA mercury results and only those results from P2VCA boreholes located northwest of the Building 6536, Room 113 foundation. This included the six samples collected from the trench area locations during the P1VCA and P2VCA, the spoils pile area, and the additional row added at the very northwestern edge of boreholes. The majority of the sample results that exceeded either the surface or the subsurface background values are in these areas. Using this limited data set provides a representative distribution of residual mercury contamination in the area of primary concern, which exhibited the highest concentrations of mercury in the soil. Six sample locations from the P1VCA, 32 borehole locations from the P2VCA, and a total of 144 soil sample analyses are represented in this data set. The limited data set used in the second risk assessment is provided as Table E-1 in Annex E of the SWMU 105 Proposal for Corrective Action Complete (CAC), and the data set excluded from the second risk assessment is provided in Table E-2.

I.1 Site Description and History

Building 6536, the Radiant Heat Facility, was originally constructed as the Re-Entry Burn-Up Facility but has also been used to simulate many types of high-heat environments (Shaw October 2004). The main part of Building 6536 was built in 1967, a mezzanine was added in 1980, and the two westernmost rooms (112 and 113, also known as 6536A and 6536B, respectively) were added in 1983. Room 113 was also known as the Equipment Room. An investigation report in 1977 states that a mercury vacuum tube exploded (location not specified), but no mercury vapor was detected (SNL/NM February 1977). A 1982 Industrial Hygiene (IH) report indicated that approximately 10 cubic centimeters of visible mercury had been spilled on a lab bench (location not specified) and on a desktop (SNL/NM February 1982). The visible mercury was picked up with a mercury vacuum cleaner and no mercury vapor was detected before or after the cleanup. A third IH report in 1985 states that a minor amount of mercury was spilled in the high bay of Building 6536 (Room 111) and the level of mercury contamination was within acceptable limits (units of measure or methods of measurement not described) (SNL/NM May 1985). The report states that a mercury decontaminant was used to decontaminate surfaces. Personnel interviews conducted in 1985 indicated that a mercury bath used to measure pressure in equipment was examined in 1972, and it was determined that the bath contained 10 to 13 pounds less mercury than the full volume capacity (SNL/NM October 1990). It was unknown whether the bath had ever been at full capacity. At a later unknown date, the mercury bath was removed. Personnel interviews conducted in 1990 in an attempt to clarify the use and release(s) of mercury in Building 6536 mention the 1977 mercury tube explosion, but stated that the mercury bath referenced never existed (SNL/NM March 1990). Two of the three documented events occurred within Building 6536 prior to the addition of Room 113 in 1983; however, no documentation exists pertaining to the use of instrumentation containing mercury in Room 113.

Elemental mercury has been identified as the constituent of concern (COC) for SWMU 105.

I.2 History of Release

On May 9, 2005, during decontamination and demolition (D&D) activities at Building 6536, mercury contamination was found inside the building within a concrete trench, located along the northwest wall of Room 113. On June 29, 2005, free mercury was found to be visible in the large pores of a concrete block and in nearby soil outside the building when an exterior trench was excavated along the northwest wall of the building. The release to the soil probably originated from a crack in the building foundation adjacent to the interior concrete trench.

I.3 Summary of the 2005 Phase One Voluntary Corrective Action Plan

The 2005 investigation was performed by the SNL/NM Facilities Management and Operations Center that was conducting the D&D activities and is referred to as the P1VCA. Six discrete soil samples were collected from the exterior trench on July 6 and 21, 2005. The analytical results for the soil samples indicated mercury concentrations ranging from 0.17 to 39.6 milligrams (mg)/kilogram (kg) next to the exposed concrete block, all exceeding the NMED-approved subsurface background value of less than 0.1 mg/kg (Dinwiddie September 1997).

During the week of September 6, 2005, D&D personnel removed the concrete block located adjacent to the northwest wall of Building 6536 and collected residual free mercury from both the concrete block surface and the soil surrounding the block. The mercury-contaminated soil was excavated to 4 feet below ground surface (bgs) in the area of the June 2005 release, but more mercury-contaminated soil remained.

On October 6, 2005, the concrete foundation of the Building 6536 Room 113 was removed. In situ soil-vapor readings were taken with a mercury vapor analyzer (MVA). As the foundation removal continued, positive MVA readings were detected in the soil beneath the foundation. Upon completion of removal of the building foundation, a 5- by 5-foot grid was established in the area of the former building footprint. Positive MVA readings ranging from 0.003 to 0.093 mg/cubic meter (m³) were detected along the center of the northeastern side of the grid area.

The survey points with the five highest positive MVA readings ranging from 0.013 to 0.093 mg/m³ were flagged for future investigation activities. All construction debris, concrete rubble, and mercury-contaminated soil (removed during the trench excavation) were removed from the site. These waste streams were managed by D&D personnel and disposed of in accordance with SNL/NM waste management policy.

The activities and analytical results described represent the P1VCA investigation. A summary of the P1VCA data and site assessments are presented in the "Building 6536 Radiant Heat Facility Characterization and Removal Project Report" (Shaw 2006).

I.4 Summary of 2006 Phase Two Voluntary Corrective Action Plan

Based upon the findings of remaining mercury contamination in the soil during the initial P1VCA activities, a Phase 2 investigation conducted by Environmental Restoration (ER) Project personnel was necessary (SNL/NM December 2005). The purpose of the P2VCA was to determine the extent of the contamination, remove mercury-contaminated soil from the original release area, and containerize and dispose of the excavated soil at an off-site waste disposal facility. Analytical results were evaluated to determine whether mercury was present in the soil at levels considered hazardous to human health for either the industrial or residential land-use risk scenarios. The primary activities of the P2VCA were conducted from January through March 2006.

I.5 Collection of Confirmatory Soil Samples

The collection of the P2VCA soil samples was performed by several methods depending upon the terrain encountered at the site. A Geoprobe®, a backhoe and bucket, and hand-auger equipment were used to collect samples. Soil samples were submitted to an off-site laboratory, General Engineering Laboratories, Inc. (GEL), for analysis of total mercury by EPA Method 7471A (EPA November 1986). This method is approved for measuring total mercury (organic and inorganic) in soil samples. Samples were recorded on Analysis Request/Chain of Custody (AR/COC) forms.

I.6 Summary of Confirmatory Soil Sample Results

The analytical results for mercury as a metal in the soil samples collected during the P2VCA range from no detection (ND) above the method detection limit to 342 mg/kg.

The analytical results for the surface samples (labeled 0 feet bgs) from the site range from 0.00249 J to 339 mg/kg. Of the 139 primary surface soil and duplicate samples collected, 46 sample results exceed the surface background value of less than 0.25 mg/kg.

The analytical results for the subsurface samples (greater than 0.5 feet to a maximum of 11 feet bgs) range from ND to 342 mg/kg. Of the 432 primary subsurface soil and duplicate samples collected, 65 sample results exceed the subsurface background value of less than 0.1 mg/kg.

The samples collected from the original release point are labeled Borehole 105-BH-73. The sample collected from the surface of the trench (identified as 0 feet in the sample identification as measured from the surface of the trench) was from a depth of approximately 3 feet bgs and contained 318 J mg/kg of mercury. This material was placed on a tarp for waste disposal. The sample identified as 2 feet (approximately 5 feet bgs) contained 90.3 J mg/kg of mercury, and this material was also placed on the tarp. These sample results are not included in the data set, as they were from material designated as waste and do not represent characterization samples. The 4-foot sample (approximately 7 feet bgs) contained 27.5 J mg/kg of mercury, and a duplicate of this sample contained 137 J mg/kg of mercury. These samples exceed the subsurface background value for mercury of less than 0.1 mg/kg. This material was left in place. The next two samples, from 6 and 8 feet (approximately 9 and 11 feet bgs, respectively) contained 0.679 and 0.0574 mg/kg of mercury, respectively. The results for the primary samples from 6 feet and the duplicate sample from 8 feet (0.75 mg/kg) exceed the subsurface background value. It was determined that the vertical extent of mercury contamination had been defined in this area.

II. Data Quality Objectives

The data quality objectives (DQOs) were presented in the SWMU 105 P2VCA Plan (SNL/NM December 2005). The DQOs outline the quality assurance (QA)/quality control (QC) requirements necessary for producing defensible analytical data suitable for risk assessment purposes. The specific objectives for additional investigative work at SWMU 105 were:

- The advancement of boreholes with a Geoprobe® to define the vertical and horizontal extent of contamination
- The collection and analyses of soil samples to obtain supporting data for a CAC decision
- The collection of QA/QC samples (duplicate soil and equipment blank samples).

Table D-1 summarizes the samples collected and provides the rationale for sample locations.

Table D-1
Summary of SWMU 105 P2VCA Sampling Performed to Meet Data Quality Objectives

SWMU 105 Sampling Area	Sampling Location Rationale	Number of Boreholes in Area	Sample Density (ft bgs) [sampling grid ~5 by 5 ft]	Number of Primary Soil Samples Collected
Original mercury release point (in trench)	Confirm that no significant levels of the COC exist at release point.	1 ^a	Samples collected from surface of trench followed by 2-ft intervals (7, 9, and 11 ft ^b).	3
Area adjacent to release point (in trench)	,		9	
Location of former spoils piles	Confirm that no significant levels of the COC remain following removal of spoils piles.	5 ^a	Samples collected from ground surface followed by 2-ft intervals (0, 2, 4, 6, and 8 ft).	25
Areas of elevated soil- vapor readings	Confirm that no significant levels of the COC exist beneath building foundation.	5	Samples collected from ground surface followed by 2-ft intervals (0, 2, 4, 6, and 8 ft).	25
Perimeter of Room 113			132 ^d	
Area within footprint of Room 113	Confirm that no significant levels of the COC exist beneath building foundation.	72	Samples collected from ground surface followed by 2-ft intervals (0, 2, 4, and 8 ft).	286 ^e
Area northwest of former spoils piles	Confirm that no significant levels of the COC have migrated beyond the spoils piles.	15 ^a	Samples collected from ground surface followed by 2-ft intervals (0, 2, 4, and 8 ft).	60
Total	_	143	_	540

^aAll boreholes used for the limited data set.

bgs = Below ground surface.

COC = Constituents of concern.

= Foot (feet).

P2VCA = Phase 2 Voluntary Corrective Action.

SWMU = Solid Waste Management Unit.

– = Not applicable.

RISK ASSESSMENT FOR SWMU 105

^bTarget depths are expressed as feet below the original ground surface at this site.

^cEight boreholes used for the limited data set.

dSamples also collected at 9 and 11 ft in two locations and 8 ft in two locations.

eSamples recovered from only two depths at one location due to subsurface obstruction.

Table D-2 presents the data quality requirements for sampling at SWMU 105. All samples were submitted to GEL and recorded on AR/COC forms.

Table D-2
Summary of Data Quality Requirements for SWMU 105

Data Set	Analytical Requirement	Data Quality Level	Total Number of Soil Samples Collected
P2VCA Samples collected January– March 2006	Total Mercury (EPA Method 7471A ^a)	Defensible	542 ^b

^aEPA November 1986.

^bThe number of samples does not include QA/QC samples such as duplicates and equipment blanks.

EPA = U.S. Environmental Protection Agency.

QA/QC = Quality assurance/quality control. P2VCA = Phase 2 Voluntary Corrective Action.

SWMU = Solid Waste Management Unit.

Forty-eight QA/QC samples were collected during the P2VCA. The QA/QC samples consisted of 34 soil duplicate and 14 aqueous equipment blank samples (Table D-3). No significant QA/QC problems were identified in any of the QA/QC samples.

Table D-3
Summary of Quality Assurance/Quality Control Samples for SWMU 105

Sample Type	Frequency	Total Number of Samples	Matrix
Duplicate Soil Samples	~5%	34	Soil
Equipment Blank Samples	1 per day	14	Aqueous

SWMU = Solid Waste Management Unit.

All of the sample results (soil and equipment blank) were verified/validated according the "Data Validation Procedure for Chemical and Radiochemical Data, Rev. 01" (SNL/NM December 2003). Reviews confirmed that the data from the analytical laboratory are defensible and therefore acceptable for use in the CAC proposal, fulfilling the DQO requirements. Some of the sample results have been qualified with a J, defined as an estimated value. One sample result received an R qualification due to failure in meeting laboratory QA/QC requirements. This sample was not used in the risk assessments.

III. Determination of Nature, Rate, and Extent of Contamination

The conceptual site model for SWMU 105 is based upon the COC identified from operational history information, process knowledge, and previous investigations. This section summarizes the nature and extent of contamination and the environmental fate of the COC.

III.1 Nature, Extent, and Migration Rate of Contamination

The only COC for SWMU 105 has been identified as elemental mercury. The operational history of the site provided evidence that equipment containing mercury had been used inside Building 6536 and that there had been releases of mercury within the building. Other potential types and sources of contamination were identified and eliminated from consideration during the P1VCA (Shaw 2006). The only contaminant identified as released to the environment was elemental mercury. The presence of mercury vapor in the soil is attributed to the volatilization of the elemental mercury, and not due to a separate source. The analytical methods used are appropriate for characterizing the identified COC.

The sampling activities conducted during the P2VCA are considered to have resulted in soil samples that adequately represent the soil beneath the foundation of Room 113, as well as the immediate surrounding area. The sampling target depths are sufficient to determine the vertical extent of mercury contamination.

The highest levels of mercury in the soil were present in the uppermost portion of the soil column (typically within the 0- to 2-foot depths). Samples were collected to a depth of 8 feet across the site, except in the trench area where the maximum sample depth was 11 feet bgs. A discussion that took place on March 6, 2006, with the NMED during the sampling event prompted the collection of additional samples from three locations (105-BH-44, -73, and -75) at 9 and 11 feet bgs. The vertical and horizontal extent of contamination has therefore been defined by the sampling and analyses.

SWMU 105 is currently an inactive site at which the primary source of contamination has been eliminated. As a result, any migration of residual mercury in the soil is predominately dependent upon precipitation and occasional surface-water flow. The borehole data collected are adequate for characterizing the migration of mercury in the subsurface.

III.2 Environmental Fate and Transport

The primary release(s) of mercury to the environment at SWMU 105 was to the soil along the northwest foundation wall of Building 6536, Room 113. The release may have occurred by a migration of mercury through a crack in the foundation. It is neither clear nor documented as to how or why mercury was present in Room 113. All documentation indicates that two of the three reported incidences of mercury releases in the building occurred prior to the construction of Room 113. Wind, water, and biota are natural mechanisms of COC transport from the primary release point; however, because the area of the release point is relatively small and the source has been removed, these are not considered to be of potential significance. Infiltration of precipitation is also considered to be low at SWMU 105. Because groundwater at the site is 497 feet bgs (SNL/NM April 2004), the potential for the COC to reach groundwater through the unsaturated zone above the water table is extremely low.

The COCs at SWMU 105 are limited to a single constituent, elemental mercury.

Wind, water, and biota are considered to be of low significance as potential transport mechanisms at this site. Significant leaching into the subsurface soil is unlikely, and leaching into the groundwater at this site is highly unlikely. The potential for transformation of the COC is low.

In summary, the design and execution of the confirmatory soil sampling for SWMU 105 was appropriate and adequate to determine the nature and extent of elemental mercury in the soil at the site.

IV. Comparison of COCs to Background Screening Levels

Site history and characterization activities are used to identify potential COCs. The SWMU 105 proposal for CAC with controls describes the identification of the COC and the sampling that was conducted in order to determine the concentration levels of the COC across the site. In order to provide conservatism in this risk assessment, the calculation uses only the maximum concentration value of the COC found for the entire site. The SNL/NM maximum background concentration (Dinwiddie September 1997) was selected to provide the background screen listed in Table D-4. Table D-4 lists the nonradiological COC evaluated for the human health and ecological risk assessments performed for SWMU 105.

V. Fate and Transport

The primary release of the COC at SWMU 105 was to the surface and subsurface soil resulting partly from an imperfection in the building foundation stem wall. Wind, water, and biota are natural mechanisms of COC transport from the primary release point; however, because the discharge was to subsurface soil, none of these mechanisms are considered to be of potential significance as transport mechanisms at this site. Because groundwater at this site is approximately 500 feet bgs, the potential for the COC to reach groundwater through the unsaturated zone above the water table is extremely low.

The only COC at SWMU 105 is mercury. It is a nonradiological analyte (no radiological analytes were evaluated). It is elemental in form and is not considered to be degradable. Transformations of this inorganic constituent could include changes in valence (oxidation/reduction reactions) or incorporation into organic forms.

Table D-5 summarizes the fate and transport processes that can occur at SWMU 105. The COC at this site is a nonradiological inorganic analyte. Wind, surface water, and biota are considered to be of low significance as potential transport mechanisms at this site. Significant leaching into the subsurface soil is unlikely, and leaching into the groundwater at this site is highly unlikely.

Table D-4 Nonradiological COCs for Human Health and Ecological Risk Assessments at SWMU 105 with Comparison to the Associated SNL/NM Background Screening Value, BCF, and Log Kow

COC	Maximum Concentration (All Samples) (mg/kg)	SNL/NM Background Concentration (mg/kg) ^a	Is Maximum COC Concentration Less Than or Equal to the Applicable SNL/NM Background Screening Value?	BCF (maximum aquatic)	Log K _{ow} (for organic COCs)	Bioaccumulator? ^b (BCF>40, Log K _{ow} >4)
Inorganic						
Mercury	342	<0.1	No	5,500°	_	Yes

Note: **Bold** indicates the COCs that exceed the background screening values and/or are bioaccumulators.

= Bioconcentration factor. **BCF** COC = Constituent of concern.

= Octanol-water partition coefficient. K_{ow}

= Logarithm (base 10). Log = Milligram(s) per kilogram. mg/kg

= New Mexico Environment Department. NMED SNL/NM = Sandia National Laboratories/New Mexico.

= Solid Waste Management Unit. SWMU

= Information not available.

^aDinwiddie September 1997, Southwest Area Supergroup.

bNMED March 1998.

^cYanicak March 1997.

Table D-5
Summary of Fate and Transport at SWMU 105

Transport and Fate Mechanism	Existence at Site	Significance
Wind	Yes	Low
Surface runoff	Yes	Low
Migration to groundwater	No	None
Food chain uptake	Yes	Low
Transformation/degradation	Yes	Low

SWMU = Solid Waste Management Unit.

VI. Human Health Risk Assessment

VI.1 Introduction

The human health risk assessment of this site includes a number of steps that culminate in a quantitative evaluation of the potential adverse human health effects caused by constituents located at the site. The steps to be discussed include the following:

Step 1.	Site data are described that provide information on the potential COCs, as well as the relevant physical characteristics and properties of the site.
Step 2.	Potential pathways are identified by which a representative population might be exposed to the COC.
Step 3.	The potential intake of the COC by the representative population is calculated using a tiered approach. The first component of the tiered approach is a screening procedure that compares the maximum concentration of the COC to an SNL/NM maximum background screening value. COCs that are not eliminated during the first screening procedure are carried forward in the risk assessment process.
Step 4.	Toxicological parameters are identified and referenced for COCs that were not eliminated during the screening procedure.
Step 5.	Potential toxicity effects (specified as a hazard index [HI]) and estimated excess cancer risks are calculated for nonradiological COCs and background.
Step 6.	These values are compared with guidelines established by the EPA, NMED, and DOE to determine whether further evaluation and potential site cleanup are required. Nonradiological COC risk values also are compared to background risk so that an incremental risk can be calculated.
Step 7.	Uncertainties of the above steps are addressed.

VI.2 Step 1. Site Data

Section I.1 of this risk assessment provides the site description and history for SWMU 105. Section II presents a comparison of results to DQOs. Section III discusses the nature, rate, and extent of contamination.

VI.3 Step 2. Pathway Identification

SWMU 105 has been designated with a future land-use scenario of industrial (DOE et al. September 1995) (see Appendix 1 for default exposure pathways and parameters). However,

the residential land-use scenario is also considered in the pathway analysis. Because of the location and characteristics of the potential contaminants, the primary pathway for human exposure is considered to be soil ingestion for the nonradiological COCs. The inhalation pathway for nonradiological COCs is included because the potential exists to inhale dust and volatiles. The dermal pathway is included for the nonradiological COCs because of the potential for the receptor to be exposed to contaminated soil. No water pathways to the groundwater are considered. Depth to groundwater at SWMU 105 is approximately 500 feet bgs. No intake routes through plant, meat, or milk ingestion are considered appropriate for either the industrial or residential land-use scenarios. Figure D-1 shows the conceptual site model flow diagram for SWMU 105.

Pathway Identification

Nonradiological Constituents				
Soil ingestion				
Inhalation (dust and volatiles)				
Dermal contact				

VI.4 Step 3. Background Screening Procedure

This section discusses Step 3, the background screening procedure, which compares the maximum COC concentration to the background screening level. The methodology and results are described in the following sections.

VI.4.1 Methodology

The maximum concentration of the nonradiological COC is compared to the approved SNL/NM maximum screening levels for this area (Dinwiddie September 1997). The SNL/NM maximum background concentration was selected to provide the background screen in Table D-4 and used to calculate risk attributable to background in Sections VI.6.2 and VI.7. The COC does not have either a quantifiable or calculated background screening level and therefore is considered in further risk assessment analyses.

VI.4.2 Results

Table D-4 shows the SWMU 105 maximum COC concentration that was compared to the SNL/NM maximum background values (Dinwiddie September 1997) for the human health risk assessment. Mercury is the only COC identified at SWMU 105. The maximum concentration is the same for the entire data set and the limited data set.

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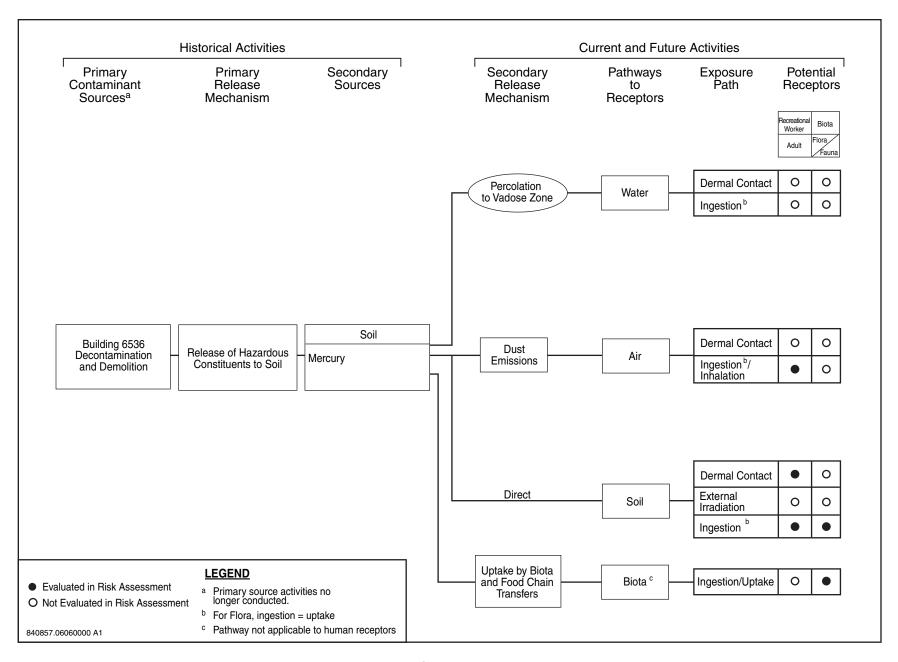


Figure D-1 SWMU 105, Mercury Spill (Building 6536) Conceptual Site Model Flow Diagram

VI.5 Step 4. Identification of Toxicological Parameters

Table D-6 lists the nonradiological COC retained in the risk assessment and provides the values for the available toxicological information. The toxicological values for mercury, the nonradiological COC presented in Table D-6, were obtained from the Integrated Risk Information System (IRIS) (EPA 2004a), the Health Effects Assessment Summary Tables (HEAST) (EPA 1997a), and the Technical Background Document for Development of Soil Screening Levels (NMED February 2004).

VI.6 Step 5. Exposure Assessment and Risk Characterization

Section VI.6.1 describes the exposure assessment for this risk assessment. Section VI.6.2 provides the risk characterization, including the HI and excess cancer risk for both the potential nonradiological COC and associated background for the industrial and residential land-use scenarios.

VI.6.1 Exposure Assessment

Appendix 1 provides the equations and parameter input values used in calculating intake values and subsequent HI and excess cancer risk values for the individual exposure pathways. The appendix shows parameters for both the industrial and residential land-use scenarios. The equations for nonradiological COCs are based upon the Risk Assessment Guidance for Superfund (RAGS) (EPA 1989). Parameters are based upon information from the RAGS (EPA 1989), the Technical Background Document for Development of Soil Screening Levels (NMED February 2004), as well as other EPA and NMED guidance documents, and reflect the reasonable maximum exposure (RME) approach advocated by the RAGS (EPA 1989).

VI.6.2 Risk Characterization

Table D-7 shows an HI of 1.19 for the SWMU 105 nonradiological COC and no quantified estimated excess cancer risk for the designated industrial land-use scenario. The numbers presented include exposure from soil ingestion, dermal contact, and dust and volatile inhalation for the nonradiological COC. Table D-8 shows no quantified HI or estimated excess cancer risk for the SWMU 105 associated background constituents under the designated industrial land-use scenario.

For the nonradiological COC under the residential land-use scenario, the HI is 15.0 with no quantified estimated excess cancer risk. The numbers in the table include exposure from soil ingestion, dermal contact, and dust and volatile inhalation. Although the EPA guidelines (1991) generally recommend that inhalation not be included in a residential land-use scenario, this pathway is included because of the potential for soil in Albuquerque, New Mexico, to be eroded and for dust to be present in predominantly residential areas. Because of the nature of the local soil, other exposure pathways are not considered (see Appendix 1). Table D-8 shows no quantified HI or estimated excess cancer risk for the SWMU 105 associated background constituents under the residential land-use scenario.

Table D-6 **Toxicological Parameter Values for SWMU 105 Nonradiological COCs**

coc	RfD _O (mg/kg-d)	Confidence ^a	RfD _{inh} (mg/kg-d)	Confidence ^a	SF _O (mg/kg-d) ⁻¹	SF _{inh} (mg/kg-d) ⁻¹	Cancer Class ^b	ABS
Inorganic								
Mercury	3E-4 ^c	-	8.6E-5 ^d	M	-	-	D	0.01 ^e

^aConfidence associated with IRIS (EPA 2004a) database values. Confidence: M = medium.

^bEPA weight-of-evidence classification system for carcinogenicity (EPA 1989) taken from IRIS (EPA 2004a):

D = Not classifiable as to human carcinogenicity.

^cToxicological parameter values from HEAST (EPA 1997a).

^dToxicological parameter values from IRIS electronic database (EPA 2004a).

eToxicological parameter values from NMED (February 2004).

= Gastrointestinal absorption coefficient. ABS

COC = Constituent of concern.

= U.S. Environmental Protection Agency. EPA = Health Effects Assessment Summary Tables. HEAST

IRIS = Integrated Risk Information System. = Milligram(s) per kilogram-day. mg/kg-d = Per milligram per kilogram-day. $(mq/kq-d)^{-1}$

= New Mexico Environment Department. NMED RfD_{inh} = Inhalation chronic reference dose. RfD₀ = Oral chronic reference dose. SF_{inh} SF_o = Inhalation slope factor.

= Oral slope factor.

= Solid Waste Management Unit. SWMU = Information not available.

RISK ASSESSMENT FOR SWMU 105

Table D-7 Risk Assessment Values for SWMU 105 Nonradiological COCs

	Maximum Concentration		Land-Use nario ^a	Residential Land-Use Scenario ^a	
coc	(All Samples) (mg/kg)	Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Inorganic					
Mercury	342	1.19	_	15.0	_
Total		1.19	_	15.0	_

^aEPA 1989.

COC = Constituent of concern.

EPA = U.S. Environmental Protection Agency. mg/kg = Milligram(s) per kilogram. SWMU = Solid Waste Management Unit. = Information not quantified.

Table D-8 Risk Assessment Values for SWMU 105 Nonradiological Background Constituents

	Background Concentration ^a (mg/kg)	Industrial Land-Use Scenario ^b		Residential Land-Use Scenario ^b	
сос		Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Mercury	<0.1	_	-	-	_
Total		_	_	_	_

^aDinwiddie September 1997, Southwest Area Supergroup.

^bEPA 1989.

COC = Constituent of concern.

EPA = U.S. Environmental Protection Agency.

mg/kg = Milligram(s) per kilogram. SWMU = Solid Waste Management Unit. = Information not quantified.

VI.7 Step 6. Comparison of Risk Values to Numerical Guidelines

The human health risk assessment analysis evaluates the potential for adverse health effects for both the industrial (the designated land-use scenario for this site) and residential land-use scenarios.

For the nonradiological COC under the industrial land-use scenario, the HI is 1.19 (slightly greater than the numerical guideline of 1 suggested in the RAGS [EPA 1989]). There was no quantified estimated excess cancer risk. NMED guidance states that cumulative excess lifetime cancer risk must be less than 1E-5 (Bearzi January 2001); thus the excess cancer risk for this site is below the suggested acceptable risk value. This assessment also determines risks considering background concentrations of the potential nonradiological COC for both the industrial and residential land-use scenarios. Assuming the industrial land-use scenario, there is neither a quantifiable HI nor an excess cancer risk for the nonradiological COC. The incremental risk is determined by subtracting risk associated with background from potential COC risk. These numbers are not rounded before the difference is determined and therefore may appear to be inconsistent with numbers presented in tables and within the text. For conservatism, the background constituents that do not have quantified background screening concentrations are assumed to have a hazard quotient (HQ) of 0.00. However, there was no quantified HI or estimated excess cancer risk for the SWMU 105 associated background constituents under the industrial land-use scenario.

The calculated HI for the nonradiological COC under the residential land-use scenario is 15, which is above numerical guidance. There was no quantified estimated excess cancer risk. NMED guidance states that cumulative excess lifetime cancer risk must be less than 1E-5 (Bearzi January 2001); thus the excess cancer risk for this site is below the suggested acceptable risk value. There was no quantified HI or estimated excess cancer risk for the SWMU 105 associated background constituent under the residential land-use scenario.

VI.8 Step 7. Uncertainty Discussion

Because of the location, history of the site, and future land use, there is low uncertainty in the land-use scenario and the potentially affected populations that were considered in performing the risk assessment analysis. Based upon the COC found in the near-surface soil and the location and physical characteristics of the site, there is little uncertainty in the exposure pathways relevant to the analysis.

An RME approach is used to calculate the risk assessment values. Specifically, the parameter values in the calculations are conservative and calculated intakes are probably overestimated. Maximum measured values of COC concentrations are used to provide conservative results.

Table D-6 shows the uncertainties (confidence levels) in nonradiological toxicological parameter values. There is a combination of estimated values and values from the IRIS (EPA 2004a), HEAST (EPA 1997a), and Technical Background Document for Development of Soil Screening Levels (NMED February 2004). Where values are not provided, information is not available from the HEAST (EPA 1997a), IRIS (EPA 2004a), Technical Background Document for Development of Soil Screening Levels (NMED February 2004), Risk Assessment Information System (ORNL 2003), or EPA Regions 6, 9, or 3 (EPA 2004b, EPA 2002a, EPA 2002b).

Because of the conservative nature of the RME approach, uncertainties in toxicological values are not expected to change the conclusion from the risk assessment analysis.

Entire Data Set

Although the HI was above the NMED guideline for the industrial land-use scenario, the maximum concentration was used in the risk calculation. Because the site has been adequately characterized, the average concentration is more representative of actual site conditions. Using the 95% upper confidence limit (UCL) of the mean concentration for mercury for the entire site analytical data set (7.8 mg/kg, summarized in Appendix 2) reduces the total HI to 0.03. Thus, by using a realistic concentration in the risk calculations that more accurately depicts actual site conditions, both the total and incremental HI values are below NMED quidelines.

Although the HI was above the NMED guideline for the residential land-use scenario, the maximum concentration was used in the risk calculation. Because the site has been adequately characterized, the average concentration is more representative of actual site conditions. Using the 95% UCL of the mean concentration for mercury for the entire site analytical data set (7.8 mg/kg, summarized in Appendix 2) reduces the total HI to 0.34. Thus, by using a realistic concentration in the risk calculations that more accurately depicts actual site conditions, both the total and incremental HI values are below NMED guidelines.

Limited Data Set

Although the HI was above the NMED guideline for the industrial land-use scenario, the maximum concentration was used in the risk calculation. Because the site has been adequately characterized, the average concentration is more representative of actual site conditions. Using the 95% UCL of the mean concentration for mercury for the limited analytical data set (30.5 mg/kg, summarized in Appendix 2) reduces the total HI to 0.11. Thus, by using a realistic concentration in the risk calculations that more accurately depicts actual site conditions, both the total and incremental HI values are below NMED guidelines.

Although the HI was above the NMED guideline for the residential land-use scenario, the maximum concentration was used in the risk calculation. Because the site has been adequately characterized, the average concentration is more representative of actual site conditions. Using the 95% UCL of the mean concentration for mercury for the limited analytical data set (30.5 mg/kg, summarized in Appendix 2) reduces the total HI to 1.34. Thus, by using a realistic concentration in the risk calculations that more accurately depicts actual site conditions, both the total and incremental HI values are only slightly above NMED guidelines.

The overall uncertainty in all of the steps in the risk assessment process is not considered to be significant with respect to the conclusion reached.

VI.9 Summary

SWMU 105 contains an identified COC that is the inorganic compound mercury. Because of the location of the site, the designated industrial land-use scenario, and the nature of

contamination, potential exposure pathways identified for this site include soil ingestion, dermal contact, and dust and volatile inhalation for chemical COCs. The same exposure pathways are applied to the residential land-use scenario.

Using conservative assumptions and an RME approach to risk assessment, calculations for the nonradiological COC show that for the industrial land-use scenario the HI (1.19) is slightly greater than the accepted numerical guidance from the EPA. There was no quantified estimated excess cancer risk; thus, excess cancer risk is below the acceptable risk value provided by the NMED for an industrial land-use scenario (Bearzi January 2001). There was no quantified HI or estimated excess cancer risk for the SWMU 105 associated background constituent under the industrial land-use scenario.

Although the HI was above the NMED guideline for the industrial land-use scenario, the maximum concentration was used in the risk calculation. Because the site has been adequately characterized, the average concentration is more representative of actual site conditions. Using the 95% UCL of the mean concentration for mercury for the entire site analytical data set (7.8 mg/kg, summarized in Appendix 2) reduces the total HI to 0.03. Thus, by using a realistic concentration in the risk calculations that more accurately depicts actual site conditions, both the total and incremental HI values are below NMED guidelines.

Although the HI was above the NMED guideline for the industrial land-use scenario, the maximum concentration was used in the risk calculation. Because the site has been adequately characterized, the average concentration is more representative of actual site conditions. Using the 95% UCL of the mean concentration for mercury for the limited analytical data set (30.5 mg/kg, summarized in Appendix 2) reduces the total HI to 0.11. Thus, by using a realistic concentration in the risk calculations that more accurately depicts actual site conditions, both the total and incremental HI values are below NMED guidelines.

Using conservative assumptions and an RME approach to risk assessment, calculations for the nonradiological COC shows that for the residential land-use scenario the HI (15.0) is above the accepted numerical guidance from the EPA. There was no quantified estimated excess cancer risk; thus, excess cancer risk is below the acceptable risk value provided by the NMED for a residential land-use scenario (Bearzi January 2001). There was no quantified HI or estimated excess cancer risk for the SWMU 105 associated background constituent under the residential land-use scenario.

Although the HI was above the NMED guideline for the residential land-use scenario, the maximum concentration was used in the risk calculation. Because the site has been adequately characterized, the average concentration is more representative of actual site conditions. Using the 95% UCL of the mean concentration for mercury for the entire site analytical data set (7.8 mg/kg, summarized in Appendix 2) reduces the total HI to 0.34. Thus, by using a realistic concentration in the risk calculations that more accurately depicts actual site conditions, both the total and incremental HI values are below NMED guidelines.

Although the HI was above the NMED guideline for the residential land-use scenario, the maximum concentration was used in the risk calculation. Because the site has been adequately characterized, the average concentration is more representative of actual site conditions. Using the 95% UCL of the mean concentration for mercury for the limited analytical data set (30.5 mg/kg, summarized in Appendix 2) reduces the total HI to 1.34. Thus, by using a

realistic concentration in the risk calculations that more accurately depicts actual site conditions, both the total and incremental HI values are only slightly above NMED guidelines.

Uncertainties associated with the calculations are considered small relative to the conservatism of the risk assessment analysis. Therefore, it is concluded that this site poses insignificant risk to human health under the industrial land-use scenario when evaluating all of the data for mercury for the entire site, as well as the limited data set.

VII. Ecological Risk Assessment

VII.1 Introduction

This section addresses the ecological risks associated with exposure to the constituent of potential ecological concern (COPEC) in the soil at SWMU 105. A component of the NMED Risk-Based Decision Tree (NMED March 1998) is to conduct an ecological assessment that corresponds with that presented in the EPA's Ecological RAGS (EPA 1997b). The current methodology is tiered and contains an initial scoping assessment followed by a more detailed risk assessment. Initial components of the NMED's decision tree (a discussion of DQOs, data assessment, and evaluations of bioaccumulation as well as fate and transport potential) are addressed in previous sections of this report. Following the completion of the scoping assessment, a determination is made as to whether a more detailed examination of potential ecological risk is necessary. If deemed necessary, the scoping assessment proceeds to a risk assessment whereby a more quantitative estimate of ecological risk is conducted. Although this assessment incorporates conservatisms into the estimation of ecological risks, ecological relevance and professional judgment are also used as recommended by the EPA (1998) to ensure that predicted exposures of selected ecological receptors reflect those reasonably expected to occur at the site.

VII.2 Scoping Assessment

The scoping assessment focuses primarily on the likelihood of exposure of biota at, or adjacent to, the site to constituents associated with site activities. Included in this section are an evaluation of existing data and a comparison of maximum detected concentrations to background concentrations, examination of bioaccumulation potential, and fate and transport potential. A scoping risk-management decision (Section VII.2.4) summarizes the scoping results and assesses the need for further examination of potential ecological impacts.

VII.2.1 Data Assessment

As indicated in Section IV (Table D-4), the inorganic constituent, mercury, is present in the soil within the 0- to 5-foot depth interval at concentrations that exceed the background concentration.

No radiological COPECs are evaluated for SWMU 105.

VII.2.2 Bioaccumulation

Mercury, as listed in Section VII.2.1, is considered to have bioaccumulation potential in aquatic environments (Section IV, Table D-4). However, as directed by the NMED (March 1998), bioaccumulation for inorganic compounds is assessed exclusively based upon maximum reported bioconcentration factors (BCFs) for aquatic species. Because only aquatic BCFs are used to evaluate the bioaccumulation potential for metals, bioaccumulation in terrestrial species is likely to be overpredicted.

VII.2.3 Fate and Transport Potential

The potential for the COPEC to migrate from the source of contamination to other media or biota is discussed in Section V. As noted in Table D-5, wind, surface water, and biota are expected to be of low significance as transport mechanisms for the COPEC at this site. Migration to groundwater is not anticipated. In general, transformation of the COPEC is expected to be of low significance.

VII.2.4 Scoping Risk-Management Decision

Based upon information gathered through the scoping assessment, it is concluded that complete ecological pathways may be associated with SWMU 105 and that the COPEC exists at the site. As a consequence, a risk assessment was deemed necessary to predict the potential level of ecological risk associated with the site.

VII.3 Risk Assessment

As concluded in Section VII.2.4, both complete ecological pathways and a COPEC are associated with SWMU 105. The risk assessment performed for the site involves a quantitative estimate of current ecological risks using exposure models in association with exposure parameters and toxicity information obtained from the literature. The estimation of potential ecological risks is conservative to ensure that ecological risks are not underpredicted.

Components within the risk assessment include the following:

- Problem Formulation—sets the stage for the evaluation of potential exposure and risk.
- Exposure Estimation—provides a quantitative estimate of potential exposure.
- Ecological Effects Evaluation—presents benchmarks used to gauge the toxicity of the COPEC to specific receptors.
- Risk Characterization—characterizes the ecological risk associated with exposure of the receptors to environmental media at the site.
- Uncertainty Assessment—discusses uncertainties associated with the estimation of exposure and risk.

- Risk Interpretation—evaluates ecological risk in terms of the HQ and ecological significance.
- Risk Assessment Scientific/Management Decision Point—presents the decision to risk managers based upon the results of the ecological risk assessment.

VII.3.1 Problem Formulation

Problem formulation is the initial stage of the ecological risk assessment that provides the introduction to the risk evaluation process. Components that are addressed in this section include a discussion of ecological pathways and the ecological setting, identification of COPECs, and selection of ecological receptors. The conceptual model, ecological food webs, and ecological endpoints (other components commonly addressed in a risk assessment) are presented in "Predictive Ecological Risk Assessment Methodology, Environmental Restoration Program, Sandia National Laboratories, New Mexico" (IT July 1998) and are not duplicated here.

VII.3.1.1 Ecological Pathways and Setting

SWMU 105 is less than an acre in size. The site is located in an area originally dominated by grassland habitat; however, this habitat has been highly disturbed in the area of the site (i.e., industrialized). No threatened or endangered species exist at this site (IT February 1995), and no surface-water bodies, seeps, or springs are associated with the site.

Complete ecological pathways may exist at this site through the exposure of plants and wildlife to the COPEC in the soil. It is assumed that direct uptake of the COPEC from the soil is the major route of exposure for plants and that exposure of plants to wind-blown soil is minor. Exposure modeling for the wildlife receptors is limited to the food and soil ingestion pathways. Because of the lack of surface water at this site, exposure to the COPEC through the ingestion of surface water is considered insignificant. Inhalation and dermal contact are also considered insignificant pathways with respect to ingestion (Sample and Suter 1994). Groundwater is not expected to be affected by the COC at this site.

VII.3.1.2 COPECs

Undocumented release of mercury through imperfections in the foundation and stem wall of Building 6536 was the primary source of the COPEC at SWMU 105. Mercury, the inorganic COPEC identified for this site, is listed in Section VII.2.1. The inorganic analyte was screened against the background concentration. Because concentrations of mercury exceed the approved SNL/NM background screening level (Dinwiddie September 1997) for the area, it is considered to be a COPEC. In order to provide conservatism, this ecological risk assessment is based upon the maximum soil concentration of the COPEC measured in the upper 5 feet of soil at this site. Table D-4 presents the maximum concentration for the COPEC.

VII.3.1.3 Ecological Receptors

A nonspecific perennial plant is selected as the receptor to represent plant species at the site (IT July 1998). Vascular plants are the principal primary producers at the site and are key to the diversity and productivity of the wildlife community associated with the site. The deer mouse (*Peromyscus maniculatus*) and the burrowing owl (*Speotyto cunicularia*) are used to represent wildlife use. Because of its opportunistic food habits, the deer mouse represents a mammalian herbivore, omnivore, and insectivore. The burrowing owl represents a top predator at this site. The burrowing owl is present at SNL/NM and is designated a species of management concern by the U.S. Fish and Wildlife Service in Region 2, which includes the state of New Mexico (USFWS September 1995).

VII.3.2 Exposure Estimation

Direct uptake from the soil is considered the only significant route of exposure for terrestrial plants. Exposure modeling for the wildlife receptors is limited to food and soil ingestion pathways. Inhalation and dermal contact are considered insignificant pathways with respect to ingestion (Sample and Suter 1994). Drinking water is also considered to be an insignificant pathway because of the lack of surface water at this site. The deer mouse is modeled under three dietary regimes: as an herbivore (100 percent of its diet as plant material), as an omnivore (50 percent of its diet as plants and 50 percent as soil invertebrates), and as an insectivore (100 percent of its diet as soil invertebrates). The burrowing owl is modeled as a strict predator on small mammals (100 percent of its diet as deer mice). Because the exposure in the burrowing owl from a diet consisting of equal parts of herbivorous, omnivorous, and insectivorous mice would be equivalent to the exposure consisting of only omnivorous mice, the diet of the burrowing owl is modeled with intake of omnivorous mice only. Both species are modeled with soil ingestion comprising 2 percent of the total dietary intake. Table D-9 presents the species-specific factors used in modeling exposures in the wildlife receptors. Justification for use of the factors presented in this table is described in the ecological risk assessment methodology document (IT July 1998).

Although home range is also included in this table, exposures for this risk assessment are modeled using an area use factor of 1.0, implying that all food items and soil ingested come from the site being investigated. The maximum COPEC concentration measured in surface soil samples is used to conservatively estimate potential exposures and risks to plants and wildlife at this site. Table D-10 provides the transfer factors used in modeling the concentration of the COPEC through the food chain. Table D-11 presents the maximum concentration in soil and derived concentrations in tissues of the various food chain elements that are used to model dietary exposures for each of the wildlife receptors.

VII.3.3 Ecological Effects Evaluation

Table D-12 shows benchmark toxicity values for the plant and wildlife receptors. For plants, the benchmark soil concentrations are based upon the lowest-observed-adverse-effect level.

Table D-9
Exposure Factors for Ecological Receptors at SWMU 105

Receptor Species	Class/Order	Trophic Level	Body Weight (kg) ^a	Food Intake Rate (kg/day) ^b	Dietary Composition ^c	Home Range (acres)
Deer Mouse (Peromyscus maniculatus)	Mammalia/ Rodentia	Herbivore	2.39E-2 ^d	3.72E-3	Plants: 100% (+ Soil at 2% of intake)	2.7E-1 ^e
Deer Mouse (Peromyscus maniculatus)	Mammalia/ Rodentia	Omnivore	2.39E-2 ^d	3.72E-3	Plants: 50% Invertebrates: 50% (+ Soil at 2% of intake)	2.7E-1 ^e
Deer Mouse (Peromyscus maniculatus)	Mammalia/ Rodentia	Insectivore	2.39E-2 ^d	3.72E-3	Invertebrates: 100% (+ Soil at 2% of intake)	2.7E-1 ^e
Burrowing owl (Speotyto cunicularia)	Aves/ Strigiformes	Carnivore	1.55E-1 ^f	1.73E-2	Rodents: 100% (+ Soil at 2% of intake)	3.5E+1 ⁹

^aBody weights are in kg wet weight.

^fDunning 1993.

gHaug et al. 1993.

EPA = U.S. Environmental Protection Agency.

kg = Kilogram(s).

SWMU = Solid Waste Management Unit.

^bFood intake rates are estimated from the allometric equations presented in Nagy (1987). Units are kg dry weight per day.

^cDietary compositions are generalized for modeling purposes. Default soil intake value of 2 percent of food intake.

dSilva and Downing 1995.

eEPA (1993), based upon the average home range measured in semiarid shrubland in Idaho.

Table D-10
Transfer Factors Used in Exposure Models for COPECs at SWMU 105

COPEC	Soil-to-Plant Transfer Factor	Soil-to-Invertebrate Transfer Factor	Food-to-Muscle Transfer Factor
Inorganic			
Mercury	1.0E+0 ^a	1.0E+0 ^b	2.5E-1 ^c

^aNCRP January 1989.

^bDefault value.

cBaes et al. 1984.

COPEC = Constituent of potential ecological concern.

NCRP = National Council on Radiation Protection and Measurements.

SWMU = Solid Waste Management Unit.

Table D-11
Media Concentrationsa for COPECs at SWMU 105

COPEC	Soil (Samples ≤ 5 ft bgs) (maximum) ^a	Plant Foliage ^b	Soil Invertebrate ^b	Deer Mouse Tissues ^c
Inorganic				
Mercury	342	342	342	273

^aIn milligrams per kilogram. All biotic media are based upon dry weight of the media. Soil concentration measurements are assumed to have been based upon dry weight. Values have been rounded to two significant digits after calculation.

^bProduct of the soil concentration and the corresponding transfer factor.

^cBased upon the deer mouse with an omnivorous diet. Product of the average concentration ingested in food and soil times the food-to-muscle transfer factor times a wet weight-dry weight conversion factor of 3.125 (EPA 1993).

bgs = Below ground surface.

COPEC = Constituent of potential ecological concern.

ft = Foot (feet).

SWMU = Solid Waste Management Unit.

Table D-12
Toxicity Benchmarks for Ecological Receptors at SWMU 105

		Mam	malian NOAELs	}		Avian NOAELs	
COPEC	Plant Benchmark ^{a,b}	Mammalian Test Species ^{c,d}	Test Species NOAELd,e	Deer Mouse NOAEL ^{e,f}	Avian Test Species ^d	Test Species NOAELd,e	Burrowing Owl NOAEL ^{e,g}
Inorganic							
Mercury (inorganic)	0.3	mouse	13.2	14.0	Japanese quail	0.45	0.45

^aln mg/kg soil dry weight.

^fBased upon NOAEL conversion methodology presented in Sample et al. (1996), using a deer mouse body weight of 0.0239 kg and a mammalian scaling factor of 0.25.

⁹Based upon NOAEL conversion methodology presented in Sample et al. (1996). The avian scaling factor of 0.0 was used, making the NOAEL independent of body weight.

COPEC = Constituents of potential ecological concern.

kg = Kilogram(s). mg = Milligram(s).

NOAEL = No-observed-adverse-effect level. SWMU = Solid Waste Management Unit. RISK ASSESSMENT FOR SWMU 105

^bEfroymson et al. 1997.

^cBody weight (in kg) for the NOAEL conversion are 0.030 for the lab mouse.

dSample et al. 1996.

^eIn mg/kg body weight per day.

For wildlife, the toxicity benchmarks are based upon the no-observed-adverse-effect level (NOAEL) for chronic oral exposure in a taxonomically similar test species.

VII.3.4 Risk Characterization

The maximum concentration in the soil and estimated dietary exposures are compared to plant and wildlife benchmark values, respectively. Table D-13 presents the results of these comparisons. The HQ is used to quantify the comparison with benchmarks for plant and wildlife exposure.

The HQ for SWMU 105 exceeds unity based upon the maximum mercury concentration. As directed by the NMED, HIs are calculated for each of the receptors (the HI is the sum of chemical-specific HQs for all pathways for a given receptor). Again all of the HIs exceed unity, with a maximum HI of 1,100 for the plant.

VII.3.5 Uncertainty Assessment

Many uncertainties are associated with the characterization of ecological risks at SWMU 105. These uncertainties result from assumptions used in calculating risk that could overestimate or underestimate true risk presented at the site. For this risk assessment, assumptions are made that are more likely to overestimate exposures and risk rather than to underestimate them. These conservative assumptions are used to be more protective of the ecological resources potentially affected by the site. Conservatisms incorporated into this risk assessment include the use of maximum analyte concentrations measured in soil to evaluate risk, the use of wildlife toxicity benchmarks based upon NOAEL values, and the incorporation of strict herbivorous and strict insectivorous diets for predicting the extreme HQ value for the deer mouse. Each of these uncertainties, which are consistent among each of the site-specific ecological risk assessments, is discussed in greater detail in the uncertainty section of the ecological risk assessment methodology document for the SNL/NM ER Program (IT July 1998).

The assumption of an area use factor of 1.0 is a source of uncertainty for the burrowing owl at this site. Because SWMU 105 is very small in size and the home range of the burrowing owl is 35 acres, an area use factor of approximately 0 would be justified for this receptor. This is sufficient to reduce the burrowing owl HQ for mercury from 69 to approximately 0. The same discussion, to a lesser extent, is accurate for the deer mouse, and the associated HI would be reduced to less than 1.0.

A further source of uncertainty associated with the prediction of ecological risks at this site is the use of the maximum measured concentration to evaluate exposure and risk. This results in a conservative exposure scenario that does not necessarily reflect actual site conditions. To evaluate the potential effect on risk predictions by using the maximum concentration as the exposure point concentration, the UCL of the mean (Appendix 2) soil concentration was calculated for mercury (9.6 mg/kg) using all of the available mercury site data. Exposure to plants at the 95% UCL concentration for mercury is reduced to an HQ of 32. The deer mouse HQ is reduced to a level below 1, indicating low average risk to this receptor from this COPEC.

Table D-13 **HQs for Ecological Receptors at SWMU 105**

COPEC	Plant HQ	Deer Mouse HQ (Herbivorous)	Deer Mouse HQ (Omnivorous)	Deer Mouse HQ (Insectivorous)	Burrowing Owl HQ
Inorganic					
Mercury (Inorganic)	1.1E+03	3.9E+00	3.9E+00	3.9E+00	6.9E+01
HI ^a	1.1E+03	3.9E+00	3.9E+00	3.9E+00	6.9E+01

Note: Values in **bold** indicate that the HQ or HI exceeds unity.

^aThe HI is the sum of individual HQs.

COPEC = Constituent of potential ecological concern.

= Hazard index. HI

HQ = Hazard quotient.
SWMU = Solid Waste Management Unit.

Using the limited data set to evaluate the potential effect on risk predictions based upon the maximum concentration as the exposure point concentration, the UCL of the mean soil concentration (Appendix 2) was also calculated for mercury (39.9 mg/kg). Exposure to plants at the 95% UCL concentration for mercury is reduced to an HQ of 130. The deer mouse HQ is reduced to a level below 1, indicating low average risk to this receptor from this COPEC.

VII.3.6 Risk Interpretation

Ecological risks associated with SWMU 105 were estimated through a risk assessment that incorporated site-specific information when available. HQs greater than unity were predicted; however, closer examination of the exposure assumptions revealed an overestimation of risk primarily attributed to conservative toxicity benchmarks; the use of the maximum concentration, maximum bioavailability, and maximum area use to estimate exposure. Based upon this final analysis, the potential for ecological risks associated with SWMU 105 is expected to be low.

VII.3.7 Risk Assessment Scientific/Management Decision Point

After potential ecological risks associated with the site have been assessed, a decision is made regarding whether the site should be recommended for CAC with controls (NMED April 2004) or whether additional data should be collected to assess actual ecological risk at the site more thoroughly. With respect to this site, ecological risks are predicted to be low.

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APPENDIX 1 EXPOSURE PATHWAY DISCUSSION FOR CHEMICAL AND RADIONUCLIDE CONTAMINATION

<u>Introduction</u>

Sandia National Laboratories/New Mexico (SNL/NM) uses a default set of exposure routes and associated default parameter values developed for each future land-use designation being considered for SNL/NM Environmental Restoration (ER) Project sites. This default set of exposure scenarios and parameter values are invoked for risk assessments unless site-specific information suggests other parameter values. Because many SNL/NM solid waste management units (SWMUs) have similar types of contamination and physical settings, SNL/NM believes that the risk assessment analyses at these sites can be similar. A default set of exposure scenarios and parameter values facilitates the risk assessments and subsequent review.

The default exposure routes and parameter values used are those that SNL/NM views as resulting in a Reasonable Maximum Exposure (RME) value. Subject to comments and recommendations by the U.S. Environmental Protection Agency (EPA) Region VI and New Mexico Environment Department (NMED), SNL/NM will use these default exposure routes and parameter values in future risk assessments.

At SNL/NM, all SWMUs exist within the boundaries of the Kirtland Air Force Base. Approximately 240 potential waste and release sites have been identified where hazardous. radiological, or mixed materials may have been released to the environment. Evaluation and characterization activities have occurred at all of these sites to varying degrees. Among other documents, the SNL/NM ER draft Environmental Assessment (DOE 1996) presents a summary of the hydrogeology of the sites and the biological resources present. When evaluating potential human health risk the current or reasonably foreseeable land use negotiated and approved for the specific SWMU/AOC, aggregate, or watershed will be used. The following references generally document these land uses: Workbook: Future Use Management Area 2 (DOE et al. September 1995); Workbook: Future Use Management Area 1 (DOE et al. October 1995); Workbook: Future Use Management Areas 3, 4, 5, and 6 (DOE and USAF January 1996); Workbook: Future Use Management Area 7 (DOE and USAF March 1996). At this time, all SNL/NM SWMUs have been tentatively designated for either industrial or recreational future land use. The NMED has also requested that risk calculations be performed based upon a residential land-use scenario. Therefore, all three land-use scenarios will be addressed in this document.

The SNL/NM ER Project has screened the potential exposure routes and identified default parameter values to be used for calculating potential intake and subsequent hazard index (HI), excess cancer risk and dose values. The EPA (EPA 1989) provides a summary of exposure routes that could potentially be of significance at a specific waste site. These potential exposure routes consist of:

- Ingestion of contaminated drinking water
- Ingestion of contaminated soil

- Ingestion of contaminated fish and shellfish
- Ingestion of contaminated fruits and vegetables
- Ingestion of contaminated meat, eggs, and dairy products
- Ingestion of contaminated surface water while swimming
- Dermal contact with chemicals in water
- Dermal contact with chemicals in soil
- Inhalation of airborne compounds (vapor phase or particulate)
- External exposure to penetrating radiation (immersion in contaminated air; immersion in contaminated water; and exposure from ground surfaces with photon-emitting radionuclides)

Based upon the location of the SNL/NM SWMUs and the characteristics of the surface and subsurface at the sites, we have evaluated these potential exposure routes for different landuse scenarios to determine which should be considered in risk assessment analyses (the last exposure route is pertinent to radionuclides only). At SNL/NM SWMUs, there is currently no consumption of fish, shellfish, fruits, vegetables, meat, eggs, or dairy products that originate on site. Additionally, no potential for swimming in surface water is present due to the high-desert environmental conditions. As documented in the RESRAD computer code manual (ANL 1993), risks resulting from immersion in contaminated air or water are not significant compared to risks from other radiation exposure routes.

For the industrial and recreational land-use scenarios, SNL/NM ER has, therefore, excluded the following five potential exposure routes from further risk assessment evaluations at any SNL/NM SWMU:

- Ingestion of contaminated fish and shellfish
- Ingestion of contaminated fruits and vegetables
- Ingestion of contaminated meat, eggs, and dairy products
- Ingestion of contaminated surface water while swimming
- Dermal contact with chemicals in water

That part of the exposure pathway for radionuclides related to immersion in contaminated air or water is also eliminated.

Based upon this evaluation, for future risk assessments the exposure routes that will be considered are shown in Table 1.

Table 1
Exposure Pathways Considered for Various Land-Use scenarios

Industrial	Recreational	Residential
Ingestion of contaminated drinking	Ingestion of contaminated	Ingestion of contaminated drinking
water	drinking water	water
Ingestion of contaminated soil	Ingestion of contaminated soil	Ingestion of contaminated soil
Inhalation of airborne compounds	Inhalation of airborne	Inhalation of airborne compounds
(vapor phase or particulate)	compounds (vapor phase or	(vapor phase or particulate)
	particulate)	
Dermal contact (nonradiological	Dermal contact (nonradiological	Dermal contact (nonradiological
constituents only) soil only	constituents only) soil only	constituents only) soil only
External exposure to penetrating	External exposure to	External exposure to penetrating
radiation from ground surfaces	penetrating radiation from	radiation from ground surfaces
	ground surfaces	

Equations and Default Parameter Values for Identified Exposure Routes

In general, SNL/NM expects that ingestion of compounds in drinking water and soil will be the more significant exposure routes for chemicals; external exposure to radiation may also be significant for radionuclides. All of the above routes will, however, be considered for their appropriate land-use scenarios. The general equation for calculating potential intakes via these routes is shown below. The equations are taken from "Assessing Human Health Risks Posed by Chemicals: Screening-Level Risk Assessment" (NMED March 2000) and "Technical Background Document for Development of Soil Screening Levels" (NMED February 2004). Equations from both documents are based upon the "Risk Assessment Guidance for Superfund" (RAGS): Volume 1 (EPA 1989, 1991). These general equations also apply to calculating potential intakes for radionuclides. A more in-depth discussion of the equations used in performing radiological pathway analyses with the RESRAD code may be found in the RESRAD Manual (ANL 1993). RESRAD is the only code designated by the U.S. Department of Energy (DOE) in DOE Order 5400.5 for the evaluation of radioactively contaminated sites (DOE 1993). The Nuclear Regulatory Commission (NRC) has approved the use of RESRAD for dose evaluation by licensees involved in decommissioning, NRC staff evaluation of waste disposal requests, and dose evaluation of sites being reviewed by NRC staff. EPA Science Advisory Board reviewed the RESRAD model. EPA used RESRAD in their rulemaking on radiation site cleanup regulations. RESRAD code has been verified, undergone several benchmarking analyses, and been included in the International Atomic Energy Agency's VAMP and BIOMOVS Il projects to compare environmental transport models.

Also shown are the default values SNL/NM ER will use in RME risk assessment calculations for industrial, recreational, and residential land-use scenarios, based upon EPA and other governmental agency guidance. The pathways and values for chemical contaminants are discussed first, followed by those for radionuclide contaminants. RESRAD input parameters that are left as the default values provided with the code are not discussed. Further information relating to these parameters may be found in the RESRAD Manual (ANL 1993) or by directly accessing the RESRAD websites at: http://web.ead.anl.gov/resrad/home2/ or http://web.ead.anl.gov/resrad/documents/.

Generic Equation for Calculation of Risk Parameter Values

The equation used to calculate the risk parameter values (i.e., hazard quotients/HI, excess cancer risk, or radiation total effective dose equivalent [TEDE] [dose]) is similar for all exposure pathways and is given by:

Risk (or Dose) = Intake x Toxicity Effect (either carcinogenic, noncarcinogenic, or radiological)

$$= C \times (CR \times EFD/BW/AT) \times Toxicity Effect$$
 (1)

where:

C = contaminant concentration (site specific)

CR = contact rate for the exposure pathway

EFD= exposure frequency and duration

BW = body weight of average exposure individual

AT = time over which exposure is averaged.

For nonradiological constituents of concern (COCs), the total risk/dose (either cancer risk or HI) is the sum of the risks/doses for all of the site-specific exposure pathways and contaminants. For radionuclides, the calculated radiation exposure, expressed as TEDE is compared directly to the exposure guidelines of 15 millirem per year (mrem/year) for industrial and recreational future use and 75 mrem/year for the unlikely event that institutional control of the site is lost and the site is used for residential purposes (EPA 1997).

The evaluation of the carcinogenic health hazard produces a quantitative estimate for excess cancer risk resulting from the COCs present at the site. This estimate is evaluated for determination of further action by comparison of the quantitative estimate with the potentially acceptable risk of 1E-5 for nonradiological carcinogens. The evaluation of the noncarcinogenic health hazard produces a quantitative estimate (i.e., the HI) for the toxicity resulting from the COCs present at the site. This estimate is evaluated for determination of further action by comparison of this quantitative estimate with the EPA standard HI of unity (1). The evaluation of the health hazard from radioactive compounds produces a quantitative estimate of doses resulting from the COCs present at the site. This estimated dose is used to calculate an assumed risk. However, this calculated risk is presented for illustration purposes only, not to determine compliance with regulations.

The specific equations used for the individual exposure pathways can be found in RAGS (EPA 1989) and are outlined below. The RESRAD Manual (ANL 1993) describes similar equations for the calculation of radiological exposures.

Soil Ingestion

A receptor can ingest soil or dust directly by working in the contaminated soil. Indirect ingestion can occur from sources such as unwashed hands introducing contaminated soil to food that is then eaten. An estimate of intake from ingesting soil will be calculated as follows:

$$I_{s} = \frac{C_{s} * IR * CF * EF * ED}{BW * AT}$$

where:

I_s = Intake of contaminant non-section in soil (mg/kg) = Chemical concentration in soil (mg/kg) = Intake of contaminant from soil ingestion (milligrams [mg]/kilogram [kg]-day)

CF = Conversion factor (1E-6 kg/mg)

EF = Exposure frequency (days/year)

ED = Exposure duration (years)

BW = Body weight (kg)

AT = Averaging time (period over which exposure is averaged) (days)

It should be noted that it is conservatively assumed that the receptor only ingests soil from the contaminated source.

Soil Inhalation

A receptor can inhale soil or dust directly by working in the contaminated soil. An estimate of intake from inhaling soil will be calculated as follows (EPA August 1997):

$$I_{s} = \frac{C_{s} * IR * EF * ED * \left(\frac{1}{VF} or \frac{1}{PEF}\right)}{BW * AT}$$

where:

 I_s = Intake of contaminant from soil inhalation (mg/kg-day) C_s = Chemical concentration in soil (mg/kg)

IR = Inhalation rate (cubic meters [m³]/day)

EF = Exposure frequency (days/year)

ED = Exposure duration (years)

VF = soil-to-air volatilization factor (m³/kg)

PEF = particulate emission factor (m³/kg)

BW = Body weight (kg)

AT = Averaging time (period over which exposure is averaged) (days)

Soil Dermal Contact

$$D_a = \frac{C_s * CF * SA * AF * ABS * EF * ED}{BW * AT}$$

where:

D_a = Absorbed dose (mg/kg-day)
 C_s = Chemical concentration in soil (mg/kg)
 CF = Conversion factor (1E-6 kg/mg)

SA = Skin surface area available for contact (cm²/event)

AF = Soil to skin adherence factor (mg/cm²)

ABS = Absorption factor (unitless)

EF = Exposure frequency (events/year)

ED = Exposure duration (years)

BW = Body weight (kg)

AT = Averaging time (period over which exposure is averaged) (days)

Groundwater Indestion

A receptor can ingest water by drinking it or through using household water for cooking. An estimate of intake from ingesting water will be calculated as follows (EPA August 1997):

$$I_{w} = \frac{C_{w} * IR * EF * ED}{BW * AT}$$

where:

 I_{w} = Intake of contaminant from water ingestion (mg/kg/day) C_{w} = Chemical concentration in water (mg/liter [L])

IR = Ingestion rate (L/day)

EF = Exposure frequency (days/year)

ED = Exposure duration (years)

BW = Body weight (kg)

AT = Averaging time (period over which exposure is averaged) (days)

Groundwater Inhalation

The amount of a constituent taken into the body via exposure to volatilization from showering or other household water uses will be evaluated using the concentration of the constituent in the water source (EPA 1991 and 1992). An estimate of intake from volatile inhalation from groundwater will be calculated as follows (EPA 1991):

$$I_{w} = \frac{C_{w} * K * IR_{i} * EF * ED}{BW * AT}$$

where:

 I_{w} = Intake of volatile in water from inhalation (mg/kg/day) C_{w} = Chemical concentration in water (mg/L)

 $K'' = \text{volatilization factor } (0.5 \text{ L/m}^3)$

IR_i = Inhalation rate (m³/day)

EF = Exposure frequency (days/year)

ED = Exposure duration (years)

BW = Body weight (kg)

AT = Averaging time (period over which exposure is averaged—days)

For volatile compounds, volatilization from groundwater can be an important exposure pathway from showering and other household uses of groundwater. This exposure pathway will only be evaluated for organic chemicals with a Henry's Law constant greater than 1x10-5 and with a molecular weight of 200 grams/mole or less (EPA 1991).

Tables 2 and 3 show the default parameter values suggested for use by SNL/NM at SWMUs. based upon the selected land-use scenarios for nonradiological and radiological COCs.

respectively. References are given at the end of the table indicating the source for the chosen parameter values. SNL/NM uses default values that are consistent with both regulatory guidance and the RME approach. Therefore, the values chosen will, in general, provide a conservative estimate of the actual risk parameter. These parameter values are suggested for use for the various exposure pathways, based upon the assumption that a particular site has no unusual characteristics that contradict the default assumptions. For sites for which the assumptions are not valid, the parameter values will be modified and documented.

Summary

SNL/NM will use the described default exposure routes and parameter values in risk assessments at sites that have an industrial, recreational, or residential future land-use scenario. There are no current residential land-use designations at SNL/NM ER sites, but NMED has requested this scenario to be considered to provide perspective of the risk under the more restrictive land-use scenario. For sites designated as industrial or recreational land use, SNL/NM will provide risk parameter values based upon a residential land-use scenario to indicate the effects of data uncertainty on risk value calculations or in order to potentially mitigate the need for institutional controls or restrictions on SNL/NM ER sites. The parameter values are based upon EPA guidance and supplemented by information from other government sources. If these exposure routes and parameters are acceptable, SNL/NM will use them in risk assessments for all sites where the assumptions are consistent with site-specific conditions. All deviations will be documented.

Table 2
Default Nonradiological Exposure Parameter Values for Various Land-Use scenarios

Parameter	Industrial	Recreational	Residential
General Exposure Parameters			
		8.7 (4 hr/wk for	
Exposure Frequency (day/yr)	250 ^{a,b}	52 wk/yr) ^{a,b}	350 ^{a,b}
Exposure Duration (yr)	25 ^{a,b,c}	30 ^{a,b,c}	30 ^{a,b,c}
	70 ^{a,b,c}	70 Adult ^{a,b,c}	70 Adult ^{a,b,c}
Body Weight (kg)		15 Child ^{a,b,c}	15 Child ^{a,b,c}
Averaging Time (days)			
for Carcinogenic Compounds	25,550 ^{a,b}	25,550 ^{a,b}	25,550 a,b
(= 70 yr x 365 day/yr)	·	·	·
for Noncarcinogenic Compounds	9,125 ^{a,b}	10,950 ^{a,b}	10,950 ^{a,b}
(= ED x 365 day/yr)			
Soil Ingestion Pathway			
Ingestion Rate (mg/day)	100 ^{a,b}	200 Child ^{a,b}	200 Child a,b
, , ,		100 Adult ^{a,b}	100 Adult ^{a,b}
Inhalation Pathway			
		15 Child ^a	10 Child ^a
Inhalation Rate (m³/day)	20 ^{a,b}	30 Adult ^a	20 Adult ^a
Volatilization Factor (m ³ /kg)	Chemical Specific	Chemical Specific	Chemical Specific
Particulate Emission Factor (m ³ /kg)	1.36E9 ^a	1.36E9 ^a	1.36E9 ^a
Water Ingestion Pathway			
	2.4 ^a	2.4 ^a	2.4 ^a
Ingestion Rate (liter/day)			
Dermal Pathway			
		0.2 Child ^a	0.2 Child ^a
Skin Adherence Factor (mg/cm ²)	0.2 ^a	0.07 Adult ^a	0.07 Adult ^a
Exposed Surface Area for Soil/Dust		2,800 Child ^a	2,800 Child ^a
(cm ² /day)	3,300 ^a	5,700 Adult ^a	5,700 Adult ^a
Skin Adsorption Factor	Chemical Specific	Chemical Specific	Chemical Specific

^aTechnical Background Document for Development of Soil Screening Levels (NMED 2000).

ED = Exposure duration.

EPA = U.S. Environmental Protection Agency.

hr = Hour(s).

kg = Kilogram(s).

m = Meter(s).

mg = Milligram(s).

NA = Not available.

wk = Week(s).

yr = Year(s).

^bRisk Assessment Guidance for Superfund, Vol. 1, Part B (EPA 1991).

^cExposure Factors Handbook (EPA August 1997).

Table 3 **Default Radiological Exposure Parameter Values for Various Land-Use scenarios**

Parameter	Industrial	Recreational	Residential
General Exposure Parameters			
	8 hr/day for		
Exposure Frequency	250 day/yr	4 hr/wk for 52 wk/yr	365 day/yr
Exposure Duration (yr)	25 ^{a,b}	30 ^{a,b}	30 ^{a,b}
Body Weight (kg)	70 Adult ^{a,b}	70 Adult ^{a,b}	70 Adult ^{a,b}
Soil Ingestion Pathway			
Ingestion Rate	100 mg/day ^c	100 mg/day ^c	100 mg/day ^c
Averaging Time (days) (= 30 yr x 365 day/yr)	10,950 ^d	10,950 ^d	10,950 ^d
Inhalation Pathway			
Inhalation Rate (m ³ /yr)	7,300 ^{d,e}	10,950 ^e	7,300 ^{d,e}
Mass Loading for Inhalation g/m ³	1.36 E-5 ^d	1.36 E-5 ^d	1.36 E-5 ^d
Food Ingestion Pathway			
Ingestion Rate, Leafy Vegetables (kg/yr)	NA	NA	16.5°
Ingestion Rate, Fruits, Non-Leafy Vegetables & Grain (kg/yr)	NA	NA	101.8 ^b
Fraction Ingested	NA	NA	0.25 ^{b,d}

^aRisk Assessment Guidance for Superfund, Vol. 1, Part B (EPA 1991).

EPA = U.S. Environmental Protection Agency.

= Gram(s) g

= Hour(s). hr

kg = Kilogram(s).

= Meter(s). m

mg = Milligram(s). NA = Not applicable.

wk = Week(s).

= Year(s). yr

^bExposure Factors Handbook (EPA August 1997).

^cEPA Region VI guidance (EPA 1996).

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APPENDIX 2 CALCULATION OF THE UPPER CONFIDENCE LIMITS OF MEAN CONCENTRATIONS

For conservatism, Sandia National Laboratories/New Mexico uses the maximum concentration of the constituents of concern (COCs) for initial risk calculation. If the maximum concentrations produce risk above New Mexico Environment Department (NMED) guidelines, conservatism with this approach is evaluated and, if appropriate, a more realistic approach is applied. When the site has been adequately characterized, an estimate of the mean concentration of the COCs is more representative of actual site conditions. The NMED has proposed the use of the 95, 97.5, or 99% upper confidence limit (UCL) of the mean (depending upon the variants of the data set) to represent average concentrations at a site (NMED February 2004). The UCL is calculated according to NMED guidance (Tharp June 2002) using the U.S. Environmental Protection Agency ProUCL program (EPA April 2002). Attached are the outputs from that program and the calculated UCLs used in the risk analysis.

References

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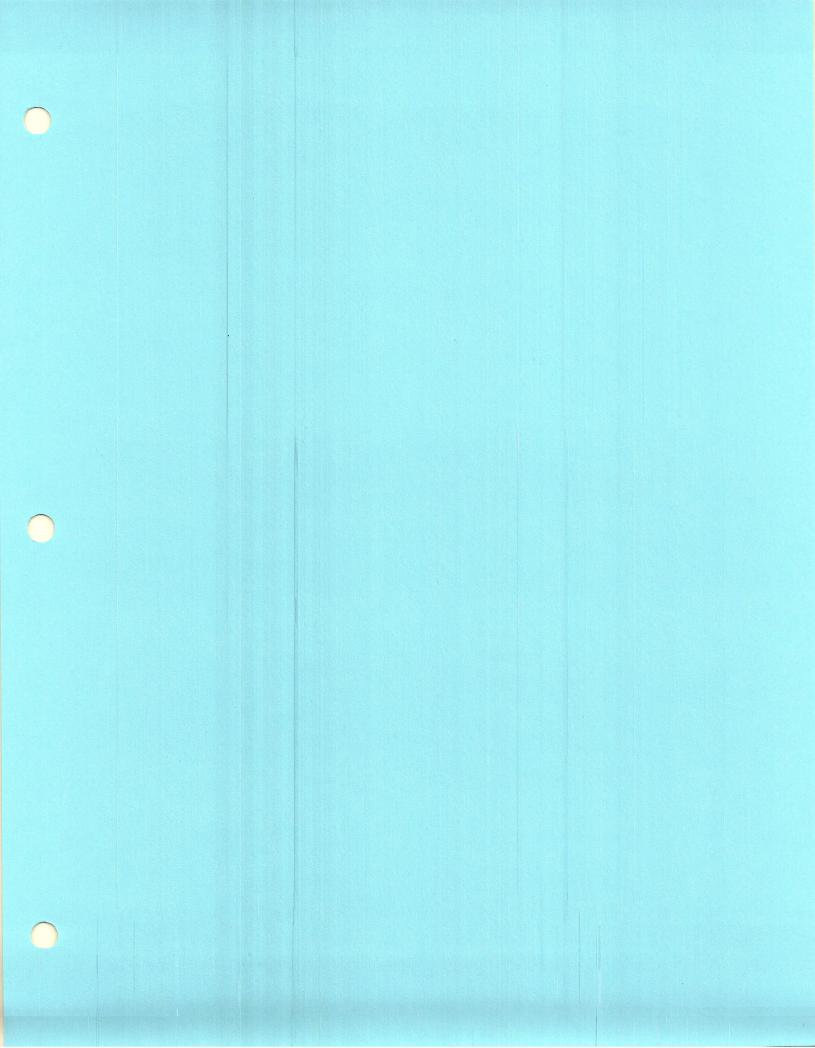
NMED, see New Mexico Environment Department.

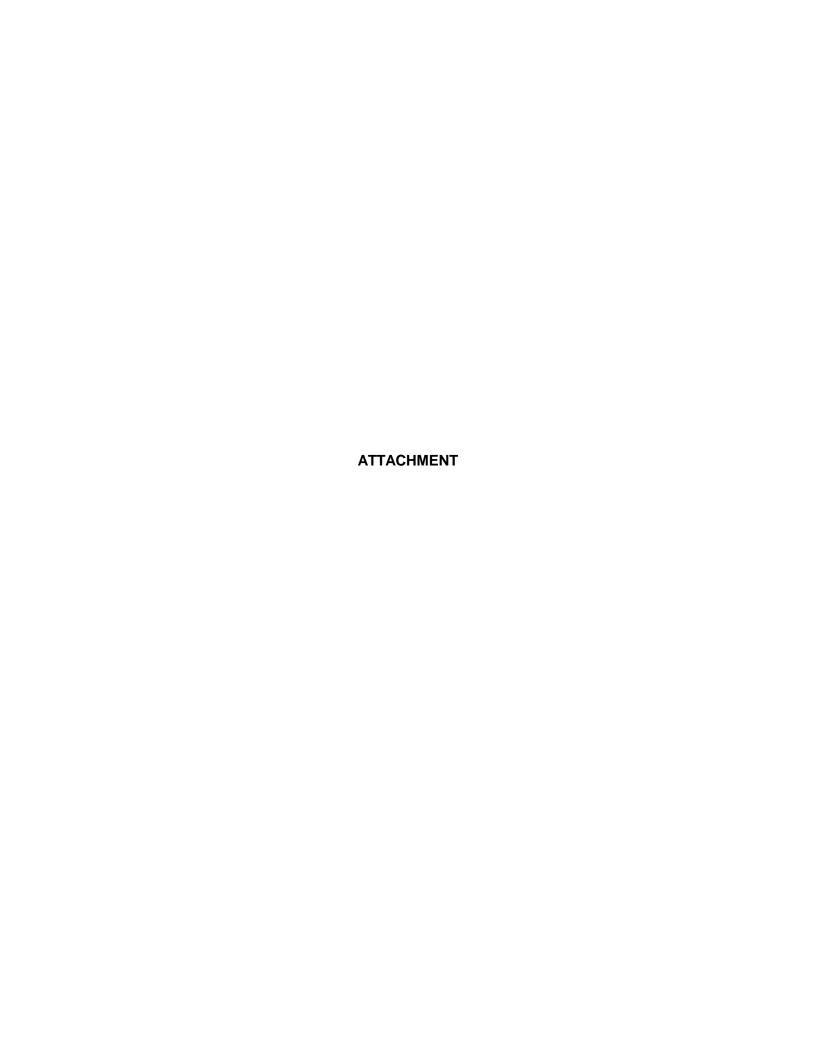
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Human Health SWMU 105 Mercury All Data		
Traman realing evivice realinered	Ty 7 III Data	
Summary Statistics for	Mercury	
Number of Samples	579	
Minimum .	0.001155	
Maximum	342	
Mean	3.51	
Median	0.012	
Standard Deviation	23.47	
Variance	550.9	
Coefficient of Variation	6.692	
Skewness	11.522	
Lilliefors Test Statisitic	0.187	
Lilliefors 5% Critical Value	0.037	
Data not Lognormal at 5% Signific	cance Level	
Data not Normal: Try Non-parame	etric UCL	
95 % UCL (Assuming No		
Student's-t	5.114	
95 % UCL (Adjusted for S		
Adjusted-CLT	5.611	
Modified-t	5.192	
95 % Non-parametric UC		
CLT	5.112	
Jackknife	5.114	
Standard Bootstrap	5.088	
Bootstrap-t	6.221	
Chebyshev (Mean, Std)	7.759	

Ecological SWMU 105 Mercury Al	l Data
,	
Summary Statistics for	Mercury
Number of Samples	463
Minimum	0.00116
Maximum	342
Mean	4.34
Median	0.014
Standard Deviation	26.18
Variance	685.5
Coefficient of Variation	6.039
Skewness	10.298
Lilliefors Test Statisitic	0.202
Lilliefors 5% Critical Value	0.041
Data not Lognormal at 5% Signific	cance Level
Data not Normal: Try Non-parame	etric UCL
95 % UCL (Assuming No	
Student's-t	6.341
95 % UCL (Adjusted for S	
Adjusted-CLT	6.959
Modified-t	6.438
95 % Non-parametric UC	
CLT	6.337
Jackknife	6.341
Standard Bootstrap	6.341
Bootstrap-t	7.976
Chebyshev (Mean, Std)	9.639

0 0 0 0		
Summary Statistics for	Mercury	
Number of Samples	143	
Minimum	0.001205	
Maximum	342	
Mean	13.78	
Median	0.595	
Standard Deviation	45.82	
Variance	2099.5	
Coefficient of Variation	3.326	
Skewness	5.679	
Lilliefors Test Statisitic	0.090	
Lilliefors 5% Critical Value	0.074	
Data not Lognormal at 5% Sig		
Data not Normal: Try Non-par	ametric UCL	
95 % UCL (Assuming		
Student's-t	20.121	
95 % UCL (Adjusted		
Adjusted-CLT	22.024	
Modified-t	20.425	
05/0/ 1	1101	
95 % Non-parametric		
CLT	20.080	
Jackknife	20.121	
Standard Bootstrap	20.225	
Bootstrap-t	25.208	
Chebyshev (Mean, Std)	30.479	

Summary Statistics for	Mercury	
Number of Samples	108	
Minimum	0.001205	
Maximum	342	
Mean	18.03	
Median	1.440	
Standard Deviation	52.07	
Variance	2710.8	
Coefficient of Variation	2.888	
Skewness	4.915	
Lilliefors Test Statisitic	0.102	
Lilliefors 5% Critical Value	0.085	
Data not Lognormal at 5% Sig		
Data not Normal: Try Non-par	ametric UCL	
95 % UCL (Assuming		
Student's-t	26.344	
07/0/1/01/1/01		
95 % UCL (Adjusted f		
Adjusted-CLT	28.804	
Modified-t	26.739	
95 % Non-parametric	LICI	
CLT	26.272	
Jackknife	26.344	
Standard Bootstrap	26.340	
Bootstrap-t	33.568	
Chebyshev (Mean, Std)	39.869	

ANNEX E SWMU 105, Mercury Spill (Building 6536) Data Sets for the Risk Assessments

Table E-1 SWMU 105, Mercury Spill (Building 6536) Limited Data Set for the Risk Assessment

Sample Attributes				Metals (EPA Method 7471A) ^a (mg/kg)	
		(mg/kg)			
Record		Sample Collection	Sample		
Number ^b	ER Sample ID	Area	Depth (ft bgs)	Mercury	
609370	105-BH-15-0-S	E	0	0.0864 J	
609370	105-BH-15-2-S	Ē	2	0.0187	
609370	105-BH-15-4-S	Ē	4	ND (0.00246)	
609370	105-BH-15-8-S	E	8	ND (0.00248)	
609370	105-BH-29-0-S	E	0	0.595	
609370	105-BH-29-2-S	E	2	0.0195	
609370	105-BH-29-4-S	E	4	0.00427	
609370	105-BH-29-8-S	Е	8	ND (0.00245)	
609349	105-BH-43-0-S	С	0	2.45 J	
609349	105-BH-43-2-S	С	2	342	
609366	105-BH-43-4-S	С	4	0.00538	
609366	105-BH-43-6-S	С	6	0.0195	
609366	105-BH-43-6-SD	С	6	0.00946	
609366	105-BH-43-8-S	С	8	ND (0.00241)	
609383	105-BH-44-0-S	E	3	16.5	
609383	105-BH-44-2-S	E	5	0.972	
609383	105-BH-44-4-S	Е	7	28.3	
609383	105-BH-44-4-SD	Е	7	18.3	
609567	105-BH-44-6-S	E	9	ND (0.00243)	
609567	105-BH-44-8-S	E	11	0.00295	
609349	105-BH-58-0-S	С	0	339	
609349	105-BH-58-2-S	С	2	125	
609366	105-BH-58-4-S	С	4	0.85	
609366	105-BH-58-6-S	С	6	7.53	
609366	105-BH-58-8-S	С	8	0.00269	
609383	105-BH-59-0-S	E	3	6.48	
609383	105-BH-59-2-S	E	5	1.41	
609383	105-BH-59-2-SD	E	5	1.15	
609383	105-BH-59-4-S	E	7	0.906	
609522	105-BH-73-4-S	A	7	27.5 J	
609522	105-BH-73-4-SD	A	7	137 J	
609567	105-BH-73-6-S	A	9	0.679	
609567	105-BH-73-8-S	A	11	0.0574	
609567	105-BH-73-8-SD	A C	11	0.75	
609349	105-BH-74-0-S	C	0 2	11.8	
609349 609349	105-BH-74-2-S 105-BH-74-2-SD	C	2	147 75.4	
609349	105-BH-74-2-SD	C	4		
609366	105-BH-74-6-S	C	6	4.4	
609366	105-BH-74-8-S	C	8	0.0106	
	Concentration (surface/su	<0.25/<0.1			
Dackground C	oncentiation (sunace/su	NU.ZU/NU. I			

Refer to footnotes at end of table.

Table E-1 (Continued) SWMU 105, Mercury Spill (Building 6536) Limited Data Set for the Risk Assessment

	Sampla Attrib	itos		Metals (EPA Method 7471A) ^a (mg/kg)
Sample Attributes Sample				(IIIg/kg)
Record		Collection	Sample	
Number ^b	ER Sample ID	Area	Depth (ft bgs)	Mercury
609383	105-BH-75-0-S	E	3	14.8
609383	105-BH-75-2-S	E	5	18.8
609383	105-BH-75-4-S	Ē	7	24.1
609567	105-BH-75-6-S	Ē	9	0.00272
609567	105-BH-75-8-S	E	11	0.448
609349	105-BH-89-0-S	C	0	40.3
609349	105-BH-89-2-S	C	2	92.5
609366	105-BH-89-4-S	C	4	5.97
609366	105-BH-89-6-S	C	6	1.96
609366	105-BH-89-8-S	С	8	0.00384
609383	105-BH-90-0-S	E	3	8.26
609383	105-BH-90-2-S	E	5	4.2
609383	105-BH-90-4-S	Е	7	2.08
609349	105-BH-104-0-S	С	0	9.45
609349	105-BH-104-2-S	С	2	89.6
609366	105-BH-104-4-S	С	4	0.0256
609366	105-BH-104-6-S	С	6	1.22
609366	105-BH-104-8-S	С	8	0.00238
609383	105-BH-105-0-S	E	3	24
609383	105-BH-105-2-S	E	5	3.22
609383	105-BH-105-4-S	E	7	0.0116
609349	105-BH-119-0-S	E	0	9.29
609349	105-BH-119-2-S	E	2	0.0416
609349	105-BH-119-4-S	E	4	0.0466
609367	105-BH-133-0-S	G	0	8.09
609367	105-BH-133-2-S	G	2	0.16
609367	105-BH-133-4-S	G	4	0.00769
609367	105-BH-133-8-S	G	8	0.00444
609367	105-BH-134-0-S	G	0	0.0142
609367	105-BH-134-2-S	G	2	0.0173
609367	105-BH-134-4-S	G	4	0.00337
609367	105-BH-134-4-SD	G	8	0.00346
609367	105-BH-134-8-S	G		ND (0.00247)
609367	105-BH-135-0-S 105-BH-135-2-S	G	2	5.05 0.019
609367 609367	105-BH-135-4-S	G	4	0.00399
609367	105-BH-135-8-S	G	8	0.00399
609367	105-BH-136-0-S	G	0	7.93
609367	105-BH-136-2-S	G	2	0.0455
609367	105-BH-136-4-S	G	4	0.0433
	ncentration (surface/sub	<0.25/<0.1		

Refer to footnotes at end of table.

Table E-1 (Continued) SWMU 105, Mercury Spill (Building 6536) Limited Data Set for the Risk Assessment

	O a sa da Austi			Metals (EPA Method 7471A) ^a
Sample Attributes				(mg/kg)
Record		Sample Collection	Sample	
Number ^b	ER Sample ID	Area	Depth (ft bgs)	Mercury
609367	105-BH-136-8-S	G	8	0.00864
609367	105-BH-137-0-S	G	0	13.5
609367	105-BH-137-2-S	G	2	5.14
609367	105-BH-137-4-S	G	4	3.33
609367	105-BH-137-8-S	G	8	0.00455 J
609368	105-BH-138-0-S	G	0	6.05
609368	105-BH-138-2-S	G	2	16.3
609368	105-BH-138-4-S	G	4	4.28
609368	105-BH-138-8-S	G	8	0.0177
609368	105-BH-139-0-S	G	0	5.74
609368	105-BH-139-2-S	G	2	0.078
609368	105-BH-139-4-S	G	4	3.6
609368	105-BH-139-8-S	G	8	0.00686 J
609368	105-BH-140-0-S	G	0	12.6
609368	105-BH-140-2-S	G	2	0.0201
609368	105-BH-140-2-SD	G	2	2.66
609368	105-BH-140-4-S	G	4	0.0205
609368	105-BH-140-8-S	G	8	0.631
609368	105-BH-141-0-S	G	0	3.36
609368	105-BH-141-2-S	G	2	0.869
609368	105-BH-141-4-S	G	4	0.006 J
609368	105-BH-141-8-S	G	8	0.0763
609369	105-BH-142-0-S	G	0	26.4
609369	105-BH-142-2-S	G	2	0.459
609369	105-BH-142-4-S	G	4	0.102 J
609369	105-BH-142-8-S	G	8	0.124 J
609369	105-BH-143-0-S	G	0	0.316 J
609369	105-BH-143-2-S	G	2	0.0112 J
609369	105-BH-143-4-S	G	4	0.0095
609369	105-BH-143-8-S	G	8	ND (0.00246) R
609369	105-BH-144-0-S	G	0	9.16 J
609369	105-BH-144-2-S	G	2	0.00387
609369	105-BH-144-4-S	G	4	0.147 J
609369	105-BH-144-8-S	G	8	4.46 J
609370	105-BH-145-0-S	G	0	26.3 J
609370	105-BH-145-2-S	G	2	0.278 J
609370	105-BH-145-4-S	G	4	0.0325 J
609370	105-BH-145-8-S	G	8	0.113 J
609370	105-BH-146-0-S	G	0	7.79 J
609370	105-BH-146-2-S	G	2	0.807 J
Background Concentration (surface/subsurface) ^c				<0.25/<0.1

Refer to footnotes at end of table.

Table E-1 (Concluded) SWMU 105, Mercury Spill (Building 6536) Limited Data Set for the Risk Assessment

				Metals (EPA Method 7471A) ^a
	Sample Attribu	(mg/kg)		
		Sample		
Record		Collection	Sample	
Number ^b	ER Sample ID	Area	Depth (ft bgs)	Mercury
609370	105-BH-146-4-S	G	4	0.0264 J
609370	105-BH-146-8-S	G	8	0.0829 J
609370	105-BH-146-8-SD	G	8	0.11 J
609521	105-BH-147-0-S	G	0	3.61
609521	105-BH-147-2-S	G	2	0.0115
609521	105-BH-147-2-SD	G	2	0.0154
609521	105-BH-147-4-S	G	4	ND (0.119)
609521	105-BH-147-8-S	G	8	0.0697
609523	105-BH-148-0-S	В	3	66.9 J
609523	105-BH-148-2-S	В	5	0.238 J
609523	105-BH-148-4-S	В	7	ND (0.00241 J)
609523	105-BH-149-0-S	В	3	1.47 J
609523	105-BH-149-2-S	В	5	0.255 J
609523	105-BH-149-2-SD	В	5	0.963 J
609523	105-BH-149-4-S	В	7	1.93 J
609523	105-BH-150-0-S	В	3	3.07 J
609523	105-BH-150-2-S	В	5	0.216 J
609523	105-BH-150-4-S	В	7	0.167 J
Background Co	oncentration (surface/subs	surface)c		<0.25/<0.1

Note: Values in **bold** exceed background concentration limit or have MDLs that exceed background concentration limit.

BH = Borehole.

EPA = U.S. Environmental Protection Agency.

ER = Environmental Restoration.

ft = Foot (feet).

J = Estimated concentration.

J () = The reported value is greater than or equal to the MDL but is less than the practical quantitation limit, shown in parentheses.

MDL = Method detection limit.mg/kg = Milligram(s) per kilogram.

ND () = Not detected above the MDL, shown in parentheses.

ND (J) = Not detected, uncertainty in the detection limit shown in parentheses, see Data Validation Report (Annex B).

R = Value is unusable, see Data Validation Report (Annex B).

S = Soil sample.

SD = Duplicate soil sample.

-- = Not applicable.

^aEPA November 1986.

^bAnalysis request/chain-of-custody record.

^cDinwiddie September 1997.

Table E-2 SWMU 105, Mercury Spill (Building 6536) Data Set Excluded from the Limited Risk Assessment

	Sample Attribut	es		Metals (EPA Method 7471 (mg/kg)	A) ^a
Record Number ^b	ER Sample ID	Sample Collection Area	Sample Depth (ft bgs)	Mercury	
609353	105-BH-1-0-S	E	0		0.41
609353	105-BH-1-2-S	E	2		4.
609353	105-BH-1-4-S	Е	4	0.0477	
609353	105-BH-2-0-S	E	0	0.132	
609353	105-BH-2-2-S	E	2		0.27
609353	105-BH-2-4-S	E	4	0.00687	
609353	105-BH-3-0-S	E	0	0.0157	
609353	105-BH-3-2-S	E	2	0.00788	
609353	105-BH-3-4-S	E	4	ND (0.00247)	
609353	105-BH-3-4-SD	E	4	ND (0.0025)	
609353	105-BH-4-0-S	E	0	0.0109	
609353	105-BH-4-2-S	E	2	ND (0.00239)	
609353	105-BH-4-4-S	E	4	ND (0.00243)	
609353	105-BH-5-0-S	E	0	0.021	
609353	105-BH-5-2-S	E	2	0.00609	
609353	105-BH-5-4-S	E	4	0.0281	
609353	105-BH-6-0-S	E	0	0.0166	
609353	105-BH-6-2-S	Е	2	0.00699	
609353	105-BH-6-4-S	E	4	ND (0.00245)	
609352	105-BH-7-0-S	E	0	0.012	
609352	105-BH-7-2-S	E	2	0.00822	
609352	105-BH-7-4-S	E	4	ND (0.00248)	
609352	105-BH-8-0-S	Е	0	0.0116	
609352	105-BH-8-2-S	E	2	0.0295	
609352	105-BH-8-4-S	Е	4	0.00307	
609352	105-BH-9-0-S	Е	0	0.0104	
609352	105-BH-9-2-S	E	2	0.0132	
609352	105-BH-9-4-S	E	4	ND (0.00241)	
609352	105-BH-9-4-SD	E	4	ND (0.00244)	
609352	105-BH-10-0-S	E	0	0.0114	
609352	105-BH-10-2-S	E	2	0.00876	
609352	105-BH-10-4-S	E	4	0.00298	
609352	105-BH-11-0-S	E	0	0.0117	
609352	105-BH-11-2-S	E	2	0.00259	
609352	105-BH-11-4-S	E	4	0.0028	
609352	105-BH-12-0-S	E	0	0.0129	
609352	105-BH-12-2-S	E	2	0.00807	
609352	105-BH-12-4-S	E	4	0.00359	
609354	105-BH-13-0-S	E	0	0.00339	
609354	105-BH-13-2-S	E	2	0.0141	
	ncentration (surface/subsurface			<0.25/<0.1	

Record Number		Sample Attribut	es		Metals (EPA Method 7471A) ^a (mg/kg)
Record Record ER Sample ID Area (ft bgs) Mercury				Sample	
Number	Record				
609354	Number ^b	ER Sample ID	Area	(ft bgs)	Mercury
609354	609354	105-BH-13-4-S	E	4	ND (0.00241)
609354 105-BH-14-4-S	609354	105-BH-14-0-S	E	0	0.007
609358 105-BH-16-0-S F 0 0.0228 609358 105-BH-16-2-S F 2 0.0216 609358 105-BH-16-4-S F 4 0.00684 609358 105-BH-16-8-S F 4 0.00296 609360 105-BH-18-0-S F 0 0.0371 609360 105-BH-18-2-S F 2 0.00527 609360 105-BH-18-8-S F 4 0.00393 609360 105-BH-18-8-S F 8 ND (0.00248) 609360 105-BH-18-8-S F 8 ND (0.00248) 609362 105-BH-19-0-S F 0 0.0201 609362 105-BH-19-4-S F 2 0.00333 609362 105-BH-19-4-S F 8 0.1 609362 105-BH-20-S F 8 0.1 609365 105-BH-20-S F 8 0.1 609365 105-BH-20-S F 8 0.0011 </td <td>609354</td> <td>105-BH-14-2-S</td> <td>E</td> <td>2</td> <td>0.0055</td>	609354	105-BH-14-2-S	E	2	0.0055
609358 105-BH-16-2-S	609354	105-BH-14-4-S		4	0.00341
609358 105-BH-16-8-S F 4 0.00684 609358 105-BH-16-8-S F 8 0.00296 609360 105-BH-18-0-S F 0 0.0371 609360 105-BH-18-2-S F 2 0.00527 609360 105-BH-18-4-S F 4 0.00393 609360 105-BH-18-8-S F 8 ND (0.00248) 609362 105-BH-19-0-S F 0 0.0201 609362 105-BH-19-0-S F 2 0.00333 609362 105-BH-19-4-S F 2 0.00333 609362 105-BH-19-8-S F 8 ND (0.00246) 609362 105-BH-19-8-S F 8 0.1 609365 105-BH-20-0-S F 0 0.0161 609365 105-BH-20-8-S F 2 0.00316 609365 105-BH-20-8-S F 8 0.00299 609371 105-BH-21-8-S F 8 0.0029 <td>609358</td> <td>105-BH-16-0-S</td> <td></td> <td>0</td> <td>0.0228</td>	609358	105-BH-16-0-S		0	0.0228
609358 105-BH-16-8-S F 8 0.00296 609360 105-BH-18-0-S F 0 0.0371 609360 105-BH-18-2-S F 2 0.00527 609360 105-BH-18-4-S F 4 0.00393 609360 105-BH-18-8-S F 8 ND (0.00248) 609362 105-BH-19-0-S F 0 0.0201 609362 105-BH-19-2-S F 2 0.00333 609362 105-BH-19-4-S F 4 ND (0.00246) 609362 105-BH-19-4-S F 4 ND (0.00246) 609362 105-BH-19-8-S F 8 0.1 609363 105-BH-19-8-S F 8 0.1 609365 105-BH-20-2-S F 0 0.0161 609365 105-BH-20-2-S F 2 0.00316 609365 105-BH-20-8-S F 8 0.00299 609371 105-BH-21-0-S F 0 0.125 <td>609358</td> <td>105-BH-16-2-S</td> <td>F</td> <td>2</td> <td>0.0216</td>	609358	105-BH-16-2-S	F	2	0.0216
609360 105-BH-18-0-S F 0 0.0371 609360 105-BH-18-2-S F 2 0.00527 609360 105-BH-18-4-S F 4 0.00393 609360 105-BH-18-8-S F 8 ND (0.00248) 609362 105-BH-19-0-S F 0 0.0201 609362 105-BH-19-2-S F 2 0.00333 609362 105-BH-19-8-S F 4 ND (0.00246) 609362 105-BH-19-8-S F 8 0.1 609365 105-BH-19-8-S F 8 0.1 609365 105-BH-20-S F 0 0.0161 609365 105-BH-20-S F 2 0.00316 609365 105-BH-20-S F 4 0.011 609365 105-BH-20-S F 8 0.00299 609371 105-BH-21-O-S F 9 0.125 609371 105-BH-21-S F 2 ND (0.00235)	609358	105-BH-16-4-S	F	4	0.00684
609360 105-BH-18-2-S F 2 0.00527 609360 105-BH-18-4-S F 4 0.00393 609360 105-BH-18-8-S F 8 ND (0.00248) 609362 105-BH-19-8-S F 0 0.0201 609362 105-BH-19-2-S F 2 0.00333 609362 105-BH-19-4-S F 4 ND (0.00246) 609362 105-BH-19-8-S F 8 0.00333 609362 105-BH-19-8-S F 4 ND (0.00246) 609365 105-BH-20-0-S F 0 0.0161 609365 105-BH-20-2-S F 2 0.00316 609365 105-BH-20-4-S F 4 0.011 609365 105-BH-20-4-S F 8 0.00299 609371 105-BH-21-0-S F 0 0.125 609371 105-BH-21-2-S F 2 ND (0.00235) 609371 105-BH-21-4-S F 8 <t< td=""><td>609358</td><td>105-BH-16-8-S</td><td>F</td><td>8</td><td>0.00296</td></t<>	609358	105-BH-16-8-S	F	8	0.00296
609360 105-BH-18-4-S F 4 0.00393 609360 105-BH-18-8-S F 8 ND (0.00248) 609362 105-BH-19-0-S F 0 0.0201 609362 105-BH-19-2-S F 2 0.00333 609362 105-BH-19-8-S F 4 ND (0.00246) 609362 105-BH-19-8-S F 8 0.1 609365 105-BH-19-8-S F 8 0.0161 609365 105-BH-20-0-S F 0 0.0161 609365 105-BH-20-0-S F 2 0.00316 609365 105-BH-20-4-S F 4 0.011 609365 105-BH-20-8-S F 8 0.00299 609371 105-BH-21-0-S F 0 0.125 609371 105-BH-21-2-SD F 2 ND (0.00235) 609371 105-BH-21-8-S F 8 0.0039 609371 105-BH-21-8-S F 8 0.0033 </td <td>609360</td> <td>105-BH-18-0-S</td> <td>F</td> <td>0</td> <td>0.0371</td>	609360	105-BH-18-0-S	F	0	0.0371
609360 105-BH-18-8-S F 8 ND (0.00248) 609362 105-BH-19-0-S F 0 0.0201 609362 105-BH-19-2-S F 2 0.00333 609362 105-BH-19-4-S F 4 ND (0.00246) 609362 105-BH-19-8-S F 8 0.1 609362 105-BH-19-8-S F 8 0.01 609365 105-BH-20-0-S F 0 0.0161 609365 105-BH-20-2-S F 2 0.00316 609365 105-BH-20-4-S F 4 0.011 609365 105-BH-20-4-S F 8 0.00299 609371 105-BH-21-0-S F 0 0.125 609371 105-BH-21-2-S F 2 ND (0.00235) 609371 105-BH-21-4-S F 8 0.0039 609371 105-BH-21-8-S F 8 0.0039 609371 105-BH-22-8-S F 8 0.00631	609360	105-BH-18-2-S	F	2	0.00527
609362 105-BH-19-0-S F 0 0.0201 609362 105-BH-19-2-S F 2 0.00333 609362 105-BH-19-4-S F 4 ND (0.00246) 609362 105-BH-19-8-S F 8 0.1 609365 105-BH-20-0-S F 0 0.0161 609365 105-BH-20-4-S F 2 0.00316 609365 105-BH-20-4-S F 4 0.011 609365 105-BH-20-8-S F 8 0.00299 609371 105-BH-21-0-S F 0 0.125 609371 105-BH-21-2-S F 2 ND (0.00235) 609371 105-BH-21-2-S F 2 0.0163 609371 105-BH-21-8-S F 8 0.0039 609371 105-BH-21-8-S F 8 0.0039 609371 105-BH-21-8-S F 8 0.0039 609373 105-BH-22-8-S F 8 0.00631	609360	105-BH-18-4-S	F	4	0.00393
609362 105-BH-19-2-S F 2 0.00333 609362 105-BH-19-4-S F 4 ND (0.00246) 609362 105-BH-19-8-S F 8 0.1 609365 105-BH-20-0-S F 0 0.0161 609365 105-BH-20-2-S F 2 0.00316 609365 105-BH-20-8-S F 4 0.011 609365 105-BH-20-8-S F 8 0.00299 609371 105-BH-21-0-S F 0 0.125 609371 105-BH-21-2-S F 2 ND (0.00235) 609371 105-BH-21-2-S F 2 0.0163 609371 105-BH-21-8-S F 8 0.0039 609371 105-BH-21-8-S F 8 0.0039 609371 105-BH-21-8-S F 8 0.00631 609373 105-BH-28-S F 8 0.00631 609373 105-BH-22-8-S F 2 0.0178	609360	105-BH-18-8-S	F	8	ND (0.00248)
609362 105-BH-19-4-S F 4 ND (0.00246) 609362 105-BH-19-8-S F 8 0.1 609365 105-BH-20-0-S F 0 0.0161 609365 105-BH-20-2-S F 2 0.00316 609365 105-BH-20-4-S F 4 0.011 609365 105-BH-20-8-S F 8 0.00299 609371 105-BH-21-0-S F 0 0.125 609371 105-BH-21-2-S F 2 ND (0.00235) 609371 105-BH-21-2-S F 2 0.0163 609371 105-BH-21-8-S F 8 0.0039 609371 105-BH-21-8-S F 8 0.0039 609373 105-BH-21-8-S F 8 0.00631 609373 105-BH-22-0-S F 0 0.0119 609373 105-BH-22-4-S F 4 0.00341 609373 105-BH-23-6-S F 8 0.00341	609362	105-BH-19-0-S	F	0	` '
609362 105-BH-19-8-S F 8 0.1 609365 105-BH-20-0-S F 0 0.0161 609365 105-BH-20-2-S F 2 0.00316 609365 105-BH-20-4-S F 4 0.011 609365 105-BH-20-8-S F 8 0.00299 609371 105-BH-21-0-S F 0 0.125 609371 105-BH-21-2-SD F 2 ND (0.00235) 609371 105-BH-21-2-SD F 2 0.0163 609371 105-BH-21-4-S F 8 0.0039 609371 105-BH-21-4-S F 8 0.0039 609371 105-BH-21-8-S F 8 0.0039 609373 105-BH-21-8-S F 8 0.00631 609373 105-BH-22-0-S F 0 0.0119 609373 105-BH-22-4-S F 4 0.00341 609373 105-BH-22-8-S F 8 0.00341 </td <td>609362</td> <td>105-BH-19-2-S</td> <td>F</td> <td>2</td> <td>0.00333</td>	609362	105-BH-19-2-S	F	2	0.00333
609362 105-BH-19-8-S F 8 0.1 609365 105-BH-20-0-S F 0 0.0161 609365 105-BH-20-2-S F 2 0.00316 609365 105-BH-20-4-S F 4 0.011 609365 105-BH-20-8-S F 8 0.00299 609371 105-BH-21-0-S F 0 0.125 609371 105-BH-21-2-S F 2 ND (0.00235) 609371 105-BH-21-2-S F 2 0.0163 609371 105-BH-21-4-S F 8 0.0039 609371 105-BH-21-4-S F 8 0.0039 609371 105-BH-21-8-S F 8 0.0039 609373 105-BH-21-8-S F 8 0.00631 609373 105-BH-22-0-S F 0 0.0119 609373 105-BH-22-4-S F 4 0.00341 609373 105-BH-23-0-S D 0 0.0172	609362		F	4	
609365 105-BH-20-0-S F 0 0.0161 609365 105-BH-20-2-S F 2 0.00316 609365 105-BH-20-4-S F 4 0.011 609365 105-BH-20-8-S F 8 0.00299 609371 105-BH-21-0-S F 0 0.125 609371 105-BH-21-2-SD F 2 ND (0.00235) 609371 105-BH-21-2-SD F 2 0.0163 609371 105-BH-21-8-S F 8 0.0039 609371 105-BH-21-8-S F 8 0.0039 609373 105-BH-22-8-S F 8 0.00631 609373 105-BH-22-4-S F 2 0.0178 609373 105-BH-22-8-S F 8 0.00341 609373 105-BH-23-0-S F 8 0.00341 609351 105-BH-23-0-S D 0 0 609351 105-BH-23-6-S D 4 0.029				8	0.173
609365 105-BH-20-2-S F 2 0.00316 609365 105-BH-20-4-S F 4 0.011 609365 105-BH-20-8-S F 8 0.00299 609371 105-BH-21-0-S F 0 0.125 609371 105-BH-21-2-S F 2 ND (0.00235) 609371 105-BH-21-2-SD F 2 0.0163 609371 105-BH-21-4-S F 8 0.0039 609371 105-BH-21-8-S F 8 0.00631 609373 105-BH-22-0-S F 0 0.0119 609373 105-BH-22-4-S F 2 0.0178 609373 105-BH-22-4-S F 4 0.00341 609373 105-BH-23-0-S F 8 0.00341 609351 105-BH-23-0-S D 0 6 609351 105-BH-23-4-S D 4 0.029 609351 105-BH-23-6-S D 6 0.0158					1
609365 105-BH-20-4-S F 4 0.011 609365 105-BH-20-8-S F 8 0.00299 609371 105-BH-21-0-S F 0 0.125 609371 105-BH-21-2-S F 2 ND (0.00235) 609371 105-BH-21-2-SD F 2 0.0163 609371 105-BH-21-4-S F 8 0.0039 609371 105-BH-21-8-S F 8 0.00631 609373 105-BH-22-0-S F 0 0.0119 609373 105-BH-22-4-S F 2 0.0178 609373 105-BH-22-4-S F 4 0.00341 609373 105-BH-23-8-S F 8 0.00341 609373 105-BH-23-0-S D 0 6 609351 105-BH-23-0-S D 0 0.0172 609351 105-BH-23-4-S D 4 0.029 609351 105-BH-23-6-S D 6 0.0158					
609365 105-BH-20-8-S F 8 0.00299 609371 105-BH-21-0-S F 0 0.125 609371 105-BH-21-2-SD F 2 ND (0.00235) 609371 105-BH-21-2-SD F 2 0.0163 609371 105-BH-21-4-S F 8 0.0039 609371 105-BH-21-8-S F 8 0.00631 609373 105-BH-22-0-S F 0 0.0119 609373 105-BH-22-2-S F 2 0.0178 609373 105-BH-22-4-S F 4 0.00341 609373 105-BH-23-0-S F 8 0.00341 609373 105-BH-23-0-S D 0 6 609351 105-BH-23-0-S D 0 0.0172 609351 105-BH-23-4-S D 4 0.029 609351 105-BH-23-6-S D 6 0.0158 609351 105-BH-23-8-S D 8 0.0163					
609371 105-BH-21-0-S F 0 0.125 609371 105-BH-21-2-S F 2 ND (0.00235) 609371 105-BH-21-2-SD F 2 0.0163 609371 105-BH-21-4-S F 8 0.0039 609371 105-BH-21-8-S F 8 0.00631 609373 105-BH-22-0-S F 0 0.0119 609373 105-BH-22-2-S F 2 0.0178 609373 105-BH-22-4-S F 4 0.00341 609373 105-BH-22-8-S F 8 0.00341 609373 105-BH-23-0-S D 0 6 609351 105-BH-23-0-S D 2 0.0172 609351 105-BH-23-4-S D 4 0.029 609351 105-BH-23-6-S D 6 0.0158 609351 105-BH-23-8-S D 8 0.0163 609351 105-BH-23-8-S D 8 0.0163					I .
609371 105-BH-21-2-S F 2 ND (0.00235) 609371 105-BH-21-2-SD F 2 0.0163 609371 105-BH-21-4-S F 8 0.0039 609371 105-BH-21-8-S F 8 0.00631 609373 105-BH-22-0-S F 0 0.0119 609373 105-BH-22-2-S F 2 0.0178 609373 105-BH-22-4-S F 4 0.00341 609373 105-BH-23-0-S F 8 0.00341 609351 105-BH-23-0-S D 0 6 609351 105-BH-23-4-S D 4 0.029 609351 105-BH-23-6-S D 6 0.0158 609351 105-BH-23-8-S D 8 0.0163 609375 105-BH-24-0-S F 0 0.0335					I .
609371 105-BH-21-2-SD F 2 0.0163 609371 105-BH-21-4-S F 8 0.0039 609371 105-BH-21-8-S F 8 0.00631 609373 105-BH-22-0-S F 0 0.0119 609373 105-BH-22-2-S F 2 0.0178 609373 105-BH-22-4-S F 4 0.00341 609373 105-BH-22-8-S F 8 0.00341 609373 105-BH-23-0-S D 0 6 609351 105-BH-23-0-S D 2 0.0172 609351 105-BH-23-4-S D 4 0.029 609351 105-BH-23-6-S D 6 0.0158 609351 105-BH-23-8-S D 8 0.0163 609375 105-BH-24-0-S F 0 0.0335					
609371 105-BH-21-4-S F 8 0.0039 609371 105-BH-21-8-S F 8 0.00631 609373 105-BH-22-0-S F 0 0.0119 609373 105-BH-22-2-S F 2 0.0178 609373 105-BH-22-4-S F 4 0.00341 609373 105-BH-23-0-S F 8 0.00341 609351 105-BH-23-0-S D 0 6 609351 105-BH-23-4-S D 4 0.029 609351 105-BH-23-6-S D 6 0.0158 609351 105-BH-23-6-S D 8 0.0163 609375 105-BH-24-0-S F 0 0.0335					` '
609371 105-BH-21-8-S F 8 0.00631 609373 105-BH-22-0-S F 0 0.0119 609373 105-BH-22-2-S F 2 0.0178 609373 105-BH-22-4-S F 4 0.00341 609373 105-BH-23-0-S F 8 0.00341 609351 105-BH-23-0-S D 0 6 609351 105-BH-23-4-S D 4 0.029 609351 105-BH-23-6-S D 6 0.0158 609351 105-BH-23-8-S D 8 0.0163 609375 105-BH-24-0-S F 0 0.0335			F		
609373 105-BH-22-0-S F 0 0.0119 609373 105-BH-22-2-S F 2 0.0178 609373 105-BH-22-4-S F 4 0.00341 609373 105-BH-23-8-S F 8 0.00341 609351 105-BH-23-0-S D 0 6 609351 105-BH-23-2-S D 2 0.0172 609351 105-BH-23-4-S D 4 0.029 609351 105-BH-23-6-S D 6 0.0158 609351 105-BH-23-8-S D 8 0.0163 609375 105-BH-24-0-S F 0 0.0335					
609373 105-BH-22-2-S F 2 0.0178 609373 105-BH-22-4-S F 4 0.00341 609373 105-BH-22-8-S F 8 0.00341 609351 105-BH-23-0-S D 0 6 609351 105-BH-23-2-S D 2 0.0172 609351 105-BH-23-4-S D 4 0.029 609351 105-BH-23-6-S D 6 0.0158 609351 105-BH-23-8-S D 8 0.0163 609375 105-BH-24-0-S F 0 0.0335					
609373 105-BH-22-4-S F 4 0.00341 609373 105-BH-22-8-S F 8 0.00341 609351 105-BH-23-0-S D 0 6 609351 105-BH-23-2-S D 2 0.0172 609351 105-BH-23-4-S D 4 0.029 609351 105-BH-23-6-S D 6 0.0158 609351 105-BH-23-8-S D 8 0.0163 609375 105-BH-24-0-S F 0 0.0335					I .
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609351 105-BH-23-0-S D 0 6 609351 105-BH-23-2-S D 2 0.0172 609351 105-BH-23-4-S D 4 0.029 609351 105-BH-23-6-S D 6 0.0158 609351 105-BH-23-8-S D 8 0.0163 609375 105-BH-24-0-S F 0 0.0335					
609351 105-BH-23-2-S D 2 0.0172 609351 105-BH-23-4-S D 4 0.029 609351 105-BH-23-6-S D 6 0.0158 609351 105-BH-23-8-S D 8 0.0163 609375 105-BH-24-0-S F 0 0.0335					6.87
609351 105-BH-23-4-S D 4 0.029 609351 105-BH-23-6-S D 6 0.0158 609351 105-BH-23-8-S D 8 0.0163 609375 105-BH-24-0-S F 0 0.0335					1
609351 105-BH-23-6-S D 6 0.0158 609351 105-BH-23-8-S D 8 0.0163 609375 105-BH-24-0-S F 0 0.0335					
609351 105-BH-23-8-S D 8 0.0163 609375 105-BH-24-0-S F 0 0.0335					
609375					
609375 105-BH-24-2-S F 2 0.012 J					
609375 105-BH-24-4-S F 4 0.00371 J					
609375 105-BH-24-8-S F 8 0.00578 J					
609377					
609377					
Background Concentration (surface/subsurface) ^c <0.25/<0.1					\ /

	Sample Attribut			Metals (EPA Method 7471 (mg/kg)	A) ^a
		Sample	Sample		
Record	ED Conside ID	Collection	Depth		
Number ^b	ER Sample ID	Area	(ft bgs)	Mercury	
609377	105-BH-25-4-S	F F	<u>4</u> 8	0.00577 J	
609377	105-BH-25-8-S	F		ND (0.00247)	
609379	105-BH-26-0-S 105-BH-26-2-S	F	<u>0</u> 2	0.00671	
609379		F	4	0.0134 ND (0.00343)	
609379	105-BH-26-4-S	F	4	ND (0.00242)	
609379	105-BH-26-4-SD			ND (0.0024)	
609379	105-BH-26-8-S	F F	8	ND (0.00249)	
609381	105-BH-27-0-S		0	0.0168	
609381	105-BH-27-2-S	F	2	0.00601	
609381	105-BH-27-4-S	F	4	ND (0.00247)	
609381	105-BH-27-8-S	F	8	0.00318	
609354	105-BH-28-0-S	E	0	0.0113	
609354	105-BH-28-2-S	E	2	0.00642	
609354	105-BH-28-4-S	E	4	0.00857	
609358	105-BH-30-0-S	F	0	0.0232	
609358	105-BH-30-2-S	F	2	0.0182	
609358	105-BH-30-4-S	F	4	0.0142	
609358	105-BH-30-4-SD	F	4	0.00552	
609358	105-BH-30-8-S	F	8	ND (0.00234)	
609360	105-BH-32-0-S	F	0	0.2	
609360	105-BH-32-2-S	F	2	0.0196	
609360	105-BH-32-4-S	F	4	0.0104	
609360	105-BH-32-8-S	F	8	0.00721	
609362	105-BH-33-0-S	F	0	0.0185	
609362	105-BH-33-2-S	F	2	0.0104	
609362	105-BH-33-4-S	F	4	ND (0.00244)	
609362	105-BH-33-8-S	F	8	ND (0.00241)	
609365	105-BH-34-0-S	F	0	0.128	
609365	105-BH-34-2-S	F	2	0.0544	
609365	105-BH-34-4-S	F	4	0.00307	
609365	105-BH-34-4-SD	F	4	0.0116	
609365	105-BH-34-8-S	F	8	0.00314	
609371	105-BH-35-0-S	F	0		1.09
609371	105-BH-35-2-S	F	2	0.0115	
609371	105-BH-35-4-S	F	4	0.00666	
609371	105-BH-35-8-S	F	8	ND (0.00233)	
609351	105-BH-36-0-S	D	0	,/	0.596
609351	105-BH-36-2-S	D	2	0.0345	
609351	105-BH-36-4-S	D	4	0.0194	
609351	105-BH-36-6-S	D	6	0.0322	
	ncentration (surface/subsurfa			<0.25/<0.1	

	Sample Attribut	es		Metals (EPA Method 7471 (mg/kg)	A) ^a
		Sample	Sample	(9,9)	
Record		Collection	Depth		
Number ^b	ER Sample ID	Area	(ft bgs)	Mercury	
609351	105-BH-36-8-S	D	8	0.0264	
609374	105-BH-37-0-S	F	0		0.935
609374	105-BH-37-2-S	F	2	0.015	
609374	105-BH-37-4-S	F	4	0.00942	
609374	105-BH-37-8-S	F	8	ND (0.00231)	
609375	105-BH-38-0-S	F	0	0.0897	
609375	105-BH-38-2-S	F	2	0.0115 J	
609375	105-BH-38-4-S	F	4	0.0058 J	
609375	105-BH-38-4-SD	F	4	0.0042 J	
609375	105-BH-38-8-S	F	8	0.0117 J	
609377	105-BH-39-0-S	F	0	0.00659 J	
609377	105-BH-39-2-S	F	2	0.00289 J	
609377	105-BH-39-4-S	F	4	ND (0.00243)	
609377	105-BH-39-8-S	F	8	0.00367 J	
609379	105-BH-40-0-S	F	0	0.00415 J	
609379	105-BH-40-2-S	F	2	0.0107	
609379	105-BH-40-4-S	F	4	0.00303	
609379	105-BH-40-8-S	F	8	ND (0.00237)	
609381	105-BH-41-0-S	F	0	0.028	
609381	105-BH-41-2-S	F	2	0.00364	
609381	105-BH-41-4-S	F	4	0.003	
609381	105-BH-41-8-S	F	8	0.00305	
609354	105-BH-42-0-S	E	0	0.0156	
609354	105-BH-42-2-S	E	2	0.00589	
609354	105-BH-42-4-S	E	4	ND (0.00236)	
609358	105-BH-45-0-S	F	0	,	0.767
609358	105-BH-45-2-S	F	2	0.0239	
609358	105-BH-45-4-S	F	4	0.00988	
609358	105-BH-45-8-S	F	8	0.00575	
609360	105-BH-47-0-S	F	0		4.15
609360	105-BH-47-2-S	F	2	0.0156	
609360	105-BH-47-4-S	F	4	0.00493	
609360	105-BH-47-8-S	F	8	0.00818	
609362	105-BH-48-0-S	F	0	0.0488	
609362	105-BH-48-2-S	F	2	0.0107	
609362	105-BH-48-2-SD	F	2	0.0117	
609362	105-BH-48-4-S	F	4	0.00724	
609362	105-BH-48-8-S	F	8	ND (0.00241)	
609365	105-BH-49-0-S	F	0	(= = =)	0.36
609365	105-BH-49-2-S	F	2	0.0151	
	ncentration (surface/subsurfa	ace) ^c		<0.25/<0.1	

	Sample Attribut	es		Metals (EPA Method 7471 (mg/kg)	A) ^a
		Sample	Sample	(g/g)	
Record		Collection	Depth		
Number ^b	ER Sample ID	Area	(ft bgs)	Mercury	
609365	105-BH-49-4-S	F	4	0.00607	
609365	105-BH-49-8-S	F	8	ND (0.00238)	
609371	105-BH-50-0-S	F	0	0.00894	
609371	105-BH-50-2-S	F	2	0.0184	
609371	105-BH-50-4-S	F	4	0.00436	
609371	105-BH-50-8-S	F	8	0.00357	
609351	105-BH-51-0-S	D	0		3.95
609351	105-BH-51-2-S	D	2	0.0824	
609351	105-BH-51-4-S	D	4	0.0176	
609351	105-BH-51-6-S	D	6	0.0183	
609351	105-BH-51-8-S	D	8	0.0874	
609374	105-BH-52-0-S	F	0		0.85
609374	105-BH-52-2-S	F	2	0.0124	
609374	105-BH-52-4-S	F	4	0.0044	
609374	105-BH-52-8-S	F	8	ND (0.00235)	
609351	105-BH-53-0-S	D	0	0.0341	
609351	105-BH-53-2-S	D	2	0.0166	
609351	105-BH-53-4-S	D	4	0.0237	
609351	105-BH-53-6-S	D	6	0.014	
609351	105-BH-53-8-S	D	8	0.0155	
609377	105-BH-54-0-S	F	0	0.00877 J	
609377	105-BH-54-2-S	F	2	0.00746 J	
609377	105-BH-54-4-S	F	4	0.00587 J	
609377	105-BH-54-8-S	F	8	0.00252 J	
609379	105-BH-55-0-S	F	0	0.00633	
609379	105-BH-55-2-S	F	2	0.0136	
609379	105-BH-55-4-S	F	4	ND (0.00242)	
609379	105-BH-55-8-S	F	8	0.00498	
609381	105-BH-56-0-S	F	0	0.0253	
609381	105-BH-56-2-S	F	2	0.0196	
609381	105-BH-56-4-S	F	4	ND (0.00241)	
609381	105-BH-56-8-S	F	8	ND (0.0025)	
609354	105-BH-57-0-S	E	0	0.0328	
609354	105-BH-57-2-S	E	2	0.0106	
609354	105-BH-57-4-S	E	4	0.0035	
609358	105-BH-60-0-S	F	0		0.401
609358	105-BH-60-2-S	F	2		0.156
609358	105-BH-60-4-S	F	4	0.00535	
609358	105-BH-60-8-S	F	8	ND (0.00242)	
609360	105-BH-62-0-S	F	0		3.62
Background Co	ncentration (surface/subsurfa	ace) ^c		<0.25/<0.1	

	Sample Attribut	es		Metals (EPA Method 7471A) ^a (mg/kg)
		Sample	Sample	, J J,
Record		Collection	Depth	
Number ^b	ER Sample ID	Area	(ft bgs)	Mercury
609360	105-BH-62-2-S	F	2	0.0128
609360	105-BH-62-4-S	F	4	0.00527
609360	105-BH-62-8-S	F	8	ND (0.00243)
609362	105-BH-63-0-S	F	0	0.0262
609362	105-BH-63-2-S	F	2	0.0129
609362	105-BH-63-4-S	F	4	0.00797
609362	105-BH-63-8-S	F	8	0.00458
609364	105-BH-64-0-S	F	0	0.393
609364	105-BH-64-2-S	F	2	0.0106
609364	105-BH-64-4-S	F	4	0.00884
609364	105-BH-64-4-SD	F	4	0.0168
609364	105-BH-64-8-S	F	8	0.00323
609371	105-BH-65-0-S	F	0	0.162
609371	105-BH-65-2-S	F	2	0.0114
609371	105-BH-65-4-S	F	4	ND (0.00242)
609371	105-BH-65-8-S	F	8	0.00434
609349	105-BH-66-0-S	D	0	0.144 J
609349	105-BH-66-2-S	D	2	0.0143 J
609349	105-BH-66-4-S	D	4	0.0487
609349	105-BH-66-4-SD	D	4	0.00464 J
609349	105-BH-66-6-S	D	6	ND (0.00237)
609349	105-BH-66-8-S	D	8	ND (0.00243)
609374	105-BH-67-0-S	F	0	0.0377
609374	105-BH-67-2-S	F	2	0.0135
609374	105-BH-67-4-S	F	4	0.00601
609374	105-BH-67-8-S	F	8	0.00383
609375	105-BH-68-0-S	F	0	0.0118 J
609375	105-BH-68-2-S	F	2	ND (0.00236)
609375	105-BH-68-4-S	F	4	0.0142
609375	105-BH-68-8-S	F	8	ND (0.00236)
609377	105-BH-69-0-S	F	0	0.0404 J
609377	105-BH-69-2-S	F	2	0.00879 J
609377	105-BH-69-2-SD	F	2	0.0241 J
609377	105-BH-69-4-S	F	4	0.00781
609377	105-BH-69-8-S	F	8	ND (0.00243)
609379	105-BH-70-0-S	F	0	0.0133
609379	105-BH-70-2-S	F	2	0.0137
609379	105-BH-70-4-S	F	4	ND (0.00238)
609379	105-BH-70-8-S	F	8	0.00259
609381	105-BH-71-0-S	F	0	0.0216
Background Co	ncentration (surface/subsurfa	ace) ^c		<0.25/<0.1

	Sample Attribut	es		Metals (EPA Method 7471A) ^a (mg/kg)
		Sample	Sample	
Record		Collection	Depth	
Numberb	ER Sample ID	Area	(ft bgs)	Mercury
609381	105-BH-71-2-S	F	2	0.00265
609381	105-BH-71-4-S	F	4	0.00388
609381	105-BH-71-8-S	F	8	0.00322
609354	105-BH-72-0-S	E	0	0.0914
609354	105-BH-72-2-S	E	2	0.0284
609354	105-BH-72-2-SD	E	2	0.0122
609354	105-BH-72-4-S	E	4	0.00311
609359	105-BH-76-0-S	F	0	0.0102
609359	105-BH-76-2-S	F	2	ND (0.00237)
609359	105-BH-76-4-S	F	4	0.00887
609359	105-BH-76-8-S	F	8	0.00435
609361	105-BH-78-0-S	F	0	0.0234
609361	105-BH-78-2-S	F	2	0.0198
609361	105-BH-78-2-SD	F	2	0.0051
609361	105-BH-78-4-S	F	4	0.00459
609361	105-BH-78-8-S	F	8	0.0077
609363	105-BH-79-0-S	F	0	0.0129
609363	105-BH-79-2-S	F	2	0.014
609364	105-BH-80-0-S	F	0	0.0185
609364	105-BH-80-2-S	F	2	0.0168
609364	105-BH-80-4-S	F	4	0.00524
609364	105-BH-80-8-S	F	8	0.00528
609372	105-BH-81-0-S	F	0	0.00677
609372	105-BH-81-2-S	F	2	0.00951
609372	105-BH-81-4-S	F	4	0.00708
609372	105-BH-81-8-S	F	8	0.00338
609373	105-BH-82-0-S	F	0	0.013
609373	105-BH-82-2-S	F	2	0.0125
609373	105-BH-82-4-S	F	4	0.0116
609373	105-BH-82-8-S	F	8	0.00258
609374	105-BH-83-0-S	F	0	0.0159
609374	105-BH-83-2-S	F	2	0.0137
609374	105-BH-83-4-S	F	4	0.0128
609374	105-BH-83-4-SD	F	4	0.0164
609374	105-BH-83-8-S	F	8	ND (0.00241)
609376	105-BH-84-0-S	F	0	0.00714 J
609376	105-BH-84-2-S	F	2	0.0161
609376	105-BH-84-4-S	F	4	0.0132
609376	105-BH-84-8-S	F	8	ND (0.0025)
609378	105-BH-85-0-S	F	0	0.0102 J
	ncentration (surface/subsurface	- 1	<u> </u>	<0.25/<0.1

Record Number		Sample Attribut	es		Metals (EPA Method 7471A) ^a (mg/kg)
Number ER Sample ID					
609378 105-BH-85-2-S F 2 0.0242 609378 105-BH-85-4-S F 4 0.00721 J 609378 105-BH-86-8-S F 8 ND (0.00232) 609380 105-BH-86-0-S F 0 0.00616 609380 105-BH-86-2-SD F 2 0.0153 609380 105-BH-86-2-SD F 2 0.00725 609380 105-BH-86-4-S F 4 0.00435 609380 105-BH-86-8-S F 8 ND (0.00238) 609382 105-BH-87-C-S F 0 0.00599 609382 105-BH-87-S-S F 2 0.00571 609382 105-BH-88-8-S F 8 0.0234 609382 105-BH-88-8-S F 8 0.0234 609382 105-BH-88-8-S F 8 0.0234 609385 105-BH-88-8-S E 0 0.126 609355 105-BH-88-S E 0 0.0126<					
609378 105-BH-85-4-S F 4 0.00721 J 609378 105-BH-85-B-S F 8 ND (0.00232) 609380 105-BH-86-C-S F 0 0.00616 609380 105-BH-86-2-SD F 2 0.00725 609380 105-BH-86-2-SD F 2 0.00725 609380 105-BH-86-8-S F 4 0.00435 609380 105-BH-86-8-S F 8 ND (0.00238) 609382 105-BH-86-8-S F 8 ND (0.00238) 609382 105-BH-87-0-S F 0 0.00599 609382 105-BH-87-S-S F 2 0.00571 609382 105-BH-88-S-S F 8 0.0234 609382 105-BH-88-S-S F 8 0.0234 609355 105-BH-88-O-S E 0 0.126 609355 105-BH-88-S-S E E 0 0.126 609355 105-BH-91-O-S F <td< td=""><td></td><td></td><td></td><td></td><td></td></td<>					
609378 105-BH-85-8-S F 8 ND (0.00232) 609380 105-BH-86-0-S F 0 0.00616 609380 105-BH-86-2-S F 2 0.0153 609380 105-BH-86-2-SD F 2 0.00725 609380 105-BH-86-8-S F 4 0.00435 609380 105-BH-87-0-S F 0 0.00599 609382 105-BH-87-2-S F 0 0.00599 609382 105-BH-87-8-S F 4 ND (0.00234) 609382 105-BH-87-8-S F 4 ND (0.00234) 609382 105-BH-87-8-S F 8 0.0234 609355 105-BH-88-0-S E 0 0.126 609355 105-BH-88-1-S E 2 0.0174 609355 105-BH-91-9-S F 0 0.013 609359 105-BH-91-S F 0 0.013 609359 105-BH-91-S F 2 0.0031 <td></td> <td></td> <td></td> <td></td> <td></td>					
609380 105-BH-86-0-S F 0 0.00616 609380 105-BH-86-2-SD F 2 0.0153 609380 105-BH-86-2-SD F 2 0.00725 609380 105-BH-86-4-S F 4 0.00435 609380 105-BH-86-8-S F 8 ND (0.00238) 609382 105-BH-87-0-S F 0 0.00599 609382 105-BH-87-2-S F 2 0.00571 609382 105-BH-87-4-S F 4 ND (0.00234) 609382 105-BH-88-0-S F 8 0.0234 609382 105-BH-88-0-S E 0 0.126 609355 105-BH-88-0-S E 0 0.126 609355 105-BH-88-0-S E 2 0.0174 609355 105-BH-91-88-C E 2 0.0174 609359 105-BH-91-8-S F 0 0.013 609359 105-BH-91-9-S F 2 0.00315 </td <td></td> <td></td> <td></td> <td></td> <td></td>					
609380 105-BH-86-2-S F 2 0.0153 609380 105-BH-86-2-SD F 2 0.00725 609380 105-BH-86-4-S F 4 0.00435 609380 105-BH-86-8-S F 8 ND (0.00238) 609382 105-BH-87-0-S F 0 0.00599 609382 105-BH-87-2-S F 2 0.00571 609382 105-BH-87-4-S F 4 ND (0.00234) 609382 105-BH-87-8-S F 8 0.0234 609382 105-BH-87-4-S F 8 0.0234 609355 105-BH-88-0-S E 0 0.126 609355 105-BH-88-0-S E 2 0.0174 609355 105-BH-88-0-S E 4 0.00485 609355 105-BH-91-0-S F 0 0.013 609359 105-BH-91-8-S F 2 0.00315 609359 105-BH-91-8-S F 4 0.00312 </td <td></td> <td></td> <td></td> <td></td> <td>, ,</td>					, ,
609380					
609380 105-BH-86-4-S F 4 0.00435 609380 105-BH-86-8-S F 8 ND (0.00238) 609382 105-BH-87-0-S F 0 0.00599 609382 105-BH-87-2-S F 2 0.00571 609382 105-BH-87-4-S F 4 ND (0.00234) 609382 105-BH-88-8-S F 8 0.0234 609355 105-BH-88-8-S E 0 0.126 609355 105-BH-88-4-S E 2 0.0174 609355 105-BH-88-4-S E 2 0.0174 609355 105-BH-91-0-S F 0 0.013 609359 105-BH-91-2-S F 2 0.00315 609359 105-BH-91-8-S F 4 0.00312 609359 105-BH-93-8-S F 4 0.00312 609359 105-BH-93-8-S F 8 ND (0.00244) 609361 105-BH-94-8-S F 8 ND (
609380					
609382		105-BH-86-4-S			
609382		105-BH-86-8-S			ND (0.00238)
609382 105-BH-87-4-S F 4 ND (0.00234) 609382 105-BH-87-8-S F 8 0.0234 609355 105-BH-88-0-S E 0 0.126 609355 105-BH-88-2-S E 2 0.0174 609355 105-BH-88-4-S E 4 0.00485 609359 105-BH-91-0-S F 0 0.013 609359 105-BH-91-2-S F 2 0.00315 609359 105-BH-91-8-S F 4 0.00312 609359 105-BH-91-8-S F 4 0.00312 609359 105-BH-91-8-S F 4 0.00312 609359 105-BH-91-8-S F 8 ND (0.02244) 609361 105-BH-91-8-S F 8 ND (0.02246) 609361 105-BH-93-8-S F 2 0.0206 609361 105-BH-93-8-S F 8 0.00362 609363 105-BH-94-0-S F 0 0.01					
609382 105-BH-87-8-S F 8 0.0234 609355 105-BH-88-0-S E 0 0.126 609355 105-BH-88-2-S E 2 0.0174 609355 105-BH-88-4-S E 4 0.00485 609359 105-BH-91-0-S F 0 0.013 609359 105-BH-91-2-S F 2 0.00315 609359 105-BH-91-4-S F 4 0.00312 609359 105-BH-91-8-S F 8 ND (0.00244) 609359 105-BH-91-8-S F 8 ND (0.00244) 609361 105-BH-93-0-S F 0 0.0276 609361 105-BH-93-2-S F 2 0.0206 609361 105-BH-93-8-S F 8 0.00362 609363 105-BH-94-0-S F 0 0.0144 609363 105-BH-94-8-S F 8 ND (0.00247) 609363 105-BH-94-8-S F 8 ND (0.	609382	105-BH-87-2-S			0.00571
609355 105-BH-88-0-S E 0 0.126 609355 105-BH-88-2-S E 2 0.0174 609355 105-BH-88-4-S E 4 0.00485 609359 105-BH-91-0-S F 0 0.013 609359 105-BH-91-8-S F 2 0.00315 609359 105-BH-91-4-S F 4 0.00312 609359 105-BH-91-8-S F 8 ND (0.00244) 609359 105-BH-91-8-S F 8 ND (0.00244) 609361 105-BH-91-8-S F 0 0.0276 609361 105-BH-93-2-S F 2 0.0206 609361 105-BH-93-2-S F 4 0.00616 609361 105-BH-93-8-S F 8 0.00362 609363 105-BH-94-0-S F 0 0.0144 609363 105-BH-94-2-S F 2 0.0142 609363 105-BH-95-2-S F 8 ND (0.00247	609382	105-BH-87-4-S		4	ND (0.00234)
609355 105-BH-88-2-S E 2 0.0174 609355 105-BH-88-4-S E 4 0.00485 609359 105-BH-91-0-S F 0 0.013 609359 105-BH-91-2-S F 2 0.00315 609359 105-BH-91-8-S F 4 0.00312 609359 105-BH-91-8-S F 8 ND (0.00244) 609361 105-BH-91-8-S F 0 0.0276 609361 105-BH-93-2-S F 2 0.0206 609361 105-BH-93-2-S F 2 0.0206 609361 105-BH-93-8-S F 8 0.00362 609361 105-BH-93-8-S F 8 0.00362 609363 105-BH-94-2-S F 0 0.0144 609363 105-BH-94-2-S F 2 0.0142 609363 105-BH-94-8-S F 8 ND (0.00247) 609364 105-BH-95-0-S F 0 0.0386 <td>609382</td> <td>105-BH-87-8-S</td> <td>F</td> <td>8</td> <td>0.0234</td>	609382	105-BH-87-8-S	F	8	0.0234
609355 105-BH-88-4-S E 4 0.00485 609359 105-BH-91-0-S F 0 0.013 609359 105-BH-91-2-S F 2 0.00315 609359 105-BH-91-4-S F 4 0.00312 609359 105-BH-91-8-S F 8 ND (0.00244) 609361 105-BH-93-0-S F 0 0.0276 609361 105-BH-93-2-S F 2 0.0206 609361 105-BH-93-2-S F 4 0.00616 609361 105-BH-93-4-S F 8 0.00362 609363 105-BH-93-4-S F 0 0.0144 609363 105-BH-94-2-S F 2 0.0142 609363 105-BH-94-2-S F 4 0.0132 609363 105-BH-95-0-S F 8 ND (0.00247) 609364 105-BH-95-0-S F 0 0.0396 609364 105-BH-95-2-S F 2 0.0082 <td>609355</td> <td>105-BH-88-0-S</td> <td>E</td> <td>0</td> <td>0.126</td>	609355	105-BH-88-0-S	E	0	0.126
609359 105-BH-91-0-S F 0 0.013 609359 105-BH-91-2-S F 2 0.00315 609359 105-BH-91-4-S F 4 0.00312 609359 105-BH-91-8-S F 8 ND (0.00244) 609359 105-BH-91-8-S F 8 ND (0.00244) 609361 105-BH-91-8-S F 0 0.0276 609361 105-BH-93-2-S F 2 0.0206 609361 105-BH-93-4-S F 4 0.00616 609361 105-BH-93-8-S F 8 0.00362 609363 105-BH-94-0-S F 0 0.0144 609363 105-BH-94-2-S F 2 0.0142 609363 105-BH-94-8-S F 8 ND (0.00247) 609363 105-BH-94-8-S F 8 ND (0.00247) 609364 105-BH-95-8-S F 2 0.00882 609364 105-BH-95-8-S F 8 <t< td=""><td>609355</td><td>105-BH-88-2-S</td><td>E</td><td>2</td><td>0.0174</td></t<>	609355	105-BH-88-2-S	E	2	0.0174
609359 105-BH-91-2-S F 2 0.00315 609359 105-BH-91-4-S F 4 0.00312 609359 105-BH-91-8-S F 8 ND (0.00244) 609361 105-BH-93-0-S F 0 0.0276 609361 105-BH-93-2-S F 2 0.0206 609361 105-BH-93-4-S F 4 0.00616 609361 105-BH-93-4-S F 8 0.00362 609363 105-BH-94-0-S F 0 0.0144 609363 105-BH-94-0-S F 2 0.0142 609363 105-BH-94-8-S F 4 0.0132 609363 105-BH-94-8-S F 8 ND (0.00247) 609364 105-BH-94-8-S F 8 ND (0.00247) 609364 105-BH-95-0-S F 2 0.00882 609364 105-BH-95-8-S F 8 ND (0.00241) 609372 105-BH-96-0-S F 0 <	609355	105-BH-88-4-S	E	4	0.00485
609359 105-BH-91-4-S F 4 0.00312 609359 105-BH-91-8-S F 8 ND (0.00244) 609361 105-BH-93-0-S F 0 0.0276 609361 105-BH-93-2-S F 2 0.0206 609361 105-BH-93-4-S F 4 0.00616 609361 105-BH-93-8-S F 8 0.00362 609363 105-BH-94-0-S F 0 0.0144 609363 105-BH-94-0-S F 2 0.0142 609363 105-BH-94-2-S F 2 0.0142 609363 105-BH-94-8-S F 4 0.0132 609363 105-BH-94-8-S F 8 ND (0.00247) 609364 105-BH-95-0-S F 0 0.0396 609364 105-BH-95-4-S F 4 0.00283 609364 105-BH-96-8-S F 8 ND (0.00241) 609372 105-BH-96-2-S F 2 0.01	609359	105-BH-91-0-S	F	0	0.013
609359 105-BH-91-8-S F 8 ND (0.00244) 609361 105-BH-93-0-S F 0 0.0276 609361 105-BH-93-2-S F 2 0.0206 609361 105-BH-93-4-S F 4 0.00616 609361 105-BH-93-8-S F 8 0.00362 609363 105-BH-94-0-S F 0 0.0144 609363 105-BH-94-2-S F 2 0.0142 609363 105-BH-94-8-S F 4 0.0132 609363 105-BH-94-8-S F 8 ND (0.00247) 609363 105-BH-95-8-S F 0 0.0396 609364 105-BH-95-2-S F 2 0.00882 609364 105-BH-95-4-S F 4 0.00283 609372 105-BH-96-0-S F 0 0.00883 609372 105-BH-96-4-S F 2 0.0175 609372 105-BH-96-4-S F 4 0.00436 </td <td>609359</td> <td>105-BH-91-2-S</td> <td>F</td> <td>2</td> <td>0.00315</td>	609359	105-BH-91-2-S	F	2	0.00315
609361 105-BH-93-0-S F 0 0.0276 609361 105-BH-93-2-S F 2 0.0206 609361 105-BH-93-4-S F 4 0.00616 609361 105-BH-93-8-S F 8 0.00362 609363 105-BH-94-0-S F 0 0.0144 609363 105-BH-94-2-S F 2 0.0142 609363 105-BH-94-8-S F 4 0.0132 609363 105-BH-94-8-S F 8 ND (0.00247) 609364 105-BH-95-0-S F 0 0.0396 609364 105-BH-95-2-S F 2 0.00882 609364 105-BH-95-8-S F 4 0.00283 609364 105-BH-96-0-S F 0 0.00883 609372 105-BH-96-0-S F 0 0.00883 609372 105-BH-96-8-S F 4 0.00436 609372 105-BH-96-8-S F 8 0.00261	609359	105-BH-91-4-S	F	4	0.00312
609361 105-BH-93-0-S F 0 0.0276 609361 105-BH-93-2-S F 2 0.0206 609361 105-BH-93-4-S F 4 0.00616 609361 105-BH-93-8-S F 8 0.00362 609363 105-BH-94-0-S F 0 0.0144 609363 105-BH-94-2-S F 2 0.0142 609363 105-BH-94-8-S F 8 ND (0.00247) 609363 105-BH-95-0-S F 0 0.0396 609364 105-BH-95-0-S F 0 0.0396 609364 105-BH-95-4-S F 2 0.00882 609364 105-BH-95-8-S F 8 ND (0.00241) 609372 105-BH-96-0-S F 0 0.00883 609372 105-BH-96-4-S F 2 0.0175 609372 105-BH-96-8-S F 8 0.00261 609373 105-BH-97-0-S F 0 0.00954 </td <td>609359</td> <td>105-BH-91-8-S</td> <td>F</td> <td>8</td> <td>ND (0.00244)</td>	609359	105-BH-91-8-S	F	8	ND (0.00244)
609361 105-BH-93-4-S F 4 0.00616 609361 105-BH-93-8-S F 8 0.00362 609363 105-BH-94-0-S F 0 0.0144 609363 105-BH-94-2-S F 2 0.0142 609363 105-BH-94-8-S F 4 0.0132 609363 105-BH-94-8-S F 8 ND (0.00247) 609364 105-BH-95-0-S F 0 0.0396 609364 105-BH-95-2-S F 2 0.00882 609364 105-BH-95-4-S F 4 0.00283 609364 105-BH-95-8-S F 8 ND (0.00241) 609372 105-BH-96-0-S F 0 0.00883 609372 105-BH-96-4-S F 2 0.0175 609372 105-BH-96-8-S F 8 0.00261 609373 105-BH-97-0-S F 0 0.00954 609373 105-BH-97-2-S F 2 0.0146<	609361		F	0	, ,
609361 105-BH-93-4-S F 4 0.00616 609361 105-BH-93-8-S F 8 0.00362 609363 105-BH-94-0-S F 0 0.0144 609363 105-BH-94-2-S F 2 0.0142 609363 105-BH-94-8-S F 4 0.0132 609363 105-BH-94-8-S F 8 ND (0.00247) 609364 105-BH-95-0-S F 0 0.0396 609364 105-BH-95-2-S F 2 0.00882 609364 105-BH-95-4-S F 4 0.00283 609364 105-BH-95-8-S F 8 ND (0.00241) 609372 105-BH-96-0-S F 0 0.00883 609372 105-BH-96-2-S F 2 0.0175 609372 105-BH-96-8-S F 8 0.00261 609373 105-BH-97-0-S F 0 0.00954 609373 105-BH-97-2-S F 2 0.0146<	609361	105-BH-93-2-S	F	2	0.0206
609361 105-BH-93-8-S F 8 0.00362 609363 105-BH-94-0-S F 0 0.0144 609363 105-BH-94-2-S F 2 0.0142 609363 105-BH-94-4-S F 4 0.0132 609363 105-BH-94-8-S F 8 ND (0.00247) 609364 105-BH-95-0-S F 0 0.0396 609364 105-BH-95-2-S F 2 0.00882 609364 105-BH-95-4-S F 4 0.00283 609364 105-BH-95-8-S F 8 ND (0.00241) 609372 105-BH-96-0-S F 0 0.00883 609372 105-BH-96-4-S F 4 0.00436 609372 105-BH-96-8-S F 8 0.00261 609373 105-BH-97-0-S F 0 0.00954 609373 105-BH-97-2-S F 2 0.0146 609373 105-BH-97-8-S F 8 ND (0.0	609361	105-BH-93-4-S	F	4	0.00616
609363 105-BH-94-0-S F 0 0.0144 609363 105-BH-94-2-S F 2 0.0142 609363 105-BH-94-4-S F 4 0.0132 609363 105-BH-94-8-S F 8 ND (0.00247) 609364 105-BH-95-0-S F 0 0.0396 609364 105-BH-95-2-S F 2 0.00882 609364 105-BH-95-4-S F 4 0.00283 609364 105-BH-95-4-S F 8 ND (0.00241) 609372 105-BH-96-0-S F 0 0.00883 609372 105-BH-96-2-S F 2 0.0175 609372 105-BH-96-8-S F 4 0.00436 609373 105-BH-97-0-S F 0 0.00954 609373 105-BH-97-4-S F 4 0.00451 609373 105-BH-97-8-S F 8 ND (0.00248)			F	8	
609363 105-BH-94-2-S F 2 0.0142 609363 105-BH-94-4-S F 4 0.0132 609363 105-BH-94-8-S F 8 ND (0.00247) 609364 105-BH-95-0-S F 0 0.0396 609364 105-BH-95-2-S F 2 0.00882 609364 105-BH-95-4-S F 4 0.00283 609364 105-BH-95-8-S F 8 ND (0.00241) 609372 105-BH-96-0-S F 0 0.00883 609372 105-BH-96-2-S F 2 0.0175 609372 105-BH-96-4-S F 4 0.00436 609372 105-BH-96-8-S F 8 0.00261 609373 105-BH-97-0-S F 0 0.00954 609373 105-BH-97-4-S F 4 0.00451 609373 105-BH-97-8-S F 8 ND (0.00248)			F	0	
609363 105-BH-94-4-S F 4 0.0132 609363 105-BH-94-8-S F 8 ND (0.00247) 609364 105-BH-95-0-S F 0 0.0396 609364 105-BH-95-2-S F 2 0.00882 609364 105-BH-95-4-S F 4 0.00283 609364 105-BH-95-8-S F 8 ND (0.00241) 609372 105-BH-96-0-S F 0 0.00883 609372 105-BH-96-2-S F 2 0.0175 609372 105-BH-96-4-S F 4 0.00436 609372 105-BH-96-8-S F 8 0.00261 609373 105-BH-97-0-S F 0 0.00954 609373 105-BH-97-2-S F 2 0.0146 609373 105-BH-97-4-S F 4 0.00451 609373 105-BH-97-8-S F 8 ND (0.00248)			F	2	
609363 105-BH-94-8-S F 8 ND (0.00247) 609364 105-BH-95-0-S F 0 0.0396 609364 105-BH-95-2-S F 2 0.00882 609364 105-BH-95-4-S F 4 0.00283 609364 105-BH-95-8-S F 8 ND (0.00241) 609372 105-BH-96-0-S F 0 0.00883 609372 105-BH-96-2-S F 2 0.0175 609372 105-BH-96-8-S F 4 0.00436 609372 105-BH-96-8-S F 8 0.00261 609373 105-BH-97-0-S F 0 0.00954 609373 105-BH-97-2-S F 2 0.0146 609373 105-BH-97-4-S F 4 0.00451 609373 105-BH-97-8-S F 8 ND (0.00248)					
609364 105-BH-95-0-S F 0 0.0396 609364 105-BH-95-2-S F 2 0.00882 609364 105-BH-95-4-S F 4 0.00283 609364 105-BH-95-8-S F 8 ND (0.00241) 609372 105-BH-96-0-S F 0 0.00883 609372 105-BH-96-2-S F 2 0.0175 609372 105-BH-96-4-S F 4 0.00436 609372 105-BH-96-8-S F 8 0.00261 609373 105-BH-97-0-S F 0 0.00954 609373 105-BH-97-2-S F 2 0.0146 609373 105-BH-97-8-S F 4 0.00451 609373 105-BH-97-8-S F 8 ND (0.00248)					
609364 105-BH-95-2-S F 2 0.00882 609364 105-BH-95-4-S F 4 0.00283 609364 105-BH-95-8-S F 8 ND (0.00241) 609372 105-BH-96-0-S F 0 0.00883 609372 105-BH-96-2-S F 2 0.0175 609372 105-BH-96-4-S F 4 0.00436 609372 105-BH-96-8-S F 8 0.00261 609373 105-BH-97-0-S F 0 0.00954 609373 105-BH-97-2-S F 2 0.0146 609373 105-BH-97-4-S F 4 0.00451 609373 105-BH-97-8-S F 8 ND (0.00248)					, ,
609364 105-BH-95-4-S F 4 0.00283 609364 105-BH-95-8-S F 8 ND (0.00241) 609372 105-BH-96-0-S F 0 0.00883 609372 105-BH-96-2-S F 2 0.0175 609372 105-BH-96-4-S F 4 0.00436 609372 105-BH-96-8-S F 8 0.00261 609373 105-BH-97-0-S F 0 0.00954 609373 105-BH-97-2-S F 2 0.0146 609373 105-BH-97-4-S F 4 0.00451 609373 105-BH-97-8-S F 8 ND (0.00248)					
609364 105-BH-95-8-S F 8 ND (0.00241) 609372 105-BH-96-0-S F 0 0.00883 609372 105-BH-96-2-S F 2 0.0175 609372 105-BH-96-4-S F 4 0.00436 609372 105-BH-96-8-S F 8 0.00261 609373 105-BH-97-0-S F 0 0.00954 609373 105-BH-97-2-S F 2 0.0146 609373 105-BH-97-4-S F 4 0.00451 609373 105-BH-97-8-S F 8 ND (0.00248)					
609372 105-BH-96-0-S F 0 0.00883 609372 105-BH-96-2-S F 2 0.0175 609372 105-BH-96-4-S F 4 0.00436 609372 105-BH-96-8-S F 8 0.00261 609373 105-BH-97-0-S F 0 0.00954 609373 105-BH-97-2-S F 2 0.0146 609373 105-BH-97-4-S F 4 0.00451 609373 105-BH-97-8-S F 8 ND (0.00248)					
609372 105-BH-96-2-S F 2 0.0175 609372 105-BH-96-4-S F 4 0.00436 609372 105-BH-96-8-S F 8 0.00261 609373 105-BH-97-0-S F 0 0.00954 609373 105-BH-97-2-S F 2 0.0146 609373 105-BH-97-4-S F 4 0.00451 609373 105-BH-97-8-S F 8 ND (0.00248)					,
609372 105-BH-96-4-S F 4 0.00436 609372 105-BH-96-8-S F 8 0.00261 609373 105-BH-97-0-S F 0 0.00954 609373 105-BH-97-2-S F 2 0.0146 609373 105-BH-97-4-S F 4 0.00451 609373 105-BH-97-8-S F 8 ND (0.00248)					
609372 105-BH-96-8-S F 8 0.00261 609373 105-BH-97-0-S F 0 0.00954 609373 105-BH-97-2-S F 2 0.0146 609373 105-BH-97-4-S F 4 0.00451 609373 105-BH-97-8-S F 8 ND (0.00248)					
609373 105-BH-97-0-S F 0 0.00954 609373 105-BH-97-2-S F 2 0.0146 609373 105-BH-97-4-S F 4 0.00451 609373 105-BH-97-8-S F 8 ND (0.00248)					
609373 105-BH-97-2-S F 2 0.0146 609373 105-BH-97-4-S F 4 0.00451 609373 105-BH-97-8-S F 8 ND (0.00248)					
609373 105-BH-97-4-S F 4 0.00451 609373 105-BH-97-8-S F 8 ND (0.00248)					
609373 105-BH-97-8-S F 8 ND (0.00248)					
009374 1103-00-90-0-3 1					, ,
Background Concentration (surface/subsurface) ^c <0.25/<0.1				<u> </u>	

				Metals (EPA Method 7471A) ^a
	Sample Attribute			(mg/kg)
Decemb		Sample	Sample	
Record Number ^b	ED Comple ID	Collection	Depth (ft bgs)	Maraur
	ER Sample ID	Area F	(ft bgs)	Mercury
609374	105-BH-98-2-S	F	2	0.00843
609374	105-BH-98-2-SD	F	4	0.0246
609374	105-BH-98-4-S	F		ND (0.0025)
609374	105-BH-98-8-S	F	8	ND (0.00246)
609376	105-BH-99-0-S	F	0	0.0219
609376	105-BH-99-2-S		2	0.00874 J
609376	105-BH-99-4-S	F	4	0.0123 J
609376	105-BH-99-8-S	F	8	ND (0.00234)
609378	105-BH-100-0-S	F	0	0.00646 J
609378	105-BH-100-2-S	F	2	0.00475 J
609378	105-BH-100-4-S	F	4	0.0393
609378	105-BH-100-4-SD	F	4	0.00624 J
609378	105-BH-100-8-S	F	8	ND (0.00243)
609380	105-BH-101-0-S	F	0	0.00429
609380	105-BH-101-2-S	F	2	ND (0.00242)
609380	105-BH-101-4-S	F	4	0.00654
609380	105-BH-101-8-S	F	8	0.00484
609382	105-BH-102-0-S	F	0	0.0128
609382	105-BH-102-2-S	F	2	0.00524
609382	105-BH-102-4-S	F	4	0.00829
609382	105-BH-102-8-S	F	8	0.0052
609355	105-BH-103-0-S	E	0	0.117
609355	105-BH-103-2-S	E	2	0.0133
609355	105-BH-103-4-S	E	4	0.00954
609355	105-BH-103-4-SD	E	4	0.006
609359	105-BH-106-0-S	F	0	0.04
609359	105-BH-106-2-S	F	2	0.135
609359	105-BH-106-4-S	F	4	0.00459
609359	105-BH-106-8-S	F	8	ND (0.00248)
609361	105-BH-108-0-S	F	0	0.0418
609361	105-BH-108-2-S	F	2	0.014
609361	105-BH-108-4-S	F	4	0.0105
609361	105-BH-108-8-S	F	8	ND (0.00236)
609363	105-BH-109-0-S	F	0	0.0584
609363	105-BH-109-2-S	F	2	ND (0.00244)
609363	105-BH-109-2-SD	F	2	ND (0.0025)
609363	105-BH-109-4-S	F	4	ND (0.00244)
609363	105-BH-109-8-S	F	8	ND (0.00246)
609364	105-BH-110-0-S	F	0	0.0552
609364	105-BH-110-2-S	F	2	0.0105
	ncentration (surface/subsurfa	ace) ^c		<0.25/<0.1

	Sample Attribut			Metals (EPA Method 7471A) ^a (mg/kg)
		Sample	Sample	
Record		Collection	Depth	
Numberb	ER Sample ID	Area	(ft bgs)	Mercury
609364	105-BH-110-4-S	F	4	0.00518
609364	105-BH-110-8-S	F	8	0.00639
609372	105-BH-111-0-S	F	0	0.00967
609372	105-BH-111-2-S	F	2	0.00887
609372	105-BH-111-4-S	F	4	0.0153
609372	105-BH-111-8-S	F	8	ND (0.00244)
609373	105-BH-112-0-S	F	0	0.0115
609373	105-BH-112-2-S	F	2	0.0105
609373	105-BH-112-4-S	F	4	0.00255
609373	105-BH-112-8-S	F	8	ND (0.00235)
609373	105-BH-113-0-S	F	0	0.024
609373	105-BH-113-2-S	F	2	0.0166
609373	105-BH-113-4-S	F	4	0.00479
609373	105-BH-113-8-S	F	8	ND (0.00245)
609376	105-BH-114-0-S	F	0	0.0433
609376	105-BH-114-2-S	F	2	ND (0.00232)
609376	105-BH-114-2-SD	F	2	0.00264 J
609376	105-BH-114-4-S	F	4	0.0108 J
609376	105-BH-114-8-S	F	8	0.00334 J
609378	105-BH-115-0-S	F	0	0.00249 J
609378	105-BH-115-2-S	F	2	0.00956 J
609378	105-BH-115-4-S	F	4	0.00716 J
609378	105-BH-115-8-S	F	8	ND (0.00245)
609380	105-BH-116-0-S	F	0	0.0496
609380	105-BH-116-2-S	F	2	0.0126
609380	105-BH-116-4-S	F	4	0.00463
609380	105-BH-116-8-S	F	8	ND (0.00243)
609382	105-BH-117-0-S	F	0	0.0091
609382	105-BH-117-2-S	F	2	0.0142
609382	105-BH-117-4-S	F	4	0.00788
609382	105-BH-117-8-S	F	8	0.00497
609355	105-BH-118-0-S	E	0	0.0615
609355	105-BH-118-2-S	E	2	0.0198
609355	105-BH-118-4-S	E	4	0.00574
609357	105-BH-120-0-S	E	0	0.40
609357	105-BH-120-2-S	E	2	0.36
609357	105-BH-120-2-SD	E	2	8.
609357	105-BH-120-4-S	E	4	0.0111
609357	105-BH-121-0-S	E	0	0.155
609357	105-BH-121-0-S	E	2	0.133
				<0.25/<0.1
	ncentration (surface/subsurfa	aue)°		<0.25/<0.1

Sample Attributes Record Numberb ER Sample ID Sample Collection Depth 609357 105-BH-121-4-S E 4 609355 105-BH-131-4-S E 4	Metals (EPA Method 7471A) ^a (mg/kg) Mercury 0.00274 ND (0.00234)
Record Numberb ER Sample ID Sample Collection Depth Area Mitted (ft bgs) 609357 105-BH-121-4-S E 4	(mg/kg) Mercury 0.00274
Record Numberb ER Sample ID Collection Area Depth (ft bgs) 609357 105-BH-121-4-S E 4	Mercury 0.00274
Numberb ER Sample ID Area (ft bgs) 609357 105-BH-121-4-S E 4	0.00274
609357 105-BH-121-4-S E 4	0.00274
600355 105-BH-131-4-S F /	ND (0.00234)
	112 (0.00201)
609357 105-BH-122-0-S E 0	0.0973
609357 105-BH-122-2-S E 2	0.0089
609357 105-BH-122-4-S E 4	0.00479
609356 105-BH-123-0-S E 0	0.0575
609356 105-BH-123-2-S E 2	0.00988
609356 105-BH-123-4-S E 4	0.00826
609356 105-BH-124-0-S E 0	0.0227
609356 105-BH-124-2-S E 2	0.0101
609356 105-BH-124-4-S E 4	0.00807
609356 105-BH-125-0-S E 0	0.00296
609356 105-BH-125-2-S E 2	0.00801
609356 105-BH-125-4-S E 4	0.0252
609356 105-BH-126-0-S E 0	2.39
609356 105-BH-126-2-S E 2	0.0501
609356 105-BH-126-4-S E 4	0.0114
609356 105-BH-127-0-S E 0	6.97
609356 105-BH-127-2-S E 2	1.53
609356 105-BH-127-4-S E 4	0.0122
609356 105-BH-127-4-SD E 4	0.89
609356 105-BH-128-0-S E 0	0.371
609356 105-BH-128-2-S E 2	0.16
609356 105-BH-128-4-S E 4	0.026
609356 105-BH-129-0-S E 0	0.0631
609356 105-BH-129-2-S E 2	0.054
609356 105-BH-129-4-S E 4	0.00481
609355 105-BH-130-0-S E 0	0.138
609355 105-BH-130-2-S E 2	0.832
609355 105-BH-130-4-S E 4	0.00603
609355 105-BH-131-0-S E 0	0.0843
609355 105-BH-131-2-S E 2	0.0184
609355 105-BH-131-2-SD E 2	0.00963
609355 105-BH-132-0-S E 0	0.129
609355 105-BH-132-2-S E 2	1.77
609355 105-BH-132-4-S E 4	0.00738
Background Concentration (surface/subsurface) ^c	<0.25/<0.1

Note: Values in **bold** exceed background concentration limit or have MDLs that exceed background concentration limit.

^aEPA November 1986.

^bAnalysis request/chain-of-custody record.

^cDinwiddie September 1997.

BH = Borehole.

EPA = U.S. Environmental Protection Agency.

ER = Environmental Restoration.

ft = Foot (feet).

J = Estimated concentration.

J () = The reported value is greater than or equal to the MDL but is less than the practical quantitation limit, shown in parentheses.

MDL = Method detection limit. mg/kg = Milligram(s) per kilogram.

ND () = Not detected above the MDL, shown in parentheses.

S = Soil sample.

SD = Duplicate soil sample.

-- = Not applicable.