Sandia National Laboratories/New Mexico

CHEMICAL WASTE LANDFILL SITE OPERATIONAL BOUNDARY CLOSURE ADDENDUM TO THE LANDFILL EXCAVATION VOLUNTARY CORRECTIVE MEASURE FINAL REPORT

August 2005

United States Department of Energy
Sandia Site Office

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EXECUTIVE SUMMARY

This report is an addendum to the Sandia National Laboratories/New Mexico Chemical Waste Landfill (CWL) Landfill Excavation (LE) Voluntary Corrective Measure (VCM) Final Report (SNL/NM April 2003). This addendum documents the cleanup activities and risk assessment conducted for closure of the CWL Site Operational Boundary (SOB). The SOB provided the space necessary for storage and processing of excavated material during the CWL LE VCM operations.

The LE VCM was an integral part of the expedited Corrective Action Program defined in the New Mexico Environment Department (NMED)-approved CWL Closure Plan (SNL/NM December 1992). Closure of the CWL was formally initiated in 1988. The CWL was a 1.9-acre landfill located approximately 6 miles southeast of Albuquerque, New Mexico, used for disposal of chemical and solid waste between 1962 and 1985. In addition, the CWL served as a storage facility for hazardous waste drums between 1981 and 1989. Liquid and solid waste disposal was discontinued in 1981 and 1985, respectively. During the LE VCM, one of the major impediments to operational efficiency was the limited space available for storage and segregation of excavated material. When Addendum B was added to Appendix S of the Closure Plan in a Class 2 amendment to the Closure Plan, definition of the SOB as a material storage and processing area was included (SNL/NM July 1999). This amendment also added a haul road from the CWL to the Corrective Action Management Unit (CAMU) for disposal. This modification was approved by the NMED in April 2000 (Lewis April 2000).

A request to expand the SOB to include the North Annex, adjacent to the CAMU, was submitted by the U.S. Department of Energy (Zamorski September 2000) and approved by the NMED in September 2000 (Lewis September 2000). At that time, the CAMU was regulated by the U.S. Environmental Protection Agency (EPA); therefore, addition of the North Annex to the CWL SOB also required EPA approval. EPA approval was granted in October 2000 (Neleigh October 2000). As indicated in the LE VCM Final Report (SNL/NM April 2003), the use of the SOB was contingent upon returning the area to prior-use conditions. The Risk-Based Approach, requested in August 2000 established risk-based cleanup standards/criteria at the CWL for two depth intervals, 0 to 5 feet below ground surface (bgs) and greater than 5 feet bgs (SNL/NM August 2000). For the SOB, only surface, or 0 to 5 feet bgs, criteria applies. Prior to use, sampling of the SOB was not conducted. However, “prior-use conditions” are defined as meeting cleanup standards/criteria that were approved by the NMED for Resource Conservation and Recovery Act (RCRA) constituents (Lewis October 2000), and by EPA Region 6 for Toxic Substances Control Act (TSCA) constituents (Cooke June 2002). Based on the location of the CWL SOB, the current and future land use is industrial.

The SOB Closure Addendum final risk assessment (Annex A) addresses the current conditions of the approved expansion area. The surface soil of the SOB meets unrestricted residential risk criteria; however, the current and projected future land use is industrial.

All final verification analytical results representing current conditions are included in the risk assessment. Excluding duplicates and resamples, 123 samples were analyzed for metals, volatile organic compounds, semivolatile organic compounds, polychlorinated biphenyls, and radionuclides. SOB surface verification soil samples were collected and analyzed from the nodes of a 50-foot grid superimposed over the expansion area as stipulated in the LE VCM

Sampling and Analysis Plan (SNL/NM November 1998) and Interim Change Notice #1 (SNL/NM March 1999).

The human health risk assessment incorporates all final verification results and uses conservative assumptions and a reasonable maximum exposure approach. Calculations for nonradiological constituents of concern (COCs) for an industrial land-use scenario show the hazard index (HI) is 0.10 and the calculated excess cancer risk is 8E-6. Both are below the acceptable risk criteria approved by the NMED (Bearzi January 2001). Calculations for nonradiological COCs for the residential land-use scenario, based upon the upper confidence limit for major contributors to excess cancer risk and hazards, show the total HI and estimated cancer risk are 0.46 and 2E-5, respectively. Therefore, the CWL SOB meets the criteria for unrestricted residential release. The incremental total effective dose equivalent (TEDE) and corresponding estimated cancer risk from radiological COCs is 5.3E-1 millirem (mrem)/year (yr) and 5.6E-6, respectively, for an industrial land-use scenario. These values are much lower than the EPA guidelines (EPA 1997a). Furthermore, for radiological COCs, the incremental TEDE for the residential land-use scenario that results from a complete loss of institutional control is only 1.4E+0 mrem/yr with an associated excess cancer risk of 1.1E-5. The guideline for this scenario is 75 mrem/yr (SNL/NM February 1998). Therefore, the CWL SOB is eligible for unrestricted radiological release.

Based upon the ecological risk assessment for radiological and nonradiological COCs, ecological risks associated with the CWL are expected to be low for both industrial and residential land-use scenarios.

The results of the SOB final verification soil sampling and final risk assessment analysis presented in this addendum demonstrate that the primary objective of leaving the SOB in a post LE VCM condition that meets the cleanup standards/criteria that were approved by the NMED for RCRA constituents (Lewis October 2000) and by EPA Region 6 for TSCA constituents (Cooke June 2002) has been achieved.

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C Chemical Waste Landfill Site Operational Boundary, Data Validation Reports

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ACRONYMS AND ABBREVIATIONS

bgs	below ground surface
CAMU	Corrective Action Management Unit
CFR	Code of Federal Regulations
COC	constituent of concern
CWL	Chemical Waste Landfill
cy	cubic yard(s)
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
ER	Environmental Restoration
GCDP	Gas Cylinder Disposal Pit
HazCat	Hazardous Categorization
HI	hazard index
HQ	hazard quotient
KAFB	Kirtland Air Force Base
kg	kilogram
LE	Landfill Excavation
MDL	method detection limit
mg	milligram
mrem	millirem
NMED	New Mexico Environment Department
PCB	polychlorinated biphenyl
RBA	Risk-Based Approach
RCRA	Resource Conservation and Recovery Act
RME	reasonable maximum exposure
RMMA	Radiological Materials Management Area
SNL/NM	Sandia National Laboratories/New Mexico
SOB	Site Operational Boundary
SVOC	semivolatile organic compound
SWMU	Solid Waste Management Unit
TA	Technical Area
TEDE	total effective dose equivalent
TSCA	Toxic Substances Control Act
UCL	upper confidence limit
VCM	Voluntary Corrective Measure
VOC	volatile organic compound
yr	year

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1.0 INTRODUCTION

Sandia National Laboratories/New Mexico (SNL/NM) is a U.S. Department of Energy (DOE) facility located on Kirtland Air Force Base (KAFB), immediately southeast of Albuquerque, New Mexico. SNL/NM consists of five Technical Areas (TAs) that occupy 2,820 acres within KAFB and includes several remote test areas that span 17,740 acres of KAFB (Figure 1-1). SNL/NM's primary mission is developing technologies to promote national security, with an emphasis on nuclear weapons development, engineering, testing, and stockpile stewardship. As a result of these activities, certain sites have been contaminated with hazardous and/or radioactive constituents.

The Chemical Waste Landfill (CWL) was a 1.9-acre disposal site located in the southeastern corner of TA-III at SNL/NM (Figure 1-1). The CWL was used for the disposal of chemical and solid waste generated by SNL/NM research activities from 1962 until 1985 and as a storage facility for hazardous waste drums from 1981 to 1989. Based upon the results of the Landfill Excavation (LE) Voluntary Corrective Measure (VCM), some radioactive waste disposal also occurred. Closure of the CWL is the responsibility of the SNL/NM Environmental Restoration (ER) Project.

As part of the closure process, the SNL/NM ER Project conducted an LE VCM from September 1998 through February 2002, during which the CWL was excavated, with the exception of one location excavated in January 2003 from the central part of the southwest excavation area (SNL/NM April 2003). The LE VCM was an integral part of the expedited Corrective Action Program defined in the New Mexico Environment Department (NMED)-approved CWL Closure Plan (SNL/NM December 1992). During the LE VCM, one of the major impediments to operational efficiency was the limited space available for storage and segregation of excavated material. The Site Operational Boundary (SOB) provided an expanded area for storage and processing of excavated material during the CWL LE VCM operations. Prior to the start of excavation activities, the landfill was designated as a Radiological Materials Management Area (RMMA); therefore, the expanded area was also designated as an RMMA upon its inception. Additionally, a Radiological Management Area for the management of excavated radiological materials was created within the SOB.

As part of the LE VCM, more than 52,000 cubic yards (cy) of contaminated soil and debris were removed, segregated, and managed prior to final treatment and/or disposal. Use of the SOB facilitated the processing of this material for final disposition. The SOB included a parcel of land directly to the east of the CWL (East SOB) and a parcel of land north of the CWL and directly adjacent to the Corrective Action Management Unit (CAMU) (North Annex). The CAMU is a treatment and containment facility for remediation waste generated by the SNL/NM ER Project; the CAMU was closed in October 2003.

This report is an addendum to the LE VCM Final Report and documents the verification sampling and cleanup activities associated with the SOB area at the CWL. The primary objective of the SOB was to provide the space necessary to efficiently excavate and stage waste from the CWL. Waste management, the primary function performed at the SOB, will be detailed in a subsequent addendum to the LE VCM Final Report.

A brief summary of the LE VCM operations and associated waste management activities is presented in Chapter 2.0. Chapter 3.0 addresses the initial scraping approach, verification

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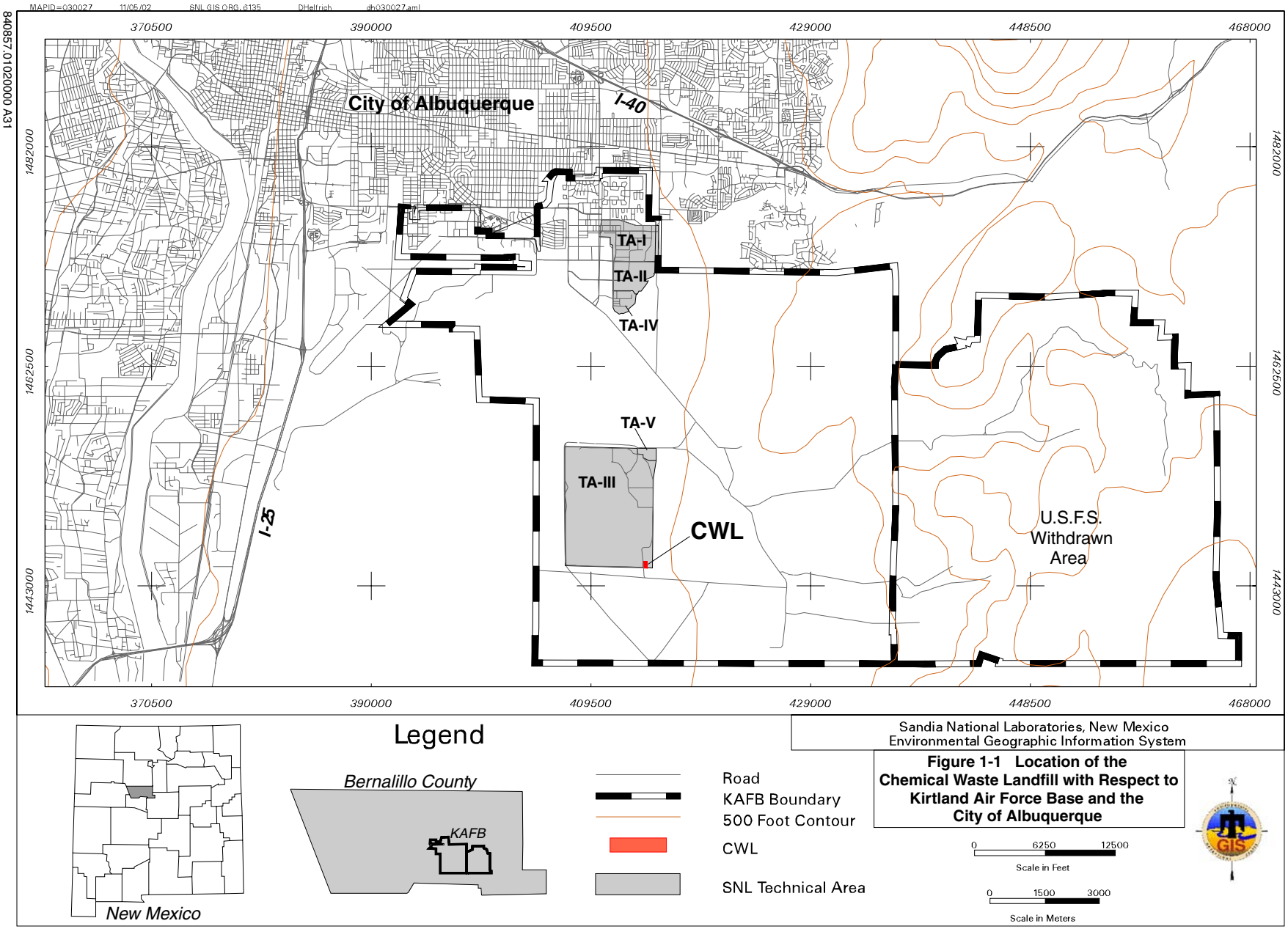

Figure 1-1 Location of the Chemical Waste Landfill with Respect to Kirtland Air Force Base and the City of Albuquerque

sampling strategy, analytical data evaluation criteria, and selected methods of cleanup for the SOB. Chapter 4.0 documents the final disposition of soil removed from the surface of the SOB. Chapter 5.0 presents the final verification sampling results for the SOB. A summary of the final risk assessment, which incorporates 123 off-site laboratory final verification analytical soil sample results that characterize the current conditions of the SOB for closure, is provided in Chapter 6.0. Chapter 7.0 presents the conclusions and recommendation for NMED approval of the final risk assessment for the CWL SOB.

The remainder of this chapter presents the following background information to provide a context for the LE VCM as it pertains to the use of the SOB:

- Regulatory Background (Section 1.1)
- Scope and Objectives (Section 1.2)
- Current Status of the SOB (Section 1.3)

1.1 Regulatory Background

The CWL is an interim status hazardous waste landfill undergoing closure under 20.4.1.600 New Mexico Administrative Code incorporating Title 40, Code of Federal Regulations (CFR), Part 265, regulations arising from the Resource Conservation and Recovery Act (RCRA). The NMED implements RCRA regulations within the State of New Mexico. The CWL Closure Plan was approved by the NMED and specifies the steps necessary to address the hazardous constituents within the landfill. Appendix S of the Closure Plan describes the VCMs to be undertaken at the CWL. Because the CWL contained polychlorinated biphenyls (PCBs) which are regulated under the Toxic Substances Control Act (TSCA), the cleanup of the landfill was also regulated by the U.S. Environmental Protection Agency (EPA), Region 6, under 40 CFR 761. The steps necessary to address PCB contamination were defined in the Risk-Based Approval Request, 40 CFR 761.61(c) Risk-Based Method for Management of PCB Materials (SNL/NM August 2000), that was approved by EPA Region 6 in June 2002 (Cooke June 2002).

During the LE VCM, one of the major impediments to operational efficiency was the limited space available for storage and segregation of excavated material. When Addendum B was added to Appendix S of the Closure Plan in a Class 2 Closure Plan amendment, definition of the SOB as a material storage and processing area was included (SNL/NM July 1999). Figure 1.1-1 shows the location of the original SOB, as well as the layout of materials staged within the SOB. This area is hereafter referred to as the East SOB. The amendment also added a haul road from the CWL to the CAMU for disposal. This modification was approved by the NMED in April 2000 (Lewis April 2000).

A request to expand the SOB to include the North Annex, adjacent to the CAMU, was submitted by the DOE (Zamorski September 2000) and approved by the NMED in September 2000 (Lewis September 2000). At that time, the CAMU was regulated by the EPA; therefore, addition of the North Annex to the CWL SOB also required EPA approval, which was granted in October 2000 (Neleigh October 2000). Figure 1.1-2 shows the location of the North Annex of the SOB in relation to the CWL and the CAMU. As indicated in the LE VCM Final Report (SNL/NM April 2003), the use of the SOB was contingent upon returning the area to prior-use conditions. The Risk-Based Approach (RBA), requested in August 2000 established risk-based cleanup standards/criteria at the CWL for two depth intervals, 0 to 5 feet below ground surface (bgs) and greater than 5 feet bgs (SNL/NM August 2000). For the SOB, only surface, or 0 to 5 feet bgs,

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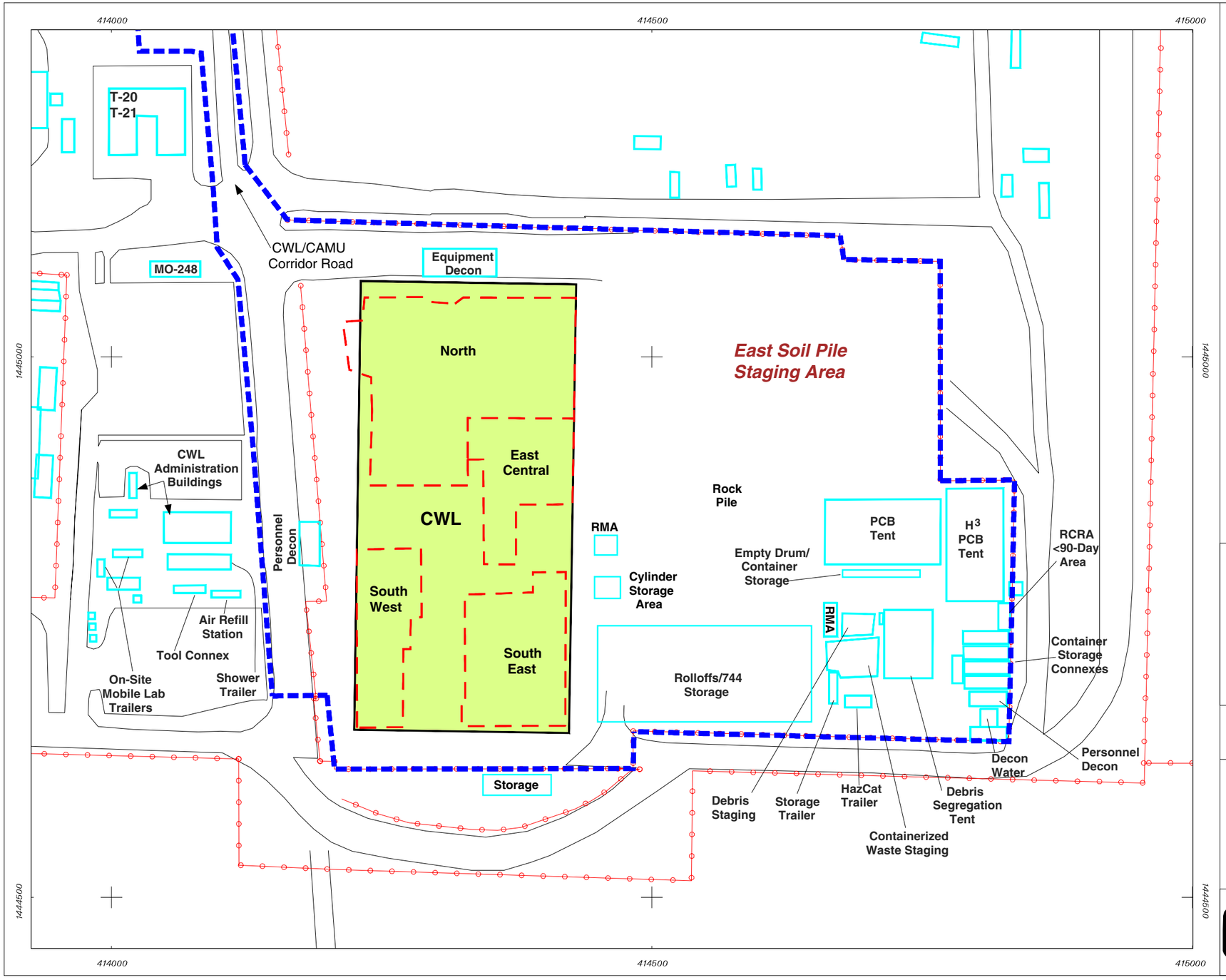

Legend

- Paved and Unpaved Road
- Fence
- CWL Excavation Area
- CWL Site Operational Boundary
- Building / Structure
- SWMU 74, Chemical Waste Landfill

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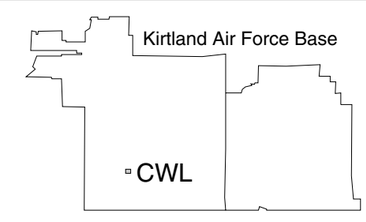

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Figure 1.1-1
Original SOB Configuration at the Chemical Waste Landfill

Transverse Mercator Projection, New Mexico State Plane Coordinate System, Central Zone, 1927 North American Horizontal Datum, 1929 North American Vertical Datum

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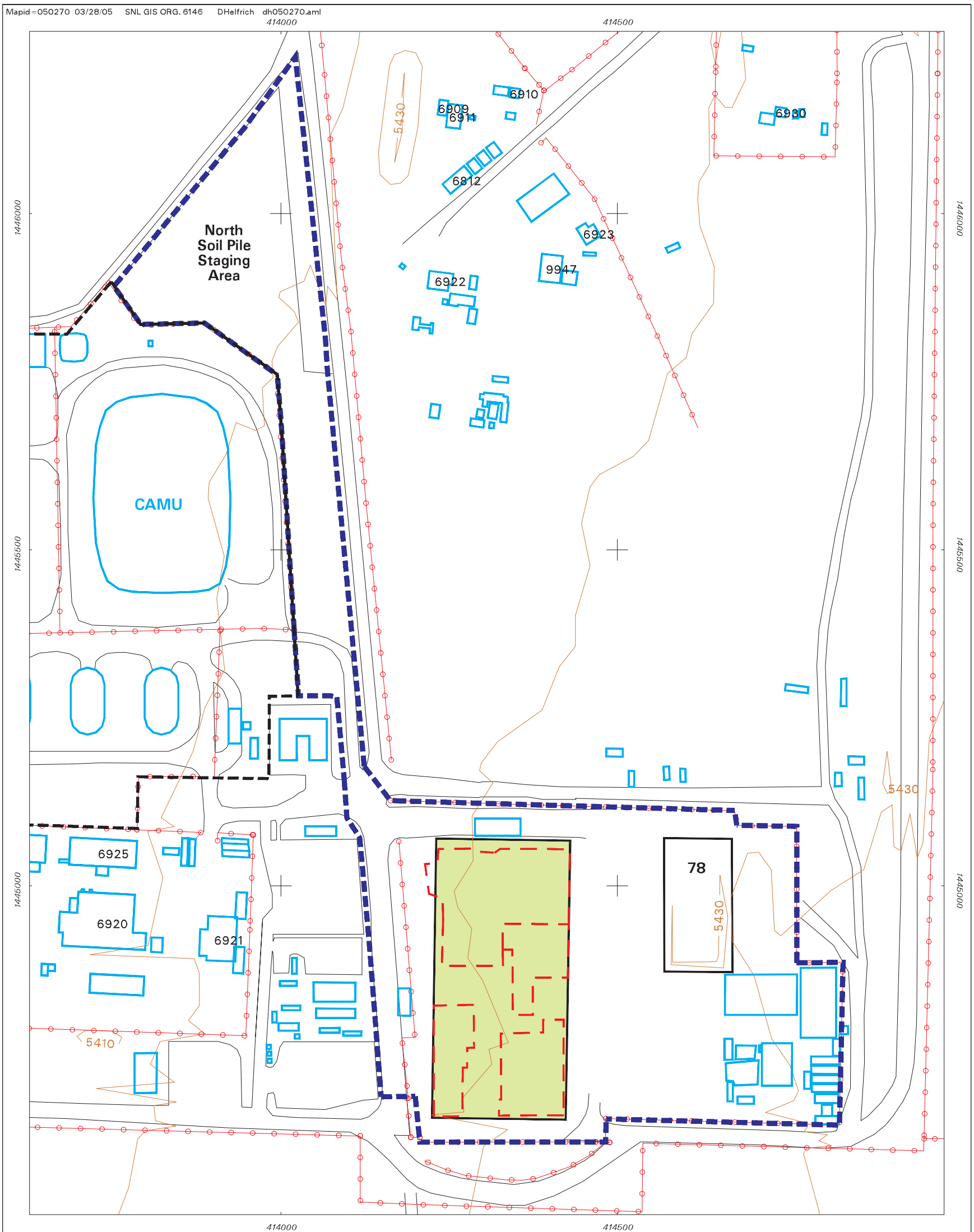
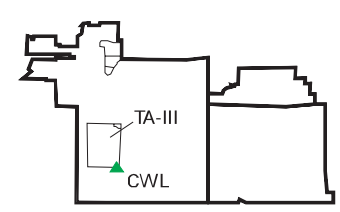


Legend

- Paved & Unpaved Road
- CWL Excavation Boundary
- 10 Foot Contour
- Fence
- CWL Operational Boundary
- SWMU 78 Boundary
- CAMU Boundary
- Building / Structure
- Chemical Waste Landfill

Figure 1.1-2
SOB with the Inclusion of the North Annex at the Chemical Waste Landfill



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Environmental Geographic Information System

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criteria applies. Prior to use, sampling of the area was not conducted. However, “prior-use conditions” are defined as meeting cleanup standards/criteria that were approved by the NMED for RCRA constituents (Lewis October 2000), and by EPA Region 6 for TSCA constituents (Cooke June 2002). This SOB Closure Addendum addresses the verification soil sampling, cleanup activities, and risk assessment analysis (Annex A) conducted to close the SOB. The results of the final verification soil sampling and final risk assessment demonstrate that the objective of leaving the SOB in a condition that meets the cleanup standards/criteria approved by the NMED for RCRA constituents (Lewis October 2000), and by EPA Region 6 for TSCA constituents (Cooke June 2002) has been achieved.

1.2 Scope and Objectives

In order to provide the NMED with adequate information to approve the closure of the SOB, the scope of this document includes the analytical data, documentation of cleanup activities, and a final risk assessment. The objective of the SOB verification sampling and cleanup activities was to demonstrate that the current conditions of the SOB meet the approved risk-based criteria for the current and future land use, which is industrial.

1.3 Overview of SOB Closure Activities

In order to return the SOB to previous conditions, the top 2 to 4 inches of surface soil were removed throughout the entire area prior to sampling. A 50-foot verification sampling grid was established to determine discrete surface soil sampling locations (Figure 1.3-1). As necessitated by ongoing backfilling and waste management operations, the SOB was cleared in stages. Chapter 3.0 describes the various methods and stages that comprised the cleanup process. Removal of the top 2 inches of surface soil from the SOB began in January 2003. Once the initial scraping was completed, the soil was stockpiled in 1,000-cy stockpiles, and a 50-foot grid was established across the area, as shown in Figure 1.3-1. During the verification sampling process, results for numerous grid locations showed concentrations of certain analytes that exceeded either the maximum value documented in the LE VCM risk assessment (SNL/NM April 2003) or risk-based criteria for surface concentrations (i.e., 0 to 5 feet bgs). Concentrations of total PCBs greater than the surface criterion of 1 milligram (mg)/kilogram (kg) were the cause of additional scraping and resampling of the SOB in most cases. Because of the number of samples that exceeded the PCB criterion, the scraping procedure was modified in October 2003 from scraping 2 to 4 inches to scraping 10 to 12 inches from the surface. This modification proved to be more effective for achieving total PCB concentrations below 1 mg/kg. The CWL, including the SOB, was removed from the RMMA program in September 2003 based upon radionuclide verification sampling results (Castillo September 2003); however, any material that may have come in contact with excavated material was managed and characterized according to previously established RMMA protocols/procedures. In February 2004, the entire SOB area had been scraped and verification samples confirmed that all risk-based criteria had been met.

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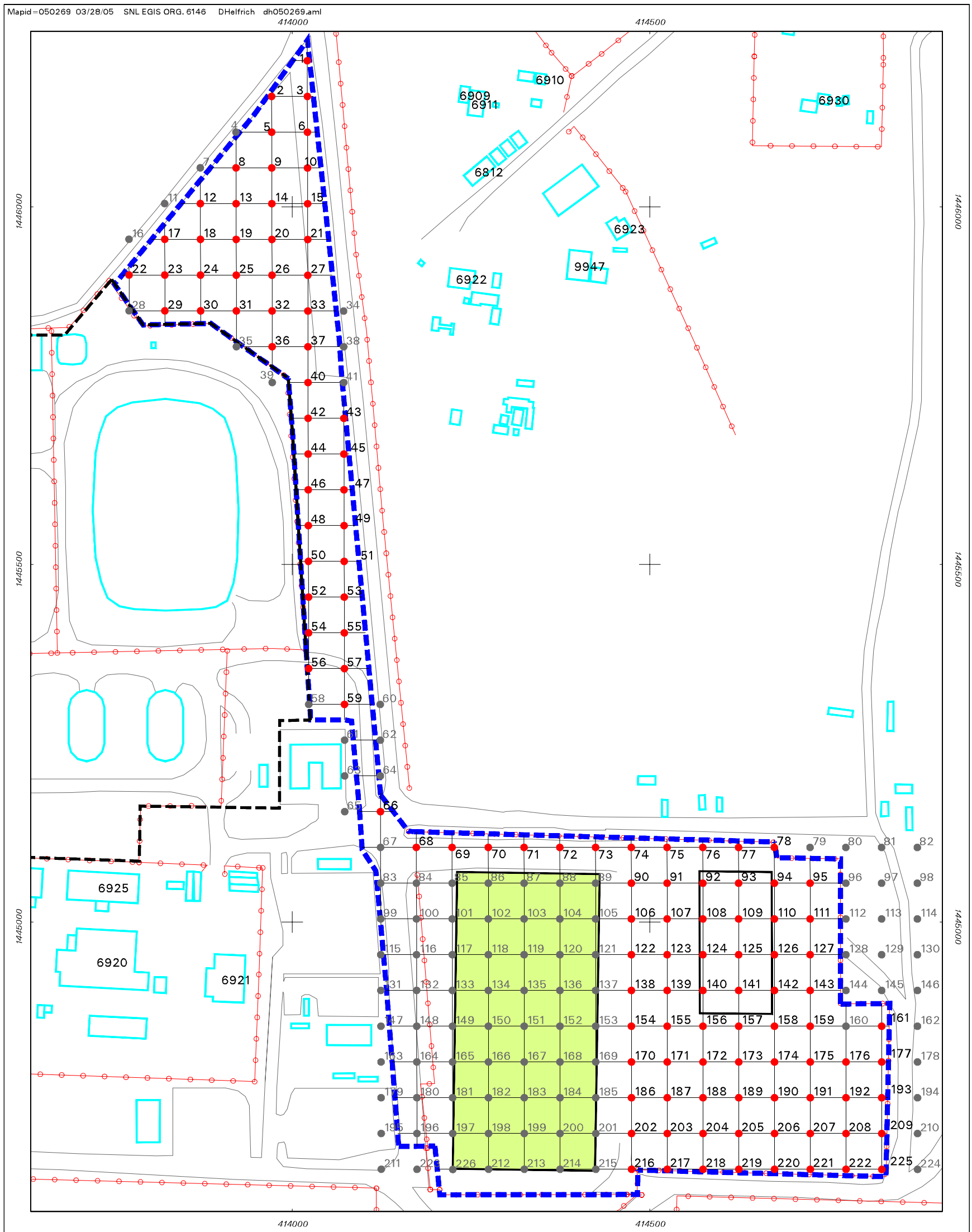
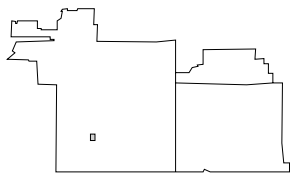


Legend

- Sampled Grid Locations
- Non-Sampled Grid Locations
- Paved & Unpaved Road
- 50 Foot Sampling Grid
- Fence
- CWL Operational Boundary
- CAMU Boundary
- SWMU 78 Gas Cylinder Disposal Pit
- Building / Structure
- Chemical Waste Landfill

Figure 1.3-1
SOB 50-foot Grid Sample Location at the Chemical Waste Landfill



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2.0 CWL LE VCM AND SOB OPERATIONAL HISTORY

Use of the CWL SOB began in July 1999, when a temporary authorization to proceed with the proposed Addendum B to Appendix S of the CWL Closure Plan was granted by the NMED (Lewis July 1999). Initially, the SOB included approximately 3.76 acres to the east of the footprint of the landfill (East SOB), as well as a dedicated haul road connecting the CWL to the CAMU (Figure 1.1-1). The land is primarily flat, with a paved road running parallel to the eastern and southern boundaries. With the approval from the EPA and the NMED of the North Annex expansion of the SOB (Neleigh October 2000, Lewis September 2000), an additional 7.64 acres of land adjacent to the CAMU were added to the SOB. The North Annex is also fairly flat, with an unpaved road running parallel to its eastern boundary (Figure 1.1-2). The North Annex of the SOB was used strictly for soil staging. Activities that occurred in the area of the SOB adjacent and east of the footprint of the landfill included the following:

- Processing and staging of excavated soil from the CWL
- Debris staging and segregation
- Initial characterization of chemicals excavated from the CWL
- Storage of debris, chemicals, and project-generated material pending characterization results and disposal
- RCRA less-than-90-day accumulation area staging

2.1 Processing and Staging of Soil from the CWL LE VCM

Excavation began at the CWL in September 1998. Material excavated from the landfill was processed through a screen mounted to a dump truck bed to separate soil from debris (Figure 2.1-1). Soil was characterized as material less than 2 inches in size; debris consisted of material greater than 2 inches. Initially, soil and debris were processed and staged within the footprint of the landfill.

Excavation operations changed in November 1998 with the introduction of a table screen on which soil could be spread by the track hoe. The table screen allowed the soil to pass through so that site workers could manually remove excavated debris from the screen surface (Figure 2.1-2). Although excavation efficiency improved slightly, production and safety were not optimum, which prompted a revision to the excavation approach.

In July 1999, a Class 2 Modification to the Closure Plan was submitted to the NMED that described the use of a mechanical screen, created the SOB based upon the Area of Concern concept to include just 3.76 acres of operational area surrounding the CWL, and eliminated spray-washing requirements for equipment traveling between the CWL and the adjacent CAMU by constructing a dedicated haul route (SNL/NM July 1999). Improvements implemented in this the Closure Plan amendment included the installation of a debris-sorting tent, which allowed debris segregation to continue during inclement weather, and the use of a

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Figure 2.1-1
Truck Bar Screening, September–October 1998

Figure 2.1-2
Table Screening, November 1998–August 1999

motorized conveyor belt with a site-built hopper, that eliminated the need to manually handle each excavated rock or debris item.

On July 30, 1999, the NMED granted a temporary authorization to proceed with the Closure Plan Class 2 Amendment (Lewis July 1999). Excavation temporarily halted while these changes were implemented. Between July and November 1999, the new site boundary was fenced for access control. Berms and silt fencing were installed to prevent storm water run-on and runoff. A waste management tent and two PCB storage tents were erected during September and October 1999. Also during this time, the air line and conveyor systems were installed, and a detour road directing traffic around the southern end of the CWL onto KAFB property was built. In addition, the dedicated haul road to the CAMU was constructed. Figure 1.1-1 shows the layout of the waste management areas created once the temporary authorization was granted.

As a result of the temporary authorization granted in July 1999, excavation and debris segregation became separate processes (Figures 2.1-3 and 2.1-4), although crew size and safety concerns prevented the two operations from occurring simultaneously. Because of its beneficial results, this approach was not significantly altered during the remainder of the excavation. Worker safety was significantly improved, and the excavation and screening rate more than doubled. The average excavation rate increased from 155 to 374 cy of soil per 50-hour workweek.

The Class 2 amendment was approved by the NMED in April 2000 (Lewis April 2000). The temporary authorization and final approval allowed the excavation and debris segregation processes to be performed as separate functions. This change resulted in the majority of the excavated materials being processed in the SOB, rather than within the footprint of the landfill. The majority of debris-processing occurred within the southern half of the SOB in the debris segregation tent (Figure 1.1-1). The northern half of the SOB was reserved for soil staging. In addition, soil contaminated with total PCBs at or above the EPA criterion of 50 mg/kg was staged in one of the two soil staging tents east of the landfill (designated “PCB Tent” and “H^3 PCB Tent” in Figure 1.1-1) or outside of the tents on top of, and covered with, a heavy plastic liner in order to protectively manage the soil.

Although 3.76 acres had been added to the boundary, the amount of soil being removed from the landfill required additional space for staging. In September 2000, the DOE requested the addition of the North Annex to the SOB of the CWL, which encompassed 7.64 acres located adjacent to the CAMU north of the access road to the SOB of the CWL (Zamorski September 2000). The addition of the North Annex was approved by the NMED in September 2000 (Lewis September 2000) and by the EPA in November 2000 (Neleigh October 2000). The North Annex was used only for soil staging throughout the LE VCM.

Initially the North Annex was used for 100-cy soil pile staging; however, the majority of the soil staged in the North Annex passed preliminary risk-based criteria. Once a 100-cy soil pile passed preliminary risk criteria, it could be stockpiled with other soil piles that preliminarily passed risk criteria for final verification sampling and final risk approval. Stockpiles were limited to 1,000 cy of soil (SNL/NM December 2000). Approximately twenty-two 1,000-cy stockpiles were generated from soil excavated from the landfill. Figure 2.1-5 presents an overview of the soil piles staged in the North Annex.

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Figure 2.1-3
ScreenAll™ Mechanical Screening

Figure 2.1-4
Conveyor System Segregation

Figure 2.1-5
Soil Piles Staged in North Annex

2.2 Processing and Staging of Debris from the LE VCM

Once the debris was screened from the soil, debris segregation was performed. This process entailed additional screening and/or sorting either at the table screen or on a conveyor belt. The following types of debris were unearthed as a result of excavation activities:

- Intact chemical containers
- Uncontainerized bulk chemicals such as resins, potassium salts, and sticky foam
- Ferrous and nonferrous metal
- Wood
- Plastic and soft debris
- Gas cylinders
- Thermal batteries
- Nonthermal batteries
- Concrete
- Rock

Excavated debris was segregated and processed at the southern area of the SOB. Intact chemical containers and uncontainerized bulk chemicals were preliminarily categorized in the Hazardous Categorization (HazCat) Laboratory located within the East SOB just west of the debris segregation tent (Figure 1.1-1). HazCat included radiological determination, hazard classification, and packaging for disposal. Many of the chemicals were also qualitatively characterized by the on-site mobile laboratory located to the southwest of the administrative trailer at the CWL (Figure 1.1-1). Those chemicals that were not characterized by the on-site mobile laboratory were sent off site for analysis. Intact containers were stored in connex boxes prior to disposal. Bulk chemicals were stored in drums or larger containers, such as roll-off bins or 7- by 7- by 4-foot containers, in the bulk staging area prior to disposal. Figure 2.2-1 presents an overall view of waste staged within the East SOB.

Ferrous and nonferrous metal less than ¼-inch thick, wood, and plastic/soft debris were surveyed for radiological activity and, once cleared, shredded. Shredding was performed in the south-central area of the SOB. Metal that was greater than ¼-inch thick was placed into larger containers for disposal. Gas cylinders were processed by a specialized contractor in the northeastern corner of the SOB. Processing included depressurizing the cylinders, draining, characterizing, and disposing of the material inside each container.

All excavated batteries were surveyed for removable radiological contamination. The thermal batteries that were in relatively good condition could be physically tested (i.e., D-tested) to determine whether they had been completely discharged. Batteries that could not be D-tested were X-rayed to make this determination. If necessary, thermal batteries were fired or discharged by another SNL/NM organization prior to disposal.

Concrete and rock were also staged at the East SOB. This material was processed through the mechanical screen multiple times in order to remove as much soil as possible. Finally, the concrete and rock were used as a marker layer at the bottom of the excavation, prior to backfilling with local soil material.

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Figure 2.2-1
Waste Staged Within the SOB

3.0 SOB CLEANUP METHODS AND SUMMARY OF ANALYTICAL RESULTS

The SOB cleanup activities were conducted in conjunction with backfilling of the landfill and final waste management operations. Thus, locations within the SOB were cleared as operations allowed. The North Annex was the first area to be scraped and sampled because it was the first area that was completely cleared of LE VCM material. The East SOB was cleared in stages due to continuing operations at the site. This section details the various methods of cleanup used, as well as the analytical results derived from the sampling effort.

3.1 Initial Scraping Method

Cleanup of the SOB began in January 2003 by scraping the top 2 to 4 inches of soil from the surface with a grader. The soil removed was stockpiled into a maximum of 1,000-cy soil piles (Figure 3.1-1). Once a stockpile was completed, it was sampled for off-site analysis. Over 5,000 cy of soil were removed from the North Annex and East SOB during the initial scraping effort. Chapter 4.0 details the disposition of all soil removed from the SOB during the cleanup activities.

3.2 Sampling Strategy

Once the area available was scraped a minimum of 2 inches, the SOB was sampled at locations on the 50-foot grid shown in Figure 1.3-1. The grid was established by imposing 50-foot squares over a map of the area as stipulated in the LE VCM Sampling and Analysis Plan (SNL/NM November 1998) and Interim Change Notice #1 (SNL/NM March 1999). Sample locations were established in the field using a Global Positioning System to locate the center point of each 50-foot square. Because the sampling locations were established by superimposing a grid at 50-foot centers over the entire SOB and excavation area, 103 grid points were located in areas that did not require sampling. Table 3.2-1 details each grid point not sampled and the rationale for not sampling.

With the exception of F067 and F160, the grid points that were not sampled were located outside the defined SOB area. Thirty-six grid points were completely outside of the fence line of the SOB. Sixty-two grid points were within the footprint of the CWL, for which a different grid layout had been generated and verification sampling had already been completed. Verification sampling results for grid points within the footprint of the landfill were reported in the LE VCM Final Report (SNL/NM April 2003). Grid point F067 was located on the asphalt corridor road between the CAMU and the CWL; therefore, this point could not be sampled. Grid point F160 was located such that it was directly beneath the structure of the H^3 PCB Tent. Approximately 18 inches of clean soil were used to create the foundation of the tent. Additionally, contaminated soil was stored on top of heavy, plastic liners within the tent. Therefore, verification sampling at this location was not required.

Ultimately, 123 grid points were sampled during the cleanup effort. Of the 123 grid points, 12 locations were not sampled during the original scraping/sampling effort. Grid locations F090, F106, F122, F154, and F170 were not sampled during the original effort because stockpiles of

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Figure 3.1-1
Stockpiles of Soil from Scraping of the SOB

Table 3.2-1
CWL SOB Grid Points Not Sampled

Grid Point Number	Rationale for Not Sampling
F004, F007, F011, F016, F028, F034, F035, F038, F039, F041, F058, F060, F061, F062, F063, F064, F065, F079, F080, F081, F082, F096, F097, F098, F112, F113, F114, F128, F129, F130, F144, F145, F146, F162, F178, F194, F210, and F224	Located outside of SOB fence line
F067	Located on asphalt road
F083, F084, F085, F086, F087, F088, F089, F099, F100, F101, F102, F103, F104, F105, F115, F116, F117, F118, F119, F120, F121, F131, F132, F133, F134, F135, F136, F137, F147, F148, F149, F150, F151, F152, F153, F163, F164, F165, F166, F167, F168, F169, F179, F180, F181, F182, F183, F184, F185, F195, F196, F197, F198, F199, F200, F201, F211, F212, F213, F214, F215, F223, and F226	Located within boundary of CWL
F160	Located beneath edge of tent

CWL = Chemical Waste Landfill.
SOB = Site Operational Boundary.

SOB scraped soil were staged at those locations. Grid locations F193, F209, and F225 located on the easternmost fence line of the SOB were sampled at a later date because this area was used for site entry and connex box storage. Grid locations F094, F095, F110, and F111 were located in the northeasternmost corner of the SOB, which was used for gas cylinder processing. Initially this area was sampled and confirmed to meet cleanup criteria when the area was no longer used for cylinder processing. However, the volatile organic compounds (VOCs), PCBs, and radiological analyses were performed by the on-site mobile laboratory, rather than an off-site laboratory. The remaining analyses, for RCRA metals and semivolatile organic compounds (SVOCs), were performed by an off-site laboratory during the earlier sampling campaign. These locations were sampled for off-site analysis of VOCs, PCBs, and radiological constituents during the second SOB sampling phase.

3.3 Evaluation Criteria

As stated earlier, the SOB cleanup effort was completed in phases to account for ongoing operations in the area. Based upon this approach, preliminary screening of each dataset focusing on individual locations was performed in order to determine whether additional scraping/sampling was necessary. Three criteria were used to evaluate the data. First, each data point was reviewed against the risk criteria as determined in the NMED-approved RBA (SNL/NM August 2000). The RBA established risk-based cleanup standards/criteria at the CWL for two depth intervals, 0 to 5 feet bgs and greater than 5 feet bgs. For the SOB, only surface, or 0 to 5 feet bgs, criteria applies. However, the risk criteria for greater than 5 feet bgs were used to determine whether soil removed from the SOB could be used as backfill material. All scraped soil that passed risk criteria for the greater than 5-foot-bgs depth interval was considered replaceable soil. Secondly, as a practical screening tool, each data point was compared with the maximum values from the LE VCM Final Report risk assessment (SNL/NM April 2003). Using the maximum values from the LE VCM Final Report as “initial threshold values” allowed a preliminary, real-time check as to whether additional scraping/sampling might be required in a given area. This comparison was performed as a best management practice to ensure the concentration levels of residual contamination remaining in the SOB surface soil

from the LE VCM activities were at reasonable levels. The industrial risk threshold value of 15 mg/kg was used as a screening level for arsenic. Finally, the EPA surface criterion of 1 mg/kg for total PCBs was used to determine whether individual locations required additional scraping/sampling for total PCBs.

3.4 Grid Sampling Results

Of the 111 grid points sampled during the first phase of the cleanup effort, 29 locations required additional scraping and sampling due to contamination either above risk criteria levels and/or above the maximum values established in the LE VCM Final Report risk assessment (SNL/NM April 2003). Primarily, additional scraping and sampling activities were based upon total PCB concentrations above the EPA surface criterion of 1 mg/kg. However, locations where arsenic concentrations exceeded the preliminary risk-based industrial threshold level of 15 mg/kg or SVOC concentrations were greater than the maximum values established by the LE VCM final risk assessment were scraped and sampled again in order to ensure overall risk-based criteria were achieved and minimal residual contamination remained on the surface. Scraping prior to the second round of sampling removed 2 to 4 inches of soil from each affected 50-foot grid using a grader. Table 3.4-1 presents the grid points that required a second round of sampling. Figure 3.4-1 shows these grid locations within the SOB.

Table 3.4-1
CWL SOB Grid Points Requiring Second Round of Sampling

Grid Point Number	Analyte Above Release Criteria or LE VCM Maximum Value
F014	Arsenic
F078 and F142	Arsenic and PCBs
F074, F140, F158, F172, and F173	Benzo(b)fluoranthene and PCBs
F125 and F141	Benzo(a)pyrene, Benzo(b)fluoranthene, and PCBs
F126	Benzo(a)pyrene, Benzo(ghi)perylene, and PCBs
F187	Bis(2-chloroethyl)ether and PCBs
F023, F031, F075, F076, F077, F092, F093, F107, F109, F123, F124, F143, F155, F156, F159, F192, and F203	PCBs

CWL = Chemical Waste Landfill.
LE = Landfill Excavation.
PCB = Polychlorinated biphenyl.
SOB = Site Operational Boundary.
VCM = Voluntary Corrective Measure.

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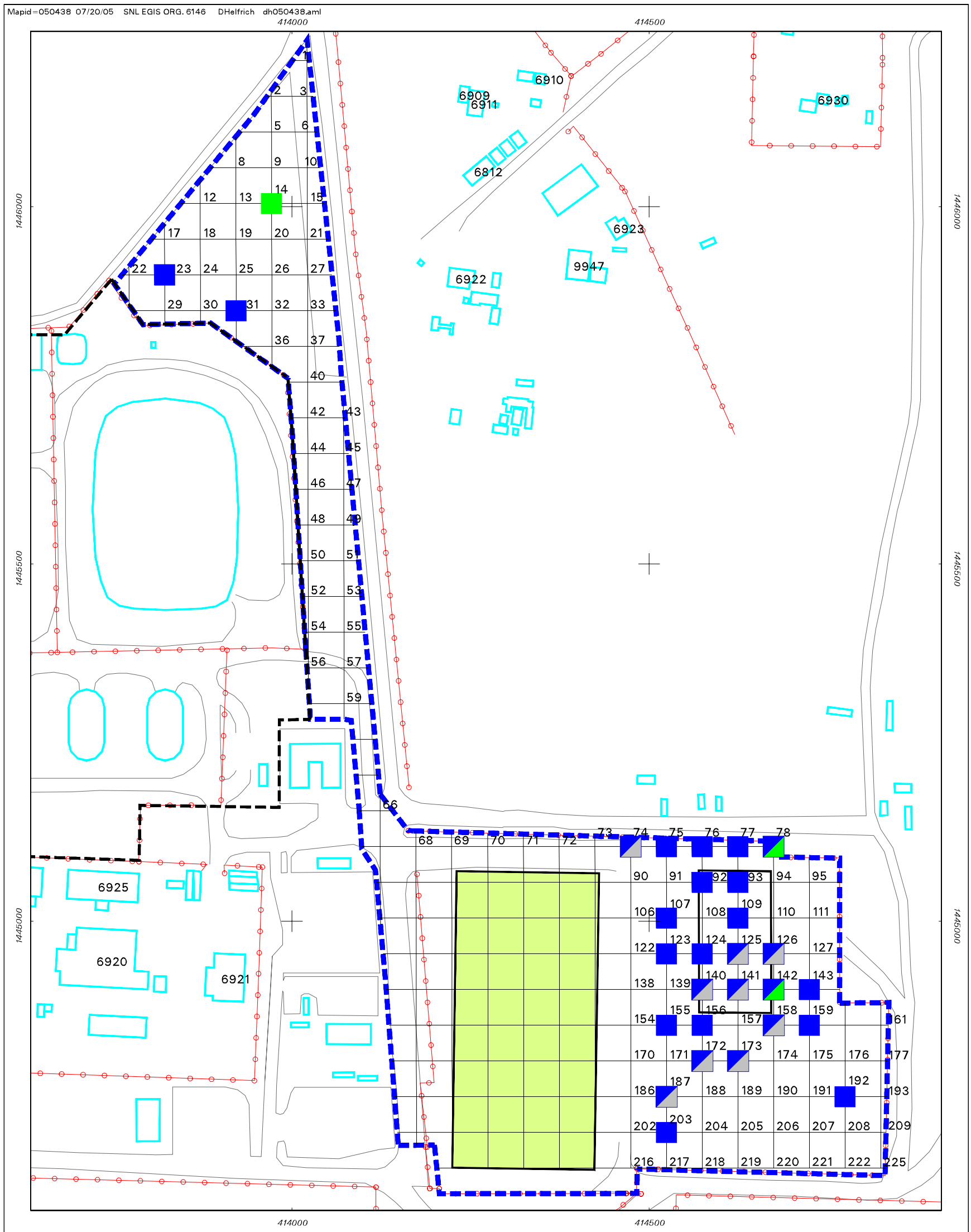
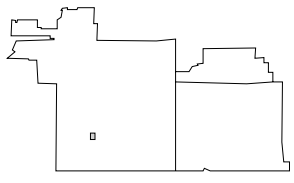


Legend

- Arsenic Failure
- PCB and Arsenic Failure
- PCB Failure
- PCBs Failure with SVOCs > LE VCM Max Value
- Paved & Unpaved Road
- Fence
- 50 Foot Sampling Grid
- CWL Site Operational Boundary
- SWMU 78 Gas Cylinder Disposal Pit
- CAMU Boundary
- Building / Structure
- Chemical Waste Landfill

Figure 3.4-1
Analytical Results above Regulatory/Risk Criteria from the First Sampling Round for the SOB at the Chemical Waste Landfill



0 150 300
Scale in Feet

0 36 72
Scale in Meters

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Environmental Geographic Information System

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In addition to the 28 grid areas sampled during the second round of sampling, 4 grid locations located in the northeastern corner (F094, F095, F110, and F111) were sampled (without scraping) for VOCs, PCBs, and radiological constituents. As stated earlier, these locations were previously sampled and analyzed for these constituents by the on-site laboratory. Off-site laboratory analytical data were previously obtained for RCRA metals and SVOCs; therefore, resampling for these specific constituents was not performed during the second round of SOB sampling. The data for RCRA metals and SVOCs for these locations are represented by sample identification numbers 74-SB-D000-V094, 74-SB-D000-V095, 74-SB-D000-V110, and 74-SB-D000-V111, based upon the identification scheme in use at the time. Of the 32 grid locations included in the second round of sampling, 16 grid points did not meet EPA surface criterion for total PCBs, and one (F125) also had SVOC concentrations greater than the LE VCM maximum values. Table 3.4-2 presents the grid points that required a third round of sampling. Figure 3.4-2 depicts these locations within the SOB.

Table 3.4-2
CWL SOB Grid Points Requiring Third Round of Sampling

Grid Point Number	Analyte Above Release Criteria or LE VCM Maximum Value
F125	Benzo(a)pyrene, Benzo(b)fluoranthene, and PCBs
F078, F092, F093, F094, F107, F111, F123, F124, F140, F141, F142, F155[a], F156, F158, and F159	PCBs

[a]F155 was partially covered by a stockpile of SOB soil; therefore, it was not scraped or sampled until the stockpiled soil had been placed into the CWL as backfill material.
CWL = Chemical Waste Landfill.
LE = Landfill Excavation.
PCB = Polychlorinated biphenyl.
SOB = Site Operational Boundary.
VCM = Voluntary Corrective Measure.

Figure 3.4-3 presents all the grid locations for all three rounds of sampling where analytical results exceeded the regulatory/risk criteria for arsenic, PCBs, and SVOCs for the CWL SOB.

3.5 Modified Scraping Method

Based upon the results of the first two rounds of sampling, the scraping process was modified. Rather than using a grader to scrape the soil, a track hoe was used. The track hoe was selected for two reasons. First, the reach on the track hoe allowed for removal of soil without driving over any portion of the grid area, which eliminated the potential for inadvertent cross-contamination. Secondly, the track hoe could accomplish removal of more than 2 to 4 inches of soil in an efficient, consistent manner. Figure 3.5-1 shows the new method of scraping using a track hoe. With the exception of F155, all grid locations listed in Table 3.4-2 were scraped and sampled at this time. Figure 3.5-2 presents an overview of the East SOB once the modified scraping method was initiated. F155 was partially covered by a stockpile of SOB soil; therefore, it was not scraped or sampled until the stockpile had been placed into the CWL as backfill material. In addition to the remaining 15 locations requiring additional remediation due to PCB concentrations greater than 1 mg/kg, the 3 areas located at the easternmost fence line of the SOB were sampled at this time (F193, F209, and F225). Because these grid locations were

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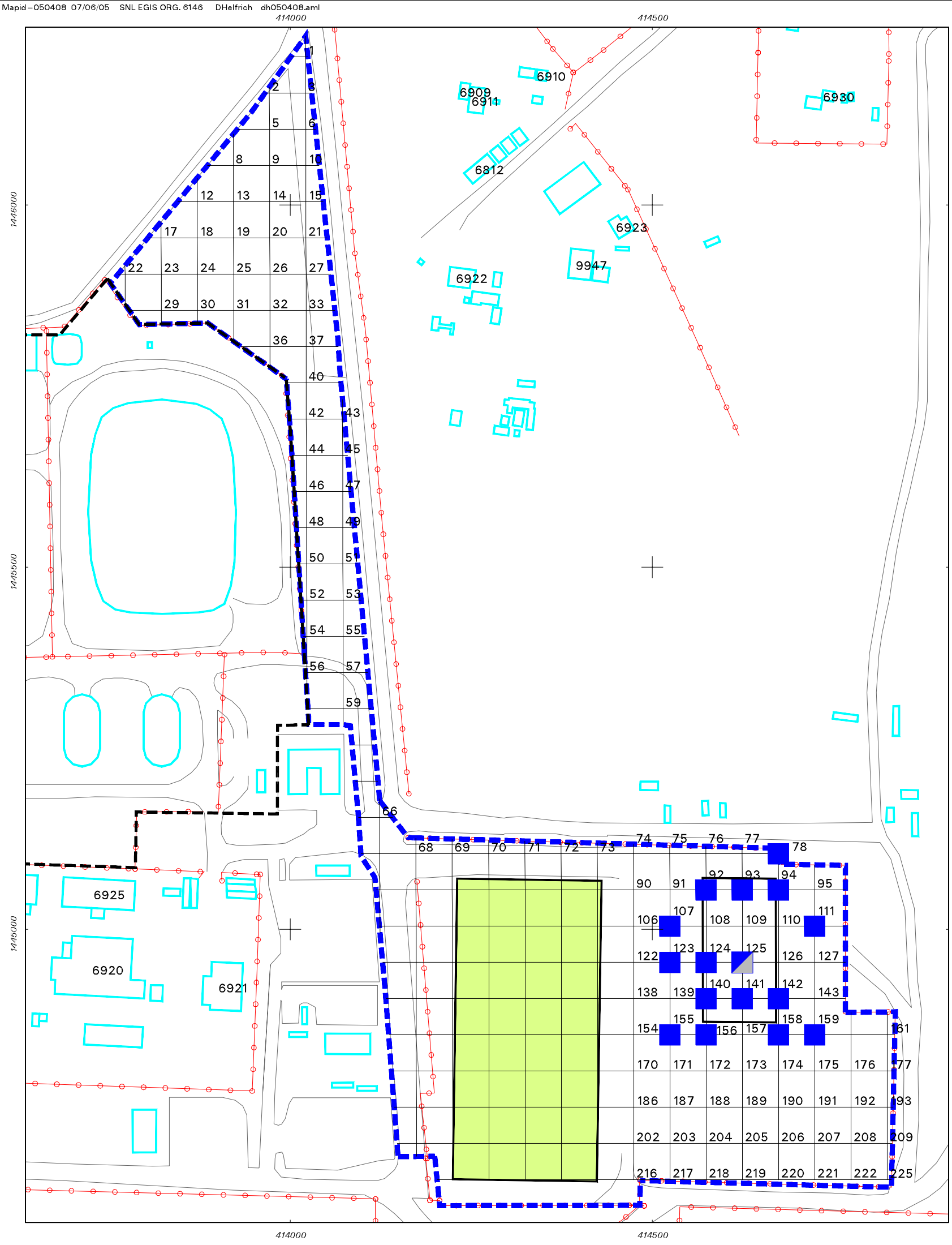
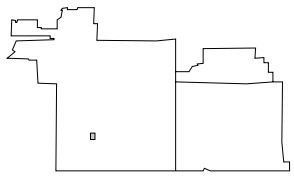


Legend

- PCB Failure
- PCBs Failure with SVOCs > LE VCM Max Value
- Paved & Unpaved Road
- Fence
- 50 Foot Sampling Grid
- CWL Site Operational Boundary
- CAMU Boundary
- Building / Structure
- SWMU 78 Gas Cylinder Disposal Pit
- Chemical Waste Landfill

Figure 3.4-2
Analytical Results above Regulatory/Risk Criteria from the Second Sampling Round for the SOB at the Chemical Waste Landfill



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Scale in Feet

0 36 72
Scale in Meters

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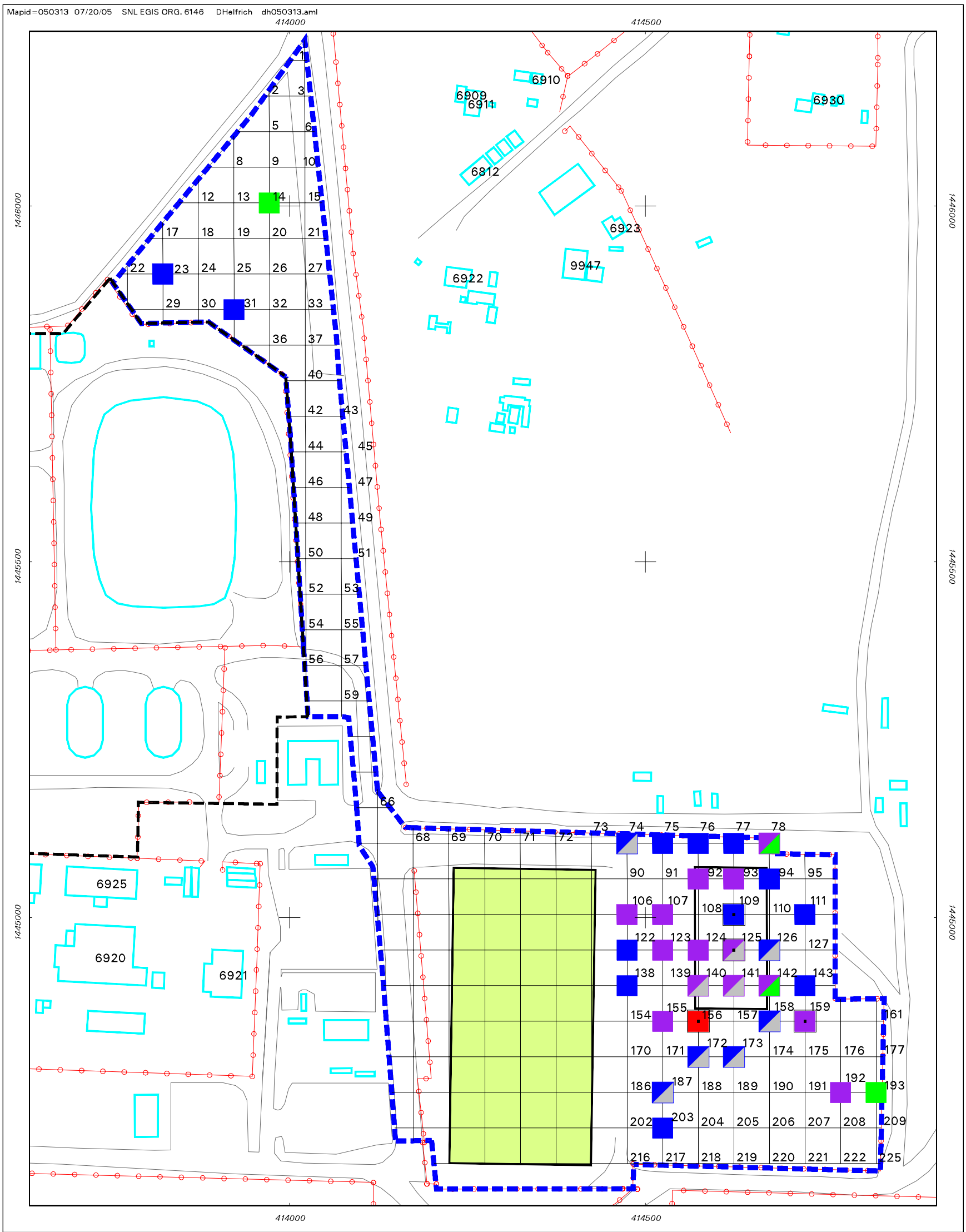
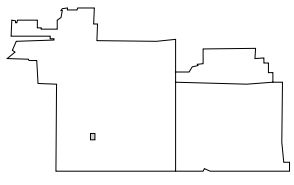


Legend

- Arsenic Failure
- PCBs with 1 Failure
- PCBs with 2 Failures
- PCBs with 3 Failures
- PCB Sub-grid Performed
- Arsenic Failure with 2 PCB Failures
- PCBs with 1 Failure and SVOCs > Max Value
- PCBs with 2 Failures and SVOCs > Max Value
- Paved & Unpaved Road
- 50 Foot Sampling Grid
- Building / Structure
- Chemical Waste Landfill
- Fence
- CAMU Boundary
- CWL Site Operational Boundary
- SWMU 78 Gas Cylinder Disposal Pit

Figure 3.4-3
Analytical Results above Regulatory/ Risk Criteria for the SOB at the Chemical Waste Landfill



0 150 300
Scale in Feet

0 36 72
Scale in Meters

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Figure 3.5-1
New Method of Scraping Using a Track Hoe

Figure 3.5-2
Overview of the East SOB With
New Method of Scraping Using a Track Hoe

along the eastern fence line of the East SOB, the likelihood of residual contamination was thought to be minimal; therefore, these locations were not scraped prior to sampling. Grid location F193 exceeded the industrial threshold risk-based level for arsenic. To remain consistent with the overall cleanup technique, scraping of all three grid locations was performed after data results were received from this sampling effort.

During this same time period, backfilling operations resumed at the CWL. Based upon the necessity to remove all structures and soil piles from the SOB, soil removed from the SOB was no longer stockpiled. At this point, any soil scraped from the SOB that was acceptable for use as replaceable soil was processed and immediately placed into the CWL as backfill material. During the third sampling round, one location that exceeded the threshold value for arsenic (F193) was scraped with a track hoe and sampled, and the results met risk criteria for arsenic. One location that did not meet the EPA surface release criterion for total PCBs (F159) was scraped again with a track hoe and sampled, and the results met surface criterion for total PCBs.

At this time, the stockpiles were transported from the SOB to the CWL excavation for use as backfill below 5 feet bgs. This included removal of approximately 12 inches of soil from underneath each pile as a best management practice. Once the stockpiles were removed from the SOB, grid locations F090, F106, F122, F154, and F170 were sampled for all analyses. Grid locations F106 and F122 did not meet the surface criterion for total PCBs and were subsequently scraped and resampled. F106 did not meet the surface criterion for total PCBs based upon the results of the second sampling event; therefore, this location was scraped again and resampled. F106 met the surface criterion for total PCBs based upon the results of this third sampling event. Grid location F138 was included in the initial sampling round and exceeded the surface criterion for total PCBs; however, soon after it was covered by stockpiled SOB soil that passed risk criteria for use as backfill below 5 feet bgs. Before additional sampling could occur at this location, soil stockpiled on top of the area had to be removed. F138 was resampled for total PCBs after removal of the stockpiled soil, including an additional 12 inches of scraping below the original sampling surface. F138 met the surface criterion for total PCBs based upon the results of the second sampling event. In addition, grid location F155 had been partially covered by stockpiled soil after the second round of sampling. Once the stockpiled soil, including at least 12 inches of soil beneath the stockpile, had been placed into the CWL excavation as backfill, F155 was resampled and the results met the surface criterion for total PCBs.

3.6 Soil Not Acceptable for CWL Replaceable Material

Approximately 3,100 cy of SOB soil generated from individual grid locations after the initial scraping effort was acceptable for use as CWL replaceable material based upon the RBA criteria (SNL/NM August 2000). However, for grid locations F109, F125, F156, and F155, total PCB concentrations exceeded the approved risk criteria (25 mg/kg) for replaceable soil. Concentrations of PCBs greater than 25 mg/kg complicated the process because the soil could not remain on the surface or be used as backfill material. Table 3.6-1 details the disposition criteria for various levels of PCB concentrations.

For the areas with analytical results indicating PCB levels above 25 mg/kg, an additional grid and sampling rationale were introduced in order to minimize waste. Prior to additional scraping, a 10- by 10-foot sub-grid was established within each 50-foot-grid square and 16 soil samples, corresponding to the 10- by 10-foot sub-grid nodes, were collected and analyzed for PCBs.

Table 3.6-1
CWL SOB PCB Disposition Criteria

Total PCB Concentration (mg/kg)	Acceptable Disposition
≤1	Remain in SOB–No action required
>1, ≤25	CWL Backfill (with placement below 5 feet bgs)
>25, <50	Off-site disposal, not TSCA-regulated
≥50	Off-site disposal, TSCA-regulated

bgs = Below ground surface.
CWL = Chemical Waste Landfill.
mg/kg = Milligram(s) per kilogram.
PCB = Polychlorinated biphenyl.
SOB = Site Operational Boundary.
TSCA = Toxic Substances Control Act.

3.6.1 F109 Sub-Grid

During the initial round of sampling, grid location F109 had a total PCB result of 284.7 mg/kg. This location was the first area where the sub-grid process was applied. Of the 16 sub-grid samples obtained at the nodes of the sub-grid for F109, none of the results exceeded 25 mg/kg. Based upon the sample results from the original grid point, the 10- by 10-foot area around the original sample location was excavated for off-site disposal. Approximately 2 cy of soil were removed and containerized for off-site disposal as TSCA-regulated waste. The remaining soil in the area with PCB concentrations below 25 mg/kg was scraped and stockpiled for placement into the CWL excavation below 5 feet bgs (i.e., replaceable soil). Table 3.6.1-1 summarizes the data obtained for the 16 sample points. Figure 3.6.1-1 presents a graphical representation (map view) of the sub-grid process for F109. After soil removal, the original grid point location was sampled. The result met the surface criterion for total PCBs; therefore, no additional scraping/sampling was performed at this location.

3.6.2 F125 Sub-Grid

During the second round of sampling, grid location F125 had a total PCB result of 33.9 mg/kg. Results from the 16 sub-grid samples indicated no PCB contamination greater than 25 mg/kg, with the exception of samples 74-SB-E002-F125-007 (87 mg/kg) and -010 (31 mg/kg). Therefore, approximately 6 cy of soil from the 10- by 10-foot area around the original sample location and sub-grid 010 were excavated, using a track hoe, for off-site disposal as non-TSCA-regulated waste. Because the total PCB concentration for sub-grid 007 was greater than 50 mg/kg, it was excavated using a track hoe for off-site disposal. Approximately 5 cy of soil were removed and containerized for off-site disposal as TSCA-regulated waste. The remaining soil in the area with PCB concentrations below 25 mg/kg was scraped and stockpiled for placement into the CWL excavation below 5 feet bgs (i.e., replaceable soil). Table 3.6.2-1 summarizes the data obtained for the 16 sample points. Figure 3.6.2-1 presents a graphical representation of the sub-grid process for F125. After soil removal, the original grid point location was sampled. The result met the surface criterion for total PCBs; therefore, no additional scraping/sample was performed at this location.

Table 3.6.1-1
CWL SOB Sub-Grid Results for F109

Sample Attributes			PCBs EPA Method 8082[a] (mg/kg)
Record Number[b]	ER Sample ID	Sample Depth (in.)	Total PCB Concentration
606547	74-SB-E002-F109-001	2–4	1.6
606547	74-SB-E002-F109-002	2–4	5.5
606547	74-SB-E002-F109-003	2–4	9.7
606547	74-SB-E002-F109-004	2–4	2.4
606547	74-SB-E002-F109-005	2–4	3.1
606547	74-SB-E002-F109-006	2–4	2.32
606547	74-SB-E002-F109-007	2–4	0.85
606547	74-SB-E002-F109-008	2–4	2.4
606547	74-SB-E002-F109-009	2–4	2.67
606547	74-SB-E002-F109-010	2–4	6.3
606547	74-SB-E002-F109-011	2–4	2.7
606547	74-SB-E002-F109-012	2–4	1.84
606547	74-SB-E002-F109-013	2–4	4.11
606547	74-SB-E002-F109-014	2–4	1.70
606547	74-SB-E002-F109-015	2–4	3.1
606547	74-SB-E002-F109-016	2–4	1.15

[a]EPA November 1986.
[b]Analysis Request/Chain-of-Custody record.
CWL = Chemical Waste Landfill.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ID = Identification.
in. = Inch(es).
mg/kg = Milligram(s) per kilogram.
PCB = Polychlorinated biphenyl.
SOB = Site Operational Boundary.

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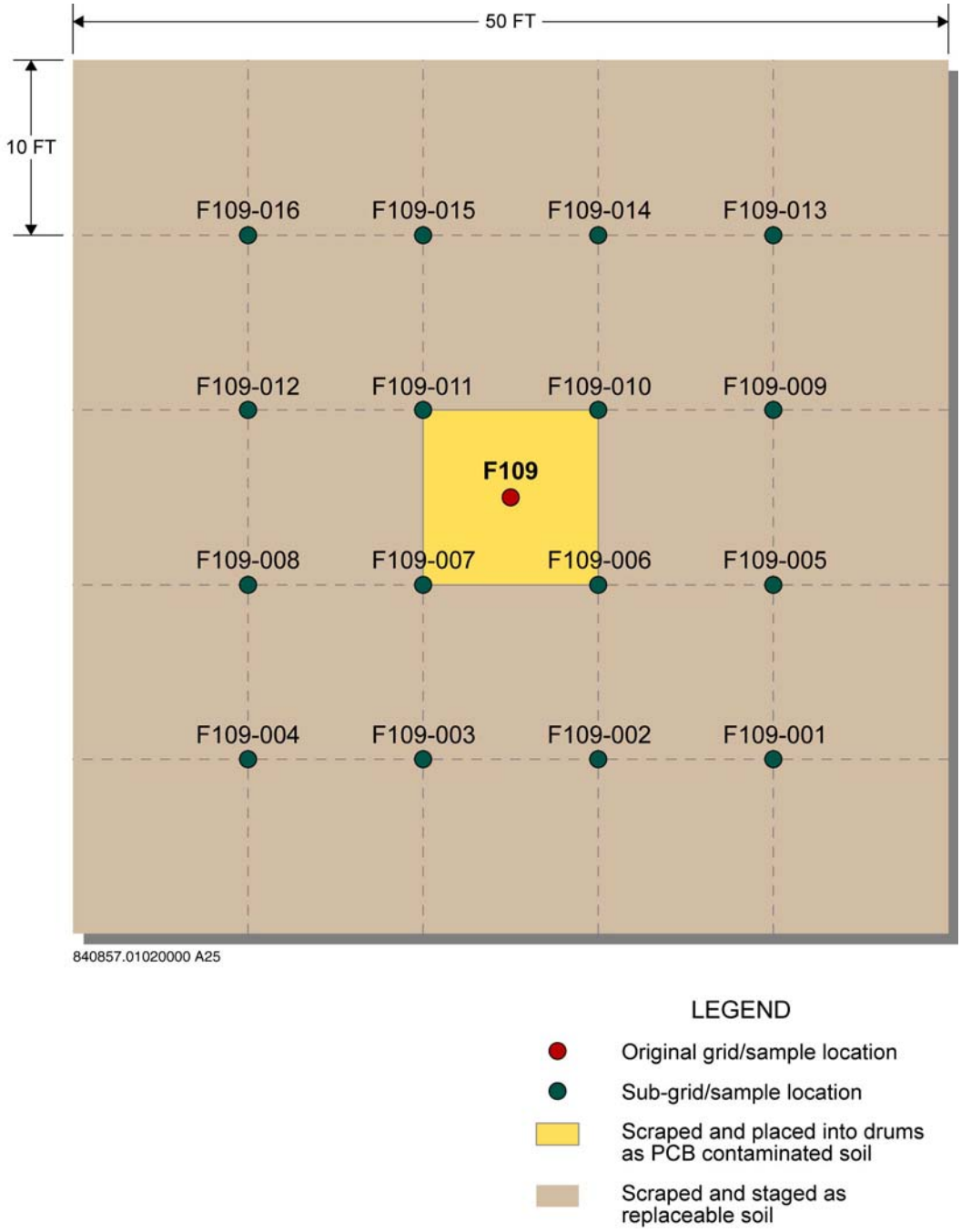

Figure 3.6.1-1
Sub-Grid for Grid Point 74-SB-E002-F109

Table 3.6.2-1
CWL SOB Sub-Grid Results for F125

Sample Attributes			PCBs EPA Method 8082[a] (mg/kg)
Record Number[b]	ER Sample ID	Sample Depth (in.)	Total PCB Concentration
606778	74-SB-E002-F125-001	2–4	1.6
606778	74-SB-E002-F125-002	2–4	3.1
606778	74-SB-E002-F125-003	2–4	5.1
606778	74-SB-E002-F125-004	2–4	16.0
606778	74-SB-E002-F125-005	2–4	5.4
606778	74-SB-E002-F125-006	2–4	8.0
606778	74-SB-E002-F125-007	2–4	**87.0**
606778	74-SB-E002-F125-008	2–4	9.7
606778	74-SB-E002-F125-009	2–4	4.5
606778	74-SB-E002-F125-010	2–4	**31.0**
606778	74-SB-E002-F125-011	2–4	3.7
606778	74-SB-E002-F125-012	2–4	18.0
606778	74-SB-E002-F125-013	2–4	4.1
606778	74-SB-E002-F125-014	2–4	3.7
606778	74-SB-E002-F125-015	2–4	3.7
606778	74-SB-E002-F125-016	2–4	7.5

Note: Values in **bold** exceed surface soil criterion.
[a]EPA November 1986.
[b]Analysis Request/Chain-of-Custody record.
CWL = Chemical Waste Landfill.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ID = Identification.
in. = Inch(es).
mg/kg = Milligram(s) per kilogram.
PCB = Polychlorinated biphenyl.
SOB = Site Operational Boundary.

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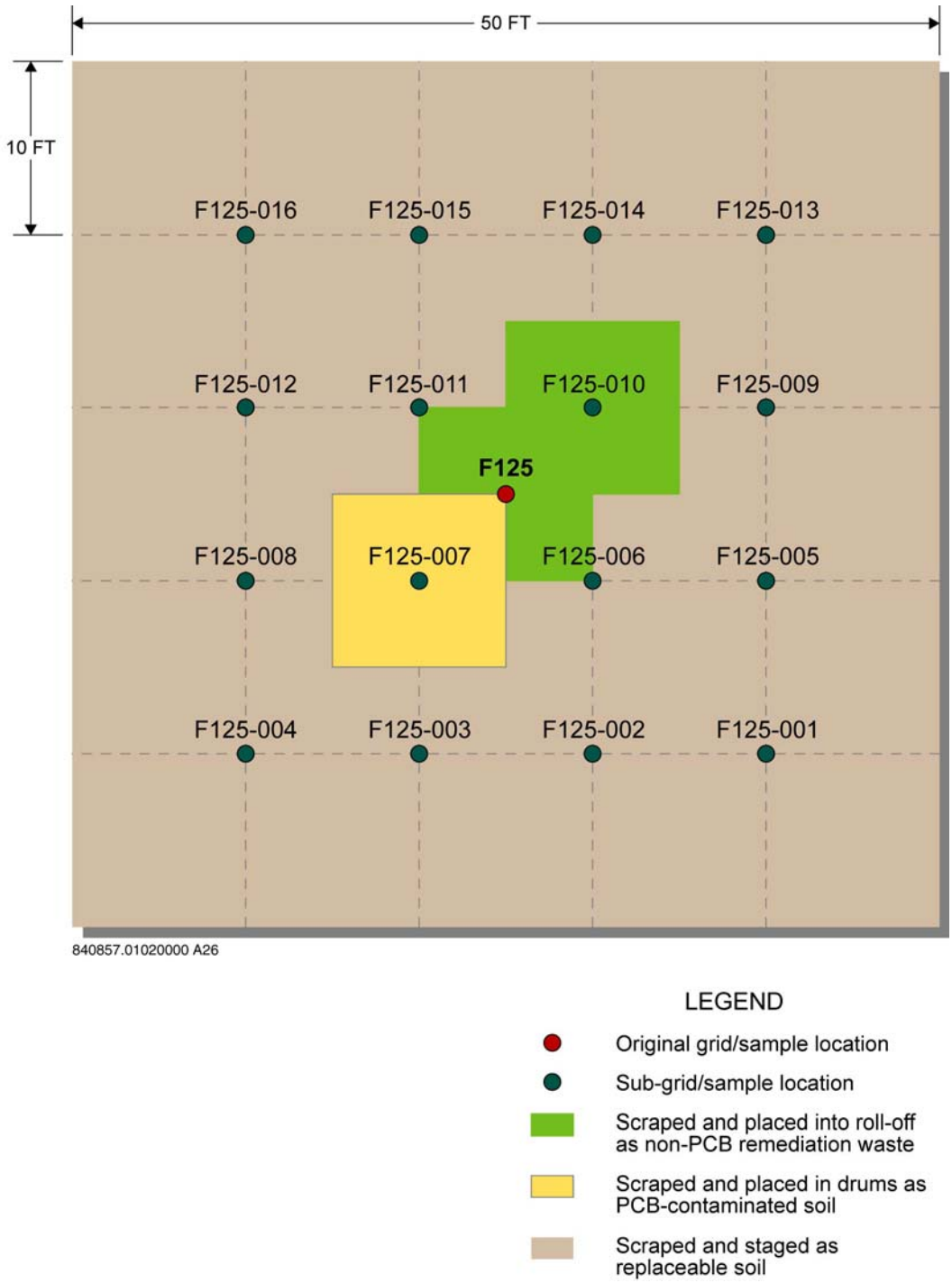

Figure 3.6.2-1
Sub-Grid for Grid Point 74-SB-E002-F125

3.6.3 F156 Sub-Grid

During the third round of sampling, grid location F156 had a total PCB result of 29.18 mg/kg. Results from the 16 sub-grid samples indicated no PCB contamination greater than 25 mg/kg. Therefore, the 10- by 10-foot area around the original grid location was excavated, using a track hoe, for off-site disposal as non-TSCA-regulated waste. During removal of the soil at F156, the field technicians noted stained soil and detected an odor. Based upon these observations, the 50- by 50-foot area around the grid location, including the 10- by 10-foot area around the original grid point, was scraped to a depth of 4 feet bgs. Approximately 16 cy of soil were removed for off-site disposal as non-TSCA-regulated waste. The remaining soil in the area with PCB concentrations below 25 mg/kg was scraped and stockpiled as replaceable soil. Table 3.6.3-1 summarizes the data obtained for the 16 sample points. Figure 3.6.3-1 presents a graphical representation of the sub-grid process for F156. After soil removal to a depth of 4 feet bgs, the original grid point location was sampled. The result met the surface criterion for total PCBs; therefore, no additional scraping/sample was performed at this location.

3.6.4 F159 Sub-Grid

During the second round of sampling, grid location F159 had a total PCB result of 29.5 mg/kg. Results from the 16 sub-grid samples indicated no PCB contamination greater than 25 mg/kg. Therefore, the 10- by 10-foot area around the original sample location was excavated, using a track hoe, for off-site disposal as non-TSCA-regulated waste. Approximately 6 cy of soil were removed for off-site disposal as non-TSCA-regulated waste. The remaining soil in the area with PCB concentrations below 25 mg/kg was scraped and stockpiled as replaceable soil. Table 3.6.4-1 summarizes the data obtained for the 16 sample points. Figure 3.6.4-1 presents a graphical representation of the sub-grid process for F159. After soil removal, the original grid point location was sampled. The result met the surface criterion for total PCBs; therefore, no additional scraping/sample was performed in this location.

Chapter 4.0 of this addendum summarizes the disposition of all soil removed from the SOB during cleanup activities. Chapter 5.0 summarizes the final verification sampling results for the SOB.

Table 3.6.3-1
CWL SOB Sub-Grid Results for F156

Sample Attributes			PCBs EPA Method 8082[a] (mg/kg)
Record Number[b]	ER Sample ID	Sample Depth (inches)	Total PCB Concentration
606902	74-SB-E002-F156-001	10–12	ND
606902	74-SB-E002-F156-002	10–12	ND
606902	74-SB-E002-F156-003	10–12	10.0
606902	74-SB-E002-F156-004	10–12	4.9
606902	74-SB-E002-F156-005	10–12	0.16
606902	74-SB-E002-F156-006	10–12	8.2
606902	74-SB-E002-F156-007	10–12	10.0
606902	74-SB-E002-F156-008	10–12	2.1
606902	74-SB-E002-F156-009	10–12	ND
606902	74-SB-E002-F156-010	10–12	1.8
606902	74-SB-E002-F156-011	10–12	11.0
606902	74-SB-E002-F156-012	10–12	7.4
606902	74-SB-E002-F156-013	10–12	0.75
606902	74-SB-E002-F156-014	10–12	2.70
606902	74-SB-E002-F156-015	10–12	0.160
606902	74-SB-E002-F156-016	10–12	0.300

[a]EPA November 1986.
[b]Analysis Request/Chain-of-Custody record.
CWL = Chemical Waste Landfill.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ID = Identification.
mg/kg = Milligram(s) per kilogram.
ND = Not detected.
PCB = Polychlorinated biphenyl.
SOB = Site Operational Boundary.

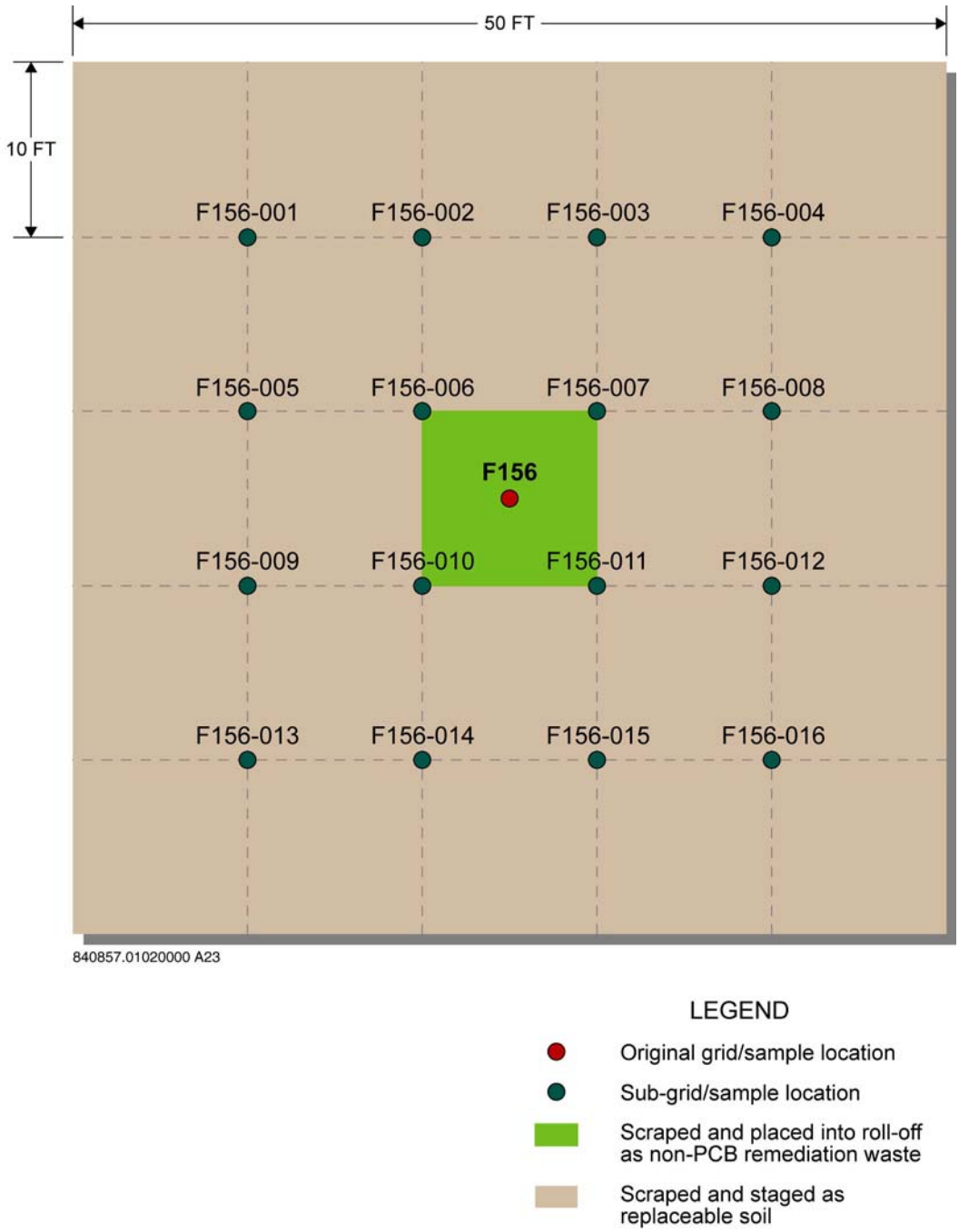

Figure 3.6.3-1
Sub-Grid for Grid Point 74-SB-E002-F156

Table 3.6.4-1
CWL SOB Sub-Grid Results for F159

Sample Attributes			PCBs EPA Method 8082[a] (mg/kg)
Record Number[b]	ER Sample ID	Sample Depth (inches)	Total PCB Concentration
606902	74-SB-E002-F159-001	10–12	0.2893
606902	74-SB-E002-F159-002	10–12	0.379
606902	74-SB-E002-F159-003	10–12	0.443
606902	74-SB-E002-F159-004	10–12	13.0
606902	74-SB-E002-F159-005	10–12	0.0309
606902	74-SB-E002-F159-006	10–12	1.150
606902	74-SB-E002-F159-007	10–12	1.173
606902	74-SB-E002-F159-008	10–12	9.34
606902	74-SB-E002-F159-009	10–12	0.0785
606902	74-SB-E002-F159-010	10–12	0.563
606902	74-SB-E002-F159-011	10–12	0.589
606902	74-SB-E002-F159-012	10–12	8.770
606902	74-SB-E002-F159-013	10–12	0.0271
606902	74-SB-E002-F159-014	10–12	2.524
606902	74-SB-E002-F159-015	10–12	1.117
606902	74-SB-E002-F159-016	10–12	4.220

[a]EPA November 1986.
[b]Analysis Request/Chain-of-Custody record.
CWL = Chemical Waste Landfill.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ID = Identification.
mg/kg = Milligram(s) per kilogram.
PCB = Polychlorinated biphenyl.
SOB = Site Operational Boundary.

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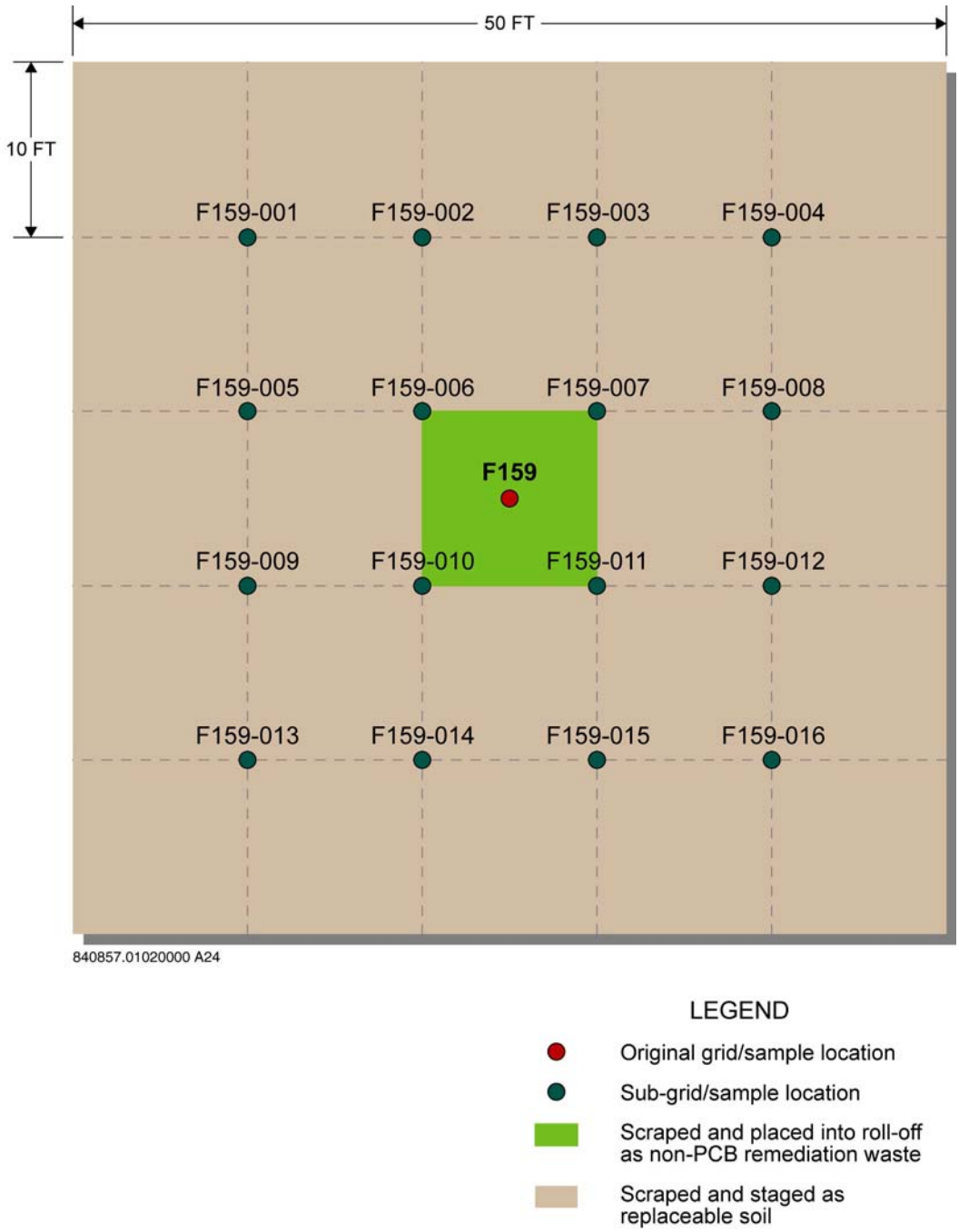

Figure 3.6.4-1
Sub-Grid for Grid Point 74-SB-E002-F159

4.0 FINAL DISPOSITION OF SOIL REMOVED FROM THE CWL SOB

Final disposition of all soil removed from the SOB was based upon the associated analytical results. This chapter provides a complete accounting of the disposition of excavated/scraped SOB soil.

4.1 Soil Removed During the Initial Scraping of the SOB

As indicated in Chapter 3.0, the initial scraping of the SOB generated approximately 5,066 cy of soil, of which approximately 1,266 cy came from scraping the North Annex. This soil was sampled in maximum 100-cy increments and sent to the CAMU for disposal. The CAMU accepted all 13 soil piles generated from the North Annex for disposal. The remaining 3,800 cy of soil, from the initial scraping of the East SOB, were stockpiled in four soil piles in maximum 1,000-cy increments and sampled for off-site laboratory analysis. Based upon the analytical results for samples obtained from this soil, all four piles met the NMED-approved RBA risk criteria for use as backfill material (i.e., replaceable soil) (SNL/NM August 2000). Therefore, this soil was placed into the excavation as backfill at a depth of greater than 5 feet bgs. Table 4.1-1 details the volumes and disposition of the soil removed from the SOB during the initial scraping effort. A final backfill report will be included in the CWL Final Closure Report that comprehensively documents the backfilling effort, including the placement of all replaceable SOB soil.

Table 4.1-1
CWL SOB Volume and Disposition of Soil Removed During Initial Scraping

Description	Estimated Volume (cy)	Disposition
13 Soil Piles from North Annex	1,266	CAMU for Disposal
74-CB-H006-N003	1,000	CWL Backfill
74-CB-H006-N004	1,000	CWL Backfill
74-CB-H006-N005	868	CWL Backfill
74-CB-H006-N006	932	CWL Backfill
Total	5,066	

CAMU = Corrective Action Management Unit.
CWL = Chemical Waste Landfill.
cy = Cubic yard(s).
SOB = Site Operational Boundary.

4.2 Summary of SOB Soil Volumes Used as Replaceable Soil

Approximately 5,520 cy of the estimated 5,555 cy of soil generated after the initial scraping/sampling effort were used as replaceable soil in the CWL excavation. Data used to confirm acceptance as replaceable soil were obtained from the individual grid point locations. A detailed risk evaluation of this data will be provided in the Final RCRA Closure Report for the CWL that will be submitted to the NMED after final approval of the CWL Corrective Measure Study Report (SNL/NM December 2004). Table 4.2-1 details the volumes of soil from the SOB that were used as backfill material.

Table 4.2-1
CWL SOB Soil Used as Backfill Material

Stockpile ID	Grid Location Origination	Estimated Volume (cy)
74-CB-H006-N007	F014, F023, F031, F074, F075, F076, F077, F078, F092, F093, F107, F109, F123, F124, F125, F126, F138, F140, F141, F142, F143, F155, F156, F172, F173, F187, F192, F203	500
74-CB-H006-N008	F078, F092, F093, F124, F140, F141, F142, F156, F158, F159	740
74-CB-H006-N009	F094, F107, F111, F123, F125	415
74-CB-H006-N010	Soil from decontamination pad disassembly	30
74-CB-H006-N011	F156	190
74-CB-H006-N012	F192	15
74-CB-H006-N013	F159	130
Individual Grid Locations East Fence Line	F193, F209, and F225	100
Individual Grid Locations Under Stockpiles	F090, F106, F122, F138, F154, F155, and F170	3,100
	Total	**5,520**

CWL = Chemical Waste Landfill.
cy = Cubic yard(s).
ID = Identification.
SOB = Site Operational Boundary.

4.3 Summary of SOB Soil Volumes Disposed of Off Site

Approximately 35 cy of the estimated 5,555 cy of soil generated after the initial scraping/ sampling effort were sent off site for disposal. Of the 35 cy disposed of off site, approximately 7 cy was TSCA-regulated for total PCBs. The remaining 28 cy of SOB soil that was disposed of off site was nonregulated soil. Table 4.3-1 details the volumes of soil from the SOB that were disposed of at approved off-site facilities.

Table 4.3-1
CWL SOB Soil Disposed of at Approved Off-Site Facilities

Disposal Path	Grid Location Origination	Estimated Volume (cy)
TSCA-Regulated Soil	F109 (Section 3.6.1)	2
	F125 (Section 3.6.2)	5
	Total	7
Nonregulated Soil	F125 (Section 3.6.2)	6
	F156 (Section 3.6.3)	16
	F159 (Section 3.6.4)	6
	Total	28
	Grand Total	**35**

CWL = Chemical Waste Landfill.
cy = Cubic yard(s).
SOB = Site Operational Boundary.
TSCA = Toxic Substances Control Act.

5.0 FINAL VERIFICATION SAMPLING RESULTS FOR THE CWL SOB

From January 2003 through February 2004, samples for off-site laboratory analysis were collected at the CWL SOB. The final verification 50-foot-grid sample locations are shown in Figure 1.3-1. This section summarizes the final results only. Tables B-1 through B-8 provided in Annex B present all final results that characterize the current conditions of the SOB, including final results obtained through resampling after additional scraping/excavation were completed. As discussed in Section 3.3, the maximum concentrations and threshold values determined in the LE VCM Final Report risk assessment were used as a screening tool to determine whether individual data points were acceptable. Table 5-1 presents the maximum concentrations from the SOB final verification sampling effort compared to the previously determined LE VCM final risk assessment maximum concentrations for the nonradiological constituents of concern (COCs).

Fourteen analytes were detected in the SOB at concentrations greater than LE VCM maximum concentrations. These analytes are anthracene, benzo(k)fluoranthene, beryllium, bromoform, chrysene, copper, 1,2-dichlorobenzene, dimethylphthalate, fluoranthene, hexachlorobenzene, lead, phenanthrene, tetrachloroethene, and trichloroethene. Six analytes detected in the SOB samples were not detected in the LE VCM final verification samples. These analytes are bromodichloromethane, chloroform, chloromethane, dibromochloromethane, diphenylamine, and 2,4,5-trichlorophenol. Additionally, 46 analytes detected in the LE VCM final verification samples were not detected in the SOB samples.

Gamma spectroscopy and Liquid Scintillation Count analyses were also performed on the SOB grid samples for all identified radiological COCs. Table 5-2 compares the maximum detections from the SOB final verification sampling effort to the LE VCM for radiological COCs. Only those COCs detected are reported in this addendum. However, standard radiological constituents typically detected at SNL/NM were evaluated in the risk assessment, whether detected or not.

The activity levels for all radiological COCs in the SOB sampling effort were below the maximum values in the LE VCM verification sampling. Cobalt-60 was detected in the LE VCM results; however, it was not detected in the SOB verification samples.

5.1 Metals

Table B-1 in Annex B presents the metals analytical results for the 123 verification soil samples and 4 duplicate samples collected from the SOB at the CWL. The background concentration limits used for comparison of the inorganic analytes detected in the soil from the SOB are NMED-approved surface background concentrations (Dinwiddie September 1997). The detections are summarized in Table 5.1-1. Only final results are used to provide this summary. The detection of metals above background concentrations in the SOB was sporadic; no one area contained the majority of the detections reported above background limits.

Table 5-1
Comparison of Maximum Detections
CWL LE VCM and SOB Final Verification Results
Nonradiological COCs

COC	LE VCM Maximum Concentration (mg/kg)	SOB Maximum Concentration (mg/kg)
Inorganic		
Arsenic	73.1	8.5
Barium	563 J	202
Beryllium	0.846	**1.14**
Cadmium	15.6	1.97
Chromium	1800	181
Chromium VI	24.6	6.03
Copper	545 J	**895**
Lead	192	**338**
Mercury	236	8.48
Nickel	26.1	17.6
Selenium	9.61	1.58
Silver	1.5	1.02
Organic		
Acenaphthene	0.406	0.153
Acenaphthylene	0.0101 J	ND
Acetone	0.617 UJ	0.106
Aniline	0.312 J	ND
Anthracene	0.209	**0.347**
Benzo(a)anthracene	0.531	0.15
Benzo(a)pyrene	0.0859	0.0522
Benzo(b)fluoranthene	0.343 J	0.279
Benzo(ghi)perylene	0.408 J	ND
Benzo(k)fluoranthene	0.121	**0.218**
Bromodichloromethane	*ND*	***0.00076***
Bromoform	0.00182	**0.006**
4-Bromophenyl phenyl ether	0.00843 J	ND
2-Butanone	0.5 U	0.0116
tert-Butylbenzene	0.00161 J	ND
Butylbenzyl phthalate	0.0728 J	0.0326 J
Carbazole	0.0572 J	0.0538
Carbon disulfide	0.00519 J	ND
Chloroform	*ND*	***0.00119***
Chloromethane	*ND*	***0.00064***
2-Chloronaphthalene	0.0125 J	ND
2-Chlorophenol	0.00622 J	ND
4-Chlorophenyl phenyl ether	0.00826 J	ND
Chrysene	0.228	**0.559**
Di-n-butyl phthalate	9.3	0.0508
Di-n-octyl phthalate	0.347	0.0341
Dibenzofuran	0.118 J	0.0766
Dibromochloromethane	*ND*	***0.00206***
Diphenylamine	*ND*	***0.0258 J***
1,2-Dibromoethane	0.00144	ND

Refer to footnotes at end of table.

Table 5-1 (Continued)
Comparison of Maximum Detections
CWL LE VCM and SOB Final Verification Results
Nonradiological COCs

COC	LE VCM Maximum Concentration (mg/kg)	SOB Maximum Concentration (mg/kg)
1,2-Dichlorobenzene	0.114 J	**0.214**
1,3-Dichlorobenzene	0.0123 J	ND
1,4-Dichlorobenzene	0.333 U	ND
2,4-Dichlorophenol	0.0128 J	ND
Diethylphthalate	0.333 U	0.0548
2,4-Dimethylphenol	0.0883 J	ND
Dimethylphthalate	0.0124 J	**0.329**
2,4-Dinitrophenol	0.699	ND
Ethyl benzene	0.00143	ND
bis(2-Ethylhexyl) phthalate	57.1	6.12
Fluoranthene	0.955	**2.03**
Fluorene	0.183	0.0947
Heptachlorodibenzofuran-p-dioxin	0.000063	ND
1,2,3,4,6,7,8-Heptachlorodibenzodioxin	0.000063	ND
Heptachlorodibenzofuran	0.000047	ND
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.000025	ND
Hexachlorobenzene	0.0167 J	**0.0203**
Hexachlorobutadiene	0.0147 J	ND
Hexachlorodibenzofuran-p-dioxin	0.00003	ND
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.00003	ND
Hexachlorodibenzofuran	0.00002	ND
1,2,3,6,7,8-Hexachlorodibenzofuran	0.00002	ND
Indeno(1,2,3-c,d)pyrene	0.267 J	ND
4-Isopropyltoluene	0.0401 J	ND
Methyl methacrylate	0.006	ND
Methylene chloride	0.864 UJ	0.0036
2-Methylnaphthalene	0.0683	0.0201
4-Methylphenol	0.0767 J	ND
Naphthalene	0.1 U	ND
Octachlorodibenzo[b,e][1,4]dioxin	0.000040 U	ND
Octachlorodibenzofuran	0.000135 U	ND
Pentachlorophenol	1.16	0.66
4-methyl-2-Pentanone	0.00328 J	ND
Phenanthrene	0.2	**0.916**
Phenol	0.578	ND
n-Propylbenzene	0.00181 J	ND
Pyrene	1.51 J	1.46
Styrene	0.00202	ND
2,3,7,8-TCDD	1.22E-5	ND
1,1,1,2-Tetrachloroethane	0.000946 J	ND
1,1,2,2-Tetrachloroethane	0.0445	ND
Tetrachloroethene	0.0108	**0.012**
Tetrahydrofuran	0.089	ND
Toluene	0.894	0.0194
o-Toluidine	0.151 J	ND

Refer to footnotes at end of table.

Table 5-1 (Concluded)
Comparison of Maximum Detections
CWL LE VCM and SOB Final Verification Results
Nonradiological COCs

COC	LE VCM Maximum Concentration (mg/kg)	SOB Maximum Concentration (mg/kg)
1,2,3-Trichlorobenzene	0.000776 J	ND
1,2,4-Trichlorobenzene	0.043 J	ND
Trichloroethene	0.00206 J	**0.0021**
2,4,5-Trichlorophenol	*ND*	***0.22***
1,2,3-Trichloropropane	0.0928	ND
1,3,5-Trimethylbenzene	0.0108	ND
Xylene	0.0174	0.00365
o-Xylene	0.00393	ND

Note: Values in *italics* indicate constituent not previously detected in LE VCM verification results or a new maximum value.
Values in **bold** indicate new maximum value in SOB data set. Constituent was detected at a lower concentration in LE VCM verification data set.

COC = Constituent of concern.
CWL = Chemical Waste Landfill.
J = Estimated concentration.
LE = Landfill Excavation.
mg/kg = Milligram(s) per kilogram.
ND = Not detected.
SOB = Site Operational Boundary.
TCDD = Tetrachlorodibenzo-p-dioxin.
U = Nondetected concentration.
VCM = Voluntary Corrective Measure.

Table 5-2
Comparison of Maximum Detections
CWL LE VCM and SOB Final Verification Results
Radiological COCs

COC	LE VCM Maximum Concentration (pCi/g)	SOB Maximum Concentration (pCi/g)
Cobalt-60	0.46	ND
Cesium-137	0.534	0.266
Tritium	9.9	ND
Thorium-232	2.3	1.09
Uranium-235	0.227	0.198
Uranium-238	3.26	2.67

COC = Constituent of concern.
CWL = Chemical Waste Landfill.
LE = Landfill Excavation.
ND = Not detected.
pCi/g = Picocurie(s) per gram.
SOB = Site Operational Boundary.
VCM = Voluntary Corrective Measure.

Table 5.1-1
Inorganic COC Detections in CWL SOB Soil Samples

Analyte	Total Number of Detections	Maximum Surface Background Concentration (mg/kg)	Number of Detections Greater than Background	Concentration(s) or Concentration Range Detected in SOB Soil (mg/kg)
Arsenic	127	5.6	11	2.62–8.5
Barium	127	130	42	68.5–202
Beryllium	127	0.65	6	0.324 J–1.14
Cadmium	114	<1	4	0.0493 J–1.97
Chromium	127	17.3	29	7.49–181
Copper	127	15.4	24	4.53–895
Hexavalent Chromium	70	1	7	0.0541 J–6.03
Lead	127	21.4	36	5.16–338
Mercury	127	<0.25	53	0.0159–8.48
Nickel	127	11.5	9	0.579–17.6
Selenium	75	<1	1	0.147 J–1.58
Silver	26	<1	1	0.0889 J–1.02

COC = Constituents of concern.
CWL = Chemical Waste Landfill.
J = Estimated concentration.
mg/kg = Milligram(s) per kilogram.
SOB = Site Operational Boundary.

5.2 VOCs

Because there are no background screening values for VOCs in soil, detectable VOCs in the samples collected from the SOB may be considered an indication of contamination. Table B-2 in Annex B summarizes the VOC analytical results for the 123 verification soil samples and 4 duplicate samples collected from the SOB.

Twelve VOCs were detected; the maximum detections for five of the VOCs (bromodichloromethane, bromoform, chloroform, chloromethane, and dibromochlormethane) were greater than the maximum values listed in the LE VCM Final Report (SNL/NM April 2003). Of the five, only bromoform was detected in the LE VCM verification samples. The detections are summarized in Table 5.2-1.

Slightly more than a third of the VOC detections were reported as estimated concentrations. Table B-3 in Annex B provides the method detection limit (MDLs) used by the off-site laboratory for analyzing VOCs.

5.3 SVOCs

Because there are no background screening values for SVOCs in soil, detectable SVOCs in the samples collected from the SOB may be considered an indication of contamination. Table B-4 in Annex B summarizes the SVOC analytical results for the 123 verification soil samples and 4 duplicate samples collected from the SOB.

Table 5.2-1
VOC Detections in CWL SOB Soil Samples

Analyte	Total Number of Detections	Number of Detections Reported as Estimated Values	Concentration(s) or Concentration Range Detected in SOB Soil (μg/kg)
Acetone	105	3	3.83 J–106
Bromodichloromethane	4	4	0.553 J–0.76 J
Bromoform	50	11	0.513 J–6
2-Butanone	51	17	3.77–11.6
Chloroform	20	17	0.545 J–1.19
Chloromethane	1	1	0.64 J
Dibromochloromethane	17	9	0.507 J–2.06
Methylene Chloride	54	54	1.35 J–3.57 J
Tetrachloroethene	6	2	2.1 J–12
Toluene	57	26	0.357 J–19.4
Trichloroethene	1	0	2.1
Xylene	6	3	0.804 J–3.65

CWL = Chemical Waste Landfill.
J = Estimated concentration.
μg/kg = Microgram(s) per kilogram.
SOB = Site Operational Boundary.
VOC = Volatile organic compound.

Twenty-four SVOCs were detected in samples collected from the SOB. The maximum detections for 10 of the SVOCs detected in the SOB sampling effort (anthracene, benzo(k)fluoranthene, chrysene, diphenylamine, 1,2-dichlorobenzene, dimethylphthalate, bis(2-ethylhexyl) phthalate, hexachlorobenzene, phenanthrene, and tetrachloroethene) were greater than the maximum values listed in the LE VCM Final Report (SNL/NM April 2003). Of the 10, only diphenylamine was not detected in the LE VCM verification samples. The detections are summarized in Table 5.3-1.

Slightly more than a third of the SVOC detections were reported as estimated concentrations. Table B-5 in Annex B provides the MDLs used by the off-site laboratory for analyzing SVOCs.

5.4 PCBs

Because there are no background screening values for PCBs in soil, detectable PCBs in the samples collected from the SOB may be considered an indication of contamination. Table B-6 in Annex B summarizes the total PCB analytical results for the 123 verification soil samples and 1 duplicate sample collected from the SOB. Five duplicate samples were collected for PCBs; however, four are associated with grid points that exceeded the surface criterion for total PCBs and are not evaluated in the risk assessment or presented in the data tables.

Table 5.3-1
SVOC Detections in CWL SOB Soil Samples

Analyte	Total Number of Detections	Number of Detections Reported as Estimated Values	Concentration(s) or Concentration Range Detected in SOB Soil (μg/kg)
Acenaphthene	8	5	8.01 J–153
Anthracene	9	3	21 J–347
Benzo(a)anthracene	6	2	24.2 J–150 J
Benzo(a)pyrene	2	0	42.4 and 52.2
Benzo(b)fluoranthene	3	0	93.2–279
Benzo(k)fluoranthene	3	1	39.3–218
Butyl Benzylphthalate	2	2	29.3 J and 32.6 J
Carbozole	2	2	26.6 J and 53.8 J
Chrysene	29	4	18.3 J–559
Di-n-butyl phthalate	12	12	24.4 J–50.8 J
Di-n-octyl phthalate	1	1	34.1 J
Dibenzofuran	2	2	65 J and 76.6 J
1,2-Dichlorobenzene	2	2	54.6 J and 214 J
Diethylphthalate	9	9	17.8 J–54.8 J
Dimethylphthalate	1	1	329 J
bis(2-Ethylhexyl) phthalate	100	74	30.15 J–6,120
Fluoranthene	47	19	6.87 J–2,030
Fluorene	15	13	4.25 J–94.7
Hexachlorobenzene	1	1	20.3 J
2-Methylnaphthalene	1	1	20.1 J
Pentachlorophenol	3	1	415–660 J
Phenanthrene	18	4	17.4 J–916
Pyrene	52	15	17.2 J–1,460
2,4,5-Trichlorophenol	4	4	25.4 J–220 J

CWL = Chemical Waste Landfill.
J = Estimated concentration.
μg/kg = Microgram(s) per kilogram.
SOB = Site Operational Boundary.
SVOC = Semivolatile organic compound.

Total PCBs were detected in the 119 samples collected from the SOB. All final PCB analytical results were less than 1 mg/kg, at concentrations ranging from 0.00165 to 0.906 mg/kg. Table B-7 in Annex B provides the MDLs used by the off-site laboratory for analyzing PCBs.

5.5 Radionuclides

Table B-8 in Annex B summarizes the off-site gamma spectroscopy and tritium analytical results for the 123 verification soil samples from the SOB. No duplicate samples were collected for gamma spectroscopy or Liquid Scintillation Count analysis. Five radiological constituents were detected in the soil from the SOB. The radiological detections and background activities are summarized in Table 5.5-1.

Table 5.5-1
Radiological COC Detections in CWL SOB Soil Samples

Analyte	Total Number of Detections	Maximum Surface Background Concentration (pCi/g)	Number of Detections Greater than Background	Concentration(s) or Concentration Range Detected in SOB Soil (pCi/g)
Cesium-137	91	0.664	0	0.014–0.242
Radium-228	118	1.01	0	0.598–1.01
Thorium-232	118	1.01	3	0.62–1.09
Uranium-235	15	0.16	5	0.0921–0.198
Uranium-238	97	1.4	24	0.599–2.14

COC = Constituents of concern.
CWL = Chemical Waste Landfill.
pCi/g = Picocurie(s) per gram.
SOB = Site Operational Boundary.

Although numerous detections above surface background activity were reported for thorium-232, uranium-235, and uranium-238, none of the detections were greater than two times background indicating low overall activities of these radionuclides.

5.6 Quality Assurance/Quality Control Samples and Data Validation Results

The laboratory data for the final verification soil samples were reviewed and verified/validated according to “Data Validation Procedure for Chemical and Radiochemical Data,” Administrative Operating Procedure 00-03, Rev. 01 (SNL/NM December 2003). No data quality issues were identified that adversely impact defensibility of the data. Annex C provides the data validation reports for the CWL SOB final verification results.

6.0 CONCEPTUAL SITE MODEL

The conceptual site model for the SOB at the CWL is based upon the operational history, physical setting, and COCs identified in the soil samples collected from the final verification sampling grid. Due to the location of the CWL SOB, the current and future land use has been designated as industrial. This section focuses on the nature and extent of contamination and the environmental fate of the COCs.

6.1 Nature and Extent of Contamination

Both the nature of contamination and the potential for the degradation of COCs were evaluated using laboratory analyses of final verification soil samples. COCs at the CWL SOB included RCRA metals, VOCs, SVOCs, PCBs, and radionuclides.

Contamination within the North Annex and East SOB resulted from its use as a waste management segregation and storage area during the CWL LE VCM. Additionally, Solid Waste Management Unit (SWMU) 78 is located in the north-central area of the East SOB (Figure 1.1-2). SWMU 78, the Gas Cylinder Disposal Pit (GCDP) was in operation from 1963 until 1984 and was used to dispose of reactive chemicals and metals, as well as flammable, oxidizing, toxic, and reactive gases in their original cylinders. A VCM was conducted during 1994 and 1995 to mitigate hazards and complete characterization of the site. Along with an initial site assessment, the VCM consisted of field activities to remove the GCDP contents, identification of the COCs, disposal of hazardous, radioactive, mixed and solid wastes, and backfilling of the excavation. Confirmatory soil samples were also collected from the bottom of the excavation and from the backfill material. A confirmatory geophysical survey was conducted in 2003, which covered the footprint of the pit (now filled to grade) and beyond, encompassing most of the ER site boundary. A final risk assessment was performed for SWMU 78 using all data representing end-state conditions of the SWMU and demonstrated that SWMU 78 met risk criteria for unrestricted industrial land use as reported in the proposal for No Further Action submitted in October 2004 (SNL/NM October 2004).

Although some residual COCs remain in the surface soil of the SOB, gross contamination has been removed. The collection of more than 123 final verification soil samples (including duplicate samples) across the 11.40-acre area was sufficient to characterize residual contamination present after completion of the cleanup activities.

RCRA metals plus beryllium were detected in all verification samples. Twelve VOCs and twenty-four SVOCs were detected in the verification samples. Total PCBs were detected in 119 of the verification samples; however, none of the detections exceeded the EPA surface criterion of 1 mg/kg. Thorium-232, uranium-235, and uranium-238 were detected above background activity in a variety of the verification samples.

6.2 Environmental Fate

The potential source of COCs at the CWL SOB is soil with residual levels of contamination from LE VCM waste management activities. Wind, water, and biota are natural mechanisms of transport for these COCs. The potential for wind and surface-water transport is limited.

Leaching of COCs into the groundwater at this site is highly unlikely due to low rainfall, high evapotranspiration rate, and depth to groundwater (approximately 485 feet bgs). Essentially, no uptake into the food chain is expected at this site due to the highly disturbed nature of the habitat. Figure 6.2-1 shows the conceptual site model flow diagram for the CWL SOB. For inorganic COCs, the potential for degradation is low. Decay of radiological COCs is insignificant due to their long half lives. Degradation and/or biotransformation of some organic COCs, however, may be more significant as a mechanism of loss.

6.3 Site Assessments

The site assessment at the CWL SOB included risk assessments for both human health and ecological risk. This section briefly summarizes the site assessment results, and Annex A discusses the risk assessment performed for the CWL SOB in more detail.

6.3.1 Summary

The site assessment concluded that the CWL SOB poses no significant risk to human health under the industrial land-use scenario. Ecological risks are predicted to be low.

6.3.2 Risk Assessments

Risk assessments were performed for both human health and ecological risk at the CWL SOB. This section summarizes the results.

6.3.2.1 Human Health

The CWL SOB contains identified COCs consisting of organic, inorganic, and radiological compounds. 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 inhalation for chemical COCs and soil ingestion, dust inhalation, and direct gamma exposure for radionuclides. The same exposure pathways are applied to the residential land-use scenario, which has been included for perspective only.

Using conservative assumptions and a reasonable maximum exposure (RME) approach to risk assessment, calculations for the nonradiological COCs show that for the industrial land-use scenario the hazard index (HI) (0.10) is significantly lower than the accepted numerical guidance from the EPA. The estimated excess cancer risk is 8E-6. Thus, excess cancer risk is also below the acceptable risk value provided by the NMED for an industrial land-use scenario (Bearzi January 2001). The incremental HI is 0.08, and the incremental excess cancer risk is 5.59E-6 for the industrial land-use scenario. These incremental risk calculations indicate insignificant risk to human health for the industrial land-use scenario.

Using conservative assumptions and an RME approach, calculations for the nonradiological COCs show that for the residential land-use scenario the HI (1.25) is above the accepted numerical guidance from the EPA. The estimated excess cancer risk is 3E-5. Thus, excess

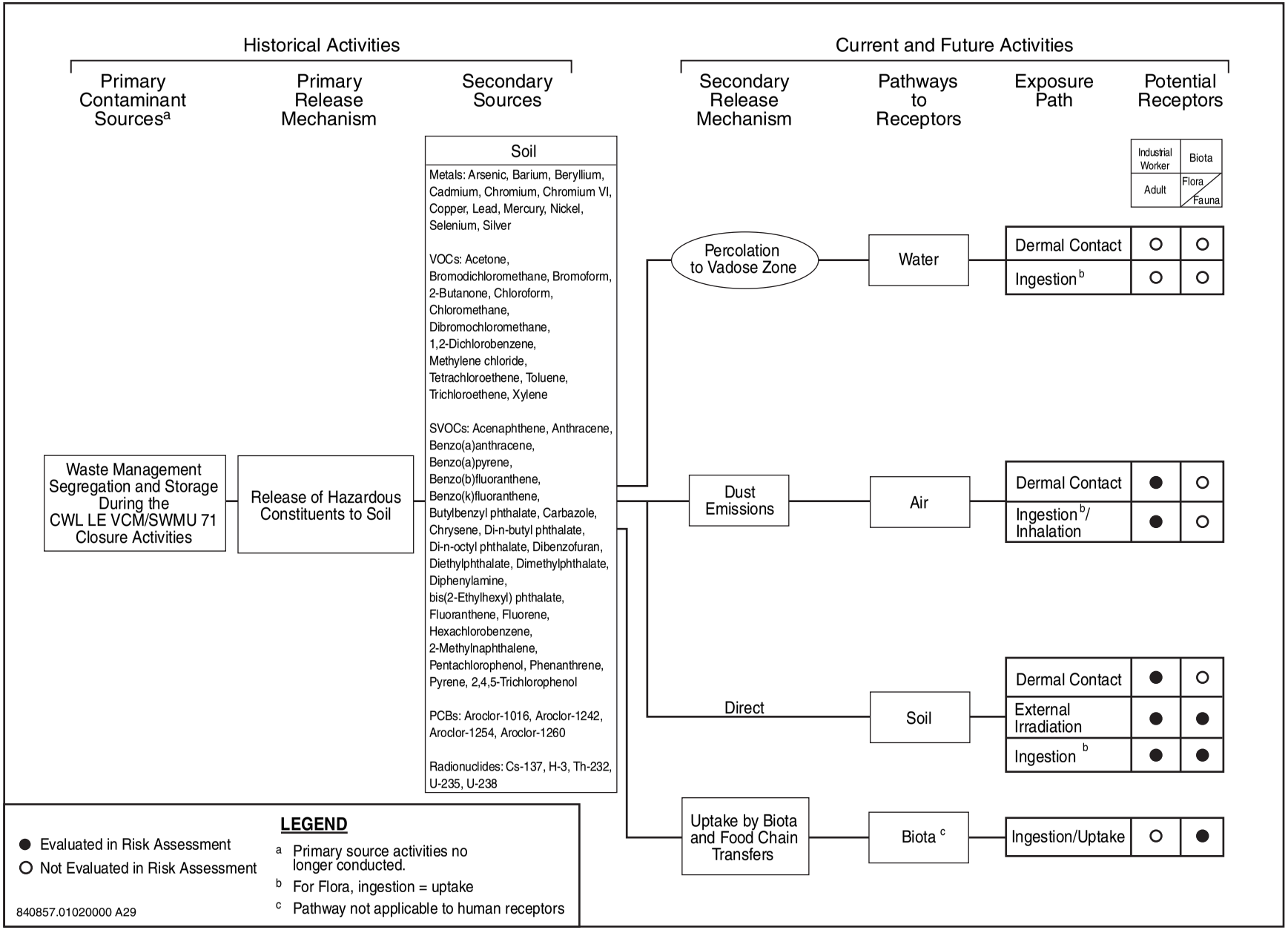

Figure 6.2-1

Conceptual Site Model Flow Diagram for the Chemical Waste Landfill Site Operational Boundary

cancer risk is above the acceptable risk value provided by the NMED for a residential land-use scenario (Bearzi January 2001). The incremental HI is 0.98 and the incremental excess cancer risk is 1.78E-5 for the residential land-use scenario. The incremental HI calculation indicates insignificant risk to human health for the residential land-use scenario.

Although both the HI and estimated excess cancer risk values are above the NMED guidelines for the residential land-use scenario, maximum concentrations were used in the risk calculation. Because the site has been adequately characterized, average concentrations are more representative of actual site conditions. Using the upper confidence limit (UCL) of the mean concentrations for the main contributors to excess cancer risk and hazards, which consist of arsenic (4.9 mg/kg), copper (89.3 mg/kg), and mercury (0.713 mg/kg), reduces the total HI and estimated excess cancer risk to 0.46 and 2E-5, respectively. The incremental HI and excess cancer risk are reduced to 0.18 and 8.52E-6, respectively. Thus, by using realistic concentrations in the risk calculations that more accurately depict actual site conditions, both the total and incremental HI risks are below NMED guidelines, and the estimated incremental excess cancer risk values are also below NMED guidelines.

The incremental total effective dose equivalent (TEDE) and corresponding estimated cancer risk from the radiological COCs are much lower than the EPA guidance values. The estimated TEDE is 2.9E-1 millirem (mrem)/year (yr) for the industrial land-use scenario, which is much lower than the EPA's numerical guidance of 15 mrem/yr (EPA 1997a). The corresponding estimated incremental cancer risk value is 3.5E-6 for the industrial land-use scenario. Furthermore, the incremental TEDE for the residential land-use scenario that results from a complete loss of institutional control is 0.74 mrem/yr with an associated risk of 1.1E-5. The guideline for this scenario is 75 mrem/yr (SNL/NM February 1998). Therefore, the CWL SOB is eligible for unrestricted radiological release.

The summation of the nonradiological and radiological carcinogenic risks is tabulated in Table 6.3.2-1.

Table 6.3.2-1
Summation of Incremental Nonradiological and Radiological Risks from
CWL SOB Carcinogens

Scenario	Nonradiological Risk	Radiological Risk	Total Risk
Industrial	5.59E-6	3.5E-6	9.1E-6
Residential	8.52E-6	1.1E-5	2.0E-5

CWL = Chemical Waste Landfill.
SOB = Site Operational Boundary.

Uncertainties associated with the calculations are considered small relative to the conservatism of this risk assessment analysis. Therefore, it is concluded that this site poses insignificant risk to human health under both the industrial and residential land-use scenarios.

6.3.2.2 Ecological

An ecological risk assessment that corresponds with the procedures in the EPA's Ecological Risk Assessment Guidance for Superfund (EPA 1997b) also was performed as set forth by the

NMED Risk-Based Decision Tree description in the “RPMP [RCRA Permits Management Program] Document Requirement Guide” (NMED March 1998). An early step in the evaluation compared COC concentrations and identified potentially bioaccumulative constituents (see Annex A, Sections IV, VII.2, and VII.3). This methodology also required developing a site conceptual model and a food web model, as well as selecting ecological receptors, as presented in “Predictive Ecological Risk Assessment Methodology, Environmental Restoration Program, Sandia National Laboratories/New Mexico” (IT July 1998). The risk assessment also includes the estimation of exposure and ecological risk.

Ecological risks associated with the CWL SOB are estimated through a screening assessment that incorporates site-specific information when available. Overall, risks to ecological receptors are expected to be low because predicted risks associated with exposure to constituents of potential ecological concern are based upon calculations using maximum detected values. The UCL concentrations of arsenic, barium, and total chromium are close to, or within, background ranges. The application of more realistic assumptions of mean concentrations (as estimated by the UCL of the mean) and limited site use by the burrowing owl result in all hazard quotients (HQs) of less than 5. It is likely, however, that these HQs overestimate actual risk because of the conservative assumptions incorporated into the assessment. Based upon this final analysis, ecological risks associated with the CWL SOB are expected to be low.

6.4 Baseline Risk Assessments

This section discusses the baseline risk assessments for human health and ecological risks.

6.4.1 Human Health

Because the results of the human health risk assessment summarized in Section 6.3.2.1 indicate that the CWL SOB poses insignificant risk to human health under the industrial and residential land-use scenarios, a baseline human health risk assessment is not required for this site.

6.4.2 Ecological

Because the results of the ecological risk assessment summarized in Section 6.3.2.2 indicate that ecological risks at the CWL SOB are expected to be low, a baseline ecological risk assessment is not required for this site.

7.0 CONCLUSIONS AND RECOMMENDATIONS

7.1 Conclusions

The results of the final verification soil sampling and final risk assessment presented in this CWL SOB Closure Addendum demonstrate that the SOB cleanup activities achieved the objective of returning the SOB to conditions acceptable for unrestricted future industrial use, and conditions equivalent to those prior to its use for waste staging/waste management as part of the CWL LE VCM. Furthermore, the risk assessment documents that the SOB meets the NMED-approved risk-based criteria (SNL/NM August 2000). Therefore, closure of the SOB is appropriate based upon current conditions.

7.2 Recommendations

NMED approval of the CWL SOB Addendum and final risk assessment is recommended. The final risk assessment is provided in Annex A and is summarized in Chapter 6.0. The final verification analytical results are provided in Annex B and are discussed in Chapter 5.0.

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8.0 REFERENCES

Bearzi, J.P. (New Mexico Environment Department), January 2001. Memorandum to RCRA-Regulated Facilities, "Risk-Based Screening Levels for RCRA Corrective Action Sites in New Mexico," Hazardous Waste Bureau, New Mexico Environment Department, Santa Fe, New Mexico. January 23, 2001.

Castillo, D.H. (Sandia National Laboratories/New Mexico), September 2003. Letter to S.G. Young (Sandia National Laboratories/New Mexico), "Abolishment of RMMA (ER-74)." September 8, 2003.

Cooke, G. (U.S. Environmental Protection Agency Region 6), June 2002. Letter to M.J. Zamorski (U.S. Department of Energy), "Approval of the TSCA Risk-Based Approach Request for the CWL." June 26, 2002.

Dinwiddie, R.S. (New Mexico Environment Department), September 1997. Letter to M.J. Zamorski (U.S. Department of Energy), "Request for Supplemental Information: Background Concentrations Report, SNL/KAFB." September 24, 1997.

EPA, see U.S. Environmental Protection Agency.

IT, see IT Corporation.

IT Corporation (IT), July 1998. "Predictive Ecological Risk Assessment Methodology, Environmental Restoration Program, Sandia National Laboratories, New Mexico," IT Corporation, Albuquerque, New Mexico.

Lewis, G.J. (New Mexico Environment Department), July 1999. Letter to M. Zamorski (U.S. Department of Energy) and J.B. Woodard (Sandia Corporation), "Temporary Authorization, Class 2 Closure Plan Modification, Chemical Waste Landfill." July 30, 1999.

Lewis, G.J. (New Mexico Environment Department), April 2000. Letter to M. Zamorski (U.S. Department of Energy) and R.J. Egan (Sandia Corporation), "Approval – Class 2 Closure Plan Modification, Chemical Waste Landfill, Sandia National Laboratories, NM5890110518 HWB-SNL-99-002." April 28, 2000.

Lewis, G.J. (New Mexico Environment Department), September 2000. Letter to M. Zamorski (U.S. Department of Energy) and R.J. Egan (Sandia Corporation), "Approval and Notice of Administrative Completeness: Class 1 Modification of Chemical Waste Landfill Closure Plan, Addendum B, Appendix S – Extension of Site Operational Boundary for Landfill Excavation Voluntary Corrective Measure, Sandia National Laboratories, EPA ID# 5890110518-1, HWB Task# HWB-SNL-00-009." September 29, 2000.

Lewis, G. (New Mexico Environment Department), October 2000. Letter to M.J. Zamorski (U.S. Department of Energy), "Approval of Risk-Based Approach for Excavation of the Chemical Waste Landfill." October 11, 2000.

Neleigh, D.W. (U.S. Environmental Protection Agency), October 2000. Letter to M. Zamorski (U.S. Department of Energy), approving the Class 1 modification to the CAMU boundary. October 13, 2000.

New Mexico Environment Department (NMED), March 1998. "RPMP Document Requirement Guide," RCRA Permits Management Program, Hazardous and Radioactive Materials Bureau, New Mexico Environment Department, Santa Fe, New Mexico.

NMED, see New Mexico Environment Department.

Sandia National Laboratories/New Mexico (SNL/NM), December 1992. "Chemical Waste Landfill Final Closure Plan and Postclosure Permit Application," Sandia National Laboratories, Albuquerque, New Mexico.

Sandia National Laboratories/New Mexico (SNL/NM), February 1998. "RESRAD Input Parameter Assumptions and Justification," Environmental Restoration Project, Sandia National Laboratories, Albuquerque, New Mexico.

Sandia National Laboratories/New Mexico (SNL/NM), November 1998. "Chemical Waste Landfill, Landfill Excavation Sampling and Analysis Plan," Sandia National Laboratories, Albuquerque, New Mexico, November 9, 1998.

Sandia National Laboratories/New Mexico (SNL/NM), March 1999. "Interim Change Notice (ICN) #1 for the Chemical Waste Landfill Excavation Sampling and Analysis Plan." Sandia National Laboratories, Albuquerque, New Mexico.

Sandia National Laboratories/New Mexico (SNL/NM), July 1999. "Class 2 Modification: Addendum B to Appendix S of the CWL Closure Plan," Sandia National Laboratories, Albuquerque, New Mexico.

Sandia National Laboratories/New Mexico (SNL/NM), August 2000. "Risk-Based Approach for Excavation and Backfilling the Chemical Waste Landfill," Sandia National Laboratories, Albuquerque, New Mexico.

Sandia National Laboratories/New Mexico (SNL/NM), December 2000. "Interim Change Notice (ICN) #2 for the Chemical Waste Landfill Excavation Sampling and Analysis Plan," Sandia National Laboratories, Albuquerque, New Mexico.

Sandia National Laboratories/New Mexico (SNL/NM), April 2003. "Chemical Waste Landfill, Landfill Excavation Voluntary Corrective Measure Final Report," Environmental Restoration Project, Sandia National Laboratories, Albuquerque, New Mexico.

Sandia National Laboratories/New Mexico (SNL/NM), December 2003. "Data Validation Procedure for Chemical and Radiochemical Data," Administrative Operating Procedure (AOP) 00-03, Rev. 01, Sandia National Laboratories, Albuquerque, New Mexico.

Sandia National Laboratories/New Mexico (SNL/NM) October 2004. "Supplemental and No Further Action Information for Various SWMUs," Environmental Restoration Project, Sandia National Laboratories, Albuquerque, New Mexico.

Sandia National Laboratories/New Mexico (SNL/NM), December 2004. "Chemical Waste Landfill Corrective Measure Study Report, December 2004, Final," Sandia National Laboratories, Albuquerque, New Mexico.

SNL/NM, see Sandia National Laboratories/New Mexico.

U.S. Environmental Protection Agency (EPA), November 1986. "Test Methods for Evaluating Solid Waste," 3rd ed., Update 3, SW-846, Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, Washington, D.C.

U.S. Environmental Protection Agency (EPA), 1997a. "Establishment of Cleanup Levels for CERCLA Sites with Radioactive Contamination," OSWER Directive No. 9200.4-18, Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, Washington, D.C.

U.S. Environmental Protection Agency (EPA), 1997b. "Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risks," Interim Final, U.S. Environmental Protection Agency, Washington, D.C.

Zamorski, M.J. (U.S. Department of Energy), September 2000. Letter to D. Neleigh (U.S. Environmental Protection Agency, Region 6), requesting approval of expansion of the Site Operational Boundary. September 14, 2000.

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ANNEX A
Chemical Waste Landfill Site Operational Boundary
Final Risk Assessment Report

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CHEMICAL WASTE LANDFILL SITE OPERATIONAL BOUNDARY: RISK ASSESSMENT REPORT

I. Site Description and History

The Chemical Waste Landfill (CWL) at Sandia National Laboratories/New Mexico (SNL/NM) was a 1.9-acre landfill located on Kirtland Air Force Base (KAFB), immediately southeast of Albuquerque, New Mexico. The CWL was used for disposal of chemical and solid waste between the years of 1962 and 1985, and as a storage facility for hazardous waste drums between 1981 and 1989. Liquid and solid waste disposal was discontinued in 1981 and 1985, respectively. Closure of the CWL was formally initiated in 1988.

Closure of the CWL has included a Vapor Extraction Voluntary Corrective Measure (VCM) and a Landfill Excavation (LE) VCM. Both VCMs comprised the expedited Corrective Action Program defined in the New Mexico Environment Department (NMED)-approved CWL Closure Plan (SNL/NM December 1992). During the LE VCM, one of the major impediments to operational efficiency was the limited space available for storage and segregation of excavated material. When Addendum B was added to Appendix S of the Closure Plan in a Class 2 Permit Amendment, clarification of the Site Operational Boundary (SOB) as a material storage and processing area was included (SNL/NM July 1999). This amendment also added a haul road from the CWL to the Corrective Action Management Unit (CAMU) for disposal. This modification was approved by the NMED in April 2000 (Lewis April 2000). A request to expand the SOB slightly to the east and to add the North Annex, adjacent to the CAMU, was submitted by the U.S. Department of Energy (DOE) and approved by the NMED in September 2000 (Lewis September 2000). At that time, the CAMU was regulated under the U.S. Environmental Protection Agency (EPA); therefore, addition of the North Annex to the CWL SOB required EPA approval, which was granted in October 2000 (Neleigh October 2000). As indicated in the LE VCM Final Report (SNL/NM April 2003), the use of the SOB was contingent upon returning the area to “prior-use conditions.” Prior to use, sampling of the area was not conducted; however, appropriate closure of the area is defined as demonstrating that the area is left in a condition that meets cleanup standards/criteria that were approved by the NMED for Resource Conservation and Recovery Act constituents (Lewis October 2000), and by EPA Region 6 for Toxic Substances Control Act constituents (Cooke June 2002). This report documents the risk assessment, which provides the basis for closure of the SOB.

Complete excavation of the CWL was performed from September 1998 through February 2002, with the exception of additional soil removal from one sampling location in the southwest area. Grid point location 74-SW-D014-F008 was removed in January 2003 due to a benezidine result. As of February 2004, the excavated landfill was backfilled up to 4 feet below ground surface (bgs). Backfill material consisted of confirmed clean soil from a designated borrow pit area adjacent to the CWL, soil excavated from the CWL that met risk criteria for use as backfill material (i.e., replaceable soil), and soil removed from the SOB during cleanup activities that met risk criteria for replaceable soil. Backfilling ceased at 4 feet bgs to allow for the at-grade construction of a vegetative soil cover as proposed in the CWL Corrective Measure Study Report (SNL/NM December 2004). Thus, the remaining 4 feet will be backfilled as part of the cover installation effort. The at-grade vegetative soil cover was approved by the NMED as an interim measure on September 22, 2004 (Keiling September 2004).

II. Data Quality Objectives

The Data Quality Objectives (DQOs) presented in the CWL Sampling and Analysis Plan (SAP) (SNL/NM November 1998) and subsequent Interim Change Notices (ICNs) #1 (SNL/NM March 1999), #2 (SNL/NM December 2000), #3 (SNL/NM July 2001), and #4 (SNL/NM December 2001) identified the site-specific sample locations, sample depths, sampling procedures, and analytical requirements to adequately characterize and verify the nature and extent of constituents of concern (COCs) in the SOB. The DQOs outline the quality assurance (QA)/quality control (QC) requirements necessary for producing defensible analytical data suitable for risk assessment purposes. The SOB sampling was designed to determine whether COCs remained in the SOB at levels exceeding risk-based criteria established for the site (SNL/NM August 2000). In addition, the sampling frequency and analytical protocol for characterizing backfill materials were also defined in the CWL SAP and subsequent ICNs. These project documents were submitted to and approved by the NMED.

A verification sampling grid on 50-foot centers was established for the SOB to provide the data to support this final risk assessment and closure of the SOB. Results were screened against the risk criteria to determine whether additional scraping was necessary. Additional scraping and sampling were performed at various grid locations, on an analyte-by-analyte basis, until all analytical results representing current conditions met the risk criteria for unrestricted industrial land use.

Table 1 summarizes the rationale for the sampling performed to meet DQOs. The analytical results for the 50-foot-square verification sampling grid are discussed in the CWL SOB Closure Addendum.

Table 1
Summary of CWL SOB Final Verification Sampling Performed to Meet Data Quality Objectives

CWL SOB Sampling	Potential COC Source	Number of Sampling Locations	Planned Sample Frequency	Actual Sample Density	Sampling Location Rationale
SOB Grid	Waste Management Segregation and Storage Activities	123 Grid Locations	1 Sample per 50-foot grid location	11 Samples per acre	East and North Annex of SOB—Characterize soil to remain on surface.

COC = Constituent of concern.
CWL = Chemical Waste Landfill.
SOB = Site Operational Boundary.

Use of the site for waste management segregation and storage activities during the LE VCM is the main source of potential COCs at the SOB. The cleanup effort for the SOB successfully removed all gross contamination related to waste management activities. Only residual COCs remain in the area. The project-specific, risk-based criteria were submitted to both the NMED and EPA in August 2000 and approved by the NMED in October 2000 (Lewis October 2000) and the EPA in June 2002 (Cooke June 2002). The NMED also approved the SAP and subsequent ICNs (SNL/NM March 1999, SNL/NM December 2000, SNL/NM July 2001,

SNL/NM December 2001) defining verification sampling and analytical requirements for the SOB.

QA/QC samples (duplicate samples, equipment blanks, trip blanks, etc.) were collected during the SOB final verification sampling effort according to the SAP and associated ICNs. A review of these data indicates that the field QA/QC procedures were adequate.

All of the final verification samples collected are summarized in Table 1, and the analyses performed are presented in Table 2. The analytical results were verified/validated by SNL/NM according to "Data Validation Procedure for Chemical and Radiochemical Data," Environmental Restoration (ER) Project AOP [Administrative Operating Procedure] 00-03, Rev. 01 (SNL/NM December 2003). The reviews confirmed that the analytical data are defensible and therefore acceptable for use in the CWL SOB Closure Addendum final risk assessment. Therefore, the DQOs have been fulfilled.

Table 2
Number of CWL SOB Final Verification Soil Samples

Sample Type	Metals (RCRA plus Be, Cr-6, Cu, and Ni)	VOCs	SVOCs	PCBs	Gamma Spectroscopy and H-3
SOB	127	127	127	124	123
Analytical Laboratory	GEL or STSL	GEL or STSL	GEL or STSL	GEL or STSL	GEL or STSL

Note: The number of samples includes duplicate samples, where applicable.
CWL = Chemical Waste Landfill.
GEL = General Engineering Laboratories, Inc.
PCB = Polychlorinated biphenyl.
RCRA = Resource Conservation and Recovery Act.
SOB = Site Operational Boundary.
STSL = Severn Trent Laboratories, St. Louis.
SVOC = Semivolatile organic compound.
VOC = Volatile organic compound.

III. Determination of Nature, Rate, and Extent of Contamination

III.1 Introduction

The determination of the nature, migration rate, and extent of contamination in the CWL SOB is based upon process knowledge of the use of the area. The area was used for waste management segregation and storage activities during the CWL LE VCM.

III.2 Nature of Contamination

The nature of contamination in the SOB was evaluated using laboratory analyses of the final verification soil samples. COCs included metals, volatile organic compounds, semivolatile organic compounds, polychlorinated biphenyls (PCBs), and radionuclides. The analytes listed in Table 2 are appropriate and adequate for characterizing the COCs within the SOB.

III.3 Rate of Contaminant Migration

The rate of contaminant migration in the SOB will be minimal. Currently, asphalt roads to the east and south of the SOB act as boundaries for run-on. No primary or secondary arroyos are present in the immediate vicinity of the SOB; therefore, runoff is unlikely to occur. Finally, depth to groundwater is approximately 485 feet bgs; therefore, migration to groundwater is unlikely to occur due to the low annual rainfall and the high evaporation rate.

III.4 Extent of Contamination

Contamination in the SOB resulted from its use as a waste management segregation and storage area during the CWL LE VCM. Although some residual COCs remain in the surface of the SOB, gross contamination has been removed. The collection of more than 123 final verification soil samples (not including duplicate samples) across the 11.40-acre area was sufficient to characterize residual contamination present after completion of the cleanup activities (i.e., current conditions).

IV. Comparison of COCs to Background Screening Levels

Site history and characterization activities are used to identify potential COCs. The SOB Closure Addendum to the CWL LE VCM Report describes the identification of COCs and the sampling that was conducted in order to determine the concentration levels of those COCs across the area. Generally, COCs evaluated in this risk assessment include all detected organic as well as inorganic and radiological COCs for which samples were analyzed. In order to provide conservatism in this risk assessment, the initial determination of risk uses only the maximum concentration value of each COC found for the entire site. The SNL/NM maximum surface background concentrations (Dinwiddie September 1997, Tharp February 1999) were selected to provide the background screening values listed in Tables 3 through 6.

Both radiological and nonradiological COCs are evaluated. Nonradiological inorganic constituents that are essential nutrients, such as iron, magnesium, calcium, potassium, and sodium, are not included in this risk assessment (EPA 1989). The nonradiological COCs evaluated include both inorganic and organic compounds.

Table 3 lists the nonradiological COCs and Table 5 lists the radiological COCs for the human health risk assessment performed for the CWL SOB. Tables 4 and 6 present the nonradiological and radiological COCs for the ecological risk assessment, respectively. All tables show the associated SNL/NM maximum surface background concentration values (Dinwiddie September 1997, Tharp February 1999). Sections VI.4, VII.2, and VII.3 discuss the results presented in Tables 3 through 6 in more detail.

V. Fate and Transport

The potential source of COCs at the CWL SOB is soil with residual levels of contamination from the CWL LE VCM waste management segregation and storage activities. Wind, water, and biota are natural mechanisms of transport for these COCs. The potential for wind and surface-

Table 3
Nonradiological COCs for Human Health Risk Assessment at the CWL SOB with Comparison to the Associated SNL/NM Background Screening Value, BCF, and Log K_{ow}

COC	Maximum Concentration (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						
Arsenic	8.5	5.6	**No**	44[c]	–	**Yes**
Barium	202	130	**No**	170[d]	–	**Yes**
Beryllium	1.14	0.65	**No**	19[c]	–	No
Cadmium	1.97	<1	**No**	64[c]	–	**Yes**
Chromium	181	17.3	**No**	16[c]	–	No
Chromium VI	6.03	1	**No**	16[c]	–	No
Copper	895	15.4	**No**	6[c]	–	No
Lead	338	21.4	**No**	49[c]	–	**Yes**
Mercury	8.48	<0.25	**No**	5,500[c]	–	**Yes**
Nickel	17.6	11.5	**No**	47[c]	–	**Yes**
Selenium	1.58	<1	**No**	800[e]	–	**Yes**
Silver	1.02	<1	**No**	0.5[c]	–	No
Organic						
Acenaphthene	0.153	NA	**NA**	389[f]	3.92[f]	**Yes**
Acetone	0.106	NA	**NA**	0.69[g]	-0.24[g]	No
Anthracene	0.347	NA	**NA**	917[c]	4.45[c]	**Yes**
Benzo(a)anthracene	0.15	NA	**NA**	10,000[f]	5.61[f]	**Yes**
Benzo(a)pyrene	0.0522	NA	**NA**	3,000[c]	6.04[c]	**Yes**
Benzo(b)fluoranthene	0.279	NA	**NA**	–	6.124[f]	**Yes**
Benzo(k)fluoranthene	0.218	NA	**NA**	93,325[f]	6.84[f]	**Yes**
Bromodichloromethane	0.00076	NA	**NA**	7[h]	1.41[h]	No
Bromoform	0.006	NA	**NA**	37.4[f]	2.38[f]	No
2-Butanone	0.0116	NA	**NA**	1[g]	0.29[g]	No
Butylbenzyl phthalate	0.0326 J	NA	**NA**	663[g]	4.77[f]	**Yes**
Carbazole	0.0538	NA	**NA**	–	–	**Insufficient Data**
Chloroform	0.00119	NA	**NA**	10.35[g]	1.92[f]	No
Chloromethane	0.00064	NA	**NA**	1.8[g]	0.91[i]	No

Refer to footnotes at end of table.

Table 3 (Continued)
Nonradiological COCs for Human Health Risk Assessment at the CWL SOB with Comparison to the Associated SNL/NM Background Screening Value, BCF, and Log K_{ow}

COC	Maximum Concentration (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)
Chrysene	0.559	NA	**NA**	18,000[f]	5.91[f]	**Yes**
Di-n-butyl phthalate	0.0508	NA	**NA**	6,761[i]	4.61[f]	**Yes**
Di-n-octyl phthalate	0.0341	NA	**NA**	9,334[f]	5.22[f]	**Yes**
Dibenzofuran	0.0766	NA	**NA**	2,800[f]	4.12[f]	**Yes**
Dibromochloromethane	0.00206	NA	**NA**	7[h]	1.41[h]	No
1,2-Dichlorobenzene	0.214	NA	**NA**	560[h]	3.38[i]	**Yes**
Diethylphthalate	0.0548	NA	**NA**	117[f]	2.47[f]	**Yes**
Dimethylphthalate	0.329	NA	**NA**	57[i]	2.12[f]	**Yes**
Diphenylamine	0.0258 J	NA	**NA**	–	–	**Insufficient Data**
bis(2-Ethylhexyl) phthalate	6.12	NA	**NA**	851[i]	7.6[f]	**Yes**
Fluoranthene	2.03	NA	**NA**	12,302[f]	4.90[f]	**Yes**
Fluorene	0.0947	NA	**NA**	2,239[f]	4.18[f]	**Yes**
Hexachlorobenzene	0.0203	NA	**NA**	31,622[i]	5.31[i]	**Yes**
Methylene chloride	0.0036	NA	**NA**	5[g]	1.25[g]	No
2-Methylnaphthalene	0.0201	NA	**NA**	2,800[f]	3.86[f]	**Yes**
Pentachlorophenol	0.66	NA	**NA**	776[j]	5.09[f]	**Yes**
Phenanthrene	0.916	NA	**NA**	23,800[c]	4.63[c]	**Yes**
Pyrene	1.46	NA	**NA**	36,300[c]	5.32[f]	**Yes**
Tetrachloroethene	0.012	NA	**NA**	49[g]	2.67[f]	**Yes**
Toluene	0.0194	NA	**NA**	10.7[c]	2.69[c]	No
Trichloroethene	0.0021	NA	**NA**	10.6[c]	2.29[c]	No
2,4,5-Trichlorophenol	0.22	NA	**NA**	–	–	**Insufficient Data**
Xylene	0.00365	NA	**NA**	23.4[g]	1.5[f]	No

Note: **Bold** indicates the COCs that exceed background screening values and/or are bioaccumulators.
[a]Dinwiddie September 1997.
[b]NMED March 1998.
[c]Yanicak March 1997.
[d]Neumann 1976.
[e]Callahan et al. 1979.

Table 3 (Concluded)
Nonradiological COCs for Human Health Risk Assessment at the CWL SOB with Comparison to the Associated SNL/NM Background Screening Value, BCF, and Log K_{ow}

[f]Micromedex, Inc. 1998.
[g]Howard 1990.
[h]Howard 1993.
[i]Howard 1989.
[j]Montgomery 1991.

BCF	= Bioconcentration factor.
COC	= Constituent of concern.
CWL	= Chemical Waste Landfill.
J	= Estimated concentration.
K_{ow}	= Octanol-water partition coefficient.
Log	= Logarithm (base 10).
mg/kg	= Milligram(s) per kilogram.
NA	= Not applicable.
NMED	= New Mexico Environment Department.
SNL/NM	= Sandia National Laboratories/New Mexico.
SOB	= Site Operational Boundary.
–	= Information not available.

Table 4
Nonradiological COCs for Ecological Risk Assessment at the CWL SOB with Comparison to the Associated SNL/NM Background Screening Value, BCF, and Log K_{ow}

COC	Maximum Concentration (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						
Arsenic	8.5	5.6	**No**	44[c]	–	**Yes**
Barium	202	130	**No**	170[d]	–	**Yes**
Beryllium	1.14	0.65	**No**	19[c]	–	No
Cadmium	1.97	<1	**No**	64[c]	–	**Yes**
Chromium	181	17.3	**No**	16[c]	–	No
Chromium VI	6.03	1	**No**	16[c]	–	No
Copper	895	15.4	**No**	6[c]	–	No
Lead	338	21.4	**No**	49[c]	–	**Yes**
Mercury	8.48	<0.25	**No**	5,500[c]	–	**Yes**
Nickel	17.6	11.5	**No**	47[c]	–	**Yes**
Selenium	1.58	<1	**No**	800[e]	–	**Yes**
Silver	1.02	<1	**No**	0.5[c]	–	No
Organic						
Acenaphthene	0.153	NA	**NA**	389[f]	3.92[f]	**Yes**
Acetone	0.106	NA	**NA**	0.69[g]	-0.24[g]	No
Anthracene	0.347	NA	**NA**	917[c]	4.45[c]	**Yes**
Benzo(a)anthracene	0.15	NA	**NA**	10,000[f]	5.61[f]	**Yes**
Benzo(a)pyrene	0.0522	NA	**NA**	3,000[c]	6.04[c]	**Yes**
Benzo(b)fluoranthene	0.279	NA	**NA**	–	6.124[f]	**Yes**
Benzo(k)fluoranthene	0.218	NA	**NA**	93,325[f]	6.84[f]	**Yes**
Bromodichloromethane	0.00076	NA	**NA**	7[h]	1.41[h]	No
Bromoform	0.006	NA	**NA**	37.4[f]	2.38[f]	No
2-Butanone	0.0116	NA	**NA**	1[g]	0.29[g]	No
Butylbenzyl phthalate	0.0326 J	NA	**NA**	663[g]	4.77[f]	**Yes**
Carbazole	0.0538	NA	**NA**	–	–	**Insufficient Data**
Chloroform	0.00119	NA	**NA**	10.35[g]	1.92[f]	No

Refer to footnotes at end of table.

Table 4 (Continued)
Nonradiological COCs for Ecological Risk Assessment at the CWL SOB with Comparison to the Associated SNL/NM Background Screening Value, BCF, and Log K_{ow}

COC	Maximum Concentration (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)
Chloromethane	0.00064	NA	**NA**	1.8[g]	0.91[i]	No
Chrysene	0.559	NA	**NA**	18,000[f]	5.91[f]	**Yes**
Di-n-butyl phthalate	0.0508	NA	**NA**	6,761[i]	4.61[f]	**Yes**
Di-n-octyl phthalate	0.0341	NA	**NA**	9,334[f]	5.22[f]	**Yes**
Dibenzofuran	0.0766	NA	**NA**	2,800[f]	4.12[f]	**Yes**
Dibromochloromethane	0.00206	NA	**NA**	7[h]	1.41[h]	No
1,2-Dichlorobenzene	0.214	NA	**NA**	560[i]	3.38[i]	**Yes**
Diethylphthalate	0.0548	NA	**NA**	117[f]	2.47[f]	**Yes**
Dimethylphthalate	0.329	NA	**NA**	57[i]	2.12[f]	**Yes**
Diphenylamine	0.0258 J	NA	**NA**	–	–	**Insufficient Data**
bis(2-Ethylhexyl) phthalate	6.12	NA	**NA**	851[i]	7.6[f]	**Yes**
Fluoranthene	2.03	NA	**NA**	12,302[f]	4.90[f]	**Yes**
Fluorene	0.0947	NA	**NA**	2,239[f]	4.18[f]	**Yes**
Hexachlorobenzene	0.0203	NA	**NA**	31,622[i]	5.31[i]	**Yes**
Methylene chloride	0.0036	NA	**NA**	5[g]	1.25[g]	No
2-Methylnaphthalene	0.0201	NA	**NA**	2,800[f]	3.86[f]	**Yes**
Pentachlorophenol	0.66	NA	**NA**	776[j]	5.09[f]	**Yes**
Phenanthrene	0.916	NA	**NA**	23,800[c]	4.63[c]	**Yes**
Pyrene	1.46	NA	**NA**	36,300[c]	5.32[f]	**Yes**
Tetrachloroethene	0.012	NA	**NA**	49[g]	2.67[f]	**Yes**
Toluene	0.0194	NA	**NA**	10.7[c]	2.69[c]	No
Trichloroethene	0.0021	NA	**NA**	10.6[c]	2.29[c]	No
2,4,5-Trichlorophenol	0.22	NA	**NA**	–	–	**Insufficient Data**
Xylene	0.00365	NA	**NA**	23.4[g]	1.5[f]	No

Note: **Bold** indicates the COCs that exceed background screening values and/or are bioaccumulators.

[a]Dinwiddie September 1997.

[b]NMED March 1998.

[c]Yanicak March 1997.

Table 4 (Concluded)
Nonradiological COCs for Ecological Risk Assessment at the CWL SOB with Comparison to the Associated SNL/NM Background Screening Value, BCF, and Log K_{ow}

[d]Neumann 1976.
[e]Callahan et al. 1979.
[f]Micromedex, Inc. 1998.
[g]Howard 1990.
[h]Howard 1993.
[i]Howard 1989.
[j]Montgomery 1991.

BCF = Bioconcentration factor.
COC = Constituent of concern.
CWL = Chemical Waste Landfill.
J = Estimated concentration.
K_{ow} = Octanol-water partition coefficient.
Log = Logarithm (base 10).
mg/kg = Milligram(s) per kilogram.
NA = Not applicable.
NMED = New Mexico Environment Department.
SNL/NM = Sandia National Laboratories/New Mexico.
SOB = Site Operational Boundary.
– = Information not available.

Table 5
Radiological COCs for Human Health Risk Assessment at the CWL SOB with Comparison to the Associated SNL/NM Background Screening Value and BCF

COC	Maximum Concentration (pCi/g)	SNL/NM Background Concentration (pCi/g unless otherwise noted)[a]	Is Maximum COC Concentration Less Than or Equal to the Applicable SNL/NM Background Screening Value?	BCF (maximum aquatic)	Is COC a Bioaccumulator?[b] (BCF >40)
Cs-137	0.266	0.079	**No**	3,000[c]	**Yes**
H-3	ND (230 pCi/L)	420 pCi/L[d]	Yes	No	No
Th-232	1.09	1.01	**No**	3,000[c]	**Yes**
U-235	0.4	0.16	**No**	900[c]	**Yes**
U-238	2.67	1.4	**No**	900[c]	**Yes**

Note: **Bold** indicates COCs that exceed background screening values and/or are bioaccumulators.
[a]Dinwiddie September 1997.
[b]NMED March 1998.
[c]Baker and Soldat 1992.
[d]Tharp February 1999, 420 pCi/L = 0.21 pCi/g assuming a soil density of 1 gram/cubic centimeter and 5 percent soil moisture.
BCF = Bioconcentration factor.
COC = Constituent of concern.
CWL = Chemical Waste Landfill.
MDA = Minimum detectable activity.
ND ( ) = Not detected above the MDA, shown in parentheses.
NMED = New Mexico Environment Department.
pCi/g = Picocurie(s) per gram.
pCi/L = Picocurie(s) per liter.
SNL/NM = Sandia National Laboratories/New Mexico.
SOB = Site Operational Boundary.

Table 6
Radiological COCs for Ecological Risk Assessment at the CWL SOB with Comparison to the Associated SNL/NM Background Screening Value and BCF

COC	Maximum Concentration (pCi/g)	SNL/NM Background Concentration (pCi/g)[a]	Is Maximum COC Concentration Less Than or Equal to the Applicable SNL/NM Background Screening Value?	BCF (maximum aquatic)	Is COC a Bioaccumulator?[b] (BCF >40)
Cs-137	0.266	0.079	**No**	3,000[c]	**Yes**
H-3	ND (230 pCi/L)	420 pCi/L[d]	Yes	No	No
Th-232	1.09	1.01	**No**	3,000[c]	**Yes**
U-235	0.4	0.16	**No**	900[c]	**Yes**
U-238	2.67	1.4	**No**	900[c]	**Yes**

Note: **Bold** indicates COCs that exceed background screening values and/or are bioaccumulators.
[a]Dinwiddie September 1997.
[b]NMED March 1998.
[c]Baker and Soldat 1992.
[d]Tharp February 1999, 420 pCi/L = 0.21 pCi/g assuming a soil density of 1 gram/cubic centimeter and 5 percent soil moisture.
BCF = Bioconcentration factor.
COC = Constituent of concern.
CWL = Chemical Waste Landfill.
MDA = Minimum detectable activity.
ND ( ) = Not detected above the MDA, shown in parentheses.
NMED = New Mexico Environment Department.
pCi/g = Picocurie(s) per gram.
pCi/L = Picocurie(s) per liter.
SNL/NM = Sandia National Laboratories/New Mexico.
SOB = Site Operational Boundary.

water transport is limited. Leaching of COCs into the groundwater at this site is highly unlikely due to low rainfall, high evapotranspiration rate, and depth to groundwater (approximately 485 feet bgs).

Water at the CWL SOB is received as precipitation (rain or occasionally snow). The annual precipitation for the area, as measured at Albuquerque International Sunport, is 8.1 inches (NOAA 1990). Precipitation either evaporates at or near the point of contact, infiltrates into the soil, or forms runoff.

Water that infiltrates into the soil will continue to percolate through the soil until field capacity is reached. COCs desorbed from the soil particles into the soil solution may be leached into the subsurface soil with this percolation. Because the estimates of evapotranspiration for the KAFB area range from 95 to 99 percent of the annual rainfall, virtually all of the moisture associated with infiltration is expected to evaporate. Groundwater at this site is approximately 485 feet bgs; therefore, the potential for COCs to reach groundwater through the unsaturated zone above the water table is very limited.

The COCs at the CWL SOB include both inorganic and organic analytes. The inorganic COCs are elemental in form and therefore are generally not considered to be degradable. Radiological COCs, however, undergo decay to stable isotopes or radioactive daughter elements. Other transformations of inorganic constituents may include changes in valence

(oxidation/reduction reactions) or incorporation into organic forms (e.g., the conversion of selenite or selenate from soil to seleno-amino acids in plants). The rate of such processes will be limited by the arid environment at this site. Degradation processes for organic COCs may include photolysis, hydrolysis, and biotransformation. Photolysis requires light and therefore takes place in the air, at the ground surface, or in surface water. Hydrolysis includes chemical transformations in water and may occur in the soil solution. Biotransformation (i.e., transformation caused by plants, animals, and microorganisms) may occur; however, biological activity may be limited by the arid environment at this site.

Table 7 summarizes the fate and transport processes that may occur at the CWL SOB. COCs at this site occur as residual contaminants in surface soil and include both inorganic constituents (metals and radionuclides) and organic constituents. Wind is a potential mechanism for transport of these COCs until vegetation is reestablished. Leaching of COCs into the groundwater at this site is highly unlikely due to low rainfall, high evapotranspiration rate, and depth to groundwater. For inorganic COCs, the potential for degradation is low. Decay of radiological COCs is insignificant due to the long half-lives (with the possible exception of H-3). Degradation and/or biotransformation of some organic COCs may be a more significant mechanism of loss.

Table 7
Summary of Fate and Transport at the CWL SOB

Transport and Fate Mechanism	Existence at Site	Significance
Wind	Yes	Low
Surface runoff	No	None
Migration to groundwater	No	None
Food chain uptake	No	None
Transformation/degradation	Yes	Moderate to low

CWL = Chemical Waste Landfill.
SOB = Site Operational Boundary.

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 COCs.
Step 3.	The potential intake of these COCs 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. For radiological COCs, the incremental total effective dose equivalent (TEDE) and estimated incremental cancer risk are calculated by subtracting applicable background concentrations directly from maximum on-site contaminant values. This background subtraction applies only when a radiological COC occurs as contamination and exists as a natural background radionuclide.
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 of this risk assessment provides the site description and history for the CWL SOB. 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

The CWL SOB 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 and direct gamma exposure for the radiological COCs. The inhalation pathway for both nonradiological and radiological COCs is included because the potential exists to inhale dust. Soil ingestion is included for the radiological COCs as well. 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 the CWL SOB is approximately 485 feet bgs. No intake routes through plant, meat, or milk ingestion are considered appropriate for either the industrial or residential land-use scenarios. Figure 1 shows the conceptual site model flow diagram for the CWL SOB.

Pathway Identification

Nonradiological Constituents	Radiological Constituents
Soil ingestion	Soil ingestion
Inhalation (dust)	Inhalation (dust)
Dermal contact	Direct gamma

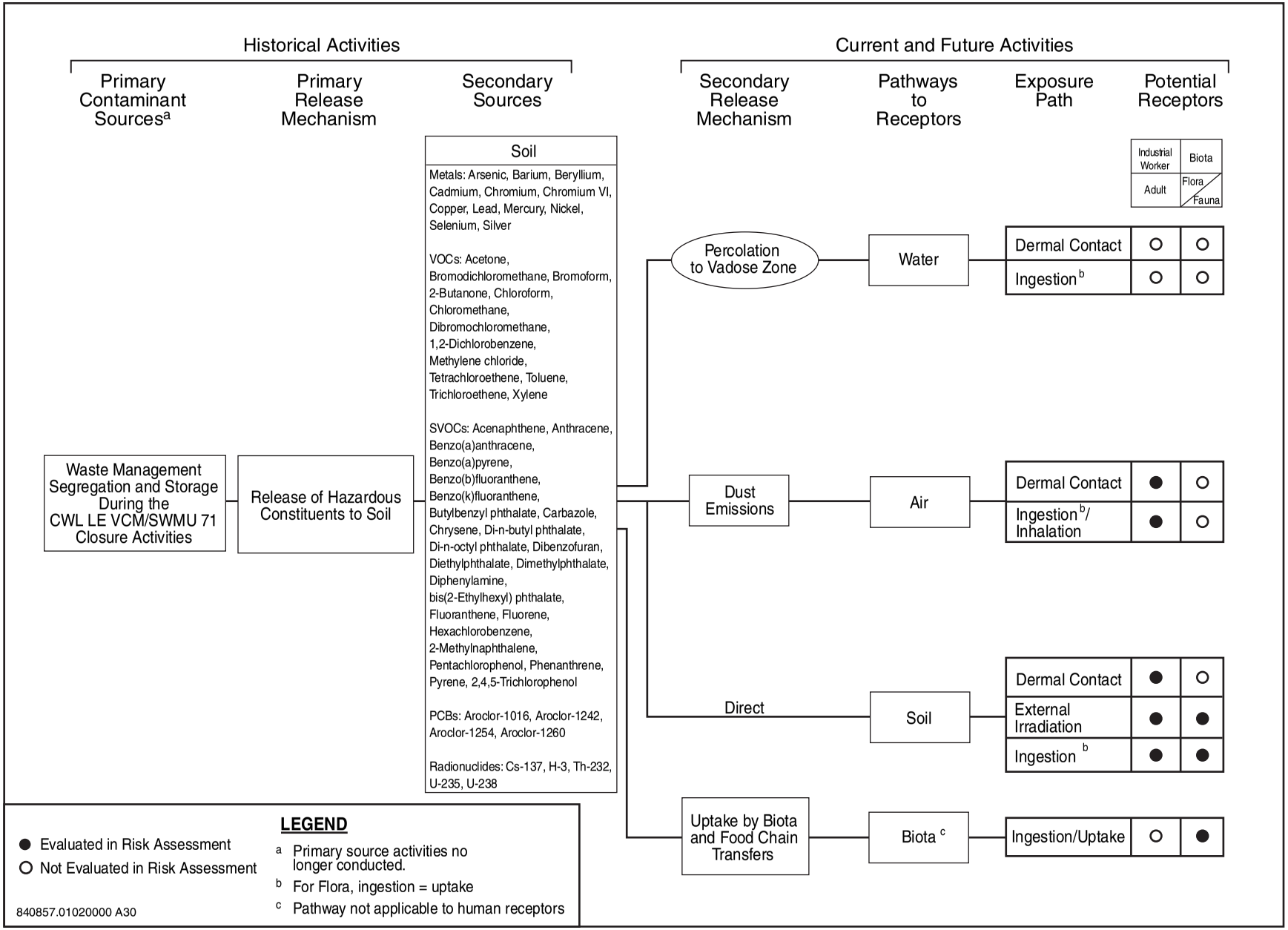

Figure 1

Conceptual Site Model Flow Diagram for the Chemical Waste Landfill Site Operational Boundary

VI.4 Step 3. COC Screening Procedures

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

Maximum concentrations of nonradiological COCs were compared to the approved SNL/NM maximum screening levels for this area. The SNL/NM maximum background concentration was selected to provide the background screen in Table 3 and used to calculate risk attributable to background in Section VI.6.2. Only the COCs that were detected above the corresponding SNL/NM maximum background screening levels or did not have either a quantifiable or calculated background screening level were considered in further risk assessment analyses.

For the radiological COCs that exceed the SNL/NM background screening levels, background values were subtracted from the individual maximum radionuclide concentrations. Those that do not exceed these background levels are not carried any further in the risk assessment. This approach is consistent with DOE Order 5400.5, “Radiation Protection of the Public and the Environment” (DOE 1993). Radiological COCs that do not have background screening values and were detected above the analytical minimum detectable activity are carried through the risk assessment at the maximum levels. The resultant radiological COCs remaining after this step are referred to as background-adjusted radiological COCs.

VI.4.2 Results

Tables 3 and 5 present the maximum COC concentrations that were compared to the SNL/NM maximum background values (Dinwiddie September 1997, Tharp February 1999) for the CWL SOB human health risk assessment. For the nonradiological COCs, 12 constituents were measured at concentrations greater than background screening values. Thirty-seven constituents are organic compounds that do not have background screening values.

The maximum concentration value for lead is 338 milligrams (mg)/kilogram (kg). The EPA intentionally does not provide any human health toxicological data on lead; therefore, no risk parameter values could be calculated. However, NMED guidance for lead screening concentrations for construction and industrial land-use scenarios are 750 and 1,500 mg/kg, respectively (Olson and Moats March 2000). The EPA screening guidance value for a residential land-use scenario is 400 mg/kg (Laws July 1994). The maximum concentration value for lead in the SOB is less than all the screening values; therefore, lead is eliminated from further consideration in the human health risk assessment.

The maximum concentration value for total PCBs is 0.906 mg/kg. This concentration is less than the EPA screening level of 1 mg/kg (Title 40, Code of Federal Regulations, Part 761). Because the maximum concentration for PCBs at this site is less than the screening value, PCBs are eliminated from further consideration in the human health risk assessment.

For the radiological COCs, four constituents (Cs-137, Th-232, U-235, and U-238) exhibited activity levels greater than the background screening values.

VI.5 Step 4. Identification of Toxicological Parameters

Tables 8 and 9 list the COCs retained in the risk assessment and provide the values for the available toxicological information. The toxicological values for the nonradiological COCs presented in Table 8 were obtained from the Integrated Risk Information System (IRIS) (EPA 2004a), the Health Effects Assessment Summary Tables (HEAST) (EPA 1997a), and the EPA Regions 9 and 3 (EPA 2002a, EPA 2002b) electronic databases. Dose conversion factors (DCFs) used in determining the excess TEDE values for radiological COCs for the individual pathways are the default values provided in the RESRAD computer code (Yu et al. 1993a) as developed in the following documents:

- DCFs for ingestion and inhalation were taken from "Federal Guidance Report No. 11, Limiting Values of Radionuclide Intake and Air Concentration and Dose Conversion Factors for Inhalation, Submersion, and Ingestion" (EPA 1988).

- DCFs for surface contamination of the site were taken from DOE/EH-0070, "External Dose-Rate Conversion Factors for Calculation of Dose to the Public" (DOE 1988).

- DCFs for volume contamination (exposure to contamination deeper than the immediate surface of the site) were calculated using the methods discussed in "Dose-Rate Conversion Factors for External Exposure to Photon Emitters in Soil" (Kocher 1983) and in ANL/EAIS-8, "Data Collection Handbook to Support Modeling the Impacts of Radioactive Material in Soil" (Yu et al. 1993b).

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 COCs and associated background for the industrial and residential land-use scenarios. The incremental TEDE and estimated incremental cancer risk are provided for the background-adjusted radiological COCs for both industrial and residential land-use scenarios.

VI.6.1 Exposure Assessment

Appendix 1 provides the equations and parameter input values used to calculate intake values and subsequent HI and excess cancer risk values for the individual exposure pathways. The appendix shows parameters for both 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). For radiological COCs, the coded equations provided in RESRAD computer code are used to estimate the incremental TEDE and cancer risk for individual exposure pathways. Further discussion of this process is provided in the "Manual for Implementing Residual Radioactive

Table 8
Toxicological Parameter Values for the CWL SOB Nonradiological COCs

COC	RfD_o (mg/kg-d)	Confidence[a]	RfD_{inh} (mg/kg-d)	Confidence[a]	SF_o $(mg/kg\text{-}d)^{-1}$	SF_{inh} $(mg/kg\text{-}d)^{-1}$	Cancer Class[b]
Inorganic							
Arsenic	3.0E-4[c]	M	–	–	1.5E+0[c]	1.5E+1[c]	A
Barium	7.0E-2[c]	M	1.4E-4[d]	–	–	–	–
Beryllium	2.0E-3[c]	L to M	5.7E-6[c]	M	–	8.4E+0[c]	B1
Cadmium	5.0E-4[c]	H	5.7E-5[d]	–	–	6.3E+0[c]	B1
Chromium	1.0E+0[c]	L	5.7E-7[e]	–	–	–	–
Chromium VI	5.0E-3[c]	L	–	–	–	4.2E+1[c]	A
Copper	3.7E-2[d]	–	–	–	–	–	D
Mercury	3.0E-4[f]	–	8.6E-5[c]	M	–	–	D
Nickel	2.0E-2[c]	M	–	–	–	–	–
Selenium	5.0E-3[c]	H	–	–	–	–	D
Silver	5.0E-3[c]	L	–	–	–	–	D
Organic							
Acenaphthene	6.0E-2[c]	L	6.0E-2[d]	–	–	–	–
Acetone	1.0E-1[c]	L	1.0E-1[d]	–	–	–	D
Anthracene	3.0E-1[c]	L	3.0E-1[d]	–	–	–	D
Benzo(a)anthracene	–	–	–	–	7.3E-1[d]	7.3E-1[d]	–
Benzo(a)pyrene	–	–	–	–	7.3E+0[c]	7.3E+0[d]	B2
Benzo(b)fluoranthene	–	–	–	–	7.3E-1[d]	7.3E-1[d]	B2
Benzo(k)fluoranthene	–	–	–	–	7.3E-2[d]	7.3E-2[d]	B2
Bromodichloromethane	2.0E-2[c]	M	2.0E-2[d]	–	6.2E-2[c]	6.2E-2[d]	B2
Bromoform	2.0E-2[c]	M	2.0E-2[d]	–	7.9E-3[d]	3.9E-3[d]	B2
Butylbenzyl phthalate	2.0E-1[c]	L	2.0E-1[d]	–	–	–	C
Carbazole	–	–	–	–	2.0E-2[f]	2.0E-2[d]	B2
Chloroform	1.0E-2[c]	M	1.0E-2[d]	–	6.1E-3[d]	8.1E-2[c]	B2
Chloromethane	2.6E-2[c]	M	–	–	1.3E-2[f]	6.3E-3[f]	C
Chrysene	–	–	–	–	7.3E-3[d]	7.3E-3[d]	B2
Di-n-butyl phthalate	1.0E-1[c]	L	1.0E-1[d]	–	–	–	D
Di-n-octyl phthalate	2.0E-2[f]	–	2.0E-2[f]	–	–	–	–
Dibenzofuran	4.0E-3[d]	–	4.0E-3[d]	–	–	–	D
Dibromochloromethane	2.0E-2[c]	M	2.0E-2[d]	–	8.4E-2[c]	8.4E-2[d]	C
1,2-Dichlorobenzene	9.0E-2[c]	L	5.7E-2[d]	–	–	–	D
Diethylphthalate	8.0E-1[c]	L	8.0E-1[d]	–	–	–	D
Dimethylphthalate	1.0E+1[d]	–	1.0E+1[d]	–	–	–	D
Diphenylamine	2.5E-2[c]	M	2.5E-2[d]	–	–	–	–
bis(2-Ethylhexyl) phthalate	2.0E-2[d]	–	2.2E-2[d]	–	1.4E-2[d]	1.4E-2[d]	–
Fluoranthene	4.0E-2[c]	L	4.0E-2[d]	–	–	–	D
Fluorene	4.0E-2[c]	L	4.0E-2[d]	–	–	–	D
Hexachlorobenzene	8.0E-4[c]	M	8.0E-4[d]	–	1.6E+0[c]	1.6E+0[c]	B2
Methylene chloride	6.0E-2[c]	M	8.6E-1[f]	–	7.5E-3[c]	1.7E-3[c]	B2
2-Methylnaphthalene	4.0E-2[e]	–	–	–	–	–	–
Pentachlorophenol	3.0E-2[c]	M	3.0E-2[d]	–	1.2E-1[c]	1.2E-1[d]	B2
Phenanthrene[g]	3.0E-1[c]	L	3.0E-1[d]	–	–	–	D
Pyrene	3.0E-2[c]	L	3.0E-2[d]	–	–	–	D
Tetrachloroethene	1.0E-2[c]	M	1.0E-2[d]	–	5.2E-2[d]	2.0E-3[d]	–
Toluene	2.0E-1[c]	M	1.1E-1[c]	M	–	–	D

Refer to footnotes at end of table.

Table 8 (Concluded)
Toxicological Parameter Values for the CWL SOB Nonradiological COCs

COC	RfD_o (mg/kg-d)	Confidence[a]	RfD_{inh} (mg/kg-d)	Confidence[a]	SF_o $(mg/kg\text{-}d)^{-1}$	SF_{inh} $(mg/kg\text{-}d)^{-1}$	Cancer Class[b]
Trichloroethene	6.0E-3[d]	–	6.0E-3[d]	–	1.1E-2[d]	6.0E-3[d]	–
2,4,5-Trichlorophenol	1.0E-1[c]	L	1.0E-1[d]	–	–	–	–
Xylene	2.0E+0[c]	M	2.0E-1[d]	–	–	–	D

[a]Confidence associated with IRIS (EPA 2004a) database values. Confidence: L = low, M = medium, H = high.
[b]EPA weight-of-evidence classification system for carcinogenicity (EPA 1989) obtained from IRIS (EPA 2004a):

- A = Human carcinogen.
- B1 = Probable human carcinogen. Limited human data available.
- B2 = Probable human carcinogen. Sufficient evidence in animals and inadequate or no evidence in humans.
- C = Possible human carcinogen.
- D = Not classifiable as to human carcinogenicity.

[c]Toxicological parameter values from IRIS electronic database (EPA 2004a).
[d]Toxicological parameter values from EPA Region 9 electronic database (EPA 2002a).
[e]Toxicological parameter values from EPA Region 3 electronic database (EPA 2002b).
[f]Toxicological parameter values from HEAST database (EPA 1997a).
[g]Phenanthrene does not have toxicological parameter values. Anthracene was used as a surrogate.

COC = Constituent of concern.
CWL = Chemical Waste Landfill.
EPA = U.S. Environmental Protection Agency.
HEAST = Health Effects Assessment Summary Tables.
IRIS = Integrated Risk Information System.
mg/kg-d = Milligram(s) per kilogram-day.
$(mg/kg\text{-}d)^{-1}$ = Per milligram per kilogram-day.
RfD_{inh} = Inhalation chronic reference dose.
RfD_o = Oral chronic reference dose.
SF_{inh} = Inhalation slope factor.
SF_o = Oral slope factor.
SOB = Site Operational Boundary.
– = Information not available.

Table 9
Radiological Toxicological Parameter Values for the CWL SOB COCs Obtained from RESRAD Risk Coefficients[a]

COC	SF_o (1/pCi)	SF_{inh} (1/pCi)	SF_{ev} (g/pCi-yr)	Cancer Class[b]
Cs-137	3.2E-11	1.9E-11	2.1E-6	A
H-3	7.2E-14	9.6E-14	0.0E+0	A
Th-232	3.3E-11	1.9E-8	2.0E-11	A
U-235	4.7E-11	1.3E-8	2.7E-7	A
U-238	6.2E-11	1.2E-8	6.6E-8	A

[a]Yu et al. 1993a.
[b]EPA weight-of-evidence classification system for carcinogenicity (EPA 1989): A = Human carcinogen for high dose and high dose rate (i.e., greater than 50 rem per year). For low-level environmental exposures, the carcinogenic effect has not been observed and documented.
1/pCi = One per picocurie.
COC = Constituent of concern.
CWL = Chemical Waste Landfill.
EPA = U.S. Environmental Protection Agency.
g/pCi-yr = Gram(s) per picocurie-year.
SF_{ev} = External volume exposure slope factor.
SF_{inh} = Inhalation slope factor.
SF_o = Oral (ingestion) slope factor.
SOB = Site Operational Boundary.

Material Guidelines Using RESRAD" (Yu et al. 1993a). Although the designated land-use scenario for this site is industrial, risk and TEDE values for a residential land-use scenario are also presented.

VI.6.2 Risk Characterization

Table 10 shows an HI of 0.10 for the CWL SOB nonradiological COCs and an estimated excess cancer risk of 8E-6 for the designated industrial land-use scenario. The numbers presented include exposure from soil ingestion, dermal contact, and dust and volatile inhalation for nonradiological COCs. Table 11 shows an HI of 0.02 and an estimated excess cancer risk of 3E-6 for the CWL SOB associated background constituents under the designated industrial land-use scenario.

For the radiological COCs, contribution from the direct gamma exposure pathway is included. For the industrial land-use scenario, a TEDE is calculated that results in an incremental TEDE of 2.9E-1 millirem (mrem)/year (yr). In accordance with EPA guidance found in Office of Solid Waste and Emergency Response (OSWER) Directive No. 9200.4-18 (EPA 1997b), an incremental TEDE of 15 mrem/yr is used for the probable land-use scenario (industrial in this case); the calculated dose value for the CWL SOB for the industrial land-use scenario is well below this guideline. The estimated excess cancer risk is 3.5E-6.

Table 10
Risk Assessment Values for the CWL SOB Nonradiological COCs

COC	Maximum Concentration (mg/kg)	Industrial Land-Use Scenario[a]		Residential Land-Use Scenario[a]	
		Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Inorganic					
Arsenic	8.5	0.03	5E-6	0.39	2E-5
Barium	202	0.00	–	0.04	–
Beryllium	1.14	0.00	5E-10	0.01	1E-9
Cadmium	1.97	0.00	6E-10	0.05	1E-9
Chromium	181	0.00	–	0.00	–
Chromium VI	6.03	0.00	1E-8	0.03	3E-8
Copper	895	0.03	–	0.32	–
Mercury	8.48	0.03	–	0.37	–
Nickel	17.6	0.00	–	0.01	–
Selenium	1.58	0.00	–	0.00	–
Silver	1.02	0.00	–	0.00	–
Organic					
Acenaphthene	0.153	0.00	–	0.00	–
Acetone	0.106	0.00	–	0.02	–
Anthracene	0.347	0.00	–	0.00	–
Benzo(a)anthracene	0.15	0.00	7E-8	0.00	2E-7
Benzo(a)pyrene	0.0522	0.00	2E-7	0.00	8E-7
Benzo(b)fluoranthene	0.279	0.00	1E-7	0.00	5E-7
Benzo(k)fluoranthene	0.218	0.00	1E-8	0.00	4E-8
Bromodichloromethane	0.00076	0.00	3E-10	0.00	8E-10
Bromoform	0.006	0.00	3E-11	0.00	1E-10
2-Butanone	0.0116	0.00	–	0.00	–
Butylbenzyl phthalate	0.0326 J	0.00	–	0.00	–
Carbazole	0.0538	0.00	4E-10	0.00	2E-9
Chloroform	0.00119	0.00	2E-9	0.00	5E-9
Chloromethane	0.00064	0.00	2E-10	0.00	5E-10
Chrysene	0.559	0.00	3E-9	0.00	9E-9
Di-n-butyl phthalate	0.0508	0.00	–	0.00	–
Di-n-octyl phthalate	0.0341	0.00	–	0.00	–
Dibenzofuran	0.0766	0.00	–	0.00	–
Dibromochloromethane	0.00206	0.00	6E-11	0.00	3E-10
1,2-Dichlorobenzene	0.214	0.00	–	0.00	–
Diethylphthalate	0.0548	0.00	–	0.00	–
Dimethylphthalate	0.329	0.00	–	0.00	–
Diphenylamine	0.0258 J	0.00	–	0.00	–
bis(2-Ethylhexyl) phthalate	6.12	0.00	3E-8	0.00	1E-7
Fluoranthene	2.03	0.00	–	0.00	–
Fluorene	0.0947	0.00	–	0.00	–
Hexachlorobenzene	0.0203	0.00	2E-8	0.00	7E-8
Methylene chloride	0.0036	0.00	2E-8	0.00	5E-8
2-Methylnaphthalene	0.0201	0.00	–	0.00	–
Pentachlorophenol	0.66	0.00	3E-8	0.00	1E-7
Phenanthrene	0.916	0.00	–	0.00	–
Pyrene	1.46	0.00	–	0.00	–
Tetrachloroethene	0.012	0.00	4E-9	0.00	8E-9
Toluene	0.0194	0.00	–	0.00	–
Trichloroethene	0.0021	0.00	2E-6	0.02	5E-6
2,4,5-Trichlorophenol	0.22	0.00	–	0.00	–
Xylene	0.00365	0.00	–	0.00	–
Totals		0.10	8E-6	1.25	3E-5

Refer to footnotes at end of table.

Table 10 (Concluded)
Risk Assessment Values for the CWL SOB Nonradiological COCs

[a]EPA 1989.
COC = Constituent of concern.
CWL = Chemical Waste Landfill.
EPA = U.S. Environmental Protection Agency.
J = Estimated concentration.
mg/kg = Milligram(s) per kilogram.
SOB = Site Operational Boundary.
– = Information not available.

Table 11
Risk Assessment Values for the CWL SOB Nonradiological Background Constituents

COC	Background Concentration[a] (mg/kg)	Industrial Land-Use Scenario[b]		Residential Land-Use Scenario[b]	
		Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Arsenic	5.6	0.02	3E-6	0.20	1E-5
Barium	130	0.00	–	0.02	–
Beryllium	0.65	0.00	3E-10	0.00	6E-10
Cadmium	<1	0.00	3E-10	0.02	6E-10
Chromium	17.3	0.00	–	0.00	–
Chromium VI	1	0.00	2E-9	0.00	5E-9
Copper	15.4	0.00	–	0.01	–
Mercury	<0.25	–	–	–	–
Nickel	11.5	0.00	–	0.01	–
Selenium	<1	–	–	–	–
Silver	<1	–	–	–	–
Total		0.02	3E-6	0.27	1E-5

[a]Dinwiddie September 1997.
[b]EPA 1989.
COC = Constituent of concern.
CWL = Chemical Waste Landfill.
EPA = U.S. Environmental Protection Agency.
mg/kg = Milligram(s) per kilogram.
SOB = Site Operational Boundary.
– = Information not available.

The HI is 1.25 with an estimated excess cancer risk of 3E-5 for the nonradiological COCs under the residential land-use scenario (Table 10). The numbers in the table include exposure from soil ingestion, dermal contact, and dust inhalation. Although the EPA (1991) guidelines 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. Based upon the nature of local soil, other exposure pathways are not evaluated (see Appendix 1). Table 11 shows an HI of 0.27 and an estimated excess cancer risk of 1E-5 for the associated background constituents at the CWL SOB under the residential land-use scenario.

For the radiological COCs, the incremental TEDE for the residential land-use scenario is 0.74 mrem/yr. The guideline being used is an excess TEDE of 75 mrem/yr (SNL/NM February 1998) for a complete loss of institutional controls (residential land use in this case); the calculated dose value for the CWL SOB for the residential land-use scenario is well below this guideline. Consequently, the CWL SOB is eligible for unrestricted radiological release as the residential land-use scenario resulted in an incremental TEDE of less than 75 mrem/yr to the on-site receptor. The estimated excess cancer risk is 1.1E-5. The excess cancer risk from the nonradiological and radiological COCs should be summed to provide risk estimates for persons exposed to both types of carcinogenic contaminants, as noted in OSWER Directive No. 9200.4-18, “Establishment of Cleanup Levels for CERCLA [Comprehensive Environmental Response, Compensation, and Liability Act] Sites with Radioactive Contamination” (EPA 1997b). This summation is tabulated in Section VI.9.

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 COCs under the industrial land-use scenario, the HI is 0.10 (less than the numerical guideline of 1 suggested in the RAGS [EPA 1989]). The excess cancer risk is 8E-6. 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 by evaluating background concentrations of the potential nonradiological COCs for both the industrial and residential land-use scenarios. 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 concentrations are assumed to have a hazard quotient (HQ) of 0.00. The incremental HI is 0.08 and the estimated incremental cancer risk is 5.59E-6 for the industrial land-use scenario. These incremental risk calculations indicate insignificant risk to human health from nonradiological COCs considering an industrial land-use scenario.

For the radiological COCs under the industrial land-use scenario, the incremental TEDE is 2.9E-1 mrem/yr, which is significantly lower than the EPA's numerical guideline of 15 mrem/yr (EPA 1997b). The estimated incremental excess cancer risk is 3.5E-6.

For the nonradiological COCs under the residential land-use scenario, the calculated HI is 1.25, which is above the numerical guidance. The excess cancer risk is 3E-5. 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 above the suggested acceptable risk value. The incremental HI is 0.98 and the estimated incremental cancer risk is 1.78E-5 for the residential land-use scenario. The incremental HI calculation indicates insignificant risk to human health from nonradiological COCs under a residential land-use scenario.

The incremental TEDE for a residential land-use scenario from the radiological components is 0.74 mrem/yr, which is significantly lower than the numerical guideline of 75 mrem/yr suggested in the SNL/NM "RESRAD Input Parameter Assumptions and Justification" (SNL/NM February 1998). The estimated excess cancer risk is 1.1E-5.

VI.8 Step 7. Uncertainty Discussion

The determination of the nature and extent of contamination within the CWL SOB is based upon process knowledge of land use (primarily CWL LE VCM waste management activities). This has been validated with removal of surface soil and final verification sampling across the area. The SOB verification sampling was implemented in accordance with the CWL SAP (SNL/NM November 1998) and subsequent ICNs #1 (SNL/NM March 1999), #2 (SNL/NM December 2000), #3 (SNL/NM July 2001), and #4 (SNL/NM December 2001). The DQOs contained in the SAP and ICNs are appropriate and were developed for use in a final risk assessment. The data collected, based upon sample location, density, and depth are representative of the site. The analytical requirements and results satisfy the DQOs. The

analytical data quality was verified/validated in accordance with SNL/NM procedures (SNL/NM December 2003). Therefore, there is no uncertainty associated with the data quality used to perform the final risk assessment for the CWL SOB.

Because of the location, history, 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 COCs found in near-surface soil and the location and physical characteristics of the site, there is low 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 may be overestimated. Maximum measured values of COC concentrations are used to provide conservative results.

Table 8 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 EPA Regions 9 and 3 (EPA 2002a, EPA 2002b). 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 (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.

Although both the HI and estimated excess cancer risk are above the NMED guidelines for the residential land-use scenario, maximum concentrations were used in the risk calculation. Because the site has been adequately characterized, average concentrations are more representative of actual site conditions. Using the upper confidence limit (UCL) of the mean concentrations for the main contributors to excess cancer risk and hazards (summarized in Appendix 2), which consist of arsenic (4.9 mg/kg), copper (89.3 mg/kg), and mercury (0.713 mg/kg), reduces the total HI and estimated excess cancer risk to 0.46 and 2E-5, respectively. The incremental HI and excess cancer risk are reduced to 0.18 and 8.52E-6, respectively. Thus, by using realistic concentrations in the risk calculations that more accurately depict actual site conditions, both the total and estimated incremental HI risks and the estimated incremental excess cancer risks are below NMED guidelines.

Risk assessment values for nonradiological COCs are within the acceptable range for human health under an industrial land-use scenario compared to established numerical guidance.

For the radiological COCs, the conclusion of the risk assessment is that potential effects on human health for both industrial and residential land-use scenarios are within guidelines and represent only a small fraction of the estimated 360 mrem/yr received by the average U.S. population (NCRP 1987).

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

The CWL SOB contains identified COCs consisting of inorganic, organic, and radiological constituents. 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 inhalation for chemical COCs and soil ingestion, dust inhalation, and direct gamma exposure for radionuclides. 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 COCs show that for the industrial land-use scenario the HI (0.10) is significantly lower than the accepted numerical guidance from the EPA. The estimated excess cancer risk is 8E-6. Thus, excess cancer risk is also below the acceptable risk value provided by the NMED for an industrial land-use scenario (Bearzi January 2001). The incremental HI is 0.08 and the incremental excess cancer risk is 5.59E-6 for the industrial land-use scenario. These incremental risk calculations indicate insignificant risk to human health for the industrial land-use scenario.

Using conservative assumptions and an RME approach to risk assessment, calculations for the nonradiological COCs show that for the residential land-use scenario the HI (1.25) is above the accepted numerical guidance from the EPA. The estimated excess cancer risk is 3E-5. Thus, excess cancer risk is above the acceptable risk value provided by the NMED for a residential land-use scenario (Bearzi January 2001). The incremental HI is 0.98 and the incremental excess cancer risk is 1.78E-5 for the residential land-use scenario. The incremental HI calculation indicates insignificant risk to human health for the residential land-use scenario.

Although both the HI and estimated excess cancer risk are above the NMED guidelines for the residential land-use scenario, maximum concentrations were used in the risk calculation. Because the site has been adequately characterized, average concentrations are more representative of actual site conditions. Using the UCL of the mean concentrations for the main contributors to excess cancer risk and hazards (summarized in Appendix 2), which consist of arsenic (4.9 mg/kg), copper (89.3 mg/kg), and mercury (0.713 mg/kg), reduces the total HI and estimated excess cancer risk to 0.46 and 2E-5, respectively. The incremental HI and excess cancer risk are reduced to 0.18 and 8.52E-6, respectively. Thus, by using realistic concentrations in the risk calculations that more accurately depict actual site conditions, both the total and estimated incremental HI risks and the estimated incremental excess cancer risk values are below NMED guidelines.

The incremental TEDE and corresponding estimated cancer risk from radiological COCs are much less than EPA guidance values. The estimated TEDE is 2.9E-1 mrem/yr for the industrial land-use scenario, which is much lower than the EPA's numerical guidance of 15 mrem/yr (EPA 1997b). The corresponding estimated incremental cancer risk value is 3.5E-6 for the industrial land-use scenario. Furthermore, the incremental TEDE for the residential land-use scenario that results from a complete loss of institutional control is 0.74 mrem/yr with an associated risk of 1.1E-5. The guideline for this scenario is 75 mrem/yr (SNL/NM February 1998). Therefore, the CWL SOB is eligible for unrestricted radiological release.

The summation of the nonradiological and radiological carcinogenic risks is tabulated in Table 12.

Table 12
Summation of Incremental Nonradiological and Radiological Risks from CWL SOB Carcinogens

Scenario	Nonradiological Risk	Radiological Risk	Total Risk
Industrial	5.59E-6	3.5E-6	9.1E-6
Residential	8.52E-6	1.1E-5	2.0E-5

CWL = Chemical Waste Landfill.
SOB = Site Operational Boundary.

Uncertainties associated with the calculations are considered small relative to the conservatism of this risk assessment analysis. Therefore, it is concluded that this site poses insignificant risk to human health under both the industrial and residential land-use scenarios.

VII. Ecological Risk Assessment

VII.1 Introduction

This section addresses the ecological risks associated with exposure to constituents of potential ecological concern (COPECs) in soil at the CWL SOB. A component of the NMED Risk-Based Decision Tree (NMED March 1998) is to conduct an ecological screening assessment that corresponds with that presented in the EPA's Ecological RAGS (EPA 1997c). The current methodology is tiered and contains an initial scoping assessment followed by a more detailed screening assessment. Initial components of 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 screening assessment whereby a more quantitative estimate of ecological risk is conducted. Although this assessment incorporates conservatisms in the estimation of ecological risks, ecological relevance and professional judgment are also used as recommended by the EPA (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 concentrations detected 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 (Tables 4 and 6), inorganic constituents in soil within the 0- to 5-foot depth interval that either exceed background screening concentrations or do not have a quantified background screening concentration consist of the following:

- Arsenic
- Barium
- Beryllium
- Cadmium
- Chromium (total)
- Chromium VI
- Copper
- Lead
- Mercury
- Nickel
- Selenium
- Silver
- Cs-137
- H-3
- Th-232
- U-235
- U-238

Organic analytes detected in the soil consist of the following:

- Acenaphthene
- Acetone
- Anthracene
- Benzo(a)anthracene
- Benzo(a)pyrene
- Benzo(b)fluoranthene
- Benzo(k)fluoranthene
- Bromodichloromethane
- Bromoform
- 2-Butanone
- Butylbenzyl phthalate
- Carbazole
- Chloroform
- Chloromethane
- Chrysene
- Di-n-butyl phthalate
- Di-n-octyl phthalate
- Dibenzofuran
- Dibromochloromethane

- 1,2-Dichlorobenzene
- Diethylphthalate
- Dimethylphthalate
- Diphenylamine
- bis(2-Ethylhexyl) phthalate
- Fluoranthene
- Fluorene
- Hexachlorobenzene
- Methylene chloride
- 2-Methylnaphthalene
- PCBs, total
- Pentachlorophenol
- Phenanthrene
- Pyrene
- Tetrachloroethene
- Toluene
- Trichloroethene
- 2,4,5-Trichlorophenol
- Xylene

VII.2.2 Bioaccumulation

Among the COPECs listed in Section VII.2.1, the following are considered to have bioaccumulation potential in aquatic environments (Section IV, Tables 4 and 6):

- Arsenic
- Barium
- Cadmium
- Lead
- Mercury
- Nickel
- Selenium
- Cs-137
- Th-232
- U-235
- U-238
- Acenaphthene
- Anthracene
- Benzo(a)anthracene
- Benzo(a)pyrene
- Benzo(b)fluoranthene
- Benzo(k)fluoranthene
- Butylbenzyl phthalate
- Chrysene

- Di-n-butyl phthalate
- Di-n-octyl phthalate
- Dibenzofuran
- 1,2-Dichlorobenzene
- Diethylphthalate
- Dimethylphthalate
- bis(2-Ethylhexyl) phthalate
- Fluoranthene
- Fluorene
- Hexachlorobenzene
- 2-Methylnaphthalene
- PCBs, total
- Pentachlorophenol
- Phenanthrene
- Pyrene
- Tetrachloroethene

However, as directed by the NMED (March 1998), bioaccumulation for inorganic constituents 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 COPECs to migrate from the source of contamination to other media or biota is discussed in Section V. As noted in Table 7 (Section V), wind and surface-water runoff are expected to be low potential transport mechanisms for COPECs at this site because the site will be revegetated. Migration to groundwater is not anticipated. Degradation (decay) and transformation of the inorganic COPECs and radionuclides is expected to be of low significance, but may be of moderate significance for some of the organic COPECs.

VII.2.4 Scoping Risk-Management Decision

Based upon information gathered through the scoping assessment, it was concluded that complete ecological pathways may be associated with the CWL SOB and that COPECs also exist at the site. As a consequence, a screening assessment is deemed necessary to predict the potential level of ecological risk associated with the site.

VII.3 Screening Assessment

As concluded in Section VII.2.4, both complete ecological pathways and COPECs are associated with the CWL SOB. The risk assessment performed for the CWL SOB 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 screening 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 COPECs 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 HQs and ecological significance.
- Screening Assessment Scientific/Management Decision Point—presents the decision to risk managers based upon the results of the screening assessment.

VII.3.1 Problem Formulation

Problem formulation is the initial stage of the screening 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 screening 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

The CWL SOB is approximately 11.4 acres in size and is located in an area dominated by grassland habitat; however, because of the scraping/excavation of the site, no natural habitat remains within this area. The surface soil layer will be revegetated. No other threatened, endangered, or other sensitive species occur within this site (NMNHP 1995).

Although unlikely because of the degree of habitat disturbance, complete ecological pathways are assumed to exist at this site through the exposure of plants and wildlife to COPECs in the soil. It is assumed that direct uptake of COPECs from this soil would be the major route of exposure for plants. Exposure modeling for the wildlife receptors is limited to the food and soil ingestion pathways and external radiation. Because of the lack of surface water at this site, exposure to COPECs 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 COCs at this site.

VII.3.1.2 COPECs

Residual contaminants in the excavated soil from the CWL SOB is the source of the COPECs associated with this area. Inorganic and organic COPECs identified for the 0- to 5-foot depth interval at this site are listed in Section VII.2.1. The inorganic COPECs include both radiological and nonradiological analytes that were screened against background concentrations. Those that exceed the approved SNL/NM background screening levels (Dinwiddie September 1997) for the area are considered to be COPECs. Nonradiological inorganic constituents that are essential nutrients, such as iron, magnesium, calcium, potassium, and sodium, are not included in this risk assessment as set forth by the EPA (1989). All organic analytes detected are considered to be COPECs for the site. In order to provide conservatism, this ecological risk assessment is based upon the maximum soil concentrations of the COPECs measured in the surface soil samples at this site. Tables 4 and 6 provide the maximum concentrations for the COPECs.

Based upon the requirements of the risk-based approach for the CWL (SNL/NM August 2000), total PCBs in soil from the 0- to 5-foot depth interval must be less than 1 mg/kg. The maximum concentration for total PCBs is 0.906 mg/kg. The maximum concentration for total PCBs from a depth of 0 to 5 feet is less than 1 mg/kg. Therefore, total PCBs are eliminated from further consideration in the ecological risk assessment.

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 is used to represent 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

For nonradiological COPECs, 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 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 13 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 were modeled using an area use factor of 1.0, implying that all food items and soil ingested come from the area being investigated. The maximum COPEC concentrations measured in surface soil samples are used to conservatively estimate potential exposures and risks to plants and wildlife at this site.

For the radiological dose-rate calculations, the deer mouse is modeled as an herbivore (100 percent of its diet as plants), and the burrowing owl is modeled as a strict predator on small mammals (100 percent of its diet as deer mice). Both are modeled with soil ingestion comprising 2 percent of the total dietary intake. Receptors are exposed to radiation both internally and externally from Cs-137, H-3, Th-232, U-235, and U-238. Internal and external dose rates to the deer mouse and the burrowing owl are approximated using modified dose-rate models from the DOE (1995) as presented in the ecological risk assessment methodology document (IT July 1998). Radionuclide-dependent data for the dose-rate calculations were obtained from Baker and Soldat (1992). The external dose-rate model examines the total-body dose rate to a receptor residing in soil exposed to radionuclides. The soil surrounding the receptor is assumed to be an infinite medium uniformly contaminated with gamma-emitting radionuclides. The external dose-rate model is the same for both the deer mouse and the burrowing owl. The internal total-body dose-rate model assumes that a fraction of the radionuclide concentration ingested by a receptor is absorbed by the body and concentrated at the center of a spherical body shape. This provides for a conservative estimate for absorbed dose. This concentrated radiation source at the center of the body of the receptor is assumed to be a “point” source. Radiation emitted from this point source is absorbed by the body tissues to contribute to the absorbed dose. Alpha and beta emitters are assumed to transfer 100 percent of their energy to the receptor as they pass through tissues. Gamma-emitting radionuclides transfer only a fraction of their energy to the tissues because gamma rays interact less with matter than do alpha or beta emitters. The external and internal dose-rate results are summed to calculate a total dose rate from exposure to Cs-137, H-3, Th-232, U-235, and U-238 in soil.

Table 14 presents the transfer factors used in modeling the concentrations of COPECs through the food chain. Table 15 presents the maximum concentrations 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 16 provides benchmark toxicity values for the plant and wildlife receptors. For plants, the benchmark soil concentrations are based upon the lowest-observed-adverse-effect level (LOAEL). For wildlife, the toxicity benchmarks are based upon the no-observed-adverse-effect

Table 13
Exposure Factors for Ecological Receptors at the CWL SOB

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[g]

[a]Body weights are in kg wet weight.
[b]Food intake rates are estimated from the allometric equations presented in Nagy 1987. Units are kg dry weight per day.
[c]Dietary compositions are generalized for modeling purposes. Default soil intake value of 2% of food intake.
[d]Silva and Downing 1995.
[e]EPA (1993), based upon the average home range measured in semiarid shrubland in Idaho.
[f]Dunning 1993.
[g]Haug et al. 1993.
CWL = Chemical Waste Landfill.
EPA = U.S. Environmental Protection Agency.
kg = Kilogram(s).
SOB = Site Operational Boundary.

Table 14
Transfer Factors Used in Exposure Models for COPECs at the CWL SOB

COPEC	Soil-to-Plant Transfer Factor	Soil-to-Invertebrate Transfer Factor	Food-to-Muscle Transfer Factor
Inorganic			
Arsenic	4.0E-2[a]	1.0E+0[b]	2.0E-3[a]
Barium	1.5E-1[a]	1.0E+0[b]	2.0E-4[c]
Beryllium	1.0E-2[a]	1.0E+0[b]	1.0E-3[a]
Cadmium	5.5E-1[a]	6.0E-1[d]	5.5E-4[a]
Chromium (total)	4.0E-2[c]	1.3E-1[e]	3.0E-2[c]
Chromium VI	4.0E-2[c]	1.3E-1[e]	3.0E-2[c]
Copper	8.0E-1[f]	2.5E-1[d]	1.0E-2[a]
Lead	9.0E-2[c]	4.0E-2[d]	8.0E-4[c]
Mercury	1.0E+0[c]	1.0E+0[b]	2.5E-1[a]
Nickel	2.0E-1[c]	3.8E-1[d]	6.0E-3[a]
Selenium	5.0E-1[c]	1.0E+0[b]	1.0E-1[c]
Silver	1.0E+0[c]	2.5E-1[d]	5.0E-3[c]
Organic[g]			
Acenaphthene	2.1E-1	2.1E+1	2.1E-4
Acetone	5.3E+1	1.3E+1	1.0E-8
Anthracene	1.0E-1	2.2E+1	7.3E-4
Benzo(a)anthracene	2.2E-2	2.5E+1	1.1E-2
Benzo(a)pyrene	1.1E-2	2.7E+1	3.8E-2
Benzo(b)fluoranthene	6.2E-3	2.8E+1	1.1E-1
Benzo(k)fluoranthene	4.3E-3	2.9E+1	2.1E-1
Bromodichloromethane	5.9E+0	1.5E+1	5.3E-7
Bromoform	1.6E+0	1.7E+1	5.3E-6
2-Butanone	2.6E+1	1.4E+1	3.7E-8
Butylbenzyl phthalate	6.8E-2	2.3E+1	1.6E-3
Carbazole	3.9E+1	1.3E+1	1.8E-8
Chloroform	3.0E+0	1.6E+1	1.8E-6
Chloromethane	1.2E+1	1.5E+1	1.6E-7
Chrysene	1.5E-2	2.6E+1	2.3E-2
Di-n-butyl phthalate	8.4E-2	2.2E+1	1.1E-3
Di-n-octyl phthalate	3.7E-2	2.4E+1	4.5E-3
Dibenzofuran	1.6E-1	2.1E+1	3.3E-4
Dibromochloromethane	5.9E+0	1.5E+1	5.3E-7
1,2-Dichlorobenzene	4.3E-1	1.9E+1	5.7E-5
Diethylphthalate	1.4E+0	1.7E+1	6.6E-6
Dimethylphthalate	2.3E+0	1.7E+1	2.9E-6
Diphenylamine	4.5E+0	1.6E+1	8.7E-7
bis(2-Ethylhexyl) phthalate	1.6E-3	3.2E+1	1.3E+0
Fluoranthene	5.7E-2	2.3E+1	2.1E-3
Fluorene	1.5E-1	2.1E+1	3.8E-4
Hexachlorobenzene	3.3E-2	2.4E+1	5.6E-3
Methylene chloride	7.3E+0	1.5E+1	3.6E-7
2-Methylnaphthalene	2.3E-1	2.1E+1	1.8E-4
Pentachlorophenol	4.4E-2	2.4E+1	3.3E-3
Phenanthrene	8.9E-2	2.2E+1	9.6E-4

Refer to footnotes at end of table.

Table 14 (Concluded)
Transfer Factors Used in Exposure Models for COPECs at the CWL SOB

COPEC	Soil-to-Plant Transfer Factor	Soil-to-Invertebrate Transfer Factor	Food-to-Muscle Transfer Factor
Pyrene	3.3E-2	2.4E+1	5.8E-3
Tetrachloroethene	1.1E+0	1.8E+1	1.1E-5
Toluene	1.0E+0	1.8E+1	1.3E-5
Trichloroethene	1.1E+0	1.8E+1	1.2E-5
2,4,5-Trichlorophenol	2.5E-1	2.0E+1	1.6E-4
Xylene	5.5E-1	1.9E+1	3.7E-5

[a]Baes et al. 1984.
[b]Default value.
[c]NCRP January 1989.
[d]Stafford et al. 1991.
[e]Ma 1982.
[f]IAEA 1994.
[g]Soil-to-plant and food-to-muscle transfer factors from equations developed in Travis and Arms 1988. Soil-to-invertebrate transfer factors from equations developed in Connell and Markwell 1990. All three equations based upon relationship of the transfer factor to the Log K_{ow} value of compound.

COPEC = Constituent of potential ecological concern.
CWL = Chemical Waste Landfill.
IAEA = International Atomic Energy Association.
K_{ow} = Octanol-water partition coefficient.
Log = Logarithm (base 10).
NCRP = National Council on Radiation Protection and Measurements.
SOB = Site Operational Boundary.

Table 15
Media Concentrations[a] for COPECs at the CWL SOB

COPEC	Soil (maximum)[a]	Plant Foliage[b]	Soil Invertebrate[b]	Deer Mouse Tissues[c]
Inorganic				
Arsenic	8.5E+0	3.4E-1	8.5E+0	2.9E-2
Barium	2.0E+2	3.0E+1	2.0E+2	7.5E-2
Beryllium	1.1E+0	1.1E-2	1.1E+0	1.9E-3
Cadmium	2.0E+0	1.1E+0	1.2E+0	2.0E-3
Chromium (total)	1.8E+2	7.2E+0	2.4E+1	1.8E+0
Chromium VI	6.0E+0	2.4E-1	7.8E-1	5.9E-2
Copper	9.0E+2	7.2E+2	2.2E+2	1.5E+1
Lead	3.4E+2	3.0E+1	1.4E+1	7.2E-2
Mercury	8.5E+0	8.5E+0	8.5E+0	6.8E+0
Nickel	1.8E+1	3.5E+0	6.7E+0	1.0E-1
Selenium	1.6E+0	7.9E-1	1.6E+0	3.8E-1
Silver	1.0E+0	1.0E+0	2.6E-1	1.0E-2
Organic				
Acenaphthene	1.5E-1	3.2E-2	3.2E+0	1.0E-3
Acetone	1.1E-1	5.6E+0	1.4E+0	1.1E-7
Anthracene	3.5E-1	3.6E-2	7.6E+0	8.7E-3
Benzo(a)anthracene	1.5E-1	3.3E-3	3.8E+0	6.8E-2
Benzo(a)pyrene	5.2E-2	5.9E-4	1.4E+0	8.2E-2
Benzo(b)fluoranthene	2.8E-1	1.7E-3	7.8E+0	1.4E+0
Benzo(k)fluoranthene	2.2E-1	9.4E-4	6.3E+0	2.1E+0
Bromodichloromethane	7.6E-4	4.5E-3	1.2E-2	1.3E-8
Bromoform	6.0E-3	9.8E-3	1.0E-1	9.4E-7
2-Butanone	1.2E-2	3.1E-1	1.6E-1	2.7E-8
Butylbenzyl phthalate	3.3E-2	2.2E-3	7.4E-1	1.8E-3
Carbazole	5.4E-2	2.1E+0	7.1E-1	8.0E-8
Chloroform	1.2E-3	3.6E-3	2.0E-2	6.4E-8
Chloromethane	6.4E-4	7.4E-3	9.3E-3	4.2E-9
Chrysene	5.6E-1	8.3E-3	1.5E+1	5.3E-1
Di-n-butyl phthalate	5.5E-2	4.6E-3	1.2E+0	2.0E-3
Di-n-octyl phthalate	3.4E-2	1.3E-3	8.2E-1	5.8E-3
Dibenzofuran	7.7E-2	1.2E-2	1.6E+0	8.5E-4
Dibromochloromethane	2.1E-3	1.2E-2	3.2E-2	3.6E-8
1,2-Dichlorobenzene	2.1E-1	9.2E-2	4.2E+0	3.8E-4
Diethylphthalate	5.1E-2	7.9E-2	9.6E-1	1.1E-5
Dimethylphthalate	3.3E-1	5.5E-1	4.0E+0	2.0E-5
Diphenylamine	2.6E-2	1.2E-1	4.1E-1	7.1E-7
bis(2-Ethylhexyl) phthalate	6.1E+0	9.6E-3	1.9E+2	3.9E+2
Fluoranthene	2.0E+0	1.2E-1	4.7E+1	1.6E-1
Fluorene	9.5E-2	1.4E-2	2.0E+0	1.2E-3
Hexachlorobenzene	2.0E-2	6.7E-4	4.9E-1	4.3E-3
Methylene chloride	3.6E-3	2.6E-2	5.3E-2	4.4E-8
2-Methylnaphthalene	2.0E-2	4.6E-3	4.1E-1	1.2E-4
Pentachlorophenol	6.6E-1	2.9E-2	1.6E+1	8.2E-2
Phenanthrene	9.2E-1	8.1E-2	2.0E+1	3.1E-2

Refer to footnotes at end of table.

Table 15 (Concluded)
Media Concentrations[a] for COPECs at the CWL SOB

COPEC	Soil (maximum)[a]	Plant Foliage[b]	Soil Invertebrate[b]	Deer Mouse Tissues[c]
Pyrene	1.5E+0	4.8E-2	3.5E+1	3.2E-1
Tetrachloroethene	1.2E-2	1.3E-2	2.1E-1	3.8E-6
Toluene	1.9E-2	1.9E-2	3.5E-1	7.4E-6
Trichloroethene	2.1E-3	2.2E-3	3.8E-2	7.3E-7
2,4,5-Trichlorophenol	2.2E-1	5.4E-2	4.5E+0	1.1E-3
Xylene	3.7E-3	2.0E-3	6.9E-2	4.2E-6

[a]In mg/kg. 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.
[b]Product of the soil concentration and the corresponding transfer factor.
[c]Based 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).
COPEC = Constituent of potential ecological concern.
CWL = Chemical Waste Landfill.
mg/kg = Milligram(s) per kilogram.
SOB = Site Operational Boundary.

Table 16
Toxicity Benchmarks for Ecological Receptors at the CWL SOB

COPEC	Plant Benchmark[a,b]	Mammalian NOAELs			Avian NOAELs		
		Mammalian Test Species[c,d]	Test Species NOAEL[d,e]	Deer Mouse NOAEL[e,f]	Avian Test Species[d]	Test Species NOAEL[d,e]	Burrowing Owl NOAEL[e,g]
Inorganic							
Arsenic	10	mouse	0.126	0.133	mallard	1	1
Barium	500	rat[h]	5.1	10.5	chicks	0.121	0.121
Beryllium	10	rat	0.66	1.29	–	–	–
Cadmium	3	rat[i]	1	1.89	mallard	1.153	1.153
Chromium (total)	1	rat	2737	5354	black duck	1.25	1.25
Chromium VI	1	rat	3.28	6.42	–	–	–
Copper	100	mink	11.7	29.8	chicks	0.534	0.534
Lead	50	rat	8	15.6	Am. kestrel	0.13	0.13
Mercury (Organic)	0.3	rat	0.032	0.063	mallard	1	1
Mercury (Inorganic)	0.3	mouse	13.2	14.0	Japanese Quail	0.15	0.15
Nickel	30	rat	40	78.2	mallard	0.782	0.782
Selenium	1	rat	0.20	0.39	Scr. owl	0.2	0.2
Silver	10	mouse	0.126	0.133	mallard	1	1
Organic							
Acenaphthene	18	mouse	17.5	18.5	–	–	–
Acetone	–	rat	10	19.6	–	–	–
Anthracene	18	mouse	100	106	–	–	–
Benzo(a)anthracene	18	mouse	1	1.1	–	–	–
Benzo(a)pyrene	18	mouse	1	1.1	–	–	–
Benzo(b)fluoranthene	18	mouse	1	1.1	–	–	–
Benzo(k)fluoranthene	18	mouse	1	1.1	–	–	–
Bromodichloromethane	–	mouse	18.3	19.4	–	–	–
Bromoform	–	rat	14.3	28.0	–	–	–
2-Butanone	–	rat	1771	3464	–	–	–
Butylbenzyl phthalate	–	rat	159	311	–	–	–
Carbazole	–	–	–	–	–	–	–
Chloroform	–	rat	15	29.3	–	–	–

Refer to footnotes at end of table.

Table 16 (Continued)
Toxicity Benchmarks for Ecological Receptors at the CWL SOB

COPEC	Plant Benchmark[a,b]	Mammalian NOAELs			Avian NOAELs		
		Mammalian Test Species[c,d]	Test Species NOAEL[d,e]	Deer Mouse NOAEL[e,f]	Avian Test Species[d]	Test Species NOAEL[d,e]	Burrowing Owl NOAEL[e,g]
Chloromethane	–	rat	5.97	11.7	–	–	–
Chrysene	18	mouse	1	1.1	–	–	–
Di-n-butyl phthalate	200	mouse	550	582	ringed dove	0.155	0.155
Di-n-octyl phthalate	–	mouse	79.4	84.0	–	–	–
Dibenzofuran	–	–	–	–	–	–	–
Dibromochloromethane	–	mouse	18.3	19.4	–	–	–
1,2-Dichlorobenzene	–	rat	134	262	–	–	–
Diethylphthalate	–	mouse	75.3	79.7	–	–	–
Dimethylphthalate	–	mouse	83	87.9	–	–	–
Diphenylamine	–	rat	4.23	8.3	–	–	–
bis(2-Ethylhexyl) phthalate	–	mouse	18.3	19.4	ringed dove	0.155	0.155
Fluoranthene	18	mouse	12.5	13.2	–	–	–
Fluorene	18	mouse	12.5	13.2	–	–	–
Hexachlorobenzene	–	rat	0.29	0.57	–	–	–
Methylene chloride	–	rat	5.85	11.4	–	–	–
2-Methylnaphthalene	18	rat	2.45	4.79	–	–	–
Pentachlorophenol	–	rat	0.24	0.47	–	–	–
Phenanthrene	18	mouse	1	1.1	–	–	–
Pyrene	18	mouse	7.5	7.9	–	–	–
Tetrachloroethene	–	mouse	1.4	1.5	–	–	–
Toluene	200	mouse	26	27.5	–	–	–
Trichloroethene	–	mouse	0.7	0.7	–	–	–
2,4,5-Trichlorophenol	–	rat	2.6	5.1	–	–	–
Xylene	–	mouse	2.1	2.2	–	–	–

[a]In mg/kg soil dry weight.
[b]Efroymson et al. 1997.
[c]Body weights (in kg) for the NOAEL conversion are as follows: lab mouse, 0.030; lab rat, 0.350 (except where noted).
[d]Sample et al. 1996, except where noted.
[e]In mg/kg body weight per day.

Table 16 (Concluded)
Toxicity Benchmarks for Ecological Receptors at the CWL SOB

[f]Based 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.
[g]Based 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.
[h]Body weight = 0.435 kg.
[i]Body weight = 0.303 kg.

COPEC	= Constituent of potential ecological concern.
CWL	= Chemical Waste Landfill.
kg	= Kilogram(s).
mg	= Milligram(s).
NOAEL	= No-observed-adverse-effect level.
SOB	= Site Operational Boundary.
–	= Insufficient toxicity data.

level (NOAEL) for chronic oral exposure in a taxonomically similar test species. Sufficient toxicity information was not available to estimate the LOAELs or NOAELs for some COPECs.

The benchmark used for exposure of terrestrial receptors to radiation is 0.1 rad/day. This value has been recommended by the International Atomic Energy Agency (IAEA 1992) for the protection of terrestrial populations. Because plants and insects are less sensitive to radiation than vertebrates (Whicker and Schultz 1982), the dose of 0.1 rad/day should also protect other groups within the terrestrial habitat of the site.

VII.3.4 Risk Characterization

Maximum concentrations in soil and estimated dietary exposures are compared to plant and wildlife benchmark values, respectively. Table 17 presents the results of these comparisons. HQs are used to quantify the comparison with benchmarks for plant and wildlife exposure.

HQs for plants exceed unity for total chromium, chromium VI, copper, lead, mercury, and selenium. Because of a lack of sufficient toxicity information, HQs for plants could not be determined for 23 of the 37 organic COPECs. HQs exceed unity for all three dietary regimes in the deer mouse for copper and for mercury when it is assumed to be entirely in organic form. HQs exceed unity for the omnivorous and insectivorous deer mice for arsenic, barium, chrysene, pentachlorophenol, and phenanthrene. Because of a lack of sufficient toxicity information, HQs for the deer mouse could not be determined for carbazole and dibenzofuran. For the burrowing owl, the only HQs that exceed unity are for mercury and bis(2-ethylhexyl) phthalate. HQs for beryllium, chromium VI, silver, and all organic COPECs, except bis(2-ethylhexyl) phthalate and di-n-butyl phthalate, could not be determined for the burrowing owl because of a lack of sufficient toxicity information. 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). All receptors have total HIs greater than unity, with a maximum HI of 230 for plants.

Tables 18 and 19 summarize the internal and external dose-rate model results for Cs-137, H-3, Th-232, U-235, and U-238 for the deer mouse and burrowing owl, respectively. The total radiation dose rate to the deer mouse is predicted to be 9.8E-4 rad/day and that for the burrowing owl is 4.9E-4 rad/day. The dose rates for the deer mouse and the burrowing owl are less than the benchmark of 0.1 rad/day.

VII.3.5 Uncertainty Assessment

Many uncertainties are associated with the characterization of ecological risks at the CWL SOB resulting from assumptions used in calculating risk that could overestimate or underestimate true risk presented at the area. 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 SOB. Conservatisms incorporated into this risk assessment include the use of maximum analyte concentrations measured in soil samples to evaluate risk, the use of wildlife toxicity benchmarks based upon NOAEL values, and the incorporation of strict herbivorous and

Table 17
HQs for Ecological Receptors at the CWL SOB

COPEC	Plant HQ[a]	Deer Mouse HQ (Herbivorous)[a]	Deer Mouse HQ (Omnivorous)[a]	Deer Mouse HQ (Insectivorous)[a]	Burrowing Owl HQ[a]
Inorganic					
Arsenic	8.5E-1	6.0E-1	**5.4E+0**	**1.0E+1**	4.3E-3
Barium	4.0E-1	5.1E-1	**1.8E+0**	**3.0E+0**	2.2E-2
Beryllium	1.1E-1	4.1E-3	7.2E-2	1.4E-1	–
Cadmium	6.6E-1	9.3E-2	9.7E-2	1.0E-1	3.2E-3
Chromium (total)	**1.8E+2**	3.2E-4	5.5E-4	7.9E-4	6.0E-1
Chromium VI	**6.0E+0**	8.8E-3	1.5E-2	2.2E-2	–
Copper	**9.0E+0**	**3.8E+0**	**2.6E+0**	**1.3E+0**	7.9E-2
Lead	**6.8E+0**	3.7E-1	2.9E-1	2.0E-1	2.0E-1
Mercury (Organic)	**2.8E+1**	**2.2E+1**	**2.2E+1**	**2.2E+1**	**1.2E+2**
Mercury (Inorganic)	**2.8E+1**	9.6E-2	9.6E-2	9.6E-2	**1.7E+0**
Nickel	5.9E-1	7.7E-3	1.1E-2	1.4E-2	6.5E-4
Selenium	**1.6E+0**	3.3E-1	4.8E-1	6.4E-1	1.0E-1
Silver	5.1E-1	4.7E-3	2.9E-3	1.2E-3	–
Organic					
Acenaphthene	8.5E-3	3.0E-4	1.3E-2	2.7E-2	–
Acetone	–	4.5E-2	2.8E-2	1.1E-2	–
Anthracene	1.9E-2	6.3E-5	5.6E-3	1.1E-2	–
Benzo(a)anthracene	8.3E-3	9.3E-4	2.8E-1	5.5E-1	–
Benzo(a)pyrene	2.9E-3	2.4E-4	1.0E-1	2.0E-1	–
Benzo(b)fluoranthene	1.6E-2	1.1E-3	5.8E-1	**1.2E+0**	–
Benzo(k)fluoranthene	1.2E-2	7.8E-4	4.6E-1	9.3E-1	–
Bromodichloromethane	–	3.6E-5	6.5E-5	9.5E-5	–
Bromoform	–	5.5E-5	3.2E-4	5.8E-4	–
2-Butanone	–	1.4E-5	1.0E-5	7.1E-6	–
Butylbenzyl phthalate	–	1.4E-6	1.9E-4	3.7E-4	–
Carbazole	–	–	–	–	–
Chloroform	–	1.9E-5	6.1E-5	1.0E-4	–
Chloromethane	–	9.9E-5	1.1E-4	1.2E-4	–
Chrysene	3.1E-2	2.9E-3	**1.1E+0**	**2.1E+0**	–
Di-n-butyl phthalate	2.7E-4	1.5E-6	1.6E-4	3.3E-4	3.2E-3

Refer to footnotes at end of table.

Table 17 (Concluded)
HQs for Ecological Receptors at the CWL SOB

COPEC	Plant HQ[a]	Deer Mouse HQ (Herbivorous)[a]	Deer Mouse HQ (Omnivorous)[a]	Deer Mouse HQ (Insectivorous)[a]	Burrowing Owl HQ[a]
Di-n-octyl phthalate	–	3.6E-6	7.6E-4	1.5E-3	–
Dibenzofuran	–	–	–	–	–
Dibromochloromethane	–	9.8E-5	1.8E-4	2.6E-4	–
1,2-Dichlorobenzene	–	5.7E-5	1.3E-3	2.5E-3	–
Diethylphthalate	–	1.6E-4	1.0E-3	1.9E-3	–
Dimethylphthalate	–	9.8E-4	4.1E-3	7.1E-3	–
Diphenylamine	–	2.2E-3	4.9E-3	7.7E-3	–
bis(2-Ethylhexyl) phthalate	–	1.1E-3	7.8E-1	**1.6E+0**	**4.0E+1**
Fluoranthene	1.1E-1	1.8E-3	2.8E-1	5.5E-1	–
Fluorene	5.3E-3	1.9E-4	1.2E-2	2.4E-2	–
Hexachlorobenzene	–	3.0E-4	6.8E-2	1.4E-1	–
Methylene chloride	–	3.5E-4	5.4E-4	7.2E-4	–
2-Methylnaphthalene	1.1E-3	1.6E-4	6.8E-3	1.3E-2	–
Pentachlorophenol	–	1.4E-2	**2.6E+0**	**5.2E+0**	–
Phenanthrene	5.1E-2	1.5E-2	**1.5E+0**	**3.0E+0**	–
Pyrene	8.1E-2	1.5E-3	3.5E-1	7.0E-1	–
Tetrachloroethene	–	1.4E-3	1.2E-2	2.3E-2	–
Toluene	9.7E-5	1.1E-4	1.0E-3	2.0E-3	–
Trichloroethene	–	4.7E-4	4.2E-3	7.9E-3	–
2,4,5-Trichlorophenol	–	1.8E-3	7.0E-2	1.4E-1	–
Xylene	–	1.5E-4	2.5E-3	4.9E-3	–
HI[b]	**2.3E+2**	**2.7E+1**	**4.0E+01**	**5.3E+01**	**1.6E+02**

[a]**Bold** values indicate the HQ or HI exceeds unity.
[b]The HI is the sum of individual HQs.
COPEC = Constituent of potential ecological concern.
CWL = Chemical Waste Landfill.
HI = Hazard index.
HQ = Hazard quotient.
SOB = Site Operational Boundary.
– = Insufficient toxicity data available for risk estimation purposes.

Table 18
Internal and External Dose Rates for Deer Mice
Exposed to Radionuclides at the CWL SOB

Radionuclide	Maximum Concentration (pCi/g)	Internal Dose (rad/day)	External Dose (rad/day)	Total Dose (rad/day)
Cs-137	1.9E-1	5.8E-6	8.5E-6	1.4E-5
H-3	2.3E+2	7.4E-4	0.0E+0	7.4E-4
Th-232	8.0E-2	4.0E-9	1.5E-5	1.5E-5
U-235	2.4E-1	2.5E-6	3.9E-6	6.5E-6
U-238	1.3E+0	1.2E-5	1.9E-4	2.1E-4
Total		7.6E-4	2.2E-4	9.8E-4

CWL = Chemical Waste Landfill.
pCi/g = Picocurie(s) per gram.
SOB = Site Operational Boundary.

Table 19
Internal and External Dose Rates for Burrowing Owls
Exposed to Radionuclides at the CWL SOB

Radionuclide	Maximum Concentration (pCi/g)	Internal Dose (rad/day)	External Dose (rad/day)	Total Dose (rad/day)
Cs-137	1.9E-1	3.8E-6	8.5E-6	1.2E-5
H-3	2.3E+2	2.6E-4	0.0E+0	2.6E-4
Th-232	8.0E-2	1.9E-8	1.5E-5	1.5E-5
U-235	2.4E-1	9.6E-7	3.9E-6	5.0E-6
U-238	1.3E+0	4.8E-6	1.9E-4	2.0E-4
Total		2.7E-4	2.2E-4	4.9E-4

CWL = Chemical Waste Landfill.
pCi/g = Picocurie(s) per gram.
SOB = Site Operational Boundary.

strict insectivorous diets for predicting the extreme HQ values for the deer mouse. Each of these uncertainties is discussed in greater detail in the uncertainty section of the ecological risk assessment methodology document for the SNL/NM ER Project (IT July 1998).

Uncertainties associated with the estimation of risk to ecological receptors from exposure to Cs-137, H-3, Th-232, U-235, and U-238 are primarily related to those inherent in the radionuclide-specific data. Radionuclide-dependent data are measured values that have their associated errors. The dose-rate models used for these calculations are based upon conservative estimates on receptor shape, radiation absorption by body tissues, and intake parameters. The goal is to provide a realistic but conservative estimate of a receptor's internal and external exposure to radionuclides in soil.

Table 20 presents predicted ecological HQs based upon exposures to metals at the corresponding background screening levels. As seen in this table, predicted HQs based upon background levels exceed 1 for some metals. These include the HQs for the omnivorous and insectivorous deer mice from background exposures to arsenic and barium, the HQ for plants from background exposures to chromium, and the HQ for the burrowing owl from background exposure to mercury when it is assumed to be in organic form. These results demonstrate the conservative nature of the HQs in predicting potential risk to these receptors. The HQs for inorganic and organic mercury represent the extremes of potential toxicity of this element based upon its form in the environment. Although the form of mercury in soil is continuously in flux, organic mercury is typically a minor component of the total. Incorporation of mercury into organic complexes (methylation) is typically associated with biological activity. At the CWL SOB, the potential for significant methylation of mercury is expected to be low due to the low biological activity in the soil of this arid environment. Therefore, the risk to the deer mouse from mercury exposure is expected to be negligible, as indicated by the HQs for the inorganic form of this element.

The use of the maximum concentrations as the basis for estimating exposure results in conservative HQ values. For the evaluation of ecological risk, mean concentrations, as conservatively estimated by the UCL of the mean (Appendix 2), provide a more realistic quantification of actual risk. Of the metals that result in HQs greater than unity for one or more of the ecological receptors, the UCL concentrations result in values less than the corresponding background screening levels. The HQs for chromium VI and selenium, based upon the UCL concentrations (0.77 and 0.43 mg/kg, respectively), are below the background levels shown in Table 4. Similarly, the UCL concentrations for arsenic and barium (4.9 and 144 mg/kg, respectively) only marginally exceed the background screening levels of 5.6 and 130 mg/kg, respectively. Therefore, the potential risk to ecological receptors from exposures to arsenic and barium, based upon the UCL concentrations of these COPECs, is only marginally higher than that from background exposure, and for this reason is considered negligible.

Exposure of plants to the UCL concentrations of chromium (31.7 mg/kg), copper (89.3 mg/kg), lead (62.3 mg/kg), and mercury (0.713 mg/kg) results in HQs of 31.7, 0.89, 1.2, and 2.4, respectively. Similarly, exposures of deer mice to the UCL concentrations of copper, mercury, chrysene (0.073 mg/kg), pentachlorophenol (0.12 mg/kg), and phenanthrene (0.066 mg/kg) reduce all HQs to values less than 1, with the exception of organic mercury. Under the conservative assumption that all mercury at the CWL SOB is in organic form, the HQs for the deer mouse and the burrowing owl are reduced to 1.8 and 10, respectively, when based upon exposure to the UCL of the mean concentration. Finally, when burrowing owl exposure to bis(2-ethylhexyl) phthalate is based upon the UCL of this compound (0.55 mg/kg), the HQ is

Table 20
HQs for Ecological Receptors Exposed to Background Concentrations at the CWL SOB

COPEC	Plant HQ[a]	Deer Mouse HQ (Herbivorous)[a]	Deer Mouse HQ (Omnivorous)[a]	Deer Mouse HQ (Insectivorous)[a]	Burrowing Owl HQ[a]
Inorganic					
Arsenic	4.4E-1	3.1E-1	**2.8E+0**	**5.2E+0**	2.2E-3
Barium	4.3E-1	5.4E-1	**1.9E+0**	**3.2E+0**	2.3E-2
Beryllium	6.5E-2	2.4E-3	4.1E-2	8.0E-2	–
Cadmium	3.0E-1	4.2E-2	4.4E-2	4.6E-2	1.5E-3
Chromium (total)	**1.6E+1**	2.8E-5	4.9E-5	6.9E-5	5.3E-2
Chromium VI	1.0E+0	1.5E-3	2.5E-3	3.6E-3	–
Copper	1.5E-1	4.0E-1	4.4E-1	2.2E-2	1.2E-4
Lead	2.4E-1	1.3E-2	1.0E-2	7.0E-3	6.9E-3
Mercury (Organic)	3.3E-1	2.5E-1	2.5E-1	2.5E-1	**1.4E+0**
Nickel	3.8E-1	5.0E-3	7.1E-3	9.1E-3	4.3E-4
Selenium	1.0E+0	2.1E-1	3.1E-1	4.1E-1	6.6E-2
Silver	5.0E-1	4.6E-3	2.9E-3	1.2E-3	–
HI[b]	**2.0E+1**	**1.3E+0**	**5.3E+0**	**9.2E+0**	**1.6E+0**

[a]**Bold** values indicate the HQ or HI exceeds unity.
[b]The HI is the sum of individual HQs.
COPEC = Constituent of potential ecological concern.
CWL = Chemical Waste Landfill.
HI = Hazard index.
HQ = Hazard quotient.
SOB = Site Operational Boundary.
– = Insufficient toxicity data available for risk estimation purposes.

reduced to 3.6. Therefore, when based upon the UCL of the mean concentrations, all HQs for the COPECs at the CWL SOB are reduced to values less than 5 with the exceptions of exposure to organic mercury in the burrowing owl and to chromium in plants. These levels of potential risk are considered low and unlikely to have insignificant ecological impact.

The two HQs that are greater than unity for the burrowing owl (bis[2-ethylhexyl] phthalate and organic mercury) are based upon the assumption that all prey eaten by the owl comes from the area of contamination. Because the home range of the burrowing owl is greater than 35 acres and the area of the CWL SOB is 11.4 acres, it is expected that no more than 5 percent of the owl's prey would come from the area of potential exposure to COPECs. Adjusting the quantity of prey taken from the site to 5 percent of the total prey eaten by the owl reduces the HQ value for bis(2-ethylhexyl) phthalate to approximately 0.19 and that for organic mercury to 0.54 (based upon the UCL concentrations of both constituents). Therefore, the risk to the burrowing owl is within NMED guidelines when more realistic assumptions of area use and exposure concentration are used in the calculation of HQs for bis(2-ethylhexyl) phthalate and mercury, regardless of the form in which mercury occurs at the site.

Based upon this uncertainty analysis, the potential for ecological risk at the CWL SOB is generally low. Although conservatively estimated exposures of ecological receptors to COPECs resulted in some HQs greater than unity, the incorporation of more realistic assumptions into the estimation of ecological risk for the CWL SOB results in predictions of potential risk that are low and within acceptable ranges.

VII.3.6 Risk Interpretation

Ecological risks associated with the CWL SOB are estimated through a screening assessment that incorporates site-specific information when available. Overall, risks to ecological receptors are expected to be low because predicted risks associated with exposure to COPECs are based upon calculations using maximum detected values. The UCL concentrations of arsenic, barium, and total chromium are close to, or within, background ranges. The application of more realistic assumptions of mean concentration (as estimated by the UCL of the mean) and limited site use by the burrowing owl result in all HQs being less than 5. It is likely, however, that these HQs overestimate actual risk because of the conservative assumptions incorporated into the assessment. Based upon this final analysis, ecological risks associated with the CWL SOB are expected to be low.

VII.3.7 Screening Assessment Scientific/Management Decision Point

After potential ecological risks associated with the CWL SOB have been assessed, a decision is made regarding whether the area should be recommended for closure or whether additional data should be collected to assess actual ecological risk more thoroughly. With respect to this area, ecological risks are predicted to be low. The scientific/management decision is to recommend the CWL SOB for closure.

VIII. References

Baes, III, C.F., R.D. Sharp, A.L. Sjoreen, and R.W. Shor, 1984. "A Review and Analysis of Parameters for Assessing Transport of Environmentally Released Radionuclides through Agriculture," ORNL-5786, Oak Ridge National Laboratory, Oak Ridge, Tennessee.

Baker, D.A., and J.K. Soldat, 1992. "Methods for Estimating Doses to Organisms from Radioactive Materials Released into the Aquatic Environment," PNL-8150, Pacific Northwest Laboratory, Richland, Washington.

Bearzi, J.P. (New Mexico Environment Department), January 2001. Memorandum to RCRA-Regulated Facilities, "Risk-Based Screening Levels for RCRA Corrective Action Sites in New Mexico," Hazardous Waste Bureau, New Mexico Environment Department, Santa Fe, New Mexico. January 23, 2001.

Callahan, M.A., M.W. Slimak, N.W. Gabel, I.P. May, C.F. Fowler, J.R. Freed, P. Jennings, R.L. Durfee, F.C. Whitmore, B. Maestri, W.R. Mabey, B.R. Holt, and C. Gould, 1979. "Water-Related Environmental Fate of 129 Priority Pollutants," EPA-440/4-79-029, Office of Water and Waste Management, Office of Water Planning and Standards, U.S. Environmental Protection Agency, Washington, D.C.

Connell, D.W., and R.D. Markwell, 1990. "Bioaccumulation in the Soil to Earthworm System," *Chemosphere*, Vol. 20, Nos. 1–2, pp. 91–100.

Cooke, G. (U.S. Environmental Protection Agency), June 2002. Letter to M.J. Zamorski (U.S. Department of Energy), "Approval of the TSCA Risk-Based Approach Request for the CWL." June 26, 2002.

Dinwiddie, R.S. (New Mexico Environment Department), September 1997. Letter to M.J. Zamorski (U.S. Department of Energy), "Request for Supplemental Information: Background Concentrations Report, SNL/KAFB." September 24, 1997.

DOE, see U.S. Department of Energy.

Dunning, J.B., 1993. *CRC Handbook of Avian Body Masses*, CRC Press, Boca Raton, Florida.

Efroymson, R.A., M.E. Will, G.W. Suter II, and A.C. Wooten, 1997. "Toxicological Benchmarks for Screening Potential Contaminants of Concern for Effects on Terrestrial Plants: 1997 Revision," ES/ER/TM-85/R3, Oak Ridge National Laboratory, Oak Ridge, Tennessee.

EPA, see U.S. Environmental Protection Agency.

Haug, E.A., B.A. Millsap, and M.S. Martell, 1993. "*Speotyto cunicularia* Burrowing Owl," *in* A. Poole and F. Gill (eds.), *The Birds of North America*, No. 61, The Academy of Natural Sciences of Philadelphia.

Howard, P.H., 1989. Vol. 1: "Large Production and Priority Pollutants," *Handbook of Environmental Fate and Exposure Data for Organic Chemicals*, Lewis Publishers, Inc., Chelsea, Michigan.

Howard, P.H., 1990. Vol. II: "Solvents," *Handbook of Environmental Fate and Exposure Data for Organic Chemicals*, Lewis Publishers, Inc., Chelsea, Michigan.

Howard, P.H., 1993. Volume IV: "Solvents 2," *Handbook of Environmental Fate and Exposure Data for Organic Chemicals*, Lewis Publishers, Inc., Chelsea, Michigan.

IAEA, see International Atomic Energy Agency.

International Atomic Energy Agency (IAEA), 1992. "Effects of Ionizing Radiation on Plants and Animals at Levels Implied by Current Radiation Protection Standards," *Technical Report Series* No. 332, International Atomic Energy Agency, Vienna, Austria.

International Atomic Energy Agency (IAEA), 1994. "Handbook of Parameter Values for the Prediction of Radionuclide Transfer in Temperate Environments," *Technical Reports Series* No. 364, International Atomic Energy Agency, Vienna, Austria.

IT, see IT Corporation.

IT Corporation (IT), July 1998. "Predictive Ecological Risk Assessment Methodology, Environmental Restoration Program, Sandia National Laboratories, New Mexico," IT Corporation, Albuquerque, New Mexico.

Kieling, J.E. (New Mexico Environment Department), September 2004. Letter to P. Wagner (U.S. Department of Energy) and P.B. Davies (Sandia Corporation), "Approval With Conditions of the Landfill Cover Interim Measure at the Chemical Waste Landfill, Sandia National Laboratories, NM5890110518 HWB-SNL-03-013, December 12, 2003."

Kocher, D.C. 1983. "Dose-Rate Conversion Factors for External Exposure to Photon Emitters in Soil," *Health Physics,* Vol. 28, pp. 193–205.

Laws, E. (U.S. Environmental Protection Agency), July 1994. Memorandum to Region Administrators I-X, "Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities," U.S. Environmental Protection Agency, Washington, D.C. July 14, 1994.

Lewis, G.J. (New Mexico Environment Department), April 2000. Letter to M. Zamorski (U.S. Department of Energy) and R.J. Egan (Sandia Corporation), "Approval – Class 2 Closure Plan Modification, Chemical Waste Landfill, Sandia National Laboratories, NM5890110518 HWB-SNL-99-002." April 28, 2000.

Lewis, G.J. (New Mexico Environment Department), September 2000. Letter to M. Zamorski (U.S. Department of Energy) and R.J. Egan (Sandia Corporation), "Approval and Notice of Administrative Completeness: Class 1 Modification of Chemical Waste Landfill Closure Plan, Addendum B, Appendix S – Extension of Site Operational Boundary for Landfill Excavation Voluntary Corrective Measure, Sandia National Laboratories, EPA ID# 5890110518-1, HWB Task# HWB-SNL-00-009." September 29, 2000.

Lewis, G. (New Mexico Environment Department), October 2000. Letter to M.J. Zamorski (U.S. Department of Energy), "Approval of Risk-Based Approach for Excavation of the Chemical Waste Landfill." October 11, 2000.

Ma, W.C. 1982. "The Influence of Soil Properties and Worm-related Factors on the Concentration of Heavy Metals in Earthworms," Pedobiology, Vol. 24, pp. 109–119.

Micromedex, Inc., 1998. "Registry of Toxic Effects of Chemical Substances (RTECS)," Hazardous Substances Databank.

Montgomery, J.H., 1991. *Groundwater Chemicals Desk Reference*, Volume 2, Lewis Publishers, Inc., Chelsea, Michigan.

Nagy, K.A., 1987. "Field Metabolic Rate and Food Requirement Scaling in Mammals and Birds," *Ecological Monographs*, Vol. 57, No. 2, pp. 111–128.

National Council on Radiation Protection and Measurements (NCRP), 1987. "Exposure of the Population in the United States and Canada from Natural Background Radiation," *NCRP Report* No. 94, National Council on Radiation Protection and Measurements, Bethesda, Maryland.

National Council on Radiation Protection and Measurements (NCRP), January 1989. "Screening Techniques for Determining Compliance with Environmental Standards: Releases of Radionuclides to the Atmosphere," *NCRP Commentary* No. 3, Rev., National Council on Radiation Protection and Measurements, Bethesda, Maryland.

National Oceanographic and Atmospheric Administration (NOAA), 1990. Local Climatological Data, Annual Summary with Comparative Data, Albuquerque, New Mexico.

NCRP, see National Council on Radiation Protection and Measurements.

Neleigh, D.W. (U.S. Environmental Protection Agency), October 2000. Letter to M. Zamorski (U.S. Department of Energy), approving the Class 1 modification to the CAMU boundary. October 13, 2000.

Neumann, G., 1976. "Concentration Factors for Stable Metals and Radionuclides in Fish, Mussels and Crustaceans—A Literature Survey," Report 85-04-24, National Swedish Environmental Protection Board.

New Mexico Environment Department (NMED), March 1998. "Risk-Based Decision Tree Description," *in* New Mexico Environment Department, "RPMP Document Requirement Guide," RCRA Permits Management Program, Hazardous and Radioactive Materials Bureau, New Mexico Environment Department, Santa Fe, New Mexico.

New Mexico Environment Department (NMED), February 2004. "Technical Background Document for Development of Soil Screening Levels, Revision 2," Hazardous Waste Bureau and Ground Water Quality Bureau Voluntary Remediation Program, New Mexico Environment Department, Santa Fe, New Mexico.

New Mexico Natural Heritage Program (NMNHP), 1995. "Threatened and Endangered Species Survey of Kirtland Air Force Base, New Mexico," New Mexico Natural Heritage Program, Albuquerque, New Mexico.

NMED, see New Mexico Environment Department.

NMNHP, see New Mexico Natural Heritage Program.

NOAA, see National Oceanographic and Atmospheric Administration.

Oak Ridge National Laboratory (ORNL), 2003. "Risk Assessment Information System," electronic database maintained by Oak Ridge National Laboratory, Oak Ridge, Tennessee.

Olson, K., and W. Moats (New Mexico Environment Department), March 2000. Memorandum to File, "Proposed ER Site 8 Cleanup Levels," Hazardous and Radioactive Materials Bureau, New Mexico Environment Department, Santa Fe, New Mexico.

ORNL, see Oak Ridge National Laboratory.

Sample, B.E., and G.W. Suter II, 1994. "Estimating Exposure of Terrestrial Wildlife to Contaminants," ES/ER/TM-125, Oak Ridge National Laboratory, Oak Ridge, Tennessee.

Sample, B.E., D.M. Opresko, and G.W. Suter II, 1996. "Toxicological Benchmarks for Wildlife: 1996 Revision," ES/ER/TM-86/R3, Risk Assessment Program, Health Sciences Research Division, Oak Ridge National Laboratory, Oak Ridge, Tennessee.

Sandia National Laboratories/New Mexico (SNL/NM), December 1992. "Chemical Waste Landfill Final Closure Plan and Postclosure Permit Application," Sandia National Laboratories, Albuquerque, New Mexico.

Sandia National Laboratories/New Mexico (SNL/NM), February 1998. "RESRAD Input Parameter Assumptions and Justification," Environmental Restoration Project, Sandia National Laboratories, Albuquerque, New Mexico.

Sandia National Laboratories/New Mexico (SNL/NM), November 1998. "Chemical Waste Landfill, Excavation Sampling and Analysis Plan," Sandia National Laboratories, Albuquerque, New Mexico.

Sandia National Laboratories/New Mexico (SNL/NM), March 1999. "Interim Change Notice (ICN) #1 for the Chemical Waste Landfill Excavation Sampling and Analysis Plan," Sandia National Laboratories, Albuquerque, New Mexico.

Sandia National Laboratories/New Mexico (SNL/NM), July 1999. "Class 2 Modification: Addendum B to Appendix S of the CWL Closure Plan," Sandia National Laboratories, Albuquerque, New Mexico.

Sandia National Laboratories/New Mexico (SNL/NM), August 2000. "Risk-Based Approach for Excavation and Backfilling of the Chemical Waste Landfill," Sandia National Laboratories, Albuquerque, New Mexico.

Sandia National Laboratories/New Mexico (SNL/NM), December 2000. "Interim Change Notice (ICN) #2 for the Chemical Waste Landfill Excavation Sampling and Analysis Plan," Sandia National Laboratories, Albuquerque, New Mexico.

Sandia National Laboratories/New Mexico (SNL/NM), July 2001. "Interim Change Notice (ICN) #3 for the Chemical Waste Landfill Excavation Sampling and Analysis Plan," Sandia National Laboratories, Albuquerque, New Mexico.

Sandia National Laboratories/New Mexico (SNL/NM), December 2001. "Interim Change Notice (ICN) #4 for the Chemical Waste Landfill Excavation Sampling and Analysis Plan," Sandia National Laboratories, Albuquerque, New Mexico.

Sandia National Laboratories/New Mexico (SNL/NM), April 2003. "Chemical Waste Landfill, Landfill Excavation Voluntary Corrective Measure Final Report," Environmental Restoration Project, Sandia National Laboratories, Albuquerque, New Mexico.

Sandia National Laboratories/New Mexico (SNL/NM), December 2003. "Data Validation Procedure for Chemical and Radiochemical Data" (AOP 00-03) Rev. 01, Environmental Restoration Project, Sandia National Laboratories, Albuquerque, New Mexico.

Sandia National Laboratories/New Mexico (SNL/NM), December 2004. "Chemical Waste Landfill Corrective Measure Study Report, December 2004, Final," Sandia National Laboratories, Albuquerque, New Mexico.

Silva, M., and J.A. Downing, 1995. *CRC Handbook of Mammalian Body Masses*, CRC Press, Boca Raton, Florida.

SNL/NM, see Sandia National Laboratories/New Mexico.

Stafford, E.A., J.W. Simmers, R.G. Rhett, and C.P. Brown, 1991. "Interim Report: Collation and Interpretation of Data for Times Beach Confined Disposal Facility, Buffalo, New York," *Miscellaneous Paper* D-91-17, U.S. Army Corps of Engineers, Buffalo, New York.

Tharp, T.L. (Sandia National Laboratories/New Mexico), February 1999. Memorandum to F.B. Nimick (Sandia National Laboratories/New Mexico), "Tritium Background Data Statistical Analysis for Site-Wide Surface Soils." February 25, 1999.

Travis, C.C., and A.D. Arms, 1988. "Bioconcentration of Organics in Beef, Milk, and Vegetables," *Environmental Science and Technology*, Vol. 22, No. 3, pp. 271–274.

U.S. Department of Energy (DOE), 1988. "External Dose-Rate Conversion Factors for Calculation of Dose to the Public," DOE/EH-0070, Assistant Secretary for Environment, Safety and Health, U.S. Department of Energy, Washington, D.C.

U.S. Department of Energy (DOE), 1993. DOE Order 5400.5, "Radiation Protection of the Public and the Environment," U.S. Department of Energy, Washington, D.C.

U.S. Department of Energy (DOE), 1995. "Hanford Site Risk Assessment Methodology," DOE/RL-91-45 (Rev. 3), U.S. Department of Energy, Richland, Washington.

U.S. Department of Energy, U.S. Air Force, and U.S. Forest Service, September 1995. "Workbook: Future Use Management Area 2," prepared by the Future Use Logistics and Support Working Group in cooperation with the U.S. Department of Energy Affiliates, the U.S. Air Force, and the U.S. Forest Service.

U.S. Environmental Protection Agency (EPA), 1988. "Federal Guidance Report No. 11, Limiting Values of Radionuclide Intake and Air Concentration and Dose Conversion Factors for Inhalation, Submersion, and Ingestion," Office of Radiation Programs, U.S. Environmental Protection Agency, Washington, D.C.

U.S. Environmental Protection Agency (EPA), 1989. "Risk Assessment Guidance for Superfund, Vol. I: Human Health Evaluation Manual," EPA/540-1089/002, Office of Emergency and Remedial Response, U.S. Environmental Protection Agency, Washington, D.C.

U.S. Environmental Protection Agency (EPA), 1991. "Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part B)," Office of Emergency and Remedial Response, U.S. Environmental Protection Agency, Washington, D.C.

U.S. Environmental Protection Agency (EPA), 1993. "Wildlife Exposure Factors Handbook, Volume I of II," EPA/600/R-93/187a, Office of Research and Development, U.S. Environmental Protection Agency, Washington, D.C.

U.S. Environmental Protection Agency (EPA), 1997a. "Health Effects Assessment Summary Tables (HEAST), FY 1997 Update," EPA-540-R-97-036, Office of Research and Development and Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, Washington, D.C.

U.S. Environmental Protection Agency (EPA), 1997b. "Establishment of Cleanup Levels for CERCLA Sites with Radioactive Contamination," OSWER Directive No. 9200.4-18, Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, Washington, D.C.

U.S. Environmental Protection Agency (EPA), 1997c. "Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risks," Interim Final, U.S. Environmental Protection Agency, Washington, D.C.

U.S. Environmental Protection Agency (EPA), 1998. "Guidelines for Ecological Risk Assessment," EPA/630/R-95/002F, Risk Assessment Forum, U.S. Environmental Protection Agency, Washington, D.C.

U.S. Environmental Protection Agency (EPA), 2002a. "Region 9 Preliminary Remediation Goals (PRGs) 2002," electronic database maintained by Region 9, U.S. Environmental Protection Agency, San Francisco, California.

U.S. Environmental Protection Agency (EPA), 2002b. "Risk-Based Concentration Table," electronic database maintained by Region 3, U.S. Environmental Protection Agency, Philadelphia, Pennsylvania.

U.S. Environmental Protection Agency (EPA), 2004a. Integrated Risk Information System (IRIS) electronic database, maintained by the U.S. Environmental Protection Agency, Washington D.C.

U.S. Environmental Protection Agency (EPA), 2004b. "EPA Region 6 Human Health Screening Value Table," electronic database maintained by Region 6, U.S. Environmental Protection Agency, Dallas, Texas.

U.S. Fish and Wildlife Service (USFWS), September 1995. "Migratory Nongame Birds of Management Concern in the United States: The 1995 List," Office of Migratory Bird Management, U.S. Fish and Wildlife Service, Washington, D.C.

USFWS, see U.S. Fish and Wildlife Service.

Whicker, F.W., and V. Schultz, 1982. *Radioecology: Nuclear Energy and the Environment*, Vol. 2, CRC Press, Boca Raton, Florida.

Yanicak, S. (Oversight Bureau, Department of Energy, New Mexico Environment Department), March 1997. Letter to M. Johansen (DOE/AIP/POC Los Alamos National Laboratory), "(Tentative) list of constituents of potential ecological concern (COPECs) which are considered to be bioconcentrators and/or biomagnifiers." March 3, 1997.

Yu, C., A.J. Zielen, J.-J. Cheng, Y.C. Yuan, L.G. Jones, D.J. LePoire, Y.Y. Wang, C.O. Loureiro, E. Gnanapragasam, E. Faillace, A. Wallo III, W.A. Williams, and H. Peterson, 1993a. "Manual for Implementing Residual Radioactive Material Guidelines Using RESRAD," Version 5.0. Environmental Assessment Division, Argonne National Laboratory, Argonne, Illinois.

Yu, C., C. Loureiro, J.-J. Cheng, L.G. Jones, Y.Y. Wang, Y.P. Chia, and E. Faillace, 1993b. "Data Collection Handbook to Support Modeling the Impacts of Radioactive Material in Soil," ANL/EAIS-8, Argonne National Laboratory, Argonne, Illinois.

APPENDIX 1
EXPOSURE PATHWAY DISCUSSION FOR CHEMICAL AND RADIONUCLIDE CONTAMINATION

Introduction

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 land-use 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 water	Ingestion of contaminated drinking water	Ingestion of contaminated drinking water
Ingestion of contaminated soil	Ingestion of contaminated soil	Ingestion of contaminated soil
Inhalation of airborne compounds (vapor phase or particulate)	Inhalation of airborne compounds (vapor phase or particulate)	Inhalation of airborne compounds (vapor phase or particulate)
Dermal contact (nonradiological constituents only) soil only	Dermal contact (nonradiological constituents only) soil only	Dermal contact (nonradiological constituents only) soil only
External exposure to penetrating radiation from ground surfaces	External exposure to penetrating radiation from ground surfaces	External exposure to penetrating radiation from 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 II 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 x (CR x EFD/BW/AT) x 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 from soil ingestion (milligrams [mg]/kilogram [kg]-day)
C_s = Chemical concentration in soil (mg/kg)
IR = Ingestion rate (mg soil/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):

$$I_s = \frac{C_s * IR * EF * ED * \left(1/VF \text{ or } 1/PEF \right)}{BW * AT}$$

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 [m^3]/day)
EF = Exposure frequency (days/year)
ED = Exposure duration (years)
VF = soil-to-air volatilization factor (m^3/kg)
PEF = particulate emission factor (m^3/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 (cm^2/event)
AF = Soil to skin adherence factor (mg/cm^2)
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 Ingestion

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 = volatilization factor (0.5 L/m^3)
IR_i = Inhalation rate (m^3/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			
Exposure Frequency (day/yr)	250[a,b]	8.7 (4 hr/wk for 52 wk/yr)[a,b]	350[a,b]
Exposure Duration (yr)	25[a,b,c]	30[a,b,c]	30[a,b,c]
Body Weight (kg)	70[a,b,c]	70 Adult[a,b,c] 15 Child[a,b,c]	70 Adult[a,b,c] 15 Child[a,b,c]
Averaging Time (days) for Carcinogenic Compounds (= 70 yr x 365 day/yr) for Noncarcinogenic Compounds (= ED x 365 day/yr)	25,550[a,b] 9,125 [a,b]	25,550[a,b] 10,950[a,b]	25,550 [a,b] 10,950 [a,b]
Soil Ingestion Pathway			
Ingestion Rate (mg/day)	100[a,b]	200 Child[a,b] 100 Adult[a,b]	200 Child [a,b] 100 Adult [a,b]
Inhalation Pathway			
Inhalation Rate (m^3/day)	20[a,b]	15 Child[a] 30 Adult[a]	10 Child[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			
Ingestion Rate (liter/day)	2.4[a]	2.4[a]	2.4[a]
Dermal Pathway			
Skin Adherence Factor (mg/cm^2)	0.2[a]	0.2 Child[a] 0.07 Adult[a]	0.2 Child[a] 0.07 Adult[a]
Exposed Surface Area for Soil/Dust (cm^2/day)	3,300[a]	2,800 Child[a] 5,700 Adult[a]	2,800 Child[a] 5,700 Adult[a]
Skin Adsorption Factor	Chemical Specific	Chemical Specific	Chemical Specific

[a]Technical Background Document for Development of Soil Screening Levels (NMED 2000).
[b]Risk Assessment Guidance for Superfund, Vol. 1, Part B (EPA 1991).
[c]Exposure Factors Handbook (EPA August 1997).
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).

Table 3
Default Radiological Exposure Parameter Values for Various Land-Use Scenarios

Parameter	Industrial	Recreational	Residential
General Exposure Parameters			
Exposure Frequency	8 hr/day for 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[c]
Ingestion Rate, Fruits, Non-Leafy Vegetables & Grain (kg/yr)	NA	NA	101.8[b]
Fraction Ingested	NA	NA	0.25[b,d]

[a]Risk Assessment Guidance for Superfund, Vol. 1, Part B (EPA 1991).
[b]Exposure Factors Handbook (EPA August 1997).
[c]EPA Region VI guidance (EPA 1996).
[d]For radionuclides, RESRAD (ANL 1993).
[e]SNL/NM (February 1998).
EPA = U.S. Environmental Protection Agency.
g = Gram(s)
hr = Hour(s).
kg = Kilogram(s).
m = Meter(s).
mg = Milligram(s).
NA = Not applicable.
wk = Week(s).
yr = Year(s).

References

ANL, see Argonne National Laboratory.

Argonne National Laboratory (ANL), 1993. *Manual for Implementing Residual Radioactive Material Guidelines Using RESRAD*, Version 5.0, ANL/EAD/LD-2, Argonne National Laboratory, Argonne, IL.

DOE, see U.S. Department of Energy.

DOE and USAF, see U.S. Department of Energy and U.S. Air Force.

EPA, see U.S. Environmental Protection Agency.

New Mexico Environment Department (NMED), March 2000. "Assessing Human Health Risks Posed by Chemical: Screening-level Risk Assessment," Hazardous and Radioactive Materials Bureau, NMED, March 6, 2000.

New Mexico Environment Department (NMED), December 2000. "Technical Background Document for Development of Soil Screening Levels," Hazardous Waste Bureau and Ground Water Quality Bureau Voluntary Remediation Program, December 18, 2000.

Sandia National Laboratories/New Mexico (SNL/NM), February 1998. "RESRAD Input Parameter Assumptions and Justification," Sandia National Laboratories/New Mexico Environmental Restoration Project, Albuquerque, New Mexico.

U.S. Department of Energy (DOE), 1993. DOE Order 5400.5, "Radiation Protection of the Public and the Environment," U.S. Department of Energy, Washington, D.C.

U.S. Department of Energy (DOE), 1996. "Environmental Assessment of the Environmental Restoration Project at Sandia National Laboratories/New Mexico," U.S. Department of Energy, Kirtland Area Office.

U.S. Department of Energy, U.S. Air Force, and U.S. Forest Service, September 1995. "Workbook: Future Use Management Area 2," prepared by the Future Use Logistics and Support Working Group in cooperation with U.S. Department of Energy Affiliates, the U.S. Air Force, and the U.S. Forest Service.

U.S. Department of Energy, U.S. Air Force, and U.S. Forest Service, October 1995. "Workbook: Future Use Management Area 1," prepared by the Future Use Logistics and Support Working Group in cooperation with U.S. Department of Energy Affiliates, the U.S. Air Force, and the U.S. Forest Service.

U.S. Department of Energy and U.S. Air Force (DOE and USAF), January 1996. "Workbook: Future Use Management Areas 3,4,5,and 6," prepared by the Future Use Logistics and Support Working Group in cooperation with U.S. Department of Energy Affiliates, and the U.S. Air Force.

U.S. Department of Energy and U.S. Air Force (DOE and USAF), March 1996. "Workbook: Future Use Management Area 7," prepared by the Future Use Logistics and Support Working Group in cooperation with U.S. Department of Energy Affiliates and the U.S. Air Force.

U.S. Environmental Protection Agency (EPA), 1989. "Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual," EPA/540-1089/002, U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, Washington, D.C.

U.S. Environmental Protection Agency (EPA), 1991. "Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part B)," EPA/540/R-92/003, U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, Washington, D.C.

U.S. Environmental Protection Agency (EPA), 1992. "Dermal Exposure Assessment: Principles and Applications," EPA/600/8-91/011B, Office of Research and Development, Washington, D.C.

U.S. Environmental Protection Agency (EPA), 1996. "Soil Screening Guidance: Technical Background Document," EPA/540/1295/128, Office of Solid Waste and Emergency Response, Washington, D.C.

U.S. Environmental Protection Agency (EPA), August 1997. *Exposure Factors Handbook*, EPA/600/8-89/043, U.S. Environmental Protection Agency, Office of Health and Environmental Assessment, Washington, D.C.

U.S. Environmental Protection Agency (EPA), 1997. (OSWER No. 9200.4-18) *Establishment of Cleanup Levels for CERCLA Sites with Radioactive Contamination*, U.S. EPA Office of Radiation and Indoor Air, Washington D.C, August 1997.

Sandia National Laboratories/New Mexico (SNL/NM), January 2000. "Data Validation Procedure for Chemical and Radiochemical Data, Sandia National Laboratories/New Mexico Environmental Restoration Project, Administrative Operating Procedure (AOP) 00-03," Sandia National Laboratories, Albuquerque, New Mexico.

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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 December 2000). 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

EPA, see U.S. Environmental Protection Agency.

New Mexico Environment Department (NMED), December 2000. "Technical Background Document for Development of Soil Screening Levels," Hazardous Waste Bureau and Ground Water Quality Bureau Voluntary Remediation Program, New Mexico Environment Department, Santa Fe, New Mexico. December 18, 2000.

NMED, see New Mexico Environment Department.

Tharp, T. (Weston Solutions, Inc.), June 2002. *Personal communication* with K. Olsen (Hazardous Waste Bureau, New Mexico Environment Department). June 12, 2002.

U.S. Environmental Protection Agency (EPA), April 2002. *ProUCL User's Guide*, U.S. Environmental Protection Agency, Washington, D.C.

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ATTACHMENT

Human Health and Ecological CWL SOB			
Summary Statistics for		Arsenic	
Number of Samples		127	
Minimum		2.62	
Maximum		8.5	
Mean		4.263	
Median		4	
Standard Deviation		1.123	
Variance		1.262	
Coefficient of Variation		0.263	
Skewness		1.894	
Lilliefors Test Statistic		0.104	
Lilliefors 5% Critical Value		0.079	
Data not Lognormal at 5% Significance Level			
Data not Normal: Try Non-parametric UCL			
97.5	% UCL (Assuming Normal Data)		
Student's-t		4.461	
97.5	% UCL (Adjusted for Skewness)		
Adjusted-CLT		4.483	
Modified-t		4.463	
97.5	% Non-parametric UCL		
CLT		4.459	
Jackknife		4.461	
Standard Bootstrap		4.457	
Bootstrap-t		4.496	
Chebyshev (Mean, Std)		4.886	

Ecological CWL SOB			
Summary Statistics for		Barium	
Number of Samples		127	
Minimum		68.5	
Maximum		202	
Mean		119.95	
Median		119	
Standard Deviation		27.66	
Variance		764.97	
Coefficient of Variation		0.231	
Skewness		0.465	
Lilliefors Test Statistic		0.09	
Lilliefors 5% Critical Value		0.08	
Data not Lognormal at 5% Significance Level			
Data not Normal: Try Non-parametric UCL			
99	% UCL (Assuming Normal Data)		
Student's-t		125.73	
99	% UCL (Adjusted for Skewness)		
Adjusted-CLT		125.86	
Modified-t		125.75	
99	% Non-parametric UCL		
CLT		125.66	
Jackknife		125.73	
Standard Bootstrap		125.59	
Bootstrap-t		125.58	
Chebyshev (Mean, Std)		144.37	

Ecological CWL SOB			
Summary Statistics for		Chromium	
Number of Samples		127	
Minimum		7.49	
Maximum		181	
Mean		16.72	
Median		12.5	
Standard Deviation		16.97	
Variance		288.06	
Coefficient of Variation		1.02	
Skewness		7.65	
Lilliefors Test Statistic		0.17	
Lilliefors 5% Critical Value		0.08	
Data not Lognormal at 5% Significance Level			
Data not Normal: Try Non-parametric UCL			
99	% UCL (Assuming Normal Data)		
Student's-t		20.27	
99	% UCL (Adjusted for Skewness)		
Adjusted-CLT		22.23	
Modified-t		20.44	
99	% Non-parametric UCL		
CLT		20.22	
Jackknife		20.27	
Standard Bootstrap		20.29	
Bootstrap-t		24.14	
Chebyshev (Mean, Std)		31.70	

Ecological CWL SOB			
Summary Statistics for		Chromium VI	
Number of Samples		123	
Minimum		0.026	
Maximum		6.030	
Mean		0.395	
Median		0.076	
Standard Deviation		0.950	
Variance		0.903	
Coefficient of Variation		2.403	
Skewness		4.447	
Lilliefors Test Statistic		0.208	
Lilliefors 5% Critical Value		0.080	
Data not Lognormal at 5% Significance Level			
Data not Normal: Try Non-parametric UCL			
95	% UCL (Assuming Normal Data)		
Student's-t		0.537	
95	% UCL (Adjusted for Skewness)		
Adjusted-CLT		0.573	
Modified-t		0.543	
95	% Non-parametric UCL		
CLT		0.536	
Jackknife		0.537	
Standard Bootstrap		0.532	
Bootstrap-t		0.610	
Chebyshev (Mean, Std)		0.769	

Human Health and Ecological CWL SOB			
Summary Statistics for		Copper	
Number of Samples		127	
Minimum		4.53	
Maximum		895	
Mean		19.76	
Median		9.56	
Standard Deviation		78.80	
Variance		6208.81	
Coefficient of Variation		3.99	
Skewness		11.05	
Lilliefors Test Statistic		0.15	
Lilliefors 5% Critical Value		0.08	
Data not Lognormal at 5% Significance Level			
Data not Normal: Try Non-parametric UCL			
99	% UCL (Assuming Normal Data)		
Student's-t		36.23	
99	% UCL (Adjusted for Skewness)		
Adjusted-CLT		49.53	
Modified-t		37.38	
99	% Non-parametric UCL		
CLT		36.02	
Jackknife		36.23	
Standard Bootstrap		35.86	
Bootstrap-t		119.96	
Chebyshev (Mean, Std)		89.33	

Ecological CWL SOB			
Summary Statistics for		Lead	
Number of Samples		127	
Minimum		5.16	
Maximum		338	
Mean		25.91	
Median		13.4	
Standard Deviation		41.25	
Variance		1701.72	
Coefficient of Variation		1.59	
Skewness		5.54	
Lilliefors Test Statistic		0.13	
Lilliefors 5% Critical Value		0.08	
Data not Lognormal at 5% Significance Level			
Data not Normal: Try Non-parametric UCL			
99	% UCL (Assuming Normal Data)		
Student's-t		34.53	
99	% UCL (Adjusted for Skewness)		
Adjusted-CLT		37.97	
Modified-t		34.83	
99	% Non-parametric UCL		
CLT		34.42	
Jackknife		34.53	
Standard Bootstrap		34.67	
Bootstrap-t		44.61	
Chebyshev (Mean, Std)		62.33	

Human Health and Ecological CWL SOB					
Summary Statistics for		Mercury		Summary Statistics for	ln(Mercury)
Number of Samples		127		Minimum	-4.141
Minimum		0.0159		Maximum	2.138
Maximum		8.48		Mean	-1.649
Mean		0.520		Standard Deviation	1.406
Median		0.188		Variance	1.977
Standard Deviation		1.033			
Variance		1.068		Lilliefors Test Statistic	0.076
Coefficient of Variation		1.989		Lilliefors 5% Critical Value	0.079
Skewness		5.178		Data are Lognormal at 5% Significance Level	
95	% UCL (Assuming Normal Data)			Estimates Assuming Lognormal Distribution	
Student's-t		0.672		MLE Mean	0.517
				MLE Standard Deviation	1.289
95	% UCL (Adjusted for Skewness)			MLE Coefficient of Variation	2.495
Adjusted-CLT		0.716		MLE Skewness	23.006
Modified-t		0.679		MLE Median	0.192
				MLE 80% Quantile	0.631
95	% Non-parametric UCL			MLE 90% Quantile	1.171
CLT		0.671		MLE 95% Quantile	1.942
Jackknife		0.672		MLE 99% Quantile	5.061
Standard Bootstrap		0.671			
Bootstrap-t		0.765		MVU Estimate of Median	0.191
Chebyshev (Mean, Std)		0.919		MVU Estimate of Mean	0.509
				MVU Estimate of Std. Dev.	1.191
				MVU Estimate of SE of Mean	0.086
				UCL Assuming Lognormal Distribution	
				95% H-UCL	0.713
				95% Chebyshev (MVUE) UCL	0.886
				99% Chebyshev (MVUE) UCL	1.369
				Recommended UCL to use:	
				H-UCL	

Ecological CWL SOB			
Summary Statistics for		Selenium	
Number of Samples		127	
Minimum		0.072	
Maximum		1.58	
Mean		0.241	
Median		0.2	
Standard Deviation		0.208	
Variance		0.043	
Coefficient of Variation		0.864	
Skewness		2.658	
Lilliefors Test Statistic		0.220	
Lilliefors 5% Critical Value		0.079	
Data not Lognormal at 5% Significance Level			
Data not Normal: Try Non-parametric UCL			
99	% UCL (Assuming Normal Data)		
Student's-t		0.285	
99	% UCL (Adjusted for Skewness)		
Adjusted-CLT		0.293	
Modified-t		0.286	
99	% Non-parametric UCL		
CLT		0.284	
Jackknife		0.285	
Standard Bootstrap		0.285	
Bootstrap-t		0.298	
Chebyshev (Mean, Std)		0.425	

Ecological CWL SOB			
Summary Statistics for		Chrysene	
Number of Samples		127	
Minimum		0.0032	
Maximum		0.5590	
Mean		0.0391	
Median		0.0084	
Standard Deviation		0.0887	
Variance		0.0079	
Coefficient of Variation		2.2697	
Skewness		3.9704	
Lilliefors Test Statistic		0.4476	
Lilliefors 5% Critical Value		0.0786	
Data not Lognormal at 5% Significance Level			
Data not Normal: Try Non-parametric UCL			
95	% UCL (Assuming Normal Data)		
Student's-t		0.0521	
95	% UCL (Adjusted for Skewness)		
Adjusted-CLT		0.0550	
Modified-t		0.0526	
95	% Non-parametric UCL		
CLT		0.0521	
Jackknife		0.0521	
Standard Bootstrap		0.0521	
Bootstrap-t		0.0578	
Chebyshev (Mean, Std)		0.0734	

Ecological CWL SOB			
Summary Statistics for		bis(2-Ethylhexyl) phthalate	
Number of Samples		127	
Minimum		0.004	
Maximum		6.120	
Mean		0.280	
Median		0.067	
Standard Deviation		0.694	
Variance		0.482	
Coefficient of Variation		2.475	
Skewness		5.781	
Lilliefors Test Statistic		0.097	
Lilliefors 5% Critical Value		0.079	
Data not Lognormal at 5% Significance Level			
Data not Normal: Try Non-parametric UCL			
95	% UCL (Assuming Normal Data)		
Student's-t		0.382	
95	% UCL (Adjusted for Skewness)		
Adjusted-CLT		0.415	
Modified-t		0.388	
95	% Non-parametric UCL		
CLT		0.382	
Jackknife		0.382	
Standard Bootstrap		0.379	
Bootstrap-t		0.453	
Chebyshev (Mean, Std)		0.549	

Ecological CWL SOB			
Summary Statistics for		Pentachlorophenol	
Number of Samples		127	
Minimum		0.031	
Maximum		0.660	
Mean		0.093	
Median		0.084	
Standard Deviation		0.070	
Variance		0.005	
Coefficient of Variation		0.755	
Skewness		6.235	
Lilliefors Test Statistic		0.480	
Lilliefors 5% Critical Value		0.079	
Data not Lognormal at 5% Significance Level			
Data not Normal: Try Non-parametric UCL			
95	% UCL (Assuming Normal Data)		
Student's-t		0.103	
95	% UCL (Adjusted for Skewness)		
Adjusted-CLT		0.107	
Modified-t		0.104	
95	% Non-parametric UCL		
CLT		0.103	
Jackknife		0.103	
Standard Bootstrap		0.103	
Bootstrap-t		0.114	
Chebyshev (Mean, Std)		0.120	

Ecological CWL SOB			
Summary Statistics for		Phenanthrene	
Number of Samples		127	
Minimum		0.002	
Maximum		0.916	
Mean		0.027	
Median		0.008	
Standard Deviation		0.103	
Variance		0.011	
Coefficient of Variation		3.875	
Skewness		7.655	
Lilliefors Test Statistic		0.467	
Lilliefors 5% Critical Value		0.079	
Data not Lognormal at 5% Significance Level			
Data not Normal: Try Non-parametric UCL			
95	% UCL (Assuming Normal Data)		
Student's-t		0.042	
95	% UCL (Adjusted for Skewness)		
Adjusted-CLT		0.048	
Modified-t		0.043	
95	% Non-parametric UCL		
CLT		0.042	
Jackknife		0.042	
Standard Bootstrap		0.042	
Bootstrap-t		0.101	
Chebyshev (Mean, Std)		0.066	

ANNEX B
Chemical Waste Landfill Site Operational Boundary
Analytical Results Tables

LIST OF TABLES

Table

B-1 Summary of Confirmatory Soil Sampling, Metals Analytical Results, CWL SOB

B-2 Summary of Confirmatory Soil Sampling, VOC Analytical Results, CWL SOB

B-3 Summary of VOC Analytical MDLs, CWL SOB

B-4 Summary of Confirmatory Soil Sampling, SVOC Analytical Results, CWL SOB

B-5 Summary of SVOC Analytical MDLs, CWL SOB

B-6 Total PCB Analytical Results, CWL SOB

B-7 Summary of PCB Analytical MDLs, CWL SOB

B-8 Summary of Gamma Spectroscopy Analytical Results, CWL SOB

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Table B-1
Summary of Confirmatory Soil Sampling, Metals Analytical Results, CWL SOB

Sample Attributes			Metals (EPA Method 6010B/7196A/7471A/SW846 3050/SW846 7196/SW846 7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Depth (in.)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Chromium (VI)
604708	74-SB-D000-V094	2–4	3.59	93.6	0.532	0.208 J (0.481)	10.9	NR
604708	74-SB-D000-V095	2–4	3.82	94	0.546	0.214 J (0.49)	11.6	NR
604708	74-SB-D000-V110	2–4	3.45	92.7	0.516	0.177 J (0.481)	10.3	NR
604708	74-SB-D000-V111	2–4	3.17	82.5	0.413 J (0.49)	0.154 J (0.49)	**70**	NR
606339	74-SB-E002-F001	2–4	3.45	88.7	0.409 J (0.472)	0.0833 J (0.472)	8.77	0.0882 J (0.101)
606339	74-SB-E002-F002	2–4	3.48	**160**	0.403 J (0.455)	0.105 J (0.455)	8.47	0.0543 J (0.0997)
606339	74-SB-E002-F003	2–4	3.29	122	0.371 J (0.463)	ND (0.0443)	7.49	ND (0.0537)
606339	74-SB-E002-F005	2–4	4.62	**144**	0.454 J (0.455)	0.0918 J (0.455)	12.4	ND (0.0538)
606339	74-SB-E002-F006	2–4	3.83	**169**	0.358 J (0.5)	0.0725 J (0.5)	8.35	ND (0.0538)
606339	74-SB-E002-F008	2–4	4.55	**148**	0.473	0.178 J (0.472)	14.4	0.0755 J (0.0988)
606339	74-SB-E002-F009	2–4	4.2	**174**	0.45 J (0.5)	0.137 J (0.5)	**21.3**	0.941
606339	74-SB-E002-F010	2–4	4.59	**155**	0.407 J (0.459)	0.0907 J (0.459)	9.78	0.0541 J (0.0992)
606339	74-SB-E002-F012	2–4	4	125	0.449 J (0.455)	0.0916 J (0.455)	10.8	ND (0.0537)
606339	74-SB-E002-F013	2–4	4.7	**162**	0.47 J (0.481)	0.198 J (0.481)	**28.3**	ND (0.0538)
606339	74-SB-E002-F014	2–4	NR	**137**	0.442 J (0.455)	0.0972 J (0.455)	11.3	0.142
606649	74-SB-E002-F014-R	4–6	3.47	NR	NR	NR	NR	NR
606339	74-SB-E002-F015	2–4	3.81	**132**	0.437 J (0.455)	0.139 J (0.455)	13.4	0.143
606339	74-SB-E002-F017	2–4	4.39	**152**	0.414 J (0.476)	0.0811 J (0.476)	10.3	ND (0.0528)
606339	74-SB-E002-F018	2–4	4.69	**153**	0.468	0.255 J (0.463)	13.3	0.0986 J (0.1)
606339	74-SB-E002-F019	2–4	5.21	**138**	0.519	0.201 J (0.476)	13.9	ND (0.0537)
606339	74-SB-E002-F020	2–4	4.22	**136**	0.493	0.0507 J (0.467)	10.3	ND (0.0537)
606339	74-SB-E002-F021	2–4	4.08	**140**	0.474 J (0.481)	0.105 J (0.481)	11.1	ND (0.0528)
606339	74-SB-E002-F022	2–4	4.11	**150**	0.467	0.128 J (0.455)	10.7	ND (0.0547)
606339	74-SB-E002-F023	2–4	5.34	**155**	0.484	0.448 J (0.463)	14.3	0.14
606339	74-SB-E002-F024	2–4	4.69	121	0.503	0.11 J (0.49)	13.6	0.0543 J (0.0995)
606381	74-SB-E002-F025	2–4	5.53	121	**0.653**	0.0844 J (0.495)	16.9	0.0622 J (0.0927)
606381	74-SB-E002-F026	2–4	3.75	126	0.473	0.0675 J (0.472)	10.3	ND (0.0528)
606381	74-SB-E002-F027	2–4	4.42	**152**	0.499 J (0.5)	0.0964 J (0.5)	12	0.174
Background Concentration			5.6	130	0.65	<1	17.3	1

Refer to footnotes at end of table.

Table B-1 (Continued)
Summary of Confirmatory Soil Sampling, Metals Analytical Results, CWL SOB

Sample Attributes			Metals (EPA Method 6010B/7196A/7471A/SW846 3050/SW846 7196/SW846 7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Depth (in.)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Chromium (VI)
606381	74-SB-E002-F029	2–4	4.69	**161**	0.595	0.117 J (0.467)	13.1	ND (0.0534)
606381	74-SB-E002-F030	2–4	5.47	119	0.582	0.0493 J (0.459)	12.1	ND (0.0518)
606381	74-SB-E002-F031	2–4	4.58	130	0.578	0.152 J (0.485)	**18.2**	ND (0.055)
606381	74-SB-E002-F032	2–4	4.46	127	0.455 J (0.5)	ND (0.0478)	11	ND (0.0521)
606381	74-SB-E002-F033	2–4	3.86	90.6	0.524	0.0623 J (0.463)	11.7	ND (0.0532)
606381	74-SB-E002-F036	2–4	4.07	127	0.458 J (0.49)	ND (0.0469)	10.1	ND (0.0513)
606381	74-SB-E002-F037	2–4	4.72	**138**	**0.662**	0.118 J (0.455)	14.4	0.118
606382	74-SB-E002-F040	2–4	4.06	**136**	0.389 J (0.495)	0.396 J (0.495)	9.34	ND (0.0551)
606382	74-SB-E002-F042	2–4	4.59	**148**	0.478	0.438 J (0.467)	11.9	ND (0.0521)
606382	74-SB-E002-F043	2–4	3.47	104	0.476 J (0.495)	ND (0.0473)	9.81	ND (0.0545)
606382	74-SB-E002-F044	2–4	4.11	**145**	0.52	0.144 J (0.5)	11.6	ND (0.0545)
606382	74-SB-E002-F045	2–4	3.29	93.4	0.451 J (0.467)	0.0881 J (0.467)	9.66	ND (0.0549)
606382	74-SB-E002-F046	2–4	4.29	116	0.507	0.0521 J (0.455)	10.7	ND (0.0517)
606382	74-SB-E002-F047	2–4	3.91	114	0.49	0.0752 J (0.459)	12.3	ND (0.052)
606382	74-SB-E002-F048	2–4	4.29	**145**	0.552	0.0915 J (0.495)	13	0.481
606382	74-SB-E002-F049	2–4	3.85	97.4	0.521	ND (0.0478)	11.2	ND (0.0517)
606382	74-SB-E002-F050	2–4	4.56	**164**	0.427 J (0.481)	0.092 J (0.481)	11.7	ND (0.0518)
606383	74-SB-E002-F051	2–4	3.86	107	0.481 J (0.495)	ND (0.0473)	9.35	ND (0.0527)
606383	74-SB-E002-F052	2–4	3.86	121	**0.66**	0.138 J (0.485)	14.4	ND (0.0537)
606383	74-SB-E002-F053	2–4	3.49	96.8	0.443 J (0.5)	ND (0.0478)	8.56	ND (0.0542)
606383	74-SB-E002-F054	2–4	3.56	127	0.438 J (0.463)	0.172 J (0.463)	11.6	ND (0.0545)
606383	74-SB-E002-F055	2–4	4	109	0.54	0.0547 J (0.467)	11.2	ND (0.06)
606383	74-SB-E002-F056	2–4	3.93	102	0.416 J (0.455)	0.0709 J (0.455)	10	ND (0.0515)
606383	74-SB-E002-F057	2–4	3.53	95	0.474	ND (0.0451)	11.6	0.0894 J (0.101)
606383	74-SB-E002-F059	2–4	4.25	119	**0.739**	0.0707 J (0.5)	14.3	0.108
606383	74-SB-E002-F066	2–4	3.61	101	0.394 J (0.481)	0.0657 J (0.481)	12.1	0.152
606383	74-SB-E002-F068	2–4	3.89	95.1	0.387 J (0.481)	0.175 J (0.481)	14.4	0.425
606384	74-SB-E002-F069	2–4	4.47	123	0.483 J (0.495)	0.178 J (0.495)	12.7	ND (0.0517)
Background Concentration			5.6	130	0.65	<1	17.3	1

Refer to footnotes at end of table.

Table B-1 (Continued)
Summary of Confirmatory Soil Sampling, Metals Analytical Results, CWL SOB

Sample Attributes			Metals (EPA Method 6010B/7196A/7471A/SW846 3050/SW846 7196/SW846 7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Depth (in.)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Chromium (VI)
606384	74-SB-E002-F070	2–4	3.24	80.8	0.414 J (0.49)	0.0652 J (0.49)	9.7	ND (0.054)
606384	74-SB-E002-F071	2–4	3.59	93.8	0.471 J (0.495)	0.218 J (0.495)	11.4	ND (0.0551)
606384	74-SB-E002-F072	2–4	4.24	102	0.607	0.0593 J (0.485)	12.5	0.896
606384	74-SB-E002-F073	2–4	4.07	103	0.473 J (0.495)	0.0523 J (0.495)	10.8	**4.33**
606384	74-SB-E002-F074	2–4	5.31	118	0.51	0.41 J (0.485)	**22.8**	**1.84**
606384	74-SB-E002-F075	2–4	**7.79**	**148**	0.449 J (0.49)	0.49	**21.2**	ND (0.0524)
606384	74-SB-E002-F076	2–4	4.1	95.6	0.42 J (0.463)	0.393 J (0.463)	15.6	0.0579 J (0.0991)
606384	74-SB-E002-F077	2–4	**6.1**	108	0.595	0.337 J (0.5)	**20.9**	ND (0.0545)
606384	74-SB-E002-F078	2–4	NR	113	0.447 J (0.459)	0.767	**26.8**	0.551
606592	74-SB-E002-F078-R	4–6	**5.64**	NR	NR	NR	NR	NR
607041	74-SB-E002-F090	4–6	**6.1**	**144**	0.47 J (0.52)	0.17 J (0.52)	15.6	ND (0.28)
606397	74-SB-E002-F091	2–4	3.8	**134**	0.396 J (0.49)	0.381 J (0.49)	**21.8**	ND (0.0533)
606397	74-SB-E002-F092	2–4	5.08	121	0.607	**1.09**	**23.3**	0.933
606397	74-SB-E002-F093	2–4	2.62	**131**	0.327 J (0.455)	0.24 J (0.455)	**44.5**	0.398
607041	74-SB-E002-F106	4–6	4.3	102	0.44 J (0.52)	0.19 J (0.52)	14.1	ND (0.28)
606397	74-SB-E002-F107	2–4	**5.85**	**170**	**1.14**	0.674	**39.5**	0.699
606397	74-SB-E002-F108	2–4	**7.94**	**188**	0.554	0.844	**34.9**	**4.59**
606397	74-SB-E002-F109	2–4	3.8	**139**	0.431 J (0.485)	0.154 J (0.485)	**18**	**2.44**
607041	74-SB-E002-F122	4–6	3.5	102	0.52	0.15 J (0.52)	13.6	ND (0.28)
606397	74-SB-E002-F123	2–4	3.99	**132**	0.478 J (0.495)	0.171 J (0.495)	**17.7**	0.703
606397	74-SB-E002-F124	2–4	3.25	**202**	0.366 J (0.476)	0.229 J (0.476)	15.2	0.794
606397	74-SB-E002-F125	2–4	5.25	**148**	0.535	0.734	**24.1**	0.588
606397	74-SB-E002-F126	2–4	4.35	128	0.646	0.121 J (0.49)	14.1	0.999
606397	74-SB-E002-F126-DU	(D)	4.18	126	0.493 J (0.495)	0.176 J (0.495)	16.1	0.97
606421	74-SB-E002-F127	2–4	2.62	68.5	0.39 J (0.485)	0.116 J (0.485)	11.4	0.861
606421	74-SB-E002-F138	2–4	**8.5**	121	0.58	0.446 J (0.472)	**25.4**	0.268
606421	74-SB-E002-F139	2–4	**7.98**	**134**	0.495	0.639	**20.2**	**6.03**
606421	74-SB-E002-F140	2–4	5.08	**147**	0.408 J (0.49)	0.445 J (0.49)	**22.6**	**1.13**
Background Concentration			5.6	130	0.65	<1	17.3	1

Refer to footnotes at end of table.

Table B-1 (Continued)
Summary of Confirmatory Soil Sampling, Metals Analytical Results, CWL SOB

Sample Attributes			Metals (EPA Method 6010B/7196A/7471A/SW846 3050/SW846 7196/SW846 7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Depth (in.)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Chromium (VI)
606421	74-SB-E002-F141	2–4	**6.56**	125	0.541	0.195 J (0.476)	17.3	0.513
606421	74-SB-E002-F142	2–4	NR	**154**	0.488 J (0.495)	**1.97**	**181**	0.3
606592	74-SB-E002-F142-R	4–6	3.47	NR	NR	NR	NR	NR
606421	74-SB-E002-F143	2–4	4.37	**155**	0.422 J (0.485)	0.479 J (0.485)	**33.5**	0.426
607040	74-SB-E002-F154	2–4	4	115	0.55	0.069 J (0.54)	10.8	ND (0.28)
606421	74-SB-E002-F155	2–4	4.91	**158**	0.441 J (0.476)	0.496	**32.2**	**5.52**
606421	74-SB-E002-F156	2–4	4.29	**161**	0.443 J (0.485)	0.637	**33.6**	0.789
606421	74-SB-E002-F157	2–4	5.3	**139**	0.459	0.816	**29.8**	0.559
606421	74-SB-E002-F157-DU	(D)	5.21	127	0.448 J (0.495)	0.57	**30.5**	0.429
605917	74-SB-E002-F158	2–4	3.63	103	0.504	0.244 J (0.495)	16	0.375
605917	74-SB-E002-F159	2–4	3.78	99.6	0.437 J (0.5)	0.212 J (0.5)	**17.8**	0.608
606162	74-SB-E002-F161	2–4	3.58	91.6	0.454 J (0.485)	ND (0.0464)	8.91	0.123
607040	74-SB-E002-F170	4–6	3.8	102	0.55	ND (0.037)	8.7	ND (0.28)
606424	74-SB-E002-F171	2–4	4.65	99.9	0.5	0.786	15.3	0.48
606424	74-SB-E002-F172	2–4	**7.57**	**183**	0.598	**1.82**	**34.2**	0.136
606424	74-SB-E002-F173	2–4	5.23	119	**0.672**	0.171 J (0.459)	16.7	ND (0.0518)
606424	74-SB-E002-F174	2–4	3.11	94.2	0.41 J (0.476)	0.118 J (0.476)	9.68	0.076 J (0.1)
606424	74-SB-E002-F175	2–4	3.79	110	0.505	0.111 J (0.49)	13.8	ND (0.0523)
606424	74-SB-E002-F176	2–4	4.28	95.1	0.47 J (0.495)	0.0974 J (0.495)	9.75	ND (0.053)
606162	74-SB-E002-F177	2–4	3.25	86.1	0.517	ND (0.0478)	9.13	0.181
606424	74-SB-E002-F186	2–4	4.07	**138**	0.54	0.146 J (0.463)	15.3	0.0544 J (0.0973)
606424	74-SB-E002-F187	2–4	3.68	89.6	0.484 J (0.49)	0.219 J (0.49)	**22.4**	0.0635 J (0.0965)
606424	74-SB-E002-F188	2–4	3.17	105	0.575	0.115 J (0.472)	17.2	ND (0.0528)
606424	74-SB-E002-F189	2–4	3.49	99.1	0.605	0.0847 J (0.476)	10.9	0.0752 J (0.099)
606424	74-SB-E002-F189-DU	(D)	3.23	86.6	0.551	0.143 J (0.459)	10.1	ND (0.0527)
606425	74-SB-E002-F190	2–4	3.28	100	0.446 J (0.485)	ND (0.0464)	9.08	0.0545 J (0.0976)
606425	74-SB-E002-F191	2–4	3.09	80.5	0.484	0.108 J (0.481)	11.6	ND (0.0531)
606425	74-SB-E002-F192	2–4	3.12	94.6	0.494	0.121 J (0.49)	13.1	ND (0.0539)
Background Concentration			5.6	130	0.65	<1	17.3	1

Refer to footnotes at end of table.

Table B-1 (Continued)
Summary of Confirmatory Soil Sampling, Metals Analytical Results, CWL SOB

Sample Attributes			Metals (EPA Method 6010B/7196A/7471A/SW846 3050/SW846 7196/SW846 7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Depth (in.)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Chromium (VI)
607039	74-SB-E002-F193	2–4	NR	88.7	0.541	0.121 J (0.476)	10.1	0.295
607147	74-SB-E002-F193-R	4–6	4	NR	NR	NR	NR	NR
606166	74-SB-E002-F202	2–4	3.84	84.8	0.52	0.113 J (0.481)	11.4	0.204
606166	74-SB-E002-F203	2–4	4.32	116	0.572	0.339 J (0.45)	14.2	0.286
606166	74-SB-E002-F204	2–4	2.87	76.8	0.446 J (0.467)	0.579	10	0.205
606166	74-SB-E002-F205	2–4	4.5	103	0.607	ND (0.0469)	14	ND (0.0538)
606425	74-SB-E002-F206	2–4	3.14	108	0.538	0.135 J (0.485)	12.8	ND (0.0543)
606425	74-SB-E002-F207	2–4	4.51	111	0.569	**1.17**	**18.2**	0.0644 J (0.0978)
606425	74-SB-E002-F208	2–4	3.33	84.3	0.481 J (0.495)	0.102 J (0.495)	11.6	0.0765 J (0.101)
607039	74-SB-E002-F209	2–4	3.16	112	0.404 J (0.485)	0.236 J (0.485)	9.01	0.686
606166	74-SB-E002-F216	2–4	3.88	95.7	0.537	0.0514 J (0.495)	10.5	0.111
606166	74-SB-E002-F217	2–4	3.35	76.9	0.473	0.116 J (0.45)	10.5	0.399
606166	74-SB-E002-F218	2–4	3.89	89.7	0.481	0.139 J (0.442)	10.8	0.312
606166	74-SB-E002-F219	2–4	3.58	102	0.513	0.146 J (0.485)	10.7	0.159
606425	74-SB-E002-F220	2–4	3.31	91.3	0.449 J (0.476)	0.243 J (0.476)	13.7	ND (0.0528)
606425	74-SB-E002-F221	2–4	3.58	165	0.469	0.186 J (0.455)	15.1	0.111
606425	74-SB-E002-F222	2–4	3.2	86.5	0.44 J (0.495)	0.105 J (0.495)	12.1	0.0758 J (0.0999)
606425	74-SB-E002-F222-DU	2–4	3.17	80.9	0.418 J (0.5)	0.137 J (0.5)	11.3	0.0634 J (0.0962)
607039	74-SB-E002-F225	2–4	**8.47**	75.5	0.4 J (0.5)	0.187 J (0.5)	8.6	0.373
Background Concentration			5.6	130	0.65	<1	17.3	1

Refer to footnotes at end of table.

Table B-1 (Continued)
Summary of Confirmatory Soil Sampling, Metals Analytical Results, CWL SOB

Sample Attributes			Metals (EPA Method 6010B/7196A/7471A/SW846 3050/SW846 7196/SW846 7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Depth (in.)	Copper	Lead	Mercury	Nickel	Selenium	Silver
604708	74-SB-D000-V094	2–4	8.61	8.43	0.0604	8.28	0.471 J (0.481)	ND (0.111)
604708	74-SB-D000-V095	2–4	8.28	14.5	0.149	8.35	0.863	ND (0.113)
604708	74-SB-D000-V110	2–4	7.75	6.98	**0.774**	8.02	0.454 J (0.481)	ND (0.111)
604708	74-SB-D000-V111	2–4	**29.1**	7.57	0.0998	6.74	0.513	ND (0.113)
606339	74-SB-E002-F001	2–4	5.47	6.37	0.0191	6.17	0.315 J (0.472)	ND (0.0851)
606339	74-SB-E002-F002	2–4	5.57	7.08	0.0501	6	0.147 J (0.455)	ND (0.082)
606339	74-SB-E002-F003	2–4	4.53	5.16	0.0174	5.79	0.324 J (0.463)	ND (0.0835)
606339	74-SB-E002-F005	2–4	8.68	**25**	**0.276**	7.75	0.266 J (0.455)	ND (0.082)
606339	74-SB-E002-F006	2–4	5.11	6.79	0.0715	5.87	ND (0.162)	ND (0.0902)
606339	74-SB-E002-F008	2–4	12.3	16.7	**0.376**	8.98	ND (0.153)	ND (0.0851)
606339	74-SB-E002-F009	2–4	12.5	15.9	**0.404**	7.64	0.179 J (0.5)	ND (0.0902)
606339	74-SB-E002-F010	2–4	5.89	13	0.0595	6.66	ND (0.149)	ND (0.0828)
606339	74-SB-E002-F012	2–4	**40.6**	10.4	**0.832**	8	0.176 J (0.455)	ND (0.082)
606339	74-SB-E002-F013	2–4	**23.1**	**29.8**	**0.376**	7.47	ND (0.156)	ND (0.0867)
606339	74-SB-E002-F014	2–4	7.22	15.2	0.122	7.18	0.459	ND (0.082)
606649	74-SB-E002-F014-R	4–6	NR	NR	NR	NR	NR	NR
606339	74-SB-E002-F015	2–4	12.1	14.5	0.194	7.15	ND (0.147)	0.459
606339	74-SB-E002-F017	2–4	13.5	11.8	0.188	7.75	0.227 J (0.476)	ND (0.0859)
606339	74-SB-E002-F018	2–4	**35.6**	**24.9**	**0.501**	8.81	0.209 J (0.463)	ND (0.0835)
606339	74-SB-E002-F019	2–4	12.2	**22.7**	**0.278**	9.04	0.37 J (0.476)	ND (0.0859)
606339	74-SB-E002-F020	2–4	7.82	10.1	0.091	7.66	ND (0.151)	ND (0.0843)
606339	74-SB-E002-F021	2–4	11.1	11.9	0.164	7.7	ND (0.156)	ND (0.0867)
606339	74-SB-E002-F022	2–4	11.7	11.1	0.187	**12.2**	0.277 J (0.455)	ND (0.082)
606339	74-SB-E002-F023	2–4	11.3	20.5	0.234	8.42	0.162 J (0.463)	ND (0.0835)
606339	74-SB-E002-F024	2–4	13.1	14.3	0.18	8.25	0.338 J (0.49)	ND (0.0884)
606381	74-SB-E002-F025	2–4	10.6	18.3	0.136	10.2	0.532	ND (0.0893)
606381	74-SB-E002-F026	2–4	7.07	10.9	0.0953	7.31	0.426 J (0.472)	ND (0.0851)
606381	74-SB-E002-F027	2–4	10.6	12.5	0.19	8	0.304 J (0.5)	ND (0.0902)
606381	74-SB-E002-F029	2–4	10.8	12.3	**0.61**	10.9	ND (0.151)	0.102 J (0.467)
Background Concentration			15.4	21.4	<0.25	11.5	<1	<1

Refer to footnotes at end of table.

Table B-1 (Continued)
Summary of Confirmatory Soil Sampling, Metals Analytical Results, CWL SOB

Sample Attributes			Metals (EPA Method 6010B/7196A/7471A/SW846 3050/SW846 7196/SW846 7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Depth (in.)	Copper	Lead	Mercury	Nickel	Selenium	Silver
606381	74-SB-E002-F030	2–4	9.29	12.6	0.104	8.76	0.172 J (0.459)	ND (0.0828)
606381	74-SB-E002-F031	2–4	**18.4**	20.1	0.235	9.24	0.275 J (0.485)	0.225 J (0.485)
606381	74-SB-E002-F032	2–4	7.73	12	0.238	6.93	0.2 J (0.5)	ND (0.0902)
606381	74-SB-E002-F033	2–4	7.94	9.68	0.0725	8.4	0.226 J (0.463)	ND (0.0835)
606381	74-SB-E002-F036	2–4	7.07	9.29	0.086	7.12	0.618	ND (0.0884)
606381	74-SB-E002-F037	2–4	11.6	11.9	0.101	9.8	ND (0.147)	ND (0.082)
606382	74-SB-E002-F040	2–4	14.4	9.49	**0.257**	6.72	ND (0.16)	ND (0.0893)
606382	74-SB-E002-F042	2–4	**895**	21.4	**1.03**	**12.6**	0.309 J (0.467)	ND (0.0843)
606382	74-SB-E002-F043	2–4	7.08	7.2	0.0245	7.3	ND (0.16)	ND (0.0893)
606382	74-SB-E002-F044	2–4	13.1	14	**0.388**	9.52	0.239 J (0.5)	ND (0.0902)
606382	74-SB-E002-F045	2–4	7.01	7.49	0.0228	8.49	0.18 J (0.467)	ND (0.0843)
606382	74-SB-E002-F046	2–4	9.56	10.4	**0.278**	9.33	0.302 J (0.455)	ND (0.082)
606382	74-SB-E002-F047	2–4	7.42	10.2	0.0307	7.71	ND (0.149)	ND (0.0828)
606382	74-SB-E002-F048	2–4	13.1	15.7	**0.409**	**12.5**	ND (0.16)	ND (0.0893)
606382	74-SB-E002-F049	2–4	8.24	9.46	0.0315	8.2	0.207 J (0.5)	ND (0.0902)
606382	74-SB-E002-F050	2–4	**17.9**	19	**0.498**	10.8	0.259 J (0.481)	ND (0.0867)
606383	74-SB-E002-F051	2–4	6.06	7.08	0.0159	7.14	ND (0.16)	ND (0.0893)
606383	74-SB-E002-F052	2–4	10.7	18.6	**0.654**	**14.6**	0.392 J (0.485)	ND (0.0876)
606383	74-SB-E002-F053	2–4	6.2	8.57	0.0176	6.43	ND (0.162)	ND (0.0902)
606383	74-SB-E002-F054	2–4	14	**23.4**	**0.806**	**13.5**	ND (0.15)	ND (0.0835)
606383	74-SB-E002-F055	2–4	8.18	11.2	0.042	8.72	0.439 J (0.467)	ND (0.0843)
606383	74-SB-E002-F056	2–4	7.74	10.2	0.0806	6.71	0.152 J (0.455)	ND (0.082)
606383	74-SB-E002-F057	2–4	9.16	9.48	0.0229	7.28	ND (0.153)	ND (0.0851)
606383	74-SB-E002-F059	2–4	10.1	11.8	0.0341	10.7	0.295 J (0.5)	ND (0.0902)
606383	74-SB-E002-F066	2–4	7.95	10.8	0.0315	6.48	0.258 J (0.481)	ND (0.0867)
606383	74-SB-E002-F068	2–4	11.4	18.6	0.245	6.79	0.169 J (0.481)	ND (0.0867)
606384	74-SB-E002-F069	2–4	9.74	17.5	**0.425**	8.05	ND (0.16)	ND (0.0893)
606384	74-SB-E002-F070	2–4	7.4	11.2	0.0328	6.57	0.306 J (0.49)	ND (0.0884)
606384	74-SB-E002-F071	2–4	7.83	15.7	0.204	7.22	0.465 J (0.495)	ND (0.0893)
Background Concentration			15.4	21.4	<0.25	11.5	<1	<1

Refer to footnotes at end of table.

Table B-1 (Continued)
Summary of Confirmatory Soil Sampling, Metals Analytical Results, CWL SOB

Sample Attributes			Metals (EPA Method 6010B/7196A/7471A/SW846 3050/SW846 7196/SW846 7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Depth (in.)	Copper	Lead	Mercury	Nickel	Selenium	Silver
606384	74-SB-E002-F072	2–4	8.91	10.2	0.043	8.65	ND (0.157)	0.17 J (0.485)
606384	74-SB-E002-F073	2–4	7.32	11.8	0.0878	7.31	ND (0.16)	ND (0.0893)
606384	74-SB-E002-F074	2–4	14.5	**36.7**	**0.863**	9.33	0.435 J (0.485)	0.0964 J (0.485)
606384	74-SB-E002-F075	2–4	**20**	**41.4**	**1.16**	9.02	ND (0.159)	ND (0.0884)
606384	74-SB-E002-F076	2–4	11.5	**31.4**	**0.887**	7.16	0.251 J (0.463)	ND (0.0835)
606384	74-SB-E002-F077	2–4	15.1	**40.3**	**0.837**	9.19	0.545	ND (0.0902)
606384	74-SB-E002-F078	2–4	**24.1**	**278**	**2.85**	7.32	0.278 J (0.459)	0.193 J (0.459)
606592	74-SB-E002-F078-R	4–6	NR	NR	NR	NR	NR	NR
607041	74-SB-E002-F090	4–6	11.4	19.9	**0.86**	7	ND (0.213)	0.51 J (1)
606397	74-SB-E002-F091	2–4	**45.3**	**29.8**	0.0618	8.01	ND (0.159)	ND (0.0884)
606397	74-SB-E002-F092	2–4	13.3	**52.4**	**2.29**	9.11	ND (0.149)	ND (0.0828)
606397	74-SB-E002-F093	2–4	**22.5**	11.4	**1.49**	8.46	ND (0.147)	ND (0.082)
607041	74-SB-E002-F106	4–6	11.4	**25.6**	**0.51**	7.4	ND (0.213)	0.06 J (1)
606397	74-SB-E002-F107	2–4	**29.9**	**96.5**	**1.21**	11.1	0.18 J (0.463)	0.244 J (0.463)
606397	74-SB-E002-F108	2–4	**57.5**	**77.5**	**1.83**	**12.4**	0.188 J (0.481)	0.199 J (0.481)
606397	74-SB-E002-F109	2–4	14.5	**25.1**	**8.48**	7.63	ND (0.157)	ND (0.0876)
607041	74-SB-E002-F122	4–6	9.1	17.8	**0.37**	7.5	ND (0.213)	ND (0.0393)
606397	74-SB-E002-F123	2–4	13.6	**46.2**	**1.43**	7.84	ND (0.16)	ND (0.0893)
606397	74-SB-E002-F124	2–4	9.38	**56.4**	**1.12**	6.75	ND (0.154)	ND (0.0859)
606397	74-SB-E002-F125	2–4	**22.3**	**66.3**	**1.34**	10.9	0.2 J (0.49)	0.109 J (0.49)
606397	74-SB-E002-F126	2–4	9.33	19.5	**1.02**	**11.6**	ND (0.159)	ND (0.0884)
606397	74-SB-E002-F126-DU	(D)	10.3	**76**	**1.11**	8.11	ND (0.16)	ND (0.0893)
606421	74-SB-E002-F127	2–4	8.64	9.38	**0.299**	6.03	ND (0.157)	ND (0.0876)
606421	74-SB-E002-F138	2–4	**18.8**	**70.6**	**0.856**	8.13	0.726	0.288 J (0.472)
606421	74-SB-E002-F139	2–4	**40.1**	**75.1**	**0.593**	8.69	0.236 J (0.481)	0.377 J (0.481)
606421	74-SB-E002-F140	2–4	**26.1**	**60.4**	**2.6**	7.67	ND (0.159)	0.125 J (0.49)
606421	74-SB-E002-F141	2–4	**16.9**	**26.7**	**2.39**	9.15	ND (0.154)	0.0929 J (0.476)
606421	74-SB-E002-F142	2–4	**42.7**	**338**	**0.591**	**15**	**1.58**	**1.02**
606592	74-SB-E002-F142-R	4–6	NR	NR	NR	NR	NR	NR
Background Concentration			15.4	21.4	<0.25	11.5	<1	<1

Refer to footnotes at end of table.

Table B-1 (Continued)
Summary of Confirmatory Soil Sampling, Metals Analytical Results, CWL SOB

Sample Attributes			Metals (EPA Method 6010B/7196A/7471A/SW846 3050/SW846 7196/SW846 7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Depth (in.)	Copper	Lead	Mercury	Nickel	Selenium	Silver
606421	74-SB-E002-F143	2–4	**22.5**	**62.9**	**0.64**	8.22	ND (0.157)	0.105 J (0.485)
607040	74-SB-E002-F154	2–4	9.5	10.7	0.1	8.8	ND (0.213)	ND (0.0393)
606421	74-SB-E002-F155	2–4	**27.8**	**48.9**	**1.43**	9.47	ND (0.154)	0.223 J (0.476)
606421	74-SB-E002-F156	2–4	**23.6**	**61**	**2.03**	8.99	ND (0.157)	0.0998 J (0.485)
606421	74-SB-E002-F157	2–4	**16.3**	**52.5**	**0.26**	8.44	ND (0.147)	ND (0.082)
606421	74-SB-E002-F157-DU	(D)	14.8	**42.7**	**0.552**	8.15	ND (0.16)	ND (0.0893)
605917	74-SB-E002-F158	2–4	6.62	**24.6**	0.178	7.19	0.425 J (0.495)	ND (0.0893)
605917	74-SB-E002-F159	2–4	7.88	**27.5**	0.169	6.67	0.204 J (0.5)	ND (0.0902)
606162	74-SB-E002-F161	2–4	5.81	10.7	0.0277	6.7	ND (0.157)	ND (0.0876)
607040	74-SB-E002-F170	4–6	7.7	7.9	0.042	7.7	ND (0.213)	ND (0.0393)
606424	74-SB-E002-F171	2–4	9.67	**22.3**	**0.545**	8.02	0.446 J (0.485)	0.0889 J (0.485)
606424	74-SB-E002-F172	2–4	**35.4**	**127**	**6.02**	**17.6**	0.407 J (0.5)	0.495 J (0.5)
606424	74-SB-E002-F173	2–4	11.8	19.7	**0.284**	10.5	0.486	ND (0.0828)
606424	74-SB-E002-F174	2–4	5.81	10.6	0.107	6.71	0.295 J (0.476)	ND (0.0859)
606424	74-SB-E002-F175	2–4	8.72	13.8	0.192	8.33	0.25 J (0.49)	ND (0.0884)
606424	74-SB-E002-F176	2–4	6.43	7.23	0.0302	6.98	0.242 J (0.495)	ND (0.0893)
606162	74-SB-E002-F177	2–4	8.2	7.1	0.0239	7	0.164 J (0.5)	ND (0.0902)
606424	74-SB-E002-F186	2–4	10.1	10.7	0.0867	8.04	0.224 J (0.463)	ND (0.0835)
606424	74-SB-E002-F187	2–4	13.5	20	**0.336**	8.5	0.561	ND (0.0884)
606424	74-SB-E002-F188	2–4	10.9	12.8	0.0952	9.01	0.437 J (0.472)	ND (0.0851)
606424	74-SB-E002-F189	2–4	7.85	7.18	0.0256	7.72	ND (0.154)	ND (0.0859)
606424	74-SB-E002-F189-DU	(D)	6.8	6.65	0.0213	6.99	ND (0.149)	ND (0.0828)
606425	74-SB-E002-F190	2–4	5.15	7.35	0.108	6.61	0.286 J (0.485)	ND (0.0876)
606425	74-SB-E002-F191	2–4	7.39	10.4	0.0844	7.77	0.235 J (0.481)	ND (0.0867)
606425	74-SB-E002-F192	2–4	8.91	19.1	0.156	7.6	0.431 J (0.49)	ND (0.0884)
607039	74-SB-E002-F193	2–4	8.13	12.2	0.0498	7.86	0.646	0.229 J (0.476)
607147	74-SB-E002-F193-R	4–6	NR	NR	NR	NR	NR	NR
606166	74-SB-E002-F202	2–4	8.27	8.74	**0.386**	7.47	0.283 J (0.481)	ND (0.0867)
606166	74-SB-E002-F203	2–4	9.28	13.9	0.158	8.36	ND (0.146)	0.0893 J (0.45)
Background Concentration			15.4	21.4	<0.25	11.5	<1	<1

Refer to footnotes at end of table.

Table B-1 (Concluded)
Summary of Confirmatory Soil Sampling, Metals Analytical Results, CWL SOB

Sample Attributes			Metals (EPA Method 6010B/7196A/7471A/SW846 3050/SW846 7196/SW846 7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Depth (in.)	Copper	Lead	Mercury	Nickel	Selenium	Silver
606166	74-SB-E002-F204	2–4	6.17	9.28	0.0856	6.24	ND (0.151)	ND (0.0843)
606166	74-SB-E002-F205	2–4	9.26	8.54	0.0577	8.47	ND (0.159)	ND (0.0884)
606425	74-SB-E002-F206	2–4	8.53	10.7	0.0701	8.32	0.578	ND (0.0876)
606425	74-SB-E002-F207	2–4	13.2	**24.9**	**0.266**	11.1	0.556	0.132 J (0.5)
606425	74-SB-E002-F208	2–4	7.81	12.8	0.0539	7.59	0.338 J (0.495)	ND (0.0893)
607039	74-SB-E002-F209	2–4	7.1	9.47	0.0295	6.33	ND (0.157)	0.231 J (0.485)
606166	74-SB-E002-F216	2–4	7.98	8.02	0.0504	8.08	0.206 J (0.495)	ND (0.0893)
606166	74-SB-E002-F217	2–4	7.96	8.83	0.0669	7.03	ND (0.146)	ND (0.0813)
606166	74-SB-E002-F218	2–4	7.81	10.7	0.0709	8.75	ND (0.143)	ND (0.0798)
606166	74-SB-E002-F219	2–4	8.77	10.2	0.0972	7.19	ND (0.157)	ND (0.0876)
606425	74-SB-E002-F220	2–4	9.91	16.1	0.206	9.32	0.325 J (0.476)	ND (0.0859)
606425	74-SB-E002-F221	2–4	10.1	**25.6**	**0.286**	7.77	0.581	ND (0.082)
606425	74-SB-E002-F222	2–4	7.69	13.4	0.0864	7.03	0.294 J (0.495)	ND (0.0893)
606425	74-SB-E002-F222-DU	2–4	7.29	18.8	0.0845	6.93	0.244 J (0.5)	ND (0.0902)
607039	74-SB-E002-F225	2–4	6.79	7.85	0.0183	6.41	0.241 J (0.5)	0.188 J (0.5)
Background Concentration			15.4	21.4	<0.25	11.5	<1	<1

Note: Values in **bold** exceed background soil concentrations.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.

CWL = Chemical Waste Landfill.
D = Duplicate sample.
DU = Duplicate sample.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ID = Identification.
in. = Inch(es).
J ( ) = The reported value is greater than or equal to the MDL but is less than the practical quantitation limit, shown in parenthesis.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
ND ( ) = Not detected above the MDL, shown in parentheses.
NR = Not reported.
R = Resample.
SOB = Site Operational Boundary.

Table B-2
Summary of Confirmatory Soil Sampling, VOC Analytical Results, CWL SOB

Sample Attributes			VOCs (EPA Method 8260B/SW846 8260[a]) (µg/kg)					
Record Number[b]	ER Sample ID	Sample Depth (in.)	Acetone	Bromodichloromethane	Bromoform	2-Butanone	Chloroform	Chloromethane
606339	74-SB-E002-F001	2–4	**23**	ND (0.49)	ND (0.49)	ND (3.74)	ND (0.52)	ND (0.37)
606339	74-SB-E002-F002	2–4	**14.9**	ND (0.49)	ND (0.49)	ND (3.74)	ND (0.52)	ND (0.37)
606339	74-SB-E002-F003	2–4	**12.2**	ND (0.49)	ND (0.49)	ND (3.74)	ND (0.52)	ND (0.37)
606339	74-SB-E002-F005	2–4	**12.8**	ND (0.49)	**2.36**	ND (3.74)	**0.623 J (1)**	ND (0.37)
606339	74-SB-E002-F006	2–4	ND (3.52)	ND (0.49)	ND (0.49)	ND (3.74)	**0.595 J (1)**	ND (0.37)
606339	74-SB-E002-F008	2–4	**24.1**	ND (0.49)	**1.3**	**3.81 J (5)**	ND (0.52)	ND (0.37)
606339	74-SB-E002-F009	2–4	**24.8**	ND (0.49)	**2.37**	**5.17**	ND (0.52)	ND (0.37)
606339	74-SB-E002-F010	2–4	**9.59**	ND (0.49)	ND (0.49)	ND (3.74)	ND (0.52)	ND (0.37)
606339	74-SB-E002-F012	2–4	**17.1**	ND (0.49)	ND (0.49)	ND (3.74)	ND (0.52)	ND (0.37)
606339	74-SB-E002-F013	2–4	**90.6**	ND (0.49)	**3.59**	**11.6**	**0.555 J (1)**	**0.64 J (1)**
606339	74-SB-E002-F014	2–4	**23.7**	ND (0.49)	**1.74**	**4.11 J (5)**	ND (0.52)	ND (0.37)
606339	74-SB-E002-F015	2–4	**14**	ND (0.49)	ND (0.49)	ND (3.74)	ND (0.52)	ND (0.37)
606339	74-SB-E002-F017	2–4	**34.2**	**0.553 J (1)**	**5.81**	**4.43 J (5)**	ND (0.52)	ND (0.37)
606339	74-SB-E002-F018	2–4	**40.7**	ND (0.49)	**3.75**	**5.73**	ND (0.52)	ND (0.37)
606339	74-SB-E002-F019	2–4	**77.8**	ND (0.49)	ND (0.49)	**10.8**	**0.662 J (1)**	ND (0.37)
606339	74-SB-E002-F020	2–4	**65.4**	ND (0.49)	ND (0.49)	**5.54**	ND (0.52)	ND (0.37)
606339	74-SB-E002-F021	2–4	ND (3.52)	ND (0.49)	ND (0.49)	ND (3.74)	ND (0.52)	ND (0.37)
606339	74-SB-E002-F022	2–4	**36.2**	ND (0.49)	ND (0.49)	ND (3.74)	ND (0.52)	ND (0.37)
606339	74-SB-E002-F023	2–4	**80.3**	ND (0.49)	**1.66**	**7.34**	ND (0.52)	ND (0.37)
606339	74-SB-E002-F024	2–4	**106**	ND (0.49)	ND (0.49)	**10.3**	ND (0.52)	ND (0.37)
606381	74-SB-E002-F025	2–4	**37.8**	ND (0.49)	**0.842 J (1)**	**6.95**	ND (0.52)	ND (0.37)
606381	74-SB-E002-F026	2–4	**19.5**	ND (0.49)	**1.31**	**4.09 J (5)**	ND (0.52)	ND (0.37)
606381	74-SB-E002-F027	2–4	**11**	ND (0.49)	ND (0.49)	ND (3.74)	ND (0.52)	ND (0.37)
606381	74-SB-E002-F029	2–4	**27.4**	ND (0.49)	ND (0.49)	**5.45**	ND (0.52)	ND (0.37)
606381	74-SB-E002-F030	2–4	**29**	ND (0.49)	ND (0.49)	**5.36**	ND (0.52)	ND (0.37)
606381	74-SB-E002-F031	2–4	**27.6**	ND (0.49)	ND (0.49)	**6.3**	ND (0.52)	ND (0.37)
606381	74-SB-E002-F032	2–4	**21.5**	ND (0.49)	**1.96**	**5.05**	ND (0.52)	ND (0.37)
606381	74-SB-E002-F033	2–4	**22.8**	ND (0.49)	ND (0.49)	**4.54 J (5)**	ND (0.52)	ND (0.37)
606381	74-SB-E002-F036	2–4	**40.2**	ND (0.49)	**2.89**	**7.96**	ND (0.52)	ND (0.37)
606381	74-SB-E002-F037	2–4	**25.9**	ND (0.49)	**0.679 J (1)**	**4.37 J (5)**	ND (0.52)	ND (0.37)
606382	74-SB-E002-F040	2–4	**14.4**	**0.618 J (1)**	**4.81**	**4.25 J (5)**	ND (0.52)	ND (0.37)
606382	74-SB-E002-F042	2–4	**16.2**	ND (0.49)	**0.715 J (1)**	ND (3.74)	ND (0.52)	ND (0.37)

Refer to footnotes at end of table.

Table B-2 (Continued)
Summary of Confirmatory Soil Sampling, VOC Analytical Results, CWL SOB

Sample Attributes			VOCs (EPA Method 8260B/SW846 8260[a]) (µg/kg)					
Record Number[b]	ER Sample ID	Sample Depth (in.)	Acetone	Bromodichloromethane	Bromoform	2-Butanone	Chloroform	Chloromethane
606382	74-SB-E002-F043	2–4	**9.64**	ND (0.49)	ND (0.49)	ND (3.74)	ND (0.52)	ND (0.37)
606382	74-SB-E002-F044	2–4	**20.4**	ND (0.49)	ND (0.49)	**3.77 J (5)**	ND (0.52)	ND (0.37)
606382	74-SB-E002-F045	2–4	**33.2**	ND (0.49)	ND (0.49)	**5.81**	ND (0.52)	ND (0.37)
606382	74-SB-E002-F046	2–4	**36.5**	ND (0.49)	**0.804 J (1)**	**7.17**	**0.55 J (1)**	ND (0.37)
606382	74-SB-E002-F047	2–4	**24.7**	ND (0.49)	ND (0.49)	**5.07**	ND (0.52)	ND (0.37)
606382	74-SB-E002-F048	2–4	**24.2**	ND (0.49)	ND (0.49)	**4.7 J (5)**	ND (0.52)	ND (0.37)
606382	74-SB-E002-F049	2–4	**31.8**	ND (0.49)	**2.3**	**6.96**	ND (0.52)	ND (0.37)
606382	74-SB-E002-F050	2–4	**27.1**	ND (0.49)	ND (0.49)	**5.2**	ND (0.52)	ND (0.37)
606383	74-SB-E002-F051	2–4	**21.5**	ND (0.49)	**0.513 J (1)**	**4.07 J (5)**	ND (0.52)	ND (0.37)
606383	74-SB-E002-F052	2–4	**45.9**	ND (0.49)	ND (0.49)	**7.97**	ND (0.52)	ND (0.37)
606383	74-SB-E002-F053	2–4	**78.1**	ND (0.49)	ND (0.49)	ND (3.74)	ND (0.52)	ND (0.37)
606383	74-SB-E002-F054	2–4	**6.16**	ND (0.49)	ND (0.49)	ND (3.74)	ND (0.52)	ND (0.37)
606383	74-SB-E002-F055	2–4	**40.5**	ND (0.49)	ND (0.49)	**7.09**	ND (0.52)	ND (0.37)
606383	74-SB-E002-F056	2–4	**22.5**	ND (0.49)	ND (0.49)	**4.89 J (5)**	ND (0.52)	ND (0.37)
606383	74-SB-E002-F057	2–4	**60.6**	ND (0.49)	ND (0.49)	**8.82**	ND (0.52)	ND (0.37)
606383	74-SB-E002-F059	2–4	**27.6**	ND (0.49)	ND (0.49)	**7.17**	ND (0.52)	ND (0.37)
606383	74-SB-E002-F066	2–4	**37.2**	ND (0.49)	ND (0.49)	**8.06**	ND (0.52)	ND (0.37)
606383	74-SB-E002-F068	2–4	**30.2**	ND (0.49)	ND (0.49)	**7.31**	ND (0.52)	ND (0.37)
606384	74-SB-E002-F069	2–4	**14.3**	ND (0.49)	**2.16**	**4.05 J (5)**	ND (0.52)	ND (0.37)
606384	74-SB-E002-F070	2–4	**27.2**	ND (0.49)	**1.03**	**5.84**	ND (0.52)	ND (0.37)
606384	74-SB-E002-F071	2–4	**24.7**	ND (0.49)	**0.611 J (1)**	ND (3.74)	ND (0.52)	ND (0.37)
606384	74-SB-E002-F072	2–4	**30**	ND (0.49)	**2.31**	**7.13**	ND (0.52)	ND (0.37)
606384	74-SB-E002-F073	2–4	**21.4**	ND (0.49)	**2.06**	**5.69**	ND (0.52)	ND (0.37)
606384	74-SB-E002-F074	2–4	**9.15**	ND (0.49)	**1.67**	ND (3.74)	ND (0.52)	ND (0.37)
606384	74-SB-E002-F075	2–4	**26.2**	ND (0.49)	**3.71**	**7.39**	**0.733 J (1)**	ND (0.37)
606384	74-SB-E002-F076	2–4	**15.9**	ND (0.49)	**3.81**	ND (3.74)	**0.565 J (1)**	ND (0.37)
606384	74-SB-E002-F077	2–4	**8.81**	ND (0.49)	**4.39**	ND (3.74)	**0.602 J (1)**	ND (0.37)
606384	74-SB-E002-F078	2–4	**16.5**	ND (0.49)	**1.15**	ND (3.74)	ND (0.52)	ND (0.37)
607041	74-SB-E002-F090	2–4	**13 J (20)**	ND (0.07)	ND (0.62)	ND (1.1)	ND (0.12)	ND (0.23)
606397	74-SB-E002-F091	2–4	**11.5**	ND (0.49)	ND (0.49)	ND (3.74)	ND (0.52)	ND (0.37)
606397	74-SB-E002-F092	2–4	**13.8**	ND (0.49)	**1.17**	ND (3.74)	**0.555 J (1)**	ND (0.37)
606397	74-SB-E002-F093	2–4	**16.1**	ND (0.49)	**3.12**	ND (3.74)	**0.712 J (1)**	ND (0.37)

Refer to footnotes at end of table.

Table B-2 (Continued)
Summary of Confirmatory Soil Sampling, VOC Analytical Results, CWL SOB

Sample Attributes			VOCs (EPA Method 8260B/SW846 8260[a]) (µg/kg)					
Record Number[b]	ER Sample ID	Sample Depth (in.)	Acetone	Bromodichloromethane	Bromoform	2-Butanone	Chloroform	Chloromethane
606649	74-SB-E002-F094-R	2–4	ND (3.52)	ND (0.49)	ND (0.49)	ND (3.74)	ND (0.52)	ND (0.37)
606649	74-SB-E002-F095-R	2–4	ND (3.52)	ND (0.49)	ND (0.49)	ND (3.74)	ND (0.52)	ND (0.37)
607041	74-SB-E002-F106	2–4	**10 J (20)**	ND (0.07)	ND (0.62)	ND (1.1)	ND (0.12)	ND (0.23)
606397	74-SB-E002-F107	2–4	**11.6**	ND (0.49)	**2.26**	ND (3.74)	ND (0.52)	ND (0.37)
606397	74-SB-E002-F108	2–4	**14**	ND (0.49)	ND (0.49)	ND (3.74)	ND (0.52)	ND (0.37)
606397	74-SB-E002-F109	2–4	**15.3**	ND (0.49)	**0.891 J (1)**	ND (3.74)	**0.992 J (1)**	ND (0.37)
606649	74-SB-E002-F110-R	2–4	ND (3.52)	ND (0.49)	ND (0.49)	ND (3.74)	ND (0.52)	ND (0.37)
606649	74-SB-E002-F111-R	2–4	ND (3.52)	ND (0.49)	ND (0.49)	ND (3.74)	ND (0.52)	ND (0.37)
607041	74-SB-E002-F122	2–4	**20**	ND (0.07)	ND (0.62)	ND (1.1)	ND (0.12)	ND (0.23)
606397	74-SB-E002-F123	2–4	**10.6**	ND (0.49)	**2.07**	ND (3.74)	**0.836 J (1)**	ND (0.37)
606397	74-SB-E002-F124	2–4	**10.6**	ND (0.49)	**0.597 J (1)**	ND (3.74)	ND (0.52)	ND (0.37)
606397	74-SB-E002-F125	2–4	**13.4**	ND (0.49)	**1.9**	ND (3.74)	**0.612 J (1)**	ND (0.37)
606397	74-SB-E002-F126	2–4	**9.85**	ND (0.49)	ND (0.49)	ND (3.74)	ND (0.52)	ND (0.37)
606397	74-SB-E002-F126-DU	2–4	**11.4**	ND (0.49)	ND (0.49)	ND (3.74)	ND (0.52)	ND (0.37)
606421	74-SB-E002-F127	2–4	**15.5**	**0.638 J (1)**	**4.49**	ND (3.74)	**1.17**	ND (0.37)
606421	74-SB-E002-F138	2–4	**18**	ND (0.49)	**1.13**	**3.88 J (5)**	**1.19**	ND (0.37)
606421	74-SB-E002-F139	2–4	**11.8**	ND (0.49)	**3.35**	ND (3.74)	ND (0.52)	ND (0.37)
606421	74-SB-E002-F140	2–4	**16.6**	ND (0.49)	**0.694 J (1)**	ND (3.74)	**0.612 J (1)**	ND (0.37)
606421	74-SB-E002-F141	2–4	**16.8**	ND (0.49)	ND (0.49)	**3.91 J (5)**	**0.734 J (1)**	ND (0.37)
606421	74-SB-E002-F142	2–4	**15.1**	ND (0.49)	ND (0.49)	ND (3.74)	ND (0.52)	ND (0.37)
606421	74-SB-E002-F143	2–4	**18.9**	ND (0.49)	**1.94**	ND (3.74)	**0.545 J (1)**	ND (0.37)
607040	74-SB-E002-F154	2–4	**49**	ND (0.07)	ND (0.62)	ND (1.1)	ND (0.12)	ND (0.23)
606421	74-SB-E002-F155	2–4	**24**	ND (0.49)	**2.29**	**5.42**	**0.769 J (1)**	ND (0.37)
606421	74-SB-E002-F156	2–4	**19.6**	**0.76 J (1)**	**6**	ND (3.74)	**1.02**	ND (0.37)
606421	74-SB-E002-F157	2–4	ND (3.52)	ND (0.49)	ND (0.49)	ND (3.74)	ND (0.52)	ND (0.37)
606421	74-SB-E002-F157-DU	2–4	**13.2**	ND (0.49)	ND (0.49)	ND (3.74)	ND (0.52)	ND (0.37)
605917	74-SB-E002-F158	2–4	ND (3.52)	ND (0.49)	ND (0.49)	ND (3.74)	ND (0.52)	ND (0.37)
605917	74-SB-E002-F159	2–4	ND (3.52)	ND (0.49)	ND (0.49)	ND (3.74)	ND (0.52)	ND (0.37)
606162	74-SB-E002-F161	2–4	ND (3.52)	ND (0.49)	ND (0.49)	ND (3.74)	ND (0.52)	ND (0.37)
607040	74-SB-E002-F170	2–4	**20**	ND (0.07)	ND (0.62)	ND (1.1)	ND (0.12)	ND (0.23)
606424	74-SB-E002-F171	2–4	**15.3**	ND (0.49)	**1.28**	ND (3.74)	ND (0.52)	ND (0.37)
606424	74-SB-E002-F172	2–4	**21.7**	ND (0.49)	ND (0.49)	**4.98 J (5)**	ND (0.52)	ND (0.37)

Refer to footnotes at end of table.

Table B-2 (Continued)
Summary of Confirmatory Soil Sampling, VOC Analytical Results, CWL SOB

Sample Attributes			VOCs (EPA Method 8260B/SW846 8260[a]) (µg/kg)					
Record Number[b]	ER Sample ID	Sample Depth (in.)	Acetone	Bromodichloromethane	Bromoform	2-Butanone	Chloroform	Chloromethane
606424	74-SB-E002-F173	2–4	**23.2**	ND (0.49)	**1.23**	ND (3.74)	ND (0.52)	ND (0.37)
606424	74-SB-E002-F174	2–4	**21.1**	ND (0.49)	**0.778 J (1)**	ND (3.74)	ND (0.52)	ND (0.37)
606424	74-SB-E002-F175	2–4	**14.3**	ND (0.49)	ND (0.49)	ND (3.74)	ND (0.52)	ND (0.37)
606424	74-SB-E002-F176	2–4	ND (3.52)	ND (0.49)	ND (0.49)	ND (3.74)	ND (0.52)	ND (0.37)
606162	74-SB-E002-F177	2–4	ND (3.52)	ND (0.49)	ND (0.49)	ND (3.74)	ND (0.52)	ND (0.37)
606424	74-SB-E002-F186	2–4	**18**	ND (0.49)	**1**	ND (3.74)	ND (0.52)	ND (0.37)
606424	74-SB-E002-F187	2–4	**19.1**	ND (0.49)	ND (0.49)	ND (3.74)	ND (0.52)	ND (0.37)
606424	74-SB-E002-F188	2–4	**29**	ND (0.49)	**1.52**	**4.96 J (5)**	ND (0.52)	ND (0.37)
606424	74-SB-E002-F189	2–4	**13**	ND (0.49)	ND (0.49)	ND (3.74)	ND (0.52)	ND (0.37)
606424	74-SB-E002-F189-DU	2–4	**12.5**	ND (0.49)	ND (0.49)	ND (3.74)	ND (0.52)	ND (0.37)
606425	74-SB-E002-F190	2–4	**31.7**	ND (0.49)	ND (0.49)	**4.41 J (5)**	ND (0.52)	ND (0.37)
606425	74-SB-E002-F191	2–4	**15.8**	ND (0.49)	ND (0.49)	ND (3.74)	ND (0.52)	ND (0.37)
606425	74-SB-E002-F192	2–4	**35.9**	ND (0.49)	**0.554 J (1)**	**6.72**	ND (0.52)	ND (0.37)
607039	74-SB-E002-F193	2–4	ND (3.52)	ND (0.49)	ND (0.49)	ND (3.74)	ND (0.52)	ND (0.37)
606166	74-SB-E002-F202	2–4	ND (3.52)	ND (0.49)	ND (0.49)	ND (3.74)	ND (0.52)	ND (0.37)
606166	74-SB-E002-F203	2–4	**3.83 J (5)**	ND (0.49)	ND (0.49)	ND (3.74)	ND (0.52)	ND (0.37)
606166	74-SB-E002-F204	2–4	ND (3.52)	ND (0.49)	ND (0.49)	ND (3.74)	ND (0.52)	ND (0.37)
606166	74-SB-E002-F205	2–4	ND (3.52)	ND (0.49)	ND (0.49)	ND (3.74)	ND (0.52)	ND (0.37)
606425	74-SB-E002-F206	2–4	**6.53**	ND (0.49)	ND (0.49)	ND (3.74)	ND (0.52)	ND (0.37)
606425	74-SB-E002-F207	2–4	**52.4**	ND (0.49)	**1.13**	**9.24**	ND (0.52)	ND (0.37)
606425	74-SB-E002-F208	2–4	**11**	ND (0.49)	ND (0.49)	ND (3.74)	ND (0.52)	ND (0.37)
607039	74-SB-E002-F209	2–4	ND (3.52)	ND (0.49)	ND (0.49)	ND (3.74)	ND (0.52)	ND (0.37)
606166	74-SB-E002-F216	2–4	ND (3.52)	ND (0.49)	ND (0.49)	ND (3.74)	ND (0.52)	ND (0.37)
606166	74-SB-E002-F217	2–4	ND (3.52)	ND (0.49)	ND (0.49)	ND (3.74)	ND (0.52)	ND (0.37)
606166	74-SB-E002-F218	2–4	ND (3.52)	ND (0.49)	ND (0.49)	ND (3.74)	ND (0.52)	ND (0.37)
606166	74-SB-E002-F219	2–4	ND (3.52)	ND (0.49)	ND (0.49)	ND (3.74)	ND (0.52)	ND (0.37)
606425	74-SB-E002-F220	2–4	**37.4**	ND (0.49)	**1.27**	**8.64**	ND (0.52)	ND (0.37)
606425	74-SB-E002-F221	2–4	**6.84**	ND (0.49)	ND (0.49)	ND (3.74)	ND (0.52)	ND (0.37)
606425	74-SB-E002-F222	2–4	**37.1**	ND (0.49)	ND (0.49)	**8.25**	ND (0.52)	ND (0.37)
606425	74-SB-E002-F222-DU	2–4	**45.9**	ND (0.49)	ND (0.49)	**8.91**	ND (0.52)	ND (0.37)
607039	74-SB-E002-F225	2–4	ND (3.52)	ND (0.49)	ND (0.49)	ND (3.74)	ND (0.52)	ND (0.37)

Refer to footnotes at end of table.

Table B-2 (Continued)
Summary of Confirmatory Soil Sampling, VOC Analytical Results, CWL SOB

Sample Attributes			VOCs (EPA Method 8260B/SW846 8260[a]) (µg/kg)					
Record Number[b]	ER Sample ID	Sample Depth (in.)	Dibromochloro-methane	Methylene chloride	Tetrachloroethene	Toluene	Trichloroethene	Xylene
606339	74-SB-E002-F001	2–4	ND (0.5)	**2.1 J (5)**	ND (0.38)	**9.36**	ND (0.45)	ND (0.39)
606339	74-SB-E002-F002	2–4	ND (0.5)	ND (1.35)	ND (0.38)	**3.08**	ND (0.45)	ND (0.39)
606339	74-SB-E002-F003	2–4	ND (0.5)	ND (1.35)	ND (0.38)	**2.15**	ND (0.45)	ND (0.39)
606339	74-SB-E002-F005	2–4	ND (0.5)	**1.37 J (5)**	ND (0.38)	**5.38**	ND (0.45)	ND (0.39)
606339	74-SB-E002-F006	2–4	ND (0.5)	ND (1.35)	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
606339	74-SB-E002-F008	2–4	ND (0.5)	**1.43 J (5)**	ND (0.38)	**4.57**	ND (0.45)	ND (0.39)
606339	74-SB-E002-F009	2–4	ND (0.5)	**1.53 J (5)**	ND (0.38)	**11.6**	ND (0.45)	ND (0.39)
606339	74-SB-E002-F010	2–4	ND (0.5)	ND (1.35)	ND (0.38)	**1.17**	ND (0.45)	ND (0.39)
606339	74-SB-E002-F012	2–4	ND (0.5)	ND (1.35)	ND (0.38)	**4.21**	ND (0.45)	ND (0.39)
606339	74-SB-E002-F013	2–4	**0.565 J (1)**	**3.57 J (5)**	ND (0.38)	**19.4**	ND (0.45)	ND (0.39)
606339	74-SB-E002-F014	2–4	ND (0.5)	**1.53 J (5)**	ND (0.38)	**4.61**	ND (0.45)	ND (0.39)
606339	74-SB-E002-F015	2–4	ND (0.5)	**1.44 J (5)**	ND (0.38)	**1.77**	ND (0.45)	ND (0.39)
606339	74-SB-E002-F017	2–4	**1.41**	**1.7 J (5)**	ND (0.38)	**8.65**	ND (0.45)	ND (0.39)
606339	74-SB-E002-F018	2–4	**0.859 J (1)**	**1.72 J (5)**	ND (0.38)	**10.3**	ND (0.45)	ND (0.39)
606339	74-SB-E002-F019	2–4	ND (0.5)	**2.48 J (5)**	ND (0.38)	**16.1**	ND (0.45)	ND (0.39)
606339	74-SB-E002-F020	2–4	ND (0.5)	**2.23 J (5)**	ND (0.38)	**11**	ND (0.45)	ND (0.39)
606339	74-SB-E002-F021	2–4	ND (0.5)	ND (1.35)	ND (0.38)	**1.39**	ND (0.45)	ND (0.39)
606339	74-SB-E002-F022	2–4	ND (0.5)	**1.35 J (5)**	ND (0.38)	**3.47**	ND (0.45)	ND (0.39)
606339	74-SB-E002-F023	2–4	ND (0.5)	**1.87 J (5)**	ND (0.38)	**18.3**	ND (0.45)	ND (0.39)
606339	74-SB-E002-F024	2–4	ND (0.5)	**2.34 J (5)**	ND (0.38)	**15.2**	ND (0.45)	ND (0.39)
606381	74-SB-E002-F025	2–4	ND (0.5)	**1.84 J (5)**	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
606381	74-SB-E002-F026	2–4	ND (0.5)	ND (1.35)	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
606381	74-SB-E002-F027	2–4	ND (0.5)	**1.4 J (5)**	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
606381	74-SB-E002-F029	2–4	ND (0.5)	**1.49 J (5)**	ND (0.38)	**2.54**	ND (0.45)	ND (0.39)
606381	74-SB-E002-F030	2–4	ND (0.5)	**1.8 J (5)**	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
606381	74-SB-E002-F031	2–4	ND (0.5)	**1.53 J (5)**	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
606381	74-SB-E002-F032	2–4	ND (0.5)	**1.4 J (5)**	ND (0.38)	**2.02**	ND (0.45)	ND (0.39)
606381	74-SB-E002-F033	2–4	ND (0.5)	**2.14 J (5)**	ND (0.38)	**0.357 J (1)**	ND (0.45)	ND (0.39)
606381	74-SB-E002-F036	2–4	**0.666 J (1)**	**1.82 J (5)**	ND (0.38)	**0.416 J (1)**	ND (0.45)	ND (0.39)
606381	74-SB-E002-F037	2–4	ND (0.5)	**1.78 J (5)**	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
606382	74-SB-E002-F040	2–4	**1.28**	ND (1.35)	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
606382	74-SB-E002-F042	2–4	ND (0.5)	ND (1.35)	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)

Refer to footnotes at end of table.

Table B-2 (Continued)
Summary of Confirmatory Soil Sampling, VOC Analytical Results, CWL SOB

Sample Attributes			VOCs (EPA Method 8260B/SW846 8260[a]) (µg/kg)					
Record Number[b]	ER Sample ID	Sample Depth (in.)	Dibromochloro-methane	Methylene chloride	Tetrachloroethene	Toluene	Trichloroethene	Xylene
606382	74-SB-E002-F043	2–4	ND (0.5)	ND (1.35)	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
606382	74-SB-E002-F044	2–4	ND (0.5)	**1.5 J (5)**	ND (0.38)	**0.993 J (1)**	ND (0.45)	ND (0.39)
606382	74-SB-E002-F045	2–4	ND (0.5)	**1.96 J (5)**	ND (0.38)	**1.49**	ND (0.45)	**0.917 J (1)**
606382	74-SB-E002-F046	2–4	ND (0.5)	**2.43 J (5)**	ND (0.38)	**1.07**	ND (0.45)	ND (0.39)
606382	74-SB-E002-F047	2–4	ND (0.5)	**1.51 J (5)**	ND (0.38)	**0.609 J (1)**	ND (0.45)	ND (0.39)
606382	74-SB-E002-F048	2–4	ND (0.5)	**1.82 J (5)**	ND (0.38)	**0.388 J (1)**	ND (0.45)	ND (0.39)
606382	74-SB-E002-F049	2–4	ND (0.5)	**2.28 J (5)**	ND (0.38)	**0.851 J (1)**	ND (0.45)	ND (0.39)
606382	74-SB-E002-F050	2–4	ND (0.5)	**1.97 J (5)**	ND (0.38)	**0.515 J (1)**	ND (0.45)	ND (0.39)
606383	74-SB-E002-F051	2–4	ND (0.5)	ND (1.35)	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
606383	74-SB-E002-F052	2–4	ND (0.5)	**1.88 J (5)**	ND (0.38)	**0.695 J (1)**	ND (0.45)	ND (0.39)
606383	74-SB-E002-F053	2–4	ND (0.5)	**2.15 J (5)**	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
606383	74-SB-E002-F054	2–4	ND (0.5)	ND (1.35)	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
606383	74-SB-E002-F055	2–4	ND (0.5)	ND (1.35)	ND (0.38)	**0.412 J (1)**	ND (0.45)	ND (0.39)
606383	74-SB-E002-F056	2–4	ND (0.5)	ND (1.35)	ND (0.38)	**0.712 J (1)**	ND (0.45)	**1.62**
606383	74-SB-E002-F057	2–4	ND (0.5)	**2.7 J (5)**	ND (0.38)	**0.496 J (1)**	ND (0.45)	ND (0.39)
606383	74-SB-E002-F059	2–4	ND (0.5)	ND (1.35)	ND (0.38)	**1.37**	ND (0.45)	**2.51**
606383	74-SB-E002-F066	2–4	ND (0.5)	ND (1.35)	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
606383	74-SB-E002-F068	2–4	ND (0.5)	ND (1.35)	ND (0.38)	**0.447 J (1)**	ND (0.45)	ND (0.39)
606384	74-SB-E002-F069	2–4	ND (0.5)	ND (1.35)	ND (0.38)	**5.02**	ND (0.45)	ND (0.39)
606384	74-SB-E002-F070	2–4	ND (0.5)	ND (1.35)	ND (0.38)	**0.484 J (1)**	ND (0.45)	ND (0.39)
606384	74-SB-E002-F071	2–4	ND (0.5)	**2.04 J (5)**	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
606384	74-SB-E002-F072	2–4	**0.507 J (1)**	ND (1.35)	ND (0.38)	**0.395 J (1)**	ND (0.45)	ND (0.39)
606384	74-SB-E002-F073	2–4	ND (0.5)	**2.31 J (5)**	ND (0.38)	**0.449 J (1)**	ND (0.45)	ND (0.39)
606384	74-SB-E002-F074	2–4	ND (0.5)	**1.59 J (5)**	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
606384	74-SB-E002-F075	2–4	**1.5**	**2.15 J (5)**	ND (0.38)	**0.377 J (1)**	ND (0.45)	ND (0.39)
606384	74-SB-E002-F076	2–4	**1.34**	ND (1.35)	ND (0.38)	**0.369 J (1)**	ND (0.45)	ND (0.39)
606384	74-SB-E002-F077	2–4	**1.8**	ND (1.35)	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
606384	74-SB-E002-F078	2–4	ND (0.5)	ND (1.35)	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
607041	74-SB-E002-F090	2–4	ND (0.59)	**2.9 J (5)**	**9.3**	ND (0.59)	ND (0.06)	ND (0.82)
606397	74-SB-E002-F091	2–4	ND (0.5)	ND (1.35)	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
606397	74-SB-E002-F092	2–4	ND (0.5)	ND (1.35)	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
606397	74-SB-E002-F093	2–4	**1.04**	ND (1.35)	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)

Refer to footnotes at end of table.

Table B-2 (Continued)
Summary of Confirmatory Soil Sampling, VOC Analytical Results, CWL SOB

Sample Attributes			VOCs (EPA Method 8260B/SW846 8260[a]) (μg/kg)					
Record Number[b]	ER Sample ID	Sample Depth (in.)	Dibromochloro-methane	Methylene chloride	Tetrachloroethene	Toluene	Trichloroethene	Xylene
606649	74-SB-E002-F094-R	2–4	ND (0.5)	ND (1.35)	ND (0.38)	ND (0.34)	ND (0.45)	**0.902 J (1)**
606649	74-SB-E002-F095-R	2–4	ND (0.5)	ND (1.35)	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
607041	74-SB-E002-F106	2–4	ND (0.59)	**2.9 J (5)**	**2.1 J (5)**	ND (0.59)	ND (0.06)	ND (0.82)
606397	74-SB-E002-F107	2–4	**0.731 J (1)**	ND (1.35)	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
606397	74-SB-E002-F108	2–4	ND (0.5)	ND (1.35)	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
606397	74-SB-E002-F109	2–4	ND (0.5)	ND (1.35)	**2.23**	**4.46**	**2.1**	ND (0.39)
606649	74-SB-E002-F110-R	2–4	ND (0.5)	ND (1.35)	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
606649	74-SB-E002-F111-R	2–4	ND (0.5)	ND (1.35)	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
607041	74-SB-E002-F122	2–4	ND (0.59)	**2.9 J (5)**	**5.4**	ND (0.59)	ND (0.06)	ND (0.82)
606397	74-SB-E002-F123	2–4	**0.841 J (1)**	ND (1.35)	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
606397	74-SB-E002-F124	2–4	ND (0.5)	ND (1.35)	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
606397	74-SB-E002-F125	2–4	ND (0.5)	ND (1.35)	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
606397	74-SB-E002-F126	2–4	ND (0.5)	ND (1.35)	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
606397	74-SB-E002-F126-DU	2–4	ND (0.5)	ND (1.35)	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
606421	74-SB-E002-F127	2–4	**1.76**	ND (1.35)	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
606421	74-SB-E002-F138	2–4	ND (0.5)	ND (1.35)	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
606421	74-SB-E002-F139	2–4	**0.968 J (1)**	ND (1.35)	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
606421	74-SB-E002-F140	2–4	ND (0.5)	ND (1.35)	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
606421	74-SB-E002-F141	2–4	ND (0.5)	ND (1.35)	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
606421	74-SB-E002-F142	2–4	ND (0.5)	ND (1.35)	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
606421	74-SB-E002-F143	2–4	**0.608 J (1)**	ND (1.35)	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
607040	74-SB-E002-F154	2–4	ND (0.59)	**2.9 J (5)**	**12**	ND (0.59)	ND (0.06)	ND (0.82)
606421	74-SB-E002-F155	2–4	**0.823 J (1)**	ND (1.35)	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
606421	74-SB-E002-F156	2–4	**2.06**	ND (1.35)	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
606421	74-SB-E002-F157	2–4	ND (0.5)	ND (1.35)	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
606421	74-SB-E002-F157-DU	2–4	ND (0.5)	ND (1.35)	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
605917	74-SB-E002-F158	2–4	ND (0.5)	ND (1.35)	ND (0.38)	**0.431 J (1)**	ND (0.45)	**0.804 J (1)**
605917	74-SB-E002-F159	2–4	ND (0.5)	ND (1.35)	ND (0.38)	**0.436 J (1)**	ND (0.45)	**3.65**
606162	74-SB-E002-F161	2–4	ND (0.5)	ND (1.35)	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
607040	74-SB-E002-F170	2–4	ND (0.59)	**2.9 J (5)**	**3.5 J (5)**	ND (0.59)	ND (0.06)	ND (0.82)
606424	74-SB-E002-F171	2–4	ND (0.5)	ND (1.35)	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
606424	74-SB-E002-F172	2–4	ND (0.5)	ND (1.35)	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)

Refer to footnotes at end of table.

Table B-2 (Continued)
Summary of Confirmatory Soil Sampling, VOC Analytical Results, CWL SOB

Sample Attributes			VOCs (EPA Method 8260B/SW846 8260[a]) (µg/kg)					
Record Number[b]	ER Sample ID	Sample Depth (in.)	Dibromochloro-methane	Methylene chloride	Tetrachloroethene	Toluene	Trichloroethene	Xylene
606424	74-SB-E002-F173	2–4	ND (0.5)	ND (1.35)	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
606424	74-SB-E002-F174	2–4	ND (0.5)	ND (1.35)	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
606424	74-SB-E002-F175	2–4	ND (0.5)	ND (1.35)	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
606424	74-SB-E002-F176	2–4	ND (0.5)	ND (1.35)	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
606162	74-SB-E002-F177	2–4	ND (0.5)	ND (1.35)	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
606424	74-SB-E002-F186	2–4	ND (0.5)	**1.49 J (5)**	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
606424	74-SB-E002-F187	2–4	ND (0.5)	**1.38 J (5)**	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
606424	74-SB-E002-F188	2–4	ND (0.5)	**1.72 J (5)**	ND (0.38)	**0.369 J (1)**	ND (0.45)	ND (0.39)
606424	74-SB-E002-F189	2–4	ND (0.5)	**1.43 J (5)**	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
606424	74-SB-E002-F189-DU	2–4	ND (0.5)	**1.37 J (5)**	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
606425	74-SB-E002-F190	2–4	ND (0.5)	**1.78 J (5)**	ND (0.38)	**0.579 J (1)**	ND (0.45)	ND (0.39)
606425	74-SB-E002-F191	2–4	ND (0.5)	**1.36 J (5)**	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
606425	74-SB-E002-F192	2–4	ND (0.5)	**1.75 J (5)**	ND (0.38)	**0.508 J (1)**	ND (0.45)	ND (0.39)
607039	74-SB-E002-F193	2–4	ND (0.5)	ND (1.35)	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
606166	74-SB-E002-F202	2–4	ND (0.5)	ND (1.35)	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
606166	74-SB-E002-F203	2–4	ND (0.5)	ND (1.35)	ND (0.38)	**0.651 J (1)**	ND (0.45)	ND (0.39)
606166	74-SB-E002-F204	2–4	ND (0.5)	ND (1.35)	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
606166	74-SB-E002-F205	2–4	ND (0.5)	ND (1.35)	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
606425	74-SB-E002-F206	2–4	ND (0.5)	ND (1.35)	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
606425	74-SB-E002-F207	2–4	ND (0.5)	**2.12 J (5)**	ND (0.38)	**0.822 J (1)**	ND (0.45)	ND (0.39)
606425	74-SB-E002-F208	2–4	ND (0.5)	ND (1.35)	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
607039	74-SB-E002-F209	2–4	ND (0.5)	ND (1.35)	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
606166	74-SB-E002-F216	2–4	ND (0.5)	ND (1.35)	ND (0.38)	**0.626 J (1)**	ND (0.45)	ND (0.39)
606166	74-SB-E002-F217	2–4	ND (0.5)	ND (1.35)	ND (0.38)	**1.04**	ND (0.45)	ND (0.39)
606166	74-SB-E002-F218	2–4	ND (0.5)	ND (1.35)	ND (0.38)	**2.46**	ND (0.45)	ND (0.39)
606166	74-SB-E002-F219	2–4	ND (0.5)	ND (1.35)	ND (0.38)	**3.68**	ND (0.45)	ND (0.39)
606425	74-SB-E002-F220	2–4	ND (0.5)	**1.46 J (5)**	ND (0.38)	**0.469 J (1)**	ND (0.45)	ND (0.39)
606425	74-SB-E002-F221	2–4	ND (0.5)	ND (1.35)	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)
606425	74-SB-E002-F222	2–4	ND (0.5)	**3.37 J (5)**	ND (0.38)	**1.01**	ND (0.45)	ND (0.39)
606425	74-SB-E002-F222-DU	2–4	ND (0.5)	**3.25 J (5)**	ND (0.38)	**1.13**	ND (0.45)	ND (0.39)
607039	74-SB-E002-F225	2–4	ND (0.5)	ND (1.35)	ND (0.38)	ND (0.34)	ND (0.45)	ND (0.39)

Refer to footnotes at end of table.

Table B-2 (Concluded)
Summary of Confirmatory Soil Sampling, VOC Analytical Results, CWL SOB

Note: Values in **bold** represent detected analytes.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.

CWL	= Chemical Waste Landfill.
DU	= Duplicate sample.
EPA	= U.S. Environmental Protection Agency.
ER	= Environmental Restoration.
ID	= Identification.
in.	= Inch(es).
J ( )	= The reported value is greater than or equal to the MDL but is less than the practical quantitation limit, shown in parenthesis.
MDL	= Method detection limit.
µg/kg	= Microgram(s) per kilogram.
ND ( )	= Not detected above the MDL, shown in parentheses.
R	= Resample.
SOB	= Site Operational Boundary.
VOC	= Volatile organic compound.

Table B-3
Summary of VOC Analytical MDLs, CWL SOB

Analyte	EPA Method 8260[a] Detection Limit (μg/kg)
Acetone	1.3–3.52
Benzene	0.11–0.45
Bromodichloromethane	0.07–0.49
Bromoform	0.49–0.62
Bromomethane	0.5–0.89
Butanone 2-	1.1–3.74
Carbon disulfide	0.27–2.36
Carbon tetrachloride	0.14–0.49
Chlorobenzene	0.12–0.41
Chloroethane	0.56–0.81
Chloroform	0.12–0.52
Chloromethane	0.23–0.37
Dibromochloromethane	0.5–0.59
1,2-Dichlorobenzene	0.87
1,3-Dichlorobenzene	0.52
1,4-Dichlorobenzene	0.39
1,1-Dichloroethane	0.21–0.47
1,2-Dichloroethane	0.14–0.43
1,1-Dichloroethene	0.5–0.68
1,2-Dichloroethene	0.61
trans-1,2-Dichloroethene	0.53
cis-1,2-Dichloroethene	0.47
1,2-Dichloropropane	0.1–0.48
cis-1,3-Dichloropropene	0.15–0.43
trans-1,3-Dichloropropene	0.25–0.53
Ethyl benzene	0.38
2-Hexanone	1.3–3.77
4-Methyl-2-pentanone	0.9–4.03
Methylene chloride	1.35–2.6
Styrene	0.2–0.39
1,1,2,2-Tetrachloroethane	0.73–0.91
Tetrachloroethene	0.2–0.38
Toluene	0.34–0.59
1,1,1-Trichloroethane	0.11–0.53
1,1,2-Trichloroethane	0.54–0.77
Trichloroethene	0.06–0.45
Vinyl acetate	1.78
Vinyl chloride	0.56–0.64
Xylene	0.39–0.82

[a]EPA November 1986.
CWL = Chemical Waste Landfill.
EPA = U.S. Environmental Protection Agency.
MDL = Method detection limit.
μg/kg = Microgram(s) per kilogram.
SOB = Site Operational Boundary.
VOC = Volatile organic compound.

Table B-4
Summary of Confirmatory Soil Sampling, SVOC Analytical Results, CWL SOB

Sample Attributes			SVOCs (EPA Method 8270C/SW846 8270[a]) (µg/kg)					
Record Number[b]	ER Sample ID	Sample Depth (in.)	1,2-Dichloro-benzene	2,4,B-Trichloro-phenol	2-Methylnaph-thalene	Acenaphthene	Anthracene	Benzo(a) anthracene
604708	74-SB-D000-V094	2–4	ND (4.33)	ND (42.3)	ND (4)	ND (4)	ND (4.67)	ND (6)
604708	74-SB-D000-V095	2–4	ND (4.33)	ND (42.3)	ND (4)	ND (4)	ND (4.67)	ND (6)
604708	74-SB-D000-V110	2–4	ND (4.33)	ND (42.3)	ND (4)	ND (4)	ND (4.67)	ND (6)
604708	74-SB-D000-V111	2–4	ND (4.33)	ND (42.3)	ND (4)	ND (4)	ND (4.67)	ND (6)
606339	74-SB-E002-F001	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606339	74-SB-E002-F002	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606339	74-SB-E002-F003	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606339	74-SB-E002-F005	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606339	74-SB-E002-F006	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606339	74-SB-E002-F008	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606339	74-SB-E002-F009	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606339	74-SB-E002-F010	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606339	74-SB-E002-F012	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606339	74-SB-E002-F013	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606339	74-SB-E002-F014	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606339	74-SB-E002-F015	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606339	74-SB-E002-F017	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606339	74-SB-E002-F018	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606339	74-SB-E002-F019	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606339	74-SB-E002-F020	2–4	ND (10)	ND (17.3)	ND (16.7)	**8.37 J (33.3)**	ND (16.7)	ND (16.7)
606339	74-SB-E002-F021	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606339	74-SB-E002-F022	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606339	74-SB-E002-F023	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606339	74-SB-E002-F024	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606381	74-SB-E002-F025	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606381	74-SB-E002-F026	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606381	74-SB-E002-F027	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606381	74-SB-E002-F029	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606381	74-SB-E002-F030	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)

Refer to footnotes at end of table.

Table B-4 (Continued)
Summary of Confirmatory Soil Sampling, SVOC Analytical Results, CWL SOB

Sample Attributes			SVOCs (EPA Method 8270C/SW846 8270[a]) (μg/kg)					
Record Number[b]	ER Sample ID	Sample Depth (in.)	1,2-Dichloro-benzene	2,4,B-Trichloro-phenol	2-Methylnaph-thalene	Acenaphthene	Anthracene	Benzo(a) anthracene
606381	74-SB-E002-F031	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606381	74-SB-E002-F032	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606381	74-SB-E002-F033	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606381	74-SB-E002-F036	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606381	74-SB-E002-F037	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606382	74-SB-E002-F040	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606382	74-SB-E002-F042	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606382	74-SB-E002-F043	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606382	74-SB-E002-F044	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606382	74-SB-E002-F045	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606382	74-SB-E002-F046	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606382	74-SB-E002-F047	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606382	74-SB-E002-F048	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606382	74-SB-E002-F049	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606382	74-SB-E002-F050	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606383	74-SB-E002-F051	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606383	74-SB-E002-F052	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606383	74-SB-E002-F053	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606383	74-SB-E002-F054	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606383	74-SB-E002-F055	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606383	74-SB-E002-F056	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606383	74-SB-E002-F057	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606383	74-SB-E002-F059	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606383	74-SB-E002-F066	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606383	74-SB-E002-F068	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606384	74-SB-E002-F069	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606384	74-SB-E002-F070	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606384	74-SB-E002-F071	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606384	74-SB-E002-F072	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)

Refer to footnotes at end of table.

Table B-4 (Continued)
Summary of Confirmatory Soil Sampling, SVOC Analytical Results, CWL SOB

Sample Attributes			SVOCs (EPA Method 8270C/SW846 8270[a]) (μg/kg)					
Record Number[b]	ER Sample ID	Sample Depth (in.)	1,2-Dichloro-benzene	2,4,B-Trichloro-phenol	2-Methylnaph-thalene	Acenaphthene	Anthracene	Benzo(a) anthracene
606384	74-SB-E002-F073	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606384	74-SB-E002-F074	2–4	**214 J (333)**	ND (17.3)	**20.1 J (33.3)**	ND (8)	**29.1 J (33.3)**	**98.1**
606592	74-SB-E002-F074-R	2–4	NR	NR	NR	NR	NR	NR
606384	74-SB-E002-F075	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606384	74-SB-E002-F076	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606384	74-SB-E002-F077	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606384	74-SB-E002-F078	2–4	ND (10)	**220 J (333)**	ND (16.7)	ND (8)	ND (16.7)	**68.5**
607041	74-SB-E002-F090	10–12	ND (12)	ND (30)	ND (15)	ND (16)	ND (18)	ND (23)
606397	74-SB-E002-F091	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606397	74-SB-E002-F092	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606397	74-SB-E002-F093	2–4	**54.6 J (333)**	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
607041	74-SB-E002-F106	10–12	ND (12)	ND (30)	ND (15)	ND (16)	ND (18)	**150 J (330)**
606397	74-SB-E002-F107	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606397	74-SB-E002-F108	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606397	74-SB-E002-F109	2–4	ND (10)	**36.6 J (333)**	ND (16.7)	**133**	**129**	ND (16.7)
607041	74-SB-E002-F122	10–12	ND (12)	ND (30)	ND (15)	ND (16)	ND (18)	ND (23)
606397	74-SB-E002-F123	2–4	ND (10)	**25.4 J (333)**	ND (16.7)	**36.5**	ND (16.7)	**130**
606397	74-SB-E002-F124	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606397	74-SB-E002-F125	2–4	ND (10)	ND (17.3)	ND (16.7)	**15.2 J (33.3)**	**32 J (33.3)**	ND (16.7)
606592	74-SB-E002-F125-R	2–4	NR	NR	NR	NR	NR	NR
606799	74-SB-E002-F125-R	10–12	NR	NR	NR	NR	NR	NR
606397	74-SB-E002-F126	2–4	ND (10)	ND (17.3)	ND (16.7)	**8.01 J (33.3)**	**95.7**	ND (16.7)
606592	74-SB-E002-F126-R	2–4	NR	NR	NR	NR	NR	NR
606397	74-SB-E002-F126-DU	(D)	ND (10)	ND (17.3)	ND (16.7)	**12.8 J (33.3)**	**142**	ND (16.7)
606421	74-SB-E002-F127	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606421	74-SB-E002-F138	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606421	74-SB-E002-F139	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606421	74-SB-E002-F140	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	**124**	ND (16.7)

Refer to footnotes at end of table.

Table B-4 (Continued)
Summary of Confirmatory Soil Sampling, SVOC Analytical Results, CWL SOB

Sample Attributes			SVOCs (EPA Method 8270C/SW846 8270[a]) (µg/kg)					
Record Number[b]	ER Sample ID	Sample Depth (in.)	1,2-Dichloro-benzene	2,4,B-Trichloro-phenol	2-Methylnaph-thalene	Acenaphthene	Anthracene	Benzo(a) anthracene
606592	74-SB-E002-F140-R	2–4	NR	NR	NR	NR	NR	NR
606421	74-SB-E002-F141	2–4	ND (10)	**30.2 J (333)**	ND (16.7)	**153**	**347**	ND (16.7)
606592	74-SB-E002-F141-R	2–4	NR	NR	NR	NR	NR	NR
606421	74-SB-E002-F142	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606421	74-SB-E002-F143	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
607040	74-SB-E002-F154	10–12	ND (12)	ND (30)	ND (15)	ND (16)	ND (18)	ND (23)
606421	74-SB-E002-F155	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606421	74-SB-E002-F156	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606421	74-SB-E002-F157	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606421	74-SB-E002-F157-DU	(D)	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	**24.2 J (33.3)**
605917	74-SB-E002-F158	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	**43.7**	ND (16.7)
606689	74-SB-E002-F158-R	2–4	NR	NR	NR	NR	NR	NR
605917	74-SB-E002-F159	2–4	ND (10)	ND (17.3)	ND (16.7)	**9.08 J (33.3)**	**21 J (33.3)**	ND (16.7)
606162	74-SB-E002-F161	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
607040	74-SB-E002-F170	10–12	ND (12)	ND (30)	ND (15)	ND (16)	ND (18)	ND (23)
606424	74-SB-E002-F171	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606424	74-SB-E002-F172	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606649	74-SB-E002-F172-R	2–4	NR	NR	NR	NR	NR	NR
606424	74-SB-E002-F173	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606649	74-SB-E002-F173-R	2–4	NR	NR	NR	NR	NR	NR
606424	74-SB-E002-F174	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606424	74-SB-E002-F175	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606424	74-SB-E002-F176	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606162	74-SB-E002-F177	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606424	74-SB-E002-F186	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606424	74-SB-E002-F187	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	**39.3**
606592	74-SB-E002-F187-R	2–4	NR	NR	NR	NR	NR	NR

Refer to footnotes at end of table.

Table B-4 (Continued)
Summary of Confirmatory Soil Sampling, SVOC Analytical Results, CWL SOB

Sample Attributes			SVOCs (EPA Method 8270C/SW846 8270[a]) (µg/kg)					
Record Number[b]	ER Sample ID	Sample Depth (in.)	1,2-Dichloro-benzene	2,4,B-Trichloro-phenol	2-Methylnaph-thalene	Acenaphthene	Anthracene	Benzo(a) anthracene
606592	74-SB-E002-F187-R-DU	(D)	NR	NR	NR	NR	NR	NR
606424	74-SB-E002-F188	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606424	74-SB-E002-F189	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606424	74-SB-E002-F189-DU	(D)	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606425	74-SB-E002-F190	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606425	74-SB-E002-F191	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606425	74-SB-E002-F192	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
607039	74-SB-E002-F193	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606166	74-SB-E002-F202	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606166	74-SB-E002-F203	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606166	74-SB-E002-F204	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606166	74-SB-E002-F205	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606425	74-SB-E002-F206	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606425	74-SB-E002-F207	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606425	74-SB-E002-F208	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
607039	74-SB-E002-F209	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606166	74-SB-E002-F216	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606166	74-SB-E002-F217	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606166	74-SB-E002-F218	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606166	74-SB-E002-F219	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606425	74-SB-E002-F220	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606425	74-SB-E002-F221	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606425	74-SB-E002-F222	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
606425	74-SB-E002-F222-DU	(DU)	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)
607039	74-SB-E002-F225	2–4	ND (10)	ND (17.3)	ND (16.7)	ND (8)	ND (16.7)	ND (16.7)

Refer to footnotes at end of table.

Table B-4 (Continued)
Summary of Confirmatory Soil Sampling, SVOC Analytical Results, CWL SOB

Sample Attributes			SVOCs (EPA Method 8270C/SW846 8270[a]) (µg/kg)					
Record Number[b]	ER Sample ID	Sample Depth (in.)	Benzo(a) pyrene	Benzo(b) fluoranthene	Benzo(ghi) perylene	Benzo(k) fluoranthene	bis(2-Chloro-ethyl)ether	Butylbenzyl phthalate
604708	74-SB-D000-V094	2–4	ND (2)	ND (2.33)	ND (5)	ND (5)	ND (6.67)	ND (12.7)
604708	74-SB-D000-V095	2–4	ND (2)	ND (2.33)	ND (5)	ND (5)	ND (6.67)	ND (12.7)
604708	74-SB-D000-V110	2–4	ND (2)	ND (2.33)	ND (5)	ND (5)	ND (6.67)	ND (12.7)
604708	74-SB-D000-V111	2–4	ND (2)	ND (2.33)	ND (5)	ND (5)	ND (6.67)	ND (12.7)
606339	74-SB-E002-F001	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606339	74-SB-E002-F002	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606339	74-SB-E002-F003	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606339	74-SB-E002-F005	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606339	74-SB-E002-F006	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606339	74-SB-E002-F008	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606339	74-SB-E002-F009	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606339	74-SB-E002-F010	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606339	74-SB-E002-F012	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606339	74-SB-E002-F013	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606339	74-SB-E002-F014	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606339	74-SB-E002-F015	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606339	74-SB-E002-F017	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606339	74-SB-E002-F018	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606339	74-SB-E002-F019	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606339	74-SB-E002-F020	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606339	74-SB-E002-F021	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606339	74-SB-E002-F022	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606339	74-SB-E002-F023	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606339	74-SB-E002-F024	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606381	74-SB-E002-F025	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606381	74-SB-E002-F026	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606381	74-SB-E002-F027	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606381	74-SB-E002-F029	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606381	74-SB-E002-F030	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)

Refer to footnotes at end of table.

Table B-4 (Continued)
Summary of Confirmatory Soil Sampling, SVOC Analytical Results, CWL SOB

Sample Attributes			SVOCs (EPA Method 8270C/SW846 8270[a]) (μg/kg)					
Record Number[b]	ER Sample ID	Sample Depth (in.)	Benzo(a) pyrene	Benzo(b) fluoranthene	Benzo(ghi) perylene	Benzo(k) fluoranthene	bis(2-Chloro-ethyl)ether	Butylbenzyl phthalate
606381	74-SB-E002-F031	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606381	74-SB-E002-F032	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606381	74-SB-E002-F033	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606381	74-SB-E002-F036	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606381	74-SB-E002-F037	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606382	74-SB-E002-F040	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606382	74-SB-E002-F042	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606382	74-SB-E002-F043	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606382	74-SB-E002-F044	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606382	74-SB-E002-F045	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606382	74-SB-E002-F046	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606382	74-SB-E002-F047	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606382	74-SB-E002-F048	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606382	74-SB-E002-F049	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606382	74-SB-E002-F050	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606383	74-SB-E002-F051	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606383	74-SB-E002-F052	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606383	74-SB-E002-F053	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606383	74-SB-E002-F054	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606383	74-SB-E002-F055	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606383	74-SB-E002-F056	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606383	74-SB-E002-F057	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606383	74-SB-E002-F059	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606383	74-SB-E002-F066	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606383	74-SB-E002-F068	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606384	74-SB-E002-F069	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606384	74-SB-E002-F070	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606384	74-SB-E002-F071	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606384	74-SB-E002-F072	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)

Refer to footnotes at end of table.

Table B-4 (Continued)
Summary of Confirmatory Soil Sampling, SVOC Analytical Results, CWL SOB

Sample Attributes			SVOCs (EPA Method 8270C/SW846 8270[a]) (μg/kg)					
Record Number[b]	ER Sample ID	Sample Depth (in.)	Benzo(a) pyrene	Benzo(b) fluoranthene	Benzo(ghi) perylene	Benzo(k) fluoranthene	bis(2-Chloro-ethyl)ether	Butylbenzyl phthalate
606384	74-SB-E002-F073	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606384	74-SB-E002-F074	2–4	ND (16.7)	**99**	ND (16.7)	**39.9**	ND (37.3)	ND (28.7)
606592	74-SB-E002-F074-R	2–4	NR	ND (16.7)	NR	NR	NR	NR
606384	74-SB-E002-F075	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606384	74-SB-E002-F076	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606384	74-SB-E002-F077	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606384	74-SB-E002-F078	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
607041	74-SB-E002-F090	10–12	ND (19)	ND (38)	ND (100)	ND (19)	ND (13)	ND (26)
606397	74-SB-E002-F091	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606397	74-SB-E002-F092	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606397	74-SB-E002-F093	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
607041	74-SB-E002-F106	10–12	ND (19)	89 J (330)	ND (100)	**110 J (330)**	ND (13)	ND (26)
606397	74-SB-E002-F107	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606397	74-SB-E002-F108	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606397	74-SB-E002-F109	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
607041	74-SB-E002-F122	10–12	ND (19)	ND (38)	ND (100)	ND (19)	ND (13)	ND (26)
606397	74-SB-E002-F123	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606397	74-SB-E002-F124	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606397	74-SB-E002-F125	2–4	NR	NR	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606592	74-SB-E002-F125-R	2–4	NR	NR	NR	NR	NR	NR
606799	74-SB-E002-F125-R	10–12	ND (16.7)	ND (16.7)	NR	NR	NR	NR
606397	74-SB-E002-F126	2–4	NR	ND (16.7)	NR	**218**	ND (37.3)	ND (28.7)
606592	74-SB-E002-F126-R	2–4	ND (16.7)	NR	ND (16.7)	NR	NR	NR
606397	74-SB-E002-F126-DU	(D)	**52.2**	**219**	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606421	74-SB-E002-F127	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606421	74-SB-E002-F138	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606421	74-SB-E002-F139	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606421	74-SB-E002-F140	2–4	ND (16.7)	NR	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)

Refer to footnotes at end of table.

Table B-4 (Continued)
Summary of Confirmatory Soil Sampling, SVOC Analytical Results, CWL SOB

Sample Attributes			SVOCs (EPA Method 8270C/SW846 8270[a]) (μg/kg)					
Record Number[b]	ER Sample ID	Sample Depth (in.)	Benzo(a) pyrene	Benzo(b) fluoranthene	Benzo(ghi) perylene	Benzo(k) fluoranthene	bis(2-Chloro-ethyl)ether	Butylbenzyl phthalate
606592	74-SB-E002-F140-R	2–4	NR	**93.2**	NR	NR	NR	NR
606421	74-SB-E002-F141	2–4	NR	NR	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606592	74-SB-E002-F141-R	2–4	**42.4**	**279**	NR	NR	NR	NR
606421	74-SB-E002-F142	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606421	74-SB-E002-F143	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
607040	74-SB-E002-F154	10–12	ND (19)	ND (38)	ND (100)	ND (19)	ND (13)	ND (26)
606421	74-SB-E002-F155	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606421	74-SB-E002-F156	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606421	74-SB-E002-F157	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606421	74-SB-E002-F157-DU	(D)	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
605917	74-SB-E002-F158	2–4	ND (16.7)	NR	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606689	74-SB-E002-F158-R	2–4	NR	ND (16.7)	NR	NR	NR	NR
605917	74-SB-E002-F159	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606162	74-SB-E002-F161	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
607040	74-SB-E002-F170	10–12	ND (19)	ND (38)	ND (100)	ND (19)	ND (13)	ND (26)
606424	74-SB-E002-F171	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606424	74-SB-E002-F172	2–4	ND (16.7)	NR	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606649	74-SB-E002-F172-R	2–4	NR	ND (16.7)	NR	NR	NR	NR
606424	74-SB-E002-F173	2–4	ND (16.7)	NR	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606649	74-SB-E002-F173-R	2–4	NR	ND (16.7)	NR	NR	NR	NR
606424	74-SB-E002-F174	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606424	74-SB-E002-F175	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606424	74-SB-E002-F176	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	**29.3 J (333)**
606162	74-SB-E002-F177	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606424	74-SB-E002-F186	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606424	74-SB-E002-F187	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	NR	ND (28.7)
606592	74-SB-E002-F187-R	2–4	NR	NR	NR	NR	ND (37.3)	NR

Refer to footnotes at end of table.

Table B-4 (Continued)
Summary of Confirmatory Soil Sampling, SVOC Analytical Results, CWL SOB

Sample Attributes			SVOCs (EPA Method 8270C/SW846 8270[a]) (µg/kg)					
Record Number[b]	ER Sample ID	Sample Depth (in.)	Benzo(a) pyrene	Benzo(b) fluoranthene	Benzo(ghi) perylene	Benzo(k) fluoranthene	bis(2-Chloro-ethyl)ether	Butylbenzyl phthalate
606592	74-SB-E002-F187-R-DU	(D)	NR	NR	NR	NR	ND (37.3)	NR
606424	74-SB-E002-F188	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606424	74-SB-E002-F189	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606424	74-SB-E002-F189-DU	(D)	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606425	74-SB-E002-F190	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606425	74-SB-E002-F191	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606425	74-SB-E002-F192	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
607039	74-SB-E002-F193	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606166	74-SB-E002-F202	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606166	74-SB-E002-F203	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606166	74-SB-E002-F204	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606166	74-SB-E002-F205	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606425	74-SB-E002-F206	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606425	74-SB-E002-F207	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606425	74-SB-E002-F208	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
607039	74-SB-E002-F209	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606166	74-SB-E002-F216	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606166	74-SB-E002-F217	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606166	74-SB-E002-F218	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606166	74-SB-E002-F219	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606425	74-SB-E002-F220	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606425	74-SB-E002-F221	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
606425	74-SB-E002-F222	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	**32.6 J (333)**
606425	74-SB-E002-F222-DU	(DU)	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)
607039	74-SB-E002-F225	2–4	ND (16.7)	ND (16.7)	ND (16.7)	ND (16.7)	ND (37.3)	ND (28.7)

Refer to footnotes at end of table.

Table B-4 (Continued)
Summary of Confirmatory Soil Sampling, SVOC Analytical Results, CWL SOB

Sample Attributes			SVOCs (EPA Method 8270C/SW846 8270[a]) (μg/kg)				
Record Number[b]	ER Sample ID	Sample Depth (in.)	Carbazole	Chrysene	Di-n-butyl phthalate	Di-n-octyl phthalate	Dibenzofuran
604708	74-SB-D000-V094	2–4	ND (5)	ND (6.33)	ND (20.7)	ND (9)	ND (2.67)
604708	74-SB-D000-V095	2–4	ND (5)	ND (6.33)	ND (20.7)	ND (9)	ND (2.67)
604708	74-SB-D000-V110	2–4	ND (5)	ND (6.33)	ND (20.7)	ND (9)	ND (2.67)
604708	74-SB-D000-V111	2–4	ND (5)	ND (6.33)	ND (20.7)	ND (9)	ND (2.67)
606339	74-SB-E002-F001	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606339	74-SB-E002-F002	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606339	74-SB-E002-F003	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606339	74-SB-E002-F005	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606339	74-SB-E002-F006	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606339	74-SB-E002-F008	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606339	74-SB-E002-F009	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606339	74-SB-E002-F010	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606339	74-SB-E002-F012	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606339	74-SB-E002-F013	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606339	74-SB-E002-F014	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606339	74-SB-E002-F015	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606339	74-SB-E002-F017	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606339	74-SB-E002-F018	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606339	74-SB-E002-F019	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606339	74-SB-E002-F020	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606339	74-SB-E002-F021	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606339	74-SB-E002-F022	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606339	74-SB-E002-F023	2–4	ND (16.7)	**36**	ND (24)	ND (30.3)	ND (17)
606339	74-SB-E002-F024	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606381	74-SB-E002-F025	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606381	74-SB-E002-F026	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606381	74-SB-E002-F027	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606381	74-SB-E002-F029	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606381	74-SB-E002-F030	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)

Refer to footnotes at end of table.

Table B-4 (Continued)
Summary of Confirmatory Soil Sampling, SVOC Analytical Results, CWL SOB

Sample Attributes			SVOCs (EPA Method 8270C/SW846 8270[a]) (μg/kg)				
Record Number[b]	ER Sample ID	Sample Depth (in.)	Carbazole	Chrysene	Di-n-butyl phthalate	Di-n-octyl phthalate	Dibenzofuran
606381	74-SB-E002-F031	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606381	74-SB-E002-F032	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606381	74-SB-E002-F033	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606381	74-SB-E002-F036	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606381	74-SB-E002-F037	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606382	74-SB-E002-F040	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606382	74-SB-E002-F042	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606382	74-SB-E002-F043	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606382	74-SB-E002-F044	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606382	74-SB-E002-F045	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606382	74-SB-E002-F046	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606382	74-SB-E002-F047	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606382	74-SB-E002-F048	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606382	74-SB-E002-F049	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606382	74-SB-E002-F050	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606383	74-SB-E002-F051	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606383	74-SB-E002-F052	2–4	ND (16.7)	ND (16.7)	**27.1 J (333)**	ND (30.3)	ND (17)
606383	74-SB-E002-F053	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606383	74-SB-E002-F054	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606383	74-SB-E002-F055	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606383	74-SB-E002-F056	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606383	74-SB-E002-F057	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606383	74-SB-E002-F059	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606383	74-SB-E002-F066	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606383	74-SB-E002-F068	2–4	ND (16.7)	ND (16.7)	**33.2 J (333)**	ND (30.3)	ND (17)
606384	74-SB-E002-F069	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606384	74-SB-E002-F070	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606384	74-SB-E002-F071	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606384	74-SB-E002-F072	2–4	ND (16.7)	ND (16.7)	ND (24)	**34.1 J (333)**	ND (17)

Refer to footnotes at end of table.

Table B-4 (Continued)
Summary of Confirmatory Soil Sampling, SVOC Analytical Results, CWL SOB

Sample Attributes			SVOCs (EPA Method 8270C/SW846 8270[a]) (μg/kg)				
Record Number[b]	ER Sample ID	Sample Depth (in.)	Carbazole	Chrysene	Di-n-butyl phthalate	Di-n-octyl phthalate	Dibenzofuran
606384	74-SB-E002-F073	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606384	74-SB-E002-F074	2–4	ND (16.7)	**226**	ND (24)	ND (30.3)	ND (17)
606592	74-SB-E002-F074-R	2–4	NR	NR	NR	NR	NR
606384	74-SB-E002-F075	2–4	ND (16.7)	**67.7**	**26.9 J (333)**	ND (30.3)	ND (17)
606384	74-SB-E002-F076	2–4	ND (16.7)	**28.1 J (33.3)**	**25.6 J (333)**	ND (30.3)	ND (17)
606384	74-SB-E002-F077	2–4	ND (16.7)	ND (16.7)	**46.4 J (333)**	ND (30.3)	ND (17)
606384	74-SB-E002-F078	2–4	ND (16.7)	**125**	ND (24)	ND (30.3)	ND (17)
607041	74-SB-E002-F090	10–12	ND (20)	ND (14)	ND (28)	ND (140)	ND (22)
606397	74-SB-E002-F091	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606397	74-SB-E002-F092	2–4	ND (16.7)	**78.1**	ND (24)	ND (30.3)	ND (17)
606397	74-SB-E002-F093	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
607041	74-SB-E002-F106	10–12	ND (20)	**250 J (330)**	ND (28)	ND (140)	ND (22)
606397	74-SB-E002-F107	2–4	ND (16.7)	**77.2**	ND (24)	ND (30.3)	ND (17)
606397	74-SB-E002-F108	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606397	74-SB-E002-F109	2–4	ND (16.7)	**320**	ND (24)	ND (30.3)	**65 J (333)**
607041	74-SB-E002-F122	10–12	ND (20)	**83 J (330)**	ND (28)	ND (140)	ND (22)
606397	74-SB-E002-F123	2–4	ND (16.7)	**171**	ND (24)	ND (30.3)	ND (17)
606397	74-SB-E002-F124	2–4	ND (16.7)	**50**	ND (24)	ND (30.3)	ND (17)
606397	74-SB-E002-F125	2–4	ND (16.7)	**256**	ND (24)	ND (30.3)	ND (17)
606592	74-SB-E002-F125-R	2–4	NR	NR	NR	NR	NR
606799	74-SB-E002-F125-R	10–12	NR	NR	NR	NR	NR
606397	74-SB-E002-F126	2–4	ND (16.7)	**390**	ND (24)	ND (30.3)	ND (17)
606592	74-SB-E002-F126-R	2–4	NR	NR	NR	NR	NR
606397	74-SB-E002-F126-DU	(D)	ND (16.7)	**512**	ND (24)	ND (30.3)	ND (17)
606421	74-SB-E002-F127	2–4	ND (16.7)	ND (16.7)	**30.1 J (333)**	ND (30.3)	ND (17)
606421	74-SB-E002-F138	2–4	ND (16.7)	**97.9**	ND (24)	ND (30.3)	ND (17)
606421	74-SB-E002-F139	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606421	74-SB-E002-F140	2–4	**53.8 J (333)**	**215**	ND (24)	ND (30.3)	ND (17)

Refer to footnotes at end of table.

Table B-4 (Continued)
Summary of Confirmatory Soil Sampling, SVOC Analytical Results, CWL SOB

Sample Attributes			SVOCs (EPA Method 8270C/SW846 8270[a]) (μg/kg)				
Record Number[b]	ER Sample ID	Sample Depth (in.)	Carbazole	Chrysene	Di-n-butyl phthalate	Di-n-octyl phthalate	Dibenzofuran
606592	74-SB-E002-F140-R	2–4	NR	NR	NR	NR	NR
606421	74-SB-E002-F141	2–4	ND (16.7)	**559**	ND (24)	ND (30.3)	**76.6 J (333)**
606592	74-SB-E002-F141-R	2–4	NR	NR	NR	NR	NR
606421	74-SB-E002-F142	2–4	ND (16.7)	**67.4**	ND (24)	ND (30.3)	ND (17)
606421	74-SB-E002-F143	2–4	ND (16.7)	**75.5**	ND (24)	ND (30.3)	ND (17)
607040	74-SB-E002-F154	10–12	ND (20)	ND (14)	ND (28)	ND (140)	ND (22)
606421	74-SB-E002-F155	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606421	74-SB-E002-F156	2–4	ND (16.7)	**33.8**	**27.3 J (333)**	ND (30.3)	ND (17)
606421	74-SB-E002-F157	2–4	ND (16.7)	**42.7**	ND (24)	ND (30.3)	ND (17)
606421	74-SB-E002-F157-DU	(D)	ND (16.7)	**60.8**	ND (24)	ND (30.3)	ND (17)
605917	74-SB-E002-F158	2–4	**26.6 J (333)**	**78.1**	ND (24)	ND (30.3)	ND (17)
606689	74-SB-E002-F158-R	2–4	NR	NR	NR	NR	NR
605917	74-SB-E002-F159	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606162	74-SB-E002-F161	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
607040	74-SB-E002-F170	10–12	ND (20)	ND (14)	ND (28)	ND (140)	ND (22)
606424	74-SB-E002-F171	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606424	74-SB-E002-F172	2–4	ND (16.7)	**104**	**50.8 J (333)**	ND (30.3)	ND (17)
606649	74-SB-E002-F172-R	2–4	NR	NR	NR	NR	NR
606424	74-SB-E002-F173	2–4	ND (16.7)	**36.9**	ND (24)	ND (30.3)	ND (17)
606649	74-SB-E002-F173-R	2–4	NR	NR	NR	NR	NR
606424	74-SB-E002-F174	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606424	74-SB-E002-F175	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606424	74-SB-E002-F176	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606162	74-SB-E002-F177	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606424	74-SB-E002-F186	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606424	74-SB-E002-F187	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606592	74-SB-E002-F187-R	2–4	NR	NR	NR	NR	NR

Refer to footnotes at end of table.

Table B-4 (Continued)
Summary of Confirmatory Soil Sampling, SVOC Analytical Results, CWL SOB

Sample Attributes			SVOCs (EPA Method 8270C/SW846 8270[a]) (µg/kg)				
Record Number[b]	ER Sample ID	Sample Depth (in.)	Carbazole	Chrysene	Di-n-butyl phthalate	Di-n-octyl phthalate	Dibenzofuran
606592	74-SB-E002-F187-R-DU	(D)	NR	NR	NR	NR	NR
606424	74-SB-E002-F188	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606424	74-SB-E002-F189	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606424	74-SB-E002-F189-DU	(D)	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606425	74-SB-E002-F190	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606425	74-SB-E002-F191	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606425	74-SB-E002-F192	2–4	ND (16.7)	**33.8**	ND (24)	ND (30.3)	ND (17)
607039	74-SB-E002-F193	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606166	74-SB-E002-F202	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606166	74-SB-E002-F203	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606166	74-SB-E002-F204	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606166	74-SB-E002-F205	2–4	ND (16.7)	ND (16.7)	**24.4 J (333)**	ND (30.3)	ND (17)
606425	74-SB-E002-F206	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606425	74-SB-E002-F207	2–4	ND (16.7)	**18.3 J (33.3)**	**24.6 J (333)**	ND (30.3)	ND (17)
606425	74-SB-E002-F208	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
607039	74-SB-E002-F209	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606166	74-SB-E002-F216	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606166	74-SB-E002-F217	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606166	74-SB-E002-F218	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606166	74-SB-E002-F219	2–4	ND (16.7)	ND (16.7)	**27.4 J (333)**	ND (30.3)	ND (17)
606425	74-SB-E002-F220	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
606425	74-SB-E002-F221	2–4	ND (16.7)	**78.6**	ND (24)	ND (30.3)	ND (17)
606425	74-SB-E002-F222	2–4	ND (16.7)	ND (16.7)	**32 J (333)**	ND (30.3)	ND (17)
606425	74-SB-E002-F222-DU	(DU)	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)
607039	74-SB-E002-F225	2–4	ND (16.7)	ND (16.7)	ND (24)	ND (30.3)	ND (17)

Refer to footnotes at end of table.

Table B-4 (Continued)
Summary of Confirmatory Soil Sampling, SVOC Analytical Results, CWL SOB

Sample Attributes			SVOCs (EPA Method 8270C/SW846 8270[a]) (µg/kg)				
Record Number[b]	ER Sample ID	Sample Depth (in.)	Diethylphthalate	Dimethylphthalate	Diphenyl amine	bis(2-Ethylhexyl) phthalate	Fluoranthene
604708	74-SB-D000-V094	2–4	ND (19.7)	ND (11.7)	ND (15.7)	ND (7)	**6.87 J (33.3)**
604708	74-SB-D000-V095	2–4	ND (19.7)	ND (11.7)	ND (15.7)	ND (7)	ND (3.33)
604708	74-SB-D000-V110	2–4	ND (19.7)	ND (11.7)	ND (15.7)	ND (7)	ND (3.33)
604708	74-SB-D000-V111	2–4	ND (19.7)	ND (11.7)	ND (15.7)	ND (7)	ND (3.33)
606339	74-SB-E002-F001	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**30.8 J (333)**	ND (16.7)
606339	74-SB-E002-F002	2–4	ND (17.7)	ND (18.3)	ND (22.3)	ND (30)	ND (16.7)
606339	74-SB-E002-F003	2–4	ND (17.7)	ND (18.3)	ND (22.3)	ND (30)	ND (16.7)
606339	74-SB-E002-F005	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**45.8 J (333)**	ND (16.7)
606339	74-SB-E002-F006	2–4	ND (17.7)	ND (18.3)	ND (22.3)	ND (30)	ND (16.7)
606339	74-SB-E002-F008	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**62.4 J (333)**	**21.4 J (33.3)**
606339	74-SB-E002-F009	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**46.1 J (333)**	ND (16.7)
606339	74-SB-E002-F010	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**48.1 J (333)**	ND (16.7)
606339	74-SB-E002-F012	2–4	ND (17.7)	ND (18.3)	ND (22.3)	ND (30)	ND (16.7)
606339	74-SB-E002-F013	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**88.8 J (333)**	ND (16.7)
606339	74-SB-E002-F014	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**128 J (333)**	ND (16.7)
606339	74-SB-E002-F015	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**42.8 J (333)**	ND (16.7)
606339	74-SB-E002-F017	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**45.3 J (333)**	ND (16.7)
606339	74-SB-E002-F018	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**119 J (333)**	ND (16.7)
606339	74-SB-E002-F019	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**6,120**	ND (16.7)
606339	74-SB-E002-F020	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**51.4 J (333)**	ND (16.7)
606339	74-SB-E002-F021	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**276 J (333)**	ND (16.7)
606339	74-SB-E002-F022	2–4	ND (17.7)	ND (18.3)	ND (22.3)	ND (30)	ND (16.7)
606339	74-SB-E002-F023	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**211 J (333)**	**90.6**
606339	74-SB-E002-F024	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**79.2 J (333)**	**31.7 J (33.3)**
606381	74-SB-E002-F025	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**56.2 J (333)**	**22.6 J (33.3)**
606381	74-SB-E002-F026	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**44.2 J (333)**	ND (16.7)
606381	74-SB-E002-F027	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**52.3 J (333)**	ND (16.7)
606381	74-SB-E002-F029	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**89.8 J (333)**	ND (16.7)
606381	74-SB-E002-F030	2–4	**19.8 J (333)**	ND (18.3)	ND (22.3)	**67.8 J (333)**	ND (16.7)

Refer to footnotes at end of table.

Table B-4 (Continued)
Summary of Confirmatory Soil Sampling, SVOC Analytical Results, CWL SOB

Sample Attributes			SVOCs (EPA Method 8270C/SW846 8270)[a] (µg/kg)				
Record Number[b]	ER Sample ID	Sample Depth (in.)	Diethylphthalate	Dimethylphthalate	Diphenyl amine	bis(2-Ethylhexyl) phthalate	Fluoranthene
606381	74-SB-E002-F031	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**203 J (333)**	**61.6**
606381	74-SB-E002-F032	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**60.3 J (333)**	ND (16.7)
606381	74-SB-E002-F033	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**30.8 J (333)**	ND (16.7)
606381	74-SB-E002-F036	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**35.4 J (333)**	ND (16.7)
606381	74-SB-E002-F037	2–4	**21.6 J (333)**	ND (18.3)	ND (22.3)	**36.1 J (333)**	ND (16.7)
606382	74-SB-E002-F040	2–4	**54.8 J (333)**	ND (18.3)	ND (22.3)	**115 J (333)**	ND (16.7)
606382	74-SB-E002-F042	2–4	**30.8 J (333)**	ND (18.3)	ND (22.3)	**103 J (333)**	**20.8 J (33.3)**
606382	74-SB-E002-F043	2–4	**23.7 J (333)**	ND (18.3)	ND (22.3)	ND (30)	ND (16.7)
606382	74-SB-E002-F044	2–4	**22.2 J (333)**	ND (18.3)	ND (22.3)	**43.1 J (333)**	ND (16.7)
606382	74-SB-E002-F045	2–4	**20.7 J (333)**	ND (18.3)	ND (22.3)	ND (30)	ND (16.7)
606382	74-SB-E002-F046	2–4	ND (17.7)	ND (18.3)	ND (22.3)	ND (30)	ND (16.7)
606382	74-SB-E002-F047	2–4	**17.8 J (333)**	ND (18.3)	ND (22.3)	ND (30)	ND (16.7)
606382	74-SB-E002-F048	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**35.6 J (333)**	ND (16.7)
606382	74-SB-E002-F049	2–4	ND (17.7)	ND (18.3)	ND (22.3)	ND (30)	ND (16.7)
606382	74-SB-E002-F050	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**48.2 J (333)**	ND (16.7)
606383	74-SB-E002-F051	2–4	ND (17.7)	ND (18.3)	ND (22.3)	ND (30)	ND (16.7)
606383	74-SB-E002-F052	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**74.1 J (333)**	ND (16.7)
606383	74-SB-E002-F053	2–4	ND (17.7)	ND (18.3)	ND (22.3)	ND (30)	ND (16.7)
606383	74-SB-E002-F054	2–4	ND (17.7)	**329 J (333)**	ND (22.3)	**54.4 J (333)**	ND (16.7)
606383	74-SB-E002-F055	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**30.6 J (333)**	ND (16.7)
606383	74-SB-E002-F056	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**38.7 J (333)**	ND (16.7)
606383	74-SB-E002-F057	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**39.5 J (333)**	ND (16.7)
606383	74-SB-E002-F059	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**38.7 J (333)**	ND (16.7)
606383	74-SB-E002-F066	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**49.2 J (333)**	**20.9 J (33.3)**
606383	74-SB-E002-F068	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**79.1 J (333)**	ND (16.7)
606384	74-SB-E002-F069	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**108 J (333)**	**19.6 J (33.3)**
606384	74-SB-E002-F070	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**55.5 J (333)**	ND (16.7)
606384	74-SB-E002-F071	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**50.1 J (333)**	ND (16.7)
606384	74-SB-E002-F072	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**56.8 J (333)**	ND (16.7)

Refer to footnotes at end of table.

Table B-4 (Continued)
Summary of Confirmatory Soil Sampling, SVOC Analytical Results, CWL SOB

Sample Attributes			SVOCs (EPA Method 8270C/SW846 8270)[a] (µg/kg)				
Record Number[b]	ER Sample ID	Sample Depth (in.)	Diethylphthalate	Dimethylphthalate	Diphenyl amine	bis(2-Ethylhexyl) phthalate	Fluoranthene
606384	74-SB-E002-F073	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**74.7 J (333)**	ND (16.7)
606384	74-SB-E002-F074	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**604**	**135**
606592	74-SB-E002-F074-R	2–4	NR	NR	NR	NR	NR
606384	74-SB-E002-F075	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**733**	**145**
606384	74-SB-E002-F076	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**374**	**67.6**
606384	74-SB-E002-F077	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**171 J (333)**	**30.7 J (33.3)**
606384	74-SB-E002-F078	2–4	**25 J (333)**	ND (18.3)	ND (22.3)	**1,710**	**428**
607041	74-SB-E002-F090	10–12	ND (41)	ND (20)	NR	**800**	ND (23)
606397	74-SB-E002-F091	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**38.2 J (333)**	**18.9 J (33.3)**
606397	74-SB-E002-F092	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**688**	**162**
606397	74-SB-E002-F093	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**598**	**85.2**
607041	74-SB-E002-F106	10–12	ND (41)	ND (20)	NR	**310 J (330)**	ND (23)
606397	74-SB-E002-F107	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**426**	**126**
606397	74-SB-E002-F108	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**350**	**32 J (33.3)**
606397	74-SB-E002-F109	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**2,780**	**733**
607041	74-SB-E002-F122	10–12	ND (41)	ND (20)	NR	**390**	ND (23)
606397	74-SB-E002-F123	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**467**	**610**
606397	74-SB-E002-F124	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**506**	**94.4**
606397	74-SB-E002-F125	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**783**	**753**
606592	74-SB-E002-F125-R	2–4	NR	NR	NR	NR	NR
606799	74-SB-E002-F125-R	10–12	NR	NR	NR	NR	NR
606397	74-SB-E002-F126	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**581**	**415**
606592	74-SB-E002-F126-R	2–4	NR	NR	NR	NR	NR
606397	74-SB-E002-F126-DU	(D)	ND (17.7)	ND (18.3)	ND (22.3)	**494**	**491**
606421	74-SB-E002-F127	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**53 J (333)**	ND (16.7)
606421	74-SB-E002-F138	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**340**	**151**
606421	74-SB-E002-F139	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**265 J (333)**	**22 J (33.3)**
606421	74-SB-E002-F140	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**704**	**222**

Refer to footnotes at end of table.

Table B-4 (Continued)
Summary of Confirmatory Soil Sampling, SVOC Analytical Results, CWL SOB

Sample Attributes			SVOCs (EPA Method 8270C/SW846 8270)[a] (μg/kg)				
Record Number[b]	ER Sample ID	Sample Depth (in.)	Diethylphthalate	Dimethylphthalate	Diphenyl amine	bis(2-Ethylhexyl) phthalate	Fluoranthene
606592	74-SB-E002-F140-R	2–4	NR	NR	NR	NR	NR
606421	74-SB-E002-F141	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**2,220**	**2,030**
606592	74-SB-E002-F141-R	2–4	NR	NR	NR	NR	NR
606421	74-SB-E002-F142	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**123 J (333)**	**31.6 J (33.3)**
606421	74-SB-E002-F143	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**230 J (333)**	**68**
607040	74-SB-E002-F154	10–12	ND (41)	ND (20)	NR	ND (34)	ND (23)
606421	74-SB-E002-F155	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**999**	**46.3**
606421	74-SB-E002-F156	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**486**	**66.1**
606421	74-SB-E002-F157	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**205 J (333)**	**29.1 J (33.3)**
606421	74-SB-E002-F157-DU	(D)	ND (17.7)	ND (18.3)	ND (22.3)	NR	NR
605917	74-SB-E002-F158	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**349**	**253**
606689	74-SB-E002-F158-R	2–4	NR	NR	NR	NR	NR
605917	74-SB-E002-F159	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**374**	**89.4**
606162	74-SB-E002-F161	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**310 J (333)**	ND (16.7)
607040	74-SB-E002-F170	10–12	ND (41)	ND (20)	NR	ND (34)	ND (23)
606424	74-SB-E002-F171	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**176 J (333)**	**26.9 J (33.3)**
606424	74-SB-E002-F172	2–4	ND (17.7)	ND (18.3)	**25.8 J (333)**	**2,050**	**138**
606649	74-SB-E002-F172-R	2–4	NR	NR	NR	NR	NR
606424	74-SB-E002-F173	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**93.4 J (333)**	**22.3 J (33.3)**
606649	74-SB-E002-F173-R	2–4	NR	NR	NR	NR	NR
606424	74-SB-E002-F174	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**83.6 J (333)**	**19.9 J (33.3)**
606424	74-SB-E002-F175	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**87.8 J (333)**	ND (16.7)
606424	74-SB-E002-F176	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**67.1 J (333)**	ND (16.7)
606162	74-SB-E002-F177	2–4	ND (17.7)	ND (18.3)	ND (22.3)	ND (30)	**17.7 J (33.3)**
606424	74-SB-E002-F186	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**73.9 J (333)**	ND (16.7)
606424	74-SB-E002-F187	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**150 J (333)**	**41.1**
606592	74-SB-E002-F187-R	2–4	NR	NR	NR	NR	NR

Refer to footnotes at end of table.

Table B-4 (Continued)
Summary of Confirmatory Soil Sampling, SVOC Analytical Results, CWL SOB

Sample Attributes			SVOCs (EPA Method 8270C/SW846 8270)[a] (µg/kg)				
Record Number[b]	ER Sample ID	Sample Depth (in.)	Diethylphthalate	Dimethylphthalate	Diphenyl amine	bis(2-Ethylhexyl) phthalate	Fluoranthene
606592	74-SB-E002-F187-R-DU	(D)	NR	NR	NR	NR	NR
606424	74-SB-E002-F188	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**77.8 J (333)**	ND (16.7)
606424	74-SB-E002-F189	2–4	ND (17.7)	ND (18.3)	ND (22.3)	ND (30)	ND (16.7)
606424	74-SB-E002-F189-DU	(D)	ND (17.7)	ND (18.3)	ND (22.3)	ND (30)	ND (16.7)
606425	74-SB-E002-F190	2–4	ND (17.7)	ND (18.3)	ND (22.3)	ND (30)	ND (16.7)
606425	74-SB-E002-F191	2–4	ND (17.7)	ND (18.3)	ND (22.3)	ND (30)	ND (16.7)
606425	74-SB-E002-F192	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**79 J (333)**	**51.7**
607039	74-SB-E002-F193	2–4	ND (17.7)	ND (18.3)	ND (22.3)	ND (30)	ND (16.7)
606166	74-SB-E002-F202	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**202 J (333)**	**33.1 J (33.3)**
606166	74-SB-E002-F203	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**182 J (333)**	ND (16.7)
606166	74-SB-E002-F204	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**30.6 J (333)**	ND (16.7)
606166	74-SB-E002-F205	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**30.1 J (333)**	ND (16.7)
606425	74-SB-E002-F206	2–4	ND (17.7)	ND (18.3)	ND (22.3)	ND (30)	ND (16.7)
606425	74-SB-E002-F207	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**138 J (333)**	ND (16.7)
606425	74-SB-E002-F208	2–4	ND (17.7)	ND (18.3)	ND (22.3)	ND (30)	ND (16.7)
607039	74-SB-E002-F209	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**44 J (333)**	ND (16.7)
606166	74-SB-E002-F216	2–4	ND (17.7)	ND (18.3)	ND (22.3)	ND (30)	ND (16.7)
606166	74-SB-E002-F217	2–4	ND (17.7)	ND (18.3)	ND (22.3)	ND (30)	ND (16.7)
606166	74-SB-E002-F218	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**34.6 J (333)**	ND (16.7)
606166	74-SB-E002-F219	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**118 J (333)**	ND (16.7)
606425	74-SB-E002-F220	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**111 J (333)**	**28.2 J (33.3)**
606425	74-SB-E002-F221	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**105 J (333)**	**111**
606425	74-SB-E002-F222	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**2,380**	**21.5 J (33.3)**
606425	74-SB-E002-F222-DU	(DU)	ND (17.7)	ND (18.3)	ND (22.3)	NR	ND (16.7)
607039	74-SB-E002-F225	2–4	ND (17.7)	ND (18.3)	ND (22.3)	**43.1 J (333)**	ND (16.7)

Refer to footnotes at end of table.

Table B-4 (Continued)
Summary of Confirmatory Soil Sampling, SVOC Analytical Results, CWL SOB

Sample Attributes			SVOCs (EPA Method 8270C/SW846 8270)[a] (µg/kg)				
Record Number[b]	ER Sample ID	Sample Depth (in.)	Fluorene	Hexachlorobenzene	Pentachlorophenol	Phenanthrene	Pyrene
604708	74-SB-D000-V094	2–4	ND (3)	ND (4.67)	ND (61)	ND (4)	ND (8.67)
604708	74-SB-D000-V095	2–4	ND (3)	ND (4.67)	ND (61)	ND (4)	ND (8.67)
604708	74-SB-D000-V110	2–4	ND (3)	ND (4.67)	ND (61)	ND (4)	ND (8.67)
604708	74-SB-D000-V111	2–4	ND (3)	ND (4.67)	ND (61)	ND (4)	ND (8.67)
606339	74-SB-E002-F001	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606339	74-SB-E002-F002	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606339	74-SB-E002-F003	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606339	74-SB-E002-F005	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606339	74-SB-E002-F006	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606339	74-SB-E002-F008	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	**20.4 J (33.3)**
606339	74-SB-E002-F009	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606339	74-SB-E002-F010	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606339	74-SB-E002-F012	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606339	74-SB-E002-F013	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606339	74-SB-E002-F014	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606339	74-SB-E002-F015	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606339	74-SB-E002-F017	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606339	74-SB-E002-F018	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606339	74-SB-E002-F019	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	**49.7**
606339	74-SB-E002-F020	2–4	**7.8 J (33.3)**	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606339	74-SB-E002-F021	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606339	74-SB-E002-F022	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606339	74-SB-E002-F023	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	**72.9**
606339	74-SB-E002-F024	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	**18 J (33.3)**
606381	74-SB-E002-F025	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	**19.5 J (33.3)**
606381	74-SB-E002-F026	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606381	74-SB-E002-F027	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606381	74-SB-E002-F029	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606381	74-SB-E002-F030	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)

Refer to footnotes at end of table.

Table B-4 (Continued)
Summary of Confirmatory Soil Sampling, SVOC Analytical Results, CWL SOB

Sample Attributes			SVOCs (EPA Method 8270C/SW846 8270)[a] (μg/kg)				
Record Number[b]	ER Sample ID	Sample Depth (in.)	Fluorene	Hexachlorobenzene	Pentachlorophenol	Phenanthrene	Pyrene
606381	74-SB-E002-F031	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	**60.9**
606381	74-SB-E002-F032	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606381	74-SB-E002-F033	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606381	74-SB-E002-F036	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606381	74-SB-E002-F037	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606382	74-SB-E002-F040	2–4	**6.26 J (33.3)**	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606382	74-SB-E002-F042	2–4	**7.84 J (33.3)**	ND (20)	ND (167)	ND (16.7)	**24.8 J (33.3)**
606382	74-SB-E002-F043	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606382	74-SB-E002-F044	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606382	74-SB-E002-F045	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606382	74-SB-E002-F046	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606382	74-SB-E002-F047	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606382	74-SB-E002-F048	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606382	74-SB-E002-F049	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606382	74-SB-E002-F050	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606383	74-SB-E002-F051	2–4	**4.36 J (33.3)**	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606383	74-SB-E002-F052	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606383	74-SB-E002-F053	2–4	**4.25 J (33.3)**	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606383	74-SB-E002-F054	2–4	**4.46 J (33.3)**	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606383	74-SB-E002-F055	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606383	74-SB-E002-F056	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606383	74-SB-E002-F057	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606383	74-SB-E002-F059	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606383	74-SB-E002-F066	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	**21.9 J (33.3)**
606383	74-SB-E002-F068	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	**17.3 J (33.3)**
606384	74-SB-E002-F069	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	**17.7 J (33.3)**
606384	74-SB-E002-F070	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606384	74-SB-E002-F071	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606384	74-SB-E002-F072	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)

Refer to footnotes at end of table.

Table B-4 (Continued)
Summary of Confirmatory Soil Sampling, SVOC Analytical Results, CWL SOB

Sample Attributes			SVOCs (EPA Method 8270C/SW846 8270)[a] (µg/kg)				
Record Number[b]	ER Sample ID	Sample Depth (in.)	Fluorene	Hexachlorobenzene	Pentachlorophenol	Phenanthrene	Pyrene
606384	74-SB-E002-F073	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606384	74-SB-E002-F074	2–4	ND (4)	ND (20)	ND (167)	**41.1**	**353**
606592	74-SB-E002-F074-R	2–4	NR	NR	NR	NR	NR
606384	74-SB-E002-F075	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	**168**
606384	74-SB-E002-F076	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	**62.2**
606384	74-SB-E002-F077	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	**34.2**
606384	74-SB-E002-F078	2–4	ND (4)	ND (20)	ND (167)	**58.1**	**461**
607041	74-SB-E002-F090	10–12	ND (19)	ND (18)	ND (120)	ND (16)	ND (22)
606397	74-SB-E002-F091	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	**152**
606397	74-SB-E002-F092	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	**299**
606397	74-SB-E002-F093	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	**206**
607041	74-SB-E002-F106	10–12	ND (19)	ND (18)	ND (120)	ND (16)	**390**
606397	74-SB-E002-F107	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	**326**
606397	74-SB-E002-F108	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	**182**
606397	74-SB-E002-F109	2–4	**69.2**	**20.3 J (333)**	ND (167)	**713**	**918**
607041	74-SB-E002-F122	10–12	ND (19)	ND (18)	**660 J (1,600)**	**69 J (330)**	**250 J (330)**
606397	74-SB-E002-F123	2–4	**9.54 J (33.3)**	ND (20)	ND (167)	**39.8**	**879**
606397	74-SB-E002-F124	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	**235**
606397	74-SB-E002-F125	2–4	**11 J (33.3)**	ND (20)	ND (167)	**106**	**756**
606592	74-SB-E002-F125-R	2–4	NR	NR	NR	NR	NR
606799	74-SB-E002-F125-R	10–12	NR	NR	NR	NR	NR
606397	74-SB-E002-F126	2–4	ND (4)	ND (20)	ND (167)	**38.4**	**563**
606592	74-SB-E002-F126-R	2–4	NR	NR	NR	NR	NR
606397	74-SB-E002-F126-DU	(D)	NR	ND (20)	ND (167)	NR	NR
606421	74-SB-E002-F127	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606421	74-SB-E002-F138	2–4	**6.87 J (33.3)**	ND (20)	ND (167)	**34**	**278**
606421	74-SB-E002-F139	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	**166**
606421	74-SB-E002-F140	2–4	**9.41 J (33.3)**	ND (20)	ND (167)	**58.4**	**405**

Refer to footnotes at end of table.

Table B-4 (Continued)
Summary of Confirmatory Soil Sampling, SVOC Analytical Results, CWL SOB

Sample Attributes			SVOCs (EPA Method 8270C/SW846 8270)[a] (μg/kg)				
Record Number[b]	ER Sample ID	Sample Depth (in.)	Fluorene	Hexachlorobenzene	Pentachlorophenol	Phenanthrene	Pyrene
606592	74-SB-E002-F140-R	2–4	NR	NR	NR	NR	NR
606421	74-SB-E002-F141	2–4	**94.7**	ND (20)	ND (167)	**916**	**1,460**
606592	74-SB-E002-F141-R	2–4	NR	NR	NR	NR	NR
606421	74-SB-E002-F142	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	**170**
606421	74-SB-E002-F143	2–4	ND (4)	ND (20)	ND (167)	**26 J (33.3)**	**217**
607040	74-SB-E002-F154	10–12	ND (19)	ND (18)	ND (120)	ND (16)	ND (22)
606421	74-SB-E002-F155	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	**182**
606421	74-SB-E002-F156	2–4	ND (4)	ND (20)	ND (167)	**17.4 J (33.3)**	**203**
606421	74-SB-E002-F157	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	**171**
606421	74-SB-E002-F157-DU	(D)	ND (4)	ND (20)	ND (167)	NR	NR
605917	74-SB-E002-F158	2–4	**14.6 J (33.3)**	ND (20)	**439**	**155**	**302**
606689	74-SB-E002-F158-R	2–4	NR	NR	NR	NR	NR
605917	74-SB-E002-F159	2–4	**9.49 J (33.3)**	ND (20)	**415**	**72.6**	**124**
606162	74-SB-E002-F161	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
607040	74-SB-E002-F170	10–12	ND (19)	ND (18)	ND (120)	ND (16)	ND (22)
606424	74-SB-E002-F171	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	**43.8**
606424	74-SB-E002-F172	2–4	ND (4)	ND (20)	ND (167)	**51.9**	**279**
606649	74-SB-E002-F172-R	2–4	NR	NR	NR	NR	NR
606424	74-SB-E002-F173	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	**20.2 J (33.3)**
606649	74-SB-E002-F173-R	2–4	NR	NR	NR	NR	NR
606424	74-SB-E002-F174	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	**23.2 J (33.3)**
606424	74-SB-E002-F175	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606424	74-SB-E002-F176	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606162	74-SB-E002-F177	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606424	74-SB-E002-F186	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606424	74-SB-E002-F187	2–4	ND (4)	ND (20)	ND (167)	**22.4 J (33.3)**	**74.2**
606592	74-SB-E002-F187-R	2–4	NR	NR	NR	NR	NR

Refer to footnotes at end of table.

Table B-4 (Continued)
Summary of Confirmatory Soil Sampling, SVOC Analytical Results, CWL SOB

Sample Attributes			SVOCs (EPA Method 8270C/SW846 8270)[a] (µg/kg)				
Record Number[b]	ER Sample ID	Sample Depth (in.)	Fluorene	Hexachlorobenzene	Pentachlorophenol	Phenanthrene	Pyrene
606592	74-SB-E002-F187-R-DU	(D)	NR	NR	NR	NR	NR
606424	74-SB-E002-F188	2–4	ND (4)	ND (20)	**297 J (333)**	ND (16.7)	ND (16.7)
606424	74-SB-E002-F189	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606424	74-SB-E002-F189-DU	(D)	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606425	74-SB-E002-F190	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606425	74-SB-E002-F191	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606425	74-SB-E002-F192	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	**57.3**
607039	74-SB-E002-F193	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606166	74-SB-E002-F202	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	**23 J (33.3)**
606166	74-SB-E002-F203	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	**17.2 J (33.3)**
606166	74-SB-E002-F204	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606166	74-SB-E002-F205	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606425	74-SB-E002-F206	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606425	74-SB-E002-F207	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	**19.9 J (33.3)**
606425	74-SB-E002-F208	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
607039	74-SB-E002-F209	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606166	74-SB-E002-F216	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606166	74-SB-E002-F217	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606166	74-SB-E002-F218	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606166	74-SB-E002-F219	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
606425	74-SB-E002-F220	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	**28.3 J (33.3)**
606425	74-SB-E002-F221	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	**187**
606425	74-SB-E002-F222	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	**18.3 J (33.3)**
606425	74-SB-E002-F222-DU	(DU)	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)
607039	74-SB-E002-F225	2–4	ND (4)	ND (20)	ND (167)	ND (16.7)	ND (16.7)

Note: Values in **bold** represent detected analytes.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
CWL = Chemical Waste Landfill.
D = Duplicate sample.
DU = Duplicate sample.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.

Table B-4 (Concluded)
Summary of Confirmatory Soil Sampling, SVOC Analytical Results, CWL SOB

ID	= Identification.
in.	= Inch(es).
J ( )	= The reported value is greater than or equal to the MDL but is less than the practical quantitation limit, shown in parenthesis.
MDL	= Method detection limit.
µg/kg	= Microgram(s) per kilogram.
ND ( )	= Not detected above the MDL, shown in parentheses.
NR	= Not reported.
R	= Resample.
SOB	= Site Operational Boundary.
SVOC	= Semivolatile organic compound.

Table B-5
Summary of SVOC Analytical MDLs, CWL SOB

Analyte	EPA Method 8270[a] Detection Limit (μg/kg)
Acenaphthene	4–16
Acenaphthylene	3.67–16.7
Acetophenone	46.3
2-Acetylaminofluorene	68
4-Aminobiphenyl	191
Aniline	53
Anthracene	4.67–18
Benzidine	221
Benzo(a)anthracene	6–23
Benzo(a)pyrene	2–19
Benzo(b)fluoranthene	2.33–38
Benzo(ghi)perylene	5–100
Benzo(k)fluoranthene	5–19
3-benzodioxole, B-(2-Propenyl)-1	147
Benzyl alcohol	3.33
4-Bromophenyl phenyl ether	4.67–34
Butylbenzyl phthalate	12.7–28.7
Carbazole	5–20
4-Chlorobenzenamine	31–167
Chlorobenzilate	71
bis(2-Chloroethoxy)methane	6–21
bis(2-Chloroethyl)ether	6.67–37.3
bis-Chloroisopropyl ether	11–37.2
2-Chloronaphthalene	3.67–16
2-Chlorophenol	5–15.3
4-Chlorophenyl phenyl ether	3.33–19.7
Chrysene	6.33–16.7
o-Cresol	19–47.7
p-Cresol	5.67–33.3
m,p-Cresol	33.3
m-,p-Cresol	33.3
Diallate	55.3
Dibenz[a,h]anthracene	2.67–81
Dibenzofuran	2.67–22
1,2-Dichlorobenzene	4.33–12
1,3-Dichlorobenzene	3.33–12
1,4-Dichlorobenzene	6–15.7
3,3'-Dichlorobenzidine	23–167
2,4-Dichlorophenol	8–26
2,6-Dichlorophenol	155
Diethylphthalate	17.7–41
4-Dimethylaminoazobenzene	37.3
7,12-Dimethylbenz(a)anthracene	66.7
3,3'-Dimethylbenzidine	1070
2,4-Dimethylphenol	28–167

Refer to footnotes at end of table.

Table B-5 (Continued)
Summary of SVOC Analytical MDLs, CWL SOB

Analyte	EPA Method 8270[a] Detection Limit (μg/kg)
Dimethylphthalate	11.7–20
Di-n-butyl phthalate	20.7–28
1,3-Dinitrobenzene	120
Dinitro-o-cresol	16–167
2,4-Dinitrophenol	15–167
2,4-Dinitrotoluene	5–25.3
2,6-Dinitrotoluene	3–33.3
Di-n-octyl phthalate	9–140
Dinoseb	105
Diphenyl amine	15.7–22.3
Ethyl methanesulfonate	130
bis(2-Ethylhexyl) phthalate	7–60
Fluoranthene	3.33–23
Fluorene	3–19
Hexachlorobenzene	4.67–20
Hexachlorobutadiene	6.67–12.7
Hexachlorocyclopentadiene	33–167
Hexachloroethane	4.33–22
Hexachloropropene	122
Indeno(1,2,3-c,d)pyrene	6.67–17
Isodrin	63.3
Isophorone	2.33–18
Isosafrole	129
Kepone	60.3
Methyl methanesulfonate	99.7
3-Methylcholanthrene	97.7
2-Methylnaphthalene	4–16.7
4-Chloro-3-Methylphenol	27–167
4-Methylphenol	51
2-Methylpyridine	126
2-Naphthalenamine	246
Naphthalene	3.33–16.7
1,4-Naphthoquinone	134
1-Naphthylamine	271
2-Nitroaniline	38–167
3-Nitroaniline	26–167
4-Nitroaniline	22–84
Nitro-benzene	18–36.7
B-Nitro-o-toluidine	48.7
2-Nitrophenol	17–46.3
4-Nitrophenol	21–167
n-Nitrosodiethylamine	130
n-Nitrosodimethylamine	6.33
n-Nitroso-di-n-butylamine	127
n-Nitrosodiphenylamine	21

Refer to footnotes at end of table.

Table B-5 (Concluded)
Summary of SVOC Analytical MDLs, CWL SOB

Analyte	EPA Method 8270[a] Detection Limit (μg/kg)
n-Nitrosodipropylamine	20–33
n-Nitrosomethylethylamine	263
n-Nitrosopiperidine	61
n-Nitrosopyrrolidine	131
Pentachlorobenzene	130
Pentachloroethane	137
Pentachloronitrobenzene	74.7
Pentachlorophenol	61–167
Phenacetin	51.7
Phenanthrene	4–16.7
Phenol	3.67–87
Pronamide	22.7
Pyrene	8.67–22
Pyridine	4.67
1,2,4,B-Tetrachlorobenzene	130
2,3,4,6-Tetrachlorophenol	108
o-Toluidine	81.3
1,2,4-Trichlorobenzene	4.67–17
2,4,B-Trichlorophenol	17.3–42.3
2,4,6-Trichlorophenol	24.7–31
1,3,B-Trinitrobenzene	143

[a]EPA November 1986.
CWL = Chemical Waste Landfill.
EPA = U.S. Environmental Protection Agency.
MDL = Method detection limit.
μg/kg = Microgram(s) per kilogram.
SOB = Site Operational Boundary.
SVOC = Semivolatile organic compound.

Table B-6
Total PCB Analytical Results, CWL SOB

Sample Attributes			PCB (EPA Method 8082/SW846 8082)[a] mg/kg
Record Number[b]	ER Sample ID	Sample Depth (in.)	
606339	74-SB-E002-F001	2–4	0.02079
606339	74-SB-E002-F002	2–4	0.0399
606339	74-SB-E002-F003	2–4	0.0121
606339	74-SB-E002-F005	2–4	0.36897
606339	74-SB-E002-F006	2–4	0.0806
606339	74-SB-E002-F008	2–4	0.877
606339	74-SB-E002-F009	2–4	0.1865
606339	74-SB-E002-F010	2–4	0.1122
606339	74-SB-E002-F012	2–4	0.0999
606339	74-SB-E002-F013	2–4	0.1178
606339	74-SB-E002-F014	2–4	0.0824
606339	74-SB-E002-F015	2–4	0.335
606339	74-SB-E002-F017	2–4	0.1317
606339	74-SB-E002-F018	2–4	0.4852
606339	74-SB-E002-F019	2–4	0.2555
606339	74-SB-E002-F020	2–4	0.1136
606339	74-SB-E002-F021	2–4	0.2724
606339	74-SB-E002-F022	2–4	0.2221
606339	74-SB-E002-F023	2–4	NR
606592	74-SB-E002-F023-R	4–6	0.3508[c]
606339	74-SB-E002-F024	2–4	0.769
606381	74-SB-E002-F025	2–4	0.906
606381	74-SB-E002-F026	2–4	0.0747
606381	74-SB-E002-F027	2–4	0.22
606381	74-SB-E002-F029	2–4	0.1114
606381	74-SB-E002-F030	2–4	0.0783
606381	74-SB-E002-F031	2–4	NR
606592	74-SB-E002-F031-R	4–6	0.1182[c]
606381	74-SB-E002-F032	2–4	0.2084
606381	74-SB-E002-F033	2–4	0.0231
606381	74-SB-E002-F036	2–4	0.051
606381	74-SB-E002-F037	2–4	0.0831
606382	74-SB-E002-F040	2–4	0.1351
606382	74-SB-E002-F042	2–4	0.3229
606382	74-SB-E002-F043	2–4	0.0089
606382	74-SB-E002-F044	2–4	0.204
606382	74-SB-E002-F045	2–4	0.0154
606382	74-SB-E002-F046	2–4	0.0331
606382	74-SB-E002-F047	2–4	0.0225
606382	74-SB-E002-F048	2–4	0.064
606382	74-SB-E002-F049	2–4	0.0178

Refer to footnotes at end of table.

Table B-6 (Continued)
Total PCB Analytical Results, CWL SOB

Sample Attributes			PCB (EPA Method 8082/SW846 8082)[a] mg/kg
Record Number[b]	ER Sample ID	Sample Depth (in.)	
606382	74-SB-E002-F050	2–4	0.1647
606383	74-SB-E002-F051	2–4	0.0083
606383	74-SB-E002-F052	2–4	0.0912
606383	74-SB-E002-F053	2–4	0.0084
606383	74-SB-E002-F054	2–4	0.1247
606383	74-SB-E002-F055	2–4	0.0238
606383	74-SB-E002-F056	2–4	0.0799
606383	74-SB-E002-F057	2–4	0.0139
606383	74-SB-E002-F059	2–4	0.0149
606383	74-SB-E002-F066	2–4	0.0595
606383	74-SB-E002-F068	2–4	0.2701
606384	74-SB-E002-F069	2–4	0.1607
606384	74-SB-E002-F070	2–4	0.0533
606384	74-SB-E002-F071	2–4	0.0982
606384	74-SB-E002-F072	2–4	0.0878
606384	74-SB-E002-F073	2–4	0.1529
606384	74-SB-E002-F074	2–4	NR
606592	74-SB-E002-F074-R	4–6	0.7368[c]
606384	74-SB-E002-F075	2–4	NR
606592	74-SB-E002-F075-R	4–6	0.3665[c]
606384	74-SB-E002-F076	2–4	NR
606592	74-SB-E002-F076-R	4–6	0.0651[c]
606384	74-SB-E002-F077	2–4	NR
606592	74-SB-E002-F077-R	4–6	0.2501[c]
606384	74-SB-E002-F078	2–4	NR
606592	74-SB-E002-F078-R	4–6	NR
606788	74-SB-E002-F078-R	6–8	ND[d]
607041	74-SB-E002-F090	2–4	0.54
606397	74-SB-E002-F091	2–4	0.5142
606397	74-SB-E002-F092	2–4	NR
606592	74-SB-E002-F092-R	4–6	NR
606788	74-SB-E002-F092-R	6–8	0.2936[d]
606397	74-SB-E002-F093	2–4	NR
606592	74-SB-E002-F093-R	4–6	NR
606788	74-SB-E002-F093-R	6–8	0.2952[d]
606649	74-SB-E002-F094-R	2–4	NR
606795	74-SB-E002-F094-R	4–6	0.1399[c]
606649	74-SB-E002-F095-R*	2–4	0.6922
607041	74-SB-E002-F106	2–4	NR

Refer to footnotes at end of table.

Table B-6 (Continued)
Total PCB Analytical Results, CWL SOB

Sample Attributes			PCB (EPA Method 8082/SW846 8082)[a] mg/kg
Record Number[b]	ER Sample ID	Sample Depth (in.)	
607147	74-SB-E002-F106-R	14–16	NR
607164	74-SB-E002-F106-RR	24–26	ND[d]
606397	74-SB-E002-F107	2–4	NR
606592	74-SB-E002-F107-R	4–6	NR
606799	74-SB-E002-F107-R	18–20	0.0119[d]
606397	74-SB-E002-F108	2–4	0.633
606397	74-SB-E002-F109	2–4	NR
606592	74-SB-E002-F109-R	4–6	0.718[c]
606649	74-SB-E002-F110-R*	2–4	0.7198
606649	74-SB-E002-F111-R*	2–4	NR
606795	74-SB-E002-F111-R	4–6	0.00165[c]
607041	74-SB-E002-F122	2–4	NR
607147	74-SB-E002-F122-R	14–16	0.075[c]
606397	74-SB-E002-F123	2–4	NR
606592	74-SB-E002-F123-R	4–6	NR
606799	74-SB-E002-F123-R	18–20	0.0472[d]
606397	74-SB-E002-F124	2–4	NR
606592	74-SB-E002-F124-R	4–6	NR
606689	74-SB-E002-F124-R	6–8	0.1228[d]
606397	74-SB-E002-F125	2–4	NR
606592	74-SB-E002-F125-R	4–6	NR
606799	74-SB-E002-F125-R	18–20	0.1553[d]
606397	74-SB-E002-F126	2–4	NR
606592	74-SB-E002-F126-R	4–6	0.4176[c]
606421	74-SB-E002-F127	2–4	0.5271
606421	74-SB-E002-F138	2–4	NR
607040	74-SB-E002-F138-R	12–14	0.069[c]
606421	74-SB-E002-F139	2–4	0.841
606421	74-SB-E002-F140	2–4	NR
606592	74-SB-E002-F140-R	4–6	NR
606782	74-SB-E002-F140-R	6–8	0.017[d]
606421	74-SB-E002-F141	2–4	NR
606592	74-SB-E002-F141-R	4–6	NR
606782	74-SB-E002-F141-R	6–8	0.0114[d]
606421	74-SB-E002-F142	2–4	NR
606592	74-SB-E002-F142-R	4–6	NR
606782	74-SB-E002-F142-R	6–8	0.114[d]
606421	74-SB-E002-F143	2–4	NR
606592	74-SB-E002-F143-R	4–6	0.3721[c]
607040	74-SB-E002-F154	10–12	0.15

Refer to footnotes at end of table.

Table B-6 (Continued)
Total PCB Analytical Results, CWL SOB

Sample Attributes			PCB (EPA Method 8082/SW846 8082)[a] mg/kg
Record Number[b]	ER Sample ID	Sample Depth (in.)	
606421	74-SB-E002-F155	2–4	NR
606592	74-SB-E002-F155-R	4–6	NR
607040	74-SB-E002-F155-R	14–16	ND[d]
606421	74-SB-E002-F156	2–4	NR
606592	74-SB-E002-F156-R	4–6	NR
606782	74-SB-E002-F156-R	6–8	NR
606995	74-SB-E002-F156-RR	4 ft	ND
606421	74-SB-E002-F157	2–4	0.844
605917	74-SB-E002-F158	2–4	NR
606689	74-SB-E002-F158-R	4–6	0.3367[c]
605917	74-SB-E002-F159	2–4	NR
606689	74-SB-E002-F159-R	4–6	NR
606995	74-SB-E002-F159-RR	18–20	ND
606162	74-SB-E002-F161	2–4	0.1811
607040	74-SB-E002-F170	10–12	0.092
606424	74-SB-E002-F171	2–4	0.476
606424	74-SB-E002-F172	2–4	NR
606649	74-SB-E002-F172-R	4–6	0.836[c]
606424	74-SB-E002-F173	2–4	NR
606649	74-SB-E002-F173-R	4–6	0.6032[c]
606424	74-SB-E002-F174	2–4	0.381
606424	74-SB-E002-F175	2–4	0.3243
606424	74-SB-E002-F176	2–4	0.1184
606162	74-SB-E002-F177	2–4	0.0675
606424	74-SB-E002-F186	2–4	0.293
606424	74-SB-E002-F187	2–4	NR
606592	74-SB-E002-F187-R	4–6	0.0898[c]
606424	74-SB-E002-F188	2–4	0.3593
606424	74-SB-E002-F189	2–4	0.0511
606425	74-SB-E002-F190	2–4	0.0494
606425	74-SB-E002-F191	2–4	0.1121
606425	74-SB-E002-F192	2–4	NR
606649	74-SB-E002-F192-R	4–6	NR
607038	74-SB-E002-F192-R	14–16	0.0096[d]
607039	74-SB-E002-F193	2–4	0.156
606166	74-SB-E002-F202	2–4	0.209
606166	74-SB-E002-F203	2–4	NR
606400	74-SB-E002-F203	4–6	0.0076[c]
606166	74-SB-E002-F204	2–4	0.843

Refer to footnotes at end of table.

Table B-6 (Concluded)
Total PCB Analytical Results, CWL SOB

Sample Attributes			PCB (EPA Method 8082/SW846 8082)[a] mg/kg
Record Number[b]	ER Sample ID	Sample Depth (in.)	
606166	74-SB-E002-F205	2–4	0.403
606425	74-SB-E002-F206	2–4	0.0208
606425	74-SB-E002-F207	2–4	0.2194
606425	74-SB-E002-F208	2–4	0.1087
607039	74-SB-E002-F209	2–4	0.0504
606166	74-SB-E002-F216	2–4	0.042
606166	74-SB-E002-F217	2–4	0.1602
606166	74-SB-E002-F218	2–4	0.1566
606166	74-SB-E002-F219	2–4	0.1422
606425	74-SB-E002-F220	2–4	0.504
606425	74-SB-E002-F221	2–4	0.5212
606425	74-SB-E002-F222	2–4	0.0861
606425	74-SB-E002-F222-DU	(DU)	0.1106
607039	74-SB-E002-F225	2–4	0.003

Values in **bold** represent results that exceeded risk criteria.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]Resampled one time.
[d]Resampled two times.
CWL = Chemical Waste Landfill.
DU = Duplicate sample.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ID = Identification.
in. = Inch(es).
mg/kg = Milligram(s) per kilogram.
ND = Not detected.
PCB = Polychlorinated biphenyl.
R or RR = Resample.
SOB = Site Operational Boundary.
* = This sample was not resampled, see text for details.

Table B-7
Summary of PCB Analytical MDLs, CWL SOB

Analyte	EPA Method 8082[a] Detection Limit (μg/kg)
Aroclor-1016	1–5,000
Aroclor-1221	2.82–14,100
Aroclor-1232	1.67–8,330
Aroclor-1242	1.67–8,330
Aroclor-1248	1–5,000
Aroclor-1254	0.5–2,500
Aroclor-1260	1–5,000
Aroclor-1262	4
Aroclor-1268	9.9

[a]EPA November 1986.
CWL = Chemical Waste Landfill.
EPA = U.S. Environmental Protection Agency.
MDL = Method detection limit.
μg/kg = Microgram(s) per kilogram.
PCB = Polychlorinated biphenyl.
SOB = Site Operational Boundary.

Table B-8
Summary of Gamma Spectroscopy Analytical Results, CWL SOB

Sample Attributes			Activity (pCi/g)									
			Cesium-137		Radium-228		Thorium-232		Uranium-235		Uranium-238	
Record Number[a]	ER Sample ID	Sample Depth (in.)	Result	Error[b]	Result	Error[b]	Result	Error[b]	Result	Error[b]	Result	Error[b]
606339	74-SB-E002-F001	2–4	0.12	0.0273	0.656	0.149	0.747	0.098	ND (0.128)	--	**1.5**	0.522
606339	74-SB-E002-F002	2–4	ND (0.00807)	--	0.697	0.122	0.725	0.0818	ND (0.0943)	--	0.704	0.727
606339	74-SB-E002-F003	2–4	ND (0.021)	--	0.697	0.137	0.692	0.0803	ND (0.0583)	--	0.636	0.639
606339	74-SB-E002-F005	2–4	0.0573	0.0287	0.688	0.152	0.773	0.103	ND (0.134)	--	1.37	0.574
606339	74-SB-E002-F006	2–4	ND (0.0149)	--	0.598	0.114	0.664	0.0757	ND (0.103)	--	1.04	1
606339	74-SB-E002-F008	2–4	0.0596	0.0187	0.791	0.149	0.81	0.0895	ND (0.0801)	--	0.686	0.63
606339	74-SB-E002-F009	2–4	ND (0.0144)	--	0.63	0.14	0.77	0.0722	ND (0.121)	--	**1.78**	0.954
606339	74-SB-E002-F010	2–4	0.031	0.0237	0.786	0.146	0.797	0.104	ND (0.112)	--	**1.8**	0.53
606339	74-SB-E002-F012	2–4	0.0401	0.0225	0.798	0.155	0.807	0.0949	ND (0.0695)	--	**1.42**	0.918
606339	74-SB-E002-F013	2–4	0.0967	0.0245	0.765	0.163	0.706	0.0852	ND (0.132)	--	0.907	0.967
606339	74-SB-E002-F014	2–4	0.0341	0.0172	0.733	0.145	0.78	0.0893	ND (0.112)	--	**1.52**	1.07
606339	74-SB-E002-F015	2–4	0.0397	0.0393	0.69	0.148	0.749	0.0915	ND (0.142)	--	0.745	0.57
606339	74-SB-E002-F017	2–4	ND (0.00968)	--	0.722	0.146	0.728	0.0831	ND (0.0778)	--	1.02	0.563
606339	74-SB-E002-F018	2–4	0.0348	0.0181	0.665	0.144	0.833	0.103	ND (0.1)	--	1.2	0.475
606339	74-SB-E002-F019	2–4	0.0387	0.018	0.798	0.134	0.825	0.0927	ND (0.0958)	--	0.815	0.659
606339	74-SB-E002-F020	2–4	0.0444	0.0158	0.696	0.131	0.808	0.0886	0.0921	0.0797	**1.56**	0.839
606339	74-SB-E002-F021	2–4	0.0401	0.0172	0.712	0.127	0.821	0.0928	ND (0.0997)	--	0.73	0.639
606339	74-SB-E002-F022	2–4	0.0219	0.015	0.78	0.132	0.819	0.127	ND (0.074)	--	0.956	0.332
606339	74-SB-E002-F023	2–4	0.024	0.0168	0.681	0.126	0.803	0.09	ND (0.0643)	--	1	0.687
606339	74-SB-E002-F024	2–4	0.0236	0.0183	0.782	0.138	0.889	0.0739	ND (0.0648)	--	0.985	0.827
606381	74-SB-E002-F025	2–4	**0.0963**	0.0333	0.799	0.172	0.994	0.131	ND (0.139)	--	**1.93**	0.681
606381	74-SB-E002-F026	2–4	0.0431	0.0246	0.852	0.158	0.881	0.14	ND (0.123)	--	1.33	0.523
606381	74-SB-E002-F027	2–4	0.0442	0.0302	0.897	0.179	0.844	0.111	ND (0.0786)	--	1	0.543
606381	74-SB-E002-F029	2–4	ND (0.0227)	--	0.84	0.176	0.922	0.11	ND (0.117)	--	ND (0.582)	--
606381	74-SB-E002-F030	2–4	ND (0.0186)	--	0.78	0.185	0.966	0.116	ND (0.1)	--	ND (1.14)	--
606381	74-SB-E002-F031	2–4	0.0389	0.0281	**0.981**	0.207	0.922	0.116	ND (0.153)	--	1.16	0.999
606381	74-SB-E002-F032	2–4	0.0318	0.0134	0.723	0.135	0.846	0.0947	0.112	0.0844	0.832	0.678
606381	74-SB-E002-F033	2–4	**0.0965**	0.0254	0.877	0.162	1	0.111	ND (0.0942)	--	0.987	0.738
606381	74-SB-E002-F036	2–4	0.0395	0.0166	0.789	0.141	0.829	0.0934	**0.189**	0.125	0.818	0.668
606381	74-SB-E002-F037	2–4	0.0394	0.0161	0.755	0.136	0.911	0.102	ND (0.0597)	--	ND (0.754)	--
606382	74-SB-E002-F040	2–4	0.0551	0.0176	0.726	0.136	0.827	0.0914	0.0955	0.0933	1.05	0.884
606382	74-SB-E002-F042	2–4	0.0192	0.0146	0.806	0.146	0.84	0.0926	ND (0.0821)	--	1.13	0.715
606382	74-SB-E002-F043	2–4	0.0666	0.0237	0.798	0.144	0.924	0.114	ND (0.095)	--	**1.44**	0.461
606382	74-SB-E002-F044	2–4	0.0253	0.0128	0.807	0.138	0.916	0.0982	ND (0.0772)	--	1.26	0.625
606382	74-SB-E002-F045	2–4	**0.105**	0.0357	0.877	0.175	0.916	0.109	ND (0.169)	--	1.21	0.787
606382	74-SB-E002-F046	2–4	0.0351	0.0202	0.825	0.152	0.885	0.115	ND (0.121)	--	**1.51**	0.509
606382	74-SB-E002-F047	2–4	**0.0992**	0.0215	0.804	0.137	0.894	0.0987	ND (0.0523)	--	ND (0.695)	--
Background Concentration			0.079		0.93		1.01		0.16		1.4	

Refer to footnotes at end of table.

Table B-8 (Continued)
Summary of Gamma Spectroscopy Analytical Results, CWL SOB

Sample Attributes			Activity (pCi/g)									
			Cesium-137		Radium-228		Thorium-232		Uranium-235		Uranium-238	
Record Number[a]	ER Sample ID	Sample Depth (in.)	Result	Error[b]	Result	Error[b]	Result	Error[b]	Result	Error[b]	Result	Error[b]
606382	74-SB-E002-F048	2–4	0.0571	0.0259	0.795	0.176	0.963	0.112	ND (0.124)	--	1.07	0.984
606382	74-SB-E002-F049	2–4	**0.101**	0.0365	0.793	0.175	0.896	0.104	ND (0.153)	--	**1.72**	1.05
606382	74-SB-E002-F050	2–4	0.0282	0.0185	0.778	0.166	0.871	0.101	ND (0.108)	--	**1.56**	1.05
606383	74-SB-E002-F051	2–4	0.0701	0.0179	0.809	0.144	0.876	0.0977	0.126	0.0839	1.24	0.767
606383	74-SB-E002-F052	2–4	0.0345	0.0187	0.895	0.167	0.997	0.111	ND (0.0927)	--	0.927	0.746
606383	74-SB-E002-F053	2–4	**0.108**	0.0254	0.728	0.134	0.87	0.0979	ND (0.0542)	--	0.989	0.762
606383	74-SB-E002-F054	2–4	0.0284	0.0178	0.833	0.14	0.905	0.101	ND (0.117)	--	**1.72**	0.915
606383	74-SB-E002-F055	2–4	**0.119**	0.0213	0.771	0.142	0.879	0.0962	ND (0.112)	--	1.37	0.867
606383	74-SB-E002-F056	2–4	0.0346	0.0149	0.718	0.131	0.776	0.0856	0.0974	0.0826	0.839	0.727
606383	74-SB-E002-F057	2–4	**0.107**	0.0195	0.761	0.143	0.912	0.103	ND (0.0935)	--	0.915	0.798
606383	74-SB-E002-F059	2–4	**0.162**	0.0343	**1.01**	0.167	**1.09**	0.138	ND (0.115)	--	**1.88**	0.559
606383	74-SB-E002-F066	2–4	0.0388	0.0179	0.724	0.132	0.787	0.123	ND (0.0917)	--	0.849	0.288
606383	74-SB-E002-F068	2–4	0.0535	0.0197	0.716	0.145	0.844	0.105	ND (0.104)	--	1.1	0.427
606384	74-SB-E002-F069	2–4	0.0594	0.018	0.704	0.128	0.87	0.0965	ND (0.091)	--	1.17	0.856
606384	74-SB-E002-F070	2–4	**0.144**	0.0402	0.851	0.183	0.862	0.104	**0.168**	0.14	1.05	0.725
606384	74-SB-E002-F071	2–4	**0.0833**	0.0183	0.733	0.139	0.888	0.0999	ND (0.064)	--	0.759	0.614
606384	74-SB-E002-F072	2–4	**0.242**	0.0374	0.888	0.158	0.958	0.122	ND (0.121)	--	**1.63**	0.547
606384	74-SB-E002-F073	2–4	**0.118**	0.0241	0.729	0.135	0.878	0.136	ND (0.0929)	--	1.08	0.352
606384	74-SB-E002-F074	2–4	0.0608	0.02	0.83	0.15	0.932	0.114	ND (0.104)	--	1.33	0.406
606384	74-SB-E002-F075	2–4	0.0756	0.017	0.81	0.139	0.869	0.0968	ND (0.0971)	--	1.14	0.852
606384	74-SB-E002-F076	2–4	**0.163**	0.0329	0.791	0.139	0.886	0.112	ND (0.111)	--	**1.93**	0.513
606384	74-SB-E002-F077	2–4	ND (0.0189)	--	0.903	0.164	0.928	0.102	ND (0.0901)	--	1	0.6
606384	74-SB-E002-F078	2–4	0.0393	0.0152	0.882	0.147	0.864	0.0953	ND (0.0802)	--	0.98	0.619
607041	74-SB-E002-F090	2–4	ND (0.041)	--	ND (0.34)	--	0.65	0.19	**ND (0.18)**	--	ND (0.75)	--
606397	74-SB-E002-F091	2–4	**0.213**	0.0279	0.692	0.114	0.854	0.093	ND (0.0694)	--	1.18	0.662
606397	74-SB-E002-F092	2–4	ND (0.0151)	--	0.779	0.138	**1.02**	0.0893	ND (0.137)	--	1.35	1.14
606397	74-SB-E002-F093	2–4	ND (0.0154)	--	0.684	0.105	0.817	0.0656	ND (0.0867)	--	0.608	0.908
606649	74-SB-E002-F094-R	2–4	0.0421	0.0143	0.604	0.117	0.724	0.0925	ND (0.0856)	--	**1.92**	0.506
606649	74-SB-E002-F095-R	2–4	0.037	0.0186	0.643	0.12	0.767	0.098	0.0927	0.097	**1.98**	0.51
607041	74-SB-E002-F106	2–4	ND (0.047)	--	ND (0.41)	--	0.72	0.24	ND (0.22)	--	ND (1)	--
606397	74-SB-E002-F107	2–4	0.0228	0.0136	0.7	0.132	0.801	0.0883	ND (0.0805)	--	1.18	0.569
606397	74-SB-E002-F108	2–4	ND (0.0176)	--	0.891	0.148	0.922	0.101	ND (0.0493)	--	0.732	0.619
606397	74-SB-E002-F109	2–4	ND (0.00814)	--	0.648	0.116	0.733	0.0814	ND (0.0839)	--	**1.54**	0.785
606649	74-SB-E002-F110-R	2–4	0.0498	0.0275	0.627	0.125	0.645	0.0781	ND (0.103)	--	1.08	0.555
606649	74-SB-E002-F111-R	2–4	0.0335	0.0141	0.621	0.11	0.698	0.0772	ND (0.0768)	--	1.15	0.633
607041	74-SB-E002-F122	2–4	ND (0.044)	--	ND (0.32)	--	0.62	0.24	**ND (0.2)**	--	ND (0.77)	--
606397	74-SB-E002-F123	2–4	ND (0.0089)	--	0.68	0.11	0.799	0.0878	ND (0.086)	--	1.19	0.658
Background Concentration			0.079		0.93		1.01		0.16		1.4	

Refer to footnotes at end of table.

Table B-8 (Continued)
Summary of Gamma Spectroscopy Analytical Results, CWL SOB

Sample Attributes			Activity (pCi/g)									
			Cesium-137		Radium-228		Thorium-232		Uranium-235		Uranium-238	
Record Number[a]	ER Sample ID	Sample Depth (in.)	Result	Error[b]	Result	Error[b]	Result	Error[b]	Result	Error[b]	Result	Error[b]
606397	74-SB-E002-F124	2–4	0.014	0.012	0.751	0.133	0.798	0.0868	ND (0.0846)	--	0.926	0.627
606397	74-SB-E002-F125	2–4	ND (0.00864)	--	0.713	0.13	0.82	0.0921	ND (0.0959)	--	ND (0.602)	--
606397	74-SB-E002-F126	2–4	0.0235	0.0189	0.828	0.143	0.865	0.111	ND (0.0978)	--	**1.88**	0.53
606421	74-SB-E002-F127	2–4	ND (0.00911)	--	0.679	0.106	0.794	0.122	ND (0.0688)	--	0.994	0.304
606421	74-SB-E002-F138	2–4	0.0456	0.0215	0.83	0.143	0.856	0.104	ND (0.083)	--	**1.49**	0.426
606421	74-SB-E002-F139	2–4	ND (0.00723)	--	0.685	0.118	0.775	0.0862	ND (0.0694)	--	1.27	0.761
606421	74-SB-E002-F140	2–4	ND (0.0085)	--	0.733	0.112	0.807	0.0642	ND (0.0707)	--	0.991	0.447
606421	74-SB-E002-F141	2–4	0.0334	0.0342	0.731	0.143	0.76	0.0917	ND (0.146)	--	**1.47**	0.629
606421	74-SB-E002-F142	2–4	0.0439	0.0167	0.785	0.127	0.852	0.0931	ND (0.0788)	--	0.753	0.565
606421	74-SB-E002-F143	2–4	0.0208	0.0139	0.795	0.115	0.982	0.0861	0.135	0.153	ND (1.11)	--
607040	74-SB-E002-F154	2–4	ND (0.04)	--	ND (0.41)	--	0.66	0.21	**ND (0.18)**	--	ND (0.84)	--
606421	74-SB-E002-F155	2–4	**0.161**	0.0243	0.76	0.123	0.824	0.066	ND (0.0994)	--	0.828	0.664
606421	74-SB-E002-F156	2–4	0.0456	0.0152	0.774	0.133	0.752	0.0845	ND (0.0871)	--	0.867	0.768
606421	74-SB-E002-F157	2–4	ND (0.0207)	--	0.657	0.123	0.78	0.102	ND (0.112)	--	1.35	0.447
605917	74-SB-E002-F158	2–4	0.0339	0.0216	0.772	0.16	0.889	0.109	ND (0.11)	--	1.32	0.5
605917	74-SB-E002-F159	2–4	0.0506	0.0159	0.736	0.131	0.877	0.0963	**0.179**	0.104	ND (0.754)	--
606162	74-SB-E002-F161	2–4	0.062	0.0262	0.656	0.175	0.757	0.103	ND (0.149)	--	**2.14**	0.701
607040	74-SB-E002-F170	2–4	ND (0.049)	--	ND (0.42)	--	0.68	0.22	ND (0.21)	--	ND (0.85)	--
606424	74-SB-E002-F171	2–4	0.0279	0.0198	0.92	0.17	0.933	0.106	ND (0.0989)	--	ND (0.824)	--
606424	74-SB-E002-F172	2–4	0.0326	0.0209	0.843	0.18	0.889	0.101	0.136	0.105	ND (0.779)	--
606424	74-SB-E002-F173	2–4	ND (0.0129)	--	**0.991**	0.172	**1.05**	0.116	ND (0.106)	--	ND (0.923)	--
606424	74-SB-E002-F174	2–4	0.059	0.0269	0.867	0.188	0.917	0.115	ND (0.124)	--	0.969	0.487
606424	74-SB-E002-F175	2–4	ND (0.0394)	--	**0.975**	0.2	0.839	0.107	ND (0.103)	--	0.719	0.656
606424	74-SB-E002-F176	2–4	0.0703	0.0239	0.768	0.161	1.01	0.097	ND (0.116)	--	**2.67**	1.49
606162	74-SB-E002-F177	2–4	0.0466	0.0265	0.845	0.167	0.803	0.129	ND (0.112)	--	1.06	0.478
606424	74-SB-E002-F186	2–4	0.0234	0.0169	0.886	0.139	0.933	0.0762	**0.198**	0.119	ND (0.523)	--
606424	74-SB-E002-F187	2–4	ND (0.0406)	--	**0.987**	0.206	0.961	0.119	**ND (0.167)**	--	**1.59**	0.794
606424	74-SB-E002-F188	2–4	ND (0.0216)	--	**0.984**	0.163	0.93	0.104	ND (0.0958)	--	ND (0.782)	--
606424	74-SB-E002-F189	2–4	0.0602	0.0136	0.847	0.126	0.898	0.0724	0.111	0.0858	0.732	0.563
606425	74-SB-E002-F190	2–4	ND (0.0148)	--	0.77	0.132	0.866	0.134	ND (0.0864)	--	0.701	0.301
606425	74-SB-E002-F191	2–4	**0.165**	0.0368	0.855	0.159	0.955	0.123	ND (0.124)	--	**1.84**	0.557
606425	74-SB-E002-F192	2–4	**0.138**	0.0226	0.839	0.149	0.965	0.106	ND (0.089)	--	ND (0.773)	--
607039	74-SB-E002-F193	2–4	0.0744	0.0169	0.771	0.121	0.928	0.0735	ND (0.0902)	--	1.36	0.666
606166	74-SB-E002-F202	2–4	ND (0.0237)	--	0.922	0.189	0.934	0.111	ND (0.154)	--	ND (1.27)	--
606166	74-SB-E002-F203	2–4	0.0681	0.0265	0.834	0.173	0.925	0.107	ND (0.134)	--	1.2	0.886
606166	74-SB-E002-F204	2–4	0.077	0.0201	0.772	0.147	0.913	0.105	ND (0.0778)	--	ND (1.02)	--
606166	74-SB-E002-F205	2–4	ND (0.0319)	--	0.825	0.175	0.952	0.11	ND (0.12)	--	ND (1.26)	--
Background Concentration			0.079		0.93		1.01		0.16		1.4	

Refer to footnotes at end of table.

Table B-8 (Concluded)
Summary of Gamma Spectroscopy Analytical Results, CWL SOB

Sample Attributes			Activity (pCi/g)									
			Cesium-137		Radium-228		Thorium-232		Uranium-235		Uranium-238	
Record Number[a]	ER Sample ID	Sample Depth (in.)	Result	Error[b]	Result	Error[b]	Result	Error[b]	Result	Error[b]	Result	Error[b]
606425	74-SB-E002-F206	2–4	**0.119**	0.0194	0.924	0.136	0.962	0.0771	ND (0.0854)	--	0.599	0.49
606425	74-SB-E002-F207	2–4	ND (0.0217)	--	0.811	0.15	0.841	0.0965	ND (0.0663)	--	1.26	0.858
606425	74-SB-E002-F208	2–4	**0.266**	0.0371	0.835	0.153	0.939	0.105	ND (0.0856)	--	ND (0.754)	--
607039	74-SB-E002-F209	2–4	0.0713	0.0166	0.718	0.13	0.783	0.0689	0.114	0.0983	ND (0.776)	--
606166	74-SB-E002-F216	2–4	ND (0.0152)	--	**0.935**	0.181	0.892	0.104	ND (0.127)	--	0.927	1.09
606166	74-SB-E002-F217	2–4	0.0557	0.0236	0.649	0.123	0.866	0.0528	ND (0.0878)	--	0.944	1.02
606166	74-SB-E002-F218	2–4	0.0501	0.025	0.762	0.172	0.827	0.0984	ND (0.111)	--	ND (0.783)	--
606166	74-SB-E002-F219	2–4	0.068	0.0248	0.686	0.162	0.827	0.098	0.155	0.145	1.29	1.07
606425	74-SB-E002-F220	2–4	0.0578	0.0191	0.772	0.154	0.943	0.0898	ND (0.101)	--	ND (1.27)	--
606425	74-SB-E002-F221	2–4	**0.106**	0.0214	0.763	0.143	0.847	0.0945	ND (0.0574)	--	0.827	0.976
606425	74-SB-E002-F222	2–4	**0.111**	0.0252	0.865	0.153	0.888	0.0981	ND (0.091)	--	0.943	0.792
607039	74-SB-E002-F225	2–4	**0.113**	0.0318	0.927	0.181	0.907	0.0912	ND (0.103)	--	**ND (1.56)**	--
Background Concentration			0.079		0.93		1.01		0.16		1.4	

[a]Analysis request/chain-of-custody record.
[b]Two standard deviations about the mean detected activity.
CWL = Chemical Waste Landfill
ER = Environmental Restoration.
ID = Identification.
in. = Inch(es).
MDA = Minimum detectable activity.
ND ( ) = Not detected above the MDA, shown in parentheses.
ND ( ) = Not detected but the MDA (shown in parentheses) exceeds background activity.
pCi/g = Picocurie(s) per gram.
R = Resample.
SOB = Site Operational Boundary.
-- = Error not calculated for nondetected results.

ANNEX C
Chemical Waste Landfill Site Operational Boundary
Data Validation Reports

Sample Findings Summary

Site: S-74 CWLF Rem. Wide Ex. **AR/COC:** 604708 **Data Type:** Organic and Inorganic

Sample ID	Method/CAS Number (Analysis/Analyte)																					
	7782-49-2 (selenium)	7440-22-4 (silver)	7440-39-3 (barium)	7440-47-3 (chromium)	7440-50-8 (copper)	7439-92-1 (lead)	7439-97-6 (mercury)		119-93-7 (3,3'-dimethylbenzidine)													
056922-002 74-SB-D000-V111	J,B	UJ,B3	J	J,A2	J	J	J		UJ													
056923-002 74-SB-D000-V095	J,B	UJ,B3	J	J,A2	J	J	J		UJ													
056924-002 74-SB-D000-V110	J,B	UJ,B3	J	J,A2	J	J	J		UJ													
056925-002 74-SB-D000-V094	J,B	UJ,B3	J	J,A2	J	J	J		UJ													

Validated By: Ms. Marcia Hilchey **Date:** 10/18/01

Analytical Quality Associates, Inc.
616 Maxine NE
Albuquerque, NM 87123
Phone: 505-299-5201
Fax: 505-299-6744
Email: minteer@aol.com

MEMORANDUM

DATE: 09/18/01

TO: File

FROM: Marcia Hilchey

SUBJECT: Organic Data Review and Validation - SNL
Site: S-74 CWLF Rem, Wide Ex., ARCOC #604708
GEL SDG # 46809 Project/Task No. 7221.02.02.03

See the attached Data Validation Worksheets for supporting documentation on the data review and validation.

Summary

All samples were prepared and analyzed with approved procedures using method EPA 8270C SVOCs. Problems were identified with the data package that result in the qualification of data.

1. SVOC Analysis: The CCV %D for 3,3'-dimethylbenzidene was >40 and <60, with low bias. All associated sample results were non-detect and are qualified "UJ."

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

Holding Times/Preservation

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

Calibration

All initial and continuing calibrations met QC acceptance criteria except as noted above in the summary section and as follows. The CCV %Ds for several target compounds were >20 and <40. All associated sample results were non-detect and are not qualified.

Blanks

All blank acceptance criteria were met.

Surrogates

The surrogate recoveries met QC acceptance criteria.

Internal Standards (ISs)

The IS areas and retention times (RTs) met QC acceptance criteria.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

The MS/MSD analyses met acceptance criteria.

Laboratory Control Samples (LCS/LCSD) Analysis

All LCS/LCSD acceptance criteria were met.

Other QC

No field blank (FB), equipment blank, or field duplicate was submitted on the AR/COC.

No other specific issues were identified which affect data quality.

Please contact me if you have any questions or comments regarding the review of this package.

Analytical Quality Associates, Inc.
616 Maxine NE
Albuquerque, NM 87123
Phone: 505-299-5201
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MEMORANDUM

DATE: 10/18/01

TO: File

FROM: Marcia Hilchey

SUBJECT: Inorganic Data Review and Validation - SNL
Site: S-74 CWLF Rem. Wide Ex. ARCOC #604708
GEL SDG #46809 Project/Task No. 7221.02.02.03

See the attached Data Validation Worksheets for supporting documentation on the data review and validation.

Summary

All samples were prepared and analyzed with approved procedures using methods EPA 6010B ICP-AES metals, and EPA 7470A CVAA mercury. Problems were identified with the data package that result in the qualification of data.

1. ICP: All sample results for Se are qualified "J,B" due to method blank (MB) contamination.

   All sample results for Ag are qualified "UJ,B3" due to negative associated calibration blank values.

   All sample results for Ba, Cr, Cu, and Pb are qualified "J" due to high replicate RPD.

   All sample results for Cr are qualified "J,A2" due to low MS recovery.

2. CVAA: All sample results for Hg are qualified "J'" due to high replicate RPD.

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

Holding Times/Preservation

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

Calibration

All Analyses: The initial and continuing calibration verifications met all QC acceptance criteria.

Blanks

No target analytes were detected in the blanks except as noted above in the summary and as follows.

ICP Analysis: Ba, Cu, and Se were detected in the MB at >DL. Se was detected in a CCB at >DL. Positive sample results <5x the greatest associated blank concentration are qualified as noted above in the summary section. Non-detects and results >5x the blank concentrations are not qualified.

Ba, Cr, Ag, and As were reported in the ICB and/or a CCB at negative concentrations, with absolute values >DL and <RL. The associated non-detect sample results are qualified as noted above in the summary section. All other associated sample results were >5x DL and are not qualified.

CVAA Analysis: Hg was reported in the ICB at a negative concentration, with absolute value >DL and <RL. All sample results were >5x DL and are not qualified.

Matrix Spike (MS) Analysis

All Analyses: All MS acceptance criteria were met except as noted above in the summary section.

Laboratory Control Sample (LCS/LCSD) Analyses

All Analyses: The LCS/LCSD analyses met all QC acceptance criteria.

Replicate Analysis

All Analyses: All replicate acceptance criteria were met except as noted above in the summary section.

ICP Interference Check Sample (ICS)

ICP Analysis: The ICS met all QC acceptance criteria.

ICP Serial Dilution

ICP Analysis: All serial dilution acceptance criteria were met.

Other QC

All Analyses: No field duplicate, field blank or equipment blank was submitted on the AR/COC.

No other specific issues were identified which affect data quality.

Please contact me if you have any questions or comments regarding the review of this package.

Data Validation Summary

Site/Project: S-74 CWLF Rem Project/Task #: 7221.02.02.03 # of Samples: 4 Matrix: soil

AR/COC #: 604708 Wide Ex Laboratory Sample IDs: 416809-001 → 004

Laboratory: CEL

Laboratory Report #: 416809

QC Element	Analysis									
	Organics				Inorganics				RAD	Other
	~~VOC~~	SVOC	~~Pesticide/ PCB~~	~~HPLC (HE)~~	ICP/AES	~~GFAA/ AA~~	CVAA (Hg)	~~CN~~		
1. Holding Times/Preservation		✓			✓		✓			
2. Calibrations		UJ			✓		✓			
3. ~~Method~~ Blanks		✓			J/UJ		✓			
4. MS/MSD		✓			✓		✓			
5. Laboratory Control Samples		✓			✓		✓			
6. Replicates					J		J			
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										

J = Estimated
U = Not Detected
UJ = Not Detected, Estimated
R = Unusable

Check (√) = Acceptable
Shaded Cells = Not Applicable (also "NA")
NP = Not Provided
Other: _____

Reviewed By: [signature] Date: 10/18/01

Inorganic Metals

Site/Project: S-74 CWLF Rem. AR/COC #: 604708 Laboratory Sample IDs:

Laboratory: GEL Wide Ex. Laboratory Report #: 46809 46809-001-004

Methods: 6010B, 7471A

# of Samples: 4 Matrix: soil Batch #s:

CAS #/ Analyte	QC Element																		
	TAL	ICV	CCV	ug/l ICB	CCB	mg/kg Method Blanks	LCS	LCSD	LCSD RPD	MS	~~MSD~~	MSD RPD	Rep. RPD	ICS AB	Serial Dilu-tion	Field Dup. RPD	Equip. Blanks	Field Blanks	5x61K mg/kg
7429-90-5 Al																			
7440-39-3 Ba	✓	✓		-.401		.034	✓	✓	✓	✓			51	✓	✓				3.4 m
7440-41-7 Be	✓	✓					✓	✓	✓	✓			✓	✓	✓				
7440-43-9 Cd	✓	✓					✓	✓	✓	✓			✓	✓	✓				
7440-70-2 Ca																			
7440-47-3 Cr	✓	✓		-1.57	-.699		✓	✓	✓	52			39	✓	✓				m
7440-48-4 Co																			
7440-50-8 Cu	✓	✓				.0867	✓	✓	✓	✓			48	✓	✓				8.67
7439-89-6 Fe																			
7439-95-4 Mg																			
7439-96-5 Mn																			
7440-02-0 Ni	✓	✓					✓	✓	✓	✓			✓	✓	✓				
7440-09-7 K																			
7440-22-4 Ag	✓	✓		-2.63	-1.61		✓	✓	✓	✓			✓	✓	✓				m
7440-23-5 Na																			
7440-62-2 V																			
7440-66-6 Zn																			
7439-92-1 Pb	✓	✓					✓	✓	✓	✓			51	✓	✓				
7782-49-2 Se	✓	✓			4.31	.481	✓	✓	✓	✓			✓	✓	✓				48.1 m
7440-38-2 As	✓	✓		-4.50	-4.18		✓	✓	✓	✓			✓	✓	✓				
7440-36-0 Sb																			
7440-28-0 Tl																			
7439-97-6 Hg	✓	✓		-.091		✓	✓	✓	✓	✓			52	n/a	n/a				m
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 / l

PRP **Comments:**

1:50 ICP 8/11 CCV5 1 CCV6 2,3,4 CCV7 (mg/kg)(20/df) = mg/l

64:30 CVAA 8/11 CCV1 1,2 CCV2 3,4 CCV3 (mg/kg)(21.3/df) = mg/l

Reviewed By: [signature] Date: 10/18/01

Semivolatile Organics (SW 846 Method 8270)

Site/Project: S-74 CWLF Rem. AR/COC #: 604708 Laboratory Sample IDs:

Laboratory: GEL Wide EA. Laboratory Report #: 46809

Methods: 8270C

# of Samples: 4 Matrix: soil Batch #s:

ID	BNA	CAS #	NAME	TCL	Min. RF	Internal Std	Calib. RF	Calib. Rsqr or RF	CCV %D	Method Blank	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup RPD	Surrogate Control	Client Matrix		
							>.05	<20% / 0.99	20%												
		95-94-3	1,2,4,5-Tetrachlorobenzene	✓			✓	✓	✓	✓											
2	BN	120-82-1	1,2,4-Trichlorobenzene	✓	0.2						✓										
1	BN	95-50-1	1,2-Dichlorobenzene	✓	0.4																
		99-35-4	1,3,5-Trinitrobenzene	✓		✓															
1	BN	541-73-1	1,3-Dichlorobenzene	✓	0.6																
		99-65-0	1,3-Dinitrobenzene	✓																	
1	BN	106-46-7	1,4-Dichlorobenzene	✓	0.5						✓										
		130-15-4	1,4-Naphthoquinone	✓																	
		134-32-7	1-Naphthylamine	✓																	
		58-90-2	2,3,4,6-Tetrachlorophenol	✓					-24.7												
3	A	95-95-4	2,4,5-Trichlorophenol	✓	0.2				✓		✓										
3	A	88-06-2	2,4,6-Trichlorophenol	✓	0.2						✓										
2	A	120-83-2	2,4-Dichlorophenol	✓	0.2																
2	A	105-67-9	2,4-Dimethylphenol	✓	0.2																
3	A	51-28-5	2,4-Dinitrophenol	✓	0.01																
1	BN	121-14-2	2,4-Dinitrotoluene	✓	0.2						✓										
		87-65-0	2,6-Dichlorophenol	✓																	
3	BN	606-20-2	2,6-Dinitrotoluene	✓	0.2																
		53-96-3	2-Acetylaminofluorene	✓																	
3	BN	91-58-7	2-Chloronaphthalene	✓	0.8																
1	A	95-57-8	2-Chlorophenol	✓	0.8						✓										
2	BN	91-57-6	2-Methylnaphthalene	✓	0.4																
1	A	95-48-7	2-Methylphenol	✓	0.7						✓										
		91-59-8	2-Naphthylamine	✓					-23.6												
3	BN	88-74-4	2-Nitroaniline	✓	0.01				✓												
2	A	88-75-5	2-Nitrophenol	✓	0.1				✓												

Comments:

Notes: Shaded rows are RCRA compounds.

Reviewed By: Date: 10/6/21

Semivolatile Organics

Site/Project: _____ AR/COC #: 604708 Batch #s: _____

Laboratory: _____ Laboratory Report #: _____ # of Samples: _____ Matrix: _____

#	BNA	CAS #	NAME	TCL	min. RF	Interest	Calib. RF	Calib. Ave. RF	CCV %D	Method Blank	LCS	LCSD	Lab RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blank	Field Blank		
							>.05	<20% / 0.99	20%												
		109-06-8	2-Picoline	✓			✓	✓	✓	✓											
5	BN	91-94-1	3,3'-Dichlorobenzidine	✓	0.01				✓												
		119-93-7	3,3-Dimethylbenzidine	✓					-44.8												
		56-49-5	3-Methylcholanthrene	✓					-22.2												
3	BN	99-09-2	3-Nitroaniline	✓	0.01				✓												
4	A	534-52-1	4,6-Dinitro-2-methylphenol	✓	0.01																
		92-67-1	4-Aminobiphenyl	✓																	
4	BN	101-55-3	4-Bromophenyl-phenylether	✓	0.1																
2	A	59-50-7	4-Chloro-3-methylphenol	✓	0.2						✓										
2	BN	106-47-8	4-Chloroaniline	✓	0.01																
3	BN	7005-72-3	4-Chlorophenyl-phenylether	✓	0.4																
1	A	106-44-5	4-Methylphenol	✓	0.6						✓										
3	BN	100-01-6	4-Nitroaniline	✓	0.01				-30												
3	A	100-02-7	4-Nitrophenol	✓	0.01				✓		✓										
		99-55-8	5-Nitro-o-toluidine	✓																	
		57-97-6	7,12-Dimethylbenz(a)anthracene	✓																	
3	BN	83-32-9	Acenaphthene	✓	0.9						✓										
3	BN	208-96-8	Acenaphthylene	✓	0.9																
		98-86-2	Acetophenone	✓																	
		62-53-3	Aniline	✓																	
4	BN	120-12-7	Anthracene	✓	0.7																
5	BN	56-55-3	Benzo(a)anthracene	✓	0.8																
6	BN	50-32-8	Benzo(a)pyrene	✓	0.7																
6	BN	205-99-2	Benzo(b/k)fluoranthene	✓	0.7																
6	BN	191-24-2	Benzo(g,h,l)perylene	✓	0.5	✓															
6	BN	207-08-9	Benzo(k)fluoranthene	✓	0.7																
		100-51-6	Benzyl Alcohol	✓																	
2	BN	111-91-1	bis(2-Chloroethoxy)methane	✓	0.3																
1	BN	111-44-4	bis(2-Chloroethyl)ether	✓	0.7																

Semivolatile Organics

Site/Project: _____ AR/COC #: 607708 Batch #s: _____

Laboratory: _____ Laboratory Report #: _____ # of Samples: _____ Matrix: _____

IS	BNA	CAS #	NAME	T C L	Min. RF	manual	Cal. RF >.05	Cal. RSD/ RRF <20% / 0.99	CCV %D 20%	Method Blanks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks		
1	BN	108-60-1	bis(2-chloroisopropyl)ether	✓	0.01		✓	✓	✓	✓											
5	BN	117-81-7	bis(2-Ethylhexyl)phthalate	✓	0.01																
5	BN	85-68-7	Butylbenzylphthalate	✓	0.01																
4	BN	86-74-8	Carbazole	✓	0.01																
		510-15-6	Chlorobenzilate	✓																	
5	BN	218-01-9	Chrysene	✓	0.7																
		2303-16-4	Diallate	✓																	
6	BN	53-70-3	Dibenz(a,h)anthracene	✓	0.4	✓															
3	BN	132-64-9	Dibenzofuran	✓	0.8																
3	BN	84-66-2	Diethylphthalate	✓	0.01																
3	BN	131-11-3	Dimethylphthalate	✓	0.01																
4	BN	84-74-2	Di-n-butylphthalate	✓	0.01																
6	BN	117-84-0	Di-n-octylphthalate	✓	0.01																
		88-85-7	Dinoseb	✓		✓															
		122-39-4	Diphenylamine	✓																	
		62-50-0	Ethyl Methanesulfonate	✓																	
4	BN	206-44-0	Fluoranthene	✓	0.6																
3	BN	86-73-7	Fluorene	✓	0.9																
4	BN	118-74-1	Hexachlorobenzene	✓	0.1						✓										
2	BN	87-68-3	Hexachlorobutadiene	✓	0.01						✓										
3	BN	77-47-4	Hexachlorocyclopentadiene	✓	0.01																
1	BN	67-72-1	Hexachloroethane		0.3						✓										
		1888-71-7	Hexachloropropene	✓																	
6	BN	193-39-5	Indeno(1,2,3-cd)pyrene	✓	0.5	✓															
		465-73-6	Isodrin	✓																	
2	BN	78-59-1	Isophorone	✓	0.4																
		924-16-5	Isosafrole	✓																	
		143-50-0	Kepone	✓																	
		66-27-3	Methyl methanesulfonate	✓																	

Semivolatile Organics

Site/Project: _____ AR/COC #: 604708 Batch #s: _____

Laboratory: _____ Laboratory Report #: _____ # of Samples: _____ Matrix: _____

ID	Bank	CAS #	NAME	TOL	Blank RF	Internal	Cont. RF	Cont. RRF R	CCV %D	Surrogate Recov	LCS	LCSD	LCS RPD	Int	MSD	MS RPD	Spike Dup RPD	Equip Blanks	Field Blanks		
							>.05	<20% / 0.99	20%												
2	BN	91-20-3	Naphthalene	✓	0.7		✓	✓	✓	✓											
2	BN	[illegible]	[illegible]	✓	0.7						✓										
		55-18-5	N-Nitrosodiethylamine	✓																	
		62-75-9	N-Nitrosodimethylamine																		
		924-16-3	N-Nitrosodi-n-butylamine	✓																	
4	BN	86-30-6	N-Nitrosodiphenylamine (1)		0.01																
1	BN	621-64-7	N-Nitroso-di-n-propylamine	✓	0.5						✓										
		10595-95-6	N-Nitrosomethylethylamine	✓					21.4												
		100-75-4	N-Nitrosopiperidine	✓					✓												
		930-55-2	N-Nitrosopyrrolidine	✓																	
		95-53-4	o-Toluidine	✓																	
		60-11-7	p-Dimethylaminoazobenzene	✓																	
		608-93-5	Pentachlorobenzene	✓																	
		76-01-7	Pentachloroethane	✓																	
		82-68-8	Pentachloronitrobenzene	✓																	
4	A	[illegible]	[illegible]	✓	0.1	✓					✓										
		62-44-2	Phenacetine	✓																	
4	BN	85-01-8	Phenanthrene	✓	0.7																
1	A	108-95-2	Phenol	✓	0.8						✓										
		23950-58-5	Pronamide	✓																	
5	BN	129-00-0	Pyrene	✓	0.6						✓										
		110-86-1	Pyridine	✓							✓										
		94-59-7	Safrole	✓																	
		92-87-5	Benzidine	✓		✓															

Comments:

Semivolatile Organics

Site/Project: _____ AR/COC #: 607708 Batch #s: _____

Laboratory: _____ Laboratory Report #: _____ # of Samples: _____ Matrix: _____

Surrogate Recovery Outliers

Sample	SMC 1	SMC 2	SMC 3	SMC 4	SMC 5	SMC 6	SMC 7	SMC 8

met criteria

SMC 1: Nitrobenzene-d5 (BN)
SMC 2: 2-Fluorobiphenyl (BN)
SMC 3: p-Terphenyl-d14 (BN)
SMC 4: Phenol-d6 (A)
SMC 5: 2-Fluorophenol (A)
SMC 6: 2,4,6-Tribromophenol (A)
SMC 7: 2-2-Chlorophenol-d4 (A)
SMC 8: 1,2-Dichlorobenzene-d4 (BN)

Comments:

Internal Standard Outliers

Sample	IS 1-area	IS 1-RT	IS 2-area	IS 2-RT	IS 3-area	IS 3-RT	IS 4-area	IS 4-RT	IS 5-area	IS 5-RT	IS 6-area	IS 6-RT

met criteria

IS 1: 1,4-Dichlorobenzene-d4 (BN)
IS 2: Naphthalene-d8 (BN)
IS 3: Acenaphthene-d10 (BN)
IS 4: Phenathrene-d10 (BN)
IS 5: Chrysene-d12 (BN)
IS 6: Perylene-d12 (BN)

Sample Findings Summary

Site: S-74 Chem Waste LF Remed **ARCOC:** 605917 **Data:** Organic, Inorganic and Radiochemistry

Sample ID	VOC (8260A/B)	SVOC (8270C)	86-74-8 (carbazole)	53-70-3 (dibenzo(a,h)anthracene)	129-00-0 (pyrene)	PCB	Metals	7782-49-2 (selenium)	7439-97-6 (mercury)	General Chemistry	Radiochemistry	All Gamma Spec results flagged "X" by the lab (see EDD)		
060291-002 74-SB-E002-F158	All QC acceptance criteria were met.No data will be qualified.		J	UJ	J	All QC acceptance criteria were met.No data will be qualified.		J, B	J, A2	All QC acceptance criteria were met.No data will be qualified.				
060295-002 74-SB-E002-F159				UJ	J			J, B	J, A2					
060293-004 74-SB-E002-F158												R		
060297-004 74-SB-E002-F159												R		

Validated By: K Mal **Date:** 01/10/03

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

MEMORANDUM

DATE: 01/10/03

TO: File

FROM: Linda Thal

SUBJECT: Inorganic Data Review and Validation - SNL
Site: S-74 Chem Waste LF Remed
ARCOC # 605917
GEL SDG # 70970 and 70974
Project/Task No. 7221.02.02.03

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM ER Project AOP 00-03.

Summary

The samples were prepared and analyzed with approved procedures using methods SW-846 6010B (ICP-AES metals), SW-846 7471A (Hg) and SW-846 7196A (hexavalent chromium). Problems were identified with the data package that resulted in the qualification of data.

ICP-AES

Selenium was detected in the MB at a value > DL but < RL. Both associated sample results were detects, < 5X blank value and will be qualified "J, B".

Hg-CVAA

The replicate had a RPD (43%) > QC acceptance criteria (35%). The MS (155%) had a %R > QC acceptance criteria (75-125%). Both associated sample results were detects, > 5X RL and will be qualified "J, A2, ".

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

Holding Times/Preservation

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

Calibration

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

Blanks

All Analyses: All blank criteria were met except as mentioned above in the summary section and as follows:

ICP-AES
Chromium was detected in the MB at a value > DL but < RL. Both associated sample results were detects, > 5X blank value and will not be qualified.

Hg-CVAA
Mercury was detected in the MB and the CCB at values > DL but < RL. Both associated sample results were detects, > 5X blank values and will not be qualified.

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

All Analyses: The LCS/LCSD met QC acceptance criteria.

Matrix Spike (MS) Analysis

All Analyses: The MS met QC acceptance criteria except as mentioned above in the summary section.

Replicate Analysis

All Analyses: The replicate analysis met QC acceptance criteria except as mentioned above in the summary section.

ICP Interference Check Sample (ICS)

ICP-AES: The ICS-AB met QC acceptance criteria.

All Other Analyses: No ICS required.

ICP Serial Dilution

ICP-AES: The serial dilution met QC acceptance criteria.

All other Analyses: No serial dilution required.

Detection Limits/Dilutions

All Analyses: All detection limits were properly reported.

ICP-AES: All soil samples were diluted 2X.

All Other Analyses: No dilutions were performed.

Other QC

All Analyses: No field blank, field duplicate or equipment blank was submitted on the ARCOC.

No other specific issues were identified which affect data quality.

Reviewed By: DJS **Level:** I **Date:** 01/17/03

Analytical Quality Associates, Inc.
616 Maxine NE
Albuquerque, NM 87123
Phone: 505-299-5201
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Email: minteer@aol.com

MEMORANDUM

DATE: 01/09/03

TO: File

FROM: Linda Thal

SUBJECT: Organic Data Review and Validation - SNL
Site: S-74 Chem Waste LF Remed
ARCOC # 605917
GEL SDG # 70970 and 70974
Project/Task No. 7221.02.02.03

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM ER Project AOP 00-03.

Summary

The samples were prepared and analyzed with approved procedures using methods SW-846 8260A/B (VOC), 8270C (SVOC) and 8082 (PCBs). Problems were identified with the data package that resulted in the qualification of data.

SVOC
The %R for carbazole (22%) in the CCV was > 20% with a positive bias. Sample 70970-003 was detect and will be qualified "J".
The %R for pyrene (39%) in the CCV was > 20% with a positive bias. Both associated sample results were detect and will be qualified "J".
The %R for dibenzo(a,h)anthracene (52%) in the CCV was > 40% but < 60% with a negative bias. Both associated sample results were non-detect and will be qualified "UJ".

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

Holding Times/Preservation

All Analyses: The samples were properly preserved and analyzed within the method prescribed holding time.

VOC
It should be noted that one of the vials received for sample 70974-001 had headspace and no preservation was recorded on the COC. Analysis proceeded on the remaining vials and the PH was recorded in the sample run log as < 2. No data will be qualified.

Calibration

All Analyses: All initial and continuing calibration acceptance criteria were met except as follows:

VOC Batch # 217702
The RF for trichloroethene in the initial calibration was < specified minimum (0.30) but > 0.01. The associated sample results were non-detect, and using professional judgment no data will be qualified.

The CCV had%Rs > 20% with a positive bias for several compounds (see Data Validation Worksheet). The associated sample results were non-detect and unaffected by a positive bias; no data will be qualified.

SVOC
Di-n-octylphthalate had a correlation coefficient (0.98) > 0.90 but < 0.99 in the initial calibration preceding the samples. All associated sample results were non-detect and will not be qualified.

Benzo(k)fluoranthene had a %D (41%) >40% but < 60% with a positive bias in the CCV preceding the samples. All associated sample results were non-detect and will not be qualified.

Several other compounds had %Ds > 20% but < 40% in the CCV preceding the samples. All associated sample results were non-detect and will not be qualified.

Blanks

All Analyses: All method blank (MB) and trip blank (TB) acceptance criteria were met.

Surrogates

All Analyses: All surrogate acceptance criteria were met.

Internal Standards (ISs)

VOC and SVOC: All internal standard acceptance criteria were met with the following exception:

SVOC
Perylene-d12 (internal standard 6) was out of criteria high in the MSD. The sample and the MS were in criteria and no data will be qualified.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

All Analyses: All MS/MSD acceptance criteria were met except as follows:

VOC Batch # 217579
It should be noted that the sample used for the MS/MSD was of similar matrix from another SNL SDG. No data will be qualified.

SVOC
Several compounds (see DV worksheet) had %R < QC acceptance criteria (75-125%). Using professional judgment, no data will be qualified.

PCB
The %R of aroclor 1260 in the MS/MSD was < 10%. However, the extracts were diluted 50X due to high concentrations of aroclor 1242 and 1254 present in the sample. The spiked amount (aroclor 1260) was diluted below the detection limit. However, the surrogate %Rs are in criteria and using professional judgment, no data will be qualified.

Laboratory Control Samples (LCS/LCSD) Analysis

All Analyses: The LCS acceptance criteria were met. No LCSD was analyzed. The MS/MSD is used to assess the precision for the batch. No data will be qualified as a result.

VOC
It should be noted that no LCS compound was associated with internal standard 1,4-dichlorobenzene-d4. No data will be qualified as a result.

SVOC
It should be noted that no LCS compound was associated with internal standard perylene-d12. No data will be qualified as a result.

Detection Limits/Dilutions

All Analyses: All detection limits were properly reported. Samples were not diluted with the following exceptions:

PCB
Sample 70970-003 was diluted 50X, and sample 70970-004 20X due to high concentrations of aroclors present.

Confirmation Analyses

VOC and SVOC: No confirmation analyses required.

PCB: All confirmation acceptance criteria were met.

Other QC

VOC: A trip blank was submitted on the ARCOC. No field duplicate or equipment blank was submitted.

SVOC, PCB: No equipment blank, field duplicate or field blank was submitted on the ARCOC.

No other specific issues were identified which affect data quality.

Reviewed By: DJS **Level:** I **Date:** 01/16/03

Analytical Quality Associates, Inc.
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MEMORANDUM

DATE: 01/10/03

TO: File

FROM: Linda Thal

SUBJECT: Radiochemical Data Review and Validation - SNL
Site: S-74 Chem Waste LF Remed
ARCOC 605917
GEL SDG # 70970 and 70974
Project/Task No. 7221.02.02.03

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.

Summary

All samples were prepared and analyzed with approved procedures using method EPA 906.0 (tritium) and DOE EML HASL 300 (gamma spec). Problems were identified with the data package that resulted in the qualification of data.

Gamma Spec Analysis

Several Gamma Spec results for samples 70970-007 and -008 were "X" flagged by the laboratory due to interference, no valid peak or low abundance (See Electronic Data Deliverable). Thus, these sample results will be qualified "R" (unusable).

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

Holding Times/Preservation

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

Calibration

The case narrative stated the instruments used were properly calibrated.

Blanks

No target analytes were detected in the method blank at concentrations > the associated MDA/TPUs.

Matrix Spike (MS) Analysis

The MS analyses met all QC acceptance criteria.

Laboratory Control Sample (LCS) Analysis

The LCS analyses met all QC acceptance criteria.

Replicates

The replicate analyses met all QC acceptance criteria.

Tracer/Carrier Recoveries

No tracer/carrier required.

Negative Bias

All sample results met negative bias QC acceptance criteria.

Detection Limits/Dilutions

All detection limits were properly reported. No samples were diluted.

Other QC

No equipment blank, field blank or field duplicate was submitted on the ARCOC.

No other specific issues were identified which affect data quality.

Reviewed By: DJS **Level:** 1 **Date:** 01/17/03

Data Validation Summary

Site/Project: S-74 Chem Waste (LF Rerun) Project/Task #: 7221.02.02.03 # of Samples: 8 & 1 Matrix: Soil & H2O

AR/COC #: 605917 Laboratory Sample IDs: 70970

Laboratory: ~~70970~~ NJ GEL 70974 - 001 (TB)

Laboratory Report #: 70970 (70974)

QC Element	Analysis									
	Organics				Inorganics				RAD	Hexavalent Other Chromium
	VOC	SVOC	Pesticide/ PCB	HPLC (HE)	ICP/AES	GFAA/ AA	CVAA (Hg)	CN		
1. Holding Times/Preservation	✓	✓	✓	NA	✓	NA	✓	NA	✓	✓
2. Calibrations	✓	✓	✓		✓		✓			✓
3. Method Blanks	✓	J, UJ	✓		J, B		✓			✓
4. MS/MSD	✓	✓	✓		✓		J			✓
5. Laboratory Control Samples	✓	✓	✓		✓		✓			✓
6. Replicates					✓		J			✓
7. Surrogates	✓	✓	✓							NA
8. Internal Standards	✓	✓								
9. TCL Compound Identification	✓	✓								
10. ICP Interference Check Sample					✓					
11. ICP Serial Dilution					✓					
12. Carrier/Chemical Tracer Recoveries									NA	
13. Other QC	TB ✓	NA	NA		NA		NA		NA	

J = Estimated
U = Not Detected
UJ = Not Detected, Estimated
R = Unusable

Check (√) = Acceptable
Shaded Cells = Not Applicable (also "NA")
NP = Not Provided
Other: _____

Reviewed By: [illegible] Date: 01.10.03

Volatile Organics (SW 846 Method 8260)

Site/Project: 574 CWL Reused. AR/COC #: 605917 # of Samples: 2 & 1 Matrix: Soil & H2O

Laboratory: GEL Laboratory Report #: 70970 and 70974 Laboratory Sample IDs: 70970 - 001 & -002 70974 - 001

Methods: SW - 846 8260 A/B Batch #s: 217702 (soils) 217579 (TB)

IS	CAS #	Name	TCL	Min. RF	Intercept	Calib. RF (>.05) 1	Calib. RF (>.05) 2	Calib. RSD/R² (<20%/0.99) 1	Calib. RSD/R² (<20%/0.99) 2	CCV %D (20%) 1	CCV %D (20%) 2	Method Blks 1	Method Blks 2	LCS 1	LCS 2	LCS RPD (NA)	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Trip Blanks	2 MS	2 MSD	2
1	71-55-6	1,1,1-trichloroethane	✓	0.10		✓	✓	✓	✓		✓	✓	✓									✓			
2	79-34-5	1,1,2,2-tetrachloroethane		0.30																					
2	79-00-5	1,1,2-trichloroethane		0.10																					
1	75-34-3	**1,1-dichloroethane**		0.10																					
1	75-35-4	**1,1-dichloroethene**		0.20	✓	✓		✓						✓	✓		✓	✓	✓				✓	✓	✓
1	107-06-2	**1,2-dichloroethane**		0.10																					
1	540-59-0	**1,2-dichloroethene(total)** cis	✗	0.01																					
1	78-87-5	**1,2-dichloropropane**	✓	0.01																					
1	78-93-3	**2-butanone (MEK) (10xblk)-**	✓	0.01																					
1	110-75-8	2-chloroethyl vinyl ether																							
2	591-78-6	2-hexanone (MBK)	✓	0.01																					
2	108-10-1	4-methyl-2-pentanone (MIBK)		0.10																					
1	67-64-1	**acetone(10xblk)**		0.01						420.2															
1	71-43-2	**benzene**		0.50						✓				✓	✓		✓	✓	✓				✓	✓	✓
1	75-27-4	bromodichloromethane		0.20						✓															
3	75-25-2	bromoform		0.10						✓															
1	74-83-9	bromomethane		0.10						430															
1	75-15-0	carbon disulfide		0.10						✓															
1	56-23-5	**carbon tetrachloride**		0.10						422															
2	108-90-7	**chlorobenzene**		0.50						✓				✓	✓		✓	✓	✓				✓	✓	✓
1	75-00-3	chloroethane		0.01	✓	✓		✓																	
1	67-66-3	**chloroform**		0.20																					
1	74-87-3	chloromethane		0.10																					
1	10061-01-5	cis-1,3-dichloropropene		0.20																					
2	124-48-1	dibromochloromethane		0.10																					
2	100-41-4	ethylbenzene		0.10																					
1	75-09-2	methylene chloride (10xblk)		0.01	✓	✓	✓	✓	✓	✓															
2	100-42-5	styrene		0.30																					
2	127-18-4	**tetrachloroethene**		0.20																					
2	108-88-3	toluene(10xblk)		0.40										✓	✓		✓	✓	✓				✓	✓	✓
2	10061-02-6	trans-1,3-dichloropropene		0.10																					
1	79-01-6	**trichloroethene**		0.30		.124	.23							✓	✓		✓	✓	✓				✓	✓	✓
1	75-01-4	**vinyl chloride**		0.10		✓	✓																		
2	1330-20-7	xylenes(total)		0.30	✓	✓		✓																	
	cis - 1,2 - Dichloroethene																								
	trans - 1,2 - Dichloroethene																								
	Vinyl acetate		✓																						

Comments: 217579: 70871 PS/PSD only SOG.

70974 - 001 1 vial had headspace.

No preservative

Notes: Shaded rows are RCRA compounds

Reviewed By: [signature] Date: 01.09.10

Volatile Organics

Site/Project: _____ AR/COC #: 605 917 Batch #s: _____

Laboratory: _____ Laboratory Report #: _____ # of Samples: _____ Matrix: _____

Surrogate Recovery and Internal Standard Outliers (SW 846 Method 8260)

Sample	SMC 1	SMC 2	SMC 3	IS 1 Area	IS 1 RT	IS 2 area	IS 2 RT	IS 3 area	IS 3 RT
in criteria									

SMC 1: 4-Bromofluorobenzene
SMC 2: Dibromofluoromethane
SMC 3: Toluene-d8

IS 1: Fluorobenzene
IS 2: Chorobenzene-d5
IS 3: 1,4-Dichlorobenzene-d4

Comments:

Semivolatile Organics (SW 846 Method 8270)

Site/Project: S-74 CWL AR/COC #: 605917 Laboratory Sample IDs: 70970 - 003 & 004

Laboratory: GEL Laboratory Report #: 70970 and 70974

Methods: SW - 846 8270C

# of Samples: 2 Matrix: Soil Batch #s: 227634

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blanks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks		
							>.05	<20% / 0.99	20%												
2	BN	120-82-1	1,2,4-Trichlorobenzene	✓	0.20		✓	✓	✓	✓	✓	NA		✓	✓	✓	NA				
1	BN	95-50-1	1,2-Dichlorobenzene		0.40																
1	BN	541-73-1	1,3-Dichlorobenzene		0.60																
1	BN	106-46-7	1,4-Dichlorobenzene		0.50						✓			✓	✓	✓					
3	A	95-95-4	2,4,5-Trichlorophenol		0.20						✓			52	60	✓					
3	A	88-06-2	2,4,6-Trichlorophenol		0.20						✓			52	61	✓					
2	A	120-83-2	2,4-Dichlorophenol		0.20																
2	A	105-67-9	2,4-Dimethylphenol		0.20																
3	A	51-28-5	2,4-dinitrophenol		0.01				-28												
3	BN	121-14-2	2,4-Dinitrotoluene		0.20				✓		✓			✓	✓	✓					
3	BN	606-20-2	2,6-Dinitrotoluene		0.20																
3	BN	91-58-7	2-Chloronaphthalene		0.80																
1	A	95-57-8	2-Chlorophenol		0.80						✓			✓	✓	✓					
2	BN	91-57-6	2-Methylnaphthalene		0.40																
1	A	95-48-7	2-Methylphenol (o-cresol)		0.70						✓			56	65						
3	BN	88-74-4	2-Nitroaniline		0.01																
2	A	88-75-5	2-Nitrophenol		0.10																
5	BN	91-94-1	3,3'-Dichlorobenzidine		0.01																
3	BN	99-09-2	3-Nitroaniline		0.01																
4	A	534-52-1	4,6-Dinitro-2-methylphenol		0.01	✓	✓	✓													
4	BN	101-55-3	4-Bromophenyl-phenylether		0.10																
3	BN	7005-72-3	4-Chlorophenyl-phenylether		0.40																
2	A	59-50-7	4-Chloro-3-methylphenol		0.20						✓			✓	✓	✓					
2	BN	106-47-8	4-Chloroaniline		0.01																
1	A	106-44-5	4-Methylphenol (p-cresol)		0.60																

Comments: m,p-cresol ✓

Notes: Shaded rows are RCRA compounds.

✓ 61 70 ✓

Reviewed By: [signature] Date: 01.09.03

Semivolatile Organics

Site/Project: _____ AR/COC #: 605917 Batch #s: _____

Laboratory: _____ Laboratory Report #: _____ # of Samples: _____ Matrix: _____

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blanks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks		
							>.05	<20% / 0.99	20%												
3	BN	100-01-6	4-Nitroaniline	✓	0.01		✓	✓	✓	✓		NA					NA				
3	A	100-02-7	4-Nitrophenol		0.01						✓			✓	✓	✓					
3	BN	83-32-9	Acenaphthene		0.90						✓			✓	✓	✓					
3	BN	208-96-8	Acenaphthylene		0.90																
4	BN	120-12-7	Anthracene		0.70																
5	BN	56-55-3	Benzo(a)anthracene		0.80																
6	BN	50-32-8	Benzo(a)pyrene		0.70	✓	✓	✓													
6	BN	205-99-2	Benzo(b)fluoranthene		0.70	✓	✓	✓													
6	BN	191-24-2	Benzo(g,h,i)perylene		0.50	✓	✓	✓	-34												
6	BN	207-08-9	Benzo(k)fluoranthene		0.70				+41												
2	BN	111-91-1	bis(2-Chloroethoxy)methane		0.30				✓												
1	BN	111-44-4	bis(2-Chloroethyl)ether		0.70				✓												
1	BN	108-60-1	bis(2-chloroisopropyl)ether		0.01				-23												
5	BN	117-81-7	bis(2-Ethylhexyl)phthalate		0.01	✓	✓	✓	✓												
5	BN	85-68-7	Butylbenzylphthalate		0.01				✓												
4	BN	86-74-8	Carbazole		0.01				+22												
5	BN	218-01-9	Chrysene		0.70				✓												
6	BN	53-70-3	Dibenz(a,h)anthracene		0.40	✓	✓	✓	-52												
3	BN	132-64-9	Dibenzofuran		0.80				✓												
3	BN	84-66-2	Diethylphthalate		0.01																
3	BN	131-11-3	Dimethylphthalate		0.01																
4	BN	84-74-2	Di-n-butylphthalate		0.01																
6	BN	117-84-0	Di-n-octylphthalate		0.01	✓	✓	0.981													
4	BN	206-44-0	Fluoranthene		0.60			✓													
3	BN	86-73-7	Fluorene		0.90																
4	BN	118-74-1	Hexachlorobenzene		0.10						✓			49	54	✓					
2	BN	87-68-3	Hexachlorobutadiene		0.01						✓			46	50	✓					
3	BN	77-47-4	Hexachlorocyclopentadiene		0.01																
1	BN	67-72-1	Hexachloroethane		0.30						✓			55	61	✓					

Comments:

Semivolatile Organics

Site/Project: _____ AR/COC #: 605917 Batch #s: _____

Laboratory: _____ Laboratory Report #: _____ # of Samples: _____ Matrix: _____

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blanks	LCS	LCS D	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks		
							>.05	<20% / 0.99	20%												
6	BN	193-39-5	Indeno(1,2,3-cd)pyrene	✓	0.50	✓	✓	✓	-35	✓											
2	BN	78-59-1	Isophorone		0.40				✓												
2	BN	91-20-3	Naphthalene		0.70																
2	BN	98-95-3	Nitrobenzene		0.20						✓			56	62	✓					
4	BN	86-30-6	N-Nitrosodiphenylamine (1)		0.01																
1	BN	621-64-7	N-Nitroso-di-propylamine	✓	0.50						✓			✓	✓	✓					
4	A	87-86-5	Pentachlorophenol		0.05	✓	✓	✓			✓			✓	✓	✓					
4	BN	85-01-8	Phenanthrene		0.70																
1	A	108-95-2	Phenol		0.80						✓			✓	✓	✓					
5	BN	129-00-0	Pyrene		0.60				+39.3		✓			✓	✓	✓					
			Diphenylamine						✓												

Surrogate Recovery Outliers

Sample	SMC 1	SMC 2	SMC 3	SMC 4	SMC 5	SMC 6	SMC 7	SMC 8
IN CRITERIA								

SMC 1: Nitrobenzene-d5 (BN) SMC 2: 2-Fluorobiphenyl (BN) SMC 3: p-Terphenyl-d14 (BN)
SMC 4: Phenol-d6 (A) SMC 5: 2-Fluorophenol (A) SMC 6: 2,4,6-Tribromophenol (A)
SMC 7: 2-2-Chlorophenol-d4 (A) SMC 8: 1,2-Dichlorobenzene-d4 (BN)

Comments: MB analysis time on form IV = 10.15 (According to the run log - did not use)
QC summary 10.36
Form V = 10.36

Internal Standard Outliers

Sample	IS 1-area	IS 1-RT	IS 2-area	IS 2-RT	IS 3-area	IS 3-RT	IS 4-area	IS 4-RT	IS 5-area	IS 5-RT	Is 6-area	IS 6-RT
MJD	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	↑	✓

IS 1: 1,4-Dichlorobenzene-d4 (BN) IS 2: Naphthalene-d8 (BN) IS 3: Acenaphthene-d10 (BN)
IS 4: Phenathrene-d10 (BN) IS 5: Chrysene-d12 (BN) IS 6: Perylene-d12 (BN)

PCBs (SW 846 - Method 8082)

Site/Project: 3-7N CWL AR/COC #: 605917 Laboratory Sample IDs: 70970 - 003 & - 004

Laboratory: GEL Laboratory Report #: 70970 and 70974

Methods: SW-846 8082

# of Samples: 2 Matrix: Soils Batch #s: 217657

CAS #	Name	TCL	Intercept	Calib RSD / R^2 <20% / 0.99	CCV %D 20%	Method Blanks	LCS	LCSD	LCS RPD 20%	MS	MSD	MS RPD 20%	Field Dup. RPD	Equip. Blanks	Field Blanks		
12674-11-2	Aroclor-1016	✓	NA	✓	✓	✓		NA					NA				
11104-28-2	Aroclor-1221	✓				✓											
11141-16-5	Aroclor-1232	✓				✓											
53469-21-9	Aroclor-1242	✓		✓	✓	✓											
12672-29-6	Aroclor-1248	✓		✓		✓											
11097-69-1	Aroclor-1254	✓		✓	✓	✓											
11096-82-5	Aroclor-1260	✓		✓	✓	✓	✓			O	O	✓					

Sample	SMC % REC	SMC RT	Sample	SMC % REC	SMC RT
IN CRITERIA					

Comments: -003 50X MS/MSD
-004 20X

MS/MSD 1260 diluted out.

Confirmation

Sample	CAS #	RPD > 25%	Sample	CAS #	RPD > 25%
IN CRITERIA					

Sample -004 pattern matches - requested 2nd opinion

Reviewed By: [signature] Date: 01.10.03

Inorganic Metals

Site/Project: S-74 CWL AR/COC #: 605917 Laboratory Sample IDs: 70970-003 & 004

Laboratory: GEL Laboratory Report #: 70970 and 70974

Methods: SW-846 7471A (Hg) 6010B (Metals)

# of Samples: 2 Matrix: Soils Batch #s: 217732 (Hg) 218257 (Metals)

CAS #/ Analyte	QC Element																			
					ug/l	mg/kg														
	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								NA			NA					NA				
7440-39-3 Ba	✓	✓	✓	✓	✓	✓	✓			NA			✓	✓	✓					
7440-41-7 Be	✓	✓	✓	✓	✓	✓	✓			✓			NA	✓	✓					
7440-43-9 Cd	✓	✓	✓	✓	✓	✓	✓			✓			NA	✓	✓					
7440-70-2 Ca																				
7440-47-3 Cr	✓	✓	✓	✓	✓	.199J	✓			✓			✓	✓	✓					
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	✓	✓	✓	✓	✓	✓	✓			✓			NA	✓	NA					
7440-23-5 Na																				
7440-62-2 V																				
7440-66-6 Zn																				
7439-92-1 Pb	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓					
7782-49-2 Se	✓	✓	✓	✓	✓	.249J	✓			✓			NA	✓	NA					
7440-38-2 As	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓					
7440-36-0 Sb																				
7440-28-0 Tl																				
7439-97-6 Hg	✓	✓	✓	✓	.141	.00535J	✓			155			H3	NA	NA					
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 / l

Comments: ICP-AES 2X

Reviewed By: [signature] Date: 01.10.03

mg/kg →
Hg ug/l

3 $\frac{.699}{30} \times 1000 = 23.3$

4 $\frac{.606}{3} \times 1000 = 20.2$

General Chemistry

Site/Project: S-7H CWL AR/COC #: 605917 Laboratory Sample IDs: 70970 - 003 & -004

Laboratory: GEL Laboratory Report #: 70970 and 70974

Methods: SW-846 7196A (Cr 6+)

# of Samples: 2 Matrix: Soil Batch #s: 220480 (Cr 6+)

CAS #	Analyte	QC Element																	
		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
	Hexavalent Chromium	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	NA	NA	✓	NA	NA	NA	NA	NA

Comments:

Reviewed By: [illegible] Date: 1·10·03

Radiochemistry

Site/Project: S-7th CWL AR/COC #: 605917 Laboratory Sample IDs: 70970 - 005, -006 (H^3)
Laboratory: GEL Laboratory Report #: 70970 and 70974 -007, -008 (γ spec)
Methods: EPA 906.0 (H^3) DOE Em HASL 300 (γ spec)
# of Samples: 4 Matrix: SOIL Batch #s: 219079 (H^3) 219153 (γ spec)

Analyte	QC Element													
	Method Blanks	LCS	MS	Rep RER	Equip. Blanks	Field Dup. RER	Field Blanks	Sample ID	Isotope	IS/Trace	Sample ID	Isotope	IS/Trace
Criteria	U	20%	25%	<1.0	U	<1.0	U			50-105			50-105
H3	✓	✓	✓	✓	NA	NA	NA	NA					
U-238													
U-234													
U-235/-236													
Th-232													
Th-228													
Th-230													
Pu-239/-240													
Gross Alpha													
Nonvolatile Beta													
Ra-226													
Ra-28													
Ni-63													
Gamma Spec. Am-241	✓	✓	NA	✓	NA	NA	NA						
Gamma Spec. Cs-137	✓	✓		✓									
Gamma Spec. Co-60	✓	✓		✓									

Parameter	Method	Typical Tracer	Typical Carrier
Iso-U	Alpha spec.	U-232	NA
Iso-Pu	Alpha spec.	Pu-242	NA
Iso-Th	Alpha spec.	Th-229	NA
Am-241	Alpha spec.	Am-242	NA
Sr-90	Beta	Y ingrowth	NA
Ni-63	Beta	NA	Ni by ICP
Ra-226	Deamination	NA	NA
Ra-226	Alpha spec.	Ba-133 or Ra-225	NA
Ra-228	Gamma spec.	Ba-133	NA

Gamma spec. LCS contains: Am-241, Cs-137, and Co-60

Comments: MDA SA

MB Pb 212 .0192 0.28
TPU .0227 0.246
= ND

Th 232 .0191 .0274
TPU .0226 .024
= ND

Reviewed By: [signature] Date: 01 10 03

Sample Findings Summary

Site: S-74 Chem Waste LF Remed | ARCOC: 606162 and 606166 | Data: Organic, Inorganic and Radiochemistry

Sample ID		All VOC (8260B) TAL compounds except:	108-88-3 (toluene)	All SVOC (8270C) TAL compounds	All aroclor (8082) TAL compounds except:	53469-21-9 (aroclor 1242)	11097-69-1 (aroclor 1254)	Metals	7439-97-6 (mercury)	7782-49-2 (selenium)	General Chemistry	18540-29-9 (hexavalent chromium)	Radiochemistry	All Gamma Spec results flagged "X" by the lab (see EDD)	13967-70-9 (cesium-134)	14683-10-4 (antimony-124)
061176-005 74-SB-E002-F177-TB		P2		All QC acceptance criteria were met.No data will be qualified.												
061216-005 74-SB-E002-F203-TB		P2														
061219-001 74-SB-E002-F216		UJ	J													
061175-002 74-SB-E002-F161	11				UJ,HT,P2	J,HT,P2	J,HT,P2		J	UJ,B3		J,A2				
061176-002 74-SB-E002-F177	12				UJ,HT,P2	J,HT,P2	J,HT,P2		J	J,B3		J,A2				
061215-002 74-SB-E002-F202	13				UJ,HT,P2	J,HT,P2	J,HT,P2			J,B3		J,A2				
061216-002 74-SB-E002-F203	14				UJ,HT,P2	J,HT,P2	J,HT,P2			UJ,B3		J,A2				
061217-002 74-SB-E002-F204	15				UJ,HT,P2	J,HT,P2	J,HT,P2			UJ,B3		J,A2				
061218-002 74-SB-E002-F205	16				UJ,HT,P2	J,HT,P2	247J,HT,P2			UJ,B3		UJ,A2				
061219-002 74-SB-E002-F216	17				UJ,HT,P2	J,HT,P2	J,HT,P2			J,B3		J,A2				
061220-002 74-SB-E002-F217	18				UJ,HT,P2	J,HT,P2	J,HT,P2			UJ,B3		J,A2				
061221-002 74-SB-E002-F218	19				UJ,HT,P2	J,HT,P2	74.1J,HT,P2			UJ,B3		J,A2				
061222-002 74-SB-E002-F219	20				UJ,HT,P2	J,HT,P2	J,HT,P2			UJ,B3		J,A2				
061175-004 74-SB-E002-F161	31													R		
061176-004 74-SB-E002-F177	32													R	R	
061215-004 74-SB-E002-F202	33													R		R
061216-004 74-SB-E002-F203	34													R		
061217-004 74-SB-E002-F204	35													R		
061218-004 74-SB-E002-F205	36													R		
061219-004 74-SB-E002-F216	37													R		
061220-004 74-SB-E002-F217	38													R		
061221-004 74-SB-E002-F218	39													R		
061222-004 74-SB-E002-F219	40													R		

Validated By: [illegible] Date: 03/18/03

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MEMORANDUM

DATE: 03/17/03

TO: File

FROM: Linda Thal

SUBJECT: Inorganic Data Review and Validation - SNL
Site: S-74 Chem Waste LF Remed
ARCOC # 606162 and 606166
GEL SDG # 74917
Project/Task No. 7221.02.02.03

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM ER Project AOP 00-03.

Summary

The samples were prepared and analyzed with approved procedures using methods SW-846 6010B (ICP-AES metals), SW-846 7471A (Hg) and SW-846 7196A (hexavalent chromium). Problems were identified with the data package that resulted in the qualification of data.

ICP-AES
Selenium was detected in the CCB at a negative value with an absolute value > DL but < RL. Samples 74917-012, -013 and -017 were detects with values < 5X DL and will be qualified "J, B3". The remaining samples were all non-detect and will be qualified "UJ, B3".

Hg-CVAA
The replicate had a value < 5X RL and a RPD > RL. Sample 74917-011 and -012 were detects with values < 5X RL and will be qualified "J". The remaining samples had values > 5X RL and will not be qualified.

Hexavalent Chromium
The MS %R (43%) was < SPC limit (49-130%) due to matrix interference. Sample 74917-016 was non-detect and will be qualified "UJ, A2"; the remaining samples were detects and will be qualified "J, A2".

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

Holding Times/Preservation

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

Calibration

All Analyses: The initial and continuing calibration data met QC acceptance criteria with the following exception:

Hexavalent Chromium

The frequency of the CCVs did not meet criteria. The samples (10), a matrix spike and a duplicate were run between the CCVs. The data is already qualified "J" and "UJ" due to matrix spike failure, and using professional judgment will not be further qualified.

Blanks

All Analyses: All blank criteria were met except as mentioned above in the summary section and as follows:

ICP-AES

Nickel was detected in the MB, and nickel and lead in the ICB/CCB at values > DL but < RL. All associated sample results were detect, with values > 5X blank values and will not be qualified. Arsenic was detected in the ICB/CCB at a negative value with an absolute value >DL but < RL. All associated sample results had values > 5X DL and will not be qualified.

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

All Analyses: The LCS met QC acceptance criteria.

Matrix Spike (MS) Analysis

All Analyses: The MS analysis met QC acceptance criteria except as mentioned above in the summary section.

Replicate Analysis

All Analyses: The replicate analysis met QC acceptance criteria except as mentioned above in the summary section.

ICP Interference Check Sample (ICS)

ICP-AES: The ICS-AB met QC acceptance criteria.

All Other Analyses: No ICS required.

ICP Serial Dilution

ICP-AES: The serial dilution met QC acceptance criteria.

All other Analyses: No serial dilution required.

Detection Limits/Dilutions

All Analyses: All detection limits were properly reported and the samples were not diluted with the following exceptions:

ICP-AES: All soil samples were diluted 2X.

Other QC

All Analyses: No field blank, field duplicate or equipment blank was submitted on the ARCOC.

No other specific issues were identified which affect data quality.

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MEMORANDUM

DATE: 03/17/03

TO: File

FROM: Linda Thal

SUBJECT: Organic Data Review and Validation - SNL
Site: S-74 Chem Waste LF Remed
ARCOC # 606162 and 606166
GEL SDG # 74917 and 74924
Project/Task No. 7221.02.02.03

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM ER Project AOP 00-03.

Summary

The samples were prepared and analyzed with approved procedures using methods SW-846 8260A/B (VOC), 8270C (SVOC) and 8082 (PCBs). Problems were identified with the data package that resulted in the qualification of data.

VOC Batch # 234803
All internal standard recoveries for sample 74917-007 were >25% but < 50%. Toluene was a detect and will be qualified "J"; all other compounds were non-detect and will be qualified "UJ".

VOC Batch # 233630
No MS/MSD, LCSD or duplicate was performed for this batch. As there is no measure of precision available, both sample results will be qualified "P2".

PCB
Due to a QC failure the samples were re-extracted out of hold time but within 2X the hold time. Only the re-extracted sample results appear on the Certificate of Analysis and only the re-extracted sample results will be validated. All detects will be qualified "J, HT" and all non-detects "UJ, HT".
The sample used for the MS/MSD was from another SNL SDG and failed recovery and RPD due to matrix interference. Using professional judgment, the data will not be used, and all the sample results will be qualified "P2" due to lack of precision information.
Sample 74917-016 and -019 had confirmation RPDs > 25% but < 75% for aroclor 1254. Both samples will have the 1254 result changed to the highest reported value and will be qualified "J".

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

Holding Times/Preservation

All Analyses: The samples were properly preserved and analyzed within the method prescribed holding time.

Calibration

All Analyses: All initial and continuing calibration acceptance criteria were met except as follows:

VOC
The CCV preceding samples 74917-002, 007 and 010 had a %R > 20% with a positive bias for bromomethane (22%). The CCV preceding the remaining soil samples had a %R > 20% with a positive bias for bromomethane (26%) and chloromethane (22%). The associated sample results were non-detect and unaffected by a positive bias; no data will be qualified.
The CCV preceding samples 74924-001and -002 had a %R > 20% with a positive bias for acetone (25%). The associated sample results were non-detect and unaffected by a positive bias; no data will be qualified.

SVOC Batch # 233374
Fluorene (RF=0.74) and naphthalene (RF=0.60) had a response factor < the recommended minimum response factor (0.90 and 0.70 respectively) in the initial calibration preceding the samples. All associated sample results were non-detect and using professional judgment will not be qualified.

Blanks

All Analyses: All method blank (MB) and trip blank (TB) acceptance criteria were met except as follows:

VOC
The TB (74924-002) associated with samples 74917-003 through -010 had a methylene chloride value > RL. All associated sample results were non-detect and will not be qualified.

Surrogates

All Analyses: All surrogate acceptance criteria were met.

Internal Standards (ISs)

VOC and SVOC: All internal standard acceptance criteria were met except as mentioned above in the summary section and as follows:

VOC
The MSD associated with Batch # 234803 had internal standard recoveries > 25% but < 50%. The spike recoveries and RPD met QC acceptance criteria and no data will be qualified.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

All Analyses: All MS/MSD acceptance criteria were met except as mentioned above in the summary section and as follows:

SVOC Batch # 233374
Several target compounds (see DV worksheet) for which laboratory recovery criteria were not recommended had MS/MSD %R > QC acceptance criteria (75-125%). Using professional judgment, no data will be qualified.

Laboratory Control Samples (LCS/LCSD) Analysis

All Analyses: The LCS acceptance criteria were met. No LCSD was analyzed. The MS/MSD is used to assess the precision for the batch. No data will be qualified as a result.

VOC
In Batch # 233630 the LCS acceptance criteria were met by the analysis of a second source CCV.
It should be noted that no LCS compound was associated with internal standard 1,4-dichlorobenzene-d4.
No data will be qualified as a result.

SVOC
It should be noted that no LCS compound was associated with internal standard perylene-d12. No data will be qualified as a result.

Detection Limits/Dilutions

All Analyses: All detection limits were properly reported. Samples were not diluted with the following exceptions:

PCB
Sample 74917-011, -013, -016 and 018 were diluted 5X, sample 74917-015 10X, and sample 74917-014 50X due to high concentrations of aroclors present.

Confirmation Analyses

VOC and SVOC: No confirmation analyses required.

PCB: All confirmation acceptance criteria were met except as mentioned above in the summary section.

Other QC

VOC: A trip blank was submitted on each ARCOC. No field duplicate or equipment blank was submitted.

SVOC, PCB: No equipment blank, field duplicate or field blank was submitted on the ARCOC.

No other specific issues were identified which affect data quality.

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MEMORANDUM

DATE: 03/18/03

TO: File

FROM: Linda Thal

SUBJECT: Radiochemical Data Review and Validation - SNL
Site: S-74 Chem Waste LF Remed
ARCOC 606162 and 606166
GEL SDG # 74917
Project/Task No. 7221.02.02.03

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.

Summary

All samples were prepared and analyzed with approved procedures using method EPA 906.0 (tritium) and DOE EML HASL 300 (gamma spec). Problems were identified with the data package that resulted in the qualification of data.

Gamma Spec Analysis
Several Gamma Spec results for samples 74917-031 through -040 were "X" flagged by the laboratory due to interference, no valid peak/uncertain identification or low abundance. (See Electronic Data Deliverable). Thus, these sample results will be qualified "R" (unusable).

The absolute values of the negative sample results for Cs-134 and Sb-124 in samples 74917-032 and -033 respectively were > the associated MDA and will be qualified "R".

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

Holding Times/Preservation

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

Calibration

The case narrative stated the instruments used were properly calibrated.

Blanks

No target analytes were detected in the method blank at concentrations > the associated MDA/TPU.

Matrix Spike (MS) Analysis

The MS analyses met all QC acceptance criteria.

Laboratory Control Sample (LCS) Analysis

The LCS analyses met all QC acceptance criteria.

Replicates

The replicate analyses met all QC acceptance criteria.

Tracer/Carrier Recoveries

No tracer/carrier required.

Negative Bias

All sample results met negative bias QC acceptance criteria except as mentioned above in the summary section.

Detection Limits/Dilutions

All detection limits were properly reported. No samples were diluted.

Other QC

No equipment blank, field blank or field duplicate was submitted on the ARCOC.

No other specific issues were identified which affect data quality.

Data Validation Summary

Site/Project: S-7H CWL Project/Task #: 7221.02.02.03 # of Samples: 40 & 2 Matrix: Soils & H2O

AR/COC #: 606162 & 606166 Laboratory Sample IDs: 74917-001 thru -040

Laboratory: GEL 74924-001 & -002

Laboratory Report #: 74917 74924 (TBs)

QC Element	Analysis									
	Organics				Inorganics				RAD	Other
	VOC	SVOC	Pesticide/ PCB	HPLC (HE)	ICP/AES	GFAA/ AA	CVAA (Hg)	CN		
1. Holding Times/Preservation	✓	✓	J,UJ,HT	NA	✓	NA	✓	NA	✓	✓
2. Calibrations	✓	✓	✓		✓		✓		✓	✓
3. Method Blanks	✓	✓	✓		J,UJ,B3		✓		✓	✓
4. MS/MSD	✓ / P2	✓	P2		✓		✓		✓	J,UJ A2
5. Laboratory Control Samples	✓	✓	✓		✓		✓		✓	✓
6. Replicates					✓		J		✓	✓
7. Surrogates	✓	✓	✓							NA
8. Internal Standards	J,UJ / ✓	✓								
9. TCL Compound Identification	✓	✓								
10. ICP Interference Check Sample					✓					
11. ICP Serial Dilution					✓					
12. Carrier/Chemical Tracer Recoveries									NA	
13. Other QC	TB's	NA	NA		NA		NA		R-Neg bias & rejected by lab	

J = Estimated
U = Not Detected
UJ = Not Detected, Estimated
R = Unusable

Check (√) = Acceptable
Shaded Cells = Not Applicable (also "NA")
NP = Not Provided
Other: _____

Reviewed By: [signature] Date: 03.18.03

Holding Time and Preservation

Site/Project: S-74 - CWL AR/COC #: 606162 606166 Laboratory Sample IDs: 74917 -001 thru -040
Laboratory: GEL Laboratory Report #: 74917 74924 -001 & -002
# of Samples: 40 & 2 Matrix: Soils & Aqueous

Sample ID	Analytical Method	Holding Time Criteria	Days Holding Time was Exceeded	Preservation Criteria	Preservation Deficiency	Comments
74917-011 thru	SW846 8082	14 days	8	NA	NA	7HT < 2XHT
020						Detects J NDs UJ

Reviewed By: KMal Date: 03.17.03

WS 1 of 2 (soils)

Volatile Organics (SW 846 Method 8260)

Site/Project: S-7H CWL AR/COC #: 606162 606166 # of Samples: 10 Matrix: Soils

Laboratory: GEL Laboratory Report #: 7H917 Laboratory Sample IDs: 7H917 - 001 thru - 010

Methods: SW-846 8260A Batch #s: 234803

IS	CAS #	Name	TCL	Min. RF	Intercept	Calib. RF >.05	Calib. RSD/ R^2 <20% / 0.99	CCV %D 20%	Method Blks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	7H924- Trip Blanks 001	7H924 TB 002	SQ 3-10
1	71-55-6	1,1,1-trichloroethane	✓	0.10		✓	✓	✓ ✓	✓ ✓	✗	✗	NA						✓	✓	
2	79-34-5	1,1,2,2-tetrachloroethane		0.30																
2	79-00-5	1,1,2-trichloroethane		0.10																
1	75-34-3	**1,1-dichloroethane**		0.10																
1	75-35-4	**1,1-dichloroethene**		0.20						✓	✓		✓	✓	✓					
1	107-06-2	**1,2-dichloroethane**	✓	0.10																
1	540-59-0	**1,2-dichloroethene(total)**		0.01																
1	78-87-5	**1,2-dichloropropane**	✓	0.01																
1	78-93-3	**2-butanone (MEK) (10xblk)**	✓	0.01																
1	110-75-8	2-chloroethyl vinyl ether																		
2	591-78-6	2-hexanone (MBK)	✓	0.01																
2	108-10-1	4-methyl-2-pentanone (MIBK)		0.10																
1	67-64-1	**acetone(10xblk)**		0.01																
1	71-43-2	**benzene**		0.50						✓	✓		✓	✓	✓					
1	75-27-4	bromodichloromethane		0.20																
3	75-25-2	bromoform		0.10	✓	✓	✓													
1	74-83-9	bromomethane		0.10				77 74												
1	75-15-0	carbon disulfide		0.10				✓ ✓												
1	56-23-5	**carbon tetrachloride**		0.10																
2	108-90-7	**chlorobenzene**		0.50						✓	✓		✓	✓	✓					
1	75-00-3	chloroethane		0.01																
1	67-66-3	**chloroform**		0.20																
1	74-87-3	chloromethane		0.10				77												
1	10061-01-5	cis-1,3-dichloropropene		0.20				✓												
2	124-48-1	dibromochloromethane		0.10																
2	100-41-4	ethylbenzene		0.10																
1	75-09-2	methylene chloride (10xblk)		0.01															71.7 ug/l	
2	100-42-5	styrene		0.30															✓	
2	127-18-4	**tetrachloroethene**		0.20																
2	108-88-3	toluene(10xblk)		0.40						✓	✓		✓	✓	✓					
2	10061-02-6	trans-1,3-dichloropropene		0.10																
1	79-01-6	**trichloroethene**		0.30						✓	✓		✓	✓	✓					
1	75-01-4	**vinyl chloride**		0.10	✓	✓	✓													
2	1330-20-7	xylenes(total)		0.30																
		cis-1,2-Dichloroethene																		
		trans-1,2-Dichloroethene																		

Comments:

Notes: Shaded rows are RCRA compounds.

Reviewed By: [illegible] Date: 03.14.03

WS lot 2 (soils)

Volatile Organics

Site/Project: _____ AR/COC #: 606162 606166 Batch #s: _____

Laboratory: _____ Laboratory Report #: _____ # of Samples: _____ Matrix: _____

Surrogate Recovery and Internal Standard Outliers (SW 846 Method 8260)

Sample	SMC 1	SMC 2	SMC 3	IS 1 Area	IS 1 RT	IS 2 area	IS 2 RT	IS 3 area	IS 3 RT
7H917 -007				>25% <50%	OK	>25% <50%	OK	>25% <50%	
-001 MSD				↓	↓	↓	↓	↓	
Samples reprepped & reanalyzed to confirm matrix effects.									

SMC 1: 4-Bromofluorobenzene
SMC 2: Dibromofluoromethane
SMC 3: Toluene-d8

IS 1: Fluorobenzene
IS 2: Chorobenzene-d5
IS 3: 1,4-Dichlorobenzene-d4

Comments:

Sa 2,7,10 2/19 VOA 2 ICal 01/14 8:26-15:30 CCV 1 02/19 8.00

Resr 2/20 " " CCV 2 02/20 8.41

-007 IS ↓ Tol "J" All others TML "UJ"

Semivolatile Organics (SW 846 Method 8270)

Site/Project: S-7H CWL AR/COC #: 606162 606166 Laboratory Sample IDs: 7H917 - 011 thru -020

Laboratory: GEL Laboratory Report #: 7H917

Methods: SW846 - 8270C

# of Samples: 10 Matrix: Soil Batch #s: 233374

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF >.05	Calib. RSD/ R^2 <20%/ 0.99	CCV %D 20%	Method Blanks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks		
2	BN	120-82-1	1,2,4-Trichlorobenzene	✓	0.20		✓	✓	✓	✓	✓	NA		✓	✓	✓	NA				
1	BN	95-50-1	1,2-Dichlorobenzene	✓	0.40																
1	BN	541-73-1	1,3-Dichlorobenzene	✓	0.60																
1	BN	106-46-7	1,4-Dichlorobenzene	✓	0.50						✓			✓	✓	✓					
3	A	95-95-4	2,4,5-Trichlorophenol	✓	0.20						✓			✓	71	✓					
3	A	88-06-2	2,4,6-Trichlorophenol	✓	0.20						✓			71	68	✓					
2	A	120-83-2	2,4-Dichlorophenol	✓	0.20																
2	A	105-67-9	2,4-Dimethylphenol	✓	0.20																
3	A	51-28-5	2,4-dinitrophenol	✓	0.01	✓	✓	✓													
3	BN	121-14-2	2,4-Dinitrotoluene	✓	0.20						✓			✓	✓	✓					
3	BN	606-20-2	2,6-Dinitrotoluene	✓	0.20																
3	BN	91-58-7	2-Chloronaphthalene	✓	0.80																
1	A	95-57-8	2-Chlorophenol	✓	0.80						✓			✓	✓	✓					
2	BN	91-57-6	2-Methylnaphthalene	✓	0.40																
1	A	95-48-7	2-Methylphenol (o-cresol)	✓	0.70						✓			✓	74	✓					
3	BN	88-74-4	2-Nitroaniline	✓	0.01																
2	A	88-75-5	2-Nitrophenol	✓	0.10																
5	BN	91-94-1	3,3'-Dichlorobenzidine	✓	0.01																
3	BN	99-09-2	3-Nitroaniline	✓	0.01																
4	A	534-52-1	4,6-Dinitro-2-methylphenol	✓	0.01	✓	✓	✓													
4	BN	101-55-3	4-Bromophenyl-phenylether	✓	0.10																
3	BN	7005-72-3	4-Chlorophenyl-phenylether	✓	0.40																
2	A	59-50-7	4-Chloro-3-methylphenol	✓	0.20						✓			✓	✓	✓					
2	BN	106-47-8	4-Chloroaniline	✓	0.01																
1	A	106-44-5	4-Methylphenol (p-cresol)		0.60																

Comments: m,p cresol ✓

Notes: Shaded rows are RCRA compounds.

Reviewed By: [illegible] Date: 03.17.03

Semivolatile Organics

Site/Project: _____ AR/COC #: 606162 606166 Batch #s: _____

Laboratory: _____ Laboratory Report #: _____ # of Samples: _____ Matrix: _____

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blanks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks		
							>.05	<20% / 0.99	20%												
3	BN	100-01-6	4-Nitroaniline	✓	0.01		✓	✓	✓	✓		NA					NA				
3	A	100-02-7	4-Nitrophenol	✓	0.01																
3	BN	83-32-9	Acenaphthene	✓	0.90						✓			✓	✓	✓					
3	BN	208-96-8	Acenaphthylene	✓	0.90																
4	BN	120-12-7	Anthracene	✓	0.70																
5	BN	56-55-3	Benzo(a)anthracene	✓	0.80																
6	BN	50-32-8	Benzo(a)pyrene	✓	0.70																
6	BN	205-99-2	Benzo(b)fluoranthene	✓	0.70																
6	BN	191-24-2	Benzo(g,h,i)perylene	✓	0.50	✓	✓	.985 ✓													
6	BN	207-08-9	Benzo(k)fluoranthene	✓	0.70																
2	BN	111-91-1	bis(2-Chloroethoxy)methane	✓	0.30																
1	BN	111-44-4	bis(2-Chloroethyl)ether	✓	0.70																
1	BN	108-60-1	bis(2-chloroisopropyl)ether	✓	0.01																
5	BN	117-81-7	bis(2-Ethylhexyl)phthalate	✓	0.01	✓	✓	✓													
5	BN	85-68-7	Butylbenzylphthalate	✓	0.01																
4	BN	86-74-8	Carbazole	✓	0.01																
5	BN	218-01-9	Chrysene	✓	0.70																
6	BN	53-70-3	Dibenz(a,h)anthracene	✓	0.40	✓	✓	.988 ✓													
3	BN	132-64-9	Dibenzofuran	✓	0.80																
3	BN	84-66-2	Diethylphthalate	✓	0.01																
3	BN	131-11-3	Dimethylphthalate	✓	0.01																
4	BN	84-74-2	Di-n-butylphthalate	✓	0.01																
6	BN	117-84-0	Di-n-octylphthalate	✓	0.01																
4	BN	206-44-0	Fluoranthene	✓	0.60																
3	BN	86-73-7	Fluorene	✓	0.90	✓	0.7429	✓													
4	BN	118-74-1	Hexachlorobenzene	✓	0.10		✓				✓			✓	72	✓					
2	BN	87-68-3	Hexachlorobutadiene	✓	0.01						✓			71	71	✓					
3	BN	77-47-4	Hexachlorocyclopentadiene	✓	0.01																
1	BN	67-72-1	Hexachloroethane	✓	0.30						✓			73	71	✓					

Comments:

Semivolatile Organics

Site/Project: _____ AR/COC #: 606162 606166 Batch #s: _____

Laboratory: _____ Laboratory Report #: _____ # of Samples: _____ Matrix: _____

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blanks	LCS	LCS D	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks		
							>.05	<20%/ 0.99	20%												
6	BN	193-39-5	Indeno(1,2,3-cd)pyrene	✓	0.50	✓	✓	= .99 .989 ✓	✓	✓		NA					NA				
2	BN	78-59-1	Isophorone	✓	0.40			✓													
2	BN	91-20-3	Naphthalene	✓	0.70	✓	.604Q	.99 .989 = ✓													
2	BN	98-95-3	Nitrobenzene	✓	0.20		✓	✓			✓			✓	✓	✓					
4	BN	86-30-6	N-Nitrosodiphenylamine (1)		0.01																
1	BN	621-64-7	N-Nitroso-di-propylamine	✓	0.50						✓			✓	✓	✓					
4	A	87-86-5	Pentachlorophenol	✓	0.05						✓			✓	✓	✓					
4	BN	85-01-8	Phenanthrene	✓	0.70																
1	A	108-95-2	Phenol	✓	0.80						✓			✓	✓	✓					
5	BN	129-00-0	Pyrene	✓	0.60						✓			✓	✓	✓					
			Diphenylamine	✓																	

MS/MSD 75 - 125 several ↓

Surrogate Recovery Outliers

Sample	SMC 1	SMC 2	SMC 3	SMC 4	SMC 5	SMC 6	SMC 7	SMC 8
IN CRITERIA								

SMC 1: Nitrobenzene-d5 (BN)
SMC 2: 2-Fluorobiphenyl (BN)
SMC 3: p-Terphenyl-d14 (BN)
SMC 4: Phenol-d6 (A)
SMC 5: 2-Fluorophenol (A)
SMC 6: 2,4,6-Tribromophenol (A)
SMC 7: 2-2-Chlorophenol-d4 (A)
SMC 8: 1,2-Dichlorobenzene-d4 (BN)

Comments:

SA 011 → 019 CCV 16.33 16.55 2/20

SA 020 CCV 11.09 11.30 2/21

Internal Standard Outliers

Sample	IS 1-area	IS 1-RT	IS 2-area	IS 2-RT	IS 3-area	IS 3-RT	IS 4-area	IS 4-RT	IS 5-area	IS 5-RT	Is 6-area	IS 6-RT
IN CRITERIA												

IS 1: 1,4-Dichlorobenzene-d4 (BN)
IS 2: Naphthalene-d8 (BN)
IS 3: Acenaphthene-d10 (BN)
IS 4: Phenathrene-d10 (BN)
IS 5: Chrysene-d12 (BN)
IS 6: Perylene-d12 (BN)

PCBs (SW 846 - Method 8082)

Site/Project: S-7H CWL AR/COC #: 606162 606166 Laboratory Sample IDs: 7H917 - 011 thru 020

Laboratory: GEL Laboratory Report #: 7H917

Methods: SW846

# of Samples: 10 Matrix: Soils Batch #s: 236636

CAS #	Name	TCL	Intercept	Calib RSD / R^2 <20% / 0.99	CCV %D 20%	Method Blanks	LCS	LCSD	LCS RPD 20%	MS	MSD	MS RPD 20%	Field Dup. RPD	Equip. Blanks	Field Blanks		
12674-11-2	Aroclor-1016	✓	NA	✓	✓	✓	✓		NA								
11104-28-2	Aroclor-1221	✓				✓											
11141-16-5	Aroclor-1232	✓				✓											
53469-21-9	Aroclor-1242	✓		✓	✓	✓											
12672-29-6	Aroclor-1248	✓		✓		✓											
11097-69-1	Aroclor-1254	✓		✓	✓	✓											
11096-82-5	Aroclor-1260	✓		✓	✓	✓	✓										

Sample	SMC % REC	SMC RT	Sample	SMC % REC	SMC RT
IN CRITERIA					

Comments: Prep 8 days after IH (LCS fail) expired J, UJ CCVs failed

DF 1X = 12, 17, 19, 20

5X = 11, 13, 16, 18

10X = 15

50X = 1X

Confirmation

Sample	CAS #	RPD > 25%	Sample	CAS #	RPD > 25%
7H917 -013	1242	%D = 28.6	7H917 - 019	1254	%D 40.9
		RPD = 25 ✓	OK.		RPD 33.9%
				Change to	~~24.7~~ "J"
-016	1254	%D = 33.5			74.1
		RPD = 28.7%			
	Change to	24.7 "J"			

1st XT 2/13 CCVs & LCS failed

2nd XT 2/28

MS/MSD = 75631 failed %R & RPD due to matrix interference data not used

Run logs not included -

Reviewed By: [signature] Date: 03.17.03

Inorganic Metals

Site/Project: S-74 CWL AR/COC #: 606162 606166 Laboratory Sample IDs: 74917 - 0011 thru -020

Laboratory: GEL Laboratory Report #: 74917

Methods: SW-846 7471 (Hg) 6010 (Metals)

# of Samples: 10 Matrix: Soils Batch #s: 233348 (Hg) 234371 (Metals)

CAS #/ Analyte	QC Element																			
				ug/l	ug/l	mg/kg														
	TAL	ICV	CCV	ICB	CCB	Method Blanks	LCS	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilution	Field Dup. RPD	Equip. Blanks	Field Blanks		
7429-90-5 Al																				
7440-39-3 Ba	✓	✓	✓	✓	✓	✓	✓	NA		✓	NA		✓	✓	✓	NA				
7440-41-7 Be	✓												✓		✓					
7440-43-9 Cd	✓												NA		NA					
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	✓			.936	.884	0.105							✓		✓					
7440-09-7 K				✓	✓															
7440-22-4 Ag	✓			✓	✓	✓							NA		NA					
7440-23-5 Na																				
7440-62-2 V																				
7440-66-6 Zn																				
7439-92-1 Pb	✓			2.90	3.12								✓		NA					
7782-49-2 Se	✓			✓	[-3.15]								NA		NA					
7440-38-2 As	✓			[-2.40]	[-3.61]	✓							✓		✓	NA				
7440-36-0 Sb				✓	✓															
7440-28-0 Tl																				
7439-97-6 Hg	✓	✓	✓	✓	✓	✓	~~✓ 4x~~			✓			DH, >RL							
							✓						SA < 5XRL							
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 / l liter)] / Dilution Factor = µg / l

13 > 5XRL Soils are sta 2x for ICP-AES
14 18
15 19
16 20

Dhal 03.17.03

General Chemistry

Site/Project: S-74 CWL AR/COC #: 606162 606166 Laboratory Sample IDs: 74917-011 thru -020

Laboratory: GEL Laboratory Report #: 74917

Methods: SW846 7196 A

# of Samples: 10 Matrix: Soils Batch #s: 234192 / 234189

CAS #	Analyte	QC Element																		
		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	
	Hexavalent Chromium		✓	✓	✓	✓	✓	✓	NA	NA	43	NA	NA	✓	NA	NA	NA	NA	NA	
											(49-130 %) SPC Limit			<RL						
											NCR 18220									
										>30	< lower limit				All 90		J, A2			
															except		16	UJ, A2		

Comments:

Sa 74917-011 has the prep date incorrectly entered on the CofA
Amended CofA requested.

234189 2/17 1255
234192 2/18 10.32 } < 24 hours ✓

Reviewed By: [signature] Date: 03.18.03

QC and SA -011 reprepped & reanalyzed.
Only 1st set of data on CofA to be validated.

Radiochemistry

Site/Project: S-7H CWL AR/COC #: 606162 606166 Laboratory Sample IDs: 7H917 - 021 thru - 030 (H^3)
- 031 thru - 040 (γ spec)

Laboratory: GEL Laboratory Report #:

Methods: EPA 906.0 (H^3) : 00C EML HASL 300 (γ spec)

# of Samples: 20 Matrix: Soils Batch #s: 233528 (H^3) 233848 (γ spec)

Analyte	QC Element												
	Method Blanks	LCS	MS	Rep RER	Equip. Blanks	Field Dup. RER	Field Blanks	Sample ID	Isotope	IS/Trace	Sample ID	Isotope	IS/Trace
Criteria	U	20%	25%	<1.0	U	<1.0	U			50-105			50-105
H3	✓	✓	✓	✓	NA	NA	NA						
U-238													
U-234													
U-235/-236													
Th-232													
Th-228													
Th-230													
Pu-239/-240													
Gross Alpha													
Nonvolatile Beta													
Ra-226													
Ra-28													
Ni-63													
Gamma Spec. Am-241	✓	✓	NA	✓	NA								
Gamma Spec. Cs-137	✓	✓	↓	✓									
Gamma Spec. Co-60	✓	✓	↓	✓									

Parameter	Method	Typical Tracer	Typical Carrier
Iso-U	Alpha spec.	U-232	NA
Iso-Pu	Alpha spec.	Pu-242	NA
Iso-Th	Alpha spec.	Th-229	NA
Am-241	Alpha spec.	Am-242	NA
Sr-90	Beta	Y ingrowth	NA
Ni-63	Beta	NA	Ni by ICP
Ra-226	Deamination	NA	NA
Ra-226	Alpha spec.	Ba-133 or Ra-225	NA
Ra-228	Gamma spec.	Ba-133	NA

Gamma spec. LCS contains: Am-241, Cs-137, and Co-60

Comments: Neg Bias
32 Cs 134 R
33 Sb 124 R

X data rej. due to interference
low abundance
no valid peak

Reviewed By: [signature] Date: 03.18.03

WS 2 of 2 (Aqueous)

Volatile Organics (SW 846 Method 8260)

Site/Project: S-74 CWL AR/COC #: 606162 606166 # of Samples: 2 Matrix: Aqueous

Laboratory: GEL Laboratory Report #: 74917 Laboratory Sample IDs: 74924 - 001 & - 002

Methods: SW 846 8260B Batch #s: 233630

IS	CAS #	Name	TCL	Min. RF	Intercept	Calib. RF >.05	Calib. RSD/ R^2 <20% / 0.99	CCV %D 20%	Method Blks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Trip Blanks		
1	71-55-6	1,1,1-trichloroethane		0.10		✓	✓	✓	✓		NA									
2	79-34-5	1,1,2,2-tetrachloroethane		0.30																
2	79-00-5	1,1,2-trichloroethane		0.10																
1	75-34-3	**1,1-dichloroethane**		0.10																
1	75-35-4	**1,1-dichloroethene**		0.20						✓										
1	107-06-2	**1,2-dichloroethane**	✓	0.10																
1	540-59-0	**1,2-dichloroethene(total)**		0.01																
1	78-87-5	**1,2-dichloropropane**	✓	0.01																
1	78-93-3	**2-butanone (MEK) (10xblk)**	✓	0.01																
1	110-75-8	2-chloroethyl vinyl ether																		
2	591-78-6	2-hexanone (MBK)	✓	0.01																
2	108-10-1	4-methyl-2-pentanone (MIBK)		0.10																
1	67-64-1	**acetone(10xblk)**		0.01				725												
1	71-43-2	**benzene**		0.50				✓		✓										
1	75-27-4	bromodichloromethane		0.20																
3	75-25-2	bromoform		0.10	✓	✓	✓													
1	74-83-9	bromomethane		0.10																
1	75-15-0	carbon disulfide		0.10																
1	56-23-5	**carbon tetrachloride**		0.10																
2	108-90-7	**chlorobenzene**		0.50						✓										
1	75-00-3	chloroethane		0.01																
1	67-66-3	**chloroform**		0.20																
1	74-87-3	chloromethane		0.10																
1	10061-01-5	cis-1,3-dichloropropene		0.20																
2	124-48-1	dibromochloromethane		0.10																
2	100-41-4	ethylbenzene		0.10																
1	75-09-2	methylene chloride (10xblk)		0.01																
2	100-42-5	styrene		0.30																
2	127-18-4	**tetrachloroethene**		0.20																
2	108-88-3	toluene(10xblk)		0.40						✓										
2	10061-02-6	trans-1,3-dichloropropene		0.10																
1	79-01-6	**trichloroethene**		0.30						✓										
1	75-01-4	**vinyl chloride**		0.10	✓	✓	✓													
2	1330-20-7	xylenes(total)		0.30																
		cis-1,2-Dichloroethene																		
		trans-1,2-Dichloroethene																		

Comments:

Notes: Shaded rows are RCRA compounds.

Reviewed By: KVhal Date: 03.17.03

WS 2 of 2 (Aqueous)

Volatile Organics

Site/Project: _____ AR/COC #: 606162 606166 Batch #s: _____

Laboratory: _____ Laboratory Report #: _____ # of Samples: _____ Matrix: _____

Surrogate Recovery and Internal Standard Outliers (SW 846 Method 8260)

Sample	SMC 1	SMC 2	SMC 3	IS 1 Area	IS 1 RT	IS 2 area	IS 2 RT	IS 3 area	IS 3 RT
IN CRITERIA									

SMC 1: 4-Bromofluorobenzene
SMC 2: Dibromofluoromethane
SMC 3: Toluene-d8

IS 1: Fluorobenzene
IS 2: Chorobenzene-d5
IS 3: 1,4-Dichlorobenzene-d4

Comments:

Sa 74924 - 001 No preservation indicated on COC. The run log had a PH = 2 OK ✓

CCV & LCS same file

No precision P2.

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February 18, 2003

Sandia National Laboratories
1515 Eubank SE
Albuquerque, New Mexico 87123
Attention: Pam Puissant, MS-0756, Org. 7578, Building 823/ Room 4276

Re: ARCOC-606162 SDG#74917A; ARCOC-606166 SDG#74917B

Project Coordinator: Pam Puissant

Dear Ms. Puissant:

Enclosed is the data package for the aqueous sample and soil samples for ARCOC-606162 SDG#74917A and ARCOC-606166 SDG#74917B, which were analyzed for Volatiles, Semivolatiles, PCBs, Metals, General Chemistry, and Radiochemistry parameters.

General Engineering Laboratories appreciates this opportunity to provide you with analytical results, and trusts that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 769-7385.

Yours very truly,

Edith M. Kent
Project Manager

enclosure

P.O. Box 30712 • Charleston, SC 29417 • 2040 Savage Road (29407)
Phone (843) 556-8171 • Fax (843) 766-1178 • www.gel.com

Sample Findings Summary

Site: S-74, CWLF **AR/COC:** 606339 **Data Type:** Organic, Inorganic, RAD (Page 1/2)

Sample ID	VOCs:	EPA8260B (All VOCS, except...)	79-01-6 (trichloroethane)	SVOCs:	129-00-0 (pyrene)	534-52-1 (4,6-dinitro-2-methylphenol)	PCBs:	EPA8082 (All PCBs, except...)	53469-21-9 (Aroclor-1242)	11097-69-1 (Aroclor-1254)	11096-82-5 (Aroclor-1260)	Metals:	7440-38-2 (As)	7440-22-4 (Ag)	7440-39-3 (Ba)	7782-49-2 (Se)		EPA7196A (Cr+6)		
		Method/CAS Number (Analysis/Analyte)																		
061820-001 74-SB-E002-F001			UJ																	
061821-001 74-SB-E002-F002			UJ																	
061821-005 74-SB-E002-F002-TB		P2	UJ,P2																	
061822-001 74-SB-E002-F003			UJ																	
061823-001 74-SB-E002-F005			UJ																	
061824-001 74-SB-E002-F006			UJ																	
061825-001 74-SB-E002-F008			UJ																	
061826-001 74-SB-E002-F009			UJ																	
061827-001 74-SB-E002-F010			UJ																	
061828-001 74-SB-E002-F012			UJ																	
061829-001 74-SB-E002-F013			UJ																	
061830-001 74-SB-E002-F014			UJ																	
061831-001 74-SB-E002-F015			UJ																	
061832-001 74-SB-E002-F017			UJ																	
061833-001 74-SB-E002-F018			UJ																	
061834-001 74-SB-E002-F019			UJ																	
061835-001 74-SB-E002-F020			UJ																	
061836-001 74-SB-E002-F021			UJ																	
061837-001 74-SB-E002-F022			UJ																	
061838-001 74-SB-E002-F023			UJ																	
061839-001 74-SB-E002-F024			UJ																	
061820-002 74-SB-E002-F001						UJ							J	UJ,B3	J,A2	J,B3		J,A2		
061821-002 74-SB-E002-F002						UJ					J		J	UJ,B3	J,A2	J,B3		J,A2		
061822-002 74-SB-E002-F003						UJ							J	UJ,B3	J,A2	J,B3		UJ,A2		
061823-002 74-SB-E002-F005						UJ					J		J	UJ,B3	J,A2	J,B3		UJ,A2		
061824-002 74-SB-E002-F006						UJ							J	UJ,B3	J,A2			UJ,A2		
061825-002 74-SB-E002-F008						UJ							J	UJ,B3	J,A2			J,A2		
061826-002 74-SB-E002-F009						UJ		UJ,HT	J,HT	J,HT	J,HT		J	UJ,B3	J,A2	J,B3		J,A2		
061827-002 74-SB-E002-F010						UJ							J	UJ,B3	J,A2			J,A2		
061828-002 74-SB-E002-F012						UJ					J		J	UJ,B3	J,A2	J,B3		UJ,A2		
061829-002 74-SB-E002-F013						UJ							J	UJ,B3	J,A2			UJ,A2		
061830-002 74-SB-E002-F014						UJ							J	UJ,B3	J,A2	J,B3		J,A2		
061831-002 74-SB-E002-F015						UJ			J				J	UJ,B3	J,A2	J,B3		J,A2		
061832-002 74-SB-E002-F017						UJ							J	UJ,B3	J,A2	J,B3		UJ,A2		
061833-002 74-SB-E002-F018						UJ					J		J	UJ,B3	J,A2	J,B3		J,A2		
061834-002 74-SB-E002-F019					J	UJ							J	UJ,B3	J,A2	J,B3		UJ,A2		
061835-002 74-SB-E002-F020						UJ					J		J	UJ,B3	J,A2			UJ,A2		
061836-002 74-SB-E002-F021						UJ					J		J	UJ,B3	J,A2			UJ,A2		
061837-002 74-SB-E002-F022						UJ							J	UJ,B3	J,A2	J,B3		UJ,A2		
061838-002 74-SB-E002-F023						UJ							J	UJ,B3	J,A2	J,B3		J,A2		
061839-002 74-SB-E002-F024						UJ							J	UJ,B3	J,A2	J,B3		J,A2		

Validated By: Mr. Kenneth Salaz **Date:** 06/17/03

Sample Findings Summary

Site: S-74, CWLF **AR/COC:** 606339 **Data Type:** Organic, Inorganic, RAD (Page 2/2)

Sample ID	Method/CAS Number (Analysis/Analyte)																			
	RAD:	All Gamma Spec results flagged "X" by the lab (see EDD)	13967-70-9 (Cs-134)	13982-39-3 (Zn-65)																
061820-004 74-SB-E002-F001		R																		
061821-004 74-SB-E002-F002		R																		
061822-004 74-SB-E002-F003		R																		
061823-004 74-SB-E002-F005		R		R																
061824-004 74-SB-E002-F006		R																		
061825-004 74-SB-E002-F008		R																		
061826-004 74-SB-E002-F009		R																		
061827-004 74-SB-E002-F010		R																		
061828-004 74-SB-E002-F012		R																		
061829-004 74-SB-E002-F013		R	R																	
061830-004 74-SB-E002-F014		R																		
061831-004 74-SB-E002-F015		R																		
061832-004 74-SB-E002-F017		R																		
061833-004 74-SB-E002-F018		R																		
061834-004 74-SB-E002-F019		R																		
061835-004 74-SB-E002-F020		R																		
061836-004 74-SB-E002-F021		R																		
061837-004 74-SB-E002-F022		R																		
061838-004 74-SB-E002-F023		R																		
061839-004 74-SB-E002-F024		R																		

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MEMORANDUM

DATE: June 18, 2003

TO: File

FROM: Kenneth Salaz

SUBJECT: Inorganic Data Review and Validation - SNL
S-74, CWLF; ARCOC #606339,
GEL SDG #79982, Case No. 7221.02.02.03

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM ER Project AOP 00-03.

Summary

All samples were prepared and analyzed with approved procedures using methods EPA6010B ICP-AES Metals, EPA74701A CVAA, and EPA7196A (Cr+6). Problems were identified with the data package that result in the qualification of data.

1. ICP Analysis: In the continuing calibration blank (CCB), selenium (Se) was detected. The associated results of all samples, except 79982-025, -026, -028, -030, -036, and -037 were detects less than (<) 5X the blank concentration and, thus, will be qualified "J,B3." In the CCB, silver (Ag) was detected at a negative concentration. The absolute value was greater than (>) the detection limit (DL) but < the reporting limit (RL). All associated sample results were ND and, thus, will be qualified "UJ,B3."

2. ICP Analysis: The MS percent recovery (%R) of barium (Ba) was >125%. All associated sample results were detects and, thus, will be qualified "J,A2."

   Cr+6 Analysis: The MS/MSD %Rs were <75% but <30%. The associated results of samples 79982-023, -024, -025, -029, -030, -0333, -035, -036, -037, and -038 were ND and, thus, will be qualified "UJ,A2." All other associated sample results were detects and, thus, will be qualified "J,A2."

3. ICP Analysis: The replicate relative percent difference (RPD) of arsenic (As) was > the QC acceptance limit. All associated sample results were detects and, thus, will be qualified "J."

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 method specified holding times and properly preserved.

Calibration

All Analyses: The initial and continuing calibrations met all QC acceptance criteria.

Blanks

ICP Analysis: No target analytes were detected in the blanks except as noted above in the summary section.

CVAA Analysis: No target analytes were detected in the blanks except for the following. In the CCBs, mercury (Hg) was detected at positive and negative concentrations. The absolute value of the negative concentration was > the DL but < the RL. However, all associated sample results were either >5X the blank concentration or >5X the DL and, thus, will not be qualified.

Cr+6 Analysis: No target analytes were detected in the blanks.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analyses

ICP Analysis: The MS analysis met QC acceptance criteria except as noted above in the summary section. No MSD analysis was performed. The replicate analysis was used as a measure of laboratory precision.

CVAA Analysis: The MS analysis met all QC acceptance criteria. No MSD analysis was performed. The replicate analysis was used as a measure of laboratory precision.

Cr+6 Analysis: The MS/MSD analyses did not meet QC acceptance criteria as noted above in theSsummary section.

Laboratory Control Sample (LCS/LCSD) Analyses

All Analyses: The LCS analyses met all QC acceptance criteria. No LCSD analyses were performed. No sample data will be qualified as a result.

Replicate Analysis

ICP Analysis: The replicate analysis met QC acceptance criteria except as noted above in the summary section.

CVAA/Cr+6 Analyses: The replicate analyses met all QC acceptance criteria.

ICP Interference Check Sample (ICS)

ICP Analysis: The ICS met all QC acceptance criteria.

CVAA/Cr+6 Analyses: No ICS was required for these methods.

ICP Serial Dilution

ICP Analysis: The serial dilution analysis met all QC acceptance criteria.

CVAA/Cr+6 Analyses: No serial dilution was required for these methods.

Detection Limits/Dilutions

ICP Analysis: All detection limits were properly reported. All soil samples were diluted the standard 2X. Samples 79982-025, -028, and -030 were diluted 5X for Ba due to calcium (Ca) interference. No other samples were diluted.

CVAA Analysis: All detection limits were properly reported. Samples 79982-024, -026, -027, -029, -030, -034, -035, and -039 were diluted 10X in order to bring Hg concentrations into the calibration range. No other samples were diluted.

Cr+6 Analysis: All detection limits were properly reported. No samples were diluted.

Other QC

All Analyses: No field duplicates, equipment blanks (EBs), or field blanks (FBs) were submitted on the ARCOC.

No other specific issues were identified which affect data quality.

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MEMORANDUM

DATE: June 17, 2003

TO: File

FROM: Kenneth Salaz

SUBJECT: Organic Data Review and Validation - SNL
S-74, CWLF; ARCOC #606339,
GEL SDG #79982/79983, Case No. 7221.02.02.03

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM ER Project AOP 00-03.

Summary

All samples were prepared and analyzed with approved procedures using methods EPA8260A/B VOCs, EPA8270C SVOCs, and EPA8082 PCBs. Problems were identified with the data package that result in the qualification of data.

1. PCB Analysis: Sample 79982-027 was re-extracted beyond 2X the method specified holding time due to initial surrogate failure. The Aroclor-1242, -1254, and -1260 were detects greater than (>) the reporting limit (RL) and, thus, will be qualified "J,HT." All other results for this sample were non-detect (ND) and, thus, will be qualified "UJ,HT."

2. VOC Analysis: For the trip blank (TB) and the soil samples, the initial calibration response factors (RFs) of trichloroethene were less than (<) the required minimum but >0.01. All associated sample results were ND and, thus, will be qualified "UJ."

   SVOC Analysis: The initial calibration correlation coefficient (R^2 value) of 4,6-dinitro-2-methylphenol was <0.99 but >0.90, and the continuing calibration verification (CCV) percent differences (%Ds) were >20% but <40%. All associated sample results were ND and, thus, will be qualified "UJ," based on professional judgment. The CCV %D of pyrene for samples 79982-035 and -036 was >20% but <40%. The associated result of sample -035 was a detect and, thus, will be qualified "J." The associated result of sample -036 was ND and, thus, will not be qualified.

3. VOC Analysis: For the TB, no MSD, LCSD, Replicate, or other measure of precision was analyzed. All results for this sample was ND and, thus, will be qualified "P2."

4. PCB Analysis: The confirmation relative percent differences (RPDs) of Aroclor-1242 for sample 79982-032 and Aroclor-1260 for samples -022, -024, -029, -034, -036, and -037 were >25% but <75%. The associated sample results will be qualified "J."

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 method specified holding times and properly preserved.

Calibration

VOC Analysis: The initial and continuing calibrations met QC acceptance criteria except as noted above in the Summary section and the following. For the TB, the CCV %D of bromoform was >20% but <40%. For the soil samples, the CCV %Ds of carbon tetrachloride and chloromethane were >20% but <40%. However, all associated sample results were ND and, thus, will not be qualified.

SVOC Analysis: The initial and continuing calibrations met QC acceptance criteria except as noted above in the Summary section and the following. The initial calibration R^2 value of di-n-octylphthalate was <0.99 but >0.90, and the CCV %Ds of several other compounds (see SVOC DV worksheet) were >20% but <40%. However, all associated sample results were ND and, thus, will not be qualified.

PCB Analysis: The initial and continuing calibrations met all QC acceptance criteria.

Blanks

All Analyses: No target analytes were detected in the blanks.

Surrogates

All Analyses: All surrogate percent recoveries (%Rs) met QC acceptance criteria.

Internal Standards (ISs)

VOC/SVOC Analyses: The IS areas and retention times (RTs) met all QC acceptance criteria.

PCB Analysis: No ISs were required for this method.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analyses

VOC Analysis: The MS/MSD analyses for the soil samples met all QC acceptance criteria. No MS/MSD or any other measure of precision was performed for the TB, as noted above in the Summary section.

SVOC Analysis: The MS/MSD analyses met all QC acceptance criteria. No MS/MSD or any other measure of precision was performed for the EB, as noted above in the Summary section.

PCB Analysis: The MS/MSD analyses met QC acceptance criteria except for the following. The MS/MSD %Rs of Aroclor-1016 for the re-extraction of sample 79982-027 were > QC acceptance limits. However, this MS/MSD was performed on an SNL sample of similar matrix from another SDG. Thus, no sample data will be qualified based on professional judgment.

Laboratory Control Sample (LCS/LCSD) Analyses

VOC/PCB Analyses: The LCS analyses met all QC acceptance criteria. No LCSD analyses were performed. No sample data will be qualified as a result.

SVOC Analysis: The LCS analysis met QC acceptance criteria except for the following. The LCS %R of 4,6-dinitro-2-methylphenol was > the QC acceptance limit. However, all associated sample results were ND and, thus, will not be qualified.

Confirmation Analyses

PCB Analysis: Confirmation analyses met QC acceptance criteria except as noted above in the Summary section.

VOC/SVOC Analyses: No confirmation analyses were required for these methods.

Detection Limits/Dilutions

VOC Analysis: All detection limits were properly reported. No samples were diluted.

SVOC Analyses: All detection limits were properly reported. Sample 79982-035 was diluted 2X for bis(2-ethylhexyl)phthalate due to an over-range detect. No other samples were diluted.

PCB Analysis: All detection limits were properly reported. Samples 79982-024, -026, -032, -034, -035, -037, -038, and -039 were diluted (see COAs for dilution factors) due to over-range detects. No other samples were diluted.

Other QC

VOC Analysis: A TB was submitted. No field duplicate or field blank (FB) was submitted on the ARCOC.

SVOC/PCB Analyses: No field duplicates, EBs, or FBs were submitted on the ARCOC.

No other specific issues were identified which affect data quality.

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MEMORANDUM

DATE: June 18, 2003

TO: File

FROM: Kenneth Salaz

SUBJECT: Radiochemical Data Review and Validation - SNL
S-74, CWLF; ARCOC #606339,
GEL SDG #79982, Case No. 7221.02.02.03

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM ER Project AOP 00-03.

Summary

All samples were prepared and analyzed with approved procedures using methods EPA906.0 Tritium and HASL300, 4.5.2.3 Gamma Spec.

1. Gamma Spec Analysis: Several Gamma Spec results for all samples were "X" flagged by the laboratory due to low abundance or lack of a valid peak (see Electronic Data Deliverable). Thus, these sample results will be qualified "R" (unusable).

2. Gamma Spec Analysis: The Cs-134 result of sample 79982-070 and the Zn-65 result of sample -064 were negative, and the absolute values were > the associated MDAs. Thus, these samples results will be qualified "R" (unusable).

Data are acceptable except as noted above. 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: The case narratives stated the instruments used were properly calibrated.

Blanks

All Analyses: No target analytes were detected in the blanks at concentrations > the associated MDAs.

Data Validation Summary

Site/Project: S-74, CWLF Project/Task #: 7221.02.02.03 # of Samples: 81 Matrix: 80 soil / 1 aqueous

AR/COC #: 606339 Laboratory Sample IDs: 79982-001 to -080

Laboratory: GEL 79983-001 (TB)

SDG #: 79982/79983

QC Element	Analysis									
	Organics				Inorganics				RAD	Other
	VOC	SVOC	Pesticide/ PCB	HPLC (HE)	ICP/AES	GFAA/ AA	CVAA (Hg)	CN		
1. Holding Times/Preservation	✓	✓	J, HT UJ, HT	NA	✓	NA	✓	NA	✓	✓
2. Calibrations	UJ	J; UJ	✓		✓		✓		✓	✓
3. Method Blanks	✓	✓	✓		J, B3 UJ, B3		✓		✓	✓
4. MS/MSD	P2	✓	✓		J, A2		✓		✓	J, A2 UJ, A2
5. Laboratory Control Samples	✓	✓	✓		✓		✓		✓	✓
6. Replicates					J		✓		✓	✓
7. Surrogates	✓	✓	✓							NA
8. Internal Standards	✓	✓								
9. TCL Compound Identification	✓	✓								
10. ICP Interference Check Sample					✓					
11. ICP Serial Dilution					✓					
12. Carrier/Chemical Tracer Recoveries									NA	
13. Other QC	✓	NA	J		NA		NA		R	

J = Estimated
U = Not Detected
UJ = Not Detected, Estimated
R = Unusable

Check (√) = Acceptable
Shaded Cells = Not Applicable (also "NA")
NP = Not Provided
Other: _____

Reviewed By: [signature] Date: 6/17/03

Holding Time and Preservation

Site/Project: S-74, CWLF AR/COC #: 606339 Laboratory Sample IDs: 79982-001 to -080

Laboratory: GEL SDG #: 79982/79983 79983-001

# of Samples: 81 Matrix: soil/aqueous

Sample ID	Analytical Method	Holding Time Criteria	Days Holding Time was Exceeded	Preservation Criteria	Preservation Deficiency	Comments
79982-027	EPA 8082 (PCBs)	14 days (extraction)	16	NA	NA	Sample re-extracted beyond 2x H.T. due to initial surrogate failure.

Reviewed By: [signature] Date: 6/17/03

Volatile Organics (SW 846 Method 8260)

Site/Project: S-74, CWLF AR/COC #: 606339 # of Samples: 20 Matrix: Soil

Laboratory: GEL SDG #: 79982 Laboratory Sample IDs: 79982-001 to -020

Methods: EPA8260A Batch #s: 251186

IS	CAS #	Name	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	①CCV %D	Method Blks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Trip Blanks		
						>.05	<20% / 0.99	20%												
1	71-55-6	1,1,1-trichloroethane	✓	0.10	NA	✓	✓	✓	✓							NA	NA	✓		
2	79-34-5	1,1,2,2-tetrachloroethane		0.30		✓	✓													
2	79-00-5	1,1,2-trichloroethane		0.10		✓	✓													
1	75-34-3	**1,1-dichloroethane**		0.10		✓	✓													
1	75-35-4	**1,1-dichloroethene**		0.20		✓	✓			✓	NA	NA	✓	✓	✓					
1	107-06-2	**1,2-dichloroethane**		0.10		✓	✓													
1	540-59-0	**1,2-dichloroethene(total)**		0.01		✓	✓													
1	78-87-5	**1,2-dichloropropane**		0.01		✓	✓													
1	78-93-3	2-butanone (MEK) (10xblk)	✓	0.01		✓	✓	✓	✓									✓		
~~1~~	~~110-75-8~~	~~2-chloroethyl vinyl ether~~																		
2	591-78-6	2-hexanone (MBK)	✓	0.01		✓	✓	✓	✓									✓		
2	108-10-1	4-methyl-2-pentanone (MIBK)		0.10		✓	✓													
1	67-64-1	**acetone(10xblk)**		0.01		✓	✓													
1	71-43-2	**benzene**		0.50		✓	✓			✓	NA	NA	✓	✓	✓					
1	75-27-4	bromodichloromethane		0.20		✓	✓													
3	75-25-2	bromoform		0.10		✓	✓													
1	74-83-9	bromomethane		0.10		✓	✓													
1	75-15-0	carbon disulfide		0.10		✓	✓	✓												
1	56-23-5	**carbon tetrachloride**		0.10		✓	✓	✓/25.0												
2	108-90-7	**chlorobenzene**		0.50		✓	✓	✓		✓	NA	NA	✓	✓	✓					
1	75-00-3	chloroethane		0.01		✓	✓													
1	67-66-3	**chloroform**		0.20		✓	✓	✓												
1	74-87-3	chloromethane		0.10		✓	✓	✓/-26.4												
1	10061-01-5	cis-1,3-dichloropropene		0.20		✓	✓	✓												
2	124-48-1	dibromochloromethane		0.10		✓	✓													
2	100-41-4	ethylbenzene		0.10		✓	✓													
1	75-09-2	methylene chloride (10xblk)		0.01		✓	✓													
2	100-42-5	styrene		0.30		✓	✓													
2	127-18-4	**tetrachloroethene**		0.20		✓	✓													
2	108-88-3	toluene(10xblk)		0.40		✓	✓			✓	NA	NA	✓	✓	✓					
2	10061-02-6	trans-1,3-dichloropropene		0.10		✓	✓													
1	79-01-6	**trichloroethene**		0.30		0.26	✓			✓	NA	NA	✓	✓	✓					
1	75-01-4	**vinyl chloride**		0.10		✓	✓													
2	1330-20-7	xylenes(total)		0.30		✓	✓													
	108-05-4	Vinyl acetate	✓		✓	✓	✓	✓	✓							✓	✓	✓		

Comments:
① 2nd CCV applies to samples -001, -012, + -013 only.

Notes: Shaded rows are RCRA compounds.

Reviewed By: [signature] Date: 6/12/03

Volatile Organics

Site/Project: S-74, CWLF AR/COC #: 606339 Batch #s: 251186

Laboratory: GEL SDG #: 79982 # of Samples: 20 Matrix: Soil

Surrogate Recovery and Internal Standard Outliers (SW 846 Method 8260)

Sample	SMC 1	SMC 2	SMC 3	IS 1 area	IS 1 RT	IS 2 area	IS 2 RT	IS 3 area	IS 3 RT
All									
Passed									

SMC 1: Bromofluorobenzene
SMC 2: Dibromofluoromethane
SMC 3: Toluene-d8

IS 1: Fluorobenzene
IS 2: Chlorobenzene-d5
IS 3: 1,4-Dichlorobenzene-d4

Comments:

Volatile Organics (SW 846 Method 8260)

Site/Project: S-74, CWLF AR/COC #: 606339 # of Samples: 1 Matrix: aqueous

Laboratory: GEL SDG #: 79983 Laboratory Sample IDs: 79983-001 (TB)

Methods: EPA 8260B Batch #s: 250774

IS	CAS #	Name	TCL	Min. RF	Intercept	Calib. RF >.05	Calib. RSD/ R^2 <20% / 0.99	CCV %D 20%	Method Blks	LCS	① LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Trip Blanks
1	71-55-6	1,1,1-trichloroethane	✓	0.10	NA	✓	✓	✓	✓		NA	NA	NA	NA	NA	NA	NA	NA
2	79-34-5	1,1,2,2-tetrachloroethane		0.30		✓	✓											
2	79-00-5	1,1,2-trichloroethane		0.10		✓	✓											
1	75-34-3	1,1-dichloroethane		0.10		✓	✓											
1	75-35-4	1,1-dichloroethene		0.20		✓	✓			✓								
1	107-06-2	1,2-dichloroethane		0.10		✓	✓											
1	540-59-0	1,2-dichloroethene(total)		0.01		✓	✓											
1	78-87-5	1,2-dichloropropane		0.01		✓	✓											
1	78-93-3	2-butanone (MEK) (10xblk)	✓	0.01		✓	✓	↓	↓									
~~1~~	~~110-75-8~~	~~2-chloroethyl vinyl ether~~																
2	591-78-6	2-hexanone (MBK)	✓	0.01		✓	✓	✓	✓									
2	108-10-1	4-methyl-2-pentanone (MIBK)		0.10		✓	✓											
1	67-64-1	acetone(10xblk)		0.01		✓	✓											
1	71-43-2	benzene		0.50		✓	✓			✓								
1	75-27-4	bromodichloromethane		0.20		✓	✓	↓										
3	75-25-2	bromoform		0.10		✓	✓	30.0										
1	74-83-9	bromomethane		0.10		✓	✓	✓										
1	75-15-0	carbon disulfide		0.10		✓	✓											
1	56-23-5	carbon tetrachloride		0.10		✓	✓											
2	108-90-7	chlorobenzene		0.50		✓	✓			✓								
1	75-00-3	chloroethane		0.01		✓	✓											
1	67-66-3	chloroform		0.20		✓	✓											
1	74-87-3	chloromethane		0.10		✓	✓											
1	10061-01-5	cis-1,3-dichloropropene		0.20		✓	✓											
2	124-48-1	dibromochloromethane		0.10		✓	✓											
2	100-41-4	ethylbenzene		0.10	↓	✓	✓											
1	75-09-2	methylene chloride (10xblk)		0.01	✓	✓	✓											
2	100-42-5	styrene		0.30	NA	✓	✓											
2	127-18-4	tetrachloroethene		0.20		✓	✓											
2	108-88-3	toluene(10xblk)		0.40		✓	✓			✓								
2	10061-02-6	trans-1,3-dichloropropene		0.10		✓	✓											
1	79-01-6	trichloroethene		0.30		0.29	✓			✓								
1	75-01-4	vinyl chloride		0.10		✓	✓											
2	1330-20-7	xylenes(total)		0.30		✓	✓											
	108-05-4	vinyl acetate	✓		↓	✓	✓	↓	↓									

Comments:

① No MS/MSD, LCSD, or any other measure of precision performed.

Notes: Shaded rows are RCRA compounds.

Reviewed By: [signature] Date: 6/12/03

Volatile Organics

Site/Project: S-74, CWLF AR/COC #: 606339 Batch #s: 250774

Laboratory: GEL SDG #: 79983 # of Samples: 1 Matrix: aqueous

Surrogate Recovery and Internal Standard Outliers (SW 846 Method 8260)

Sample	SMC 1	SMC 2	SMC 3	IS 1 area	IS 1 RT	IS 2 area	IS 2 RT	IS 3 area	IS 3 RT
All									
Passed									

SMC 1: Bromofluorobenzene
SMC 2: Dibromofluoromethane
SMC 3: Toluene-d8

IS 1: Fluorobenzene
IS 2: Chlorobenzene-d5
IS 3: 1,4-Dichlorobenzene-d4

Comments:

Semivolatile Organics (SW 846 Method 8270)

Site/Project: S-74, CWLF AR/COC #: 606339 Laboratory Sample IDs: 79982-021 to -040

Laboratory: OEL SDG #: 79982

Methods: EPA 8270C

# of Samples: 20 Matrix: Soil Batch #s: 250475

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF >.05	Calib. RSD/ R^2 <20%/ 0.99	① CCV %D 20%	Method Blanks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks	CCV %D
1	A	108-95-2	Phenol	✓	0.80	NA	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	NA	NA	NA	✓
1	BN	111-44-4	bis(2-Chloroethyl)ether		0.70		✓	✓	-20.6											-23.0
1	A	95-57-8	2-Chlorophenol		0.80		✓	✓	✓		✓	NA	NA	✓	✓	✓				✓
1	BN	541-73-1	1,3-Dichlorobenzene		0.60		✓	✓												
1	BN	106-46-7	1,4-Dichlorobenzene		0.50		✓	✓			✓	NA	NA	✓	✓	✓				
1	BN	95-50-1	1,2-Dichlorobenzene		0.40		✓	✓												
1	A	95-48-7	o-cresol		0.70		✓	✓	✓		✓	NA	NA	✓	✓	✓				✓
1	BN	108-60-1	bis(2-chloroisopropyl)ether		0.01		✓	✓	-23.6											-26.1
1	A	N22	m,p-cresols		0.60		✓	✓	✓		✓	NA	NA	✓	✓	✓				✓
1	BN	621-64-7	N-Nitroso-di-n-propylamine		0.50		✓	✓			✓	NA	NA	✓	✓	✓				
1	BN	67-72-1	Hexachloroethane		0.30		✓	✓			✓	NA	NA	✓	✓	✓				
2	BN	98-95-3	Nitrobenzene		0.20		✓	✓			✓	NA	NA	✓	✓	✓				
2	BN	78-59-1	Isophorone		0.40		✓	✓												
2	A	88-75-5	2-Nitrophenol		0.10		✓	✓												
2	A	105-67-9	2,4-Dimethylphenol		0.20		✓	✓												
2	BN	111-91-1	bis(2-Chloroethoxy)methane		0.30		✓	✓												
2	A	120-83-2	2,4-Dichlorophenol		0.20		✓	✓												
2	BN	120-82-1	1,2,4-Trichlorobenzene		0.20		✓	✓			✓	NA	NA	✓	✓	✓				
2	BN	91-20-3	Naphthalene		0.70		✓	✓												
2	BN	106-47-8	4-Chloroaniline		0.01		✓	✓												
2	BN	87-68-3	Hexachlorobutadiene		0.01		✓	✓			✓	NA	NA	✓	✓	✓				
2	A	59-50-7	4-Chloro-3-methylphenol		0.20		✓	✓			✓	NA	NA	✓	✓	✓				
2	BN	91-57-6	2-Methylnaphthalene		0.40		✓	✓												
3	BN	77-47-4	Hexachlorocyclopentadiene		0.01		✓	✓												
3	A	88-06-2	2,4,6-Trichlorophenol		0.20		✓	✓			✓	NA	NA	✓	✓	✓				
3	A	95-95-4	2,4,5-Trichlorophenol	↓	0.20	↓	✓	✓	↓	↓	✓	NA	NA	✓	✓	✓	↓	↓	↓	↓

Comments: ① Sample -035 dil. 2X for bis(2-ethylhexyl)phthalate due to over-range hit.
② 2nd CCV applies to samples -035 + -036 only.

Notes: Shaded rows are RCRA compounds.

Reviewed By: [signature] Date: 6/12/03

Semivolatile Organics

Site/Project: S-74, CWLF AR/COC #: 606339 Batch #s: 250475

Laboratory: GEL SDG #: 79982 # of Samples: 20 Matrix: soil

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blanks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks	CCV° %D
							>.05	<20% / 0.99	20%											
3	BN	91-58-7	2-Chloronaphthalene	✓	0.80	NA	✓	✓	✓	✓							NA	NA	NA	✓
3	BN	88-74-4	2-Nitroaniline (o-)		0.01		✓	✓												
3	BN	131-11-3	Dimethylphthalate		0.01		✓	✓												
3	BN	208-96-8	Acenaphthylene		0.90		✓	✓												
3	BN	606-20-2	2,6-Dinitrotoluene		0.20	✓	✓	✓												
3	BN	99-09-2	3-Nitroaniline (m-)		0.01	NA	✓	✓												
3	BN	83-32-9	Acenaphthene		0.90	NA	✓	✓			✓	NA	NA	✓	✓	✓				✓
3	A	51-28-5	2,4-Dinitrophenol		0.01	✓	✓	✓	44.0											43.4
3	A	100-02-7	4-Nitrophenol		0.01	NA	✓	✓	✓		✓	NA	NA	✓	✓	✓				✓
3	BN	132-64-9	Dibenzofuran		0.80	NA	✓	✓												✓
3	BN	121-14-2	2,4-Dinitrotoluene		0.20	✓	✓	✓			✓	NA	NA	✓	✓	✓				22.9
3	BN	84-66-2	Diethylphthalate		0.01	NA	✓	✓												✓
3	BN	7005-72-3	4-Chlorophenyl-phenylether		0.40		✓	✓												
3	BN	86-73-7	Fluorene		0.90		✓	✓												
3	BN	100-01-6	4-Nitroaniline (p-)		0.01		✓	✓												
4	A	534-52-1	4,6-Dinitro-2-methylphenol		0.01	✓	✓	0.98	37.4		116	NA	NA	✓	✓	✓				36.5
4	BN	122-39-4	Diphenylamine		0.01	NA	✓	✓	✓											✓
4	BN	101-55-3	4-Bromophenyl-phenylether		0.10		✓	✓												
4	BN	118-74-1	Hexachlorobenzene		0.10		✓	✓			✓	NA	NA	✓	✓	✓				
4	A	87-86-5	Pentachlorophenol		0.05		✓	✓			✓	NA	NA	✓	✓	✓				
4	BN	85-01-8	Phenanthrene		0.70		✓	✓												
4	BN	120-12-7	Anthracene		0.70		✓	✓												
4	BN	86-74-8	Carbazole		0.01		✓	✓												
4	BN	84-74-2	Di-n-butylphthalate		0.01		✓	✓												
4	BN	206-44-0	Fluoranthene		0.60		✓	✓												✓
5	BN	129-00-0	Pyrene		0.60		✓	✓			✓	NA	NA	✓	✓	✓				-21.6
5	BN	85-68-7	Butylbenzylphthalate		0.01		✓	✓												✓
5	BN	91-94-1	3,3'-Dichlorobenzidine		0.01		✓	✓												
5	BN	56-55-3	Benzo(a)anthracene	✓	0.80	✓	✓	✓	✓	✓							✓	✓	✓	✓

Comments:

Semivolatile Organics

Site/Project: S-74, CWLF AR/COC #: 606339 Batch #s: 250475

Laboratory: GEL SDG #: 79982 # of Samples: 20 Matrix: soil

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blanks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks	CCV %D
							>.05	<20% / 0.99	20%											
5	BN	218-01-9	Chrysene	✓	0.70	NA	✓	✓	✓	✓							NA	NA	NA	✓
5	BN	117-81-7	bis(2-Ethylhexyl)phthalate		0.01	NA	✓	✓												
6	BN	117-84-0	Di-n-octylphthalate		0.01	✓	✓	0.98												
6	BN	205-99-2	Benzo(b)fluoranthene		0.70	NA	✓	✓												
6	BN	207-08-9	Benzo(k)fluoranthene		0.70		✓	✓												
6	BN	50-32-8	Benzo(a)pyrene		0.70		✓	✓												
6	BN	193-39-5	Indeno(1,2,3-cd)pyrene		0.50	✓	✓	✓												
6	BN	53-70-3	Dibenz(a,h)anthracene		0.40	✓	✓	✓												
6	BN	191-24-2	Benzo(g,h,i)perylene		0.50	✓	✓	✓												

Surrogate Recovery Outliers

Sample	SMC 1	SMC 2	SMC 3	SMC 4	SMC 5	SMC 6	SMC 7	SMC 8

Comments:

SMC 1: Nitrobenzene-d5 (BN) SMC 2: 2-Fluorobiphenyl (BN) SMC 3: Terphenyl-d14 (BN)
SMC 4: Phenol-d5 (A) SMC 5: 2-Fluorophenol (A) SMC 6: 2,4,6-Tribromophenol (A)
~~SMC 7: 2-2-Chlorophenol-d4 (A)~~ ~~SMC 8: 1,2-Dichlorobenzene-d4 (BN)~~

Internal Standard Outliers

Sample	IS 1-area	IS 1-RT	IS 2-area	IS 2-RT	IS 3-area	IS 3-RT	IS 4-area	IS 4-RT	IS 5-area	IS 5-RT	Is 6-area	IS 6-RT
All Passed												

IS 1: 1,4-Dichlorobenzene-d4 (BN) IS 2: Naphthalene-d8 (BN) IS 3: Acenaphthene-d10 (BN)
IS 4: Phenathrene-d10 (BN) IS 5: Chrysene-d12 (BN) IS 6: Perylene-d12 (BN)

PCBs (SW 846 - Method 8082)

Site/Project: S-74, CWLF AR/COC #: 606339 Laboratory Sample IDs: 79982-021 to -040

Laboratory: GEL SDG #: 79982

Methods: EPA 8082

# of Samples: 20 Matrix: Soil Batch #s: 250462, 254948

CAS #	Name	TCL	Intercept	Calib RSD / R^2 <20% / 0.99	CCV %D 20%	Method Blanks	LCS	LCSD	LCS RPD 20%	(2) MS	MSD	MS RPD 20%	Field Dup. RPD	Equip. Blanks	Field Blanks		
12674-11-2	Aroclor-1016	✓	NA	✓	✓	✓	✓	NA	NA	✓/173	✓/150	✓	NA	NA	NA		
11104-28-2	Aroclor-1221			NA													
11141-16-5	Aroclor-1232			NA													
53469-21-9	Aroclor-1242			✓	✓												
12672-29-6	Aroclor-1248																
11097-69-1	Aroclor-1254				✓												
11096-82-5	Aroclor-1260	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	✓	✓	✓		

Sample	SMC % REC	SMC RT	Sample	SMC % REC	SMC RT
All					
Passed.					

Comments: (5X) (10X) (1) Samples -024, -026, -032(5X), -034(5X), -035(5X), -037(5X), -038(5X), -039(10X), + -040(10X) due to over range hits.

(2) MS/MSD for sample -027 performed on an SNL sample of similar matrix from another SDG; 2nd entries.

Confirmation

Sample	CAS #	RPD > 25%	Sample	CAS #	RPD > 25%
79982-022	Aroclor-1260	56.0	79982-037	Aroclor-1260	28.3
-024	-1260	35.4			
-027	-1260	39.5			
-032	-1242	25.5			
-034	-1260	32.6			
-036	-1260	32.8			

Reviewed By: [signature] Date: 6/12/03

Inorganic Metals

Site/Project: S-74, CWLF AR/COC #: 606339 Laboratory Sample IDs: 79982-021 to -040

Laboratory: GEL SDG #: 79982

Methods: EPA 6010B (ICP-AES), ~~EPA 1030~~ 7471A (CVAA)

# of Samples: 20 Matrix: soil Batch #s: 250392, 252556

CAS #/ Analyte	QC Element																			
	TAL	ICV	CCV	ICB	(µg/L) CCB ②	Method Blanks	LCS	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilu-tion	Field Dup. RPD	Equip. Blanks	Field Blanks	CCB (µg/L)	
7429-90-5 Al																NA	NA	NA		
7440-39-3 Ba	✓	✓	✓	✓	✓	✓	✓	NA	NA	126	✓	✓	✓	✓	✓					
7440-41-7 Be	✓	↓	↓	↓	↓	↓	↓	↓	↓	✓	↓	↓	NA	↓	NA					
7440-43-9 Cd	✓									✓			NA		NA					
7440-70-2 Ca																				
7440-47-3 Cr	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	✓	✓	NA					
7440-48-4 Co																				
7440-50-8 Cu	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	✓	✓	NA					
7439-89-6 Fe																				
7439-95-4 Mg																				
7439-96-5 Mn																				
7440-02-0 Ni	✓	✓	✓	✓	-0.973	✓	✓	NA	NA	✓	✓	✓	✓	✓	NA					
7440-09-7 K																				
7440-22-4 Ag	✓	✓	✓	✓	-0.913	✓	✓	NA	NA	✓	✓	✓	NA	✓	NA					
7440-23-5 Na																				
7440-62-2 V																				
7440-66-6 Zn																				
7439-92-1 Pb	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	✓	✓	NA					
7782-49-2 Se	✓	↓	↓	↓	4.59	↓	↓	↓	↓	↓	↓	↓	NA	↓	↓					
7440-38-2 As	✓				✓								39							
7440-36-0 Sb																				
7440-28-0 Tl																				
7439-97-6 Hg	✓	✓	✓	✓	-0.0963	✓	✓	NA	NA	✓	✓	✓	✓	NA	NA	↓	↓	↓	0.0203	
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 / l

Comments: ① All samples dil. std. 2X for ICP soils. Samples -024(10X), -026(10X), -027(10X), -029(10X), -030(10X), -034(10X), -035(10X), +-039(10X) dil. for Hg due to high concs. Sample -025(5X), -028(5X), -030(5X), dil. for Ba due to Ca interferences.

② 2nd Hg CCB applies to samples -025, -028, -031, -032, -033, -036, -037, -038, +-040 only.

Reviewed By: [signature] Date: 6/16/03

General Chemistry

Site/Project: S-74, CWLF AR/COC #: 606339 Laboratory Sample IDs: 79982

Laboratory: GEL SDG #: 79982

Methods: EPA7196A (Cr+6)

# of Samples: Matrix: Batch #s: 251157

CAS #	Analyte	QC Element																		
		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	
18540-29-9	Cr+6	✓	✓	✓	✓	✓	✓	✓	NA	NA	33	30	✓	✓	NA	NA	NA	NA	NA	

Comments:

Reviewed By: [signature] Date: 6/16/03

Radiochemistry

Site/Project: S-74, CWLF AR/COC #: 606339 Laboratory Sample IDs: 79982-061 & -080 (G.S.)

Laboratory: GEL SDG #: 79982

Methods: HASL 300, 4.5.2.3 (Gamma Spec), EPA 906.0 (H3)

# of Samples: 40 Matrix: soil Batch #s: 252323, 253551

Analyte	QC Element												
	Method Blanks	LCS	MS	Rep RER	Equip. Blanks	Field Dup. RER	Field Blanks	Sample ID	Isotope	IS/Trace	Sample ID	Isotope	IS/Trace
Criteria	U	20%	25%	<1.0	U	<1.0	U			50-105			50-105
H3	✓	✓	✓	✓	NA	NA	NA						
U-238								NA					
U-234													
U-235/-236													
Th-232													
Th-228													
Th-230													
Pu-239/-240													
Gross Alpha													
Nonvolatile Beta													
Ra-226													
Ra-228													
Ni-63													
Gamma Spec. Am-241	✓	✓	NA	✓	NA	NA	NA						
Gamma Spec. Cs-137	↓	↓	↓	↓	↓	↓	↓						
Gamma Spec. Co-60	↓	↓	↓	↓	↓	↓	↓						

Parameter	Method	Typical Tracer	Typical Carrier
Iso-U	Alpha spec.	U-232	NA
Iso-Pu	Alpha spec.	Pu-242	NA
Iso-Th	Alpha spec.	Th-229	NA
Am-241	Alpha spec.	Am-242	NA
Sr-90	Beta	Y ingrowth	NA
Ni-63	Beta	NA	Ni by ICP
Ra-226	Deamination	NA	NA
Ra-226	Alpha spec.	Ba-133 or Ra-225	NA
Ra-228	Gamma spec.	Ba-133	NA

Gamma spec. LCS contains: Am-241, Cs-137, and Co-60

Comments:

Reviewed By: [signature] Date: 6/17/03

Sample Findings Summary - Revised

Site: S-74, CWLF **AR/COC:** 606381/606382 **Data Type:** Organic, Inorganic, RAD (Page 1/2)

Sample ID	VOCs:	EPA8260B (All VOCS, except...)	67-64-1 (acetone)	78-93-3 (2-butanone)	79-01-6 (trichloroethene)	SVOCs:	84-66-2 (diethylphthalate)	PCBs:	53469-21-9 (Arcolor-1242)	11097-69-1 (Aroclor-1254)	11096-82-5 (Aroclor-1260)	Metals:	7782-49-2 (Se)		EPA7196A (Cr+6)		
	Method/CAS Number (Analysis/Analyte)																
061956-001 74-SB-E002-F025			J	J	UJ												
061957-001 74-SB-E002-F026			J		UJ												
061957-005 74-SB-E002-F026-TB		P2	P2	P2	UJ,P2												
061958-001 74-SB-E002-F027			J		UJ												
061959-001 74-SB-E002-F029			J	J	UJ												
061960-001 74-SB-E002-F030			J	J	UJ												
061961-001 74-SB-E002-F031			J	J	UJ												
061962-001 74-SB-E002-F032			J	J	UJ												
061963-001 74-SB-E002-F033			J	J	UJ												
061964-001 74-SB-E002-F036			J	J	UJ												
061965-001 74-SB-E002-F037			J	J	UJ												
061966-001 74-SB-E002-F040			J	J	UJ												
061967-001 74-SB-E002-F042			J	J	UJ												
061968-001 74-SB-E002-F043			J		UJ												
061969-001 74-SB-E002-F044			J	J	UJ												
061970-001 74-SB-E002-F045			J	J	UJ												
061971-001 74-SB-E002-F046			J	J	UJ												
061972-001 74-SB-E002-F047			J	J	UJ												
061973-001 74-SB-E002-F048			J	J	UJ												
061974-001 74-SB-E002-F049			J	J	UJ												
061975-001 74-SB-E002-F050			J	J	UJ												
061956-002 74-SB-E002-F025							333U,B		J,A1	J,A1	J,A1				UJ,A2		
061957-002 74-SB-E002-F026							333U,B		J,A1	J,A1	J,A1		J,B3		UJ,A2		
061958-002 74-SB-E002-F027							333U,B		J,A1	J,A1					UJ,A2		
061959-002 74-SB-E002-F029							333U,B		J,A1	J,A1			J,B3		UJ,A2		
061960-002 74-SB-E002-F030							333U,B		J,A1	J,A1			J,B3		UJ,A2		
061961-002 74-SB-E002-F031									J,A1	J,A1	J,A1		J,B3		UJ,A2		
061962-002 74-SB-E002-F032							333U,B		J,A1	J,A1					UJ,A2		
061963-002 74-SB-E002-F033									J,A1	J,A1	J,A1				J,A2		
061964-002 74-SB-E002-F036									J,A1	J,A1			J,B3		UJ,A2		
061965-002 74-SB-E002-F037									J,A1	J,A1			J,B3		UJ,A2		
061966-002 74-SB-E002-F040									J,A1	J,A1			J,B3		J,A2		
061967-002 74-SB-E002-F042									J,A1	J,A1			J,B3		UJ,A2		
061968-002 74-SB-E002-F043									J,A1	J,A1			J,B3		J,A2		
061969-002 74-SB-E002-F044									J,A1	J,A1	J,A1				UJ,A2		
061970-002 74-SB-E002-F045							333U,B		J,A1	J,A1			J,B3		UJ,A2		
061971-002 74-SB-E002-F046									J,A1	J,A1			J,B3		UJ,A2		
061972-002 74-SB-E002-F047									J,A1	J,A1	J,A1		J,B3		UJ,A2		
061973-002 74-SB-E002-F048									J,A1	J,A1			J,B3		UJ,A2		
061974-002 74-SB-E002-F049									J,A1	J,A1	J,A1		J,B3		UJ,A2		
061974-002 74-SB-E002-F050							333U,B		J,A1	J,A1	J,A1				J,A2		

Validated By: Mr. Kenneth Salaz **Date:** 06/10/03

Sample Findings Summary - Revised

Site: S-74, CWLF **AR/COC:** 606381/606382 **Data Type:** Organic, Inorganic, RAD (Page 2/2)

Sample ID	RAD:	All Gamma Spec results flagged "X" by the lab (see EDD)	13981-41-4 (Ba-133)	15623-45-7 (Ra-223)	13982-39-3 (Zn-65)												
	Method/CAS Number (Analysis/Analyte)																
061956-004 74-SB-E002-F025		R	J														
061957-004 74-SB-E002-F026		R	J														
061958-004 74-SB-E002-F027		R	J														
061959-004 74-SB-E002-F029		R	J	R													
061960-004 74-SB-E002-F030		R	J														
061961-004 74-SB-E002-F031		R	R														
061962-004 74-SB-E002-F032		R	J														
061963-004 74-SB-E002-F033		R	J														
061964-004 74-SB-E002-F036		R	J														
061965-004 74-SB-E002-F037		R	R														
061966-004 74-SB-E002-F040		R	J		R												
061967-004 74-SB-E002-F042		R	J														
061968-004 74-SB-E002-F043		R	J														
061969-004 74-SB-E002-F044		R	J														
061970-004 74-SB-E002-F045		R	J														
061971-004 74-SB-E002-F046		R															
061972-004 74-SB-E002-F047		R	J														
061973-004 74-SB-E002-F048		R	J														
061974-004 74-SB-E002-F049		R	J														
061974-004 74-SB-E002-F050		R	J														

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MEMORANDUM
(Revised)

DATE: July 10, 2003

TO: File

FROM: Kenneth Salaz

SUBJECT: Inorganic Data Review and Validation - SNL S-74, CWLF; ARCOC #606381/606382, GEL SDG #80273, Case No. 7221.02.02.03

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM ER Project AOP 00-03.

Summary

All samples were prepared and analyzed with approved procedures using methods EPA6010B ICP-AES Metals, EPA74701A CVAA, and EPA7196A (Cr+6). Problems were identified with the data package that result in the qualification of data.

1. ICP Analysis: In the initial calibration blank (ICB) and continuing calibration blank (CCB), selenium (Se) was detected. The associated results of samples 80273-022, -024, -025, -026, -029, -030, -031, -032, -033, -035, -036, -037, -038, and -039 were detects less than (<) 5X the blank concentrations and, thus, will be qualified "J,B3."

2. Cr+6 Analysis: The MS/MSD percent recoveries (%Rs) for all samples, except 80273-033, -038, and -038, were <30%. However, due to complications with this method for soil samples, the associated ND sample results will be qualified "UJ,A2," based on professional judgment. The associated detects will be qualified "J,A2." The MS/MSD %Rs for samples -033, -038, and -039 were < the QC acceptance limit but >30%. The associated results of sample -038 and -039 were ND and, thus, will be qualified "UJ,A2." The associated result of sample -039 was a detects and, thus, will be qualified "J,A2."

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 method specified holding times and properly preserved.

Calibration

All Analyses: The initial and continuing calibrations met all QC acceptance criteria.

Blanks

ICP Analysis: No target analytes were detected in the blanks except as noted above in the summary section and the following. In the ICB, CCB, and method blank, nickel (Ni) was detected. However, all associated sample results were >5X the blank concentrations and, thus, will not be qualified.

CVAA Analysis: No target analytes were detected in the blanks except for the following. In the ICB and method blank, Hg was detected. However, all associated sample results were >5X the blank concentrations and, thus, will not be qualified. In the CCB, Hg was detected at a negative concentration. The absolute value was > the detection limit (DL) but < the reporting limit (RL). However, all associated sample results were >5X the DL and, thus, will not be qualified.

Cr+6 Analysis: No target analytes were detected in the blanks.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analyses

ICP Analysis: The MS analysis met all QC acceptance criteria. No MSD analysis was performed. The replicate analysis was used as a measure of laboratory precision.

CVAA Analysis: The MS analysis met QC acceptance criteria except for the following. The MSD %R was < the QC acceptance limit but >30%. However, the MS %R and MSD RPD met QC acceptance criteria. Thus, no sample data will be qualified, based on professional judgment. No MSD analysis was performed. The replicate analyses were used as measures of laboratory precision.

Cr+6 Analysis: The MS/MSD analyses did not meet QC acceptance criteria, as noted above in the Summary section.

Laboratory Control Sample (LCS/LCSD) Analyses

All Analyses: The LCS analyses met all QC acceptance criteria. No LCSD analyses were performed. No sample data will be qualified as a result.

Replicate Analysis

All Analyses: The replicate analyses met all QC acceptance criteria.

ICP Interference Check Sample (ICS)

ICP Analysis: The ICS met all QC acceptance criteria.

CVAA/Cr+6 Analyses: No ICS was required for these methods.

ICP Serial Dilution

ICP Analysis: The serial dilution analysis met all QC acceptance criteria.

CVAA/Cr+6 Analyses: No serial dilution was required for these methods.

Detection Limits/Dilutions

ICP Analysis: All detection limits were properly reported. All soil samples were diluted the standard 2X.

CVAA Analysis: All detection limits were properly reported. Samples 80273-022, -030, and -034 diluted were diluted 10X, 2X, and 2X, respectively, in order to bring Hg concentrations into the calibration range. No other samples were diluted.

Cr+6 Analysis: All detection limits were properly reported. No samples were diluted.

Other QC

All Analyses: No field duplicates, equipment blanks (EBs), or field blanks (FBs) were submitted on the ARCOC.

No other specific issues were identified which affect data quality.

AQA Nonconformance Report

NCR No. 07-10-03KAS

Pg 1 of 1

SECTION 1

Document Title: DV report: SNL COC 606381/2	Project or Program: Data Validation
Originator / Date: Ken Salaz 7/8/03	Contract No.: 3719 Project No.: 7221.02.02.03

DESCRIPTION OF NONCONFORMANCE

Requirement: All results should be qualified appropriately.

Condition Found: The Cr+6 sample results were rejected ("R" qualified) due to low MS recovery. However, the data were subsequently considered acceptable due to complications with the method for soil samples.

Assigned to: Ken Salaz Response Due 07/10/03

DISPOSITION: Accept-As-Is____ Reject____ Administrative Action X

Justification: The Cr+6 results were considered acceptable, even though the MS %R was <30%, due to complications with the method for soil samples.

Instructions: (Identify what Administrative Actions and/or Corrective Actions will occur.)
Revise and re-issue DV report.

Responsible Employee Ken Salaz Corrective Action Due Date 07/10/03

SECTION 3

VERIFICATION AND CLOSURE: Disposition Completed As Directed X Other (Specify)____

Originator or QA Coordinator (Signature/Date) Mr. Kenneth Salaz 07/10/03

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MEMORANDUM

DATE: June 8, 2003

TO: File

FROM: Kenneth Salaz

SUBJECT: Organic Data Review and Validation - SNL
S-74, CWLF; ARCOC #606381/606382,
GEL SDG #80273/80278, Case No. 7221.02.02.03

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM ER Project AOP 00-03.

Summary

All samples were prepared and analyzed with approved procedures using methods EPA8260A/B VOCs, EPA8270C SVOCs, and EPA8082 PCBs. Problems were identified with the data package that result in the qualification of data.

1. VOC Analysis: For the trip blank (TB) and the soil samples, the initial calibration response factors (RFs) of trichloroethene were less than (<) the required minimum but greater than (>) 0.01. All associated sample results were ND and, thus, will be qualified "UJ." For the soil samples, the continuing calibration verification (CCV) percent difference (%D) of acetone and 2-butanone were >20% but <40%. All acetone sample results, as well as the 2-butanone results of samples 80273-001, -004, -005, -006, -007, -008, -009, -010, -011, -012, -014, -015, -016, -017, -018, -019, and -020 were detects and, thus, will be qualified "J."

2. SVOC Analysis: In the method blank, diethylphthalate was detected. The associated results of samples 80273-021, -022, -023, -024, -025, -027, -035, and -040 were detects, <10X the blank concentration, < the reporting limit (RL), and, thus, will be qualified "U,B" at the RL (333 ug/kg).

3. VOC Analysis: For the TB, no MSD, LCSD, or Replicate was analyzed. All samples results were ND and, thus, will be qualified "P2."

   PCB Analysis: The MS/MSD percent recoveries (%Rs) of Aroclor-1016 were < the QC acceptance limit. Thus, all detected results for all samples will be qualified "J,A1."

4. PCB Analysis: The confirmation relative percent differences (RPDs) of Aroclor-1242 for samples 80273-021, -022, -024, -026, -028, -038, and -039 and Aroclor-1260 for samples -021, -022, and -039 were >25% but <75%. The associated sample results will be qualified "J."

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 method specified holding times and properly preserved.

Calibration

VOC Analysis: The initial and continuing calibrations met QC acceptance criteria except as noted above in the Summary section and the following. For the EB, the CCV %Ds of acetone and chloromethane, as well as those of 2-hexanone and 4-methyl-2-pentanone for the soil samples, were >20% but <40%. However, all associated sample results were ND and, thus, will not be qualified.

SVOC Analysis: The initial and continuing calibrations met QC acceptance criteria except for the following. The initial calibration correlation coefficients (R^2 values) of 4,6-dinitrophenol-3-methylphenol and di-n-octylphthalate were <0.99 but >0.90. Also, the CCV %Ds of bis(2-chloroethyl)ether, bis(2-chloroisopropyl)ether, and p-nitroaniline were >20% but <40%. However, all associated sample results were ND and, thus, will not be qualified.

PCB Analysis: The initial and continuing calibrations met all QC acceptance criteria.

Blanks

VOC/PCB Analyses: No target analytes were detected in the blanks.

SVOC Analysis: Except as noted above in the Summary section, no target analytes were detected in the blanks.

Surrogates

All Analyses: All surrogate %Rs met QC acceptance criteria.

Internal Standards (ISs)

VOC/SVOC Analyses: The IS areas and retention times (RTs) met all QC acceptance criteria.

PCB Analysis: No ISs were required for this method.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analyses

VOC Analysis: The MS/MSD analyses for the soil samples met all QC acceptance criteria. No MS/MSD or any other measure of precision was performed for the EB, as noted above in the Summary section.

SVOC Analysis: The MS/MSD analyses met all QC acceptance criteria.

PCB Analysis: The MS/MSD analyses met QC acceptance criteria except as noted above in the Summary section.

Laboratory Control Sample (LCS/LCSD) Analyses

All Analyses: The LCS analyses met all QC acceptance criteria. No LCSD analyses were performed. No sample data will be qualified as a result.

Confirmation Analyses

PCB Analysis: Confirmation analyses met QC acceptance criteria except as noted above in the Summary section.

VOC/SVOC Analyses: No confirmation analyses were required for these methods.

Detection Limits/Dilutions

VOC/SVOC Analyses: All detection limits were properly reported. No samples were diluted.

PCB Analysis: All detection limits were properly reported. Samples 80273-022, -024, -030, -031, -033, -036, and -037 were diluted 5X, 5X, 10X, 10X, 5X, 20X, and 5X, respectively, due to over-range detects. No other samples were diluted.

Other QC

VOC Analysis: A TB was submitted. No field duplicate, EB, or field blank (FB) was submitted on the ARCOC.

SVOC/PCB Analyses: No field duplicates, EBs, or FBs were submitted on the ARCOC.

No other specific issues were identified which affect data quality.

Blanks

ICP Analysis: No target analytes were detected in the blanks except as noted above in the summary section and the following. In the ICB, CCB, and method blank, nickel (Ni) was detected. However, all associated sample results were >5X the blank concentrations and, thus, will not be qualified.

CVAA Analysis: No target analytes were detected in the blanks except for the following. In the ICB and method blank, Hg was detected. However, all associated sample results were >5X the blank concentrations and, thus, will not be qualified. In the CCB, Hg was detected at a negative concentration. The absolute value was > the detection limit (DL) but < the reporting limit (RL). However, all associated sample results were >5X the DL and, thus, will not be qualified.

Cr+6 Analysis: No target analytes were detected in the blanks.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analyses

ICP

CVAA Analysis: The MS analysis met QC acceptance criteria except for the following. The MSD %R was < the QC acceptance limit but >30%. However, the MS %R and MSD RPD met QC acceptance criteria. Thus, no sample data will be qualified, based on professional judgment. No MSD analysis was performed. The replicate analyses were used as measures of laboratory precision.

Cr+6 Analysis: The MS/MSD analyses did not meet QC acceptance criteria, as noted above in the Summary section.

Laboratory Control Sample (LCS/LCSD) Analyses

All Analyses: The LCS analyses met all QC acceptance criteria. No LCSD analyses were performed. No sample data will be qualified as a result.

Replicate Analysis

All Analyses: The replicate analyses met all QC acceptance criteria.

ICP Interference Check Sample (ICS)

ICP Analysis: The ICS met all QC acceptance criteria.

CVAA/Cr+6 Analyses: No ICS was required for these methods.

ICP Serial Dilution

ICP Analysis: The serial dilution analysis met all QC acceptance criteria.

CVAA/Cr+6 Analyses: No serial dilution was required for these methods.

Detection Limits/Dilutions

ICP Analysis: All detection limits were properly reported. All soil samples were diluted the standard 2X.

CVAA Analysis: All detection limits were properly reported. Samples 80273-022, -030, and -034 diluted were diluted 10X, 2X, and 2X, respectively, in order to bring Hg concentrations into the calibration range. No other samples were diluted.

Cr+6 Analysis: All detection limits were properly reported. No samples were diluted.

Other QC

All Analyses: No field duplicates, equipment blanks (EBs), or field blanks (FBs) were submitted on the ARCOC.

No other specific issues were identified which affect data quality.

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MEMORANDUM

DATE: June 8, 2003

TO: File

FROM: Kenneth Salaz

SUBJECT: Radiochemical Data Review and Validation - SNL S-74, CWLF; ARCOC #606381/606382, GEL SDG #80273, Case No. 7221.02.02.03

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM ER Project AOP 00-03.

Summary

All samples were prepared and analyzed with approved procedures using methods EPA906.0 Tritium and HASL300, 4.5.2.3 Gamma Spec.

1. Gamma Spec Analysis: Several Gamma Spec results for all samples were "X" flagged by the laboratory due to low abundance or lack of a valid peak (see Electronic Data Deliverable). Thus, these sample results will be qualified "R" (unusable).

2. Gamma Spec Analysis: The replicate relative error ratio (RER) of Ba-133 was greater than (>) 1 but less than (<) 3. The associated results of samples 80273-061, -062, -063, -064, -065, -066, -067, -068, -069, -070, -071, -072, -073, -074, -075, -077, -078, -079, and -080 will be qualified "J." It should be noted that the associated results of samples -066 and -070 required further qualification (see #3 below). The associated result of sample -076 was al ready qualified (see #1 above).

3. Gamma Spec Analysis: The Ra-223 result of sample 80273-064, the Ba-133 results of samples -066 and -070, and the Zn-65 result of sample -071, were negative, and the absolute values were > the associated MDAs. Thus, these samples results will be qualified "R" (unusable).

Data are acceptable except as noted above. 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: The case narratives stated the instruments used were properly calibrated.

Blanks

All Analyses: No target analytes were detected in the blanks at concentrations > the associated MDAs.

Matrix Spike (MS) Analysis

Gamma Spec Analysis: No MS analysis was required for this method.

Tritium Analysis: The MS analysis met all QC acceptance criteria.

Laboratory Control Sample (LCS) Analysis

All Analyses: The LCS analyses met all QC acceptance criteria.

Replicates

Gamma Spec Analysis: The replicate analysis met QC acceptance criteria except as noted above in the summary section.

Tritium Analysis: The replicate analysis met all QC acceptance criteria.

Tracer/Carrier Recoveries

All Analyses: No tracers/carriers were required for these methods.

Negative Bias

Gamma Spec Analysis: Sample results met negative bias QC acceptance criteria except as noted above in the summary section.

Tritium Analysis: All sample results met negative bias QC acceptance criteria.

Other QC

All Analyses: No field duplicates, equipment blanks (EBs), or field blanks (FBs) were submitted on the ARCOC.

No other specific issues were identified which affect data quality.

Data Validation Summary

Site/Project: S-74, CWLF Project/Task #: 7221.02.02.03 # of Samples: 81 Matrix: 80 soil / 1 aqueous (TB)

AR/COC #: 606381/606382 Laboratory Sample IDs: 80273-001 to -080

Laboratory: GEL 80278-001 (TB)

SDG #: 80273/80278

QC Element	Analysis									
	Organics				Inorganics				RAD	Other
	VOC	SVOC	Pesticide/ PCB	HPLC (HE)	ICP/AES	GFAA/ AA	CVAA (Hg)	CN		
1. Holding Times/Preservation	✓	✓	✓	NA	✓	NA	✓	NA	✓	✓
2. Calibrations	J; UJ	✓	✓		✓		✓		✓	✓
3. Method Blanks	✓	333U,B	✓		J,B3		✓		✓	✓
4. MS/MSD	P2	✓	J,A1 UJ,A1		✓		✓		✓	R,A2; J,A2; UJ,A2
5. Laboratory Control Samples	✓	✓	✓		✓		✓		✓	✓
6. Replicates					✓		✓		J	✓
7. Surrogates	✓	✓	✓							NA
8. Internal Standards	✓	✓								
9. TCL Compound Identification	✓	✓								
10. ICP Interference Check Sample					✓					
11. ICP Serial Dilution					✓					
12. Carrier/Chemical Tracer Recoveries									NA	
13. Other QC	✓	NA	J		NA		NA		R	

J = Estimated
U = Not Detected
UJ = Not Detected, Estimated
R = Unusable

Check (√) = Acceptable
Shaded Cells = Not Applicable (also "NA")
NP = Not Provided
Other: _____

Reviewed By: [signature] Date: 6/8/03

Volatile Organics (SW 846 Method 8260)

Site/Project: S-74, CWLF AR/COC #: 606381/606382 # of Samples: 20 Matrix: soil

Laboratory: GEL SDG #: 80273 Laboratory Sample IDs: 80273-001 to -020

Methods: EPA8260A Batch #s: 251667

IS	CAS #	Name	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Trip Blanks		
						>.05	<20% / 0.99	20%												
1	71-55-6	1,1,1-trichloroethane	✓	0.10	NA	✓	✓	✓	✓							NA	NA	✓		
2	79-34-5	1,1,2,2-tetrachloroethane		0.30		✓	✓													
2	79-00-5	1,1,2-trichloroethane		0.10		✓	✓													
1	75-34-3	1,1-dichloroethane		0.10		✓	✓													
1	75-35-4	1,1-dichloroethene		0.20		✓	✓			✓	NA	NA	✓	✓	✓					
1	107-06-2	1,2-dichloroethane		0.10		✓	✓													
STOP 1	~~540-59-0~~	~~1,2-dichloroethene(total)~~	✓	~~0.01~~		✓	✓													
1	78-87-5	1,2-dichloropropane	✓	0.01		✓	✓	✓												
1	78-93-3	2-butanone (MEK) (10xblk)	✓	0.01		✓	✓	-23.1	✓											
~~1~~	~~110-75-8~~	~~2-chloroethyl vinyl ether~~																		
2	591-78-6	2-hexanone (MBK)	✓	0.01		✓	✓	-27.6	✓											
2	108-10-1	4-methyl-2-pentanone (MIBK)		0.10	✓	✓	✓	-21.4												
1	67-64-1	acetone(10xblk)		0.01	✓	✓	✓	-21.7												
1	71-43-2	benzene		0.50	NA	✓	✓	✓		✓	NA	NA	✓	✓	✓					
1	75-27-4	bromodichloromethane		0.20		✓	✓													
3	75-25-2	bromoform		0.10		✓	✓													
1	74-83-9	bromomethane		0.10		✓	✓													
1	75-15-0	carbon disulfide		0.10		✓	✓													
1	56-23-5	carbon tetrachloride		0.10		✓	✓													
2	108-90-7	chlorobenzene		0.50		✓	✓			✓	NA	NA	✓	✓	✓					
1	75-00-3	chloroethane		0.01		✓	✓													
1	67-66-3	chloroform		0.20	✓	✓	✓													
1	74-87-3	chloromethane		0.10	✓	✓	✓													
1	10061-01-5	cis-1,3-dichloropropene		0.20	NA	✓	✓													
2	124-48-1	dibromochloromethane		0.10		✓	✓													
2	100-41-4	ethylbenzene		0.10	✓	✓	✓													
1	75-09-2	methylene chloride (10xblk)		0.01	✓	✓	✓													
2	100-42-5	styrene		0.30	NA	✓	✓													
2	127-18-4	tetrachloroethene		0.20		✓	✓													
2	108-88-3	toluene(10xblk)		0.40		✓	✓			✓	NA	NA	✓	✓	✓					
2	10061-02-6	trans-1,3-dichloropropene		0.10		✓	✓													
1	79-01-6	trichloroethene		0.30		0.28	✓			✓	NA	NA	✓	✓	✓					
1	75-01-4	vinyl chloride		0.10		✓	✓													
2	1330-20-7	xylenes(total)		0.30		✓	✓													
	108-05-4	vinyl acetate	✓		✓	✓	✓	✓	✓							✓	✓	✓		

Comments:

Notes: Shaded rows are RCRA compounds.

Reviewed By: [signature] Date: 6/7/03

Volatile Organics

Site/Project: S-74, CWLF AR/COC #: 606381/606382 Batch #s: 231667

Laboratory: GEL SDG #: 80273 # of Samples: 20 Matrix: Soil

Surrogate Recovery and Internal Standard Outliers (SW 846 Method 8260)

Sample	SMC 1	SMC 2	SMC 3	IS 1 area	IS 1 RT	IS 2 area	IS 2 RT	IS 3 area	IS 3 RT
All									
Passed									

SMC 1: Bromofluorobenzene
SMC 2: Dibromofluoromethane
SMC 3: Toluene-d8

IS 1: Fluorobenzene
IS 2: Chlorobenzene-d5
IS 3: 1,4-Dichlorobenzene-d4

Comments:

Volatile Organics (SW 846 Method 8260)

Site/Project: S-74, CWLF AR/COC #: 606381/606382 # of Samples: 1 Matrix: aqueous

Laboratory: GEL SDG #: 80278 Laboratory Sample IDs: 80278-001 (TB)

Methods: EPA8260B Batch #s: 251491

IS	CAS #	Name	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Trip Blanks		
						>.05	<20% / 0.99	20%												
1	71-55-6	1,1,1-trichloroethane	✓	0.10	NA	✓	✓	✓	✓							NA	NA	NA		
2	79-34-5	1,1,2,2-tetrachloroethane		0.30		✓	✓													
2	79-00-5	1,1,2-trichloroethane		0.10		✓	✓													
1	75-34-3	1,1-dichloroethane		0.10		✓	✓													
1	75-35-4	1,1-dichloroethene		0.20		✓	✓			✓	NA	NA	NA	NA	NA					
1	107-06-2	1,2-dichloroethane		0.10		✓	✓													
1	540-59-0	1,2-dichloroethene(total)		0.01		✓	✓													
1	78-87-5	1,2-dichloropropane		0.01		✓	✓													
1	78-93-3	2-butanone (MEK) (10xblk)	✓	0.01		✓	✓	✓	✓											
~~1~~	~~110-75-8~~	~~2-chloroethyl vinyl ether~~																		
2	591-78-6	2-hexanone (MBK)	✓	0.01		✓	✓	✓	✓											
2	108-10-1	4-methyl-2-pentanone (MIBK)		0.10		✓	✓	✓												
1	67-64-1	acetone(10xblk)		0.01		✓	✓	-22.8												
1	71-43-2	benzene		0.50		✓	✓	✓		✓	NA	NA	NA	NA	NA					
1	75-27-4	bromodichloromethane		0.20		✓	✓													
3	75-25-2	bromoform		0.10		✓	✓													
1	74-83-9	bromomethane		0.10		✓	✓													
1	75-15-0	carbon disulfide		0.10		✓	✓													
1	56-23-5	carbon tetrachloride		0.10		✓	✓													
2	108-90-7	chlorobenzene		0.50		✓	✓			✓	NA	NA	NA	NA	NA					
1	75-00-3	chloroethane		0.01		✓	✓													
1	67-66-3	chloroform		0.20		✓	✓	✓												
1	74-87-3	chloromethane		0.10		✓	✓	-25.2												
1	10061-01-5	cis-1,3-dichloropropene		0.20		✓	✓	✓												
2	124-48-1	dibromochloromethane		0.10		✓	✓													
2	100-41-4	ethylbenzene		0.10	✓	✓	✓													
1	75-09-2	methylene chloride (10xblk)		0.01	✓	✓	✓													
2	100-42-5	styrene		0.30	NA	✓	✓													
2	127-18-4	tetrachloroethene		0.20		✓	✓													
2	108-88-3	toluene(10xblk)		0.40		✓	✓			✓	NA	NA	NA	NA	NA					
2	10061-02-6	trans-1,3-dichloropropene		0.10		✓	✓													
1	79-01-6	trichloroethene		0.30		0.29	✓			✓	NA	NA	NA	NA	NA					
1	75-01-4	vinyl chloride		0.10		✓	✓													
2	1330-20-7	xylenes(total)		0.30		✓	✓													
	108-05-4	vinyl acetate	✓		✓	✓	✓	✓	✓							✓	✓	✓		

Comments:

① No LCSD or MS/MSD analyzed. No other measure of precision.

Notes: Shaded rows are RCRA compounds.

Reviewed By: [signature] Date: 6/7/03

Volatile Organics

Site/Project: S-74, CWLF AR/COC #: 606381/606382 Batch #s:

Laboratory: GEL SDG #: 80278 # of Samples: Matrix:

Surrogate Recovery and Internal Standard Outliers (SW 846 Method 8260)

Sample	SMC 1	SMC 2	SMC 3	IS 1 area	IS 1 RT	IS 2 area	IS 2 RT	IS 3 area	IS 3 RT
All									
Passed									

SMC 1: Bromofluorobenzene
SMC 2: Dibromofluoromethane
SMC 3: Toluene-d8

IS 1: Fluorobenzene
IS 2: Chlorobenzene-d5
IS 3: 1,4-Dichlorobenzene-d4

Comments:

Semivolatile Organics (SW 846 Method 8270)

Site/Project: S-74, CWLF AR/COC #: 606381/606382 Laboratory Sample IDs: 80273-021 to -040

Laboratory: GEL SDG #: 80273

Methods: EPA 8270C

# of Samples: 20 Matrix: Soil Batch #s: 251508

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blanks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks		
							>.05	<20% / 0.99	20%												
1	A	108-95-2	Phenol	✓	0.80	NA	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	NA	NA	NA		
1	BN	111-44-4	bis(2-Chloroethyl)ether		0.70		✓	✓	-32.7												
1	A	95-57-8	2-Chlorophenol		0.80		✓	✓	✓		✓	NA	NA	✓	✓	✓					
1	BN	541-73-1	1,3-Dichlorobenzene		0.60		✓	✓													
1	BN	106-46-7	1,4-Dichlorobenzene		0.50		✓	✓			✓	NA	NA	✓	✓	✓					
1	BN	95-50-1	1,2-Dichlorobenzene		0.40		✓	✓													
1	A	95-48-7	o-cresol		0.70		✓	✓	✓		✓	NA	NA	✓	✓	✓					
1	BN	108-60-1	bis(2-chloroisopropyl)ether		0.01		✓	✓	-24.1												
1	A	N22	m,p-cresols		0.60		✓	✓	✓		✓	NA	NA	✓	✓	✓					
1	BN	621-64-7	N-Nitroso-di-n-propylamine		0.50		✓	✓			✓	NA	NA								
1	BN	67-72-1	Hexachloroethane		0.30		✓	✓			✓	NA	NA								
2	BN	98-95-3	Nitrobenzene		0.20		✓	✓			✓	NA	NA	✓	✓	✓					
2	BN	78-59-1	Isophorone		0.40		✓	✓													
2	A	88-75-5	2-Nitrophenol		0.10		✓	✓													
2	A	105-67-9	2,4-Dimethylphenol		0.20		✓	✓													
2	BN	111-91-1	bis(2-Chloroethoxy)methane		0.30		✓	✓													
2	A	120-83-2	2,4-Dichlorophenol		0.20		✓	✓													
2	BN	120-82-1	1,2,4-Trichlorobenzene		0.20		✓	✓			✓	NA	NA	✓	✓	✓					
2	BN	91-20-3	Naphthalene		0.70		✓	✓													
2	BN	106-47-8	4-Chloroaniline		0.01		✓	✓													
2	BN	87-68-3	Hexachlorobutadiene		0.01		✓	✓			✓	NA	NA	✓	✓	✓					
2	A	59-50-7	4-Chloro-3-methylphenol		0.20		✓	✓			✓	NA	NA	✓	✓	✓					
2	BN	91-57-6	2-Methylnaphthalene		0.40		✓	✓													
3	BN	77-47-4	Hexachlorocyclopentadiene		0.01		✓	✓													
3	A	88-06-2	2,4,6-Trichlorophenol		0.20		✓	✓			✓	NA	NA	✓	✓	✓					
3	A	95-95-4	2,4,5-Trichlorophenol	✓	0.20	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	✓	✓	✓		

Comments:

Notes: Shaded rows are RCRA compounds.

Reviewed By: [signature] Date: 6/7/03

Semivolatile Organics

Site/Project: S-74, CULF AR/COC #: 606381/606382 Batch #s: 251508

Laboratory: GEL SDG #: 80273 # of Samples: 20 Matrix: soil

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blanks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks		
							>.05	<20%/ 0.99	20%												
3	BN	91-58-7	2-Chloronaphthalene	✓	0.80	NA	✓	✓	✓	✓							NA	NA	NA		
3	BN	88-74-4	2-Nitroaniline (o-)		0.01		✓	✓													
3	BN	131-11-3	Dimethylphthalate		0.01		✓	✓													
3	BN	208-96-8	Acenaphthylene		0.90		✓	✓													
3	BN	606-20-2	2,6-Dinitrotoluene		0.20	✓	✓	✓													
3	BN	99-09-2	3-Nitroaniline (m-)		0.01	NA	✓	✓													
3	BN	83-32-9	Acenaphthene		0.90	NA	✓	✓			✓	NA	NA	✓	✓	✓					
3	A	51-28-5	2,4-Dinitrophenol		0.01	✓	✓	✓													
3	A	100-02-7	4-Nitrophenol		0.01	NA	✓	✓			✓	NA	NA	✓	✓	✓					
3	BN	132-64-9	Dibenzofuran		0.80	NA	✓	✓													
3	BN	121-14-2	2,4-Dinitrotoluene		0.20	✓	✓	✓			✓	NA	NA	✓	✓	✓					
3	BN	84-66-2	Diethylphthalate		0.01	NA	✓	✓		92.8											
3	BN	7005-72-3	4-Chlorophenyl-phenylether		0.40		✓	✓		✓											
3	BN	86-73-7	Fluorene		0.90		✓	✓	✓												
3	BN	100-01-6	4-Nitroaniline (p-)		0.01		✓	✓	-26.4												
4	A	534-52-1	4,6-Dinitro-2-methylphenol		0.01	✓	✓	0.98	✓												
4	BN	122-39-4	Diphenylamine		0.01	NA	✓	✓													
4	BN	101-55-3	4-Bromophenyl-phenylether		0.10		✓	✓													
4	BN	118-74-1	Hexachlorobenzene		0.10		✓	✓			✓	NA	NA	✓	✓	✓					
4	A	87-86-5	Pentachlorophenol		0.05		✓	✓			✓	NA	NA	✓	✓	✓					
4	BN	85-01-8	Phenanthrene		0.70		✓	✓													
4	BN	120-12-7	Anthracene		0.70		✓	✓													
4	BN	86-74-8	Carbazole		0.01		✓	✓													
4	BN	84-74-2	Di-n-butylphthalate		0.01		✓	✓													
4	BN	206-44-0	Fluoranthene		0.60		✓	✓													
5	BN	129-00-0	Pyrene		0.60		✓	✓			✓	NA	NA	✓	✓	✓					
5	BN	85-68-7	Butylbenzylphthalate		0.01		✓	✓													
5	BN	91-94-1	3,3'-Dichlorobenzidine		0.01		✓	✓													
5	BN	56-55-3	Benzo(a)anthracene	✓	0.80	✓	✓	✓	✓	✓							✓	✓	✓		

Comments:

Semivolatile Organics

Site/Project: S-7, CWLF AR/COC #: 606381/606382 Batch #s: 251508

Laboratory: GEL SDG #: 80273 # of Samples: 20 Matrix: soil

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blanks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks		
							>.05	<20% / 0.99	20%												
5	BN	218-01-9	Chrysene	✓	0.70	NA	✓	✓	✓	✓							NA	NA	NA		
5	BN	117-81-7	bis(2-Ethylhexyl)phthalate		0.01	NA	✓	✓													
6	BN	117-84-0	Di-n-octylphthalate		0.01	✓	✓	0.98													
6	BN	205-99-2	Benzo(b)fluoranthene		0.70	NA	✓	✓													
6	BN	207-08-9	Benzo(k)fluoranthene		0.70		✓	✓													
6	BN	50-32-8	Benzo(a)pyrene		0.70		✓	✓													
6	BN	193-39-5	Indeno(1,2,3-cd)pyrene		0.50	✓	✓	✓													
6	BN	53-70-3	Dibenz(a,h)anthracene		0.40	✓	✓	✓													
6	BN	191-24-2	Benzo(g,h,i)perylene	✓	0.50	✓	✓	✓	✓	✓							✓	✓	✓		

Surrogate Recovery Outliers

Sample	SMC 1	SMC 2	SMC 3	SMC 4	SMC 5	SMC 6	SMC 7	SMC 8
All Passed								

Comments:

SMC 1: Nitrobenzene-d5 (BN)
SMC 2: 2-Fluorobiphenyl (BN)
SMC 3: Terphenyl-d14 (BN)
SMC 4: Phenol-d5 (A)
SMC 5: 2-Fluorophenol (A)
SMC 6: 2,4,6-Tribromophenol (A)
SMC 7: 2-2-Chlorophenol-d4 (A)
SMC 8: 1,2-Dichlorobenzene-d4 (BN)

Internal Standard Outliers

Sample	IS 1-area	IS 1-RT	IS 2-area	IS 2-RT	IS 3-area	IS 3-RT	IS 4-area	IS 4-RT	IS 5-area	IS 5-RT	Is 6-area	IS 6-RT
All Passed												

IS 1: 1,4-Dichlorobenzene-d4 (BN)
IS 2: Naphthalene-d8 (BN)
IS 3: Acenaphthene-d10 (BN)
IS 4: Phenathrene-d10 (BN)
IS 5: Chrysene-d12 (BN)
IS 6: Perylene-d12 (BN)

PCBs (SW 846 - Method 8082)

Site/Project: S-74, CWLF AR/COC #: 606381/606382 Laboratory Sample IDs: 80273-021 to -040

Laboratory: GEL SDG #: 80273

Methods: EPA 8082

# of Samples: 20 Matrix: soil Batch #s: 251496

CAS #	Name	TCL	Intercept	Calib RSD / R^2 <20% / 0.99	CCV %D 20%	Method Blanks	LCS	LCSD	LCS RPD 20%	MS	MSD	MS RPD 20%	Field Dup. RPD	Equip. Blanks	Field Blanks		
12674-11-2	Aroclor-1016	✓	NA	✓	✓	✓	✓	NA	NA	231	202	✓	NA	NA	NA		
11104-28-2	Aroclor-1221			NA													
11141-16-5	Aroclor-1232			NA													
53469-21-9	Aroclor-1242			✓	✓												
12672-29-6	Aroclor-1248																
11097-69-1	Aroclor-1254				✓												
11096-82-5	Aroclor-1260	✓			✓		✓	NA	NA	✓	✓	✓	NA				

Sample	SMC % REC	SMC RT	Sample	SMC % REC	SMC RT
All Passed					

Comments: ① Samples -022(5X), -024(5X), -030(10X), -031(10X), -033(5X), -036(20X), + -037(5X) due to over-range target analytes.

Confirmation

Sample	CAS #	RPD > 25%	Sample	CAS #	RPD > 25%
-021	Aroclor-1242	26.5	-038	Aroclor-1242	32.4
-021	" -1260	42.5	-039	-1242	27.3
-022	-1242/-1260	27.6/29.8	-039	-1260	25.9
-024	-1242	29.7			
-026	-1242	35.6			
-028	-1242	50.6			

Reviewed By: [signature] Date: 4/8/03

Inorganic Metals

Site/Project: S-74, Cuff AR/COC #: 606381/606382 Laboratory Sample IDs: 80273-021 to -040

Laboratory: GEL SDG #: 80273

Methods: EPA6010C (ICP-AES), EPA7471A (CVAA)

# of Samples: 20 Matrix: soil Batch #s: 251735, 251670

CAS #/ Analyte	QC Element																			
	TAL	ICV	CCV	ICB (µg/L)	CCB (µg/L)	(mg/kg) Method Blanks	LCS	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilution	Field Dup. RPD	Equip. Blanks	Field Blanks		
7429-90-5 Al																NA	NA	NA		
7440-39-3 Ba	✓	✓	✓	✓	✓	✓	✓	NA	NA	NA	NA	NA	✓	✓	✓					
7440-41-7 Be	✓	↓	↓	↓	↓	↓	↓	↓	↓	✓	✓	✓	✓	↓	NA					
7440-43-9 Cd	✓	↓	↓	↓	↓	↓	↓	↓	↓	✓	✓	✓	NA	↓	NA					
7440-70-2 Ca																				
7440-47-3 Cr	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	✓	✓	NA					
7440-48-4 Co																				
7440-50-8 Cu	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	✓	✓	NA					
7439-89-6 Fe																				
7439-95-4 Mg																				
7439-96-5 Mn																				
7440-02-0 Ni	✓	✓	✓	1.28	1.78	0.148	✓	NA	NA	✓	✓	✓	✓	✓	NA					
7440-09-7 K																				
7440-22-4 Ag	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	NA	✓	NA					
7440-23-5 Na																				
7440-62-2 V																				
7440-66-6 Zn																				
7439-92-1 Pb	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	✓	✓	NA					
7782-49-2 Se	✓	↓	↓	6.68	3.72	↓	↓	↓	↓	↓	↓	↓	NA	↓	↓					
7440-38-2 As	✓	↓	↓	✓	✓	↓	↓	↓	↓	↓	↓	↓	✓	↓	↓					
7440-36-0 Sb																				
7440-28-0 Tl																				
7439-97-6 Hg	✓	✓	✓	✓	0.034/ -0.0648	0.00447	✓	NA	NA	✓	68	✓	✓	NA	NA	↓	↓	↓		
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 / l

Comments: Samples -022, ~~-024~~, -030, + -034 were dil. 10X, 2X, + 2X due to over-range Hg concentrations. All Samples dil. std. 2X for ICP soils.

Reviewed By: [signature] Date: 6/8/03

General Chemistry

Site/Project: S-74, CWL F AR/COC #: 606381/606382 Laboratory Sample IDs: 80273-021 to -040

Laboratory: GEL SDG #: 80273

Methods: EPA 7196A (Cr+6)

# of Samples: 20 Matrix: soil Batch #s: 251898/251904 (-033, -038, -039 only)

CAS #	Analyte	QC Element																		
		TAL	ICV	CCV	ICB	CCB	Method Blanks	LCS	LCSD	LCSD RPD	① MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilution	Field Dup. RPD	Equip. Blanks	Field Blanks	
18540-29-9	Cr+6	✓	✓	✓	✓	✓	✓	✓	NA	NA	24	22	✓	NA	NA	NA	NA	NA	NA	
											54/71	65/70	✓/✓	NA	↓	↓	↓	↓	↓	

Comments: ① 1st MS / MSD entries apply to all samples except -033, -038, + -039. 2nd apply to -033 only, 3rd to -038 + -039 only.

Reviewed By: [signature] Date: 6/8/03

Radiochemistry

Site/Project: S-74, CWLF AR/COC #: 606381/606382 Laboratory Sample IDs: 80273-041 to -080

Laboratory: GEL SDG #: 80273

Methods: HASL 300, 4.5.2.3 (Gamma Spec), EPA906.0 (H_3)

# of Samples: 40 Matrix: soil Batch #s: 251680, 252664/252665 (-054, -057)

Analyte	QC Element												
	Method Blanks	LCS	MS	Rep RER	Equip. Blanks	Field Dup. RER	Field Blanks	Sample ID	Isotope	IS/Trace	Sample ID	Isotope	IS/Trace
Criteria	U	20%	25%	<1.0	U	<1.0	U			50-105			50-105
H3	✓	✓	✓	✓	NA	NA	NA						
U-238								NA					
U-234													
U-235/-236													
Th-232													
Th-228													
Th-230													
Pu-239/-240													
Gross Alpha													
Nonvolatile Beta													
Ra-226													
Ra-228													
Ni-63													
Gamma Spec. Am-241	✓	✓	NA	✓	NA	NA	NA						
Gamma Spec. Cs-137	↓	↓	↓	↓	↓	↓	↓						
Gamma Spec. Co-60	↓	↓	↓	↓	↓	↓	↓						
" Ba-133	↓			1.4	↓	↓	↓						

Parameter	Method	Typical Tracer	Typical Carrier
Iso-U	Alpha spec.	U-232	NA
Iso-Pu	Alpha spec.	Pu-242	NA
Iso-Th	Alpha spec.	Th-229	NA
Am-241	Alpha spec.	Am-242	NA
Sr-90	Beta	Y ingrowth	NA
Ni-63	Beta	NA	Ni by ICP
Ra-226	Deamination	NA	NA
Ra-226	Alpha spec.	Ba-133 or Ra-225	NA
Ra-228	Gamma spec.	Ba-133	NA

Gamma spec. LCS contains: Am-241, Cs-137, and Co-60

Comments:

Reviewed By: [signature] Date: 6/8/03

Sample Findings Summary

Site: S-74, CWLF **AR/COC:** 606383/606384 **Data Type:** Organic, Inorganic, RAD (Page 1/2)

Sample ID	Method/CAS Number (Analysis/Analyte)																			
	VOCs:	EPA8260B (All VOCS, except...)	78-93-3 (2-butanone)	79-01-8 (trichloroethene)	SVOCs:	77-47-4 (hexachlorocyclopentadiene)	91-20-3 (naphthalene)	PCBs:	53469-21-9 (Arcolor-1242)	11097-69-1 (Aroclor-1254)	11096-82-5 (Aroclor-1260)	Metals:	7440-41-7 (Be)	7440-50-8 (Cu)	7440-47-3 (Cr)	7782-49-2 (Se)	7439-92-1 (Pb)	7440-22-4 (Ag)	7440-38-2 (As)	EPA7196A (Cr+6)
061976-001 74-SB-E002-F051			J																	
061977-001 74-SB-E002-F052			J																	
061977-005 74-SB-E002-F052-TB		P2	P2	UJ,P2																
061980-001 74-SB-E002-F055			J																	
061981-001 74-SB-E002-F056			J																	
061982-001 74-SB-E002-F057			J																	
061983-001 74-SB-E002-F059			J																	
061984-001 74-SB-E002-F066			J																	
061985-001 74-SB-E002-F068			J																	
061986-001 74-SB-E002-F069			J																	
061987-001 74-SB-E002-F070			J																	
061989-001 74-SB-E002-F072			J																	
061990-001 74-SB-E002-F073			J																	
061992-001 74-SB-E002-F075			J																	
061995-005 74-SB-E002-F078-EB		UJ,HT,P2	UJ,HT,P2	UJ,HT,P2																
061995-009 74-SB-E002-F078-EB						UJ,A	UJ													
061976-002 74-SB-E002-F051																	J			UJ,A2
061977-002 74-SB-E002-F052											J					J,B3	J			UJ,A2
061978-002 74-SB-E002-F053																	J			UJ,A2
061979-002 74-SB-E002-F054																	J			UJ,A2
061980-002 74-SB-E002-F055																J,B3	J			UJ,A2
061981-002 74-SB-E002-F056																J,B3	J			UJ,A2
061982-002 74-SB-E002-F057																	J			J,A2,B2
061983-002 74-SB-E002-F059										J						J,B3	J			J,A2,B2
061984-002 74-SB-E002-F066																J,B3	J			J,A2,B2
061985-002 74-SB-E002-F068									J							J,B3	J			J,A2
061986-002 74-SB-E002-F069																	J			UJ,A2
061987-002 74-SB-E002-F070									J							J,B3	J			UJ,A2
061988-002 74-SB-E002-F071										J						J,B3	J			UJ,A2
061989-002 74-SB-E002-F072																	J			J,A2
061990-002 74-SB-E002-F073																	J			J,A2
061991-002 74-SB-E002-F074											J					J,B3	J			J,A2
061992-002 74-SB-E002-F075									J,A1	J,A1							J			UJ,A2
061993-002 74-SB-E002-F076											J					J,B3	J			J,A2,B2
061994-002 74-SB-E002-F077																J,B3	J			UJ,A2
061995-002 74-SB-E002-F078									J,A1	J,A1	J,A1					J,B3	J			J,A2
061995-006 74-SB-E002-F078-EB													J,B3	J,B,B3	J,B3		J,B	UJ,B3	UJ,B3	
061995-007 74-SB-E002-F078-EB																				J,HT

Validated By: Mr. Kenneth Salaz **Date:** 06/06/03

Sample Findings Summary

Site: S-74, CWLF **AR/COC:** 606383/606384 **Data Type:** Organic, Inorganic, RAD (Page 2/2)

Sample ID	RAD:	All Gamma Spec results flagged "X" by the lab (see EDD)	13981-41-4 (Ba-133)	13967-70-9 (Cs-134)	13982-39-3 (Zn-65)
		Method/CAS Number (Analysis/Analyte)			
061976-004 74-SB-E002-F051		R			
061977-004 74-SB-E002-F052		R			
061978-004 74-SB-E002-F053		R			
061979-004 74-SB-E002-F054		R			
061980-004 74-SB-E002-F055		R	R		
061981-004 74-SB-E002-F056		R	R		
061982-004 74-SB-E002-F057		R			
061983-004 74-SB-E002-F059		R	R		
061984-004 74-SB-E002-F066		R	R	R	R
061985-004 74-SB-E002-F068		R			
061986-004 74-SB-E002-F069		R			
061987-004 74-SB-E002-F070		R			
061988-004 74-SB-E002-F071		R			
061989-004 74-SB-E002-F072		R			
061990-004 74-SB-E002-F073		R			
061991-004 74-SB-E002-F074		R			
061992-004 74-SB-E002-F075		R			
061993-004 74-SB-E002-F076		R			
061994-004 74-SB-E002-F077		R			
061995-004 74-SB-E002-F078		R			

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MEMORANDUM

DATE: June 6, 2003

TO: File

FROM: Kenneth Salaz

SUBJECT: Organic Data Review and Validation - SNL
S-74, CWLF; ARCOC #606383/606384,
GEL SDG #80382/80386, Case No. 7221.02.02.03

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM ER Project AOP 00-03.

Summary

All samples were prepared and analyzed with approved procedures using methods EPA8260A/B VOCs, EPA8270C SVOCs, and EPA8082 PCBs. Problems were identified with the data package that result in the qualification of data.

1. VOC Analysis: Sample 80386-002, the equipment blank (EB), had a pH of 5, and it was analyzed beyond but within 2X the holding time for an unpreserved sample. All results for this sample were non-detect (ND) and, thus, will be qualified "UJ,HT."

2. VOC Analysis: For the EB and trip blank (TB), the initial calibration response factor (RF) of trichloroethene was less than (<) the required minimum but greater than (>) 0.01. The associated sample results were ND and, thus, will be qualified "UJ." For the soil samples, the continuing calibration verification (CCV) percent differences (%Ds) of 2-butanone were >20% but <40%. The associated results of samples 80382-001, -002, -005, -006, -007, -008, -009, -010, -011, -012, -014, -015, and -017 were detects and, thus, will be qualified "J."

   SVOC Analysis: For the EB, the initial calibration RF of naphthalene was < the required minimum but >0.01. Also, the CCV %D of hexachlorocyclopentadiene was >40% but <60%. The associated sample results were ND and, thus, will be qualified "UJ."

3. PCB Analysis: For soil samples 80382-037 and -040, the DCB surrogate percent recoveries (%Rs) were > the QC acceptance limits. The Aroclor-1242 and -1254 results of both samples, as well as the Aroclor-1260 result of sample -040 only, were detects and, thus, will be qualified "J,A1."

4. VOC Analysis: For the EB and TB, no MSD, LCSD, or Replicate was analyzed. All samples results were ND and, thus, will be qualified "P2."

5. SVOC Analysis: For the EB, the LCS %R of hexachlorocyclopentadiene was < the QC acceptance limit but >10%. The associated sample result was ND and, thus, will be qualified "UJ,A."

6. PCB Analysis: The confirmation relative percent differences (RPDs) of Aroclor-1242 for soil samples 80382-030 and -032; Aroclor-1254 for soil samples -028 and -033, and Aroclor-1260 for soil samples-022, -036, and -038 were >25% but <75%. The associated sample results will be qualified "J."

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

Holding Times/Preservation

VOC Analysis: The samples were analyzed within the method specified holding times and properly preserved except as noted above in the Summary section.

SVOC/PCB Analyses: All samples were analyzed within the method specified holding times and properly preserved.

Calibration

VOC Analysis: The initial and continuing calibrations met QC acceptance criteria except as noted above in the Summary section and the following. For the soil samples, the CCV %Ds of 2-hexanone, 4-methyl-2-pentanone, and vinyl acetate were >20% but <40%. However, all associated sample results were ND and, thus, will not be qualified.

SVOC Analysis: The initial and continuing calibrations met QC acceptance criteria except as noted above in the Summary section and the following. For the EB, the CCV %Ds of 2,4-dimethylphenol and 4-nitrophenol, as well as that of 2,4-dinitrophenol for the soil samples, were >20% but <40%. However, all associated sample results were ND and, thus, will not be qualified.

PCB Analysis: The initial and continuing calibrations met all QC acceptance criteria.

Blanks

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

SVOC Analysis: In the EB, diethylphthalate was detected. However, all associated sample results were either ND or >10X the blank concentration and, thus, will not be qualified. No other target analytes were detected in the blanks.

PCB Analysis: In the EB, Aroclor-1242 was detected. However, all associated sample results were >5X the blank concentration and, thus, will not be qualified. No other target analytes were detected in the blanks.

Surrogates

VOC/SVOC Analyses: All surrogate %Rs met QC acceptance criteria.

PCB Analysis: Surrogate %Rs met QC acceptance criteria except as noted above in the Summary section and the following. For the EB, the DCB surrogate %Rs were < the QC acceptance limit but >10%. No sample data will be qualified as a result.

Internal Standards (ISs)

VOC/SVOC Analyses: The IS areas and retention times (RTs) met all QC acceptance criteria.

PCB Analysis: No ISs were required for this method.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analyses

VOC Analysis: The MS/MSD analyses for the soil samples met all QC acceptance criteria. No MS/MSD or any other measure of precision was performed for the EB, as noted above in the Summary section.

SVOC Analysis: The MS/MSD analyses met all QC acceptance criteria. It should be noted that the MS/MSD analyses for the EB were performed on an SNL sample of similar matrix from another SDG. No sample will be qualified as a result.

PCB Analysis: The MS/MSD analyses for the soil samples met all QC acceptance criteria. No MS/MSD was analyzed for the EB due to insufficient sample volume. No sample data will be qualified as a result. An LCSD was analyzed as a measure of precision. All QC acceptance criteria were met.

Laboratory Control Sample (LCS/LCSD) Analyses

VOC/SVOC Analyses: The LCS analyses met all QC acceptance criteria. No LCSD analyses were performed. No sample data will be qualified as a result.

PCB Analysis: The LCS/LCSD analyses met all QC acceptance criteria. For the EB, no LCSD analysis was performed. No sample data will be qualified as a result.

Confirmation Analyses

PCB Analysis: Confirmation analyses met QC acceptance criteria except as noted above in the Summary section.

VOC/SVOC Analyses: No confirmation analyses were required for these methods.

Detection Limits/Dilutions

VOC/SVOC Analyses: All detection limits were properly reported. No samples were diluted.

PCB Analysis: All detection limits were properly reported. Soil samples 80382-024, -026, -026, -030, and -031 were initially diluted 10X due to the oily matrix of the extracts. Soil samples -036, -037, -038, -039, and -040 were diluted 50X, 20X, 20X, 10X and 50X, respectively, due to over-range detects. No other samples were diluted.

Other QC

VOC Analysis: A TB and EB were submitted. No field duplicate or field blank (FB) was submitted on the ARCOC.

SVOC/PCB Analyses: No field duplicates, EBs, or FBs were submitted on the ARCOC.

No other specific issues were identified which affect data quality.

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MEMORANDUM

DATE: June 6, 2003

TO: File

FROM: Kenneth Salaz

SUBJECT: Inorganic Data Review and Validation - SNL
S-74, CWLF; ARCOC #606383/606384,
GEL SDG #80382/80386, Case No. 7221.02.02.03

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM ER Project AOP 00-03.

Summary

All samples were prepared and analyzed with approved procedures using methods EPA6010B ICP-AES Metals, EPA7470/1A CVAA, and EPA7196A (Cr+6). Problems were identified with the data package that result in the qualification of data.

1. Cr+6 Analysis: Sample 80386-003, the equipment blank (EB) was received by the laboratory beyond 2X the method specified holding time. The sample result was a detect and, thus, will be qualified "J,HT."

2. ICP Analysis: In the continuing calibration blank (CCB) for the EB, beryllium (Be), copper (Cu), and chromium (Cr) were detected. The associated sample results were detects less than (<) 5X the blank concentrations and, thus, will be qualified "J,B3." In the method blank for the EB, Cu and lead (Pb) were detected. The associated sample results were detects <5X the blank concentration and, thus, will be qualified "J,B." In the ICB and CCB for the EB, silver (Ag) and arsenic (As) were detected at negative concentrations. The absolute values were greater than (>) the detection limits (DLs) but < the reporting limits (RLs). The associated sample results were ND and, thus, will be qualified "UJ,B3."

   In the initial calibration blank (ICB) and CCB for the soil samples, selenium (Se) was detected. The associated results of samples 80382-022, -025, -026, -028, -029, -030, -032, -033, -036, -038, -039, and -040 were detects <5X the blank concentration and, thus, will be qualified "J,B3."

   Cr+6 Analysis: In the EB, Cr+6 was detected. The associated results of soil samples 80382-027, -028, -029, and -038 were detects <5X the blank concentration and, thus, will be qualified "J,B2."

3. Cr+6 Analysis: For the soil samples, the MS/MSD percent recoveries (%Rs) were < the QC acceptance limit but >30%. The associated results of samples 80382-021, -022, -023, -024, -025, -026, -031, -032, -033, -037, and -039 were ND and, thus, will be qualified "UJ,A2." All other associated sample results were detects and, thus, will be qualified "J,A2."

4. ICP Analysis: For the soil samples, the replicate relative percent difference (RPD) of Pb was > the QC acceptance limit. All associated sample results were detects and, thus, will be qualified "J."

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

Holding Times/Preservation

ICP/CVAA Analyses: The samples were analyzed within the method specified holding times and properly preserved.

Cr+6 Analysis: The samples were analyzed within the method specified holding times and properly preserved except as noted above in the Summary section.

Calibration

All Analyses: The initial and continuing calibrations met all QC acceptance criteria.

Blanks

ICP Analysis: No target analytes were detected in the blanks except as noted above in the summary section and the following. In the CCB for the EB, barium (Ba), cadmium (Cd) were detected. For the soil samples, Ba and nickel (Ni) were detected in the ICB and/or CCB, and arsenic (As) was detected in the method blank. However, all associated sample results were either ND or >5X the blank concentrations and, thus, will not be qualified. In the ICB and/or CCB for the EB, Cr and Cu were detected at negative concentrations. The absolute values were > the DL but < the RL. However, the associated sample results already qualified due to positive blank contamination.

CVAA/Cr+6 Analyses: No target analytes were detected in the blanks.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analyses

ICP Analysis: The MS analyses met all QC acceptance criteria. No MSD analyses were performed. The replicate analyses were used as measures of laboratory precision.

CVAA Analysis: The MS analyses met all QC acceptance criteria. It should be noted that the MS analysis for the EB was performed on an SNL sample of similar matrix from another SDG. No sample data will be qualified as a result. No MSD analyses were performed. The replicate analyses were used as measures of laboratory precision.

Cr+6 Analysis: The MS/MSD analyses met QC acceptance criteria except as noted above in the summary section. It should be noted that the MS/MSD analyses for soil samples 80382-038, 039, and -040 were performed on an SNL sample of similar matrix from another SDG. No sample data will be qualified as a result.

Laboratory Control Sample (LCS/LCSD) Analyses

All Analyses: The LCS analyses met all QC acceptance criteria. No LCSD analyses were performed. No sample data will be qualified as a result.

Replicate Analysis

ICP Analysis: The replicate analyses met all QC acceptance criteria.

CVAA Analysis: The replicate analyses met all QC acceptance criteria. It should be noted that the replicate analysis for the EB was performed on an SNL sample of similar matrix from another SDG. No sample data will be qualified as a result.

Data Validation Summary

Site/Project: S-74, CWLF Project/Task #: 7221.02.02.03 # of Samples: 86 Matrix: 80 soil / 6 aqueous (1 Tb + 5 EBs)

AR/COC #: 606383 / 606384 Laboratory Sample IDs: 80382-001 to -080

Laboratory: GEL 80386 - 001 to -006

SDG #: 80382 / 80386

QC Element	Analysis									
	Organics				Inorganics				RAD	Other (Cr+6)
	VOC	SVOC	Pesticide/ PCB	HPLC (HE)	ICP/AES	GFAA/ AA	CVAA (Hg)	CN		
1. Holding Times/Preservation	UJ,HT	✓	✓	NA	✓	NA	✓	NA	✓	J,HT
2. Calibrations	J;UJ	UJ	✓		✓		✓		✓	✓
3. Method Blanks	✓	✓	✓		UJ,B3 J,B,B3		✓		✓	✓
4. MS/MSD	P2	✓	✓		✓		✓		✓	UJ,A2
5. Laboratory Control Samples	✓	UJ,A	✓		✓		✓		✓	✓
6. Replicates					log ~~✓~~ J		✓		✓	✓
7. Surrogates	✓	✓	J,A1							NA
8. Internal Standards	✓	✓								
9. TCL Compound Identification	✓	✓								
10. ICP Interference Check Sample					✓					
11. ICP Serial Dilution					✓					
12. Carrier/Chemical Tracer Recoveries									NA	
13. Other QC	✓	✓	J		✓		✓		R	J,B2

J = Estimated
U = Not Detected
UJ = Not Detected, Estimated
R = Unusable

Check (√) = Acceptable
Shaded Cells = Not Applicable (also "NA")
NP = Not Provided
Other: _____

Reviewed By: [signature] Date: 6/6/03

Holding Time and Preservation

Site/Project: S-74, CWLF AR/COC #: 606383/606384 Laboratory Sample IDs: 80382-001 to -080
80386-001 to -006

Laboratory: GEL SDG #: 80382 / 80386

# of Samples: 86 Matrix: 80 soil / 6 aqueous

Sample ID	Analytical Method	Holding Time Criteria	Days Holding Time was Exceeded	Preservation Criteria	Preservation Deficiency	Comments
80386-002	EPA 8260B (VOCs)	7 days (unpreserved)	3	pH < 2	pH = 5	Sample analyzed 3 days beyond H.T. for unpreserved samples.
" -004	EPA 7196A (Cr+6)	24 hrs	2	NA	NA	Sample received by lab beyond 2X H.T.

Reviewed By: [signature] Date: 6/6/03

Volatile Organics (SW 846 Method 8260)

Site/Project: S-74, CWLF AR/COC #: 606383/606384 # of Samples: 20 Matrix: Soil

Laboratory: GEL SDG #: 80382 Laboratory Sample IDs: 80382-001 to -020

Methods: EPA8260A Batch #s: 2J1993

IS	CAS #	Name	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	①CCV %D	Method Blks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Trip Blanks	CCV %D
						>.05	<20% / 0.99	20%											
1	71-55-6	1,1,1-trichloroethane	✓	0.10	NA	✓	✓	✓	✓							NA	✓	✓	✓
2	79-34-5	1,1,2,2-tetrachloroethane		0.30		✓	✓												
2	79-00-5	1,1,2-trichloroethane		0.10		✓	✓												
1	75-34-3	1,1-dichloroethane		0.10		✓	✓												
1	75-35-4	1,1-dichloroethene		0.20		✓	✓			✓	NA	NA	✓	✓	✓				
1	107-06-2	1,2-dichloroethane		0.10		✓	✓												
1	540-59-0	1,2-dichloroethene(total)		0.01		✓	✓												
1	78-87-5	1,2-dichloropropane		0.01		✓	✓												
1	78-93-3	2-butanone (MEK) (10xblk)	✓	0.01		✓	✓	-29.3	✓										-21.0
~~1~~	~~110-75-8~~	~~2-chloroethyl vinyl ether~~																	
2	591-78-6	2-hexanone (MBK)	✓	0.01		✓	✓	-25.5	✓										✓
2	108-10-1	4-methyl-2-pentanone (MIBK)		0.10		✓	✓	-21.9											
1	67-64-1	acetone(10xblk)		0.01	✓	✓	✓	✓											
1	71-43-2	benzene		0.50	NA	✓	✓			✓	NA	NA	✓	✓	✓				
1	75-27-4	bromodichloromethane		0.20		✓	✓												
3	75-25-2	bromoform		0.10		✓	✓												
1	74-83-9	bromomethane		0.10		✓	✓												
1	75-15-0	carbon disulfide		0.10		✓	✓												
1	56-23-5	carbon tetrachloride		0.10		✓	✓												
2	108-90-7	chlorobenzene		0.50		✓	✓			✓	NA	NA	✓	✓	✓				
1	75-00-3	chloroethane		0.01		✓	✓												
1	67-66-3	chloroform		0.20		✓	✓												
1	74-87-3	chloromethane		0.10		✓	✓												
1	10061-01-5	cis-1,3-dichloropropene		0.20		✓	✓												
2	124-48-1	dibromochloromethane		0.10		✓	✓												
2	100-41-4	ethylbenzene		0.10	✓	✓	✓												
1	75-09-2	methylene chloride (10xblk)		0.01	✓	✓	✓												
2	100-42-5	styrene		0.30	NA	✓	✓												
2	127-18-4	tetrachloroethene		0.20		✓	✓												
2	108-88-3	toluene(10xblk)		0.40		✓	✓			✓	NA	NA	✓	✓	✓				
2	10061-02-6	trans-1,3-dichloropropene		0.10		✓	✓												
1	79-01-6	trichloroethene		0.30		✓	✓			✓	NA	NA	✓	✓	✓				
1	75-01-4	vinyl chloride		0.10		✓	✓												
2	1330-20-7	xylenes(total)		0.30		✓	✓												
	108-05-4	vinyl acetate	✓		✓	✓	✓	✓	✓							✓	✓	✓	-21.6

Comments:

① 1st CCV applies to all samples except -003, -007, -013, -015, -016, + -017.

Notes: Shaded rows are RCRA compounds.

Reviewed By: [signature] Date: 6/5/03

Volatile Organics

Site/Project: S-M, CWLF AR/COC #: 606383/606384 Batch #s: 251993

Laboratory: GEL SDG #: 80382 # of Samples: 20 Matrix: soil

Surrogate Recovery and Internal Standard Outliers (SW 846 Method 8260)

Sample	SMC 1	SMC 2	SMC 3	IS 1 area	IS 1 RT	IS 2 area	IS 2 RT	IS 3 area	IS 3 RT
All									
Passed									

SMC 1: Bromofluorobenzene
SMC 2: Dibromofluoromethane
SMC 3: Toluene-d8

IS 1: Fluorobenzene
IS 2: Chlorobenzene-d5
IS 3: 1,4-Dichlorobenzene-d4

Comments:

Volatile Organics (SW 846 Method 8260)

Site/Project: S-74, CWLF AR/COC #: 606383 / 606384 # of Samples: 2 Matrix: aqueous

Laboratory: GEL SDG #: 80386 Laboratory Sample IDs: 80386-001 (TB) + -002 (EB)

Methods: EPA 8260B Batch #s: 252894

IS	CAS #	Name	TCL	Min. RF	Intercept	Calib. RF >.05	Calib. RSD/ R^2 <20% / 0.99	CCV %D 20%	Method Blks	LCS	LCSD	LCS RPD	① MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Trip Blanks		
1	71-55-6	1,1,1-trichloroethane	✓	0.10	NA	✓	✓	✓	✓		NA	NA	NA	NA	NA	NA	NA	NA		
2	79-34-5	1,1,2,2-tetrachloroethane		0.30		✓	✓													
2	79-00-5	1,1,2-trichloroethane		0.10		✓	✓													
1	75-34-3	**1,1-dichloroethane**		0.10		✓	✓													
1	75-35-4	**1,1-dichloroethene**		0.20		✓	✓			✓										
1	107-06-2	**1,2-dichloroethane**		0.10		✓	✓													
1	540-59-0	**1,2-dichloroethene(total)**		0.01		✓	✓													
1	78-87-5	**1,2-dichloropropane**		0.01		✓	✓													
1	78-93-3	**2-butanone (MEK) (10xblk)**	✓	0.01		✓	✓	✓	✓											
~~1~~	~~110-75-8~~	~~2-chloroethyl vinyl ether~~																		
2	591-78-6	2-hexanone (MBK)	✓	0.01		✓	✓	✓	✓											
2	108-10-1	4-methyl-2-pentanone (MIBK)		0.10		✓	✓													
1	67-64-1	**acetone(10xblk)**		0.01	✓	✓	✓													
1	71-43-2	**benzene**		0.50	NA	✓	✓			✓										
1	75-27-4	bromodichloromethane		0.20		✓	✓													
3	75-25-2	bromoform		0.10		✓	✓													
1	74-83-9	bromomethane		0.10		✓	✓													
1	75-15-0	carbon disulfide		0.10		✓	✓													
1	56-23-5	**carbon tetrachloride**		0.10		✓	✓													
2	108-90-7	**chlorobenzene**		0.50		✓	✓			✓										
1	75-00-3	chloroethane		0.01		✓	✓													
1	67-66-3	**chloroform**		0.20		✓	✓													
1	74-87-3	chloromethane		0.10		✓	✓													
1	10061-01-5	cis-1,3-dichloropropene		0.20		✓	✓													
2	124-48-1	dibromochloromethane		0.10		✓	✓													
2	100-41-4	ethylbenzene		0.10	✓	✓	✓													
1	75-09-2	methylene chloride (10xblk)		0.01	✓	✓	✓													
2	100-42-5	styrene		0.30	NA	✓	✓													
2	127-18-4	**tetrachloroethene**		0.20		✓	✓													
2	108-88-3	toluene(10xblk)		0.40		✓	✓			✓										
2	10061-02-6	trans-1,3-dichloropropene		0.10		✓	✓													
1	79-01-6	**trichloroethene**		0.30		0.21	✓			✓										
1	75-01-4	**vinyl chloride**		0.10		✓	✓													
2	1330-20-7	xylenes(total)		0.30		✓	✓													
	108-05-4	vinyl acetate	✓		✓	✓	✓	✓	✓							✓	✓	✓		

Comments:

① No MS/MSD analyzed since samples were field QC. No LCSD analyzed. No other measure of precision.

Notes: Shaded rows are RCRA compounds.

Reviewed By: [signature] Date: 6/5/03

Volatile Organics

Site/Project: S-74, CWLF AR/COC #: 606383 / 606384 Batch #s: 252894

Laboratory: GEL SDG #: 80386 # of Samples: 2 Matrix: aqueous

Surrogate Recovery and Internal Standard Outliers (SW 846 Method 8260)

Sample	SMC 1	SMC 2	SMC 3	IS 1 area	IS 1 RT	IS 2 area	IS 2 RT	IS 3 area	IS 3 RT
All									
Passed									

SMC 1: Bromofluorobenzene
SMC 2: Dibromofluoromethane
SMC 3: Toluene-d8

IS 1: Fluorobenzene
IS 2: Chlorobenzene-d5
IS 3: 1,4-Dichlorobenzene-d4

Comments:

Semivolatile Organics (SW 846 Method 8270)

Site/Project: S-74, CWLF AR/COC #: 606383/606384 Laboratory Sample IDs: 80382-021 to -040

Laboratory: GEL SDG #: 80382

Methods: EPA8270C

# of Samples: 20 Matrix: soil Batch #s: 251759

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blanks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks		
							>.05	<20% / 0.99	20%												
1	A	108-95-2	Phenol	✓	0.80	NA	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	NA	✓	NA		
1	BN	111-44-4	bis(2-Chloroethyl)ether		0.70		✓	✓													
1	A	95-57-8	2-Chlorophenol		0.80		✓	✓			✓	NA	NA	✓	✓	✓					
1	BN	541-73-1	1,3-Dichlorobenzene		0.60		✓	✓													
1	BN	106-46-7	1,4-Dichlorobenzene		0.50		✓	✓			✓	NA	NA	✓	✓	✓					
1	BN	95-50-1	1,2-Dichlorobenzene		0.40		✓	✓													
1	A	95-48-7	o-cresol		0.70		✓	✓			✓	NA	NA	✓	✓	✓					
1	BN	108-60-1	bis(2-chloroisopropyl)ether		0.01		✓	✓													
1	A	N22	m,p-cresols		0.60		✓	✓			✓	NA	NA	✓	✓	✓					
1	BN	621-64-7	N-Nitroso-di-n-propylamine		0.50		✓	✓			✓	NA	NA								
1	BN	67-72-1	Hexachloroethane		0.30		✓	✓			✓	NA	NA								
2	BN	98-95-3	Nitrobenzene		0.20		✓	✓			✓	NA	NA	✓	✓	✓					
2	BN	78-59-1	Isophorone		0.40		✓	✓													
2	A	88-75-5	2-Nitrophenol		0.10		✓	✓													
2	A	105-67-9	2,4-Dimethylphenol		0.20		✓	✓													
2	BN	111-91-1	bis(2-Chloroethoxy)methane		0.30		✓	✓													
2	A	120-83-2	2,4-Dichlorophenol		0.20		✓	✓													
2	BN	120-82-1	1,2,4-Trichlorobenzene		0.20		✓	✓			✓	NA	NA	✓	✓	✓					
2	BN	91-20-3	Naphthalene		0.70		✓	✓													
2	BN	106-47-8	4-Chloroaniline		0.01		✓	✓													
2	BN	87-68-3	Hexachlorobutadiene		0.01		✓	✓			✓	NA	NA	✓	✓	✓					
2	A	59-50-7	4-Chloro-3-methylphenol		0.20		✓	✓			✓	NA	NA	✓	✓	✓					
2	BN	91-57-6	2-Methylnaphthalene		0.40		✓	✓													
3	BN	77-47-4	Hexachlorocyclopentadiene		0.01		✓	✓													
3	A	88-06-2	2,4,6-Trichlorophenol		0.20		✓	✓			✓	NA	NA	✓	✓	✓					
3	A	95-95-4	2,4,5-Trichlorophenol	✓	0.20	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	✓	✓	✓		

Comments:

Notes: Shaded rows are RCRA compounds.

Reviewed By: [signature] Date: 6/6/03

Semivolatile Organics

Site/Project: S-74, CWLF AR/COC #: 606383/606384 Batch #s: 251759

Laboratory: GEL SDG #: 80382 # of Samples: 20 Matrix: soil

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blanks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks (µg/L)	Field Blanks		
							>.05	<20% / 0.99	20%												
3	BN	91-58-7	2-Chloronaphthalene	✓	0.80	NA	✓	✓	✓	✓							NA	✓	NA		
3	BN	88-74-4	2-Nitroaniline (o-)		0.01		✓	✓													
3	BN	131-11-3	Dimethylphthalate		0.01		✓	✓													
3	BN	208-96-8	Acenaphthylene		0.90		✓	✓													
3	BN	606-20-2	2,6-Dinitrotoluene		0.20		✓	✓													
3	BN	99-09-2	3-Nitroaniline (m-)		0.01		✓	✓													
3	BN	83-32-9	Acenaphthene		0.90	✓	✓	✓			✓	NA	NA	✓	✓	✓					
3	A	51-28-5	2,4-Dinitrophenol		0.01	✓	✓	✓	29.3												
3	A	100-02-7	4-Nitrophenol		0.01	NA	✓	✓	✓		✓	NA	NA	✓	✓	✓					
3	BN	132-64-9	Dibenzofuran		0.80		✓	✓													
3	BN	121-14-2	2,4-Dinitrotoluene		0.20		✓	✓			✓	NA	NA	✓	✓	✓					
3	BN	84-66-2	Diethylphthalate		0.01		✓	✓										0.99			
3	BN	7005-72-3	4-Chlorophenyl-phenylether		0.40		✓	✓										✓			
3	BN	86-73-7	Fluorene		0.90		✓	✓													
3	BN	100-01-6	4-Nitroaniline (p-)		0.01	✓	✓	✓													
4	A	534-52-1	4,6-Dinitro-2-methylphenol		0.01	✓	✓	✓													
4	BN	122-39-4	Diphenylamine		0.01	NA	✓	✓													
4	BN	101-55-3	4-Bromophenyl-phenylether		0.10	↓	✓	✓													
4	BN	118-74-1	Hexachlorobenzene		0.10	↓	✓	✓			✓	NA	NA	✓	✓	✓					
4	A	87-86-5	Pentachlorophenol		0.05	✓	✓	✓			✓	NA	NA	✓	✓	✓					
4	BN	85-01-8	Phenanthrene		0.70	NA	✓	✓													
4	BN	120-12-7	Anthracene		0.70		✓	✓													
4	BN	86-74-8	Carbazole		0.01		✓	✓													
4	BN	84-74-2	Di-n-butylphthalate		0.01		✓	✓													
4	BN	206-44-0	Fluoranthene		0.60		✓	✓													
5	BN	129-00-0	Pyrene		0.60		✓	✓			✓	NA	NA	✓	✓	✓					
5	BN	85-68-7	Butylbenzylphthalate		0.01		✓	✓													
5	BN	91-94-1	3,3'-Dichlorobenzidine		0.01		✓	✓													
5	BN	56-55-3	Benzo(a)anthracene		0.80	↓	✓	✓	↓	↓							↓	↓	↓		

Comments:

Semivolatile Organics

Site/Project: S-74, CWLF AR/COC #: 606383/606384 Batch #s: 251759

Laboratory: GEL SDG #: 80382 # of Samples: 20 Matrix: Soil

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blanks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks		
							>.05	<20% / 0.99	20%												
5	BN	218-01-9	Chrysene	✓	0.70	NA	✓	✓	✓	✓							NA	✓	NA		
5	BN	117-81-7	bis(2-Ethylhexyl)phthalate		0.01		✓	✓													
6	BN	117-84-0	Di-n-octylphthalate		0.01		✓	✓													
6	BN	205-99-2	Benzo(b)fluoranthene		0.70		✓	✓													
6	BN	207-08-9	Benzo(k)fluoranthene		0.70		✓	✓													
6	BN	50-32-8	Benzo(a)pyrene		0.70		✓	✓													
6	BN	193-39-5	Indeno(1,2,3-cd)pyrene		0.50		✓	✓													
6	BN	53-70-3	Dibenz(a,h)anthracene		0.40		✓	✓													
6	BN	191-24-2	Benzo(g,h,i)perylene	✓	0.50	✓	✓	✓	✓	✓							✓	✓	✓		

Surrogate Recovery Outliers

Sample	SMC 1	SMC 2	SMC 3	SMC 4	SMC 5	SMC 6	SMC 7	SMC 8
All Passed								

Comments:

SMC 1: Nitrobenzene-d5 (BN)
SMC 2: 2-Fluorobiphenyl (BN)
SMC 3: Terphenyl-d14 (BN)
SMC 4: Phenol-d5 (A)
SMC 5: 2-Fluorophenol (A)
SMC 6: 2,4,6-Tribromophenol (A)
SMC 7: 2-2-Chlorophenol-d4 (A)
SMC 8: 1,2-Dichlorobenzene-d4 (BN)

Internal Standard Outliers

Sample	IS 1-area	IS 1-RT	IS 2-area	IS 2-RT	IS 3-area	IS 3-RT	IS 4-area	IS 4-RT	IS 5-area	IS 5-RT	Is 6-area	IS 6-RT
All Passed												

IS 1: 1,4-Dichlorobenzene-d4 (BN)
IS 2: Naphthalene-d8 (BN)
IS 3: Acenaphthene-d10 (BN)
IS 4: Phenathrene-d10 (BN)
IS 5: Chrysene-d12 (BN)
IS 6: Perylene-d12 (BN)

Semivolatile Organics (SW 846 Method 8270)

Site/Project: S-74, CWLF AR/COC #: 606383/606384 Laboratory Sample IDs: 80386-006 (EB)

Laboratory: GEL SDG #: 80386

Methods: EPA 8270C

# of Samples: 1 Matrix: aqueous Batch #s: 251858

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blanks	LCS	LCSD	LCS RPD	① MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks		
							>.05	<20%/ 0.99	20%												
1	A	108-95-2	Phenol	✓	0.80	NA	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	NA	NA	NA		
1	BN	111-44-4	bis(2-Chloroethyl)ether	✓	0.70		✓	✓													
1	A	95-57-8	2-Chlorophenol	✓	0.80		✓	✓			✓	NA	NA	✓	✓	✓					
1	BN	541-73-1	1,3-Dichlorobenzene	✓	0.60		✓	✓													
1	BN	106-46-7	1,4-Dichlorobenzene		0.50		✓	✓			✓	NA	NA	✓	✓	✓					
1	BN	95-50-1	1,2-Dichlorobenzene		0.40		✓	✓													
1	A	95-48-7	o-cresol	✓	0.70		✓	✓			✓	NA	NA	✓	✓	✓					
1	BN	108-60-1	bis(2-chloroisopropyl)ether	✓	0.01		✓	✓													
1	A	N22	m,p-cresols	✓	0.60		✓	✓			✓	NA	NA	✓	✓	✓					
1	BN	621-64-7	N-Nitroso-di-n-propylamine	✓	0.50		✓	✓			✓	NA	NA								
1	BN	67-72-1	Hexachloroethane	✓	0.30		✓	✓			✓	NA	NA								
2	BN	98-95-3	Nitrobenzene	✓	0.20		✓	✓			✓	NA	NA	✓	✓	✓					
2	BN	78-59-1	Isophorone	✓	0.40		✓	✓													
2	A	88-75-5	2-Nitrophenol	✓	0.10		✓	✓													
2	A	105-67-9	2,4-Dimethylphenol	✓	0.20		✓	✓	-21.4												
2	BN	111-91-1	bis(2-Chloroethoxy)methane	✓	0.30		✓	✓	✓												
2	A	120-83-2	2,4-Dichlorophenol	✓	0.20		✓	✓													
2	BN	120-82-1	1,2,4-Trichlorobenzene	✓	0.20	✓	✓	✓			✓	NA	NA	✓	✓	✓					
2	BN	91-20-3	Naphthalene	✓	0.70	✓	0.62	✓													
2	BN	106-47-8	4-Chloroaniline	✓	0.01	NA	✓	✓													
2	BN	87-68-3	Hexachlorobutadiene	✓	0.01		✓	✓			✓	NA	NA	✓	✓	✓					
2	A	59-50-7	4-Chloro-3-methylphenol	✓	0.20		✓	✓			✓	NA	NA	✓	✓	✓					
2	BN	91-57-6	2-Methylnaphthalene	✓	0.40		✓	✓	✓												
3	BN	77-47-4	Hexachlorocyclopentadiene	✓	0.01		✓	✓	-47.6		17.0	NA	NA	✓	✓	✓					
3	A	88-06-2	2,4,6-Trichlorophenol	✓	0.20		✓	✓	✓		✓										
3	A	95-95-4	2,4,5-Trichlorophenol	✓	0.20	✓	✓	✓	✓		✓						✓	✓	✓		

Notes: Shaded rows are RCRA compounds.

Comments: ~~① No MS/MSD analyzed because the sample was field QC. No LCSD analyzed, No other measure of precision.~~ KAT

① MS/MSD performed on an SVL sample of similar matrix from another SDG.

Reviewed By: [signature] Date: 6/6/03

Semivolatile Organics

Site/Project: S-74, CWLF AR/COC #: 606383/606384 Batch #s: 251858

Laboratory: GEL SDG #: 80386 # of Samples: 1 Matrix: aqueous

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blanks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks		
							>.05	<20% / 0.99	20%												
3	BN	91-58-7	2-Chloronaphthalene	✓	0.80	NA	✓	✓	✓	✓							NA	NA	NA		
3	BN	88-74-4	2-Nitroaniline (o-)	✓	0.01		✓	✓													
3	BN	131-11-3	Dimethylphthalate	✓	0.01		✓	✓													
3	BN	208-96-8	Acenaphthylene	✓	0.90		✓	✓													
3	BN	606-20-2	2,6-Dinitrotoluene	✓	0.20		✓	✓													
3	BN	99-09-2	3-Nitroaniline (m-)	✓	0.01		✓	✓													
3	BN	83-32-9	Acenaphthene	✓	0.90	✓	✓	✓			✓	NA	NA	✓	✓	✓					
3	A	51-28-5	2,4-Dinitrophenol	✓	0.01	✓	✓	✓													
3	A	100-02-7	4-Nitrophenol	✓	0.01	NA	✓	✓	-24.6		✓	NA	NA	✓	✓	✓					
3	BN	132-64-9	Dibenzofuran	✓	0.80	NA	✓	✓	✓												
3	BN	121-14-2	2,4-Dinitrotoluene	✓	0.20	✓	✓	✓			✓	NA	NA	✓	✓	✓					
3	BN	84-66-2	Diethylphthalate	✓	0.01	NA	✓	✓													
3	BN	7005-72-3	4-Chlorophenyl-phenylether	✓	0.40		✓	✓													
3	BN	86-73-7	Fluorene	✓	0.90		✓	✓													
3	BN	100-01-6	4-Nitroaniline (p-)	✓	0.01	✓	✓	✓													
4	A	534-52-1	4,6-Dinitro-2-methylphenol	✓	0.01	✓	✓	✓													
4	BN	122-39-4	Diphenylamine	✓	0.01	NA	✓	✓													
4	BN	101-55-3	4-Bromophenyl-phenylether	✓	0.10		✓	✓													
4	BN	118-74-1	Hexachlorobenzene	✓	0.10		✓	✓			✓	NA	NA	✓	✓	✓					
4	A	87-86-5	Pentachlorophenol	✓	0.05		✓	✓			✓	NA	NA	✓	✓	✓					
4	BN	85-01-8	Phenanthrene	✓	0.70		✓	✓													
4	BN	120-12-7	Anthracene	✓	0.70		✓	✓													
4	BN	86-74-8	Carbazole	✓	0.01		✓	✓													
4	BN	84-74-2	Di-n-butylphthalate	✓	0.01		✓	✓													
4	BN	206-44-0	Fluoranthene	✓	0.60		✓	✓													
5	BN	129-00-0	Pyrene	✓	0.60		✓	✓			✓	NA	NA	✓	✓	✓					
5	BN	85-68-7	Butylbenzylphthalate	✓	0.01		✓	✓													
5	BN	91-94-1	3,3'-Dichlorobenzidine	✓	0.01		✓	✓													
5	BN	56-55-3	Benzo(a)anthracene	✓	0.80	✓	✓	✓	✓	✓							✓	✓	✓		

Comments:

Semivolatile Organics

Site/Project: S-74, OWLF AR/COC #: 666383/666384 Batch #s: 251858

Laboratory: CEL SDG #: 80386 # of Samples: 1 Matrix: aqueous

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blanks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks		
							>.05	<20% / 0.99	20%												
5	BN	218-01-9	Chrysene	✓	0.70	NA	✓	✓	✓	✓							NA	NA	NA		
5	BN	117-81-7	bis(2-Ethylhexyl)phthalate	✓	0.01	✓	✓	✓													
6	BN	117-84-0	Di-n-octylphthalate	✓	0.01	✓	✓	✓													
6	BN	205-99-2	Benzo(b)fluoranthene	✓	0.70	NA	✓	✓													
6	BN	207-08-9	Benzo(k)fluoranthene	✓	0.70		✓	✓													
6	BN	50-32-8	Benzo(a)pyrene	✓	0.70		✓	✓													
6	BN	193-39-5	Indeno(1,2,3-cd)pyrene	✓	0.50		✓	✓													
6	BN	53-70-3	Dibenz(a,h)anthracene	✓	0.40	✓	✓	✓													
6	BN	191-24-2	Benzo(g,h,i)perylene	✓	0.50	NA	✓	✓													

Surrogate Recovery Outliers

Sample	SMC 1	SMC 2	SMC 3	SMC 4	SMC 5	SMC 6	SMC 7	SMC 8
All Passed								

Comments:

SMC 1: Nitrobenzene-d5 (BN) SMC 2: 2-Fluorobiphenyl (BN) SMC 3: Terphenyl-d14 (BN)
SMC 4: Phenol-d5 (A) SMC 5: 2-Fluorophenol (A) SMC 6: 2,4,6-Tribromophenol (A)
SMC 7: 2-2-Chlorophenol-d4 (A) SMC 8: 1,2-Dichlorobenzene-d4 (BN)

Internal Standard Outliers

Sample	IS 1-area	IS 1-RT	IS 2-area	IS 2-RT	IS 3-area	IS 3-RT	IS 4-area	IS 4-RT	IS 5-area	IS 5-RT	Is 6-area	IS 6-RT
All Passed												

IS 1: 1,4-Dichlorobenzene-d4 (BN) IS 2: Naphthalene-d8 (BN) IS 3: Acenaphthene-d10 (BN)
IS 4: Phenathrene-d10 (BN) IS 5: Chrysene-d12 (BN) IS 6: Perylene-d12 (BN)

PCBs (SW 846 - Method 8082)

Site/Project: S-74, CWLF AR/COC #: 606383/606384 Laboratory Sample IDs: 80382-021 to -040

Laboratory: GEL SDG #: 80382

Methods: EPA 8082

# of Samples: 20 Matrix: Soil Batch #s: 251754

CAS #	Name	TCL	Intercept	Calib RSD / R^2 <20% / 0.99	CCV %D 20%	Method Blanks	LCS	LCSD	LCS RPD 20%	MS	MSD	MS RPD 20%	Field Dup. RPD	Equip. Blanks (µg/L)	Field Blanks		
12674-11-2	Aroclor-1016	✓	NA	✓	✓	✓	✓	NA	NA	✓	✓	✓	NA	✓	NA		
11104-28-2	Aroclor-1221			NA													
11141-16-5	Aroclor-1232			"													
53469-21-9	Aroclor-1242			✓	✓									0.099			
12672-29-6	Aroclor-1248													✓			
11097-69-1	Aroclor-1254				✓												
11096-82-5	Aroclor-1260	✓			✓		✓	NA	NA	✓	✓	✓					

Sample	SMC % REC	SMC RT	Sample	SMC % REC	SMC RT
-037 (20X)	DCB=243	✓			
-040 (50X)	" = 178				

Comments:

① Samples -024, -026, -029, -030 & -031 were initially dil. due to oily matrix of extracts. (10X) → All

② Samples -036, -037, -038, -039 & -040 were dil. to over-range target analytes. (50X, 20X, 20X, 10X, 50X)

Confirmation

Sample	CAS #	RPD > 25%	Sample	CAS #	RPD > 25%
-022	Aroclor-1260	34.7	-038 (20X)	Aroclor-1260	28.9
-028	-1254	25.4			
-030 (10X)	-1242	34.1			
-032	-1242	31.6			
-033	-1254	29.3			
-036 (50X)	-1260	44.9			

Reviewed By: [signature] Date: 6/6/03

PCBs (SW 846 - Method 8082)

Site/Project: S-74, CWLF AR/COC #: 606383/606384 Laboratory Sample IDs: 80386

Laboratory: GEL SDG #: 80386

Methods: EPA8082

# of Samples: 1 Matrix: aqueous Batch #s: 252011

CAS #	Name	TCL	Intercept	Calib RSD / R^2 <20% / 0.99	CCV %D 20%	Method Blanks	LCS	LCSD	LCS RPD 20%	① MS	MSD	MS RPD 20%	Field Dup. RPD	Equip. Blanks	Field Blanks		
12674-11-2	Aroclor-1016	✓	NA	✓	✓	✓	✓	~~NA~~ ✓	~~NA~~ ✓	NA	NA	NA	NA	NA	NA		
11104-28-2	Aroclor-1221			NA													
11141-16-5	Aroclor-1232																
53469-21-9	Aroclor-1242			✓	✓												
12672-29-6	Aroclor-1248																
11097-69-1	Aroclor-1254																
11096-82-5	Aroclor-1260	✓		✓	✓	✓	✓	~~NA~~ ✓	~~NA~~ ✓								

Sample	SMC % REC	SMC RT	Sample	SMC % REC	SMC RT
~~MS~~ ~~All~~ LCS	DCB = 25 (<30%)	✓			
~~A~~ LCSD	DCB = 24 (")	✓			

Comments:
① MS/MSD not analyzed due to insufficient sample vol.. LCSD analyzed for precision.

Confirmation

Sample	CAS #	RPD > 25%	Sample	CAS #	RPD > 25%
All Passed					

Reviewed By: [signature] Date: 6/6/03

Inorganic Metals

Site/Project: S-74, CWLF AR/COC #: 606383/606384 Laboratory Sample IDs: 80382-021 to -040

Laboratory: GEL SDG #: 80382

Methods: EPA6010B (ICP-AES), EPA7470/1A (CVAA)

# of Samples: 20 Matrix: soil Batch #s: 251739, 252184

CAS #/ Analyte	QC Element																			
	TAL	ICV	CCV	(µg/L) ICB	(µg/L) CCB	(mg/kg) Method Blanks	LCS	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilu-tion	Field Dup. RPD	(µg/L) Equip. Blanks	Field Blanks		
7429-90-5 Al																NA		NA		
7440-39-3 Ba	✓	✓	✓	✓	0.727	✓	✓	NA	NA	NA	NA	NA	✓	✓	✓		3.38			
7440-41-7 Be	✓	↓	↓	↓	✓	↓	↓	↓	↓	✓	✓	✓	NA	↓	NA		0.229			
7440-43-9 Cd	✓	↓	↓	↓	✓	↓	↓	↓	↓	✓	✓	✓	✓	↓	NA					
7440-70-2 Ca																				
7440-47-3 Cr	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	✓	✓	NA		3.41			
7440-48-4 Co																				
7440-50-8 Cu	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	✓	✓	NA		2.04			
7439-89-6 Fe																				
7439-95-4 Mg																				
7439-96-5 Mn																				
7440-02-0 Ni	✓	✓	✓	1.28	1.64	✓	✓	NA	NA	✓	✓	✓	✓	✓	NA		2.47			
7440-09-7 K																				
7440-22-4 Ag	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	NA	✓	NA		✓			
7440-23-5 Na																				
7440-62-2 V																				
7440-66-6 Zn																				
7439-92-1 Pb	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	82.0	✓	✓		4.64			
7782-49-2 Se	✓	↓	↓	1.68	3.56	✓	↓	↓	↓	↓	↓	↓	NA	↓	NA		✓			
7440-38-2 As	✓	↓	↓	✓	✓	0.246	↓	↓	↓	↓	↓	↓	✓	↓	NA		✓			
7440-36-0 Sb																				
7440-28-0 Tl																				
7439-97-6 Hg	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	✓	NA	NA	↓	✓	↓		
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 / l

Comments: ① All samples dil. std. 2X for ICP soils. Samples -022, -024, -036, -037, -038, -039, + -040 dil. to bring Hg into calib. range.

Reviewed By: [signature] Date: 6/6/03

Inorganic Metals

Site/Project: S-74, CWLF AR/COC #: 606383/606384 Laboratory Sample IDs: 80386-003 (EB)

Laboratory: GEL SDG #: 80386

Methods: EPA6010B (ICP-AES), EPA7470A (CVAA)

# of Samples: 1 Matrix: aqueous Batch #s: 251815, 252749

CAS #/ Analyte	QC Element																			
	TAL	ICV	CCV	ICB (µg/L)	CCB (µg/L)	(µg/L) Method Blanks	LCS	LCSD	LCSD RPD	(1) MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilution	Field Dup. RPD	Equip. Blanks	Field Blanks		
7429-90-5 Al																NA	NA	NA		
7440-39-3 Ba	✓	✓	✓	✓	0.309	✓	✓	NA	NA	✓	NA	NA	NA	✓	NA					
7440-41-7 Be	✓	↓	↓	↓	0.335	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓					
7440-43-9 Cd	✓	↓	↓	↓	0.351	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓					
7440-70-2 Ca																				
7440-47-3 Cr	✓	✓	✓	-1.33	1.05/1.76	✓	✓	NA	NA	✓	NA	NA	NA	✓	NA					
7440-48-4 Co																				
7440-50-8 Cu	✓	✓	✓	✓	2.78/1.47	1.61	✓	NA	NA	✓	NA	NA	NA	✓	NA					
7439-89-6 Fe																				
7439-95-4 Mg																				
7439-96-5 Mn																				
7440-02-0 Ni	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	NA	NA	NA	✓	NA					
7440-09-7 K																				
7440-22-4 Ag	✓	✓	✓	-2.54	-2.04	✓	✓	NA	NA	✓	NA	NA	NA	✓	NA					
7440-23-5 Na																				
7440-62-2 V																				
7440-66-6 Zn																				
7439-92-1 Pb	✓	✓	✓	✓	✓	2.86	✓	NA	NA	✓	NA	NA	NA	✓	NA					
7782-49-2 Se	✓	↓	↓	✓	✓	✓	↓	↓	↓	↓	↓	↓	↓	↓	↓					
7440-38-2 As	✓	↓	↓	-2.54	-2.33	✓	↓	↓	↓	↓	↓	↓	↓	↓	↓					
7440-36-0 Sb																				
7440-28-0 Tl																				
7439-97-6 Hg	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	NA	NA	NA	NA	NA	↓	↓	↓		
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 / l

Comments: (1) MS + Rep. for Hg performed on an SVL sample of similar matrix. See another SDG.

Reviewed By: [signature] Date: 6/6/03

General Chemistry

Site/Project: S-74, CWLF AR/COC #: 606383/606384 Laboratory Sample IDs: 80382-021 to -040

Laboratory: GEL SDG #: 80382/80386 80386-004 (EB)

Methods: EPA7196A (Cr+6)

# of Samples: 21 Matrix: 20 soil / 1 aqueous Batch #s: 251904/252802, 251721

CAS #	Analyte	QC Element																		
		TAL	ICV	CCV	ICB	CCB	Method Blanks	LCS	LCSD	LCSD RPD	① MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilution	Field Dup. RPD	Equip. Blanks	Field Blanks	
18540-29-9	Cr+6 (aq.)	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓/~~44~~	✓/~~44~~	✓	✓	NA	NA	NA	NA	NA	
↓	Cr+6 (soil)	✓	✓	✓	✓	✓	✓	✓	↓	↓	70/44	65/44	✓	✓	↓	↓	↓	5.45 µg/L	↓	

Comments: ① 2nd MS/MSD applies to samples -038, -039, + -040 only. This MS/MSD performed on an SNL sample of similar matrix from another SDG.

Reviewed By: [signature] Date: 6/6/03

Radiochemistry

Site/Project: S-74, CWLF AR/COC #: 606383/606384 Laboratory Sample IDs: 80382-061 to -080 (G.S.) + -041 to -060 (Tritium)

Laboratory: GEL SDG #: 80382

Methods: EPA 906.0 (H3), HASL 300, 4.5.2.3 (Gamma Spec)

# of Samples: 40 Matrix: aqueous Batch #s: 252327 (G.S.), 252665/252666

Analyte	QC Element												
	Method Blanks	LCS	① MS	Rep RER	Equip. Blanks	Field Dup. RER	Field Blanks	Sample ID	Isotope	IS/Trace	Sample ID	Isotope	IS/Trace
Criteria	U	20%	25%	<1.0	U	<1.0	U			50-105			50-105
H3	✓	✓	✓	✓	NA	NA	NA						
U-238								NA					
U-234													
U-235/-236													
Th-232													
Th-228													
Th-230													
Pu-239/-240													
Gross Alpha													
Nonvolatile Beta													
Ra-226													
Ra-228													
Ni-63													
Gamma Spec. Am-241	✓	✓	NA	✓	NA	NA	NA						
Gamma Spec. Cs-137	↓	↓	↓	↓	↓	↓	↓						
Gamma Spec. Co-60	↓	↓	↓	↓	↓	↓	↓						

Parameter	Method	Typical Tracer	Typical Carrier
Iso-U	Alpha spec.	U-232	NA
Iso-Pu	Alpha spec.	Pu-242	NA
Iso-Th	Alpha spec.	Th-229	NA
Am-241	Alpha spec.	Am-242	NA
Sr-90	Beta	Y ingrowth	NA
Ni-63	Beta	NA	Ni by ICP
Ra-226	Deamination	NA	NA
Ra-226	Alpha spec.	Ba-133 or Ra-225	NA
Ra-228	Gamma spec.	Ba-133	NA

Gamma spec. LCS contains: Am-241, Cs-137, and Co-60

Comments:
① MS + Rep. for sample -051 performed on an SNL sample of similar matrix from another SDG.

Reviewed By: [signature] Date: 6/6/03

Sample Findings Summary

Site: S-74, CWLF **AR/COC:** 606397 **Data Type:** Organic, Inorganic, RAD (Page 1/2)

Sample ID	VOCs:	EPA8260B (All VOCS, except...)	67-64-1 (acetone)	79-01-6 (trichloroethene)	SVOCs:	EPA8270C (All SVOCs, except...)	534-52-1 (4,6-dinitro-2-methylphenol)	PCBs:	EPA8082 (All PCBs, except...)	53469-21-9 (Arcolor-1242)	11097-69-1 (Aroclor-1254)	11096-82-5 (Aroclor-1260)	Metals:	7440-39-3 (Ba)	7440-41-7 (Be)	7440-50-8 (Cu)	7440-47-3 (Cr)	7782-49-2 (Se)	7439-92-1 (Pb)	7440-22-4 (Ag)	EPA7196A (Cr+6)
	Method/CAS Number (Analysis/Analyte)																				
062024-001 74-SB-E002-F091				UJ																	
062025-001 74-SB-E002-F092				UJ																	
062025-005 74-SB-E002-F092-TB		P2	P2	UJ,P2																	
062026-001 74-SB-E002-F093				UJ																	
062027-001 74-SB-E002-F107				UJ																	
062028-001 74-SB-E002-F108				UJ																	
062029-001 74-SB-E002-F109				J																	
062030-001 74-SB-E002-F123				UJ																	
062031-001 74-SB-E002-F124				UJ																	
062032-001 74-SB-E002-F125				UJ																	
062033-001 74-SB-E002-F126			J	UJ																	
062033-005 74-SB-E002-F126-EB		P2	P2	UJ,P2																	
062033-010 74-SB-E002-F126-DU			J	UJ																	
062024-002 74-SB-E002-F091											J					J,A2				UJ,B3	UJ,A2
062025-002 74-SB-E002-F092										J,A1	J,A1					J,A2				UJ,B3	J,A2
062026-002 74-SB-E002-F093												J				J,A2				UJ,B3	J,A2
062027-002 74-SB-E002-F107																J,A2		J,B3		J,B3	J,A2
062028-002 74-SB-E002-F108											J					J,A2		J,B3		J,B3	J,A2
062029-002 74-SB-E002-F109									UJ,A1	J,A1	J,A1	UJ,A1				J,A2				UJ,B3	J,A2
062030-002 74-SB-E002-F123																J,A2				UJ,B3	J,A2
062031-002 74-SB-E002-F124																J,A2				UJ,B3	J,A2
062032-002 74-SB-E002-F125																J,A2		J,B3		J,B3	J,A2
062033-002 74-SB-E002-F126										J,A1	J,A1					J,A2				UJ,B3	J,A2
062033-009 74-SB-E002-F126-EB						P2	UJ,P2														
062033-014 74-SB-E002-F126-DU																					
062033-008 74-SB-E002-F126-EB									P2	P2	P2	P2									
062033-006 74-SB-E002-F126-EB														J,B3	J,B3	UJ,B3	UJ,B3		UJ,B3		
062033-011 74-SB-E002-F126-DU																J,A2				UJ,B3	
062033-007 74-SB-E002-F126-EB																					R,HT
062033-012 74-SB-E002-F126-DU																					J,A2

Validated By: Mr. Kenneth Salaz **Date:** 06/11/03

Sample Findings Summary

Site: S-74, CWLF **AR/COC:** 606397 **Data Type:** Organic, Inorganic, RAD (Page 2/2)

Sample ID	RAD:	All Gamma Spec results flagged "X" by the lab (see EDD)	15100-28-4 (Pa-234)	13967-70-9 (Cs-134)	14932-40-2 (Th-231)	13982-39-3 (Zn-65)
		Method/CAS Number (Analysis/Analyte)				
062024-004 74-SB-E002-F091		R		R		
062025-004 74-SB-E002-F092		R				
062026-004 74-SB-E002-F093		R				
062027-004 74-SB-E002-F107		R			J	
062028-004 74-SB-E002-F108		R				
062029-004 74-SB-E002-F109		R		J	J	
062030-004 74-SB-E002-F123		R				
062031-004 74-SB-E002-F124		R	J			
062032-004 74-SB-E002-F125		R		J		J
062033-004 74-SB-E002-F126		R				

Analytical Quality Associates, Inc.
616 Maxine NE
Albuquerque, NM 87123
Phone: 505-299-5201
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MEMORANDUM

DATE: June 11, 2003

TO: File

FROM: Kenneth Salaz

SUBJECT: Radiochemical Data Review and Validation - SNL
S-74, CWLF; ARCOC #606397,
GEL SDG #80612, Case No. 7221.02.02.03

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM ER Project AOP 00-03.

Summary

All samples were prepared and analyzed with approved procedures using methods EPA906.0 Tritium and HASL300, 4.5.2.3 Gamma Spec.

1. Gamma Spec Analysis: Several Gamma Spec results for all samples were "X" flagged by the laboratory due to low abundance or lack of a valid peak (see Electronic Data Deliverable). Thus, these sample results will be qualified "R" (unusable).

2. Gamma Spec Analysis: The replicate relative error ratio (RER) of Th-231 was greater than (>) 1 but less than (<) 3. The associated results of samples 80612-035 and -037 will be qualified "J." It should be noted that the associated results of all other samples were al ready qualified (see #1 above).

3. Gamma Spec Analysis: The Cs-134 results of samples 80612-032, -037, and -040, the Pa-234 result of sample -039, and the Zn-65 result of sample -040, were negative, and the absolute values were > the associated MDAs. Thus, these samples results will be qualified "R" (unusable).

Data are acceptable except as noted above. 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: The case narratives stated the instruments used were properly calibrated.

Blanks

All Analyses: No target analytes were detected in the blanks at concentrations > the associated MDAs.

Matrix Spike (MS) Analysis

Gamma Spec Analysis: No MS analysis was required for this method.

Tritium Analysis: The MS analysis met all QC acceptance criteria.

Laboratory Control Sample (LCS) Analysis

All Analyses: The LCS analyses met all QC acceptance criteria.

Replicates

Gamma Spec Analysis: The replicate analysis met QC acceptance criteria except as noted above in the summary section.

Tritium Analysis: The replicate analysis met all QC acceptance criteria.

Tracer/Carrier Recoveries

All Analyses: No tracers/carriers were required for these methods.

Negative Bias

Gamma Spec Analysis: Sample results met negative bias QC acceptance criteria except as noted above in the summary section.

Tritium Analysis: All sample results met negative bias QC acceptance criteria.

Other QC

All Analyses: No field duplicates, equipment blanks (EBs), or field blanks (FBs) were submitted on the ARCOC.

No other specific issues were identified which affect data quality.

Analytical Quality Associates, Inc.
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MEMORANDUM

DATE: June 11, 2003

TO: File

FROM: Kenneth Salaz

SUBJECT: Organic Data Review and Validation - SNL
S-74, CWLF; ARCOC #606397,
GEL SDG #80612/80614, Case No. 7221.02.02.03

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM ER Project AOP 00-03.

Summary

All samples were prepared and analyzed with approved procedures using methods EPA8260A/B VOCs, EPA8270C SVOCs, and EPA8082 PCBs. Problems were identified with the data package that result in the qualification of data.

1. VOC Analysis: For the trip blank (TB), equipment blank (EB), and the soil samples, the initial calibration response factors (RFs) of trichloroethene were less than (<) the required minimum but greater than (>) 0.01. The associated result of soil sample 80612-006 was a detect and, thus, will be qualified "J." All other associated sample results were non-detect (ND) and, thus, will be qualified "UJ." For the soil samples, the continuing calibration verification (CCV) percent difference (%D) of acetone was >20% but <40%. The associated results of samples 80612-010 and -011 were detects and, thus, will be qualified "J."

   SVOC Analysis: For the EB, the initial calibration correlation coefficient (R^2 value) of 4,6-dinitro-2-methylphenol was <0.99 but >0.90, and the CCV %D was >20% but <40%. The associated sample result was ND and, thus, will be qualified "UJ," based on professional judgment.

2. PCB Analysis: For soil sample 80612-017, the DCB and 4cmx surrogate percent recoveries (%Rs) were 0% due to initial dilution, with some sample results > the reporting limit (RL) . Also, the DCB and/or 4cmx surrogate %Rs for soil samples -013 and -021 were > QC acceptance limits. The Aroclor-1242 and -1254 results of these samples were detects and, thus, will be qualified "J,A1." All other results of sample -017 were ND and, thus, will be qualified "UJ,A1."

3. VOC Analysis: For the EB and TB, no MSD, LCSD, Replicate, or other measure of precision was analyzed. All results for these samples were ND and, thus, will be qualified "P2."

   SVOC Analysis: The MS/MSD for the EB was performed on a non-SNL sample from another SDG, and no other measure of precision was performed. All results for this sample were ND and, thus, will be qualified "P2."

PCB Analysis: For the EBs, no MSD, LCSD, Replicate, or other measure of precision was analyzed. All results for these samples were ND and, thus, will be qualified "P2."

4. PCB Analysis: The confirmation relative percent differences (RPDs) of Aroclor-1254 for soil samples 80612-012 and -016 and Aroclor-1260 for sample -014 were >25% but <75%. The associated sample results will be qualified "J."

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 method specified holding times and properly preserved.

Calibration

VOC Analysis: The initial and continuing calibrations met QC acceptance criteria except for the following. For the soil samples, the CCV %Ds of methylene chloride and carbon disulfide were >20% but <40%. However, all associated sample results were ND and, thus, will not be qualified.

SVOC Analysis: The initial and continuing calibrations met QC acceptance criteria except as noted above in the Summary section and the following. For the EB, the initial calibration R^2 value of di-n-octylphthalate was <0.99 but >0.90, and the CCV %Ds of several other compounds (see SVOC DV worksheet) were >20% but <40%. For the soil samples, the initial calibration R^2 value of 4,nitrophenol was <0.99 but >0.90, and the CCV %D of 4-bromophenyl-phenylether was >20% but <40%. However, all associated sample results were ND and, thus, will not be qualified.

PCB Analysis: The initial and continuing calibrations met all QC acceptance criteria.

Blanks

VOC/SVOC Analyses: No target analytes were detected in the blanks.

PCB Analysis: In the EB, Aroclor-1242 and -1254 were detected. However, all associated sample results were >5X the blank concentrations and, thus, will not be qualified. No other target analytes were detected in the blanks.

Surrogates

VOC/SVOC Analyses: All surrogate %Rs met QC acceptance criteria.

PCB Analysis: The surrogate %Rs met QC acceptance criteria except as noted above in the summary section and the following. For soil sample 80612-020, the 4cmx surrogate %R was just slightly > the QC acceptance limit. No sample data will be qualified as a result, based on professional judgment.

Internal Standards (ISs)

VOC/SVOC Analyses: The IS areas and retention times (RTs) met all QC acceptance criteria.

PCB Analysis: No ISs were required for this method.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analyses

VOC Analysis: The MS/MSD analyses for the soil samples met all QC acceptance criteria. No MS/MSD or any other measure of precision was performed for the EB and TB, as noted above in the Summary section.

SVOC Analysis: The MS/MSD analyses for the soil samples met all QC acceptance criteria. No MS/MSD or any other measure of precision was performed for the EB, as noted above in the Summary section.

PCB Analysis: The MS/MSD %Rs of Aroclor-1016 and -1260 were > QC acceptance limits. The case narrative stated that these failures were due to overlapping peaks from high concentrations of -1242 and -1254 present in the sample. No sample data will be qualified based on professional judgment. No MS/MSD or any other measure of precision was performed for the EB, as noted above in the Summary section.

Laboratory Control Sample (LCS/LCSD) Analyses

All Analyses: The LCS analyses met all QC acceptance criteria. No LCSD analyses were performed. No sample data will be qualified as a result.

Confirmation Analyses

PCB Analysis: Confirmation analyses met QC acceptance criteria except as noted above in the Summary section.

VOC/SVOC Analyses: No confirmation analyses were required for these methods.

Detection Limits/Dilutions

VOC/SVOC Analyses: All detection limits were properly reported. No samples were diluted.

PCB Analysis: All detection limits were properly reported. All soil were diluted (see COAs for dilution factors) due to over-range detects. No other samples were diluted.

Other QC

VOC Analysis: A field duplicate was submitted. However, there are no "required" review criteria for field duplicate analyses comparability. A TB and EB were also submitted. No field blank (FB) was submitted on the ARCOC.

SVOC/PCB Analyses: Field duplicates were submitted. However, there are no "required" review criteria for field duplicate analyses comparability. EBs were also submitted. No FBs were submitted on the ARCOC.

No other specific issues were identified which affect data quality.

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MEMORANDUM

DATE: June 11, 2003

TO: File

FROM: Kenneth Salaz

SUBJECT: Inorganic Data Review and Validation - SNL
S-74, CWLF; ARCOC #606397,
GEL SDG #80612/80614, Case No. 7221.02.02.03

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM ER Project AOP 00-03.

Summary

All samples were prepared and analyzed with approved procedures using methods EPA6010B ICP-AES Metals, EPA7470/1A CVAA, and EPA7196A (Cr+6). Problems were identified with the data package that result in the qualification of data.

1. Cr+6 Analysis: The equipment blank (EB) was received by the laboratory beyond 2X the method specified holding time. The sample result was non-detect (ND) and, thus, will be qualified "R,HT" (unusable).

2. ICP Analysis: In the initial calibration blank (ICB) and/or continuing calibration blank (CCB) for the EB, barium (Ba) and beryllium (Be) were detected. The associated sample results were detects less than (<) 5X the blank concentration and, thus, will be qualified "J,B3." In the CCB for the EB, chromium (Cr), copper (Cu), and lead (Pb) were detected at negative concentrations. The absolute values were greater than (>) the detection limit (DL) but < the reporting limit (RL). The associated sample results were ND and, thus, will be qualified "UJ,B3."

   In the ICB for the soil samples, selenium (Se) was detected, and silver (Ag) was detected at negative concentrations. The absolute values were > the DL but < the RL. The Se and Ag results of samples 80612-015, -016, and -020 were detects < 5X the blank concentration/<5X the DL and, thus, will be qualified "J,B3." The Ag results of all other samples were ND and, thus, will be qualified "UJ,B3."

3. ICP Analysis: The MS percent recovery (%R) of Cu for the soil samples was <75% but >30%. All associated sample results were detects and, thus, will be qualified "J,A2."

   Cr+6 Analysis: The MS/MSD %Rs for the soil samples were <75% but <30%. The associated result of sample 80612-012 was ND and, thus, will be qualified "UJ,A2." All other associated sample results were detects and, thus, will be qualified "J,A2."

Data are acceptable except as noted above. 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 method specified holding times and properly preserved.

Calibration

All Analyses: The initial and continuing calibrations met all QC acceptance criteria.

Blanks

ICP Analysis: No target analytes were detected in the blanks except as noted above in the summary section and the following. In the In the ICB and/or CCB for the EB, cadmium (Cd), nickel (Ni), and Ag were detected. However, all associated sample results were ND and, thus, will not be qualified. In the EB, Ba and Be were detected. However, all associated sample results were >5X the blank concentrations and, thus, will not be qualified.

CVAA/Cr+6 Analyses: No target analytes were detected in the blanks.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analyses

ICP Analysis: The MS analysis for the soil samples met QC acceptance criteria except as noted above in the summary section. No MSD analysis was performed. The replicate analysis was used as a measure of laboratory precision. No MS/MSD analyses were performed for the EB. An LCSD was analyzed as a measure of precision. No sample data will be qualified as a result.

CVAA Analysis: The MS analyses met all QC acceptance criteria. No MSD analyses were performed. The replicate analyses were used as measures of laboratory precision. It should be noted that the MS analysis for the EB was performed on an SNL sample of similar matrix from another SDG. No sample data will be qualified as a result.

Cr+6 Analysis: The MS analysis for the EB met all QC acceptance criteria. No MSD analysis was performed. The replicate analysis was used as a measure of laboratory precision. The MS/MSD analyses for the soil samples did not meet QC acceptance criteria, as noted above in the Summary section.

Laboratory Control Sample (LCS/LCSD) Analyses

ICP Analysis: The LCS/LCSD analyses for the EB, as well as the LCS analysis for the soil samples, met all QC acceptance criteria. No LCSD analysis was performed for the soil samples. No sample data will be qualified as a result.

CVAA/Cr+6 Analyses: The LCS analyses met all QC acceptance criteria. No LCSD analyses were performed. No sample data will be qualified as a result.

Replicate Analysis

All Analyses: The replicate analyses met all QC acceptance criteria.

ICP Interference Check Sample (ICS)

ICP Analysis: The ICS met all QC acceptance criteria.

CVAA/Cr+6 Analyses: No ICS was required for these methods.

ICP Serial Dilution

ICP Analysis: The serial dilution analysis met all QC acceptance criteria.

CVAA/Cr+6 Analyses: No serial dilution was required for these methods.

Detection Limits/Dilutions

ICP Analysis: All detection limits were properly reported. All soil samples were diluted the standard 2X. No other samples were diluted.

CVAA Analysis: All detection limits were properly reported. All soil samples, except 80612-012, were diluted (see COAs for dilution factors) in order to bring Hg concentrations into the calibration range. No other samples were diluted.

Cr+6 Analysis: All detection limits were properly reported. Soil samples 80612-016 and -017 were diluted 5X and 2X, respectively, due to high concentrations of target analytes. No other samples were diluted.

Other QC

All Analyses: Field duplicates were submitted. However, there are no "required" review criteria for field duplicate analyses comparability. EBs were also submitted. No field blanks (FBs) were submitted on the ARCOC.

No other specific issues were identified which affect data quality.

Data Validation Summary

Site/Project: S-74, CWLF Project/Task #: 7221.02.02.03 # of Samples: 51 Matrix: 45 soil / 6 aqueous (1 TB + 5 EB)

AR/COC #: 606397 Laboratory Sample IDs: 80612-001 to -045

Laboratory: GEL 80614-001 to -006

SDG #: 80612 / 80614

QC Element	Analysis									
	Organics				Inorganics				RAD	Other
	VOC	SVOC	Pesticide/ PCB	HPLC (HE)	ICP/AES	GFAA/ AA	CVAA (Hg)	CN		
1. Holding Times/Preservation	✓	✓	✓	NA	✓	NA	✓	NA	✓	R, HT
2. Calibrations	J; UJ	UJ	✓		✓		✓		✓	✓
3. Method Blanks	✓	✓	✓		J, B3 UJ, B3		✓		✓	✓
4. MS/MSD	~~✓~~ P2	P2	~~P2 NA~~		J, A2		✓		✓	J, A2 UJ, A2
5. Laboratory Control Samples	✓	✓	✓		✓		✓		✓	✓
6. Replicates					✓		✓		J	NA
7. Surrogates	✓	✓	J, A1 UJ, A1							
8. Internal Standards	✓	✓								
9. TCL Compound Identification	✓	✓								
10. ICP Interference Check Sample					✓					
11. ICP Serial Dilution					✓					
12. Carrier/Chemical Tracer Recoveries									NA	
13. Other QC	✓	✓	✓		NA		✓		R	

J = Estimated
U = Not Detected
UJ = Not Detected, Estimated
R = Unusable

Check (√) = Acceptable
Shaded Cells = Not Applicable (also "NA")
NP = Not Provided
Other: _____

Reviewed By: [signature] Date: 6/10/03

Holding Time and Preservation

Site/Project: S-74, CWLF AR/COC #: 606397 Laboratory Sample IDs: 80612-001 to -045

Laboratory: GEL SDG #: 80612/80614 80614-001 to -006

# of Samples: 51 Matrix: Soil / aqueous

Sample ID	Analytical Method	Holding Time Criteria	Days Holding Time was Exceeded	Preservation Criteria	Preservation Deficiency	Comments
80614-004 (EB)	EPA 7196 (Cr+6)	24 hours	4	NA	NA	Sample received by lab beyond 2X H.T.

Reviewed By: [signature] Date: 6/10/03

Volatile Organics (SW 846 Method 8260)

Site/Project: S-74, CWLF AR/COC #: 606397 # of Samples: 2 Matrix: aqueous

Laboratory: CEL SDG #: 80614 Laboratory Sample IDs: 80614-001(TB) + -002(FB)

Methods: EPA8260B Batch #s: 252894

IS	CAS #	Name	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Trip Blanks		
						>.05	<20% / 0.99	20%												
1	71-55-6	1,1,1-trichloroethane	✓	0.10	NA	✓	✓	✓	✓							NA	NA	NA		
2	79-34-5	1,1,2,2-tetrachloroethane		0.30		✓	✓													
2	79-00-5	1,1,2-trichloroethane		0.10		✓	✓													
1	75-34-3	1,1-dichloroethane		0.10		✓	✓													
1	75-35-4	1,1-dichloroethene		0.20		✓	✓			✓	NA	NA	NA	NA	NA					
1	107-06-2	1,2-dichloroethane		0.10		✓	✓													
1	540-59-0	1,2-dichloroethene(total)		0.01		✓	✓													
1	78-87-5	1,2-dichloropropane		0.01		✓	✓													
1	78-93-3	2-butanone (MEK) (10xblk)	✓	0.01		✓	✓	✓	✓											
~~1~~	~~110-75-8~~	~~2-chloroethyl vinyl ether~~																		
2	591-78-6	2-hexanone (MBK)	✓	0.01		✓	✓	✓	✓											
2	108-10-1	4-methyl-2-pentanone (MIBK)		0.10	✓	✓	✓													
1	67-64-1	acetone(10xblk)		0.01	✓	✓	✓													
1	71-43-2	benzene		0.50	NA	✓	✓			✓	NA	NA	NA	NA	NA					
1	75-27-4	bromodichloromethane		0.20		✓	✓													
3	75-25-2	bromoform		0.10		✓	✓													
1	74-83-9	bromomethane		0.10		✓	✓													
1	75-15-0	carbon disulfide		0.10		✓	✓													
1	56-23-5	carbon tetrachloride		0.10		✓	✓													
2	108-90-7	chlorobenzene		0.50		✓	✓			✓	NA	NA	NA	NA	NA					
1	75-00-3	chloroethane		0.01		✓	✓													
1	67-66-3	chloroform		0.20		✓	✓													
1	74-87-3	chloromethane		0.10		✓	✓													
1	10061-01-5	cis-1,3-dichloropropene		0.20		✓	✓													
2	124-48-1	dibromochloromethane		0.10		✓	✓													
2	100-41-4	ethylbenzene		0.10	✓	✓	✓													
1	75-09-2	methylene chloride (10xblk)		0.01	✓	✓	✓													
2	100-42-5	styrene		0.30	NA	✓	✓													
2	127-18-4	tetrachloroethene		0.20		✓	✓													
2	108-88-3	toluene(10xblk)		0.40		✓	✓			✓	NA	NA	NA	NA	NA					
2	10061-02-6	trans-1,3-dichloropropene		0.10		✓	✓													
1	79-01-6	trichloroethene		0.30		0.21	✓			✓	NA	NA	NA	NA	NA					
1	75-01-4	vinyl chloride		0.10		✓	✓													
2	1330-20-7	xylenes(total)		0.30		✓	✓													
	108-05-4	vinyl acetate	✓		✓	✓	✓	✓	✓							✓	✓	✓		

Comments:
① No MSD, LCSD, Rep., or other measure of precision analyzed.

Notes: Shaded rows are RCRA compounds.

Reviewed By: [signature] Date: 6/9/03

Volatile Organics

Site/Project: S-74, GULF AR/COC #: 606397 Batch #s: 252894

Laboratory: GEL SDG #: 80614 # of Samples: 2 Matrix: aqueous

Surrogate Recovery and Internal Standard Outliers (SW 846 Method 8260)

Sample	SMC 1	SMC 2	SMC 3	IS 1 area	IS 1 RT	IS 2 area	IS 2 RT	IS 3 area	IS 3 RT
All									
Passed									

SMC 1: Bromofluorobenzene
SMC 2: Dibromofluoromethane
SMC 3: Toluene-d8

IS 1: Fluorobenzene
IS 2: Chlorobenzene-d5
IS 3: 1,4-Dichlorobenzene-d4

Comments:

Volatile Organics (SW 846 Method 8260)

Site/Project: S-74, CWLF AR/COC #: 606397 # of Samples: 11 Matrix: soil

Laboratory: GEL SDG #: 80612 Laboratory Sample IDs: 80612-001 to -011

Methods: EPA8260A Batch #s:

IS	CAS #	Name	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	① CCV %D	Method Blks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	② Field Dup. RPD	Equip. Blanks	Trip Blanks	CCV %D	CCV %D
						>.05	<20% / 0.99	20%												
1	71-55-6	1,1,1-trichloroethane	✓	0.10	NA	✓	✓	✓	✓							NA	✓ NA	✓	✓	✓
2	79-34-5	1,1,2,2-tetrachloroethane		0.30		✓	✓													
2	79-00-5	1,1,2-trichloroethane		0.10		✓	✓													
1	75-34-3	**1,1-dichloroethane**		0.10		✓	✓													
1	75-35-4	**1,1-dichloroethene**		0.20		✓	✓			✓	NA	NA	✓	✓	✓					
1	107-06-2	**1,2-dichloroethane**		0.10		✓	✓													
1	540-59-0	**1,2-dichloroethene(total)**		0.01		✓	✓													
1	78-87-5	**1,2-dichloropropane**		0.01		✓	✓													
1	78-93-3	2-butanone (MEK) (10xblk)	✓	0.01		✓	✓	✓	✓								✓	✓	✓	✓
~~1~~	~~110-75-8~~	~~2-chloroethyl vinyl ether~~																		
2	591-78-6	2-hexanone (MBK)	✓	0.01		✓	✓	✓	✓								✓	✓	✓	✓
2	108-10-1	4-methyl-2-pentanone (MIBK)		0.10	✓	✓	✓													✓
1	67-64-1	**acetone(10xblk)**		0.01	✓	✓	✓													45.1
1	71-43-2	**benzene**		0.50	NA	✓	✓			✓	NA	NA	✓	✓	✓					✓
1	75-27-4	bromodichloromethane		0.20		✓	✓													
3	75-25-2	bromoform		0.10		✓	✓													
1	74-83-9	bromomethane		0.10		✓	✓													
1	75-15-0	carbon disulfide		0.10		✓	✓													26.7
1	56-23-5	**carbon tetrachloride**		0.10		✓	✓													✓
2	108-90-7	**chlorobenzene**		0.50		✓	✓			✓	NA	NA	✓	✓	✓					
1	75-00-3	chloroethane		0.01		✓	✓													
1	67-66-3	**chloroform**		0.20		✓	✓													
1	74-87-3	chloromethane		0.10		✓	✓													
1	10061-01-5	cis-1,3-dichloropropene		0.20		✓	✓													
2	124-48-1	dibromochloromethane		0.10		✓	✓													
2	100-41-4	ethylbenzene		0.10	✓	✓	✓	✓												
1	75-09-2	methylene chloride (10xblk)		0.01	✓	✓	✓	26.3												
2	100-42-5	styrene		0.30	NA	✓	✓	✓												
2	127-18-4	**tetrachloroethene**		0.20		✓	✓													
2	108-88-3	toluene(10xblk)		0.40		✓	✓			✓	NA	NA	✓	✓	✓					
2	10061-02-6	trans-1,3-dichloropropene		0.10		✓	✓													
1	79-01-6	**trichloroethene**		0.30		0.21	✓			✓	NA	NA	✓	✓	✓					
1	75-01-4	**vinyl chloride**		0.10		✓	✓													
2	1330-20-7	xylenes(total)		0.30		✓	✓													
	108-05-4	vinyl acetate	✓		✓	✓	✓	✓	✓							✓	✓	✓	✓	✓

Comments:

Notes: Shaded rows are RCRA compounds.

① 2nd CCV applies to sample -001 only, 3rd to ~~[illegible]~~ + -010 + -011, 1st to all others

② Field dup. submitted. No QC criteria.

Reviewed By: [illegible] Date: 6/9/03

Volatile Organics

Site/Project: _____ AR/COC #: _____ Batch #s: _____

Laboratory: _____ SDG #: _____ # of Samples: _____ Matrix: _____

Surrogate Recovery and Internal Standard Outliers (SW 846 Method 8260)

Sample	SMC 1	SMC 2	SMC 3	IS 1 area	IS 1 RT	IS 2 area	IS 2 RT	IS 3 area	IS 3 RT

SMC 1: Bromofluorobenzene
SMC 2: Dibromofluoromethane
SMC 3: Toluene-d8

IS 1: Fluorobenzene
IS 2: Chlorobenzene-d5
IS 3: 1,4-Dichlorobenzene-d4

Comments:

Semivolatile Organics (SW 846 Method 8270)

Site/Project: S-74, CWLF AR/COC #: 606397 Laboratory Sample IDs: 80612-012 to -021 + -045

Laboratory: GEL SDG #: 80612

Methods: EPA 8270C

# of Samples: 11 Matrix: Soil Batch #s: 254012

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blanks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	① Field Dup. RPD	Equip. Blanks	Field Blanks		
							>.05	<20% / 0.99	20%												
1	A	108-95-2	Phenol	✓	0.80	NA	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	NA	✓	NA		
1	BN	111-44-4	bis(2-Chloroethyl)ether		0.70		✓	✓													
1	A	95-57-8	2-Chlorophenol		0.80		✓	✓			✓	NA	NA	✓	✓	✓					
1	BN	541-73-1	1,3-Dichlorobenzene		0.60		✓	✓													
1	BN	106-46-7	1,4-Dichlorobenzene		0.50		✓	✓			✓	NA	NA	✓	✓	✓					
1	BN	95-50-1	1,2-Dichlorobenzene		0.40		✓	✓													
1	A	95-48-7	o-cresol		0.70		✓	✓			✓	NA	NA	✓	✓	✓					
1	BN	108-60-1	bis(2-chloroisopropyl)ether		0.01		✓	✓													
1	A	N22	m,p-cresols		0.60		✓	✓			✓	NA	NA	✓	✓	✓					
1	BN	621-64-7	N-Nitroso-di-n-propylamine		0.50		✓	✓			✓	NA	NA								
1	BN	67-72-1	Hexachloroethane		0.30		✓	✓			✓	NA	NA								
2	BN	98-95-3	Nitrobenzene		0.20		✓	✓			✓	NA	NA	✓	✓	✓					
2	BN	78-59-1	Isophorone		0.40		✓	✓													
2	A	88-75-5	2-Nitrophenol		0.10		✓	✓													
2	A	105-67-9	2,4-Dimethylphenol		0.20		✓	✓													
2	BN	111-91-1	bis(2-Chloroethoxy)methane		0.30		✓	✓													
2	A	120-83-2	2,4-Dichlorophenol		0.20		✓	✓													
2	BN	120-82-1	1,2,4-Trichlorobenzene		0.20		✓	✓			✓	NA	NA	✓	✓	✓					
2	BN	91-20-3	Naphthalene		0.70		✓	✓													
2	BN	106-47-8	4-Chloroaniline		0.01		✓	✓													
2	BN	87-68-3	Hexachlorobutadiene		0.01		✓	✓			✓	NA	NA	✓	✓	✓					
2	A	59-50-7	4-Chloro-3-methylphenol		0.20		✓	✓			✓	NA	NA	✓	✓	✓					
2	BN	91-57-6	2-Methylnaphthalene		0.40		✓	✓													
3	BN	77-47-4	Hexachlorocyclopentadiene		0.01		✓	✓													
3	A	88-06-2	2,4,6-Trichlorophenol		0.20		✓	✓			✓	NA	NA	✓	✓	✓					
3	A	95-95-4	2,4,5-Trichlorophenol	↓	0.20	↓	✓	✓	↓	↓	✓	NA	NA	✓	✓	✓	↓	↓	↓		

Comments:
① Field dup. submitted. No QC criteria.

Notes: Shaded rows are RCRA compounds.

Reviewed By: [signature] Date: 6/9/03

Semivolatile Organics

Site/Project: S-74, CWF AR/COC #: 606397 Batch #s: 254012

Laboratory: GEL SDG #: 80612 # of Samples: 11 Matrix: Soil

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blanks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks		
							>.05	<20%/ 0.99	20%												
3	BN	91-58-7	2-Chloronaphthalene	✓	0.80	NA	✓	✓	✓	✓							NA	✓	NA		
3	BN	88-74-4	2-Nitroaniline (o-)		0.01		✓	✓													
3	BN	131-11-3	Dimethylphthalate		0.01		✓	✓													
3	BN	208-96-8	Acenaphthylene		0.90		✓	✓													
3	BN	606-20-2	2,6-Dinitrotoluene		0.20		✓	✓													
3	BN	99-09-2	3-Nitroaniline (m-)		0.01		✓	✓													
3	BN	83-32-9	Acenaphthene		0.90	↓	✓	✓			✓	NA	NA	✓	✓	✓					
3	A	51-28-5	2,4-Dinitrophenol		0.01	✓	✓	✓													
3	A	100-02-7	4-Nitrophenol		0.01	✓	✓	0.98			✓	NA	NA	✓	✓	✓					
3	BN	132-64-9	Dibenzofuran		0.80	NA	✓	✓													
3	BN	121-14-2	2,4-Dinitrotoluene		0.20		✓	✓			✓	NA	NA	✓	✓	✓					
3	BN	84-66-2	Diethylphthalate		0.01		✓	✓													
3	BN	7005-72-3	4-Chlorophenyl-phenylether		0.40		✓	✓													
3	BN	86-73-7	Fluorene		0.90	↓	✓	✓													
3	BN	100-01-6	4-Nitroaniline (p-)		0.01	✓	✓	✓													
4	A	534-52-1	4,6-Dinitro-2-methylphenol		0.01	✓	✓	✓													
4	BN	122-39-4	Diphenylamine		0.01	NA	✓	✓	↓												
4	BN	101-55-3	4-Bromophenyl-phenylether		0.10		✓	✓	20.9												
4	BN	118-74-1	Hexachlorobenzene		0.10	↓	✓	✓	✓		✓	NA	NA	✓	✓	✓					
4	A	87-86-5	Pentachlorophenol		0.05	✓	✓	✓			✓	NA	NA	✓	✓	✓					
4	BN	85-01-8	Phenanthrene		0.70	NA	✓	✓													
4	BN	120-12-7	Anthracene		0.70		✓	✓													
4	BN	86-74-8	Carbazole		0.01		✓	✓													
4	BN	84-74-2	Di-n-butylphthalate		0.01		✓	✓													
4	BN	206-44-0	Fluoranthene		0.60	↓	✓	✓													
5	BN	129-00-0	Pyrene		0.60	✓	✓	✓			✓	NA	NA	✓	✓	✓					
5	BN	85-68-7	Butylbenzylphthalate		0.01	NA	✓	✓													
5	BN	91-94-1	3,3'-Dichlorobenzidine		0.01		✓	✓													
5	BN	56-55-3	Benzo(a)anthracene	↓	0.80	↓	✓	✓	↓	↓							↓	↓	↓		

Comments:

Semivolatile Organics

Site/Project: 8-74, CWLF AR/COC #: 606397 Batch #s: 254012

Laboratory: GEL SDG #: 80612 # of Samples: 11 Matrix: soil

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blanks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks		
							>.05	<20% / 0.99	20%												
5	BN	218-01-9	Chrysene	✓	0.70	NA	✓	✓	✓	✓							NA	✓	NA		
5	BN	117-81-7	bis(2-Ethylhexyl)phthalate		0.01		✓	✓													
6	BN	117-84-0	Di-n-octylphthalate		0.01		✓	✓													
6	BN	205-99-2	Benzo(b)fluoranthene		0.70		✓	✓													
6	BN	207-08-9	Benzo(k)fluoranthene		0.70		✓	✓													
6	BN	50-32-8	Benzo(a)pyrene		0.70	✓	✓	✓													
6	BN	193-39-5	Indeno(1,2,3-cd)pyrene		0.50	✓	✓	✓													
6	BN	53-70-3	Dibenz(a,h)anthracene		0.40	✓	✓	✓													
6	BN	191-24-2	Benzo(g,h,i)perylene	✓	0.50	NA	✓	✓	✓	✓							✓	✓	✓		

Surrogate Recovery Outliers

Sample	SMC 1	SMC 2	SMC 3	SMC 4	SMC 5	SMC 6	SMC 7	SMC 8
All Passed								

Comments:

SMC 1: Nitrobenzene-d5 (BN) SMC 2: 2-Fluorobiphenyl (BN) SMC 3: Terphenyl-d14 (BN)
SMC 4: Phenol-d5 (A) SMC 5: 2-Fluorophenol (A) SMC 6: 2,4,6-Tribromophenol (A)
~~SMC 7: 2-2-Chlorophenol-d4 (A)~~ ~~SMC 8: 1,2-Dichlorobenzene-d4 (BN)~~

Internal Standard Outliers

Sample	IS 1-area	IS 1-RT	IS 2-area	IS 2-RT	IS 3-area	IS 3-RT	IS 4-area	IS 4-RT	IS 5-area	IS 5-RT	Is 6-area	IS 6-RT
All Passed												

IS 1: 1,4-Dichlorobenzene-d4 (BN) IS 2: Naphthalene-d8 (BN) IS 3: Acenaphthene-d10 (BN)
IS 4: Phenathrene-d10 (BN) IS 5: Chrysene-d12 (BN) IS 6: Perylene-d12 (BN)

Semivolatile Organics (SW 846 Method 8270)

Site/Project: S-74, CMLF AR/COC #: 606397 Laboratory Sample IDs: 80614-006 (EB)

Laboratory: GEL SDG #: 80614

Methods: EPA 8270C

# of Samples: 1 Matrix: aqueous Batch #s: 252789

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blanks	LCS	LCSD	LCS RPD	① MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks		
							>.05	<20% / 0.99	20%												
1	A	108-95-2	Phenol	✓	0.80	NA	✓	✓	✓	✓	✓	NA	NA	NA	NA	NA	NA	NA	NA		
1	BN	111-44-4	bis(2-Chloroethyl)ether		0.70		✓	✓	-29.9												
1	A	95-57-8	2-Chlorophenol		0.80		✓	✓	✓		✓	NA	NA	NA	NA	NA					
1	BN	541-73-1	1,3-Dichlorobenzene		0.60		✓	✓													
1	BN	106-46-7	1,4-Dichlorobenzene		0.50		✓	✓			✓	NA	NA	NA	NA	NA					
1	BN	95-50-1	1,2-Dichlorobenzene		0.40		✓	✓													
1	A	95-48-7	o-cresol		0.70		✓	✓			✓	NA	NA	NA	NA	NA					
1	BN	108-60-1	bis(2-chloroisopropyl)ether		0.01		✓	✓													
1	A	N22	m,p-cresols		0.60		✓	✓			✓	NA	NA	NA	NA	NA					
1	BN	621-64-7	N-Nitroso-di-n-propylamine		0.50		✓	✓			✓	NA	NA								
1	BN	67-72-1	Hexachloroethane		0.30		✓	✓			✓	NA	NA								
2	BN	98-95-3	Nitrobenzene		0.20		✓	✓			✓	NA	NA								
2	BN	78-59-1	Isophorone		0.40		✓	✓													
2	A	88-75-5	2-Nitrophenol		0.10		✓	✓													
2	A	105-67-9	2,4-Dimethylphenol		0.20		✓	✓													
2	BN	111-91-1	bis(2-Chloroethoxy)methane		0.30		✓	✓													
2	A	120-83-2	2,4-Dichlorophenol		0.20		✓	✓													
2	BN	120-82-1	1,2,4-Trichlorobenzene		0.20		✓	✓			✓	NA	NA	NA	NA	NA					
2	BN	91-20-3	Naphthalene		0.70		✓	✓													
2	BN	106-47-8	4-Chloroaniline		0.01		✓	✓	-24.9												
2	BN	87-68-3	Hexachlorobutadiene		0.01		✓	✓	✓		✓	NA	NA	NA	NA	NA					
2	A	59-50-7	4-Chloro-3-methylphenol		0.20		✓	✓			✓	NA	NA	"	"	"					
2	BN	91-57-6	2-Methylnaphthalene		0.40		✓	✓													
3	BN	77-47-4	Hexachlorocyclopentadiene		0.01		✓	✓													
3	A	88-06-2	2,4,6-Trichlorophenol		0.20		✓	✓			✓	NA	NA	NA	NA	NA					
3	A	95-95-4	2,4,5-Trichlorophenol	✓	0.20	↓	✓	✓	↓	✓	✓	NA	NA	"	"	"	✓	✓	✓		

Notes: Shaded rows are RCRA compounds.

Comments:
① MS/MSD performed on a non-SVL sample. No other measure of precision performed.

Reviewed By: [signature] Date: 6/9/03

Semivolatile Organics

Site/Project: S-74, CWLF AR/COC #: 606397 Batch #s: 252789

Laboratory: GEL SDG #: 80614 # of Samples: 1 Matrix: equipment

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blanks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks		
							>.05	<20% / 0.99	20%												
3	BN	91-58-7	2-Chloronaphthalene	✓	0.80	NA	✓	✓	✓	✓							NA	NA	NA		
3	BN	88-74-4	2-Nitroaniline (o-)		0.01		✓	✓													
3	BN	131-11-3	Dimethylphthalate		0.01		✓	✓													
3	BN	208-96-8	Acenaphthylene		0.90		✓	✓													
3	BN	606-20-2	2,6-Dinitrotoluene		0.20	✓	✓	✓													
3	BN	99-09-2	3-Nitroaniline (m-)		0.01	NA	✓	✓	-26.2												
3	BN	83-32-9	Acenaphthene		0.90	NA	✓	✓	✓		✓	NA	NA	NA	NA	NA					
3	A	51-28-5	2,4-Dinitrophenol		0.01	✓	✓	✓	24.2												
3	A	100-02-7	4-Nitrophenol		0.01	NA	✓	✓	21.1		✓	NA	NA	NA	NA	NA					
3	BN	132-64-9	Dibenzofuran		0.80	NA	✓	✓	✓												
3	BN	121-14-2	2,4-Dinitrotoluene		0.20	✓	✓	✓			✓	NA	NA	NA	NA	NA					
3	BN	84-66-2	Diethylphthalate		0.01	NA	✓	✓													
3	BN	7005-72-3	4-Chlorophenyl-phenylether		0.40		✓	✓													
3	BN	86-73-7	Fluorene		0.90		✓	✓													
3	BN	100-01-6	4-Nitroaniline (p-)		0.01		✓	✓	-23.5												
4	A	534-52-1	4,6-Dinitro-2-methylphenol		0.01	✓	✓	0.98	34.1												
4	BN	122-39-4	Diphenylamine		0.01	NA	✓	✓	✓												
4	BN	101-55-3	4-Bromophenyl-phenylether		0.10		✓	✓													
4	BN	118-74-1	Hexachlorobenzene		0.10		✓	✓			✓	NA	NA	NA	NA	NA					
4	A	87-86-5	Pentachlorophenol		0.05	✓	✓	✓			✓	NA	NA	"	"	"					
4	BN	85-01-8	Phenanthrene		0.70	NA	✓	✓													
4	BN	120-12-7	Anthracene		0.70		✓	✓	✓												
4	BN	86-74-8	Carbazole		0.01		✓	✓	-21.5												
4	BN	84-74-2	Di-n-butylphthalate		0.01		✓	✓	✓												
4	BN	206-44-0	Fluoranthene		0.60		✓	✓													
5	BN	129-00-0	Pyrene		0.60		✓	✓			✓	NA	NA	NA	NA	NA					
5	BN	85-68-7	Butylbenzylphthalate		0.01		✓	✓													
5	BN	91-94-1	3,3'-Dichlorobenzidine		0.01		✓	✓													
5	BN	56-55-3	Benzo(a)anthracene	✓	0.80		✓	✓	✓	✓							✓	✓	✓		

Comments:

Semivolatile Organics

Site/Project: S-74, CWLF AR/COC #: 606397 Batch #s: 252789

Laboratory: CEL SDG #: 80614 # of Samples: 1 Matrix: aqueous

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blanks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks		
							>.05	<20% / 0.99	20%												
5	BN	218-01-9	Chrysene	✓	0.70	NA	✓	✓	✓	✓							NA	NA	NA		
5	BN	117-81-7	bis(2-Ethylhexyl)phthalate		0.01	NA	✓	✓													
6	BN	117-84-0	Di-n-octylphthalate		0.01	✓	✓	0.98													
6	BN	205-99-2	Benzo(b)fluoranthene		0.70	NA	✓	✓													
6	BN	207-08-9	Benzo(k)fluoranthene		0.70		✓	✓													
6	BN	50-32-8	Benzo(a)pyrene		0.70		✓	✓	✓												
6	BN	193-39-5	Indeno(1,2,3-cd)pyrene		0.50	✓	✓	✓	-25.1												
6	BN	53-70-3	Dibenz(a,h)anthracene		0.40	NA	✓	✓	-20.7												
6	BN	191-24-2	Benzo(g,h,i)perylene	✓	0.50	NA	✓	✓	-29.3	✓							✓	✓	✓		

Surrogate Recovery Outliers

Sample	SMC 1	SMC 2	SMC 3	SMC 4	SMC 5	SMC 6	SMC 7	SMC 8
All Passed								

Comments:

SMC 1: Nitrobenzene-d5 (BN)
SMC 2: 2-Fluorobiphenyl (BN)
SMC 3: Terphenyl-d14 (BN)
SMC 4: Phenol-d5 (A)
SMC 5: 2-Fluorophenol (A)
SMC 6: 2,4,6-Tribromophenol (A)
~~SMC 7: 2-2-Chlorophenol-d4 (A)~~
~~SMC 8: 1,2-Dichlorobenzene-d4 (BN)~~

Internal Standard Outliers

Sample	IS 1-area	IS 1-RT	IS 2-area	IS 2-RT	IS 3-area	IS 3-RT	IS 4-area	IS 4-RT	IS 5-area	IS 5-RT	Is 6-area	IS 6-RT
All Passed												

IS 1: 1,4-Dichlorobenzene-d4 (BN)
IS 2: Naphthalene-d8 (BN)
IS 3: Acenaphthene-d10 (BN)
IS 4: Phenathrene-d10 (BN)
IS 5: Chrysene-d12 (BN)
IS 6: Perylene-d12 (BN)

PCBs (SW 846 - Method 8082)

Site/Project: S-74, CWLF AR/COC #: 606397 Laboratory Sample IDs: 80612-012 to -021 + -044

Laboratory: GEL SDG #: 80612

Methods: EPA8082

# of Samples: 11 Matrix: soil Batch #s: 252768

CAS #	Name	TCL	Intercept	Calib RSD / R^2 <20% / 0.99	CCV %D 20%	Method Blanks	LCS	LCSD	LCS RPD 20%	(2) MS	MSD	MS RPD 20%	(3) Field Dup. RPD	Equip. Blanks (µg/L)	Field Blanks		
12674-11-2	Aroclor-1016	✓	NA	✓	✓	✓	✓	NA	NA	858	849	✓	NA	✓	NA		
11104-28-2	Aroclor-1221			NA													
11141-16-5	Aroclor-1232			"													
53469-21-9	Aroclor-1242			✓	✓									0.49			
12672-29-6	Aroclor-1248													✓			
11097-69-1	Aroclor-1254				✓									0.14			
11096-82-5	Aroclor-1260	✓			✓		✓	NA	NA	149	142	✓		✓			

Sample	SMC % REC	SMC RT	Sample	SMC % REC	SMC RT
MS/MSD	DCB = 17/20	✓	-020	4cmx = 115 (>114%)	✓
-013 (50X)	4cmx = 138		-021	4cmx 1006 = 152/125	✓
-017 (5000X)	DCB/4cmx = 0				

Comments:

(1) All samples were dil. (see COAs for DFs) due to over-range hits.

(2) Case narrative stated MS/MSD failed due to overlapping peaks from -1242 + -1254.

(3) Field dup. submitted. No QC criteria.

Confirmation

Sample	CAS #	RPD > 25%	Sample	CAS #	RPD > 25%
-012	Aroclor-1254	30.2			
-014	-1260	49.2			
-016	-1254	27.1			

Reviewed By: [signature] Date: 6/10/03

PCBs (SW 846 - Method 8082)

Site/Project: S-74, Cuk F AR/COC #: 606397 Laboratory Sample IDs: 80614-005 (EB)

Laboratory: GEL SDG #: 80614

Methods: EPA8082

# of Samples: 1 Matrix: aqueous Batch #s: 252808

CAS #	Name	TCL	Intercept	Calib RSD / R^2 <20% / 0.99	CCV %D 20%	Method Blanks	LCS	LCSD	LCS RPD 20%	① MS	MSD	MS RPD 20%	Field Dup. RPD	Equip. Blanks	Field Blanks		
12674-11-2	Aroclor-1016	✓	NA	✓	✓	✓	✓	NA	NA	NA	NA	NA	NA	NA	NA		
11104-28-2	Aroclor-1221			NA													
11141-16-5	Aroclor-1232			"													
53469-21-9	Aroclor-1242			✓	✓												
12672-29-6	Aroclor-1248			~~NA~~ ✓													
11097-69-1	Aroclor-1254			✓	✓												
11096-82-5	Aroclor-1260		✓	✓	✓	✓	✓	NA	NA	NA	NA	NA	✓	✓	✓		

Sample	SMC % REC	SMC RT	Sample	SMC % REC	SMC RT
All					
Passed, ~~except~~					
~~MS/MSD~~	~~Jcb 6/7/03~~				

Comments:
① No MS/MSD or other measure of precision performed.

Confirmation

Sample	CAS #	RPD > 25%	Sample	CAS #	RPD > 25%
All					
Passed					

Reviewed By: [signature] Date: 6/9/03

Inorganic Metals

Site/Project: S-74, CWLF AR/COC #: 606397 Laboratory Sample IDs: 80612-012 to -021 + -042

Laboratory: GEL SDG #: 80612

Methods: EPA6010B (ICP-AES), EPA7471A (CVAA)

# of Samples: 11 Matrix: Soil Batch #s: 252730, 253246

CAS #/ Analyte	QC Element																			
	TAL	ICV	CCV	ICB (µg/L)	CCB (µg/L)	Method Blanks	LCS	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilu-tion	② Field Dup. RPD	(µg/L) Equip. Blanks	Field Blanks		
7429-90-5 Al																NA		NA		
7440-39-3 Ba	✓	✓	✓	✓	0.934	✓	✓	NA	NA	NA	NA	✓	✓	✓	✓		1.28			
7440-41-7 Be	↓	↓	↓	↓	✓	↓	↓	↓	↓	✓	✓	✓	NA	↓	NA		0.2			
7440-43-9 Cd					✓					✓	✓	✓	NA		NA		✓			
7440-70-2 Ca																				
7440-47-3 Cr	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	✓	✓	NA		✓			
7440-48-4 Co																				
7440-50-8 Cu	✓	✓	✓	✓	✓	✓	✓	NA	NA	-69	✓	✓	✓	✓	✓		✓			
7439-89-6 Fe																				
7439-95-4 Mg																				
7439-96-5 Mn																				
7440-02-0 Ni	✓	✓	✓	✓	1.29	✓	✓	NA	NA	✓	✓	✓	✓	✓	NA		✓			
7440-09-7 K																				
7440-22-4 Ag	✓	✓	✓	-1.87	✓	✓	✓	NA	NA	✓	✓	✓	NA	✓	NA		✓			
7440-23-5 Na																				
7440-62-2 V																				
7440-66-6 Zn																				
7439-92-1 Pb	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	✓	✓	✓		✓			
7782-49-2 Se	↓	↓	↓	1.87	✓	↓	↓	↓	↓	↓	↓	↓	NA	↓	NA		↓			
7440-38-2 As	↓	↓	↓	-3.97	-3.91	↓	↓	↓	↓	↓	↓	↓	✓	↓	NA		↓			
7440-36-0 Sb																				
7440-28-0 Tl																				
7439-97-6 Hg	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	NA	NA	✓	NA	NA	✓	✓	✓		
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 / l

Comments: ① Samples dil. std. 2X for ICP soils. All samples, except -012, were dil. (see COAs for DFs) to bring Hg concs into calib. range.
② Field dup. submitted. No QC criteria.

Reviewed By: [signature] Date: 6/10/03

Inorganic Metals

Site/Project: S-74, CWLF AR/COC #: 606397 Laboratory Sample IDs: 80614-003 (EA)

Laboratory: GEL SDG #: 80614

Methods: EPA6010A (ICP-AES), EPA 7470A (CVAA)

# of Samples: 1 Matrix: aqueous Batch #s: 253280, 252749

CAS #/ Analyte	QC Element																			
	TAL	ICV	CCV	ICB (µg/L)	CCB (µg/L)	Method Blanks	LCS	LCSD	LCSD RPD	① MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilu-tion	Field Dup. RPD	Equip. Blanks	Field Blanks		
7429-90-5 Al																NA	NA	NA		
7440-39-3 Ba	✓	✓	✓	0.274	0.426	✓	✓	✓	✓	NA	NA	NA	✓	✓	NA					
7440-41-7 Be	✓	↓	↓	✓	0.199	↓	↓	↓	↓	↓	↓	↓	NA	↓	↓					
7440-43-9 Cd	✓	↓	↓	0.403	0.403	↓	↓	↓	↓	↓	↓	↓	NA	↓	↓					
7440-70-2 Ca																				
7440-47-3 Cr	✓	✓	✓	✓	-0.668	✓	✓	✓	✓	NA	NA	NA	✓	✓	NA					
7440-48-4 Co																				
7440-50-8 Cu	✓	✓	✓	✓	-1.56	✓	✓	✓	✓	NA	NA	NA	✓	✓	NA					
7439-89-6 Fe																				
7439-95-4 Mg																				
7439-96-5 Mn																				
7440-02-0 Ni	✓	✓	✓	✓	1.27	✓	✓	✓	✓	NA	NA	NA	✓	✓	NA					
7440-09-7 K																				
7440-22-4 Ag	✓	✓	✓	✓	1.58	✓	✓	✓	✓	NA	NA	NA	NA	✓	NA					
7440-23-5 Na																				
7440-62-2 V																				
7440-66-6 Zn																				
7439-92-1 Pb	✓	✓	✓	-1.82	✓	✓	✓	✓	✓	NA	NA	NA	✓	✓	NA					
7782-49-2 Se	✓	↓	↓	✓	↓	↓	↓	↓	↓	↓	↓	↓	NA	↓	↓					
7440-38-2 As	✓	↓	↓	✓	↓	↓	↓	↓	↓	↓	↓	↓	✓	↓	↓					
7440-36-0 Sb																				
7440-28-0 Tl																				
7439-97-6 Hg	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	NA	NA	NA	NA	NA	↓	↓	↓		
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 / l

Comments: ① MS + Rep. for Hg performed on an SNL sample of similar matrix from another SDG. For ICP, No MS/MSD, LCSD analyzed for precision.

Reviewed By: [signature] Date: 6/10/03

General Chemistry

Site/Project: S-74, CWLF AR/COC #: 606397 Laboratory Sample IDs: 80614-004 (GS)

Laboratory: GEL SDG #: 80614 / 80612 80612-012 & -021, -043

Methods: EPA 7196A (Cr+6)

# of Samples: 12 Matrix: 1 aqueous / 11 soil Batch #s: 252672, 252806 / 254683

CAS #	Analyte	QC Element																		
		TAL	ICV	CCV	ICB	CCB	Method Blanks	LCS	LCSD	LCSD RPD	(2) MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilution	(3) Field Dup. RPD	Equip. Blanks	Field Blanks	
18540-29-9	Cr+6 (aq.)	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	NA	NA	NA						
↓	Cr+6 (soil)	✓	✓	✓	✓	✓	✓	✓	↓	↓	72/66	73/67	✓	NA			NA	NA		

Comments: (1) Sample -016 was dil. 5X due to high conc. of target analyte. (Sample -017 dil. 2X as well)
(2) MS + Rep. for sample -017 performed on SVL samples of similar matrix from other SDGs. 2nd MS/MSD, Rep. entries apply to -017 only.
(3) Field dup. submitted. No QC criteria.

Reviewed By: [signature] Date: 6/10/03

Radiochemistry

Site/Project: S-74, CWLF AR/COC #: 606397 Laboratory Sample IDs: 80612-022 to -041

Laboratory: GEL SDG #: 80612

Methods: HASL 300, 4.5.2.3 (Gamma Spec), EPA 906.0 (H_3)

# of Samples: 20 Matrix: Soil Batch #s: 253295, 253550

Analyte	QC Element												
	Method Blanks	LCS	MS	Rep RER	Equip. Blanks	Field Dup. RER	Field Blanks	Sample ID	Isotope	IS/Trace	Sample ID	Isotope	IS/Trace
Criteria	U	20%	25%	<1.0	U	<1.0	U			50-105			50-105
H3	✓	✓	✓	✓	NA	NA	NA	NA					
U-238													
U-234													
U-235/-236													
Th-232													
Th-228													
Th-230													
Pu-239/-240													
Gross Alpha													
Nonvolatile Beta													
Ra-226													
Ra-228													
Ni-63													
Gamma Spec. Am-241	✓	✓	NA	✓	NA	NA	NA						
Gamma Spec. Cs-137	↓	↓	↓	↓	↓	↓	↓						
Gamma Spec. Co-60	↓	✓	↓	↓	↓	↓	↓						
" Th-231	↓			1.8	↓	↓	↓						

Parameter	Method	Typical Tracer	Typical Carrier
Iso-U	Alpha spec.	U-232	NA
Iso-Pu	Alpha spec.	Pu-242	NA
Iso-Th	Alpha spec.	Th-229	NA
Am-241	Alpha spec.	Am-242	NA
Sr-90	Beta	Y ingrowth	NA
Ni-63	Beta	NA	Ni by ICP
Ra-226	Deamination	NA	NA
Ra-226	Alpha spec.	Ba-133 or Ra-225	NA
Ra-228	Gamma spec.	Ba-133	NA

Gamma spec. LCS contains: Am-241, Cs-137, and Co-60

Comments:

Reviewed By: [signature] Date: 6/10/03

RECORDS CENTER CODE: ER/1267/074/DAT

SMO ANALYTICAL DATA ROUTING FORM

PROJECT NAME: S-74, Chem Waste Landfill
PROJECT/TASK: 7221_02.02.03
SNL TASK LEADER: Young
ORG/MS/CF0#: 6134/1088/CF024-03
SMO PROJECT LEAD: Palencia
SAMPLE SHIP DATE: 5/20/2003

ARCOC	LAB	LAB ID	PRELIM DATE	FINAL DATE	EDD	EDD ON Q	Cust CD	RC CD
606421	GEL	80629		6/5/2003	X	X		

DATA PACKAGE TAT:	X	RUSH		NORMAL
CORRECTIONS REQUESTED BY/DATE:		W. Palencia		6-12-03
PROBLEM #/DATE CORRECTION RECEIVED:		6466		6-12-03
CVR COMPLETED BY/DATE:		W. Palencia		6-11-03
FINAL TRANSMITTED TO/DATE:		Wedgeworth		6-12-03
SENT TO VALIDATION BY/DATE:		P. Puissant		6/6/2003
REVISIONS REQUESTED/REVISIONS RECEIVED (DATE):				
VALIDATION COMPLETED BY/DATE:				6/11/03
COPY TO WM BY/DATE:				
CD REQUESTED BY/DATE		J. Conn		06/16/03
CD RECEIVED BY/DATE				
TO ERDMS OR RECORDS CENTER BY/DATE:		J Conn		06/16/03

COMMENTS: CD included RK

Sample Findings Summary

Site: S-74 Chem Waste LF Remed | ARCOC: 606421 | Data: Organic, Inorganic and Radiochemistry

Sample ID	All VOC (8260B) TAL compounds	67-64-1 (acetone)	All SVOC (8270C) TAL compounds	95-95-4 (2,4,5-trichlorophenol)	205-99-2 (benzo(b)fluoranthene)	All Aroclors (8082) except:	53469-21-9 (aroclor-1242)	11097-69-1 (aroclor-1254)	Metals	7440-50-8 (copper)	7440-02-0 (nickel)	7439-92-1 (lead)	7440-39-3 (barium)	7439-97-6 (mercury)	7440-22-4 (silver)	7782-49-2 (selenium)	General Chemistry	18540-29-9 (hexavalent chromium)	
062072-005 74-SB-E002-F157-EB	P2																		
062072-006 74-SB-E002-F157-EB										J, B3	J, B3	J, B3							
062072-007 74-SB-E002-F157-EB																		R, HT	
062072-008 74-SB-E002-F157-EB						UJ, A1	J, A1	J, A1											
062072-009 74-SB-E002-F157-EB			P2																
062063-001 74-SB-E002-F127		15.5U, B2																	
062064-001 74-SB-E002-F138		18.0U, B2																	
062065-001 74-SB-E002-F139		11.8U, B2																	
062066-001 74-SB-E002-F140		16.6U, B2																	
062067-001 74-SB-E002-F141		16.8U, B2																	
062068-001 74-SB-E002-F142		15.1U, B2																	
062069-001 74-SB-E002-F143		18.9U, B2																	
062070-001 74-SB-E002-F155		24.0U, B2																	
062071-001 74-SB-E002-F156		19.6U, B2																	
062072-010 74-SB-E002-F157-DU		13.2U, B2																	
062063-002 74-SB-E002-F127										J			J, A2	J, A2	UJ, B3				
062064-002 74-SB-E002-F138										J			J, A2	J, A2	J, B3	J, B3			
062065-002 74-SB-E002-F139										J			J, A2	J, A2	J, B3	J, B3			
062066-002 74-SB-E002-F140					J		J, A1	J, A1		J			J, A2	J, A2	J, B3				
062067-002 74-SB-E002-F141				J	J		J, A1	J, A1		J			J, A2	J, A2	J, B3				
062068-002 74-SB-E002-F142										J			J, A2	J, A2					
062069-002 74-SB-E002-F143							J, A1	J, A1		J			J, A2	J, A2	J, B3				
062070-002 74-SB-E002-F155										J			J, A2	J, A2	J, B3			J, HT	
062071-002 74-SB-E002-F156										J			J, A2	J, A2	J, B3			J, HT	
062072-002 74-SB-E002-F157										J			J, A2	J, A2	UJ, B3				
062072-011 74-SB-E002-F157-DU										J			J, A2	J, A2	UJ, B3				

Sample Findings Summary

Site: S-74 Chem Waste LF Remed | ARCOC: 606421 | Data: Organic, Inorganic and Radiochemistry

Sample ID	Radiochemistry	All Gamma Spec results flagged "X" by the lab (see EDD)	14331-85-2 (protactinium-231)	14683-10-4 (antimony-124)															
062063-004 74-SB-E002-F127		R																	
062064-004 74-SB-E002-F138		R																	
062065-004 74-SB-E002-F139		R																	
062066-004 74-SB-E002-F140		R	R	R															
062067-004 74-SB-E002-F141		R																	
062068-004 74-SB-E002-F142		R																	
062069-004 74-SB-E002-F143		R																	
062070-004 74-SB-E002-F155		R																	
062071-004 74-SB-E002-F156		R																	
062072-004 74-SB-E002-F157		R																	

Validated By: [illegible] Date: 06/10/03

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MEMORANDUM

DATE: 06/10/03

TO: File

FROM: Linda Thal

SUBJECT: Radiochemical Data Review and Validation - SNL
Site: S-74 Chem Waste LF Remed
ARCOC 606421
GEL SDG # 80629
Project/Task No. 7221.02.02.03

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.

Summary

All samples were prepared and analyzed with approved procedures using method EPA 906.0 (tritium) and DOE EML HASL 300 (gamma spec). Problems were identified with the data package that resulted in the qualification of data.

Gamma Spec Analysis
Several Gamma Spec results for all samples were "X" flagged by the laboratory due to interference, no valid peak/uncertain identification or low abundance. (See Electronic Data Deliverable). Thus, these sample results will be qualified "R" (unusable).

Sample 80629-035 had negative values for antimony-124 and protactinium-231 with absolute values > the MDA. The sample results will be qualified "R".

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

Holding Times/Preservation

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

It should be noted that the containers for samples 80629-028, -029, -030 and -040 were received broken. Sufficient sample was available to proceed with the requested analyses.

Calibration

All Analyses: The case narrative stated the instruments used were properly calibrated.

Blanks

All Analyses: No target analytes were detected in the method blank at concentrations > the associated MDA/TPUs.

Matrix Spike (MS) Analysis

Tritium: The MS analyses met all QC acceptance criteria.

It should be noted that the sample used for the MS was of similar matrix from another SNL SDG.

Gamma Spec: No MS required.

Laboratory Control Sample (LCS) Analysis

All Analyses: The LCS analyses met all QC acceptance criteria.

Replicates

All Analyses: The replicate analyses met all QC acceptance criteria.

It should be noted that the sample used for the replicate was of similar matrix from another SNL SDG.

Tracer/Carrier Recoveries

All Analyses: No tracer/carrier required.

Negative Bias

All Analyses: All sample results met negative bias QC acceptance criteria except as mentioned above in the summary section.

Detection Limits/Dilutions

All Analyses: All detection limits were properly reported. No samples were diluted.

Other QC

All Analyses: No equipment blank, field blank or field duplicate was submitted on the ARCOC.

No other specific issues were identified which affect data quality.

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MEMORANDUM

DATE: 06/07/03

TO: File

FROM: Linda Thal

SUBJECT: Organic Data Review and Validation - SNL
Site: S-74 Chem Waste LF Remed
ARCOC # 606421
GEL SDG # 80629 and 80632
Project/Task No. 7221.02.02.03

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM ER Project AOP 00-03.

Summary

The samples were prepared and analyzed with approved procedures using methods SW-846 8260A/B (VOC), 8270C (SVOC) and 8082 (PCBs). Problems were identified with the data package that resulted in the qualification of data.

VOC Batch # 252894 (EB)
No MS/MSD, LCSD or duplicate was performed for this sample. As there is no measure of precision available, all sample results will be qualified "P2".

VOC Batch # 253244
The EB associated with the samples had an acetone value > RL. All associated samples, with the exception of sample 80629-010, had acetone values > RL but < 10X EB value. The sample results will be qualified "U, B2" at the reported values.

SVOC Batch # 252789 (EB)
No MS/MSD, LCSD or duplicate was performed for this sample. As there is no measure of precision available, all sample results will be qualified "P2".

SVOC Batch # 254230
The CCV had a %D > 20% with a positive bias for 2,4,5-trichlorophenol (24%) and benzo(b)fluoranthene (22%). Sample 80629-015 was detect for benzo(b)fluoranthene and sample 80629-016 was detect for both compounds. These sample results will be qualified "J".

PCB Batch # 252808 (EB)
Due to matrix interference, decachlorobiphenyl (DCB-surrogate) had a %R >10% but < QC acceptance criteria in the sample and MS/MSD. Aroclor-1242 and -1254 had values > DL and will be qualified "J, A1"; the remaining aroclors were non-detect and will be qualified "UJ, A1".

PCB Batch # 252772
Sample 80629-015, -016 and -018 had one or more surrogate %R biased high due to dilution of the samples (see DV Worksheet). All samples were detect for aroclor-1242 and -1254 and will be qualified "J, A1"; the remaining aroclors were non-detect and will not be qualified.

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

Holding Times/Preservation

All Analyses: The samples were properly preserved and analyzed within the method prescribed holding time.

Calibration

All Analyses: All initial and continuing calibration acceptance criteria were met except as mentioned above in the summary section and as follows:

SVOC Batch # 252789 (EB)
4,6-Dinitro-2-methylphenol had a correlation coefficient (0.98) > 0.90 but < 0.99 in the initial calibration preceding the sample. The sample result was non-detect and will not be qualified.
Several compounds had %Ds > 20% but < 40% with a negative bias in the CCV preceding the sample.
Several compounds had %Ds > 20% with a positive bias in the CCV preceding the samples (see DV Worksheet). All associated sample results were non-detect and will not be qualified.

SVOC Batch # 254230
4-Nitrophenol had a correlation coefficient (0.98) > 0.90 but < 0.99 in the initial calibration preceding the sample. The sample result was non-detect and will not be qualified.
Several compounds had %Ds > 20% with a positive bias in the CCV preceding the samples (see DV Worksheet). All associated sample results were non-detect and will not be qualified.

Blanks

All Analyses: All method blank (MB) and equipment blank (EB) acceptance criteria were met except as mentioned above in the summary section and as follows:

VOC Batch # 253244
The EB associated with the samples had an acetone value > RL. Sample 80629-010 was non-detect and will not be qualified.

SVOC Batch # 254230
The EB associated with the samples had a diethylphthalate and bis(2-ethylhexyl)phthalate value > DL but < RL. All sample results for diethylphthalate were non-detect and all the sample results for bis(2-ethylhexyl)phthalate had values > 10X EB value. No data will be qualified.

PCB Batch # 252772
The EB associated with the samples had an aroclor-1242 and -1254 value > RL. All sample results had values > 5X EB values and will not be qualified.

Surrogates

All Analyses: All surrogate acceptance criteria were met except as mentioned above in the summary section.

Internal Standards (ISs)

VOC and SVOC: All internal standard acceptance criteria were met.

PCB: No internal standard required.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

All Analyses: All MS/MSD acceptance criteria were met except as mentioned above in the summary section and as follows:

SVOC Batch # 254230
The MS/MSD RPD for 4-nitrophenol and pentachlorophenol was slightly > QC acceptance criteria. All associated sample results were non-detect for these compounds and using professional judgment will not be qualified.

PCB Batch # 252772
The MS/MSD %R for aroclor-1016 was biased high due to interference from aroclor-1242 detected in the samples. All associated sample results were non-detect for aroclor-1016, and using professional judgment will not be qualified.

Laboratory Control Samples (LCS/LCSD) Analysis

All Analyses: The LCS acceptance criteria were met. No LCSD was analyzed. The MS/MSD is used to assess the precision for the batch. No data will be qualified as a result.

VOC
In both soil batches, the LCS acceptance criteria were met by the analysis of a second source CCV.
It should be noted that no LCS compound was associated with internal standard 1,4-dichlorobenzene-d4.
No data will be qualified as a result.

SVOC
It should be noted that no LCS compound was associated with internal standard perylene-d12. No data will be qualified as a result.

Detection Limits/Dilutions

All Analyses: All detection limits were properly reported. Samples were not diluted with the following exceptions:

PCB
Sample 80629-012 was diluted 5X; sample 80629-014, -019, -020, -021 - 10X; sample 80629-013, -017, -018, -044 - 20X; sample 80629-015 - 50X and sample 80629-016 - 200X due to high concentrations of aroclors present.

Confirmation Analyses

VOC and SVOC: No confirmation analyses required.

PCB: All confirmation acceptance criteria were met.

Other QC

All Analyses: An equipment blank and a field duplicate were submitted on the ARCOC. There is no "required" validation procedure for assessing a field duplicate. No trip blank or field blank was submitted on the ARCOC.

No other specific issues were identified which affect data quality.

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MEMORANDUM

DATE: 06/09/03

TO: File

FROM: Linda Thal

SUBJECT: Inorganic Data Review and Validation - SNL
Site: S-74 Chem Waste LF Remed
ARCOC # 606421
GEL SDG # 80629 and 80632
Project/Task No. 7221.02.02.03

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM ER Project AOP 00-03.

Summary

The samples were prepared and analyzed with approved procedures using methods SW-846 6010B (ICP-AES metals), SW-846 7471A (CVAA-Hg) and SW-846 7196A (hexavalent chromium). Problems were identified with the data package that resulted in the qualification of data.

ICP-AES Batch # 253280 (EB)
Cu was detected in the CCB, and Pb in the ICB at negative values with absolute values > DL but < RL. The associated sample results were detect, < 5X DL and will be qualified "J, B3". Ni was detected in the CCB at a value > DL but < RL. The associated sample result was < 5X CCB value and will be qualified "J, B3".

ICP-AES Batch # 252732
Ag was detected in the ICB at a negative value with an absolute value > DL but < RL. Sample 80629-012, -021 and -042 were non-detect and will be qualified "UJ, B3"; sample 80629-013, -014, -015, -016, -018, -019 and -020 were detect with values < 5X DL and will be qualified "J, B3". Se was detected in the ICB/CCB at a value > DL but < RL. Sample 80629-013 and -014 were detect with values <5X blank value and will be qualified "J, B3".
The MS had a %R > QC acceptance criteria for Ba (75-125%). All associated sample results were detect and will be qualified "J, A2".
The replicate had a RPD > QC acceptance criteria (35%) for Cu (38%). All associated sample results were detect and will be qualified "J ".

Hg-CVAA Batch # 253249
The MS had a %R > QC acceptance criteria (75-125%). All associated sample results were detect and will be qualified "J, A2".

Hexavalent Chromium Batch # 252672 (EB)
The sample was received and analyzed more than 2X after its method specified hold time had expired. The sample result was non-detect and will be qualified "R, HT".
Hexavalent Chromium Batch # 252812

The samples were prepared within their method specified hold time, but were analyzed after their method specified hold time had expired (but within 2X their hold time). Both sample results were detect and will be qualified "J, HT".

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

Holding Times/Preservation

All Analyses: The samples were analyzed within the prescribed holding times and properly preserved except as mentioned above in the summary section.

Calibration

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

Blanks

All Analyses: All blank criteria were met except as mentioned above in the summary section and as follows:

ICP-AES Batch # 253280 (EB)
Cr was detected in the CCB at a negative value with an absolute value > DL but < RL. The associated sample result was > 5X DL and will not be qualified. Ba, Be, Cd and Ag were detected in the ICB and/or CCB at values > DL but < RL The sample results were either non-detect or detect, > 5X the blank value and will not be qualified.

ICP-AES Batch # 252732
Ag was detected in the ICB at a negative value with an absolute value > DL but < RL. Sample 80629-017 was detect with a value > 5X DL and will not be qualified. Se was detected in the ICB/CCB at a value > DL but < RL. All associated sample results, excluding sample 80629-013 and -014, were either non-detect or had a value > 5X blank value and will not be qualified. Ni and As were detected in the ICB and/or CCB at a negative value with an absolute value > DL but < RL. All associated sample results were detect with values > 5X DL and will not be qualified. Ba was detected in the CCB at a value > DL but < RL. All associated sample results were detect with values > 5X blank and will not be qualified. Cr, Cu and Ni were detected in the EB at a value > DL but < RL and Ba and Pb were detected at values > RL. All associated sample results were detect with values > 5X or > 10X the blank values and will not be qualified.

Hg-CVAA Batch # 253249
Hg was detected in the ICB and CCB at a negative value with an absolute value > DL but < RL. All associated sample results were detect with values > 5X DL and will not be qualified.

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

All Analyses: The LCS/LCSD met QC acceptance criteria.

Matrix Spike (MS) Analysis

All Analyses: The MS met QC acceptance criteria except as mentioned above in the summary section and as follows:

ICP-AES Batch # 253280 (EB)
Both samples in the batch were field QC and therefore no MS was extracted. Using professional judgment no data will be qualified.

Hg-CVAA Batch # 252749 (EB); Hexavalent Chromium Batch # 252672 (EB)
It should be noted that the sample used for the MS was from another SNL SDG. No data will be qualified.

Replicate Analysis

All Analyses: The replicate analysis met QC acceptance criteria except as mentioned above in the summary section and as follows.

ICP-AES Batch # 253280 (EB)
No replicate analysis was performed for this batch. A LCS/LCSD was performed and will be used to assess the precision for the batch. No data will be qualified.

Hg-CVAA Batch # 252749 (EB); Hexavalent Chromium Batch # 252672 (EB)
It should be noted that the sample used for the replicate was from another SNL SDG. No data will be qualified.

ICP Interference Check Sample (ICS)

ICP-AES: The ICS-AB met QC acceptance criteria.

All Other Analyses: No ICS required.

ICP Serial Dilution

ICP-AES: The serial dilution met QC acceptance criteria.

ICP-AES Batch # 253280 (EB)
It should be noted that the sample used for the SD was from another SNL SDG. No data will be qualified.

All other Analyses: No serial dilution required.

Detection Limits/Dilutions

All Analyses: All detection limits were properly reported and the samples undiluted with the following exceptions:

ICP-AES: All soil samples were diluted 2X.

Hg-CVAA: Sample 80629-014 was diluted 2X; sample 80629-013, -015 though -021 and -042 10X due to high concentrations of analyte present.

Hexavalent Chromium: Sample 80629-014 was diluted 5X and 80629-019 10X due to high concentrations of analyte present.

Other QC

All Analyses: A field duplicate and equipment blank were submitted on the ARCOC. There is no "required" validation procedure for assessing a field duplicate.
No field blank was submitted on the ARCOC.

No other specific issues were identified which affect data quality.

Site 74 Rened

Data Validation Summary

Site/Project: Rened. SO74 LNE Project/Task #: 7221. 02.02.03 # of Samples: 45 & 5 Matrix: Soil & H2O

AR/COC #: 606421 Laboratory Sample IDs: 80629 - 001 thru - 045

Laboratory: CEL 80632 - 001 thru - 005

SDG #: 80629

QC Element	Analysis									
	Organics				Inorganics				RAD	Other
	VOC	SVOC	Pesticide/ PCB	HPLC (HE)	ICP/AES	GFAA/ AA	CVAA (Hg)	CN		
1. Holding Times/Preservation	✓	✓	✓	NA	✓	NA	✓		✓	J,HT / R,HT ✓
2. Calibrations	✓	J / ✓	✓		✓		✓		✓	✓
3. Method Blanks	U,B2 / ✓	✓	✓		J,UJ,B3 / J,B3		✓		✓	✓
4. MS/MSD	✓ / P2	✓ / P2	✓		J,A2 / ✓		J,A2 / ✓		✓	✓
5. Laboratory Control Samples	✓	✓	✓		✓		✓		✓	✓
6. Replicates					J / ✓		✓		✓	✓
7. Surrogates	✓	✓	J,A1 / J,UJ,A1							NA
8. Internal Standards	✓	✓								NA
9. TCL Compound Identification	✓	✓								NA
10. ICP Interference Check Sample					✓					NA
11. ICP Serial Dilution					✓					NA
12. Carrier/Chemical Tracer Recoveries									NA	NA
13. Other QC	EB Field dup	EB Field dup	EB Field dup		EB Field dup		EB Field dup		EB Field Dup *R	EB Field dup

No CVR, No cover sheet.

J = Estimated
U = Not Detected
UJ = Not Detected, Estimated
R = Unusable

Check (√) = Acceptable
Shaded Cells = Not Applicable (also "NA")
NP = Not Provided
Other: R Rad analyses -ve bias & results rej. by lab

Reviewed By: [signature] Date: 06.10.03

Holding Time and Preservation

Site/Project: Sik 7H Remed AR/COC #: 606421 Laboratory Sample IDs: 80629 - 001 thru - 045
Laboratory: GEL Laboratory Report #: 80629 (80632) 80632 - 001 thru - 005
# of Samples: 45 & 5 Matrix: Soil & H2O

Sample ID	Analytical Method	Holding Time Criteria	Days Holding Time was Exceeded	Preservation Criteria	Preservation Deficiency	Comments
80632 - 003 (062072 - 007)	SW846 7196A	24hrs	1day + ~~2~~ - 5hours NT	NA	NA	>2XHT "R, HT"
80629 - 019 - 020	"	30days /24hrs	3hrs 20'	NA	NA	>HT <2XHT "J, HT"

Reviewed By: [signature] Date: NT 07.06.10.03

WS 1 of 2 Soil

Volatile Organics (SW 846 Method 8260)

Site/Project: Remed SOTH LWF AR/COC #: 606421 # of Samples: Matrix: Soil

Laboratory: GEL SDG #: 80629 Laboratory Sample IDs: 80629-001 thru -011

Methods: SW-846 8260A Batch #s: 253244

IS	CAS #	Name	TCL	Min. RF	Intercept	Calib. RF >.05	Calib. RSD/ R^2 <20%/ 0.99	CCV %D 20%	Method Blks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	10911 Field Dup. RPD	80682-001 Equip. Blanks	Trip Blanks		
1	71-55-6	1,1,1-trichloroethane	✓	0.10		✓	✓	✓	✓							✓	✓			
2	79-34-5	1,1,2,2-tetrachloroethane		0.30																
2	79-00-5	1,1,2-trichloroethane		0.10																
1	75-34-3	1,1-dichloroethane		0.10																
1	75-35-4	1,1-dichloroethene		0.20						✓			✓	✓	✓					
1	107-06-2	1,2-dichloroethane		0.10																
1	540-59-0	1,2-dichloroethene(total)		0.01																
1	78-87-5	1,2-dichloropropane	✓	0.01																
1	78-93-3	2-butanone (MEK) (10xblk)	✓	0.01																
1	110-75-8	2-chloroethyl vinyl ether																		
2	591-78-6	2-hexanone (MBK)	✓	0.01																
2	108-10-1	4-methyl-2-pentanone (MIBK)		0.10																
1	67-64-1	acetone(10xblk)		0.01	✓	✓	.987-.99										19.3			
1	71-43-2	benzene		0.50			✓			✓			✓	✓	✓		✓			
1	75-27-4	bromodichloromethane		0.20																
3	75-25-2	bromoform		0.10																
1	74-83-9	bromomethane		0.10																
1	75-15-0	carbon disulfide		0.10																
1	56-23-5	carbon tetrachloride		0.10																
2	108-90-7	chlorobenzene		0.50						✓			✓	✓	✓					
1	75-00-3	chloroethane		0.01																
1	67-66-3	chloroform		0.20																
1	74-87-3	chloromethane		0.10																
1	10061-01-5	cis-1,3-dichloropropene		0.20																
2	124-48-1	dibromochloromethane		0.10																
2	100-41-4	ethylbenzene		0.10																
1	75-09-2	methylene chloride (10xblk)		0.01	✓	✓	✓													
2	100-42-5	styrene		0.30																
2	127-18-4	tetrachloroethene		0.20																
2	108-88-3	toluene(10xblk)		0.40						✓			✓	✓	✓					
2	10061-02-6	trans-1,3-dichloropropene		0.10																
1	79-01-6	trichloroethene		0.30						✓			✓	✓	✓					
1	75-01-4	vinyl chloride		0.10																
2	1330-20-7	xylenes(total)		0.30																
	cis-1,2-Dichloroethene																			
	trans-1,2-Dichloroethene																			

Comments: Vinyl Acetate

Notes: Shaded rows are RCRA compounds.

Reviewed By: [illegible] Date: 06.07.03

CCV & LCS same file

WS 1of 2 soil

Volatile Organics

Site/Project: _____ AR/COC #: 606421 Batch #s: _____

Laboratory: _____ Laboratory Report #: _____ # of Samples: _____ Matrix: _____

Surrogate Recovery and Internal Standard Outliers (SW 846 Method 8260)

Sample	SMC 1	SMC 2	SMC 3	IS 1 Area	IS 1 RT	IS 2 area	IS 2 RT	IS 3 area	IS 3 RT

SMC 1: 4-Bromofluorobenzene IS 1: Fluorobenzene
SMC 2: Dibromofluoromethane IS 2: Chorobenzene-d5
SMC 3: Toluene-d8 IS 3: 1,4-Dichlorobenzene-d4

The CCV run on 5/28 9:41 had an acetone %D > 40%. Only the MS/MSD were used & data for this SDG not affected.

Comments:

WS 2of2 FB

Volatile Organics (SW 846 Method 8260)

Site/Project: Remed SOTH LWF AR/COC #: 606421 # of Samples: 1 Matrix: Aqueous

Laboratory: GEL Laboratory Report #: 80629 (80632) Laboratory Sample IDs: 80632 - 001

Methods: SW-846 8260B Batch #s: 252894

IS	CAS #	Name	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Trip Blanks		
						>.05	<20%/ 0.99	20%												
1	71-55-6	1,1,1-trichloroethane	✓	0.10		✓	✓	✓	✓											
2	79-34-5	1,1,2,2-tetrachloroethane		0.30																
2	79-00-5	1,1,2-trichloroethane		0.10																
1	75-34-3	**1,1-dichloroethane**		0.10																
1	75-35-4	**1,1-dichloroethene**		0.20			✓ ~~.985-.99~~	U		✓										
1	107-06-2	**1,2-dichloroethane**		0.10																
1	540-59-0	**1,2-dichloroethene(total)**		0.01																
1	78-87-5	**1,2-dichloropropane**	✓	0.01																
1	78-93-3	**2-butanone (MEK) (10xblk)**	✓	0.01																
1	110-75-8	2-chloroethyl vinyl ether																		
2	591-78-6	2-hexanone (MBK)	✓	0.01																
2	108-10-1	4-methyl-2-pentanone (MIBK)		0.10																
1	67-64-1	**acetone(10xblk)**		0.01	✓	✓	.987-.99													
1	71-43-2	**benzene**		0.50			✓			✓										
1	75-27-4	bromodichloromethane		0.20																
3	75-25-2	bromoform		0.10																
1	74-83-9	bromomethane		0.10																
1	75-15-0	carbon disulfide		0.10																
1	56-23-5	**carbon tetrachloride**		0.10																
2	108-90-7	**chlorobenzene**		0.50						✓										
1	75-00-3	chloroethane		0.01																
1	67-66-3	**chloroform**		0.20																
1	74-87-3	chloromethane		0.10																
1	10061-01-5	cis-1,3-dichloropropene		0.20																
2	124-48-1	dibromochloromethane		0.10																
2	100-41-4	ethylbenzene		0.10																
1	75-09-2	methylene chloride (10xblk)		0.01	✓	✓	✓													
2	100-42-5	styrene		0.30																
2	127-18-4	**tetrachloroethene**		0.20																
2	108-88-3	toluene(10xblk)		0.40						✓										
2	10061-02-6	trans-1,3-dichloropropene		0.10																
1	79-01-6	**trichloroethene**		0.30						✓										
1	75-01-4	**vinyl chloride**		0.10																
2	1330-20-7	xylenes(total)		0.30																
	cis - 1,2 - Dichloroethene																			
	trans - 1,2 - Dichloroethene																			

Comments: Vinyl Acetate

No precision "P2"

Notes: Shaded rows are RCRA compounds.

Reviewed By: [illegible] Date: 06.07.03

WS 2of2 FB

Volatile Organics

Site/Project: _____ AR/COC #: 606241 Batch #s: _____

Laboratory: _____ Laboratory Report #: _____ # of Samples: _____ Matrix: _____

Surrogate Recovery and Internal Standard Outliers (SW 846 Method 8260)

Sample	SMC 1	SMC 2	SMC 3	IS 1 Area	IS 1 RT	IS 2 area	IS 2 RT	IS 3 area	IS 3 RT

SMC 1: 4-Bromofluorobenzene IS 1: Fluorobenzene
SMC 2: Dibromofluoromethane IS 2: Chorobenzene-d5
SMC 3: Toluene-d8 IS 3: 1,4-Dichlorobenzene-d4

Comments:

NS lot 2 soils

Semivolatile Organics (SW 846 Method 8270)

Site/Project: Site 74 Remed AR/COC #: 606421 Laboratory Sample IDs: 80629 - 012 thru - 021 - 045 (DUP)

Laboratory: GEL Laboratory Report #:

Methods: SW-846 8270C

# of Samples: 11 Matrix: Soil Batch #s: 254230

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF >.05	Calib. RSD/ R^2 <20%/ 0.99	CCV %D 20%	Method Blanks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	02-045 Field Dup. RPD	80632-005 Equip. Blanks	Field Blanks		
2	BN	120-82-1	1,2,4-Trichlorobenzene	✓	0.20		✓	✓	✓	✓	✓	NA		✓	✓	✓	✓	✓	NA		
1	BN	95-50-1	1,2-Dichlorobenzene		0.40																
1	BN	541-73-1	1,3-Dichlorobenzene		0.60																
1	BN	106-46-7	1,4-Dichlorobenzene		0.50						✓			✓	✓	✓					
3	A	95-95-4	2,4,5-Trichlorophenol		0.20				+24		✓			✓	✓	✓					
3	A	88-06-2	2,4,6-Trichlorophenol		0.20				✓		✓			✓	✓	✓					
2	A	120-83-2	2,4-Dichlorophenol		0.20																
2	A	105-67-9	2,4-Dimethylphenol		0.20																
3	A	51-28-5	2,4-dinitrophenol		0.01	✓	✓	✓													
3	BN	121-14-2	2,4-Dinitrotoluene		0.20						✓			✓	✓	✓					
3	BN	606-20-2	2,6-Dinitrotoluene		0.20																
3	BN	91-58-7	2-Chloronaphthalene		0.80																
1	A	95-57-8	2-Chlorophenol		0.80						✓			✓	✓	✓					
2	BN	91-57-6	2-Methylnaphthalene		0.40																
1	A	95-48-7	2-Methylphenol (o-cresol)		0.70						✓			✓	✓	✓					
3	BN	88-74-4	2-Nitroaniline		0.01																
2	A	88-75-5	2-Nitrophenol		0.10				–												
5	BN	91-94-1	3,3'-Dichlorobenzidine		0.01	✓	✓	✓	+27												
3	BN	99-09-2	3-Nitroaniline		0.01				✓												
4	A	534-52-1	4,6-Dinitro-2-methylphenol		0.01	✓	✓	0.985-.99													
4	BN	101-55-3	4-Bromophenyl-phenylether		0.10			✓													
3	BN	7005-72-3	4-Chlorophenyl-phenylether		0.40																
2	A	59-50-7	4-Chloro-3-methylphenol		0.20						✓			✓	✓	✓					
2	BN	106-47-8	4-Chloroaniline		0.01																
1	A	106-44-5	4-Methylphenol (p-cresol)		0.60																

Comments: m,p - cresol ✓

Notes: Shaded rows are RCRA compounds.

Reviewed By: [signature] Date: 05-07-03

WS lot 2 soils

Semivolatile Organics

Site/Project: _____ AR/COC #: 606 421 Batch #s: _____

Laboratory: _____ Laboratory Report #: _____ # of Samples: _____ Matrix: _____

I.S.	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blanks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks		
							>.05	<20%/ 0.99	20%												
3	BN	100-01-6	4-Nitroaniline	✓	0.01	✓	✓	.988 = .99	✓	✓		NA				(0-37%)	✓	✓	NA		
3	A	100-02-7	4-Nitrophenol		0.01	✓	✓	0.983	+47		✓			✓	✓	H1					
3	BN	83-32-9	Acenaphthene		0.90			✓	✓		✓			✓	✓	✓					
3	BN	208-96-8	Acenaphthylene		0.90																
4	BN	120-12-7	Anthracene		0.70																
5	BN	56-55-3	Benzo(a)anthracene		0.80																
6	BN	50-32-8	Benzo(a)pyrene		0.70																
6	BN	205-99-2	Benzo(b)fluoranthene		0.70				+22												
6	BN	191-24-2	Benzo(g,h,i)perylene		0.50				✓												
6	BN	207-08-9	Benzo(k)fluoranthene		0.70																
2	BN	111-91-1	bis(2-Chloroethoxy)methane		0.30																
1	BN	111-44-4	bis(2-Chloroethyl)ether		0.70				+22												
1	BN	108-60-1	bis(2-chloroisopropyl)ether		0.01				✓												
5	BN	117-81-7	bis(2-Ethylhexyl)phthalate		0.01													2.21	x10 = 22.1		
5	BN	85-68-7	Butylbenzylphthalate		0.01													✓			
4	BN	86-74-8	Carbazole		0.01																
5	BN	218-01-9	Chrysene		0.70																
6	BN	53-70-3	Dibenzo(a,h)anthracene		0.40	✓	✓	✓													
3	BN	132-64-9	Dibenzofuran		0.80																
3	BN	84-66-2	Diethylphthalate		0.01													2.69J	x10 =	26.9	
3	BN	131-11-3	Dimethylphthalate		0.01													✓			
4	BN	84-74-2	Di-n-butylphthalate		0.01																
6	BN	117-84-0	Di-n-octylphthalate		0.01																
4	BN	206-44-0	Fluoranthene		0.60																
3	BN	86-73-7	Fluorene		0.90																
4	BN	118-74-1	Hexachlorobenzene		0.10						✓			✓	✓	✓					
2	BN	87-68-3	Hexachlorobutadiene		0.01						✓			✓	✓	✓					
3	BN	77-47-4	Hexachlorocyclopentadiene		0.01																
1	BN	67-72-1	Hexachloroethane		0.30						✓			✓	✓	✓					

Comments:

NS lot 2 soils

Semivolatile Organics

Site/Project: _____ AR/COC #: 606421 Batch #s: _____

Laboratory: _____ Laboratory Report #: _____ # of Samples: _____ Matrix: _____

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blanks	LCS	LCS D	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks		
							>.05	<20% / 0.99	20%												
6	BN	193-39-5	Indeno(1,2,3-cd)pyrene	✓	0.50	✓	✓	✓	✓	✓							✓	✓	NA		
2	BN	78-59-1	Isophorone		0.40																
2	BN	91-20-3	Naphthalene		0.70																
2	BN	98-95-3	Nitrobenzene		0.20						✓			✓	✓	✓					
4	BN	86-30-6	N-Nitrosodiphenylamine (1)		0.01																
1	BN	621-64-7	N-Nitroso-di-propylamine	✓	0.50						✓			✓	✓	✓					
4	A	87-86-5	Pentachlorophenol		0.05	✓	✓	✓			✓			✓	✓	34					
4	BN	85-01-8	Phenanthrene		0.70											(0-30%)					
1	A	108-95-2	Phenol		0.80						✓			✓	✓	✓					
5	BN	129-00-0	Pyrene		0.60	✓	✓	✓			✓			✓	✓	✓					
			Diphenylamine				✓	✓													

Surrogate Recovery Outliers

Sample	SMC 1	SMC 2	SMC 3	SMC 4	SMC 5	SMC 6	SMC 7	SMC 8

Comments:

SMC 1: Nitrobenzene-d5 (BN)
SMC 2: 2-Fluorobiphenyl (BN)
SMC 3: p-Terphenyl-d14 (BN)
SMC 4: Phenol-d6 (A)
SMC 5: 2-Fluorophenol (A)
SMC 6: 2,4,6-Tribromophenol (A)
SMC 7: 2-2-Chlorophenol-d4 (A)
SMC 8: 1,2-Dichlorobenzene-d4 (BN)

Internal Standard Outliers

Sample	IS 1-area	IS 1-RT	IS 2-area	IS 2-RT	IS 3-area	IS 3-RT	IS 4-area	IS 4-RT	IS 5-area	IS 5-RT	Is 6-area	IS 6-RT

IS 1: 1,4-Dichlorobenzene-d4 (BN)
IS 2: Naphthalene-d8 (BN)
IS 3: Acenaphthene-d10 (BN)
IS 4: Phenathrene-d10 (BN)
IS 5: Chrysene-d12 (BN)
IS 6: Perylene-d12 (BN)

WS 2 of 2 FB

Semivolatile Organics (SW 846 Method 8270)

Site/Project: Remed. SOTH LWF AR/COC #: 606421 Laboratory Sample IDs: 80632 - 005

Laboratory: GEL Laboratory Report #: 80632

Methods: SW-846 8270C

# of Samples: 1 Matrix: Aqueous Batch #s: 252789

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blanks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks		
							>.05	<20% / 0.99	20%												
2	BN	120-82-1	1,2,4-Trichlorobenzene	✓	0.20		✓	✓	✓	✓	✓		NA								
1	BN	95-50-1	1,2-Dichlorobenzene		0.40																
1	BN	541-73-1	1,3-Dichlorobenzene		0.60																
1	BN	106-46-7	1,4-Dichlorobenzene		0.50						✓										
3	A	95-95-4	2,4,5-Trichlorophenol		0.20						✓										
3	A	88-06-2	2,4,6-Trichlorophenol		0.20						✓										
2	A	120-83-2	2,4-Dichlorophenol		0.20																
2	A	105-67-9	2,4-Dimethylphenol		0.20																
3	A	51-28-5	2,4-dinitrophenol		0.01	✓	✓	.988 *.99	+24												
3	BN	121-14-2	2,4-Dinitrotoluene		0.20	✓	✓	✓	✓		✓										
3	BN	606-20-2	2,6-Dinitrotoluene		0.20	✓	✓	✓													
3	BN	91-58-7	2-Chloronaphthalene		0.80																
1	A	95-57-8	2-Chlorophenol		0.80						✓										
2	BN	91-57-6	2-Methylnaphthalene		0.40																
1	A	95-48-7	2-Methylphenol (o-cresol)		0.70						✓										
3	BN	88-74-4	2-Nitroaniline		0.01																
2	A	88-75-5	2-Nitrophenol		0.10																
5	BN	91-94-1	3,3'-Dichlorobenzidine		0.01																
3	BN	99-09-2	3-Nitroaniline		0.01				-26												
4	A	534-52-1	4,6-Dinitro-2-methylphenol		0.01	✓	✓	0.982	+34												
4	BN	101-55-3	4-Bromophenyl-phenylether		0.10			✓	✓												
3	BN	7005-72-3	4-Chlorophenyl-phenylether		0.40																
2	A	59-50-7	4-Chloro-3-methylphenol		0.20						✓										
2	BN	106-47-8	4-Chloroaniline		0.01				-25												
1	A	106-44-5	4-Methylphenol (p-cresol)		0.60				✓												

Comments: m,p - cresol ✓ ✓ ✓

Notes: Shaded rows are RCRA compounds.

Reviewed By: [signature] Date: 06.07.03

WS 2 of 2 FB

Semivolatile Organics

Site/Project: _____ AR/COC #: 606421 Batch #s: _____

Laboratory: _____ Laboratory Report #: _____ # of Samples: _____ Matrix: _____

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blanks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks		
							>.05	<20% / 0.99	20%												
3	BN	100-01-6	4-Nitroaniline	✓	0.01		✓	✓	-24	✓		NA									
3	A	100-02-7	4-Nitrophenol		0.01				+21		✓										
3	BN	83-32-9	Acenaphthene		0.90				✓		✓										
3	BN	208-96-8	Acenaphthylene		0.90																
4	BN	120-12-7	Anthracene		0.70																
5	BN	56-55-3	Benzo(a)anthracene		0.80																
6	BN	50-32-8	Benzo(a)pyrene		0.70																
6	BN	205-99-2	Benzo(b)fluoranthene		0.70																
6	BN	191-24-2	Benzo(g,h,i)perylene		0.50	✓	✓	✓	-29												
6	BN	207-08-9	Benzo(k)fluoranthene		0.70				✓												
2	BN	111-91-1	bis(2-Chloroethoxy)methane		0.30				✓												
1	BN	111-44-4	bis(2-Chloroethyl)ether		0.70				-30												
1	BN	108-60-1	bis(2-chloroisopropyl)ether		0.01				✓												
5	BN	117-81-7	bis(2-Ethylhexyl)phthalate		0.01				✓												
5	BN	85-68-7	Butylbenzylphthalate		0.01				✓												
4	BN	86-74-8	Carbazole		0.01				-21												
5	BN	218-01-9	Chrysene		0.70				✓												
6	BN	53-70-3	Dibenzo(a,h)anthracene		0.40	✓	✓	✓	-21												
3	BN	132-64-9	Dibenzofuran		0.80				✓												
3	BN	84-66-2	Diethylphthalate		0.01																
3	BN	131-11-3	Dimethylphthalate		0.01																
4	BN	84-74-2	Di-n-butylphthalate		0.01																
6	BN	117-84-0	Di-n-octylphthalate		0.01	✓	✓	0.85/.99													
4	BN	206-44-0	Fluoranthene		0.60			✓													
3	BN	86-73-7	Fluorene		0.90																
4	BN	118-74-1	Hexachlorobenzene		0.10						✓										
2	BN	87-68-3	Hexachlorobutadiene		0.01						✓										
3	BN	77-47-4	Hexachlorocyclopentadiene		0.01																
1	BN	67-72-1	Hexachloroethane		0.30						✓										

Comments:

NS 2of2 EB

Semivolatile Organics

Site/Project: _____ AR/COC #: 606421 Batch #s: _____

Laboratory: _____ Laboratory Report #: _____ # of Samples: _____ Matrix: _____

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blanks	LCS	LCS D	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks		
							>.05	<20%/ 0.99	20%												
6	BN	193-39-5	Indeno(1,2,3-cd)pyrene	✓	0.50	✓	✓	✓	-25	✓		NA									
2	BN	78-59-1	Isophorone		0.40				✓												
2	BN	91-20-3	Naphthalene		0.70																
2	BN	98-95-3	Nitrobenzene		0.20						✓										
4	BN	86-30-6	N-Nitrosodiphenylamine (1)		0.01																
1	BN	621-64-7	N-Nitroso-di-propylamine	✓	0.50						✓										
4	A	87-86-5	Pentachlorophenol		0.05	✓	✓	✓			✓										
4	BN	85-01-8	Phenanthrene		0.70																
1	A	108-95-2	Phenol		0.80						✓										
5	BN	129-00-0	Pyrene		0.60						✓										
			Diphenylamine																		

Surrogate Recovery Outliers

Sample	SMC 1	SMC 2	SMC 3	SMC 4	SMC 5	SMC 6	SMC 7	SMC 8
IN CRITERIA								

SMC 1: Nitrobenzene-d5 (BN) SMC 2: 2-Fluorobiphenyl (BN) SMC 3: p-Terphenyl-d14 (BN)
SMC 4: Phenol-d6 (A) SMC 5: 2-Fluorophenol (A) SMC 6: 2,4,6-Tribromophenol (A)
SMC 7: 2-2-Chlorophenol-d4 (A) SMC 8: 1,2-Dichlorobenzene-d4 (BN)

Comments: MS/MSD for the batch = non. SMC SOP ∴ "P2"

Internal Standard Outliers

Sample	IS 1-area	IS 1-RT	IS 2-area	IS 2-RT	IS 3-area	IS 3-RT	IS 4-area	IS 4-RT	IS 5-area	IS 5-RT	Is 6-area	IS 6-RT
IN CRITERIA												

IS 1: 1,4-Dichlorobenzene-d4 (BN) IS 2: Naphthalene-d8 (BN) IS 3: Acenaphthene-d10 (BN)
IS 4: Phenathrene-d10 (BN) IS 5: Chrysene-d12 (BN) IS 6: Perylene-d12 (BN)

WS 1of 2 soil

PCBs (SW 846 - Method 8082)

Site/Project: Site 7H Remed AR/COC #: 606421 Laboratory Sample IDs: 80629 - 012 thru - 021
- 044 (DUP)

Laboratory: GEL Laboratory Report #: 80629

Methods: SW846 8082

# of Samples: 11 Matrix: Soil Batch #s: 252772

CAS #	Name	TCL	Intercept	Calib RSD / R^2 <20% / 0.99	CCV %D 20%	Method Blanks	LCS	LCSD	LCS RPD 20%	MS	MSD	MS RPD 20%	Field Dup. RPD	ug/L Equip. Blanks	Field Blanks		
12674-11-2	Aroclor-1016	✓	NA	✓	✓	✓	✓			402	468	✓	✓	✓	NA		
11104-28-2	Aroclor-1221									(30-149)				✓			
11141-16-5	Aroclor-1232													✓			
53469-21-9	Aroclor-1242			✓	✓									.240			
12672-29-6	Aroclor-1248			✓										✓			
11097-69-1	Aroclor-1254			✓	✓									.40			
11096-82-5	Aroclor-1260			✓	✓		✓			✓	✓	✓		✓			

Sample	SMC % REC	SMC RT	Sample	SMC % REC	SMC RT
80629-015	HCmx 138%	(51-114%)	80629-018	DCB 138%	(51-121%)
	DCB 200%	(51-121%)			
-016	HCmx 180%	(51-114%)			

Comments: DF -012 5X
-014, -019, -020, -021 10X
-013, -017, -018, -044 20X
-015 50X
-016 200X

Confirmation

Sample	CAS #	RPD > 25%	Sample	CAS #	RPD > 25%
IN CRITERIA					

Reviewed By: [signature] Date: 06.09.03

WS 2 of 2 EB

Rened. SOTH LWE

PCBs (SW 846 - Method 8082)

Site/Project: Site 74 Rened AR/COC #: 606421 Laboratory Sample IDs: 80632 - 004

Laboratory: GFL Laboratory Report #: 80629 (80632)

Methods: SW-846 8082

# of Samples: 1 Matrix: Aqueous Batch #s: 252808

CAS #	Name	TCL	Intercept	Calib RSD / R^2 <20% / 0.99	CCV %D 20%	Method Blanks	LCS	LCSD	LCS RPD 20%	MS	MSD	MS RPD 20%	Field Dup. RPD	Equip. Blanks	Field Blanks		
12674-11-2	Aroclor-1016	✓	NA	✓	✓	✓	✓			✓	✓	✓					
11104-28-2	Aroclor-1221																
11141-16-5	Aroclor-1232																
53469-21-9	Aroclor-1242			✓	✓												
12672-29-6	Aroclor-1248			✓													
11097-69-1	Aroclor-1254			✓	✓												
11096-82-5	Aroclor-1260			✓	✓		✓			✓	✓	✓					

Sample	SMC % REC	SMC RT	Sample	SMC % REC	SMC RT
80632 - 004	22 %	DCB	J, UJ, A1		
	(30-125%)		>10%		
MS / MSD	17% / 20%				

Comments: 1242, 1254 > RL

Confirmation

Sample	CAS #	RPD > 25%	Sample	CAS #	RPD > 25%
IN CRITERIA					

Reviewed By: [illegible] Date: 06.08.03

WS lot 2 soils

Inorganic Metals

Site/Project: S-7H Rerun AR/COC #: 606421 Laboratory Sample IDs: 80629-012 thru -021
-042 (DUP)

Laboratory: GEL Laboratory Report #: 80629

Methods: SW846 7471A (Hg) 6010B (ICP-AES)

# of Samples: 11 Matrix: Soils Batch #s: 253249 (Hg) 252732 (Metals)

CAS #/ Analyte	TAL	ICV	CCV	ICB	CCB	Method Blanks	LCS	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilution	Field Dup. RPD	Equip. Blanks	Field Blanks		
	ug/L.									QC Element			35%			-042.	ug/L			
7429-90-5 Al										(75-125)										
7440-39-3 Ba	✓	✓	✓	✓	1.04	✓	✓	NA		127	✓	✓	✓	✓	✓	✓	22.1*	x10 NA		
7440-41-7 Be	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	NA	✓	NA	✓	✓			
7440-43-9 Cd	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	NA	✓	NA	✓	✓			
7440-70-2 Ca																				
7440-47-3 Cr	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	4.45	x5		
7440-48-4 Co																				
7440-50-8 Cu	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	7.38	✓	✓	✓	2.92	x5		
7439-89-6 Fe													-.38							
7439-95-4 Mg													(0-20)							
7439-96-5 Mn																				
7440-02-0 Ni	✓	✓	✓	✓	[-.912]	✓	✓			✓	✓	✓	✓	✓	✓	✓	2.58	x5		
7440-09-7 K																				
7440-22-4 Ag	✓	✓	✓	[-1.87]	✓	✓	✓			✓	✓	✓	NA	✓	NA	✓	✓			
7440-23-5 Na																				
7440-62-2 V																				
7440-66-6 Zn																				
7439-92-1 Pb	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	NA	✓	6.47*	x10		
7782-49-2 Se	✓	✓	✓	1.87	1.78	✓	✓			✓	✓	✓	NA	✓	NA	✓	✓			
7440-38-2 As	✓	✓	✓	[-3.97]	[-2.44]	✓	✓			✓	✓	✓	✓	✓	NA	✓	✓			
7440-36-0 Sb																				
7440-28-0 Tl																				
7439-97-6 Hg	✓	✓	✓	[-.053]	[-.111]	✓	✓			138	✓	✓	25 ✓							
													(0-20)	GEL						
Cyanide CN										(75-125)			35%	DV	Proc.					

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:

* > RL (x10)
ICP-AES mg/kg → ug/l (x10)

Reviewed By: [signature] Date: 06.09.03

WS 2 of 2 FB

Inorganic Metals

Site/Project: SIK 74 Remed AR/COC #: 606421 Laboratory Sample IDs: 80632 - 002

Laboratory: CEL Laboratory Report #: 80629 (80632)

Methods: SW846 6010B (ICP-AES - METALS) 7470A (Hg)

# of Samples: 1 Matrix: AQUEOUS Batch #s: 252749 (Hg) 253280 (METALS)

CAS #/ Analyte	QC Element (µg/L)																			
	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	SA 002	
7429-90-5 Al										NA						NA		BXS		
7440-39-3 Ba	✓	✓	✓	.000274	.000426	✓	✓	✓	✓					✓	NA			.00213	✓	> NO Q
7440-41-7 Be	✓	✓	✓	✓	.000199	✓	✓	✓	✓					✓	NA				ND	
7440-43-9 Cd	✓	✓	✓	.000403	.000403	✓	✓	✓	✓					✓	NA				NA	
7440-70-2 Ca																				
7440-47-3 Cr	✓	✓	✓	✓	[-.0007]	✓	✓	✓	✓					✓	NA					7 SXDL NO Q
7440-48-4 Co																				
7440-50-8 Cu	✓	✓	✓	✓	[-.0015]	✓	✓	✓	✓					✓	NA					< SXDL J, B31
7439-89-6 Fe																				
7439-95-4 Mg																				
7439-96-5 Mn																				
7440-02-0 Ni	✓	✓	✓	✓	.008127	✓	✓	✓	✓					✓	NA			.00635		< J, B31
7440-09-7 K																				
7440-22-4 Ag	✓	✓	✓	✓	.00158	✓	✓	✓	✓					✓	NA				ND	NO Q
7440-23-5 Na																				
7440-62-2 V																				
7440-66-6 Zn																				
7439-92-1 Pb	✓	✓	✓	[-.0082]	✓	✓	✓	✓	✓					✓	NA					< SXDL J, B31
7782-49-2 Se	✓	✓	✓	✓	✓	✓	✓	✓	✓					✓	NA					
7440-38-2 As	✓	✓	✓	✓	✓	✓	✓	✓	✓					✓	NA					
7440-36-0 Sb																				
7440-28-0 Tl																				
7439-97-6 Hg	✓	✓	✓	✓	✓	✓	✓			✓			NA							
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 / l

Comments: No Rep } No qual. SD = 80614 field QC
No MS (prof judgment)

Reviewed By: [signature] Date: 06.09.03

Hg - Dup/MS 80314 SMA SOG ✓

WS 1 of 2 soil

General Chemistry

Site/Project: S-7th Remed AR/COC #: 606421 Laboratory Sample IDs: 80629 - 012 thru - 021 - 043 (DUP)

Laboratory: GEL SDG #: 80629

Methods: SW846 · 7196 A

# of Samples: 11 Matrix: Soil Batch #s: 252806, 252812 (-019, -020)

	CAS #	Analyte	QC Element																		
			TAL	ICV	CCV	ICB	CCB	Method Blanks	LCS	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilution	Field Dup. RPD	Equip. Blanks	Field Blanks	
252806	18540-29-9	Hex Chromium		✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	✓	NA	NA	✓	✓	NA	
252812	18540-29-9	Hex Chromium		✓	✓	✓	✓	✓	✓	NA	NA	NA	NA	NA	✓	NA	NA	NA	✓	NA	

Comments: -019 & -020 XT analyzed > 24 hrs J, HT
[> HT within 2X HT]

-014 5X
-019 10X

Reviewed By: [signature] Date: OT 6 · 10 · 03 LT

NS 2of2 FB

General Chemistry

Site/Project: S-74 Remed AR/COC #: 606421 Laboratory Sample IDs: 80632 - 003

Laboratory: GEL Laboratory Report #:

Methods: SW846 - 7196A

# of Samples: 1 Matrix: Aqueous Batch #s: 252672

CAS #	Analyte	QC Element																	
		TAL	ICV	CCV	ICB	CCB	Method Blanks	LCS	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilution	Field Dup. RPD	Equip. Blanks	Field Blanks
18540-29-9	Hexavalent Chromium		✓	✓	✓	✓	✓	✓	NA	NA	✓	NA	NA	NA	NA	→	→	→	→

Comments: Cr +6 80632-003 ER Rec. ow of HT
Analyzed > 2X HT " R, HT "

Dup, PS 80614 SYL SDG ✓

Reviewed By: [signature] Date: 07.10.03

Radiochemistry

Site/Project: S-74 Remed AR/COC #: 606421 Laboratory Sample IDs: 80629 - 022 thru - 031 H^3
- 032 thru - 041

Laboratory: GEL Laboratory Report #: 80629

Methods: EPA 906.0 (H^3) EML HASL 300 (γ spec)

# of Samples: 20 Matrix: Soil Batch #s: 253550 (H^3) 253295 (γ spec)

Analyte	QC Element													
	Method Blanks	LCS	MS	Rep RER	Equip. Blanks	Field Dup. RER	Field Blanks	Sample ID	Isotope	IS/Trace	Sample ID	Isotope	IS/Trace
Criteria	U	20%	25%	<1.0	U	<1.0	U			50-105			50-105
H3 ✓	✓	✓	✓	✓	NA	NA	NA						
U-238													
U-234													
U-235/-236													
Th-232													
Th-228													
Th-230													
Pu-239/-240													
Gross Alpha													
Nonvolatile Beta													
Ra-226													
Ra-28													
Ni-63													
Gamma Spec. Am-241 ✓	✓	✓	NA	✓	NA	NA	NA						
Gamma Spec. Cs-137 ✓	✓	✓	✓	✓	✓	✓	✓						
Gamma Spec. Co-60 ✓	✓	✓	✓	✓	✓	✓	✓						

Parameter	Method	Typical Tracer	Typical Carrier
Iso-U	Alpha spec.	U-232	NA
Iso-Pu	Alpha spec.	Pu-242	NA
Iso-Th	Alpha spec.	Th-229	NA
Am-241	Alpha spec.	Am-242	NA
Sr-90	Beta	Y ingrowth	NA
Ni-63	Beta	NA	Ni by ICP
Ra-226	Deamination	NA	NA
Ra-226	Alpha spec.	Ba-133 or Ra-225	NA
Ra-228	Gamma spec.	Ba-133	NA

Gamma spec. LCS contains: Am-241, Cs-137, and Co-60

Comments: - 028, - 029, - 030 } 1/3 container rec. broken, 2/3 " " " } H^3
- 040 1/1 received broken — Gamma spec.

- 035 Antimony - 124 - 0.0132 MDA = .0122
Protactinium - 231 - .477 MDA = .471 R.

H^3 Dup/MS 80612 SNA SOG ✓

Reviewed By: [signature] Date: 07/10·03 LT

γ spec dup 80612 SNA SOG ✓

Sample Findings Summary
Revised

Site: S-74 Chem Waste LF Remed **ARCOC:** 606424 **Data:** Organic, Inorganic and Radiochemistry

Sample ID	All VOC (8260B) TAL compounds	67-64-1 (acetone)	SVOC (8270C)	205-99-2 (benzo(b)fluoranthene)	All Aroclors (8082)	11096-82-5 (aroclor-1260)	Metals	7440-38-2 (arsenic)	7440-50-8 (copper)	7440-02-0 (nickel)	7439-92-1 (lead)	7782-49-2 (selenium)	General Chemistry	18540-29-9 (hexavalent chromium)	
062084-005 74-SB-E002-F172-TB	P2														
062092-005 74-SB-E002-F189-EB	P2														
062092-006 74-SB-E002-F189-EB								UJ, B3	UJ, B3	UJ, B3	UJ, B3				
062092-007 74-SB-E002-F189-EB														R, HT	
062092-008 74-SB-E002-F189-EB					UJ, HT, P2										
062083-001 74-SB-E002-F171		15.3U, B2													
062084-001 74-SB-E002-F172		21.7U, B2													
062085-001 74-SB-E002-F173		23.2U, B2													
062086-001 74-SB-E002-F174		21.1U, B2													
062087-001 74-SB-E002-F175		14.3U, B2													
062089-001 74-SB-E002-F186		18.0U, B2													
062090-001 74-SB-E002-F187		19.1U, B2													
062091-001 74-SB-E002-F188		29.0U, B2													
062092-001 74-SB-E002-F189		13.0U, B2													
062092-010 74-SB-E002-F189-DU		12.5U, B2													
062083-002 74-SB-E002-F171												J, B3			
062084-002 74-SB-E002-F172				J		216J, A2						J, B3			
062085-002 74-SB-E002-F173				J								J, B3			
062086-002 74-SB-E002-F174												J, B3			
062087-002 74-SB-E002-F175												J, B3			
062088-002 74-SB-E002-F176												J, B3			
062089-002 74-SB-E002-F186												J, B3			
062090-002 74-SB-E002-F187												J, B3			
062091-002 74-SB-E002-F188						J, A2						J, B3			
062092-002 74-SB-E002-F189						J, A2									
062092-013 74-SB-E002-F189-DU						J, A2									

Sample Findings Summary
Revised

Site: S-74 Chem Waste LF Remed | **ARCOC:** 606424 | **Data:** Organic, Inorganic and Radiochemistry

Sample ID	Radiochemistry	All Gamma Spec results flagged "X" by the lab (see EDD)	15585-10-1 (europium-154)	13966-32-0 (sodium-22)											
062083-004 74-SB-E002-F171		R													
062084-004 74-SB-E002-F172		R													
062085-004 74-SB-E002-F173		R													
062086-004 74-SB-E002-F174		R													
062087-004 74-SB-E002-F175		R													
062088-004 74-SB-E002-F176		R													
062089-004 74-SB-E002-F186		R													
062090-004 74-SB-E002-F187		R	R	R											
062091-004 74-SB-E002-F188		R													
062092-004 74-SB-E002-F189		R													

K Neal

Date:07/15/03

Analytical Quality Associates, Inc.
616 Maxine NE
Albuquerque, NM 87123
Phone: 505-299-5201
Fax: 505-299-6744
Email: minteer@aol.com

Memorandum-Revised

DATE: 07/15/03

TO: File

FROM: Linda Thal

SUBJECT: Inorganic Data Review and Validation - SNL
Site: S-74 Chem Waste LF Remed
ARCOC # 606424
GEL SDG # 81201 and 81203
Project/Task No. 7221.02.02.03

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM ER Project AOP 00-03.

Summary

The samples were prepared and analyzed with approved procedures using methods SW-846 6010B (ICP-AES metals), SW-846 7470A/7471A (CVAA-Hg) and SW-846 7196A (hexavalent chromium). Problems were identified with the data package that resulted in the qualification of data.

ICP-AES Batch # 254528 (EB)
Cu, Pb, Ni and As were detected in the ICB and/or CCB at negative values with absolute values > DL but < RL. The associated sample results were non-detect and will be qualified "UJ, B3".

ICP-AES Batch # 254540
Se was detected in the CCB at a value > DL but < RL. Samples 81201-012 through -020 were detect with values <5X blank value and will be qualified "J, B3".

Hexavalent Chromium Batch # 254389 (EB)
The sample was received and analyzed more than 2X after its method specified hold time had expired. The sample result was non-detect and will be qualified "R, HT".

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

Holding Times/Preservation

All Analyses: The samples were analyzed within the prescribed holding times and properly preserved except as mentioned above in the summary section.

Calibration

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

Blanks

All Analyses: All blank criteria were met except as mentioned above in the summary section and as follows:

ICP-AES Batch # 254540
Se was detected in the CCB at a value > DL but < RL. Samples 81201-039 and -043 were non-detect and will not be qualified. Cu, Ni and As were detected in the ICB and/or CCB at negative values with absolute values > DL but < RL. All associated sample result were > 5X DL and will not be qualified. Ba and Cr were detected in the EB at a value > DL but < RL. All associated sample results were detect with values > 5X the blank values and will not be qualified.

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

All Analyses: The LCS/LCSD met QC acceptance criteria.

Matrix Spike (MS) Analysis

All Analyses: The MS/MSD met QC acceptance criteria except as follows:

ICP-AES Batch # 254528 (EB)
The sample was field QC and therefore no MS was extracted. Using professional judgment no data will be qualified.

Hg-CVAA Batch # 254812 (EB)
It should be noted that the sample used for the MS was from another SNL SDG. No data will be qualified.

Replicate Analysis

All Analyses: The replicate analysis met QC acceptance criteria except as follows:

ICP-AES Batch # 254528 (EB)
No replicate analysis was performed for this batch. A LCS/LCSD was performed and will be used to assess the precision for the batch. No data will be qualified.

Hg-CVAA Batch # 254812 (EB)
It should be noted that the sample used for the replicate was from another SNL SDG. No data will be qualified.

ICP Interference Check Sample (ICS)

ICP-AES: The ICS-AB met QC acceptance criteria.

All Other Analyses: No ICS required.

ICP Serial Dilution

ICP-AES: The serial dilution met QC acceptance criteria.

ICP-AES Batch # 254528 (EB)
It should be noted that the sample used for the SD was from another SNL SDG. No data will be qualified.

All other Analyses: No serial dilution required.

Detection Limits/Dilutions

All Analyses: All detection limits were properly reported and the samples undiluted with the following exceptions:

ICP-AES: All soil samples were diluted 2X. Sample 81201-018 and -039 were diluted 5X for Ba analysis.

Hg-CVAA: Sample 81201-012 was diluted 2X; sample 81201-014, -016 and -019 - 10X; sample 81201-013 was diluted 20X due to high concentrations of analyte present.

Other QC

All Analyses: A field duplicate and equipment blank were submitted on the ARCOC. There is no "required" validation procedure for assessing a field duplicate.
No field blank was submitted on the ARCOC.

No other specific issues were identified which affect data quality.

AQA Nonconformance Report

NCR No.07-15-03LT

Pg 1 of 1

SECTION 1

Document Title: DV report SNL COC 606424	Project or Program: SNL Data Validation
Originator / Date: Linda Thal 07-15-03	Contract No.: 3719

DESCRIPTION OF NONCONFORMANCE

Requirement: The client requested that a qualifier for chromium on sample 81201-020 and -040 be removed from the memorandum and sample finding summary.

Condition Found: Chromium was qualified due to an error in our holding time table (refer to email dated 07-10-03).

Assigned to: Linda Thal Response Due 07-15-03

SECTION 2

DISPOSITION: Accept-As-Is _____ Administrative Action ___X___

Justification: Due to an error in the hold time table, the chromium results were qualified when in actual fact the hold time had been met.

Instructions: A revised memorandum and Sample Finding Summary were issued with the chromium qualification removed. Also, as per the email issued by G. Dechant on 07-10-03, the hold time for Cr6+ extracts will be changed from 24 hours to 168 hours in the hold time table.

Responsible Employee L Thal Corrective Action Due Date 07-15-03

SECTION 3

VERIFICATION AND CLOSURE: Disposition Completed As Directed ___X___ Other (Specify)_____

Originator or QA Coordinator (Signature/Date)_____

Analytical Quality Associates, Inc.
616 Maxine NE
Albuquerque, NM 87123
Phone: 505-299-5201
Fax: 505-299-6744
Email: minteer@aol.com

MEMORANDUM

DATE: 06/10/03

TO: File

FROM: Linda Thal

SUBJECT: Radiochemical Data Review and Validation - SNL
Site: S-74 Chem Waste LF Remed
ARCOC 606424
GEL SDG # 81201
Project/Task No. 7221.02.02.03

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.

Summary

All samples were prepared and analyzed with approved procedures using method EPA 906.0 (tritium) and DOE EML HASL 300 (gamma spec). Problems were identified with the data package that resulted in the qualification of data.

Gamma Spec Analysis
Several Gamma Spec results for all samples were "X" flagged by the laboratory due to interference, no valid peak/uncertain identification or low abundance. (See Electronic Data Deliverable). Thus, these sample results will be qualified "R" (unusable).
Sample 81201-037 had negative values for europium-154 and Na-22 with absolute values > the MDA. The sample results will be qualified "R".

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

Holding Times/Preservation

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

Calibration

All Analyses: The case narrative stated the instruments used were properly calibrated.

Blanks

All Analyses: No target analytes were detected in the method blank at concentrations > the associated MDA/TPUs.

Matrix Spike (MS) Analysis

Tritium: The MS analyses met all QC acceptance criteria.

It should be noted that the sample used for the MS was of similar matrix from another SNL SDG.

Gamma Spec: No MS required.

Laboratory Control Sample (LCS) Analysis

All Analyses: The LCS analyses met all QC acceptance criteria.

Replicates

All Analyses: The replicate analyses met all QC acceptance criteria.

It should be noted that the samples used for the replicate was of similar matrix from another SNL SDG.

Tracer/Carrier Recoveries

All Analyses: No tracer/carrier required.

Negative Bias

All Analyses: All sample results met negative bias QC acceptance criteria except as mentioned above in the summary section.

Detection Limits/Dilutions

All Analyses: All detection limits were properly reported. No samples were diluted.

Other QC

All Analyses: No equipment blank, field blank or field duplicate was submitted on the ARCOC.

No other specific issues were identified which affect data quality.

Analytical Quality Associates, Inc.
616 Maxine NE
Albuquerque, NM 87123
Phone: 505-299-5201
Fax: 505-299-6744
Email: minteer@aol.com

MEMORANDUM

DATE: 06/19/03

TO: File

FROM: Linda Thal

SUBJECT: Organic Data Review and Validation - SNL
Site: S-74 Chem Waste LF Remed
ARCOC # 606424
GEL SDG # 81201 and 81203
Project/Task No. 7221.02.02.03

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM ER Project AOP 00-03.

Summary

The samples were prepared and analyzed with approved procedures using methods SW-846 8260A/B (VOC), 8270C (SVOC) and 8082 (PCBs). Problems were identified with the data package that resulted in the qualification of data.

VOC Batch # 255264 (EB and TB)
No MS/MSD, LCSD or duplicate was performed for this batch. As there is no measure of precision available, all sample results will be qualified "P2".

VOC Batch # 254796
The EB associated with the samples had an acetone value > RL. All associated samples, with the exception of sample 81201-006, had acetone values > RL but < 10X EB value. The sample results will be qualified "U, B2" at the reported values.

SVOC Batch # 254412
The CCV had a %D > 20% with a positive bias for benzo(b)fluoranthene (28%). Sample 81201-013 and -014 were detect with values > RL and will be qualified "J".

PCB Batch # 255522 (EB)
Due to a QC failure, the sample was re-extracted out of the method specified hold time but within 2X the hold time. All results were non-detect and will be qualified "UJ, HT". No MS/MSD, LCSD or duplicate was performed for this sample. As there is no measure of precision available, all sample results will be qualified "P2".

PCB Batch # 254400
The MS/MSD had %R's > QC acceptance criteria for aroclor-1260 due to matrix interference and interfering peaks from the aroclor-1254 present in the sample. Samples 81201-013, -020, -041 and -043 were detect for aroclor-1260 and will be qualified "J, A2".

Sample 81201-013 had a confirmation RPD > 25% but < 75% for aroclor-1260. The sample result will be changed to the highest reported value and is already "J" qualified due to high MS/MSD %Rs.

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

Holding Times/Preservation

All Analyses: The samples were properly preserved and analyzed within the method prescribed holding time except as mentioned above in the summary section and as follows:

VOC Batch # 255264 (EB)
It should be noted that all the vials for sample 81203-001 (TB) were received with a small amount of headspace. The sample results were non-detect and therefore unaffected. No data will be qualified.

SVOC Batch # 254412
It should be noted that the container for sample 81201-042 (duplicate) was received broken. Sufficient sample was available for analysis and the sample results appear to be unaffected. No data will be qualified.

Calibration

All Analyses: All initial and continuing calibration acceptance criteria were met except as mentioned above in the summary section and as follows:

SVOC Batch # 254414 (EB)
4,6-Dinitro-2-methylphenol had a correlation coefficient (0.98) > 0.90 but < 0.99 in the initial calibration preceding the sample. The sample result was non-detect and will not be qualified.
Several compounds had %Ds > 20% but < 40% with a negative bias in the CCV preceding the sample.
Several compounds had %Ds > 20% with a positive bias in the CCV preceding the samples (see DV Worksheet). All associated sample results were non-detect and will not be qualified.

SVOC Batch # 254412
Several compounds had %Ds > 20% with a positive bias in the CCV preceding the samples (see DV Worksheet). All associated sample results were non-detect and will not be qualified.

Blanks

All Analyses: All method blank (MB), trip blank (TB) and equipment blank (EB) acceptance criteria were met except as mentioned above in the summary section and as follows:

VOC Batch # 254796
The EB associated with the samples had an acetone value > RL and an ethylbenzene and xylene (total) value > DL but < RL. Sample 81201-006 was non-detect for acetone; all associated sample results were non-detect for ethylbenzene and xylene (total); no data will be qualified.

SVOC Batch # 254412
The EB associated with the samples had a diethylphthalate value > DL but < RL. All sample results for diethylphthalate were non-detect and no data will be qualified.

Surrogates

All Analyses: All surrogate acceptance criteria were met.

Internal Standards (ISs)

VOC and SVOC: All internal standard acceptance criteria were met.

PCB: No internal standard required.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

All Analyses: All MS/MSD acceptance criteria were met except as mentioned above in the summary section and as follows:

SVOC Batch # 254414 (EB)
The sample used for the MS/MSD was if similar matrix from another SNL SDG. No data will be qualified.

PCB Batch # 254400
The MS/MSD %R for aroclor-1016 was biased high due to interference from aroclor-1242 detected in the samples. All associated sample results were non-detect for aroclor-1016, and using professional judgment will not be qualified.

Laboratory Control Samples (LCS/LCSD) Analysis

All Analyses: The LCS acceptance criteria were met. No LCSD was analyzed. The MS/MSD is used to assess the precision for the batch. No data will be qualified as a result.

Detection Limits/Dilutions

All Analyses: All detection limits were properly reported. Samples were not diluted with the following exceptions:

PCB
Sample 81201-016, -018 and -020 were diluted 5X; sample 81201-012, -015 and -019 - 10X; sample 81201-013 and -014 - 20X due to high concentrations of aroclors present.

Confirmation Analyses

VOC and SVOC: No confirmation analyses required.

PCB: All confirmation acceptance criteria were met except as mentioned above in the summary section.

Other QC

VOC: An EB, a TB and a field duplicate were submitted on the ARCOC. There is no "required" validation procedure for assessing a field duplicate.

SVOC and PCB: An EB and a field duplicate were submitted on the ARCOC. There is no "required" validation procedure for assessing a field duplicate. No field blank was submitted on the ARCOC.

No other specific issues were identified which affect data quality.

Remed. SOTH LWE

Data Validation Summary

Site/Project: SIR 7H Remed Project/Task #: 7221.02.02.03 # of Samples: 45 & 6 Matrix: Soil & H2O

AR/COC #: 606424 Laboratory Sample IDs: 81201 - 001 thru -045

Laboratory: GEL 81203 - 001 thru - 006

SDG #: 81201

QC Element	Analysis									
	Organics				Inorganics				RAD	Other (Hexavalent Chromium)
	VOC	SVOC	Pesticide/ PCB	HPLC (HE)	ICP/AES	GFAA/ AA	CVAA (Hg)	CN		
1. Holding Times/Preservation	✓	✓	✓ / UJ,HT	NA	✓	NA	✓	NA	✓	R,HT / R,HT
2. Calibrations	✓	J / ✓	✓		✓		✓		✓	✓
3. Method Blanks	U,B2 / ✓	✓	✓		J,B3 / UJ,B3		✓		✓	✓
4. MS/MSD	✓ / P2	✓	J,A2 / P2		✓		✓		✓	✓
5. Laboratory Control Samples	✓	✓	✓		✓		✓		✓	✓
6. Replicates					✓		✓		✓	✓
7. Surrogates	✓	✓	✓							NA
8. Internal Standards	✓	✓								
9. TCL Compound Identification	✓	✓								
10. ICP Interference Check Sample										
11. ICP Serial Dilution										
12. Carrier/Chemical Tracer Recoveries									NA	
13. Other QC	TB EB Field dup	EB Field dup	EB Field dup *		EB Field dup		EB Field dup		R tur neg bias & rej by lab	EB Field dup

J = Estimated
U = Not Detected
UJ = Not Detected, Estimated
R = Unusable

Check (√) = Acceptable
Shaded Cells = Not Applicable (also "NA")
NP = Not Provided
Other: * J confirmation RPD

Reviewed By: [signature] Date: 06.23.03

Holding Time and Preservation

Site/Project: S-74 Remed AR/COC #: 606424 Laboratory Sample IDs: 81201 - 001 thru - 045
Laboratory: GEL Laboratory Report #: 81201 (81203) 81203 - 001 thru - 006
# of Samples: 45 & 6 Matrix: Soil & H2O

Sample ID	Analytical Method	Holding Time Criteria	Days Holding Time was Exceeded	Preservation Criteria	Preservation Deficiency	Comments
81203 - 005	SW846 8082	7 days	2 days	NA	NA	>HT <2XHT "UJ, HT"
81203 - 004	SW846 7196A	24 hours	> 53 hours	NA	NA	>2XHT "R, HT"
81201 - 020	" "	XT 24 hours	> 49 hours			>2XHT "R, HT"
- 040	" "	" "	"			>2XHT "R, HT"

Reviewed By: K Thal Date: 06.23.03

WS 10f2 soils

Volatile Organics (SW 846 Method 8260)

Site/Project: S-7H Remed AR/COC #: 606424 # of Samples: 11 Matrix: Soil

Laboratory: GEL SDG #: 81201 Laboratory Sample IDs: 81201-001 thru -011

Methods: SW-846 8260A Batch #s: 254796

IS	CAS #	Name	TCL	Min. RF	Intercept	Calib. RF >.05	Calib. RSD/ R^2 <20% / 0.99	CCV %D 20%	Method Blks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	10811 Field Dup. RPD	81203-002 Equip. Blanks	81203-001 Trip Blanks		
1	71-55-6	1,1,1-trichloroethane	✓	0.10		✓	✓	✓	✓		NA						✓	✓		
2	79-34-5	1,1,2,2-tetrachloroethane		0.30																
2	79-00-5	1,1,2-trichloroethane		0.10																
1	75-34-3	1,1-dichloroethane		0.10																
1	75-35-4	1,1-dichloroethene		0.20						✓			✓	✓	✓					
1	107-06-2	1,2-dichloroethane		0.10																
1	540-59-0	1,2-dichloroethene(total)		0.01																
1	78-87-5	1,2-dichloropropane	✓	0.01																
1	78-93-3	2-butanone (MEK) (10xblk)	✓	0.01																
1	110-75-8	2-chloroethyl vinyl ether																		
2	591-78-6	2-hexanone (MBK)	✓	0.01																
2	108-10-1	4-methyl-2-pentanone (MIBK)		0.10																
1	67-64-1	acetone(10xblk)		0.01													8.45			
1	71-43-2	benzene		0.50						✓			✓	✓	✓		✓			
1	75-27-4	bromodichloromethane		0.20																
3	75-25-2	bromoform		0.10																
1	74-83-9	bromomethane		0.10																
1	75-15-0	carbon disulfide		0.10																
1	56-23-5	carbon tetrachloride		0.10																
2	108-90-7	chlorobenzene		0.50						✓			✓	✓	✓					
1	75-00-3	chloroethane		0.01																
1	67-66-3	chloroform		0.20																
1	74-87-3	chloromethane		0.10																
1	10061-01-5	cis-1,3-dichloropropene		0.20																
2	124-48-1	dibromochloromethane		0.10																
2	100-41-4	ethylbenzene		0.10																
1	75-09-2	methylene chloride (10xblk)		0.01	✓	✓	✓										0.302 J			
2	100-42-5	styrene		0.30													✓			
2	127-18-4	tetrachloroethene		0.20																
2	108-88-3	toluene(10xblk)		0.40						✓			✓	✓	✓					
2	10061-02-6	trans-1,3-dichloropropene		0.10																
1	79-01-6	trichloroethene		0.30						✓			✓	✓	✓					
1	75-01-4	vinyl chloride		0.10																
2	1330-20-7	xylenes(total)		0.30													0.692 J			
	cis-1,2-trichloroethene																✓			
	trans-1,2-trichloroethene																			

Comments: vinyl acetate

Notes: Shaded rows are RCRA compounds.

Reviewed By: [signature] Date: 06.19.03

WS lot 2 soils

Volatile Organics

Site/Project: _____ AR/COC #: 606424 Batch #s: _____

Laboratory: _____ SDG #: _____ # of Samples: _____ Matrix: _____

Surrogate Recovery and Internal Standard Outliers (SW 846 Method 8260)

Sample	SMC 1	SMC 2	SMC 3	IS 1 area	IS 1 RT	IS 2 area	IS 2 RT	IS 3 area	IS 3 RT

SMC 1: Bromofluorobenzene
SMC 2: Dibromofluoromethane
SMC 3: Toluene-d8

IS 1: Fluorobenzene
IS 2: Chlorobenzene-d5
IS 3: 1,4-Dichlorobenzene-d4

Comments:

All samples U, B2 or reported value for Acetone.
(excl. -006)

WS 2of2 H20

Volatile Organics (SW 846 Method 8260)

Site/Project: Site - 74 Remed AR/COC #: 606424 # of Samples: 2 Matrix: Aqueous

Laboratory: GEL SDG #: 81201 (81203) Laboratory Sample IDs: 81203 - 001 (TB) & - 002 (FB)

Methods: SW-846 8260B Batch #s: 25526H

IS	CAS #	Name	TCL	Min. RF	Intercept	Calib. RF >.05	Calib. RSD/ R^2 <20%/ 0.99	CCV %D 20%	Method Blks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Trip Blanks		
1	71-55-6	1,1,1-trichloroethane	✓	0.10		✓	✓		✓											
2	79-34-5	1,1,2,2-tetrachloroethane		0.30																
2	79-00-5	1,1,2-trichloroethane		0.10																
1	75-34-3	**1,1-dichloroethane**		0.10																
1	75-35-4	**1,1-dichloroethene**		0.20						✓										
1	107-06-2	**1,2-dichloroethane**		0.10																
1	540-59-0	**1,2-dichloroethene(total)**		0.01																
1	78-87-5	**1,2-dichloropropane**	✓	0.01																
1	78-93-3	2-butanone (MEK) (10xblk)	✓	0.01																
1	110-75-8	2-chloroethyl vinyl ether																		
2	591-78-6	2-hexanone (MBK)	✓	0.01																
2	108-10-1	4-methyl-2-pentanone (MIBK)		0.10																
1	67-64-1	**acetone(10xblk)**		0.01	✓	✓	✓													
1	71-43-2	**benzene**		0.50						✓										
1	75-27-4	bromodichloromethane		0.20																
3	75-25-2	bromoform		0.10	✓	✓	✓													
1	74-83-9	bromomethane		0.10																
1	75-15-0	carbon disulfide		0.10																
1	56-23-5	**carbon tetrachloride**		0.10																
2	108-90-7	**chlorobenzene**		0.50						✓										
1	75-00-3	chloroethane		0.01																
1	67-66-3	**chloroform**		0.20																
1	74-87-3	chloromethane		0.10																
1	10061-01-5	cis-1,3-dichloropropene		0.20																
2	124-48-1	dibromochloromethane		0.10																
2	100-41-4	ethylbenzene		0.10																
1	75-09-2	methylene chloride (10xblk)		0.01																
2	100-42-5	styrene		0.30																
2	127-18-4	**tetrachloroethene**		0.20																
2	108-88-3	toluene(10xblk)		0.40						✓										
2	10061-02-6	trans-1,3-dichloropropene		0.10																
1	79-01-6	**trichloroethene**		0.30						✓										
1	75-01-4	**vinyl chloride**		0.10																
2	1330-20-7	xylenes(total)		0.30																
	cis - 1,2 - Dichloroethene																			
	trans - 1,2 - Dichloroethene																			

Comments: Vinyl Acetate

Notes: Shaded rows are RCRA compounds.

Reviewed By: [signature] Date: 06.19.03

TB - all vials had pea size head space.

No precision - " " "

NS 2 of 2 1120

Volatile Organics

Site/Project: _____ AR/COC #: 606424 Batch #s: _____

Laboratory: _____ SDG #: _____ # of Samples: _____ Matrix: _____

Surrogate Recovery and Internal Standard Outliers (SW 846 Method 8260)

Sample	SMC 1	SMC 2	SMC 3	IS 1 area	IS 1 RT	IS 2 area	IS 2 RT	IS 3 area	IS 3 RT
IN CRITERIA									

SMC 1: Bromofluorobenzene
SMC 2: Dibromofluoromethane
SMC 3: Toluene-d8

IS 1: Fluorobenzene
IS 2: Chlorobenzene-d5
IS 3: 1,4-Dichlorobenzene-d4

Comments:

WJ 1 of 2 Soils

Semivolatile Organics (SW 846 Method 8270)

Site/Project: S-7H Removal AR/COC #: 606424 Laboratory Sample IDs: 81201 - 012 thru - 020

Laboratory: GEL Laboratory Report #: SDG # ~~606424~~ 81201 - 0H2 & 0H3

Methods: SW-846 8270C

# of Samples: 11 Matrix: Soils Batch #s: 254412

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF >.05	Calib. RSD/ R^2 <20%/ 0.99	CCV %D 20%	Method Blanks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	H2 & H3 Field Dup. RPD	81203-006 Equip. Blanks	Field Blanks		
2	BN	120-82-1	1,2,4-Trichlorobenzene	✓	0.20		✓	✓	✓ ✓	✓	✓			✓	✓	✓	✓	✓	NA		
1	BN	95-50-1	1,2-Dichlorobenzene	✓	0.40																
1	BN	541-73-1	1,3-Dichlorobenzene	✓	0.60																
1	BN	106-46-7	1,4-Dichlorobenzene	✓	0.50						✓			✓	✓	✓					
3	A	95-95-4	2,4,5-Trichlorophenol	✓	0.20						✓			✓	✓	✓					
3	A	88-06-2	2,4,6-Trichlorophenol	✓	0.20						✓			✓	✓	✓					
2	A	120-83-2	2,4-Dichlorophenol	✓	0.20																
2	A	105-67-9	2,4-Dimethylphenol	✓	0.20																
3	A	51-28-5	2,4-dinitrophenol	✓	0.01	✓	✓	✓	+28												
3	BN	121-14-2	2,4-Dinitrotoluene	✓	0.20				✓		✓			✓	✓	✓					
3	BN	606-20-2	2,6-Dinitrotoluene	✓	0.20																
3	BN	91-58-7	2-Chloronaphthalene	✓	0.80																
1	A	95-57-8	2-Chlorophenol	✓	0.80						✓			✓	✓	✓					
2	BN	91-57-6	2-Methylnaphthalene	✓	0.40																
1	A	95-48-7	2-Methylphenol (o-cresol)	✓	0.70						✓			✓	✓	✓					
3	BN	88-74-4	2-Nitroaniline	✓	0.01																
2	A	88-75-5	2-Nitrophenol	✓	0.10																
5	BN	91-94-1	3,3'-Dichlorobenzidine	✓	0.01																
3	BN	99-09-2	3-Nitroaniline	✓	0.01																
4	A	534-52-1	4,6-Dinitro-2-methylphenol	✓	0.01			.988 ≤ .99	✓ +26.4												
4	BN	101-55-3	4-Bromophenyl-phenylether	✓	0.10			✓	+25 ✓												
3	BN	7005-72-3	4-Chlorophenyl-phenylether	✓	0.40				✓												
2	A	59-50-7	4-Chloro-3-methylphenol	✓	0.20						✓			✓	✓	✓					
2	BN	106-47-8	4-Chloroaniline	✓	0.01																
~~1~~	~~A~~	~~106-44-5~~	~~4-Methylphenol (p-cresol)~~		~~0.60~~																
											✓			✓	✓	✓					

Comments: A N22 m,p-cresol 0.6 ✓

Notes: Shaded rows are RCRA compounds.

Reviewed By: [signature] Date: 06.19.03

NS 2of 2 H2O

Semivolatile Organics (SW 846 Method 8270)

Site/Project: S-74 Remed AR/COC #: 606424 Laboratory Sample IDs: 81203 - 006 (EB)

Laboratory: GEL Laboratory Report #: SDG # 81201 (81203)

Methods: SW846 8270C

# of Samples: 1 Matrix: Aqueous Batch #s: 254414

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blanks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks		
							>.05	<20%/ 0.99	20%												
2	BN	120-82-1	1,2,4-Trichlorobenzene	✓	0.20		✓	✓	✓	✓	✓	NA		✓	✓	✓	NA				
1	BN	95-50-1	1,2-Dichlorobenzene		0.40																
1	BN	541-73-1	1,3-Dichlorobenzene		0.60																
1	BN	106-46-7	1,4-Dichlorobenzene		0.50						✓			✓	✓	✓					
3	A	95-95-4	2,4,5-Trichlorophenol		0.20						✓			✓	✓	✓					
3	A	88-06-2	2,4,6-Trichlorophenol		0.20						✓			✓	✓	✓					
2	A	120-83-2	2,4-Dichlorophenol		0.20																
2	A	105-67-9	2,4-Dimethylphenol		0.20																
3	A	51-28-5	2,4-dinitrophenol		0.01	✓	✓	.988 .99	+31												
3	BN	121-14-2	2,4-Dinitrotoluene		0.20	✓	✓	✓	123		✓			✓	✓	✓					
3	BN	606-20-2	2,6-Dinitrotoluene		0.20	✓	✓	✓	✓												
3	BN	91-58-7	2-Chloronaphthalene		0.80																
1	A	95-57-8	2-Chlorophenol		0.80						✓			✓	✓	✓					
2	BN	91-57-6	2-Methylnaphthalene		0.40																
1	A	95-48-7	2-Methylphenol (o-cresol)		0.70						✓			✓	✓	✓					
3	BN	88-74-4	2-Nitroaniline		0.01																
2	A	88-75-5	2-Nitrophenol		0.10																
5	BN	91-94-1	3,3'-Dichlorobenzidine		0.01																
3	BN	99-09-2	3-Nitroaniline		0.01				-20.3												
4	A	534-52-1	4,6-Dinitro-2-methylphenol		0.01	✓	✓	.983	+49												
4	BN	101-55-3	4-Bromophenyl-phenylether		0.10			✓	+21												
3	BN	7005-72-3	4-Chlorophenyl-phenylether		0.40				✓												
2	A	59-50-7	4-Chloro-3-methylphenol		0.20						✓			✓	✓	✓					
2	BN	106-47-8	4-Chloroaniline		0.01																
~~1~~	~~A~~	~~106-44-5~~	~~4-Methylphenol (p-cresol)~~		~~0.60~~																

Comments: A N22 m,p cresol 0.60

Notes: Shaded rows are RCRA compounds.

Reviewed By: [signature] Date: 08.19.03

MS/MSD 81227 SNL SDG

NJ 1 of 2 Soils

PCBs (SW 846 - Method 8082)

Site/Project: Site 7H Remed AR/COC #: 606424 Laboratory Sample IDs: 81201 - 012 thru - 020 - 041 (DUP) & -043

Laboratory: GEL Laboratory Report #: SDG # 81201

Methods: SW846 8082

# of Samples: 11 Matrix: Soil Batch #s: 254400

CAS #	Name	TCL	Intercept	Calib RSD / R^2 <20% / 0.99	CCV %D 20%	Method Blanks	LCS	LCSD	LCS RPD 20%	MS	MSD	MS RPD 20%	41,43 Field Dup. RPD	81203-205 Equip. Blanks	Field Blanks		
12674-11-2	Aroclor-1016	✓		✓	✓	✓	✓	NA		702	621	✓	✓	✓	NA		
11104-28-2	Aroclor-1221	✓		✓		✓				(30-149)			✓	✓			
11141-16-5	Aroclor-1232	✓		✓		✓							✓	✓			
53469-21-9	Aroclor-1242	✓		✓	✓	✓							✓	✓			
12672-29-6	Aroclor-1248	✓		✓		✓							✓	✓			
11097-69-1	Aroclor-1254	✓		✓	✓	✓							✓	✓			
11096-82-5	Aroclor-1260	✓		✓	✓	✓	✓			196	182	✓	✓	✓			
										(30-137)							

Sample	SMC % REC	SMC RT	Sample	SMC % REC	SMC RT
IN CRITERIA					

Comments: DF 1X = 17, 41, 43
5X = 16, 18, 20
10X = 12, 15, 19
20X = 13, 14

Confirmation

Sample	CAS #	RPD > 25%	Sample	CAS #	RPD > 25%
81201 - 013	1260	34%			

MS/MSD 1016 ↑ due to 1242 SA NO
1260 ↑ many & 1254 SA 13,
"J, A2" 20, 41, 43

Reviewed By: [signature] Date: 06.20.03

NJ 2 of 2 FB

PCBs (SW 846 - Method 8082)

Site/Project: S.7H Remed. AR/COC #: 606424 Laboratory Sample IDs: 81203-005

Laboratory: GEL Laboratory Report #: 81201 (81203)

Methods: SW846 8082

# of Samples: 1 Matrix: Aqueous Batch #s: 255522

CAS #	Name	TCL	Intercept	Calib RSD / R^2 <20% / 0.99	CCV %D 20%	Method Blanks	LCS	LCSD	LCS RPD 20%	MS	MSD	MS RPD 20%	Field Dup. RPD	Equip. Blanks	Field Blanks		
12674-11-2	Aroclor-1016	✓	NA	✓	✓	✓	✓		NA								
11104-28-2	Aroclor-1221	✓				✓											
11141-16-5	Aroclor-1232	✓				✓											
53469-21-9	Aroclor-1242	✓		✓		✓											
12672-29-6	Aroclor-1248	✓		✓		✓											
11097-69-1	Aroclor-1254	✓		✓		✓											
11096-82-5	Aroclor-1260	✓		✓	✓	✓	✓										

Sample	SMC % REC	SMC RT	Sample	SMC % REC	SMC RT
IN CRITERIA					

Comments: >HT < 2XHT "UJ HT"

MS/MSD non SWL SDG "P2"

Confirmation

Sample	CAS #	RPD > 25%	Sample	CAS #	RPD > 25%
NA SA ND					

Reviewed By: dthal Date: 06.19.03

WS lot 2 soils

Inorganic Metals

Site/Project: S-7H Remed AR/COC #: 606424 Laboratory Sample IDs: 81201 – 012 thru 020 – 039 (DUP) & – 043

Laboratory: GEL SDG #: 81201

Methods: SW846 7471A ; 6010B

# of Samples: 11 Matrix: Soil Batch #s: 255002 (Hg) 254540 (Metals)

CAS #/ Analyte	ug/L							QC Element									ug/L				
	TAL	ICV	CCV	ICB	CCB	Method Blanks	LCS	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilu-tion	39-43 Field Dup. RPD	81203-008 Equip. Blanks	Field Blanks NA		
7429-90-5 Al								NA												
7440-39-3 Ba	✓	✓	✓	✓	✓	✓	✓			NA	NA	NA ✓	✓	✓	✓	✓	1.33			
7440-41-7 Be	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓			
7440-43-9 Cd	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	NA	✓	NA	✓	✓			
7440-70-2 Ca																				
7440-47-3 Cr	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	.809			
7440-48-4 Co																				
7440-50-8 Cu	✓	✓	✓	[-2.56]	[-3.49]	✓	✓			✓	✓	✓	✓	✓	NA	✓	✓			
7439-89-6 Fe																				
7439-95-4 Mg																				
7439-96-5 Mn																				
7440-02-0 Ni	✓	✓	✓	[-1.55]	[-1.28]	✓	✓			✓	✓	✓	✓	✓	✓					
7440-09-7 K																✓	✓			
7440-22-4 Ag	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	NA	✓	NA					
7440-23-5 Na																✓	✓			
7440-62-2 V																				
7440-66-6 Zn																				
7439-92-1 Pb	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓			
7782-49-2 Se	✓	✓	✓	✓	3.87	✓	✓			✓	✓	✓	NA	✓	NA	✓	✓			
7440-38-2 As	✓	✓	✓	✓	[-2.69]	✓	✓			✓	✓	✓	✓	✓	NA	✓	✓			
7440-36-0 Sb																				
7440-28-0 Tl																				
7439-97-6 Hg	✓	✓	✓	✓	✓	✓	✓			NA	NA	NA/ 22%	✓							
Cyanide CN												Slightly > QC acceptance criteria ∴ Not qualified								

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:

DF All metals 2X
-018
-039 5X Ba

DF Hg 012 2X
014, 016, 019 10X
013 20X

Reviewed By: [signature] Date: 06.20.03

WS 2 of 2 1120

Inorganic Metals

Site/Project: S-74 Remed AR/COC #: 606424 Laboratory Sample IDs: 81203-003 (EB)

Laboratory: GEL SDG #: 81201 (81203)

Methods: SW846 6010B & 7470A

# of Samples: 1 Matrix: Aqueous Batch #s: 254812 (Hg) 254528 (Metals)

CAS #/ 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		
	mg/l									QC Element										
7429-90-5 Al										NA						NA				
7440-39-3 Ba	✓	✓	✓	✓	✓	✓	✓	✓	✓					✓	NA					
7440-41-7 Be	✓	✓	✓	✓	✓	✓	✓	✓	✓					✓	NA					
7440-43-9 Cd	✓	✓	✓	✓	✓	✓	✓	✓	✓					✓	NA					
7440-70-2 Ca																				
7440-47-3 Cr	✓	✓	✓	✓	✓	✓	✓	✓	✓					✓	NA					
7440-48-4 Co																				
7440-50-8 Cu	✓	✓	✓	[-.003]	[-.002]	✓	✓	✓	✓					✓	NA					
7439-89-6 Fe																				
7439-95-4 Mg																				
7439-96-5 Mn																				
7440-02-0 Ni	✓	✓	✓	[-.002]	[-.001]	✓	✓	✓	✓					✓	NA					
7440-09-7 K																				
7440-22-4 Ag	✓	✓	✓	✓	✓	✓	✓	✓	✓					✓	NA					
7440-23-5 Na																				
7440-62-2 V																				
7440-66-6 Zn																				
7439-92-1 Pb	✓	✓	✓	[-.003]	[-.002]	✓	✓	✓	✓					✓	NA					
7782-49-2 Se	✓	✓	✓	✓	✓	✓	✓	✓	✓					✓	NA					
7440-38-2 As	✓	✓	✓	✓	[-.002]	✓	✓	✓	✓					✓	NA					
7440-36-0 Sb																				
7440-28-0 Tl																				
7439-97-6 Hg	✓	✓	✓	✓	✓	✓	✓			✓			NA							
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 / l

Comments: Metals No MS/MSD (No → J, UJ) LCS/LCSD (No Rep.) ✓ SD 81229 SNA SDG ✓

Hg Dup/MS 81079 SNA SDG ✓

Cu, Pb, Ni, As 'UJ, B3'

Reviewed By: [signature] Date: 06.20.03

		12		13		14		15		16		17		18		19		20		39		43
B3	CCB -ve																					
	Se 3.87x5 = 19.35 ug/L	<	J,B3	<	J,B3	<	J,B3	<	J,B3	<		<		<		<		<		ND		ND
	Cu -ve 5xDL	>		>		>		>		>		>		>		>		>		>		>
	Ni -ve 5xDL	>		>		>		>		>		>		>		>		>		>		>
	As -ve 5x DL	>		>		>		>		>		>		>		>		>		>		>
B2	EB																					
	Ba 1.33x5 = 6.65 ug/L	>		>		>		>		>		>		>		>		>		>		>
	Cr .809x5 = 4.045 ug/L	>		>		>		>		>		>		>		>		>		>		>

All metals ug/kg → ug/L (x 10)

18, 39 Ba ug/kg → ug/L (x 40)

General Chemistry

Site/Project: Site - 7H Remed AR/COC #: 606424 Laboratory Sample IDs: 81203 - 004 EB

Laboratory: GEL SDG #: ~~60~~ LT 81201 (81203) 81201 - 012 thru - 020, -040 (DUP), -043

Methods: SW846 7196A (SA - 020, - 040

# of Samples: 1 Matrix: Aqueous Batch #s: 254389 (EB) 254693 (soil) 254697 (soil)

CAS #	Analyte	TAL	ICV	CCV	ICB	CCB	Method Blanks	LCS	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilution	Field Dup. RPD	Equip. Blanks	Field Blanks	
Batch # 254389	Hexavalent Chromium		✓	✓	✓	✓	✓	✓	NA	NA	✓	NA	NA	NA	→	→	→	→	→	"R, HT" "72XHT
254693			✓	✓	✓	✓	✓	✓	NA	NA	✓ LT	✓	✓	✓	NA	NA	* R, HT	NO R, HT	NA	
254697			✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	NA	NA	NA	* R, HT	NO R, HT	NA	20, 40 "R, HT" "72XH * 040 DUP

Comments:

Reviewed By: [signature] Date: 06.23.03

Radiochemistry

Site/Project: S-74 Remed AR/COC #: 606424 Laboratory Sample IDs: 81201-021 thru -029 (H^3) -044 -030 thru -038 & -045 (γ)

Laboratory: GEL Laboratory Report #: 81201

Methods: EPA 906.0 EMA HASL 300

# of Samples: 20 Matrix: Soil Batch #s: 255892 (H^3) 254929 (γ)

Analyte	QC Element													
	Method Blanks	LCS	MS	Rep RER	Equip. Blanks	Field Dup. RER	Field Blanks	Sample ID	Isotope	IS/Trace	Sample ID	Isotope	IS/Trace
Criteria	U	20%	25%	<1.0	U	<1.0	U			50-105			50-105
H3	✓	✓	✓	✓	NA	NA	NA	NA					
U-238													
U-234													
U-235/-236													
Th-232													
Th-228													
Th-230													
Pu-239/-240													
Gross Alpha													
Nonvolatile Beta													
Ra-226													
Ra-28													
Ni-63													
Gamma Spec. Am-241	✓	✓	NA	✓	NA	NA	NA						
Gamma Spec. Cs-137	✓	✓		✓									
Gamma Spec. Co-60	✓	✓		✓									

Parameter	Method	Typical Tracer	Typical Carrier
Iso-U	Alpha spec.	U-232	NA
Iso-Pu	Alpha spec.	Pu-242	NA
Iso-Th	Alpha spec.	Th-229	NA
Am-241	Alpha spec.	Am-242	NA
Sr-90	Beta	Y ingrowth	NA
Ni-63	Beta	NA	Ni by ICP
Ra-226	Deamination	NA	NA
Ra-226	Alpha spec.	Ba-133 or Ra-225	NA
Ra-228	Gamma spec.	Ba-133	NA

Gamma spec. LCS contains: Am-241, Cs-137, and Co-60

Comments: ~~-045 γ spec received broken~~ LT

37. Europium-154 - .0997 MDA = .0977 R
Na-22 - .0357 MDA = .035 R

254929 γ spec : Dup 81196
255892 H^3 Dup/MS 81196 SNR 504 ✓

Reviewed By: [signature] Date: 06.23.03

Sample Findings Summary

Site: S-74, CWLF **AR/COC:** 606425 **Data Type:** Organic, Inorganic, RAD (Page 1/2)

Sample ID	VOCs:	EPA8260B (All VOCS, except...)	67-64-1 (acetone)	SVOCs:	EPA8270C (All SVOCs, except...)	191-24-2 (benzo(g,h,i)perylene)	117-81-7 (bis(2-ethylhexyl)phthalate)	53-70-3 (dibenz(a,h)anthracene)	117-84-0 (di-n-octylphthalate)	206-44-0 (fluoranthene)	193-39-5 (indeno(1,2,3-cd)pyrene)	91-20-3 (naphthalene)	129-00-0 (pyrene)	534-52-1 (4,6-dinitro-2-methylphenol)	PCBs:	EPA8082 (All PCBs, except...)	53469-21-9 (Aroclor-1242)	11097-69-1 (Aroclor-1254)	11096-82-5 (Aroclor-1260)
	Method/CAS Number (Analysis/Analyte)																		
062203-001 74-SB-E002-F190			31.7U,B2																
062204-001 74-SB-E002-F191			15.8U,B2																
062205-001 74-SB-E002-F192			35.9U,B2																
062206-001 74-SB-E002-F206			6.53U,B2																
062207-001 74-SB-E002-F207			52.4U,B2																
062208-001 74-SB-E002-F208			11U,B2																
062209-001 74-SB-E002-F220			37.4U,B2																
062210-001 74-SB-E002-F221			6.84U,B2																
062211-001 74-SB-E002-F222			37.1U,B2																
062211-005 74-SB-E002-F222-EB		P2	P2																
062211-010 74-SB-E002-F222-DU			45.9U,B2																
062203-002 74-SB-E002-F190						UJ		UJ			UJ	UJ					J,A2	J,A2	J,A2
062204-002 74-SB-E002-F191						UJ		UJ			UJ	UJ					J,A2	J,A2	
062205-002 74-SB-E002-F192						UJ		UJ			UJ	UJ	J				J,A2	J,A2	
062206-002 74-SB-E002-F206						UJ		UJ			UJ	UJ					J,A2	J,A2	
062207-002 74-SB-E002-F207						UJ		UJ			UJ	UJ	J				J,A2	J,A2	J,A2
062208-002 74-SB-E002-F208						UJ		UJ			UJ	UJ					J,A2	J,A2	
062209-002 74-SB-E002-F220					UJ,TP	UJ,TP	NJ,TP	UJ,TP	UJ,TP	NJ,TP	UJ,TP	UJ,TP	NJ,TP				J,A1,A2	J,A1,A2	UJ,A1
062210-002 74-SB-E002-F221						UJ		UJ			UJ	UJ	J			UJ,A1	J,A1,A2	J,A1,A2	UJ,A1
062211-002 74-SB-E002-F222						UJ		UJ			UJ	UJ	J				J,A2	J,A2	
062211-009 74-SB-E002-F222-EB							J		J					UJ					
062211-014 74-SB-E002-F222-DU						UJ	333U,B2	UJ			UJ	UJ							
062211-008 74-SB-E002-F222-EB																UJ,A1,P2	J,A1,P2	UJ,A1,P2	UJ,A1,P2
062211-013 74-SB-E002-F222-DU																	J,A2	J,A2	

Validated By: Mr. Kenneth Salaz **Date:** 06/19/03

Sample Findings Summary

Site: S-74, CWLF **AR/COC:** 606425 **Data Type:** Organic, Inorganic, RAD (Page 2/2)

Sample ID	Metals:	7440-38-2 (As)	7440-50-8 (Cu)	7440-02-0 (Ni)	7439-92-1 (Pb)	7782-49-2 (Se)	7439-97-6 (Hg)		EPA7196A (Cr+6)		RAD:	All Gamma Spec results flagged "X" by the lab (see EDD)	13981-41-4 (Ba-133)	13967-70-9 (Cs-134)	14331-85-2 (Pa-231)	13982-39-3 (Zn-65)			
	Method/CAS Number (Analysis/Analyte)																		
062203-002 74-SB-E002-F190						J,B3	J,A2		J,B2										
062204-002 74-SB-E002-F191						J,B3	J,A2												
062205-002 74-SB-E002-F192						J,B3	J,A2												
062206-002 74-SB-E002-F206						J,B3	J,A2												
062207-002 74-SB-E002-F207						J,B3	J,A2		J,B2										
062208-002 74-SB-E002-F208						J,B3	J,A2		J,B2										
062209-002 74-SB-E002-F220						J,B3	J,A2												
062210-002 74-SB-E002-F221						J,B3	J,A2		J,B2										
062211-002 74-SB-E002-F222						J,B3	J,A2		J,B2										
062211-006 74-SB-E002-F222-EB		UJ,B3	UJ,B3	UJ,B3	UJ,B3		UJ,B3												
062211-011 74-SB-E002-F222-DU						J,B3	J,A2												
062211-007 74-SB-E002-F222-EB									J,HT										
062211-012 74-SB-E002-F222-DU									J,B2										
062203-004 74-SB-E002-F190												R	J						
062204-004 74-SB-E002-F191												R	J						
062205-004 74-SB-E002-F192												R							
062206-004 74-SB-E002-F206												R	J						
062207-004 74-SB-E002-F207												R	J			R			
062208-004 74-SB-E002-F208												R	J	R					
062209-004 74-SB-E002-F220												R	J		R				
062210-004 74-SB-E002-F221												R	J						
062211-004 74-SB-E002-F222												R	J						

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 19, 2003

TO: File

FROM: Kenneth Salaz

SUBJECT: Radiochemical Data Review and Validation - SNL
S-74, CWLF; ARCOC #606425,
GEL SDG #81196, Case No. 7221.02.02.03

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM ER Project AOP 00-03.

Summary

All samples were prepared and analyzed with approved procedures using methods EPA906.0 Tritium and HASL300, 4.5.2.3 Gamma Spec.

1. Gamma Spec Analysis: Several Gamma Spec results for all samples were "X" flagged by the laboratory due to low abundance or lack of a valid peak (see Electronic Data Deliverable). Thus, these sample results will be qualified "R" (unusable).

2. Gamma Spec Analysis: The replicate relative error ratio (RER) of Ba-133 was greater than (>) 1 but less than (<) 3. The associated results of all samples, except 81196-031, will be qualified "J." The associated result of sample -031 was al ready qualified (see #1 above).

3. Gamma Spec Analysis: The Cs-134 result of sample 81196-034, the Pa-234 result of sample -035, and the Zn-65 result of sample -033 were negative, and the absolute values were > the associated MDAs. Thus, these samples results will be qualified "R" (unusable).

Data are acceptable except as noted above. 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: The case narratives stated the instruments used were properly calibrated.

Blanks

All Analyses: No target analytes were detected in the blanks at concentrations > the associated MDAs.

Matrix Spike (MS) Analysis

Gamma Spec Analysis: No MS analysis was required for this method.

Tritium Analysis: The MS analysis met all QC acceptance criteria.

Laboratory Control Sample (LCS) Analysis

All Analyses: The LCS analyses met all QC acceptance criteria.

Replicates

Gamma Spec Analysis: The replicate analysis met QC acceptance criteria except as noted above in the summary section.

Tritium Analysis: The replicate analysis met all QC acceptance criteria.

Tracer/Carrier Recoveries

All Analyses: No tracers/carriers were required for these methods.

Negative Bias

Gamma Spec Analysis: Sample results met negative bias QC acceptance criteria except as noted above in the summary section.

Tritium Analysis: All sample results met negative bias QC acceptance criteria.

Other QC

All Analyses: No field duplicates, equipment blanks (EBs), or field blanks (FBs) were submitted on the ARCOC.

No other specific issues were identified which affect data quality.

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 19, 2003

TO: File

FROM: Kenneth Salaz

SUBJECT: Inorganic Data Review and Validation - SNL
S-74, CWLF; ARCOC #606425,
GEL SDG #81196/81205, Case No. 7221.02.02.03

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM ER Project AOP 00-03.

Summary

All samples were prepared and analyzed with approved procedures using methods EPA6010B ICP-AES Metals, EPA7470/1A CVAA, and EPA7196A (Cr+6). Problems were identified with the data package that result in the qualification of data.

1. Cr+6 Analysis: The equipment blank (EB) was received by the laboratory beyond 2X the method specified holding time. The sample result was a detect and, thus, will be qualified "J,HT."

2. ICP Analysis: In the initial calibration blank (ICB) and/or continuing calibration blank (CCB) for the EB, arsenic (As), copper (Cu), nickel (Ni), and lead (Pb) were detected at negative concentrations. The absolute values were greater than (>) the detection limit (DL) but < the reporting limit (RL). The associated sample results were non-detect (ND) and, thus, will be qualified "UJ,B3." In the CCB for the soil samples, selenium (Se) was detected. All associated sample results were detects < 5X the blank concentration and, thus, will be qualified "J,B3."

   CVAA Analysis: In the CCB, Hg was detected at a negative concentration. The absolute value was > the DL but < the RL. The associated sample result was ND and, thus, will be qualified "UJ,B3."

   Cr+6 Analysis: In the EB, Cr+6 was detected. The associated results of samples 81196-011, -015, -016, -018, -019, and -039 were detects <5X the blank concentration and, thus, will be qualified "J,B2."

3. CVAA Analysis: The MS/MSD %Rs for the soil samples were <75% but <30%, and the replicate relative percent difference (RPD) was >35%. All associated sample results were detects and, thus, will be qualified "J,A2."

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

Holding Times/Preservation

ICP Analysis: All samples were analyzed within the method specified holding times and properly preserved.

CVAA/Cr+6 Analyses: Samples were analyzed within the method specified holding times and properly preserved except for the following. Prior to these analyses, the sample container for soil sample 81196-017 was broken during inorganic sample preparation. The case narrative stated that the sample was placed in a "baggie" at ambient temperature over the weekend. The sample was placed in another container on that Monday. No sample data will be qualified based on professional judgment.

Calibration

All Analyses: The initial and continuing calibrations met all QC acceptance criteria.

Blanks

ICP Analysis: No target analytes were detected in the blanks except as noted above in the summary section and the following. In the ICB and/or CCB for the soil samples, Cu, Ni, and As were detected at negative concentrations. The absolute values were > the DL but < the RL. However, all associated sample results were >5X the DL and, thus, will not be qualified. In the EB, barium (Ba) and chromium (Cr) were detected. However, all associated sample results were >5X the blank concentrations and, thus, will not be qualified.

CVAA/Cr+6 Analyses: No target analytes were detected in the blanks.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analyses

ICP Analysis: The MS analysis for the soil samples met all QC acceptance criteria. No MSD analysis was performed. The replicate analysis was used as a measure of laboratory precision. No MS/MSD analyses were performed for the EB. An LCSD was analyzed as a measure of precision. No sample data will be qualified as a result.

CVAA Analysis: The MS/MSD analyses for the soil samples did not meet QC acceptance criteria as noted above in the Summary section. The MS analysis for the EB met all QC acceptance criteria. No MSD analysis was performed. The replicate analysis was used as a measure of laboratory precision. It should be noted that the MS analysis for the EB was performed on an SNL sample of similar matrix from another SDG. No sample data will be qualified as a result.

Cr+6 Analysis: The MS analyses met all QC acceptance criteria. No MSD analyses were performed. The replicate analyses were used as measures of laboratory precision. It should be noted that the MS analysis for the EB was performed on an SNL sample of similar matrix from another SDG. No sample data will be qualified as a result.

Laboratory Control Sample (LCS/LCSD) Analyses

ICP Analysis: The LCS/LCSD analyses for the EB, as well as the LCS analysis for the soil samples, met all QC acceptance criteria. No LCSD analysis was performed for the soil samples. No sample data will be qualified as a result.

CVAA/Cr+6 Analyses: The LCS analyses met all QC acceptance criteria. No LCSD analyses were performed. No sample data will be qualified as a result.

Replicate Analysis

ICP Analysis: No replicate analysis was performed for the EB. An LCSD was analyzed as a measure of precision. The replicate analysis for the soil samples met all QC acceptance criteria.

CVAA Analysis: The replicate analysis for the EB met all QC acceptance criteria. It should be noted that this replicate analysis was performed on an SNL sample of similar matrix from another SDG. No sample data will be qualified as a result. The replicate for the soil samples did not meet QC acceptance criteria, as noted above in the Summary section

Cr+6 Analysis: The replicate analyses met all QC acceptance criteria. It should be noted that the replicate analysis for the EB was performed on an SNL sample of similar matrix from another SDG. No sample data will be qualified as a result.

ICP Interference Check Sample (ICS)

ICP Analysis: The ICS met all QC acceptance criteria.

CVAA/Cr+6 Analyses: No ICS was required for these methods.

ICP Serial Dilution

ICP Analysis: The serial dilution analysis met all QC acceptance criteria.

CVAA/Cr+6 Analyses: No serial dilution was required for these methods.

Detection Limits/Dilutions

ICP Analysis: All detection limits were properly reported. All soil samples were diluted the standard 2X. No other samples were diluted.

CVAA/Cr+6 Analyses: All detection limits were properly reported. No samples were diluted.

Other QC

All Analyses: Field duplicates were submitted. However, there are no "required" review criteria for field duplicate analyses comparability. EBs were also submitted. No field blanks (FBs) were submitted on the ARCOC.

No other specific issues were identified which affect data quality.

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 19, 2003

TO: File

FROM: Kenneth Salaz

SUBJECT: Organic Data Review and Validation - SNL
S-74, CWLF; ARCOC #606425,
GEL SDG #81196/81205, Case No. 7221.02.02.03

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM ER Project AOP 00-03.

Summary

All samples were prepared and analyzed with approved procedures using methods EPA8260A/B VOCs, EPA8270C SVOCs, and EPA8082 PCBs. Problems were identified with the data package that result in the qualification of data.

1. SVOC Analysis: Prior to the SVOC analysis, the sample container for soil sample 81196-017 was broken during inorganic sample preparation. The case narrative stated that the sample was placed in a "baggie" at ambient temperature over the weekend. The sample was placed in another container on that Monday. The fluoranthene, pyrene, and bis(2-ethylhexyl)phthalate results of this sample were detects and, thus, will be qualified "NJ,TP." All other results for this sample ND and, thus, will be qualified "UJ,TP."

2. SVOC Analysis: For the equipment blank (EB), the initial calibration correlation coefficients (R^2 values) of 4,6-dinitro-2-methylphenol and di-n-octylphthalate were less than (<) 0.99 but greater than (>) 0.90, and the continuing calibration verification (CCV) percent differences (%Ds) of 4,6-dinitro-2-methylphenol and bis(2-ethylhexyl)phthalate were >20% but <40%. The 4,6-dinitro-2-methylphenol sample result was non-detect (ND) and, thus, will be qualified "UJ," based on professional judgment. The di-n-octylphthalate and bis(2-ethylhexyl)phthalate sample results were detects and, thus, will be qualified "J."

   For the soil samples, the initial calibration response factor (RF) of naphthalene was < the required minimum but >0.01 and the CCV %D was >20% but <40%. Also, the CCV %D benzo(g,h,i)perylene was >40% but <60%. All associated sample results were ND and, thus, will be qualified "UJ." The initial calibration R^2 values of indeno(1,2,3-cd)pyrene and dibenz(a,h)anthracene were <0.99 but >0.90, and the CCV %Ds were >20% but <40%. All associated sample results were ND and, thus, will be qualified "UJ," based on professional judgment. The CCV %D of pyrene was >20% but <40%. The associated results of samples 81196-013, -015, -017, -018, and -019 were detects and, thus, will be qualified "J."

Data Validation Summary

Site/Project: S-74, CWLF Project/Task #: 7221.02.02.03 # of Samples: 46 Matrix: 41 soil / 5 aqueous

AR/COC #: 606425 Laboratory Sample IDs: 81196-001 to -041

Laboratory: GEL 81205-001 to -005 (EB)

SDG #: 81196/81205

QC Element	Analysis									
	Organics				Inorganics				RAD	Other
	VOC	SVOC	Pesticide/ PCB	HPLC (HE)	ICP/AES	GFAA/ AA	CVAA (Hg)	CN		
1. Holding Times/Preservation	✓			NA	✓	NA		NA	✓	J, HT
2. Calibrations	✓	J; UJ	✓		✓		✓		✓	✓
3. Method Blanks	✓	✓	✓		J, B3 UJ, B3		✓		✓	✓
4. MS/MSD	P2	✓	P2; J, A2		✓		J, A2		✓	✓
5. Laboratory Control Samples	✓	✓	✓		✓		✓		✓	✓
6. Replicates					✓		J		J	NA
7. Surrogates	✓	✓	J, A1 UJ, A1							
8. Internal Standards	✓	✓								
9. TCL Compound Identification	✓	✓								
10. ICP Interference Check Sample					✓					
11. ICP Serial Dilution					✓					
12. Carrier/Chemical Tracer Recoveries									NA	
13. Other QC	U, B2	333 U, B2	✓	✓	✓	✓	✓	✓	R	J, B2

J = Estimated
U = Not Detected
UJ = Not Detected, Estimated
R = Unusable

Check (√) = Acceptable
Shaded Cells = Not Applicable (also "NA")
NP = Not Provided
Other: _____

Reviewed By: [signature] Date: 6/19/03

Holding Time and Preservation

Site/Project: S-74, CWLF AR/COC #: 606425 Laboratory Sample IDs: 81196-001 to -041

Laboratory: GEL SDG #: 81196 / 81205 81205-001 to -005 (EBs)

# of Samples: 46 Matrix: 41 soil / 5 aqueous

Sample ID	Analytical Method	Holding Time Criteria	Days Holding Time was Exceeded	Preservation Criteria	Preservation Deficiency	Comments
81196-017	(SVOCs)	NA	NA	4°C	Ambient Temp.	Sample cont. broken during Inorg. Prep.. Placed in baggie on shelf over the weekend @ ambient temp.. Recontainerized on that Monday.
	(Hg)					
	(Cr+6)					
81205-003	"	24 hrs	2	NA	NA	Sample received by lab beyond 2X H.T.

Reviewed By: [signature] Date: 6/19/03

Volatile Organics (SW 846 Method 8260)

Site/Project: S-74, CWLF AR/COC #: 606425 # of Samples: 10 Matrix: soil

Laboratory: GEL SDG #: 81196 Laboratory Sample IDs: 81196-001 to -010

Methods: EPA8260A Batch #s: 254796

IS	CAS #	Name	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	① Field Dup. RPD	Equip. Blanks (µg/L)	Trip Blanks		
						>.05	<20% / 0.99	20%												
1	71-55-6	1,1,1-trichloroethane	✓	0.10	NA	✓	✓	✓	✓							NA	✓	NA		
2	79-34-5	1,1,2,2-tetrachloroethane		0.30		✓	✓													
2	79-00-5	1,1,2-trichloroethane		0.10		✓	✓													
1	75-34-3	**1,1-dichloroethane**		0.10		✓	✓													
1	75-35-4	**1,1-dichloroethene**		0.20		✓	✓			✓	NA	NA	✓	✓	✓					
1	107-06-2	**1,2-dichloroethane**		0.10		✓	✓													
1	540-59-0	**1,2-dichloroethene(total)**		0.01		✓	✓													
1	78-87-5	**1,2-dichloropropane**		0.01		✓	✓													
1	78-93-3	**2-butanone (MEK) (10xblk)**	✓	0.01		✓	✓	✓	✓								✓			
~~1~~	~~110-75-8~~	~~2-chloroethyl vinyl ether~~																		
2	591-78-6	2-hexanone (MBK)	✓	0.01		✓	✓	✓	✓								✓			
2	108-10-1	4-methyl-2-pentanone (MIBK)		0.10		✓	✓										✓			
1	67-64-1	**acetone(10xblk)**		0.01		✓	✓										7.42			
1	71-43-2	**benzene**		0.50		✓	✓			✓	NA	NA	✓	✓	✓		✓			
1	75-27-4	bromodichloromethane		0.20		✓	✓													
3	75-25-2	bromoform		0.10		✓	✓													
1	74-83-9	bromomethane		0.10		✓	✓													
1	75-15-0	carbon disulfide		0.10		✓	✓													
1	56-23-5	**carbon tetrachloride**		0.10		✓	✓													
2	108-90-7	**chlorobenzene**		0.50		✓	✓			✓	NA	NA	✓	✓	✓					
1	75-00-3	chloroethane		0.01		✓	✓													
1	67-66-3	**chloroform**		0.20		✓	✓													
1	74-87-3	chloromethane		0.10		✓	✓													
1	10061-01-5	cis-1,3-dichloropropene		0.20		✓	✓													
2	124-48-1	dibromochloromethane		0.10		✓	✓													
2	100-41-4	ethylbenzene		0.10	✓	✓	✓													
1	75-09-2	methylene chloride (10xblk)		0.01	✓	✓	✓													
2	100-42-5	styrene		0.30	NA	✓	✓													
2	127-18-4	**tetrachloroethene**		0.20		✓	✓													
2	108-88-3	toluene(10xblk)		0.40		✓	✓			✓	NA	NA	✓	✓	✓					
2	10061-02-6	trans-1,3-dichloropropene		0.10		✓	✓													
1	79-01-6	**trichloroethene**		0.30		✓	✓			✓	NA	NA	✓	✓	✓					
1	75-01-4	**vinyl chloride**		0.10		✓	✓													
2	1330-20-7	xylenes(total)		0.30		✓	✓													
	108-05-4	vinyl acetate	✓		✓	✓	✓	✓	✓							✓	✓	✓		

cis-1,2 trans

Comments:
① Field dup - submitted. No QC criteria.

Notes: Shaded rows are RCRA compounds.

Reviewed By: [signature] Date: 6/18/03

Volatile Organics

Site/Project: S-74, CWLF AR/COC #: 606425 Batch #s: 254796

Laboratory: GEL SDG #: 81196 # of Samples: 10 Matrix: soil

Surrogate Recovery and Internal Standard Outliers (SW 846 Method 8260)

Sample	SMC 1	SMC 2	SMC 3	IS 1 area	IS 1 RT	IS 2 area	IS 2 RT	IS 3 area	IS 3 RT
All									
Passed									

SMC 1: Bromofluorobenzene
SMC 2: Dibromofluoromethane
SMC 3: Toluene-d8

IS 1: Fluorobenzene
IS 2: Chlorobenzene-d5
IS 3: 1,4-Dichlorobenzene-d4

Comments:

Volatile Organics (SW 846 Method 8260)

Site/Project: S-74, CWLF AR/COC #: 606425 # of Samples: 1 Matrix: aqueous

Laboratory: GEL SDG #: 81205 Laboratory Sample IDs: 81205-001 (EO)

Methods: EPA 8260b Batch #s: 255264

IS	CAS #	Name	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blks	LCS	LCSD	LCS RPD	① MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Trip Blanks		
						>.05	<20% / 0.99	20%												
1	71-55-6	1,1,1-trichloroethane	✓	0.10	NA	✓	✓	✓	✓											
2	79-34-5	1,1,2,2-tetrachloroethane		0.30		✓	✓													
2	79-00-5	1,1,2-trichloroethane		0.10		✓	✓													
1	75-34-3	**1,1-dichloroethane**		0.10		✓	✓													
1	75-35-4	**1,1-dichloroethene**		0.20		✓	✓			✓	NA	NA								
1	107-06-2	**1,2-dichloroethane**		0.10		✓	✓													
1	540-59-0	**1,2-dichloroethene(total)**		0.01		✓	✓													
1	78-87-5	**1,2-dichloropropane**		0.01		✓	✓													
1	78-93-3	**2-butanone (MEK) (10xblk)**	✓	0.01	✓	✓	✓	✓	✓											
~~1~~	~~110-75-8~~	~~2-chloroethyl vinyl ether~~																		
2	591-78-6	2-hexanone (MBK)	✓	0.01		✓	✓	✓	✓											
2	108-10-1	4-methyl-2-pentanone (MIBK)		0.10		✓	✓													
1	67-64-1	**acetone(10xblk)**		0.01	✓	✓	✓													
1	71-43-2	**benzene**		0.50	NA	✓	✓			✓	NA	NA								
1	75-27-4	bromodichloromethane		0.20	"	✓	✓													
3	75-25-2	bromoform		0.10	✓	✓	✓													
1	74-83-9	bromomethane		0.10	NA	✓	✓													
1	75-15-0	carbon disulfide		0.10		✓	✓													
1	56-23-5	**carbon tetrachloride**		0.10		✓	✓													
2	108-90-7	**chlorobenzene**		0.50		✓	✓			✓	NA	NA								
1	75-00-3	chloroethane		0.01		✓	✓													
1	67-66-3	**chloroform**		0.20		✓	✓													
1	74-87-3	chloromethane		0.10		✓	✓													
1	10061-01-5	cis-1,3-dichloropropene		0.20		✓	✓													
2	124-48-1	dibromochloromethane		0.10		✓	✓													
2	100-41-4	ethylbenzene		0.10		✓	✓													
1	75-09-2	methylene chloride (10xblk)		0.01		✓	✓													
2	100-42-5	styrene		0.30		✓	✓													
2	127-18-4	**tetrachloroethene**		0.20		✓	✓													
2	108-88-3	toluene(10xblk)		0.40		✓	✓			✓	NA	NA								
2	10061-02-6	trans-1,3-dichloropropene		0.10		✓	✓													
1	79-01-6	**trichloroethene**		0.30		✓	✓			✓	NA	NA								
1	75-01-4	**vinyl chloride**		0.10		✓	✓													
2	1330-20-7	xylenes(total)		0.30		✓	✓													
	108-05-4	vinyl acetate	✓		✓	✓	✓	✓	✓											

cis + trans

Comments:
① No LCSD, MSD, Rep, or any other measure of precision performed.

Notes: Shaded rows are RCRA compounds.

Reviewed By: [signature] Date: 6/18/03

Volatile Organics

Site/Project: S-74, CWLS AR/COC #: 606425 Batch #s: 255264

Laboratory: GEL SDG #: 81205 # of Samples: 1 Matrix: aqueous

Surrogate Recovery and Internal Standard Outliers (SW 846 Method 8260)

Sample	SMC 1	SMC 2	SMC 3	IS 1 area	IS 1 RT	IS 2 area	IS 2 RT	IS 3 area	IS 3 RT
All									
Passed									

SMC 1: Bromofluorobenzene
SMC 2: Dibromofluoromethane
SMC 3: Toluene-d8

IS 1: Fluorobenzene
IS 2: Chlorobenzene-d5
IS 3: 1,4-Dichlorobenzene-d4

Comments:

Semivolatile Organics (SW 846 Method 8270)

Site/Project: S-74, CWLF AR/COC #: 606425 Laboratory Sample IDs: 81196-011 to -019, -041

Laboratory: GEL SDG #: 81196

Methods: EPA8270C

# of Samples: 10 Matrix: soil Batch #s: 254407

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF >.05	Calib. RSD/ R^2 <20%/ 0.99	CCV %D 20%	Method Blanks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	① Field Dup. RPD	Equip. Blanks	Field Blanks		
1	A	108-95-2	Phenol	✓	0.80	NA	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	NA	✓	NA		
1	BN	111-44-4	bis(2-Chloroethyl)ether		0.70		✓	✓													
1	A	95-57-8	2-Chlorophenol		0.80		✓	✓			✓	NA	NA	✓	✓	✓					
1	BN	541-73-1	1,3-Dichlorobenzene		0.60		✓	✓													
1	BN	106-46-7	1,4-Dichlorobenzene		0.50		✓	✓			✓	NA	NA	✓	✓	✓					
1	BN	95-50-1	1,2-Dichlorobenzene		0.40		✓	✓													
1	A	95-48-7	o-cresol		0.70		✓	✓			✓	NA	NA	✓	✓	✓					
1	BN	108-60-1	bis(2-chloroisopropyl)ether		0.01		✓	✓													
1	A	N22	m,p-cresols		0.60		✓	✓			✓	NA	NA	✓	✓	✓					
1	BN	621-64-7	N-Nitroso-di-n-propylamine		0.50		✓	✓			✓										
1	BN	67-72-1	Hexachloroethane		0.30		✓	✓			✓										
2	BN	98-95-3	Nitrobenzene		0.20		✓	✓			✓										
2	BN	78-59-1	Isophorone		0.40		✓	✓													
2	A	88-75-5	2-Nitrophenol		0.10		✓	✓													
2	A	105-67-9	2,4-Dimethylphenol		0.20		✓	✓													
2	BN	111-91-1	bis(2-Chloroethoxy)methane		0.30		✓	✓													
2	A	120-83-2	2,4-Dichlorophenol		0.20		✓	✓													
2	BN	120-82-1	1,2,4-Trichlorobenzene		0.20		✓	✓			✓	NA	NA	✓	✓	✓					
2	BN	91-20-3	Naphthalene		0.70	✓	0.68	✓	23.8												
2	BN	106-47-8	4-Chloroaniline		0.01	NA	✓	✓	✓												
2	BN	87-68-3	Hexachlorobutadiene		0.01		✓	✓			✓	NA	NA	✓	✓	✓					
2	A	59-50-7	4-Chloro-3-methylphenol		0.20		✓	✓			✓	NA	NA	✓	✓	✓					
2	BN	91-57-6	2-Methylnaphthalene		0.40		✓	✓													
3	BN	77-47-4	Hexachlorocyclopentadiene		0.01	✓	✓	✓													
3	A	88-06-2	2,4,6-Trichlorophenol		0.20	NA	✓	✓			✓	NA	NA	✓	✓	✓					
3	A	95-95-4	2,4,5-Trichlorophenol	✓	0.20	NA	✓	✓		✓	✓	NA	NA	✓	✓	✓		✓	✓		

Notes: Shaded rows are RCRA compounds.

Comments:
① Field dup, submitted. No QC criteria.

Reviewed By: [signature] Date: 6/18/03

Semivolatile Organics

Site/Project: 5-79, CWLF AR/COC #: 606425 Batch #s: 254407

Laboratory: GEL SDG #: 81196 # of Samples: 10 Matrix: soil

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blanks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks (µg/L)	Field Blanks		
							>.05	<20%/ 0.99	20%												
3	BN	91-58-7	2-Chloronaphthalene	✓	0.80	NA	✓	✓	✓	✓							NA	✓	NA		
3	BN	88-74-4	2-Nitroaniline (o-)		0.01		✓	✓													
3	BN	131-11-3	Dimethylphthalate		0.01		✓	✓													
3	BN	208-96-8	Acenaphthylene		0.90		✓	✓													
3	BN	606-20-2	2,6-Dinitrotoluene		0.20		✓	✓													
3	BN	99-09-2	3-Nitroaniline (m-)		0.01		✓	✓													
3	BN	83-32-9	Acenaphthene		0.90	✓	✓	✓			✓	NA	NA	✓	✓	✓					
3	A	51-28-5	2,4-Dinitrophenol		0.01	✓	✓	0.98													
3	A	100-02-7	4-Nitrophenol		0.01	NA	✓	✓			✓	NA	NA	✓	✓	✓					
3	BN	132-64-9	Dibenzofuran		0.80		✓	✓													
3	BN	121-14-2	2,4-Dinitrotoluene		0.20		✓	✓			✓	NA	NA	✓	✓	✓					
3	BN	84-66-2	Diethylphthalate		0.01		✓	✓										3.27 ✓			
3	BN	7005-72-3	4-Chlorophenyl-phenylether		0.40		✓	✓													
3	BN	86-73-7	Fluorene		0.90		✓	✓													
3	BN	100-01-6	4-Nitroaniline (p-)		0.01	✓	✓	✓													
4	A	534-52-1	4,6-Dinitro-2-methylphenol		0.01	✓	✓	✓													
4	BN	122-39-4	Diphenylamine		0.01	NA	✓	✓													
4	BN	101-55-3	4-Bromophenyl-phenylether		0.10		✓	✓													
4	BN	118-74-1	Hexachlorobenzene		0.10		✓	✓			✓	NA	NA	✓	✓	✓					
4	A	87-86-5	Pentachlorophenol		0.05		✓	✓			✓	NA	NA	✓	✓	✓					
4	BN	85-01-8	Phenanthrene		0.70		✓	✓													
4	BN	120-12-7	Anthracene		0.70		✓	✓													
4	BN	86-74-8	Carbazole		0.01		✓	✓										✓			
4	BN	84-74-2	Di-n-butylphthalate		0.01		✓	✓										1.11			
4	BN	206-44-0	Fluoranthene		0.60		✓	✓	✓									✓			
5	BN	129-00-0	Pyrene		0.60		✓	✓	22.9		✓	NA	NA	✓	✓	✓					
5	BN	85-68-7	Butylbenzylphthalate		0.01		✓	✓	✓												
5	BN	91-94-1	3,3'-Dichlorobenzidine		0.01		✓	✓													
5	BN	56-55-3	Benzo(a)anthracene	✓	0.80	✓	✓	✓	✓	✓							✓	✓	✓		

Comments:

Semivolatile Organics

Site/Project: S-74, CWLF AR/COC #: 606425 Batch #s: 254407

Laboratory: CEL SDG #: 51196 # of Samples: 10 Matrix: soil

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blanks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks (µg/L)	Field Blanks		
							>.05	<20% / 0.99	20%												
5	BN	218-01-9	Chrysene	✓	0.70	NA	✓	✓	✓	✓							NA	✓	NA		
5	BN	117-81-7	bis(2-Ethylhexyl)phthalate		0.01		✓	✓										4.66			
6	BN	117-84-0	Di-n-octylphthalate		0.01		✓	✓										10.1			
6	BN	205-99-2	Benzo(b)fluoranthene		0.70		✓	✓										✓			
6	BN	207-08-9	Benzo(k)fluoranthene		0.70		✓	✓													
6	BN	50-32-8	Benzo(a)pyrene		0.70	✓	✓	✓	✓												
6	BN	193-39-5	Indeno(1,2,3-cd)pyrene		0.50	✓	✓	0.98	25.7												
6	BN	53-70-3	Dibenz(a,h)anthracene		0.40	✓	✓	0.98	20.7												
6	BN	191-24-2	Benzo(g,h,i)perylene	✓	0.50	NA	✓	✓	40.3	✓							✓	✓	✓		

Surrogate Recovery Outliers

Sample	SMC 1	SMC 2	SMC 3	SMC 4	SMC 5	SMC 6	SMC 7	SMC 8
All Passed								

Comments:

SMC 1: Nitrobenzene-d5 (BN)
SMC 2: 2-Fluorobiphenyl (BN)
SMC 3: Terphenyl-d14 (BN)
SMC 4: Phenol-d5 (A)
SMC 5: 2-Fluorophenol (A)
SMC 6: 2,4,6-Tribromophenol (A)
~~SMC 7: 2-2-Chlorophenol-d4 (A)~~
~~SMC 8: 1,2-Dichlorobenzene-d4 (BN)~~

Internal Standard Outliers

Sample	IS 1-area	IS 1-RT	IS 2-area	IS 2-RT	IS 3-area	IS 3-RT	IS 4-area	IS 4-RT	IS 5-area	IS 5-RT	Is 6-area	IS 6-RT
All Passed												

IS 1: 1,4-Dichlorobenzene-d4 (BN)
IS 2: Naphthalene-d8 (BN)
IS 3: Acenaphthene-d10 (BN)
IS 4: Phenathrene-d10 (BN)
IS 5: Chrysene-d12 (BN)
IS 6: Perylene-d12 (BN)

Semivolatile Organics (SW 846 Method 8270)

Site/Project: S-74, CWLF AR/COC #: 606425 Laboratory Sample IDs: 81205-005 (GD)

Laboratory: GEL SDG #: 81205

Methods: EPA8270C

# of Samples: 1 Matrix: aqueous Batch #s: 254414

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blanks	LCS	LCSD	LCS RPD	① MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks		
							>.05	<20% / 0.99	20%												
1	A	108-95-2	Phenol	✓	0.80	NA	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	NA	NA	NA		
1	BN	111-44-4	bis(2-Chloroethyl)ether		0.70		✓	✓													
1	A	95-57-8	2-Chlorophenol		0.80		✓	✓			✓	NA	NA	✓	✓	✓					
1	BN	541-73-1	1,3-Dichlorobenzene		0.60		✓	✓													
1	BN	106-46-7	1,4-Dichlorobenzene		0.50		✓	✓			✓	NA	NA	✓	✓	✓					
1	BN	95-50-1	1,2-Dichlorobenzene		0.40		✓	✓													
1	A	95-48-7	o-cresol		0.70		✓	✓			✓	NA	NA	✓	✓	✓					
1	BN	108-60-1	bis(2-chloroisopropyl)ether		0.01		✓	✓													
1	A	N22	m,p-cresols		0.60		✓	✓			✓	NA	NA	✓	✓	✓					
1	BN	621-64-7	N-Nitroso-di-n-propylamine		0.50		✓	✓			✓	↓	↓	↓	↓	↓					
1	BN	67-72-1	Hexachloroethane		0.30		✓	✓			✓										
2	BN	98-95-3	Nitrobenzene		0.20		✓	✓			✓	↓	↓	↓	↓	↓					
2	BN	78-59-1	Isophorone		0.40		✓	✓													
2	A	88-75-5	2-Nitrophenol		0.10		✓	✓													
2	A	105-67-9	2,4-Dimethylphenol		0.20		✓	✓													
2	BN	111-91-1	bis(2-Chloroethoxy)methane		0.30		✓	✓													
2	A	120-83-2	2,4-Dichlorophenol		0.20		✓	✓													
2	BN	120-82-1	1,2,4-Trichlorobenzene		0.20		✓	✓			✓	NA	NA	✓	✓	✓					
2	BN	91-20-3	Naphthalene		0.70		✓	✓													
2	BN	106-47-8	4-Chloroaniline		0.01		✓	✓													
2	BN	87-68-3	Hexachlorobutadiene		0.01		✓	✓			✓	NA	NA	✓	✓	✓					
2	A	59-50-7	4-Chloro-3-methylphenol		0.20		✓	✓			✓	NA	NA	✓	✓	✓					
2	BN	91-57-6	2-Methylnaphthalene		0.40		✓	✓													
3	BN	77-47-4	Hexachlorocyclopentadiene		0.01		✓	✓													
3	A	88-06-2	2,4,6-Trichlorophenol		0.20		✓	✓			✓	NA	NA	✓	✓	✓					
3	A	95-95-4	2,4,5-Trichlorophenol	✓	0.20	↓	✓	✓	↓	↓	✓	NA	NA	✓	✓	✓	↓	↓	↓		

Comments:
① MS/MSD performed on a SNL sample of similar matrix from another SDG.

Notes: Shaded rows are RCRA compounds.

Reviewed By: [signature] Date: 6/18/03

Semivolatile Organics

Site/Project: S-74, CWLF AR/COC #: 606425 Batch #s: 254414

Laboratory: GEL SDG #: 81205 # of Samples: 1 Matrix: aqueous

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blanks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks		
							>.05	<20% / 0.99	20%												
3	BN	91-58-7	2-Chloronaphthalene	✓	0.80	NA	✓	✓	✓	✓							NA	NA	NA		
3	BN	88-74-4	2-Nitroaniline (o-)		0.01		✓	✓													
3	BN	131-11-3	Dimethylphthalate		0.01		✓	✓													
3	BN	208-96-8	Acenaphthylene		0.90		✓	✓													
3	BN	606-20-2	2,6-Dinitrotoluene		0.20	✓	✓	✓													
3	BN	99-09-2	3-Nitroaniline (m-)		0.01	NA	✓	✓													
3	BN	83-32-9	Acenaphthene		0.90	"	✓	✓			✓	NA	NA	✓	✓	✓					
3	A	51-28-5	2,4-Dinitrophenol		0.01	✓	✓	✓													
3	A	100-02-7	4-Nitrophenol		0.01	NA	✓	✓			✓	NA	NA	✓	✓	✓					
3	BN	132-64-9	Dibenzofuran		0.80	"	✓	✓													
3	BN	121-14-2	2,4-Dinitrotoluene		0.20	✓	✓	✓			✓	NA	NA	✓	✓	✓					
3	BN	84-66-2	Diethylphthalate		0.01	NA	✓	✓													
3	BN	7005-72-3	4-Chlorophenyl-phenylether		0.40		✓	✓													
3	BN	86-73-7	Fluorene		0.90		✓	✓													
3	BN	100-01-6	4-Nitroaniline (p-)		0.01		✓	✓													
4	A	534-52-1	4,6-Dinitro-2-methylphenol		0.01	✓	✓	0.98	37.0		✓	NA	NA	143	✓	✓					
4	BN	122-39-4	Diphenylamine		0.01	NA	✓	✓	✓												
4	BN	101-55-3	4-Bromophenyl-phenylether		0.10		✓	✓	22.5												
4	BN	118-74-1	Hexachlorobenzene		0.10		✓	✓	✓		✓	NA	NA	✓	✓	✓					
4	A	87-86-5	Pentachlorophenol		0.05	✓	✓	✓			✓	NA	NA	✓	✓	✓					
4	BN	85-01-8	Phenanthrene		0.70	NA	✓	✓													
4	BN	120-12-7	Anthracene		0.70		✓	✓													
4	BN	86-74-8	Carbazole		0.01		✓	✓													
4	BN	84-74-2	Di-n-butylphthalate		0.01		✓	✓													
4	BN	206-44-0	Fluoranthene		0.60		✓	✓													
5	BN	129-00-0	Pyrene		0.60		✓	✓			✓	NA	NA	✓	✓	✓					
5	BN	85-68-7	Butylbenzylphthalate		0.01		✓	✓													
5	BN	91-94-1	3,3'-Dichlorobenzidine		0.01		✓	✓													
5	BN	56-55-3	Benzo(a)anthracene	✓	0.80		✓	✓	✓	✓							✓	✓	✓		

Comments:

Semivolatile Organics

Site/Project: S-74, CWLF AR/COC #: 606425 Batch #s: 254414

Laboratory: GEL SDG #: 81205 # of Samples: 1 Matrix: aqueous

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blanks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks		
							>.05	<20% / 0.99	20%												
5	BN	218-01-9	Chrysene	✓	0.70	NA	✓	✓	✓	✓											
5	BN	117-81-7	bis(2-Ethylhexyl)phthalate		0.01	"	✓	✓	29.4								NA	NA	NA		
6	BN	117-84-0	Di-n-octylphthalate		0.01	✓	✓	0.98	✓												
6	BN	205-99-2	Benzo(b)fluoranthene		0.70	NA	✓	✓													
6	BN	207-08-9	Benzo(k)fluoranthene		0.70		✓	✓													
6	BN	50-32-8	Benzo(a)pyrene		0.70		✓	✓													
6	BN	193-39-5	Indeno(1,2,3-cd)pyrene		0.50	✓	✓	✓	20.7												
6	BN	53-70-3	Dibenz(a,h)anthracene		0.40	✓	✓	✓	23.0												
6	BN	191-24-2	Benzo(g,h,i)perylene	✓	0.50	✓	✓	✓	22.6	✓							✓	✓	✓		

Surrogate Recovery Outliers

Sample	SMC 1	SMC 2	SMC 3	SMC 4	SMC 5	SMC 6	SMC 7	SMC 8
All Passed								

Comments:

SMC 1: Nitrobenzene-d5 (BN)
SMC 2: 2-Fluorobiphenyl (BN)
SMC 3: Terphenyl-d14 (BN)
SMC 4: Phenol-d5 (A)
SMC 5: 2-Fluorophenol (A)
SMC 6: 2,4,6-Tribromophenol (A)
~~SMC 7: 2-2-Chlorophenol-d4 (A)~~
~~SMC 8: 1,2-Dichlorobenzene-d4 (BN)~~

Internal Standard Outliers

Sample	IS 1-area	IS 1-RT	IS 2-area	IS 2-RT	IS 3-area	IS 3-RT	IS 4-area	IS 4-RT	IS 5-area	IS 5-RT	Is 6-area	IS 6-RT
All Passed												

IS 1: 1,4-Dichlorobenzene-d4 (BN)
IS 2: Naphthalene-d8 (BN)
IS 3: Acenaphthene-d10 (BN)
IS 4: Phenathrene-d10 (BN)
IS 5: Chrysene-d12 (BN)
IS 6: Perylene-d12 (BN)

PCBs (SW 846 - Method 8082)

Site/Project: S-74, CWLS AR/COC #: 606425 Laboratory Sample IDs: S1196-011 to -019, -040

Laboratory: GEL SDG #: S1196

Methods: EPA8082

# of Samples: 10 Matrix: Soil Batch #s: 254948

CAS #	Name	TCL	Intercept	Calib RSD / R^2 <20% / 0.99	CCV %D 20%	Method Blanks	LCS	LCSD	LCS RPD 20%	MS	MSD	MS RPD 20%	(2) Field Dup. RPD	Equip. Blanks (µg/L)	Field Blanks		
12674-11-2	Aroclor-1016	✓	NA	✓	✓	✓	✓	NA	NA	173	150	✓	NA	✓	NA		
11104-28-2	Aroclor-1221			NA													
11141-16-5	Aroclor-1232			NA													
53469-21-9	Aroclor-1242			✓	✓									0.137			
12672-29-6	Aroclor-1248													✓			
11097-69-1	Aroclor-1254				✓												
11096-82-5	Aroclor-1260	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	✓	✓	✓		

Sample	SMC % REC	SMC RT	Sample	SMC % REC	SMC RT
-017	DCB=122 (>121)	✓			
-018	DCB=48	✓			

Comments: (1) Samples -013 (10X), -015 (5X), -017 (5X), -018 (5X), + -040 (5X). dil due to over-range hits.

(2) Field dup. submitted. No QC criteria.

Confirmation

Sample	CAS #	RPD > 25%	Sample	CAS #	RPD > 25%
-011	Aroclor-1254	35.0			
-012	-1242	25.5			
-014	-1254	46.5			
-015	-1242	48.1			
-019	-1254	27.1			
-040	-1254	27.5			

Reviewed By: [signature] Date: 6/18/03

Inorganic Metals

Site/Project: S-74, CWLF AR/COC #: 606425 Laboratory Sample IDs: 81196-016 to -019, -038

Laboratory: GEL SDG #: 81196

Methods: EPA 6010B (ICP-AES), EPA 7471A (CVAA)

# of Samples: 10 Matrix: soil Batch #s: 254532, 255000

CAS #/ Analyte	QC Element																			
	TAL	ICV	CCV	ICB (µg/L)	CCB (µg/L)	Method Blanks	LCS	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilu-tion	② Field Dup. RPD	(µg/L) Equip. Blanks	Field Blanks		
7429-90-5 Al																NA		NA		
7440-39-3 Ba	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	NA	✓	✓	✓	✓		21.2			
7440-41-7 Be	✓	↓	↓	↓	↓	↓	↓	↓	↓	↓	✓	↓	NA	↓	NA		✓			
7440-43-9 Cd	✓										✓		NA		NA		✓			
7440-70-2 Ca																				
7440-47-3 Cr	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	✓	✓	NA		3.15			
7440-48-4 Co																				
7440-50-8 Cu	✓	✓	✓	-2.56	-3.49	✓	✓	NA	NA	✓	✓	✓	✓	✓	NA		✓			
7439-89-6 Fe																				
7439-95-4 Mg																				
7439-96-5 Mn																				
7440-02-0 Ni	✓	✓	✓	-1.55	✓	✓	✓	NA	NA	✓	✓	✓	✓	✓	NA		✓			
7440-09-7 K																				
7440-22-4 Ag	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	NA	✓	NA		✓			
7440-23-5 Na																				
7440-62-2 V																				
7440-66-6 Zn																				
7439-92-1 Pb	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	✓	✓	NA		✓			
7782-49-2 Se	↓	↓	↓	↓	1.66	↓	↓	↓	↓	↓	↓	↓	NA	↓	↓		↓			
7440-38-2 As	↓	↓	↓	↓	-2.69	↓	↓	↓	↓	↓	↓	↓	✓	↓	↓					
7440-36-0 Sb																				
7440-28-0 Tl																				
7439-97-6 Hg	✓	✓	✓	✓	✓	✓	✓	NA	NA	62	46	✓	50	NA	NA	✓	✓	✓		
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 / l

Comments: ① All samples dil. std. 2X for soils.
② Field dup. submitted. No QC criteria.

Reviewed By: [signature] Date: 6/19/03

Inorganic Metals

Site/Project: S-74, CWLF AR/COC #: 606425 Laboratory Sample IDs: 81205-002(EB)

Laboratory: GEL SDG #: 81205

Methods: EPA 6010B (ICP-AES), EPA 7470A (CVAA)

# of Samples: 1 Matrix: aqueous Batch #s: 254528, 254812

CAS #/ Analyte	QC Element																			
	TAL	ICV	CCV	ICB (µg/L)	CCB (µg/L)	Method Blanks	LCS	LCSD	LCSD RPD	① MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilu-tion	Field Dup. RPD	Equip. Blanks	Field Blanks		
7429-90-5 Al																NA	NA	NA		
7440-39-3 Ba	✓	✓	✓	✓	✓	✓	✓	✓	✓	NA	NA	NA	NA	✓	NA					
7440-41-7 Be	✓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓					
7440-43-9 Cd	✓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓					
7440-70-2 Ca																				
7440-47-3 Cr	✓	✓	✓	✓	✓	✓	✓	✓	✓	NA	NA	NA	NA	✓	NA					
7440-48-4 Co																				
7440-50-8 Cu	✓	✓	✓	-2.56	-2.32	✓	✓	✓	✓	NA	NA	NA	NA	✓	NA					
7439-89-6 Fe																				
7439-95-4 Mg																				
7439-96-5 Mn																				
7440-02-0 Ni	✓	✓	✓	-1.55	-1.3	✓	✓	✓	✓	NA	NA	NA	NA	✓	NA					
7440-09-7 K																				
7440-22-4 Ag	✓	✓	✓	✓	✓	✓	✓	✓	✓	NA	NA	NA	NA	✓	NA					
7440-23-5 Na																				
7440-62-2 V																				
7440-66-6 Zn																				
7439-92-1 Pb	✓	✓	✓	-2.62	-2.13	✓	✓	✓	✓	NA	NA	NA	NA	✓	NA					
7782-49-2 Se	✓	↓	↓	✓	✓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓					
7440-38-2 As	✓	↓	↓	✓	-2.47	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓					
7440-36-0 Sb																				
7440-28-0 Tl																				
7439-97-6 Hg	✓	✓	✓	-0.0564	✓	✓	✓	NA	NA	✓	NA	NA	NA	NA	NA	↓	↓	↓		
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 / l

Comments: ① MS, Rep.'s, Serial Dil's performed on SNL samples of similar matrix from earlier SDGs. LCSD analyzed for ICP instead of Rep.; No MS analyzed.

Reviewed By: [signature] Date: 6/19/03

General Chemistry

Site/Project: S-74, CWLF AR/COC #: 606425 Laboratory Sample IDs: 81196-011 to -017, -039

Laboratory: GEL SDG #: 81196/81205 81205-003 (EB)

Methods: EPA 7196A (Cr+6)

# of Samples: 11 Matrix: 10 soil / 1 aqueous Batch #s: 254389 / 254197

CAS #	Analyte	QC Element																		
		TAL	ICV	CCV	ICB	CCB	Method Blanks	LCS	LCSD	LCSD RPD	① MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilution	② Field Dup. RPD	(aqueous) Equip. Blanks	Field Blanks	
18540-29-9	(aqueous) Cr+6	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	NA	NA	NA	NA	NA	NA	NA	NA	
↓	Cr+6 (soil)	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	NA	NA	NA	↓	↓	↓	13.6 ↓ KRS	↓	

Comments: ① MS + Rep. for EB performed on an SNL sample of similar matrix from another SDG.
② Field dup. submitted. No QC criteria.

Reviewed By: [signature] Date: 6/19/03

Radiochemistry

Site/Project: S-74, CWLF AR/COC #: 606425 Laboratory Sample IDs: 81196-020 to -028 (H3)

Laboratory: GEL SDG #: 81196 " -029 to -037 (GS)

Methods: HASL300, 4.5.2.3 (Gamma Spec), EPA 906.0 (H3)

# of Samples: 18 Matrix: Soil Batch #s: 254929, 255892

Analyte	QC Element												
	Method Blanks	LCS	MS	Rep RER	Equip. Blanks	Field Dup. RER	Field Blanks	Sample ID	Isotope	IS/Trace	Sample ID	Isotope	IS/Trace
Criteria	U	20%	25%	<1.0	U	<1.0	U			50-105			50-105
H3	✓	✓	✓	✓	NA	NA	NA	NA					
U-238													
U-234													
U-235/-236													
Th-232													
Th-228													
Th-230													
Pu-239/-240													
Gross Alpha													
Nonvolatile Beta													
Ra-226													
Ra-228													
Ni-63													
Gamma Spec. Am-241	✓	✓	NA	✓	NA	NA	NA						
Gamma Spec. Cs-137	↓	↓	↓	↓	↓	↓	↓						
Gamma Spec. Co-60	↓	↓	↓	↓	↓	↓	↓						
" Ba-133	↓			2.6	↓	↓	↓						

Parameter	Method	Typical Tracer	Typical Carrier
Iso-U	Alpha spec.	U-232	NA
Iso-Pu	Alpha spec.	Pu-242	NA
Iso-Th	Alpha spec.	Th-229	NA
Am-241	Alpha spec.	Am-242	NA
Sr-90	Beta	Y ingrowth	NA
Ni-63	Beta	NA	Ni by ICP
Ra-226	Deamination	NA	NA
Ra-226	Alpha spec.	Ba-133 or Ra-225	NA
Ra-228	Gamma spec.	Ba-133	NA

Gamma spec. LCS contains: Am-241, Cs-137, and Co-60

Comments:

Reviewed By: [signature] Date: 6/19/03

Sample Findings Summary

Site: S-74 Chem Waste LF Remed **ARCOC:** 606592 **Data:** Organic and Inorganic

Sample ID		All SVOC (8270C) TAL compounds	All Aroclors (8082)	53469-21-9 (aroclor-1242)	11097-69-1 (aroclor-1254)	11096-82-5 (aroclor-1260)	Metals	7440-38-2 (arsenic)								
062810-001 74-SB-E002-F023-R	84290-001					14.1J										
062811-001 74-SB-E002-F031-R	84290-002			47U, B2		10.0J										
062658-001 74-SB-E002-F076-R	84290-005			41U, B2		5.5J										
062660-001 74-SB-E002-F078-R	84290-021							J, B2								
062661-001 74-SB-E002-F092-R	84290-008			J, A1	J, A1	J, A1										
062662-001 74-SB-E002-F093-R	84290-009			J, A1	J, A1	225J, A1										
062663-001 74-SB-E002-F107-R	84290-010					116J										
062665-001 74-SB-E002-F123-R	84290-012					174J										
062666-001 74-SB-E002-F124-R	84290-013			J, A1	J, A1	J, A1										
062667-001 74-SB-E002-F125-R	84290-014			J, A1	J, A1											
062668-001 74-SB-E002-F126-R	84290-015					24.2J										
062670-001 74-SB-E002-F140-R	84290-016			J, A1	J, A1											
062671-001 74-SB-E002-F141-R	84290-017			J, A1	J, A1											
062672-001 74-SB-E002-F142-R	84290-018, -022			J, A1	J, A1			J, B2								
062673-001 74-SB-E002-F143-R	84290-019					23.6J										
062674-001 74-SB-E002-F155-R	84290-020			J, A1	J, A1	J, A1										
062675-001 74-SB-E002-F156-R	84293-001		P2		J											
062676-001 74-SB-E002-F187-R	84293-002		P2	47U, B2												
062676-002 74-SB-E002-F187-R-DU	84293-003		P2													
062676-004 74-SB-E002-F187-EB	84297-002		P2													
062676-005 74-SB-E002-F187-EB	84297-003	P2														

Validated By: [illegible] **Date:** 08/11/03

Analytical Quality Associates, Inc.
616 Maxine NE
Albuquerque, NM 87123
Phone: 505-299-5201
Fax: 505-299-6744
Email: minteer@aol.com

Memorandum

DATE: 08/11/03

TO: File

FROM: Linda Thal

SUBJECT: Inorganic Data Review and Validation - SNL
Site: S-74 Chem Waste LF Remed
ARCOC # 606592
GEL SDG # 84290 and 84297
Project/Task No. 7221.02.02.03

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM ER Project AOP 00-03.

Summary

The samples were prepared and analyzed with approved procedures using methods SW-846 6010B (ICP-AES metals). Problems were identified with the data package that resulted in the qualification of data.

> Arsenic (As) was detected in the EB (equipment blank) at a value > RL. The associated sample results were detect, < 10X EB value and will be qualified "J, B2".

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

Holding Times/Preservation

The samples were analyzed within the prescribed holding times and properly preserved.

Calibration

The initial and continuing calibration data met QC acceptance criteria.

Blanks

All blank criteria were met except as mentioned above in the summary section.

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

The LCS met QC acceptance criteria.

Matrix Spike (MS) Analysis

The MS met QC acceptance criteria.

Replicate Analysis

The replicate analysis met QC acceptance criteria.

ICP Interference Check Sample (ICS)

The ICS-AB met QC acceptance criteria.

ICP Serial Dilution

The serial dilution met QC acceptance criteria.

Detection Limits/Dilutions

All detection limits were properly reported. The EB was undiluted and the soil samples were diluted a standard 2X.

Other QC

An equipment blank was submitted on the ARCOC. No field blank or field duplicate was submitted on the ARCOC.

No other specific issues were identified which affect data quality.

Analytical Quality Associates, Inc.
616 Maxine NE
Albuquerque, NM 87123
Phone: 505-299-5201
Fax: 505-299-6744
Email: minteer@aol.com

Memorandum

DATE: 08/11/03

TO: File

FROM: Linda Thal

SUBJECT: Organic Data Review and Validation - SNL
Site: S-74 Chem Waste LF Remed
ARCOC # 606592
GEL SDG # 84290, 84293, 84295, 84296 and 84297
Project/Task No. 7221.02.02.03

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM ER Project AOP 00-03.

Summary

The samples were prepared and analyzed with approved procedures using methods 8270C (SVOC) and 8082 (PCBs). Problems were identified with the data package that resulted in the qualification of data.

SVOC Batch # 264415 (EB)
No MS/MSD, LCSD or duplicate was performed for this sample. As there is no measure of precision available, the sample results will be qualified "P2".

PCB Batch # 264408 (EB)
No MS/MSD, LCSD or duplicate was performed for this sample. As there is no measure of precision available, the sample results will be qualified "P2".

PCB Batch # 264560 (84293-001, -002 and -003)
The EB had an aroclor-1242 value > RL. Sample 84293-002 had a value > RL but < 10X EB value and will be qualified "U, B2" at the reported value.
The MS/MSD failed %R for aroclor-1016 and aroclor-1260 due to dilution and matrix interference from other aroclors present in the sample. As there is no means to assess the precision for the batch, all associated sample results will be qualified "P2".
Sample 84293-001 had an RPD between the primary and confirmation column > 25% but < 75% for aroclor-1254. The highest result is reported and will be qualified "J".

PCB Batch # 264411 (84290-001 through -020)
The EB had an aroclor-1242 value > RL. Sample 84290-002 and -005 had a value > RL but < 10X EB value and will be qualified "U, B2" at the reported value.
Sample 84290-008, -009, -013, -014, -016, -017, -018 and -020 had one or more surrogate %R biased high due to dilution of the samples (see DV Worksheet). All samples were detect for aroclor-1242 and -1254 and will be qualified "J, A1"; samples 84290-008, -009, -013 and -020 were detect for aroclor-1260 and will be qualified "J, A1"; the remaining aroclors were non-detect and will not be qualified.

Sample 84290-001, -002, -005, -009, -010, -012, -015 and 019 had an RPD between the primary and confirmation column > 25% but < 75% for aroclor-1260.All sample results will be changed to the highest reported value and qualified "J". (Note: Sample 84290-009 is already "J" qualified due to high surrogates).

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

Holding Times/Preservation

All Analyses: The samples were properly preserved and analyzed within the method prescribed holding time.

Calibration

All Analyses: All initial and continuing calibration acceptance criteria were met except as follows:

SVOC Batch # 264421
Benzo(g,h,i)perylene had a %D > 20% with a positive bias in the CCV preceding the samples. Sample 84296-001 was non-detect and will not be qualified.

Blanks

All Analyses: All method blank (MB) and equipment blank (EB) acceptance criteria were met except as mentioned above in the summary section and as follows:

PCB Batch # 264560 (84293-001, -002 and -003)
The EB had an aroclor-1242 and aroclor-1254 value > RL. All associated sample results had values > DL and > 10X EB value for aroclor-1254 and sample 84293-001 and -003 had aroclor-1242 values > DL and > 10X EB value and will not be qualified.

PCB Batch # 264411 (84290-001 through -020)
The EB had an aroclor-1242 and aroclor-1254 value > RL. All associated sample results had values > DL and > 10X EB value for aroclor-1254 and all samples excluding 84290-002 and -005 had aroclor-1242 values > DL and > 10X EB value and will not be qualified.

Surrogates

All Analyses: All surrogate acceptance criteria were met except as mentioned above in the summary section.

Internal Standards (ISs)

SVOC: All internal standard acceptance criteria were met.

PCB: No internal standard required.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

All Analyses: All MS/MSD acceptance criteria were met except as mentioned above in the summary section and as follows:

SVOC Batch # 264421
No MS/MSD was performed for bis(2-chloroethyl)ether. A field duplicate was submitted and will be used to assess the precision for the batch. No data will be qualified.

PCB Batch # 264411 (84290-001 through -020)
The MS/MSD %R for aroclor-1016 was biased high due to interference from aroclor-1242 detected in the sample. All associated sample results were non-detect for aroclor-1016, and using professional judgment will not be qualified. The aroclor -1260 results were in criteria and will be used to assess the precision for the batch.

Laboratory Control Samples (LCS/LCSD) Analysis

All Analyses: The LCS acceptance criteria were met. No LCSD was analyzed. The MS/MSD is used to assess the precision for the batch. No data will be qualified as a result.

Detection Limits/Dilutions

All Analyses: All detection limits were properly reported. Samples were not diluted with the following exceptions:

PCB
Sample 84290-001, -004, -006, -015, -019 and 84293-003 (5X)
Sample 84290-003 and -011 (10X)
Sample 84290-007 and -010 (20X)
Sample 84290-012, -013, -018 and 84293-001 (50X)
Sample 84290-008, -009 and -020 (100X)
Sample 84290-014, -016 and -017 (500X)

Confirmation Analyses

SVOC: No confirmation analyses required.

PCB: All confirmation acceptance criteria were met except as mentioned above in the summary section.

Other QC

SVOC and PCB: An equipment blank and a field duplicate were submitted on the ARCOC. There is no "required" validation procedure for assessing a field duplicate. No trip blank or field blank was submitted on the ARCOC.

No other specific issues were identified which affect data quality.

Wide EX

Data Validation Summary

Site/Project: 5-74 CWL Remed. Project/Task #: 7221 02.02.03 # of Samples: 23 & 3 Matrix: Soils & H2O

AR/COC #: 606592 Laboratory Sample IDs: 84290 - 001 thru - 024

Laboratory: GEL 84293 - 001 thru - 003

SDG #: 84290 84295 - 001, - 002 84296 - 001

84297 - 001 thru - 003

QC Element	Analysis									
	Organics				Inorganics				RAD	Other
	VOC	SVOC	Pesticide/ PCB	HPLC (HE)	ICP/AES	GFAA/ AA	CVAA (Hg)	CN		
1. Holding Times/Preservation	NA	✓	✓	NA	✓	NA				
2. Calibrations		✓	✓		✓					
3. Method Blanks		✓	U, B2 / ✓		J, B2					
4. MS/MSD		✓ / P2	P2 / ✓ / P2		✓					
5. Laboratory Control Samples		✓	✓		✓					
6. Replicates					✓					
7. Surrogates		✓	J, A1 / ✓							
8. Internal Standards		✓								
9. TCL Compound Identification		✓								
10. ICP Interference Check Sample					✓					
11. ICP Serial Dilution					✓					
12. Carrier/Chemical Tracer Recoveries										
13. Other QC		FB Field dup	FB Field dup		FB					

J = Estimated
U = Not Detected
UJ = Not Detected, Estimated
R = Unusable

Check (√) = Acceptable
Shaded Cells = Not Applicable (also "NA")
NP = Not Provided
Other: _____

Reviewed By: [signature] Date: 08.11.03

WS lot 2 (soils)

Semivolatile Organics (SW 846 Method 8270)

Site/Project: S-74 AR/COC #: 606592 Laboratory Sample IDs: 8H296-001 (LUST D) -024, 8H295-001, -002 (C) 8H290-023 8H293-002 -003 (DUP)(E) (LOUP)-LT

Laboratory: QEL SDG #: 8H290 (8H296, -95, -93, -97)

Methods: SW 846 8270C

# of Samples: 4 ~~6~~ 7 Matrix: Soils Batch #s: 264421

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blanks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks		
							>.05	<20% / 0.99	20%												
2	BN	120-82-1	1,2,4-Trichlorobenzene		0.20																
1	BN	95-50-1	1,2-Dichlorobenzene		0.40																
1	BN	541-73-1	1,3-Dichlorobenzene		0.60																
1	BN	106-46-7	1,4-Dichlorobenzene		0.50																
3	A	95-95-4	2,4,5-Trichlorophenol		0.20																
3	A	88-06-2	2,4,6-Trichlorophenol		0.20																
2	A	120-83-2	2,4-Dichlorophenol		0.20																
2	A	105-67-9	2,4-Dimethylphenol		0.20																
3	A	51-28-5	2,4-dinitrophenol		0.01																
3	BN	121-14-2	2,4-Dinitrotoluene		0.20																
3	BN	606-20-2	2,6-Dinitrotoluene		0.20																
3	BN	91-58-7	2-Chloronaphthalene		0.80																
1	A	95-57-8	2-Chlorophenol		0.80																
2	BN	91-57-6	2-Methylnaphthalene		0.40																
1	A	95-48-7	2-Methylphenol (o-cresol)		0.70																
3	BN	88-74-4	2-Nitroaniline		0.01																
2	A	88-75-5	2-Nitrophenol		0.10																
5	BN	91-94-1	3,3'-Dichlorobenzidine		0.01																
3	BN	99-09-2	3-Nitroaniline		0.01																
4	A	534-52-1	4,6-Dinitro-2-methylphenol		0.01																
4	BN	101-55-3	4-Bromophenyl-phenylether		0.10																
3	BN	7005-72-3	4-Chlorophenyl-phenylether		0.40																
2	A	59-50-7	4-Chloro-3-methylphenol		0.20																
2	BN	106-47-8	4-Chloroaniline		0.01																
1	A	N22	3,4-Methylphenol (m,p-cresol)		0.60																

Notes: Shaded rows are RCRA compounds.

Comments:

Reviewed By: [signature] Date: 08.10.03

WJ lot 2 soils

Semivolatile Organics

Site/Project: _____ AR/COC #: 606592 Batch #s: _____

Laboratory: _____ SDG #: _____ # of Samples: _____ Matrix: _____

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blanks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	84297-003 Equip. Blanks	Field Blanks		
							>.05	<20%/ 0.99	20%												
3	BN	100-01-6	4-Nitroaniline		0.01	NA						NA	NA						NA		
3	A	100-02-7	4-Nitrophenol		0.01																
3	BN	83-32-9	Acenaphthene		0.90																
3	BN	208-96-8	Acenaphthylene		0.90																
4	BN	120-12-7	Anthracene		0.70																
5	BN	56-55-3	Benzo(a)anthracene		0.80																
6	BN	50-32-8	Benzo(a)pyrene	✓	0.70		✓	✓	✓	NO	✓			✓	✓	✓		NO			
6	BN	205-99-2	Benzo(b)fluoranthene	✓	0.70		✓	✓	✓	NO	✓			✓	✓	✓		NO			
6	BN	191-24-2	Benzo(g,h,i)perylene	✓	0.50		✓	✓	+39	NO	✓			✓	✓	✓		NO			
6	BN	207-08-9	Benzo(k)fluoranthene		0.70																
2	BN	111-91-1	bis(2-Chloroethoxy)methane		0.30																
1	BN	111-44-4	bis(2-Chloroethyl)ether	✓	0.70		✓	✓	✓	NO	✓	I		NA	NA	NA	✓	NO			
1	BN	108-60-1	bis(2-chloroisopropyl)ether		0.01																
5	BN	117-81-7	bis(2-Ethylhexyl)phthalate		0.01																
5	BN	85-68-7	Butylbenzylphthalate		0.01																
4	BN	86-74-8	Carbazole		0.01																
5	BN	218-01-9	Chrysene		0.70																
6	BN	53-70-3	Dibenzo(a,h)anthracene		0.40																
3	BN	132-64-9	Dibenzofuran		0.80																
3	BN	84-66-2	Diethylphthalate		0.01																
3	BN	131-11-3	Dimethylphthalate		0.01																
4	BN	84-74-2	Di-n-butylphthalate		0.01																
6	BN	117-84-0	Di-n-octylphthalate		0.01																
4	BN	206-44-0	Fluoranthene		0.60																
3	BN	86-73-7	Fluorene		0.90																
4	BN	118-74-1	Hexachlorobenzene		0.10																
2	BN	87-68-3	Hexachlorobutadiene		0.01																
3	BN	77-47-4	Hexachlorocyclopentadiene		0.01																
1	BN	67-72-1	Hexachloroethane		0.30																

Comments:

Benzo ghi = Lst 0 = Sa 84296-001 NO

CCV 07/22 19.24

I Cal. 04/15 → 07/ha

84293-002 & 003 for bis(2-

WS lot 2 soils

Semivolatile Organics

Site/Project: _____ AR/COC #: 606592 Batch #s: _____

Laboratory: _____ Laboratory Report #: _____ # of Samples: _____ Matrix: _____

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blanks	LCS	LCS D	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks		
							>.05	<20% / 0.99	20%												
6	BN	193-39-5	Indeno(1,2,3-cd)pyrene		0.50																
2	BN	78-59-1	Isophorone		0.40																
2	BN	91-20-3	Naphthalene		0.70																
2	BN	98-95-3	Nitrobenzene		0.20																
4	BN	86-30-6	N-Nitrosodiphenylamine (1)		0.01																
1	BN	621-64-7	N-Nitroso-di-propylamine		0.50																
4	A	87-86-5	Pentachlorophenol		0.05																
4	BN	85-01-8	Phenanthrene		0.70																
1	A	108-95-2	Phenol		0.80																
5	BN	129-00-0	Pyrene		0.60																
4	BN	122-39-4	Diphenylamine		0.01																

Surrogate Recovery Outliers

Sample	SMC 1	SMC 2	SMC 3	SMC 4	SMC 5	SMC 6	SMC 7	SMC 8

SMC 1: Nitrobenzene-d5 (BN)
SMC 2: 2-Fluorobiphenyl (BN)
SMC 3: p-Terphenyl-d14 (BN)
SMC 4: Phenol-d5 (A)
SMC 5: 2-Fluorophenol (A)
SMC 6: 2,4,6-Tribromophenol (A)
SMC 7: 2-2-Chlorophenol-d4 (A)
SMC 8: 1,2-Dichlorobenzene-d4 (BN)

Internal Standard Outliers

Sample	IS 1-area	IS 1-RT	IS 2-area	IS 2-RT	IS 3-area	IS 3-RT	IS 4-area	IS 4-RT	IS 5-area	IS 5-RT	Is 6-area	IS 6-RT

IS 1: 1,4-Dichlorobenzene-d4 (BN)
IS 2: Naphthalene-d8 (BN)
IS 3: Acenaphthene-d10 (BN)
IS 4: Phenathrene-d10 (BN)
IS 5: Chrysene-d12 (BN)
IS 6: Perylene-d12 (BN)

Comments: According to the QC summary sa 84296 - 001 (MS/MSD) was spiked with bis(2-chloroethyl) ether & the recovery was reflected as 0% due to software limitations. The raw data does not have record of this compound being detected. A field dup was analyzed & will be used. [illegible]

WS 2 of 2 EB

Semivolatile Organics (SW 846 Method 8270)

Site/Project: S - 7H AR/COC #: 606592 Laboratory Sample IDs: 8H297 - 003

Laboratory: GEL SDG #: 8H290 (8H297) - 93, -95, -96 (Lists D & E requested)

Methods: SW 846 8270 C

# of Samples: 1 Matrix: Aqueous Batch #s: 26 HH15

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blanks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks		
							>.05	<20% / 0.99	20%												
2	BN	120-82-1	1,2,4-Trichlorobenzene		0.20						✓										
1	BN	95-50-1	1,2-Dichlorobenzene		0.40																
1	BN	541-73-1	1,3-Dichlorobenzene		0.60																
1	BN	106-46-7	1,4-Dichlorobenzene		0.50						✓										
3	A	95-95-4	2,4,5-Trichlorophenol		0.20						✓										
3	A	88-06-2	2,4,6-Trichlorophenol		0.20						✓										
2	A	120-83-2	2,4-Dichlorophenol		0.20																
2	A	105-67-9	2,4-Dimethylphenol		0.20																
3	A	51-28-5	2,4-dinitrophenol		0.01																
3	BN	121-14-2	2,4-Dinitrotoluene		0.20						✓										
3	BN	606-20-2	2,6-Dinitrotoluene		0.20																
3	BN	91-58-7	2-Chloronaphthalene		0.80																
1	A	95-57-8	2-Chlorophenol		0.80						✓										
2	BN	91-57-6	2-Methylnaphthalene		0.40																
1	A	95-48-7	2-Methylphenol (o-cresol)		0.70						✓										
3	BN	88-74-4	2-Nitroaniline		0.01																
2	A	88-75-5	2-Nitrophenol		0.10																
5	BN	91-94-1	3,3'-Dichlorobenzidine		0.01																
3	BN	99-09-2	3-Nitroaniline		0.01																
4	A	534-52-1	4,6-Dinitro-2-methylphenol		0.01																
4	BN	101-55-3	4-Bromophenyl-phenylether		0.10																
3	BN	7005-72-3	4-Chlorophenyl-phenylether		0.40																
2	A	59-50-7	4-Chloro-3-methylphenol		0.20						✓										
2	BN	106-47-8	4-Chloroaniline		0.01																
1	A	N22	3,4-Methylphenol (m,p-cresol)		0.60						✓										

Notes: Shaded rows are RCRA compounds.

Comments:

MS/MSD = 8H243 non Sandia "P2"

Reviewed By: [signature] Date: 08.10.03

LT ~~MS/MSD? Not spiked ∴ no precision "P2"~~

WS 2of 2 EB

Semivolatile Organics

Site/Project: _____ AR/COC #: 606592 Batch #s: _____

Laboratory: _____ SDG #: _____ # of Samples: _____ Matrix: _____

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blanks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks		
							>.05	<20% / 0.99	20%												
3	BN	100-01-6	4-Nitroaniline		0.01							NA									
3	A	100-02-7	4-Nitrophenol		0.01						✓										
3	BN	83-32-9	Acenaphthene		0.90						✓										
3	BN	208-96-8	Acenaphthylene		0.90																
4	BN	120-12-7	Anthracene		0.70																
5	BN	56-55-3	Benzo(a)anthracene		0.80																
6	BN	50-32-8	Benzo(a)pyrene	✓	0.70		✓	✓	✓	✓											
6	BN	205-99-2	Benzo(b)fluoranthene	✓	0.70		✓	✓	✓	✓											
6	BN	191-24-2	Benzo(g,h,i)perylene	✓	0.50	✓	✓	✓	✓	✓											
6	BN	207-08-9	Benzo(k)fluoranthene		0.70																
2	BN	111-91-1	bis(2-Chloroethoxy)methane		0.30																
1	BN	111-44-4	bis(2-Chloroethyl)ether	✓	0.70		✓	✓	✓	✓											
1	BN	108-60-1	bis(2-chloroisopropyl)ether		0.01																
5	BN	117-81-7	bis(2-Ethylhexyl)phthalate		0.01																
5	BN	85-68-7	Butylbenzylphthalate		0.01																
4	BN	86-74-8	Carbazole		0.01																
5	BN	218-01-9	Chrysene		0.70																
6	BN	53-70-3	Dibenzo(a,h)anthracene		0.40																
3	BN	132-64-9	Dibenzofuran		0.80																
3	BN	84-66-2	Diethylphthalate		0.01																
3	BN	131-11-3	Dimethylphthalate		0.01																
4	BN	84-74-2	Di-n-butylphthalate		0.01																
6	BN	117-84-0	Di-n-octylphthalate		0.01																
4	BN	206-44-0	Fluoranthene		0.60																
3	BN	86-73-7	Fluorene		0.90																
4	BN	118-74-1	Hexachlorobenzene		0.10						✓										
2	BN	87-68-3	Hexachlorobutadiene		0.01						✓										
3	BN	77-47-4	Hexachlorocyclopentadiene		0.01																
1	BN	67-72-1	Hexachloroethane		0.30						✓										

Comments:

NS 2of 2 FB

Semivolatile Organics

Site/Project: _____ AR/COC #: 606592 Batch #s: _____

Laboratory: _____ Laboratory Report #: _____ # of Samples: _____ Matrix: _____

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blanks	LCS	LCS D	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks		
							>.05	<20% / 0.99	20%												
6	BN	193-39-5	Indeno(1,2,3-cd)pyrene		0.50																
2	BN	78-59-1	Isophorone		0.40																
2	BN	91-20-3	Naphthalene		0.70																
2	BN	98-95-3	Nitrobenzene		0.20						✓										
4	BN	86-30-6	N-Nitrosodiphenylamine (1)		0.01																
1	BN	621-64-7	N-Nitroso-di-propylamine		0.50						✓										
4	A	87-86-5	Pentachlorophenol		0.05						✓										
4	BN	85-01-8	Phenanthrene		0.70																
1	A	108-95-2	Phenol		0.80						✓										
5	BN	129-00-0	Pyrene		0.60						✓										
4	BN	122-39-4	Diphenylamine		0.01																
			Pyridine								✓										

Surrogate Recovery Outliers

Sample	SMC 1	SMC 2	SMC 3	SMC 4	SMC 5	SMC 6	SMC 7	SMC 8
-003	✓	✓	✓	NA	→	→	→	→

SMC 1: Nitrobenzene-d5 (BN) SMC 2: 2-Fluorobiphenyl (BN) SMC 3: p-Terphenyl-d14 (BN)
SMC 4: Phenol-d5 (A) SMC 5: 2-Fluorophenol (A) SMC 6: 2,4,6-Tribromophenol (A)
SMC 7: 2-2-Chlorophenol-d4 (A) SMC 8: 1,2-Dichlorobenzene-d4 (BN)

Comments:

Internal Standard Outliers

Sample	IS 1-area	IS 1-RT	IS 2-area	IS 2-RT	IS 3-area	IS 3-RT	IS 4-area	IS 4-RT	IS 5-area	IS 5-RT	Is 6-area	IS 6-RT
IN CRITERIA												

IS 1: 1,4-Dichlorobenzene-d4 (BN) IS 2: Naphthalene-d8 (BN) IS 3: Acenaphthene-d10 (BN)
IS 4: Phenathrene-d10 (BN) IS 5: Chrysene-d12 (BN) IS 6: Perylene-d12 (BN)

NS 1 of 2 soils

PCBs (SW 846 - Method 8082)

Site/Project: S-74 AR/COC #: 606592 Laboratory Sample IDs: 8H293-001 thru -003 (1)
Laboratory: GEL SDG #: 8H290 8H293 8H290-001 thru -020 (2)
Methods: SW 846 8082 (1) (2)
# of Samples: 23 Matrix: Soil Batch #s: 264560 264411

CAS #	Name	TCL	Intercept	Calib RSD / R^2 (<20% / 0.99)	CCV %D (±20%) 1	CCV %D (±20%) 2	Method Blanks 1	Method Blanks 2	LCS 1	LCSD 2	LCS RPD (20%)	MS 1	MSD 1	MS RPD (20%) 1	Field Dup. RPD	Equip. Blanks	Field Blanks	MS 2	MSD 2	RPD 2	
12674-11-2	Aroclor-1016	✓	NA	✓	✓	✓	✓	✓	✓	✓	NA	0	0	✓				1130	786	36	Fails due to dil. matrix int.
11104-28-2	Aroclor-1221											70% due to dil									
11141-16-5	Aroclor-1232																				
53469-21-9	Aroclor-1242			✓	✓	✓									✓?	5.9ug/L	>RL	x10 59 ppb			
12672-29-6	Aroclor-1248			✓	✓	✓															
11097-69-1	Aroclor-1254			✓	✓	✓									✓?	1.3ug/L	>RL	x10 13 ppb			
11096-82-5	Aroclor-1260			✓	✓	✓			✓	✓		NA	NA	5200	✓?			✓	✓	✓	OK
												74%	spike								

Sample	SMC Hcmx % REC DCB	SMC RT	Sample	SMC Hcmx % REC DCB	SMC RT
8H290-008 (100x)	140 / 132	(51-114)(51-121)	8H290-014 (500x)	494 / 155	(51-114)(51-121)
-009 (100x)	142 / 125	" "	-016 / 500x)	142 / 160	" "
-013 (50x)	✓ 155	✓ "	-017 (500x)	175 / 175	" "
			-018 (50x)	118 / 128	" "
			-020 (100x)	123 / ✓	" ✓

Comments: DF 1X 2, 5
5X 1, 4, 6, 15, 19
10X 3 11
20X 7 10
100X 8 9 20
500X 14 16 17
50X 12 13 18

Confirmation

Sample	CAS #	RPD > 25%	Sample	CAS #	RPD > 25%
8H290-001	1260	50%	8H290 - 015	1260	26.2 %
002	1260	28.6%	- 019	1260	44 %
005	1260	34 %	8H293 - 001	1254	40 %
009	1260	23 %			
010	1260	34 %			
012	1260	40 %			

264560 : fails due to dil & matrix int. - No precision - P2

264411 : 1260 OK No qual.

Reviewed By: [signature] Date: 08.11.03

NS 2of2 EB

PCBs (SW 846 - Method 8082)

Site/Project: S-74 AR/COC #: 606592 Laboratory Sample IDs: 84297-002

Laboratory: GEL SDG #: 84297

Methods: SW846 8082

# of Samples: 1 Matrix: Aqueous Batch #s: 264408

CAS #	Name	TCL	Intercept	Calib RSD / R^2 <20% / 0.99	CCV %D 20%	Method Blanks	LCS	LCSD	LCS RPD 20%	MS	MSD	MS RPD 20%	Field Dup. RPD	Equip. Blanks	Field Blanks		
12674-11-2	Aroclor-1016	✓	NA	✓	✓	✓	✓										
11104-28-2	Aroclor-1221							NA									
11141-16-5	Aroclor-1232																
53469-21-9	Aroclor-1242			✓	✓												
12672-29-6	Aroclor-1248			✓													
11097-69-1	Aroclor-1254			✓	✓												
11096-82-5	Aroclor-1260			✓	✓		✓										

Sample	SMC % REC	SMC RT	Sample	SMC % REC	SMC RT
IN CRITERIA					

Comments: DC = 5X

No precision "P2"

Confirmation

Sample	CAS #	RPD > 25%	Sample	CAS #	RPD > 25%
IN CRITERIA					

Reviewed By: [illegible] Date: 08.11.03

Inorganic Metals

Site/Project: S - 74 AR/COC #: 606592 Laboratory Sample IDs: 84290 - 021, - 022 (2X Soils)

Laboratory: GEL SDG #: 84290, 84297 84297- 001 (EB)

Methods: SW846 6010B

# of Samples: 2 & 1 Matrix: Soils & Aqueous Batch #s: 265143 (EB) 264479 (Soils)

	CAS #/ Analyte	QC Element																			
		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																				
	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																				
011	7440-38-2 As	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	✓	✓	NA	NA	.00661 mg/L	>RL		
	7440-36-0 Sb																				
	7440-28-0 Tl																				
																		6.61 ug/L x 10 = 66.1 ug/L			
	7439-97-6 Hg																				
	Cyanide CN																				
B	7440-38-2 As	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	NA	NA	✓	✓	NA	NA	NA	NA		

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: ICP soils dil standard 2X.

Sa 021 1.04g → 50ml (x 10.4) 58.7 ug/L.
022 1.05g → 50ml (x 10.5) 36.4 ug/L. } J, B2

Reviewed By: [signature] Date: 08.11.03

7/24 1016	1260	8 27						
8 43 1234	1254	8 10				15.20	MB	
8 24 1242	1242	8 08		7/23		15.32	LCS	
9 17 10 20 1010								
264408	EB	84297 - 002		7/24		10.14		
		5X ?						
	1016 / 1260	8 29	18 34		20 17			
	1254	8 40	18 46		20 28	18.57 MB		
	1242	9 03				LCS		
Soils						19.08	1242	54	60
	prep 7/22							
264560	(50X)	84293 - 001		7/23		19/20	2300	1330	242
	(1X)	002				19.54	46.6	37.1	6.1
	(5X)	003				20.05	45	73.2	—
						19.31 / 19.43			
						MS MSD			
ICal 7/08 → 7/08	11 24	12 10							
[redacted]					11.55	14 00	14 57		
ICal 7/07 → 7/07	11 28	12 13							
[redacted]									
ICal 7/07 → 7/07	13 56	14 43							
[redacted]						10. MB			
						10.12 LCS			
264441	(5X)	84290 - 001		7/23		10.23	271	71.3	J 85
						MS/MSD 10.35 10.46			
	1X	002				10.57 470, 82	47	63.7	7.5
	10X	003				11.09	492	205	59.8
	5X	4				11.20	203	18 9	24.5
	1X	5				11.32 40, 50, 60	40.5	20.7	3.9
	5X	6				11.43	175	63.3	11.8 J
						10.16 1260			
	20X	7				12.06	240	260	—
	100X	8				12.17	5170	76	142 J
	100X	9				12.29	5260	978	161 J
	20X	10				12.40	1130	464	82.3
	10X	11				12.52	564	115	39
	50X	12				13.03	3160	823	116 J
	50X	13				13.15	3210	1260	291
	500X	14				13.26	30900	3000	—
	5X	15				13.38	243	56	18.6
	500X	16				13.49	56990	17700	—
	500X	17			13.16 1260	14.12	56200	2170	—
	50X	18				14.23	2090	438	—
	5X	19				14.34	229	28	15.1 J
	100X	20			1242 / 1260	14.46	4030	117	10.5

606592

07/14

MSD 14
TUNE 14.41
CCV 14.57

1120 XT 07/18

16.01 MB ✓
16.22 LCS ✓ 17.04 MS
264415 84297 -003 7/23 18.48 ✓ 17.25 MSD

XT 7/17 Soils MSD 5 7/22
19.09 TUNE
19.24 CCV
264421 0.43 MB ✓
1.02 LCS ✓ MS 1.21 ✓1.41
84296 -001 7/23 3.55 ✓ ND
84295 -001 3.17 ✓ Benzo b. 787 a 181
-002 3.36 ✓ Benzo b 279 a 42.4
84293 -002 2.58 ✓ ND
DUP 003 2.58 ✓ ND
84290 -023 2.00 ✓ ND
-024 2.119 ✓ 93.2 benzo(b)

MB EB
CCB 1 @ 2 265143 7.23 12.08 > RL

Soils 264479 7/21 12.36 5.64 ug/kg
13.06 8.47 ug/kg

Sample Findings Summary

Site: S-74, Chem Waste Landfill **AR/COC:** 606649 **Data Type:** Organic, Inorganic, & RAD

Sample ID	VOCs:	EPA8260B (All VOCs, except...)	79-01-6 (trichloroethene)	SVOCs:	EPA8270C (All SVOCs, except...)	205-99-2 (benzo(b)fluroanthene)	PCBs:	EPA8082 (All PCBs, except...)	53469-21-9 (Aroclor-1242)	11097-69-1 (Aroclor-1254)	11096-82-5 (Aroclor-1260)	RAD:	EPA901.1 (All Gamma Spec Analytes, except...)	All Gamma Spec results flagged "X" by the lab (see EDD)	13967-73-2 (Sr-85)			
062752-002 74-SB-E002-F192-R-EB		P2	UJ,P2															
062752-007 74-SB-E002-F192-R-TB		P2	UJ,P2															
062749-001 74-SB-E002-F172-R						UJ,P1			J,A2	J,A2								
062750-001 74-SB-E002-F173-R						UJ,P1			J,A2	J,A2	J,A2							
062752-006 74-SB-E002-F192-R-EB					P2	P2												
062744-001 74-SB-E002-F094-R									J,A2	J,A2	J,A2			R				
062745-001 74-SB-E002-F095-R									J,A2	J,A2	J,A2			R				
062746-001 74-SB-E002-F110-R									J,A2	J,A2	J,A2			R				
062747-001 74-SB-E002-F111-R									J,A2	J,A2	J,A2			R				
062751-001 74-SB-E002-F192-R									J,A1,A2	J,A1,A2								
062752-001 74-SB-E002-F192-R-DU									J,A2	J,A2								
062752-003 74-SB-E002-F192-R-EB								UJ,A1,P2	J,A1,P2	J,A1,P2	UJ,A1,P2							
062752-005 74-SB-E002-F192-R-EB													J	R	R			

Validated By: Mr. Kenneth Sales **Date:** 08/19/03

Analytical Quality Associates, Inc.
616 Maxine NE
Albuquerque, NM 87123
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MEMORANDUM

DATE: August 19, 2003

TO: File

FROM: Kenneth Salaz

SUBJECT: Inorganic Data Review and Validation - SNL
S-74, Chem Waste Landfill; ARCOC #606649,
GEL SDG #84745, Case No. 7221.02.02.03

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM ER Project AOP 00-03.

Summary

The sample were prepared and analyzed with approved procedures using method EPA6010B ICP-AES Metals. 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

The sample was analyzed within the method specified holding times and properly preserved.

Calibration

The initial and continuing calibrations met all QC acceptance criteria.

Blanks

No target analytes were detected in the blanks.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analyses

The MS/MSD analyses met all QC acceptance criteria. It should be noted that the MS/MSD analyses were performed on an SNL sample of similar matrix from another SDG. No sample data will be qualified as a result.

Laboratory Control Sample (LCS/LCSD) Analyses

The LCS analysis met all QC acceptance criteria. No LCSD analysis was performed. No sample data will be qualified as a result.

Replicate Analysis

The replicate analysis met all QC acceptance criteria. It should be noted that the replicate analysis was performed on an SNL sample of similar matrix from another SDG. No sample data will be qualified as a result.

ICP Interference Check Sample (ICS)

The ICS met all QC acceptance criteria.

ICP Serial Dilution

The serial dilution analysis met all QC acceptance criteria. It should be noted that the serial dilution analysis was performed on an SNL sample of similar matrix from another SDG. No sample data will be qualified as a result.

Detection Limits/Dilutions

All detection limits were properly reported. The sample was not diluted.

Other QC

No field duplicate, equipment blank (EB), or field blank (FB) was submitted on the ARCOC.

No other specific issues were identified which affect data quality.

Analytical Quality Associates, Inc.
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MEMORANDUM

DATE: August 19, 2003

TO: File

FROM: Kenneth Salaz

SUBJECT: Organic Data Review and Validation - SNL
S-74, Chem Waste Landfill; ARCOC #606649,
GEL SDG #84745/84749, Case No. 7221.02.02.03

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM ER Project AOP 00-03.

Summary

All samples were prepared and analyzed with approved procedures using methods EPA8260A/B VOCs, EPA8270C SVOCs, and EPA8082 PCBs. Problems were identified with the data package that result in the qualification of data.

1. VOC Analyses: For the equipment blank (EB) and trip blank (TB), the initial calibration response factor (RF) of trichloroethene was less than (<) the required minimum but greater than (>) 0.01. All associated sample results were non-detect (ND) and, thus, will be qualified "UJ."

2. PCB Analyses: The DCB surrogate percent recovery (%R) for the EB was < the QC acceptance limit but >10%. The Arolcor-1242 and -1254 were detects and, thus, will be qualified "J,A1." All other results for this sample were ND and, thus, will be qualified "UJ,A1." The 4cmx and DCB surrogate %Rs for sample 84745-008 were > QC acceptance limits. The Arolcor-1242 and -1254 were detects and, thus, will be qualified "J,A1."

3. VOC Analyses: For the EB and TB, no MS/MSD or any other measure of precision was analyzed. Thus, all results for these samples will be qualified "P2."

   SVOC Analyses: For the EB, no MS/MSD or any other measure of precision was analyzed. Thus, all results for this sample will be qualified "P2." For the soil samples, the MSD relative percent difference (RPD) of benzo(b)fluoranthene was > the QC acceptance limit. All associated sample results were ND and, thus, will be qualified "UJ,P1."

   PCB Analyses: For the EB, the MS/MSD were performed on a non-SNL sample from another SDG, and no other measure of precision was provided. Thus, all results for this sample will be qualified "P2." For the soil samples, the MS/MSD %Rs of Aroclor-1016 were > the QC acceptance limit. Thus, all results for all samples which were detects will be qualified "J,A2."

4. PCB Analyses: For the EB, the confirmation RPD of Aroclor-1242 was >25% but <75%. For the soil samples, the confirmation RPDs of Aroclor-1260 for samples 84745-003, -004, and -007; Aroclor-1242 for sample -005; and Aroclor-1254 for sample -007 were also >25% but <75%. The highest detected values for these sample results were reported by the laboratory and will be qualified "J."

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 method specified holding times and properly preserved.

Calibration

VOC Analyses: The initial and continuing calibrations met QC acceptance criteria except as noted above in the Summary section and the following. For the soil samples, the continuing calibration verification (CCV) percent differences (%Ds) of bromoform and vinyl acetate were >20% but <40%. However, all associated sample results were ND and, thus, will not be qualified.

SVOC Analyses: The initial and continuing calibrations met QC acceptance criteria except for the following. For the EB, the CCV %Ds of o-nitroaniline, indeno(1,2,3-cd)pyrene, and benzo(g,h,i)perylene were >20% but <40%. However, all associated sample results were ND and, thus, will not be qualified.

PCB Analyses: The initial and continuing calibrations met all QC acceptance criteria.

Blanks

VOC Analyses: In the TB, acetone was detected. However, all associated sample results were ND and, thus, will not be qualified. No other target analytes were detected in the blanks.

SVOC Analyses: No target analytes were detected in the blanks.

PCB Analyses: In the EB, Aroclor-1242 and -1254 were detected. However, all associated sample results were >5X the blank concentrations and, thus, will not be qualified. No other target analytes were detected in the blanks.

Surrogates

VOC/SVOC Analyses: All surrogate %Rs met QC acceptance criteria.

PCB Analyses: Surrogate %Rs met QC acceptance criteria except as noted above in the Summary section.

Internal Standards (ISs)

VOC/SVOC Analyses: The IS areas and retention times (RTs) met all QC acceptance criteria.

PCB Analyses: No ISs were required for this method.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analyses

All Analyses: The MS/MSD analyses met QC acceptance criteria except as noted above in the Summary section.

Laboratory Control Sample (LCS/LCSD) Analyses

All Analyses: The LCS analyses met all QC acceptance criteria. No LCSD analyses were performed. No sample data will be qualified as a result.

Confirmation Analyses

VOC/SVOC Analyses: No confirmation analyses were required for these methods.

PCB Analyses: The confirmation analyses met QC acceptance criteria except as noted above in the Summary section.

Detection Limits/Dilutions

VOC/SVOC Analyses: All detection limits were properly reported. No samples were diluted.

PCB Analyses: All samples were diluted (see COAs for individual dilution factors) due to over-range detects of target analytes.

Other QC

VOC Analyses: An EB and TB were submitted. No field duplicate or field blank (FB) was submitted on the ARCOC.

SVOC Analyses: An EB was submitted. No field duplicate or FB was submitted on the ARCOC.

PCB Analyses: A field duplicate and EB were submitted. However, there are no "required" review criteria for field duplicate analyses comparability. No FB was submitted on the ARCOC.

No other specific issues were identified which affect data quality.

Analytical Quality Associates, Inc.
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MEMORANDUM

DATE: August 19, 2003

TO: File

FROM: Kenneth Salaz

SUBJECT: Radiochemical Data Review and Validation - SNL
S-74, Chem Waste Landfill; ARCOC #606649,
GEL SDG #84745/84749, Case No. 7221.02.02.03

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM ER Project AOP 00-03.

Summary

All samples were prepared and analyzed with approved procedures using methods EPA906.0/GL-RAD-A-002 Tritium and EPA901.1/EML HASL300, 4.5.2.3 Gamma Spec.

1. Gamma Spec Analyses: The equipment blank (EB) was not preserved. However, it was preserved by the laboratory after receipt. Thus, all results for this sample, except those further qualified (see #s 2 and 3 below), will be qualified "J."

2. Gamma Spec Analyses: Several Gamma Spec results for all samples were "X" flagged by the laboratory due to low abundance, interference, or lack of a valid peak (see Electronic Data Deliverable). Thus, these sample results will be qualified "R" (unusable).

3. Gamma Spec Analyses: The Sr-85 result of the EB was negative, and the absolute value was greater than (>) the associated MDA. Thus, this sample result will be qualified "R" (unusable).

Data are acceptable except as noted above. 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: The case narratives stated the instruments used were properly calibrated.

Blanks

Gamma Spec Analyses: In the EB, Bi-214, Pb-212, and Ra-226 were detected at concentrations > the associated MDAs. However, all associated sample results were >5X the blank concentrations and, thus, will not be qualified. No other target analytes were detected in the blanks.

Tritium Analyses: No target analytes were detected in the blanks at concentrations > the associated MDAs.

Matrix Spike (MS) Analysis

Gamma Spec Analyses: No MS analysis was required for this method.

Tritium Analyses: The MS analyses met all QC acceptance criteria. It should be noted that the MS analysis for the EB was performed on an SNL sample of similar matrix from another SDG. No sample data will be qualified as a result.

Laboratory Control Sample (LCS) Analysis

All Analyses: The LCS analyses met all QC acceptance criteria.

Replicates

Gamma Spec Analyses: The replicate analyses met all QC acceptance criteria.

Tritium Analyses: The replicate analyses met all QC acceptance criteria. It should be noted that the replicate analysis for the EB was performed on an SNL sample of similar matrix from another SDG. No sample data will be qualified as a result.

Tracer/Carrier Recoveries

All Analyses: No tracers/carriers were required for these methods.

Negative Bias

Gamma Spec Analyses: Sample results met negative bias QC acceptance criteria except as noted above in the summary section.

Tritium Analyses: All sample results met negative bias QC acceptance criteria.

Other QC

All Analyses: No field duplicates, equipment blanks.(EBs), or field blanks (FBs) were submitted on the ARCOC.

No other specific issues were identified which affect data quality.

Data Validation Summary

Site/Project: S-74, CWLF Project/Task #: 7721.02.02.03 # of Samples: 15 Matrix: 9 soil / 6 aqueous

AR/COC #: 606649 Laboratory Sample IDs: 84745-001 to -009

Laboratory: GEL 84749-001 to -006

SDG #: 84745 / 84749

QC Element	Analysis									
	Organics				Inorganics				RAD	Other
	VOC	SVOC	Pesticide/ PCB	HPLC (HE)	ICP/AES	GFAA/ AA	CVAA (Hg)	CN		
1. Holding Times/Preservation	✓	✓	✓	NA	✓	NA	NA	NA	✓	NA
2. Calibrations	UJ	✓	✓		✓				✓	
3. Method Blanks	✓	✓	✓		✓				✓	
4. MS/MSD	P2	P2; UJ, P1	P2; J, A2		✓				✓	
5. Laboratory Control Samples	✓	✓	✓		✓				✓	
6. Replicates					✓				✓	
7. Surrogates	✓	✓	J, A1 UJ, A1							
8. Internal Standards	✓	✓								
9. TCL Compound Identification	✓	✓								
10. ICP Interference Check Sample					✓					
11. ICP Serial Dilution					NA					
12. Carrier/Chemical Tracer Recoveries									NA	
13. Other QC	✓	✓	J	↓	NA	↓	↓	↓	R	↓

J = Estimated
U = Not Detected
UJ = Not Detected, Estimated
R = Unusable

Check (√) = Acceptable
Shaded Cells = Not Applicable (also "NA")
NP = Not Provided
Other: _____

Reviewed By: [signature] Date: 8/19/03

Holding Time and Preservation

Site/Project: S-74, CWLF AR/COC #: 606649 Laboratory Sample IDs: 84745-001 to -009

Laboratory: GEL SDG #: 84745 / 84745 84745-001 to -006

# of Samples: 15 Matrix: 9 soil / 6 aqueous

Sample ID	Analytical Method	Holding Time Criteria	Days Holding Time was Exceeded	Preservation Criteria	Preservation Deficiency	Comments
84749-005(EB)	(Gamma Spec)	NA	NA	HNO_3 (pH<2)	Not Preserved	Preserved by lab after receipt

Reviewed By: [signature] Date: 8/19/03

Volatile Organics (SW 846 Method 8260)

Site/Project: S-74, CWLF AR/COC #: 606649 # of Samples: 4 Matrix: soil

Laboratory: GEL SDG #: 84745/ Laboratory Sample IDs: 84745-002, -003, -004, -005

Methods: EPA 8260A Batch #s: 266136

IS	CAS #	Name	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Trip Blanks (µg/L)		
						>.05	<20% / 0.99	20%												
1	71-55-6	1,1,1-trichloroethane		0.10	NA	✓	✓	✓	✓							NA	✓	✓		
2	79-34-5	1,1,2,2-tetrachloroethane		0.30	↓	✓	✓	↓	↓							↓	↓	↓		
2	79-00-5	1,1,2-trichloroethane		0.10	↓	✓	✓	↓	↓							↓	↓	↓		
1	75-34-3	**1,1-dichloroethane**		0.10	↓	✓	✓	↓	↓							↓	↓	↓		
1	75-35-4	**1,1-dichloroethene**		0.20	↓	✓	✓	↓	↓	✓	NA	NA	✓	✓	✓	↓	↓	↓		
1	107-06-2	**1,2-dichloroethane**		0.10	↓	✓	✓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
1	540-59-0	**1,2-dichloroethene(total)**		0.01	↓	✓	✓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
1	78-87-5	**1,2-dichloropropane**		0.01	↓	✓	✓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
1	78-93-3	**2-butanone (MEK) (10xblk)**		0.01	↓	✓	✓	↓	✓	↓	↓	↓	↓	↓	↓	↓	✓	↓		
~~1~~	~~110-75-8~~	~~2-chloroethyl vinyl ether~~																		
2	591-78-6	2-hexanone (MBK)		0.01	↓	✓	✓	✓	✓	↓	↓	↓	↓	↓	↓	↓	✓	✓		
2	108-10-1	4-methyl-2-pentanone (MIBK)		0.10	↓	✓	✓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	✓		
1	67-64-1	**acetone(10xblk)**		0.01	✓	✓	✓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	25.1		
1	71-43-2	**benzene**		0.50	NA	✓	✓	↓	↓	✓	NA	NA	✓	✓	✓	↓	↓	✓		
1	75-27-4	bromodichloromethane		0.20	↓	✓	✓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
3	75-25-2	bromoform		0.10	↓	✓	✓	20.6	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
1	74-83-9	bromomethane		0.10	↓	✓	✓	✓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
1	75-15-0	carbon disulfide		0.10	↓	✓	✓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
1	56-23-5	**carbon tetrachloride**		0.10	↓	✓	✓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
2	108-90-7	**chlorobenzene**		0.50	↓	✓	✓	↓	↓	✓	NA	NA	✓	✓	✓	↓	↓	↓		
1	75-00-3	chloroethane		0.01	↓	✓	✓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
1	67-66-3	**chloroform**		0.20	↓	✓	✓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
1	74-87-3	chloromethane		0.10	↓	✓	✓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
1	10061-01-5	cis-1,3-dichloropropene		0.20	↓	✓	✓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
2	124-48-1	dibromochloromethane		0.10	↓	✓	✓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
2	100-41-4	ethylbenzene		0.10	↓	✓	✓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
1	75-09-2	methylene chloride (10xblk)		0.01	✓	✓	✓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
2	100-42-5	styrene		0.30	NA	✓	✓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
2	127-18-4	**tetrachloroethene**		0.20	↓	✓	✓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
2	108-88-3	toluene(10xblk)		0.40	↓	✓	✓	↓	↓	✓	NA	NA	✓	✓	✓	↓	↓	↓		
2	10061-02-6	trans-1,3-dichloropropene		0.10	↓	✓	✓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
1	79-01-6	**trichloroethene**		0.30	↓	✓	✓	↓	↓	✓	NA	NA	✓	✓	✓	↓	↓	↓		
1	75-01-4	**vinyl chloride**		0.10	↓	✓	✓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
2	1330-20-7	xylenes(total)		0.30	↓	✓	✓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
	108-05-4	vinyl acetate			↓	✓	✓	23.1	✓	↓	↓	↓	↓	↓	↓	✓	✓	✓		

cis-+ trans

Comments:

Notes: Shaded rows are RCRA compounds.

Reviewed By: [signature] Date: 8/15/03

Volatile Organics

Site/Project: S-74, CWLF AR/COC #: 606649 Batch #s: 266136

Laboratory: GEL SDG #: 84745 # of Samples: 4 Matrix: soil

Surrogate Recovery and Internal Standard Outliers (SW 846 Method 8260)

Sample	SMC 1	SMC 2	SMC 3	IS 1 area	IS 1 RT	IS 2 area	IS 2 RT	IS 3 area	IS 3 RT
All									
Passed									

SMC 1: Bromofluorobenzene
SMC 2: Dibromofluoromethane
SMC 3: Toluene-d8

IS 1: Fluorobenzene
IS 2: Chlorobenzene-d5
IS 3: 1,4-Dichlorobenzene-d4

Comments:

Volatile Organics (SW 846 Method 8260)

Site/Project: S-74, CWLF AR/COC #: 606649 # of Samples: 2 Matrix: aqueous

Laboratory: GEL SDG #: 84749 Laboratory Sample IDs: 84749-001(FB) + -002(TB)

Methods: EPA8260B Batch #s: 267215

IS	CAS #	Name	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Trip Blanks		
						>.05	<20% / 0.99	20%												
1	71-55-6	1,1,1-trichloroethane	✓	0.10	NA	✓	✓	✓	✓							NA	NA	NA		
2	79-34-5	1,1,2,2-tetrachloroethane		0.30		✓	✓													
2	79-00-5	1,1,2-trichloroethane		0.10		✓	✓													
1	75-34-3	**1,1-dichloroethane**		0.10		✓	✓													
1	75-35-4	**1,1-dichloroethene**		0.20		✓	✓			✓	NA	NA	NA	NA	NA					
1	107-06-2	**1,2-dichloroethane**		0.10		✓	✓													
1	540-59-0	**1,2-dichloroethene(total)**		0.01		✓	✓													
1	78-87-5	**1,2-dichloropropane**		0.01		✓	✓													
1	78-93-3	**2-butanone (MEK) (10xblk)**	✓	0.01	✓	✓	✓	✓	✓											
~~1~~	~~110-75-8~~	~~2-chloroethyl vinyl ether~~																		
2	591-78-6	2-hexanone (MBK)	✓	0.01		✓	✓	✓	✓											
2	108-10-1	4-methyl-2-pentanone (MIBK)		0.10		✓	✓													
1	67-64-1	**acetone(10xblk)**		0.01	✓	✓	✓													
1	71-43-2	**benzene**		0.50	NA	✓	✓			✓	NA	NA	NA	NA	NA					
1	75-27-4	bromodichloromethane		0.20		✓	✓													
3	75-25-2	bromoform		0.10		✓	✓													
1	74-83-9	bromomethane		0.10		✓	✓													
1	75-15-0	carbon disulfide		0.10		✓	✓													
1	56-23-5	**carbon tetrachloride**		0.10		✓	✓													
2	108-90-7	**chlorobenzene**		0.50		✓	✓			✓	NA	NA	NA	NA	NA					
1	75-00-3	chloroethane		0.01		✓	✓													
1	67-66-3	**chloroform**		0.20		✓	✓													
1	74-87-3	chloromethane		0.10		✓	✓													
1	10061-01-5	cis-1,3-dichloropropene		0.20		✓	✓													
2	124-48-1	dibromochloromethane		0.10		✓	✓													
2	100-41-4	ethylbenzene		0.10		✓	✓													
1	75-09-2	methylene chloride (10xblk)		0.01		✓	✓													
2	100-42-5	styrene		0.30		✓	✓													
2	127-18-4	**tetrachloroethene**		0.20		✓	✓													
2	108-88-3	toluene(10xblk)		0.40		✓	✓			✓	NA	NA	NA	NA	NA					
2	10061-02-6	trans-1,3-dichloropropene		0.10		✓	✓													
1	79-01-6	**trichloroethene**		0.30		0.26	✓			✓	NA	NA	NA	NA	NA					
1	75-01-4	**vinyl chloride**		0.10		✓	✓													
2	1330-20-7	xylenes(total)		0.30		✓	✓													
	108-05-4	vinyl acetate	✓		✓	✓	✓	✓	✓							✓	✓	✓		

cis- & trans

Comments:

(1) No MS/MSD analyzed. No other measure of precision.

Notes: Shaded rows are RCRA compounds.

Reviewed By: [signature] Date: 8/15/03

Semivolatile Organics

Sample IDs: 84745-006 + -007

Site/Project: S-74, CWLF AR/COC #: 606649 Batch #s: ~~606649~~ 265810

Laboratory: GEL SDG #: 84745 # of Samples: 2 Matrix: Soil

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blanks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks		
							>.05	<20% / 0.99	20%												
5	BN	218-01-9	Chrysene		0.70																
5	BN	117-81-7	bis(2-Ethylhexyl)phthalate		0.01																
6	BN	117-84-0	Di-n-octylphthalate		0.01																
6	BN	205-99-2	Benzo(b)fluoranthene	✓	0.70	NA	✓	✓	✓	✓	✓	NA	NA	✓	✓	48	NA	✓	NA		
6	BN	207-08-9	Benzo(k)fluoranthene		0.70																
6	BN	50-32-8	Benzo(a)pyrene		0.70																
6	BN	193-39-5	Indeno(1,2,3-cd)pyrene		0.50																
6	BN	53-70-3	Dibenzo(a,h)anthracene		0.40																
6	BN	191-24-2	Benzo(g,h,i)perylene		0.50																

Surrogate Recovery Outliers

Sample	SMC 1	SMC 2	SMC 3	SMC 4	SMC 5	SMC 6	SMC 7	SMC 8
All Passed								

Comments:

SMC 1: Nitrobenzene-d5 (BN)
SMC 2: 2-Fluorobiphenyl (BN)
SMC 3: Terphenyl-d14 (BN)
SMC 4: Phenol-d5 (A)
SMC 5: 2-Fluorophenol (A)
SMC 6: 2,4,6-Tribromophenol (A)
~~SMC 7: 2-2-Chlorophenol-d4~~ (A)
~~SMC 8: 1,2-Dichlorobenzene-d4~~ (BN)

Internal Standard Outliers

Sample	IS 1-area	IS 1-RT	IS 2-area	IS 2-RT	IS 3-area	IS 3-RT	IS 4-area	IS 4-RT	IS 5-area	IS 5-RT	Is 6-area	IS 6-RT
All Passed												

IS 1: 1,4-Dichlorobenzene-d4 (BN)
IS 2: Naphthalene-d8 (BN)
IS 3: Acenaphthene-d10 (BN)
IS 4: Phenathrene-d10 (BN)
IS 5: Chrysene-d12 (BN)
IS 6: Perylene-d12 (BN)

Semivolatile Organics (SW 846 Method 8270)

Site/Project: S-74, CWLF AR/COC #: 606649 Laboratory Sample IDs: 84749-006 (EB)

Laboratory: CEL SDG #: ~~266049~~ 84749

Methods: EPA 8270C

# of Samples: 1 Matrix: aqueous Batch #s: 266049

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blanks	LCS	LCSD	LCS RPD	① MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks		
							>.05	<20% / 0.99	20%												
1	A	108-95-2	Phenol	✓	0.80	NA	✓	✓	✓	✓	✓	NA	NA	NA	NA	NA	NA	NA	NA		
1	BN	111-44-4	bis(2-Chloroethyl)ether	✓	0.70		✓	✓													
1	A	95-57-8	2-Chlorophenol	✓	0.80		✓	✓			✓	NA	NA	NA	NA	NA					
1	BN	541-73-1	1,3-Dichlorobenzene	✓	0.60		✓	✓													
1	BN	106-46-7	1,4-Dichlorobenzene	✓	0.50		✓	✓			✓	NA	NA	NA	NA	NA					
1	BN	95-50-1	1,2-Dichlorobenzene	✓	0.40		✓	✓													
1	A	95-48-7	o-cresol	✓	0.70		✓	✓													
1	BN	108-60-1	bis(2-chloroisopropyl)ether	✓	0.01		✓	✓													
1	A	N22	m,p-cresols	✓	0.60		✓	✓													
1	BN	621-64-7	N-Nitroso-di-n-propylamine	✓	0.50		✓	✓			✓	NA	NA	NA	NA	NA					
1	BN	67-72-1	Hexachloroethane	✓	0.30		✓	✓													
2	BN	98-95-3	Nitrobenzene	✓	0.20		✓	✓													
2	BN	78-59-1	Isophorone	✓	0.40		✓	✓													
2	A	88-75-5	2-Nitrophenol	✓	0.10		✓	✓													
2	A	105-67-9	2,4-Dimethylphenol	✓	0.20		✓	✓													
2	BN	111-91-1	bis(2-Chloroethoxy)methane	✓	0.30		✓	✓													
2	A	120-83-2	2,4-Dichlorophenol	✓	0.20		✓	✓													
2	BN	120-82-1	1,2,4-Trichlorobenzene	✓	0.20		✓	✓			✓	NA	NA	NA	NA	NA					
2	BN	91-20-3	Naphthalene	✓	0.70		✓	✓													
2	BN	106-47-8	4-Chloroaniline	✓	0.01		✓	✓													
2	BN	87-68-3	Hexachlorobutadiene	✓	0.01		✓	✓													
2	A	59-50-7	4-Chloro-3-methylphenol	✓	0.20		✓	✓			✓	NA	NA	NA	NA	NA					
2	BN	91-57-6	2-Methylnaphthalene	✓	0.40	↓	✓	✓													
3	BN	77-47-4	Hexachlorocyclopentadiene	✓	0.01	✓	✓	✓													
3	A	88-06-2	2,4,6-Trichlorophenol	✓	0.20	NA	✓	✓													
3	A	95-95-4	2,4,5-Trichlorophenol	✓	0.20	NA	✓	✓	✓	✓							✓	✓	✓		

Comments:

① MS/MSD performed on a non-SDG sample from another SDG. No other measure of precision performed.

Notes: Shaded rows are RCRA compounds.

Reviewed By: [signature] Date: 8/19/03

Semivolatile Organics

Site/Project: S-74, CWLF AR/COC #: 606649 Batch #s: 216049

Laboratory: GEL SDG #: 84749 # of Samples: 1 Matrix: aqueous

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blanks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks		
							>.05	<20% / 0.99	20%												
3	BN	91-58-7	2-Chloronaphthalene	✓	0.80	NA	✓	✓	✓	✓							NA	NA	NA		
3	BN	88-74-4	2-Nitroaniline (o-)	✓	0.01		✓	✓	34.9												
3	BN	131-11-3	Dimethylphthalate	✓	0.01		✓	✓	✓												
3	BN	208-96-8	Acenaphthylene	✓	0.90		✓	✓													
3	BN	606-20-2	2,6-Dinitrotoluene	✓	0.20		✓	✓													
3	BN	99-09-2	3-Nitroaniline (m-)	✓	0.01		✓	✓													
3	BN	83-32-9	Acenaphthene	✓	0.90		✓	✓			✓	NA	NA	NA	NA	NA					
3	A	51-28-5	2,4-Dinitrophenol	✓	0.01		✓	✓													
3	A	100-02-7	4-Nitrophenol	✓	0.01		✓	✓			✓	NA	NA	NA	NA	NA					
3	BN	132-64-9	Dibenzofuran	✓	0.80	NA	✓	✓													
3	BN	121-14-2	2,4-Dinitrotoluene	✓	0.20		✓	✓			✓	NA	NA	NA	NA	NA					
3	BN	84-66-2	Diethylphthalate	✓	0.01		✓	✓													
3	BN	7005-72-3	4-Chlorophenyl-phenylether	✓	0.40		✓	✓													
3	BN	86-73-7	Fluorene	✓	0.90		✓	✓													
3	BN	100-01-6	4-Nitroaniline (p-)	✓	0.01		✓	✓													
4	A	534-52-1	4,6-Dinitro-2-methylphenol	✓	0.01		✓	✓													
4	BN	122-39-4	Diphenylamine	✓	0.01	NA	✓	✓													
4	BN	101-55-3	4-Bromophenyl-phenylether	✓	0.10		✓	✓													
4	BN	118-74-1	Hexachlorobenzene	✓	0.10		✓	✓													
4	A	87-86-5	Pentachlorophenol	✓	0.05		✓	✓			✓	NA	NA	NA	NA	NA					
4	BN	85-01-8	Phenanthrene	✓	0.70	NA	✓	✓													
4	BN	120-12-7	Anthracene	✓	0.70		✓	✓													
4	BN	86-74-8	Carbazole	✓	0.01		✓	✓													
4	BN	84-74-2	Di-n-butylphthalate	✓	0.01		✓	✓													
4	BN	206-44-0	Fluoranthene	✓	0.60		✓	✓													
5	BN	129-00-0	Pyrene	✓	0.60		✓	✓			✓	NA	NA	NA	NA	NA					
5	BN	85-68-7	Butylbenzylphthalate	✓	0.01		✓	✓													
5	BN	91-94-1	3,3'-Dichlorobenzidine	✓	0.01		✓	✓													
5	BN	56-55-3	Benzo(a)anthracene	✓	0.80		✓	✓	✓	✓							✓	✓	✓		

Comments:

Semivolatile Organics

Site/Project: S-74, CWLF AR/COC #: 606649 Batch #s: 266049

Laboratory: GEL SDG #: 84749 # of Samples: 1 Matrix: aqueous

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blanks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks		
							>.05	<20% / 0.99	20%												
5	BN	218-01-9	Chrysene	✓	0.70	NA	✓	✓	✓	✓							NA	NA	NA		
5	BN	117-81-7	bis(2-Ethylhexyl)phthalate	✓	0.01	↓	✓	✓	↓	↓							↓	↓	↓		
6	BN	117-84-0	Di-n-octylphthalate	✓	0.01	↓	✓	✓	↓	↓							↓	↓	↓		
6	BN	205-99-2	Benzo(b)fluoranthene	✓	0.70	↓	✓	✓	↓	↓							↓	↓	↓		
6	BN	207-08-9	Benzo(k)fluoranthene	✓	0.70	↓	✓	✓	↓	↓							↓	↓	↓		
6	BN	50-32-8	Benzo(a)pyrene	✓	0.70	↓	✓	✓	↓	↓							↓	↓	↓		
6	BN	193-39-5	Indeno(1,2,3-cd)pyrene	✓	0.50	✓	✓	✓	-23.2	↓							↓	↓	↓		
6	BN	53-70-3	Dibenzo(a,h)anthracene	✓	0.40	✓	✓	✓	✓	↓							↓	↓	↓		
6	BN	191-24-2	Benzo(g,h,i)perylene	✓	0.50	NA	✓	✓	-24.1	↓							↓	↓	↓		

Surrogate Recovery Outliers

Sample	SMC 1	SMC 2	SMC 3	SMC 4	SMC 5	SMC 6	SMC 7	SMC 8
All Passed								

Comments:

SMC 1: Nitrobenzene-d5 (BN)
SMC 2: 2-Fluorobiphenyl (BN)
SMC 3: Terphenyl-d14 (BN)
SMC 4: Phenol-d5 (A)
SMC 5: 2-Fluorophenol (A)
SMC 6: 2,4,6-Tribromophenol (A)
~~SMC 7: 2-2-Chlorophenol-d4 (A)~~
~~SMC 8: 1,2-Dichlorobenzene-d4 (BN).~~

Internal Standard Outliers

Sample	IS 1-area	IS 1-RT	IS 2-area	IS 2-RT	IS 3-area	IS 3-RT	IS 4-area	IS 4-RT	IS 5-area	IS 5-RT	Is 6-area	IS 6-RT
All Passed												

IS 1: 1,4-Dichlorobenzene-d4 (BN)
IS 2: Naphthalene-d8 (BN)
IS 3: Acenaphthene-d10 (BN)
IS 4: Phenathrene-d10 (BN)
IS 5: Chrysene-d12 (BN)
IS 6: Perylene-d12 (BN)

PCBs (SW 846 - Method 8082)

Site/Project: S-74, CWLF AR/COC #: 606649 Laboratory Sample IDs: 84745-002 to -009

Laboratory: GEL SDG #: 84745

Methods: EPA 8082

# of Samples: 8 Matrix: soil Batch #s: 265986

CAS #	Name	TCL	Intercept	Calib RSD / R^2 <20% / 0.99	CCV %D 20%	Method Blanks	LCS	LCSD	LCS RPD 20%	MS	MSD	MS RPD 20%	① Field Dup. RPD	Equip. Blanks (µg/L)	Field Blanks		
12674-11-2	Aroclor-1016	✓	NA	✓	✓	✓	✓	NA	NA	360	477	✓	NA	✓	NA		
11104-28-2	Aroclor-1221			NA	NA												
11141-16-5	Aroclor-1232			NA	NA												
53469-21-9	Aroclor-1242			✓	✓									0.56			
12672-29-6	Aroclor-1248				NA									✓			
11097-69-1	Aroclor-1254				✓									0.36			
11096-82-5	Aroclor-1260		✓		✓		✓	NA	NA	NA	NA	NA		✓			

Sample	SMC % REC	SMC RT	Sample	SMC % REC	SMC RT
② -008	4,mx=117, DCB=125				

Comments:
① Field dup. submitted. No QC criteria
② Sample dil. 200x. All other samples also dil. (see COAs) due to over-range target analytes

Confirmation

Sample	CAS #	RPD > 25%	Sample	CAS #	RPD > 25%
-003	Aroclor-1260	29.2			
-004	-1260	25.8			
-005	-1242	39.2			
-007	-1260	44.7			
"	-1254	30.5			

Reviewed By: [signature] Date: 8/18/03

PCBs (SW 846 - Method 8082)

Site/Project: S-74, CWLF AR/COC #: 606649 Laboratory Sample IDs: 84749-003 (ES)

Laboratory: GEL SDG #: 84749

Methods: EPA 8082 (PCBs)

# of Samples: 1 Matrix: aqueous Batch #s: 266021

CAS #	Name	TCL	Intercept	Calib RSD / R^2 <20% / 0.99	CCV %D 20%	Method Blanks	LCS	LCSD	LCS RPD 20%	(1) MS	MSD	MS RPD 20%	Field Dup. RPD	Equip. Blanks	Field Blanks		
12674-11-2	Aroclor-1016	✓	NA	✓	✓	✓	✓	NA	NA	NA	NA	NA	NA	NA	NA		
11104-28-2	Aroclor-1221			NA													
11141-16-5	Aroclor-1232			NA													
53469-21-9	Aroclor-1242			✓	✓												
12672-29-6	Aroclor-1248																
11097-69-1	Aroclor-1254				✓												
11096-82-5	Aroclor-1260	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	✓	✓	✓		

Sample	SMC % REC	SMC RT	Sample	SMC % REC	SMC RT
-003	DCB = 25 (<30)	✓			

Comments:
(1) MS/MSD performed on a non-site sample from another SDG. No other measure of precision.

Confirmation

Sample	CAS #	RPD > 25%	Sample	CAS #	RPD > 25%
-003	Aroclor-1242	40.9			

Reviewed By: [signature] Date: 8/18/03

Inorganic Metals

Site/Project: S-74, CWLF AR/COC #: 606649 Laboratory Sample IDs: 84745-001

Laboratory: GEL SDG #: 84745

Methods: EPA6010B (As)

# of Samples: 1 Matrix: Soil Batch #s: 266293

CAS #/ Analyte	QC Element																			
	TAL	ICV	CCV	ICB	CCB	Method Blanks	LCS	LCSD	LCSD RPD	① 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																				
7440-23-5 Na																				
7440-62-2 V																				
7440-66-6 Zn																				
7439-92-1 Pb																				
7782-49-2 Se																				
7440-38-2 As	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	✓	✓	NA	NA	NA	NA		
7440-36-0 Sb																				
7440-28-0 Tl																				
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 / l

Comments: ① MS, Rep., + Serial Dil. performed on an SNL sample of similar matrix from another SDG.

Reviewed By: [signature] Date: 8/18/03

Radiochemistry

Site/Project: S-74, CWLF AR/COC #: 606649 Laboratory Sample IDs: 84745-002, -003, 004, -005

Laboratory: GEL SDG #: 84745

Methods: EML HASL 300, 4.5.2.3 (Gamma Spec), GL-RAD-A-002 (H_3)

# of Samples: 4 Matrix: soil Batch #s: 266409, 266159

Analyte	QC Element												
	Method Blanks	LCS	MS	Rep RER	(pCi/g) Equip. Blanks	Field Dup. RER	Field Blanks	Sample ID	Isotope	IS/Trace	Sample ID	Isotope	IS/Trace
Criteria	U	20%	25%	<1.0	U	<1.0	U			50-105			50-105
H3	✓	✓	✓	✓	✓	NA	NA	NA					
U-238													
U-234													
U-235/-236													
Th-232													
Th-228													
Th-230													
Pu-239/-240													
Gross Alpha													
Nonvolatile Beta													
Ra-226													
Ra-228													
Ni-63													
Gamma Spec. Am-241	✓	✓	NA	✓	✓	NA	NA						
Gamma Spec. Cs-137	↓	↓	↓	↓	↓	↓	↓						
Gamma Spec. Co-60	✓	↓	↓	↓	↓	↓	↓						
Bi-214/Pb-212	~~6.49/5.55~~ ✓				6.49/5.55	↓	↓						
Ra-226	~~6.49~~ ✓ 100			↓	6.49	↓	↓						

Parameter	Method	Typical Tracer	Typical Carrier
Iso-U	Alpha spec.	U-232	NA
Iso-Pu	Alpha spec.	Pu-242	NA
Iso-Th	Alpha spec.	Th-229	NA
Am-241	Alpha spec.	Am-242	NA
Sr-90	Beta	Y ingrowth	NA
Ni-63	Beta	NA	Ni by ICP
Ra-226	Deamination	NA	NA
Ra-226	Alpha spec.	Ba-133 or Ra-225	NA
Ra-228	Gamma spec.	Ba-133	NA

Gamma spec. LCS contains: Am-241, Cs-137, and Co-60

Comments:

Reviewed By: [signature] Date: 8/19/03

Radiochemistry

Site/Project: S-74, CWLF AR/COC #: 606649 Laboratory Sample IDs: 84749-004(H3)+-005(G.S.)

Laboratory: GEL SDG #: 84749

Methods: EPA901.1 (Gamma Spec), EPA 906.0 (H3)

# of Samples: 2 Matrix: aqueous Batch #s: 266380, 266165

Analyte	QC Element												
	Method Blanks	LCS	① MS	Rep RER	Equip. Blanks	Field Dup. RER	Field Blanks	Sample ID	Isotope	IS/Trace	Sample ID	Isotope	IS/Trace
Criteria	U	20%	25%	<1.0	U	<1.0	U			50-105			50-105
H3	✓	✓	✓	✓	NA	NA	NA	NA					
U-238													
U-234													
U-235/-236													
Th-232													
Th-228													
Th-230													
Pu-239/-240													
Gross Alpha													
Nonvolatile Beta													
Ra-226													
Ra-228													
Ni-63													
Gamma Spec. Am-241	✓	✓	NA	✓	NA	NA	NA						
Gamma Spec. Cs-137	↓	↓	↓	↓	↓	↓	↓						
Gamma Spec. Co-60	↓	↓	↓	↓	↓	↓	↓						

Parameter	Method	Typical Tracer	Typical Carrier
Iso-U	Alpha spec.	U-232	NA
Iso-Pu	Alpha spec.	Pu-242	NA
Iso-Th	Alpha spec.	Th-229	NA
Am-241	Alpha spec.	Am-242	NA
Sr-90	Beta	Y ingrowth	NA
Ni-63	Beta	NA	Ni by ICP
Ra-226	Deamination	NA	NA
Ra-226	Alpha spec.	Ba-133 or Ra-225	NA
Ra-228	Gamma spec.	Ba-133	NA

Gamma spec. LCS contains: Am-241, Cs-137, and Co-60

Comments:
① MS + Rep. for H3 performed on an SNL sample of similar matrix from another SDG.

Reviewed By: _____ Date: _____

Sample Findings Summary

Site: S-74, Chem Waste Landfill **AR/COC:** 607039 **Data:** Organic, Inorganic and Radiochemistry

Sample ID	VOC 8260B	108-05-4 (vinyl acetate)	75-09-2 (methylene chloride)	SVOC 8270C	111-44-4 (bis(2-chloroethyl)ether)	117-81-7 (bis(2-ethylhexyl)phthalate)	77-47-4 (hexachlorocyclopentadiene)	91-94-1 (3,3'-dichlorobenzidine)	56-55-3 (benzo(a)anthracene)	50-32-8 (benzo(a)pyrene)	205-99-2 (benzo(b)fluoranthene)	191-24-2 (benzo(ghi)perylene)	207-08-9 (benzo(k)fluoranthene)	218-01-9 (chrysene)	53-70-3 (dibenzo(a,h)anthracene)	117-84-0 (di-n-octylphthalate)	193-39-5 (indeno(1,2,3-cd)pyrene)	129-00-0 (Pyrene)	85-68-7 (butylbenzylphthalate)
	Method/CAS Number (Analysis/Analyte)																		
063803-001 74-SB-E002-F193		R, A2, P1																	
063804-001 74-SB-E002-F209		R, A2, P1																	
063805-001 74-SB-E002-F225		R, A2, P1	UJ, A																
063803-002 74-SB-E002-F193					UJ	UJ	R, A2	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ
063804-002 74-SB-E002-F209						333U, B	R, A2												
063805-002 74-SB-E002-F225						333U, B	R, A2												

Sample ID	Metals 6010B	7440-22-4 (Ag)	7440-43-9 (Cd)	77823-49-2 (Se)	7440-38-2 (As)	7440-39-3 (Ba)	Radiochemistry	All Gamma Spec results flagged "X" by the lab (see EDD)	14683-10-4 (Sb-124)
	Method/CAS Number (Analysis/Analyte)								
063803-002 74-SB-E002-F193		J, B, B3	J, B3	J, B3	J, A2	J			
063804-002 74-SB-E002-F209		J, B, B3	J, B3	UJ, B3	J, A2	J			
063805-002 74-SB-E002-F225		J, B, B3	J, B3	J, B3	J, A2	J			
063803-004 74-SB-E002-F193								R	R
063804-004 74-SB-E002-F209								R	
063805-004 74-SB-E002-F225								R	

Validated By: L Thal
Linda Thal

Date: 02/05/04

Analytical Quality Associates, Inc.
616 Maxine NE
Albuquerque, NM 87123
Phone: 505-299-5201
Fax: 505-299-6744
Email: minteer@aol.com

Memorandum

DATE: 01/30/04

TO: File

FROM: Linda Thal

SUBJECT: Inorganic Data Review and Validation - SNL
Site: S-74, Chem Waste LF Remed
AR/COC: 607039
SDG: 104198
Laboratory: GEL
Project/Task No. 7221.02.02.03

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM ER Project AOP 00-03.

Summary

The samples were prepared and analyzed with approved procedures using methods SW-846 6010B (ICP-AES metals), SW-846 7471A (Hg) and SW-846 7196A (hexavalent chromium). Problems were identified with the data package that resulted in the qualification of data.

ICP-AES
Ag was detected in the method blank (MB) and in the initial calibration blank/continuing calibration blank (ICB/CCB) at a value greater than (>) the detection limit (DL) but less than (<) the reporting limit (RL). All associated sample results had Ag values < 5X the blank values and will be qualified "J, B, B3".
Cd was detected in the ICB/CCB at a value > the DL but < RL. All associated sample results had Cd values < 5X the blank value and will be qualified "J, B3".
Se was detected in the ICB/CCB at a value > the DL but < RL, and at a negative value with an absolute value > the DL but < RL. Sample 104198-004 and -006 had Se values < 5X the positive blank value and will be qualified "J, B3". Sample 104198-005 was non-detect for Se and will be qualified "UJ, B3".
The MS/MSD had a percent recovery (%R) for As < QC acceptance criteria and < 30%. All associated sample results were detect for As and will be qualified "J, A2".
The replicate had a relative percent difference (RPD) > QC acceptance criteria for As. All associated sample results were detect for As and will be qualified "J".
The serial dilution had an RPD > 10% for Ba.. All associated sample results had values > 50X RL and will be qualified "J".

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

Holding Times/Preservation

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

Calibration

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

Blanks

All Analyses: All blank criteria were met except as mentioned above in the summary section and as follows:

ICP-AES
Cr was detected in the MB and in the ICB/CCB at a value > DL but < RL. Ba, Ni and Pb were detected in the ICB/CCB at a value > DL but < RL. All associated sample results were non-detect for these analytes and no data will be qualified.

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

All Analyses: The LCS met all QC acceptance criteria. No LCSD was performed. The MS/MSD and/or the sample duplicate are used to assess precision for the batch.

Matrix Spike/Matrix Spike duplicate (MS/MSD) Analysis

All Analyses: The MS/MSD met all QC acceptance criteria except as mentioned above in the summary section.

Replicate Analysis

All Analyses: The replicate analysis met all QC acceptance criteria except as mentioned above in the summary section.

ICP Interference Check Sample (ICS)

SW-846 6010B: The ICS-AB met all QC acceptance criteria. It should be noted that the ICS-AB was not run at the end of the analyses .No data will be qualified as a result.

SW-846 7471A and SW-846 7196A: No ICS-AB required.

ICP Serial Dilution

SW-846 6010B: The serial dilution met all QC acceptance criteria except as mentioned above in the summary section.

SW-846 7471A and SW-846 7196A: No serial dilution required.

Detection Limits/Dilutions

SW-846 6010B: All detection limits were properly reported. The soil samples were diluted a standard 2X.

SW-846 7471A: All detection limits were properly reported. No samples were diluted.

SW-846 7196A: All detection limits were properly reported. Sample 104198-004 was run at a 1X and samples 104198-005 and -006 were run at a 2X.

Other QC

All Analyses: No equipment blank, field blank or field duplicate was submitted on the ARCOC.

No other specific issues were identified that affect data quality.

Analytical Quality Associates, Inc.
616 Maxine NE
Albuquerque, NM 87123
Phone: 505-299-5201
Fax: 505-299-6744
Email: minteer@aol.com

Memorandum

Date: 01/29/04

To: File

From: Linda Thal

Subject: Organic Data Review and Validation - SNL
Site: S-74, Chem Waste LF Remed
ARCOC: 607039
SDG: 104198 and 104201
Laboratory: GEL
Project/Task No. 7221.02.02.03

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM ER Project AOP 00-03.

Summary

The samples were prepared and analyzed with approved procedures using methods SW-846 8260B (VOC), 8270C (SVOC) and SW-846 8082 (PCB). Problems were identified with the data package that resulted in the qualification of data.

VOC Batch # 299598 (Sample 104198-001, -002, -003)
The LCS associated with sample 104198-003 had a %R slightly < QC acceptance criteria for methylene chloride. The sample result was non-detect and will be qualified "UJ, A".
The MS/MSD had a %R (percent recovery) < QC acceptance criteria and < 10% for vinyl acetate. The RPD was > QC acceptance criteria. All associated sample results were non-detect for vinyl acetate and will be qualified "R, A2, P1".

SVOC
Bis(2-chloroethyl)ether had a percent difference (%D) > 40% with a negative bias in the CCV preceding sample 104198-004.The sample result for bis(2-chloroethyl)ether was non-detect and will be qualified "UJ".
Bis(2-ethylhexyl)phthalate was detected in the method blank (MB) at a value > DL (detection level) but < RL (reporting level). Sample 104198-005 and -006 had bis(2-ethylhexyl)phthalate values > DL but < RL and < 10X MB value and will be qualified "U, B" at the RL. Sample 104198-004 was non-detect for bis(2-ethylhexyl)phthalate and will not be qualified.
The MS/MSD had percent recoveries (%Rs) < QC control limits and < 10% for hexachlorocyclopentadiene. All associated sample results were non-detect for hexachlorocyclopentadiene and will be qualified "R, A2".
Sample 104198-004 had internal standards chrysene-d12 and perylene-d12 area counts < 50% but > 25% of the average calibration standard area counts. All associated compounds were non-detect and will be qualified "UJ"

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

Holding Times/Preservation

All Analyses: The samples were properly preserved and analyzed within the method prescribed holding time.

Calibration

All Analyses: All initial and continuing calibration acceptance criteria were met except as mentioned above in the summary section and as follows:

VOC Batch # 299669 (Sample 104201-001)
Acetone had a %D (percent difference) > 20% but < 40% with a negative bias in the CCV preceding the samples.). The sample result was non-detect for acetone and therefore no data will be qualified.

VOC Batch # 299598 (Sample 104198-001, -002, -003)
Methylene chloride had a %D > 20% but < 40% with a negative bias in the CCV preceding sample 104198-003. The sample result was non-detect for methylene chloride and therefore no data will be qualified.

SVOC
2-Nitroaniline had a %D > 40% but < 60% with a positive bias in the CCV preceding sample 104198-004. The sample result for 2-nitroaniline was non-detect and using professional judgment will not be qualified. Several compounds had %Ds > 20% but < 40% with a negative bias in the CCV's preceding the samples. Several compounds had %Ds > 20% but < 40% with a positive bias in the CCV's preceding the samples (see DV Worksheet). All associated sample results were non-detect for these compounds and will not be qualified.

Blanks

All Analyses: All method blank (MB) acceptance criteria were met except as mentioned above in the summary section.

Surrogates

All Analyses: All surrogate acceptance criteria were met.

Internal Standards (ISs)

SVOC and VOC: All internal standard acceptance criteria were met except as mentioned above in the summary section.

PCB: No internal standards required.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

All Analyses: All MS/MSD QC acceptance criteria were met except as mentioned above in the summary section and as follows:

VOC Batch # 299669 (Sample 104201-001)
It should be noted that the sample used for the MS/MSD was of similar matrix from another SNL SDG. No data will be qualified as a result.

PCB
The aroclor-1016 had a %R > QC acceptance criteria. The QC sample contained large amounts of aroclor-1242. This aroclor co-elutes and interferes with the spiking aroclor-1016 thus elevating the recovery for aroclor-1016. All associated sample results were non-detect for aroclor-1016 and using professional judgment, no data will be qualified.

Laboratory Control Samples (LCS/LCSD) Analysis

VOC Batch # 299669 (Sample 104201-001), SVOC and PCB: All LCS QC acceptance criteria were met

VOC Batch # 299598 (Sample 104198-001, -002, -003): All LCS QC acceptance criteria (except as mentioned above in the summary section), were met by the successful analysis of a second source CCV.

All Analyses: No LCSD was analyzed. The MS/MSD is used to assess the precision for the batch. No data will be qualified as a result.

Detection Limits/Dilutions

All Analyses: All detection limits were properly reported. The samples were not diluted.

Confirmation Analyses

PCB: All confirmation criteria were met.

All other Analyses: No confirmation analyses required.

Other QC

VOC: A trip blank was submitted on the ARCOC. No equipment blank or field duplicate was submitted.

All other Analyses: No equipment blank, trip blank, field blank or field duplicate were submitted on the ARCOC.

No other specific issues were identified that affect data quality.

Analytical Quality Associates, Inc.
616 Maxine NE
Albuquerque, NM 87123
Phone: 505-299-5201
Fax: 505-299-6744
Email: minteer@aol.com

Memorandum

Date: 02/05/04

To: File

From: Linda Thal

Subject: Radiochemical Data Review and Validation - SNL
Site: S-74 Chem Waste LF Remed
AR/COC: 607039
SDG: 104198
Laboratory: GEL
Project/Task No. 7221.02.02.03

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.

Summary

All samples were prepared and analyzed with approved procedures using method GL-RAD-A-002 (tritium) and DOE EML HASL 300 (gamma spec). Problems were identified with the data package that resulted in the qualification of data.

Gamma Spec Analysis
Several Gamma Spec results for all samples were "X" flagged by the laboratory due to interference, no valid peak or low abundance. (See Electronic Data Deliverable). Thus, these sample results will be qualified "R" (unusable).
Sample 104198-010 had a negative value for Sb-124 with an absolute value > the MDA. The sample result will be qualified "R".

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

Holding Times/Preservation

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

It should be noted that one of the three containers for sample 104198-008 was received broken with the contents contained in the plastic wrapper. It is not known if the sample was used for the analysis and no data were qualified as a result.

Calibration

All Analyses: The case narrative stated the instruments used were properly calibrated.

Blanks

All Analyses: No target analytes were detected in the method blank at concentrations > the associated MDA/TPUs.

Matrix Spike (MS) Analysis

Tritium: The MS analyses met all QC acceptance criteria.

Gamma Spec: No MS required.

Laboratory Control Sample (LCS) Analysis

All Analyses: The LCS analyses met all QC acceptance criteria.

Replicates

All Analyses: The replicate analyses met all QC acceptance criteria.

Tracer/Carrier Recoveries

All Analyses: No tracer/carrier required.

Negative Bias

All Analyses: All sample results met negative bias QC acceptance criteria except as mentioned above in the summary section.

Detection Limits/Dilutions

All Analyses: All detection limits were properly reported. No samples were diluted.

Other QC

All Analyses: No equipment blank, field blank or field duplicate was submitted on the ARCOC.

No other specific issues were identified that affect data quality.

Data Validation Summary

Site/Project: S-74, Chem Waste Landfill Project/Task #: 7221.02.02.03 # of Samples: 12 & 1 Matrix: Soil & Aqueous

AR/COC #: 607039 Laboratory Sample IDs: 104198 - 001 thru - 012

Laboratory: GEL 104201 - 001

SDG #: 104198

QC Element	Analysis									
	Organics				Inorganics				H^3 RAD γ spec	Cr^{6+} Other
	VOC	SVOC	Pesticide/ PCB	HPLC (HE)	ICP/AES	GFAA/ AA	CVAA (Hg)	CN		
1. Holding Times/Preservation	✓	✓	✓	NA	✓	NA	✓	NA	✓	✓
2. Calibrations	✓	UJ	✓		✓		✓		✓	✓
3. Method Blanks	✓	B, U	✓		J, UJ, B, B3		✓		✓	✓
4. MS/MSD LT	R UJ, A2, P1	R, A2	✓		J, A2		✓		✓	✓
5. Laboratory Control Samples	UJ, A	✓	✓		✓		✓		✓	✓
6. Replicates					J		✓		✓	✓
7. Surrogates	✓	✓	✓							NA
8. Internal Standards	✓	UJ								
9. TCL Compound Identification	✓	✓								
10. ICP Interference Check Sample					✓					
11. ICP Serial Dilution					J					
12. Carrier/Chemical Tracer Recoveries									NA	
13. Other QC	TB	NA	NA		NA		NA		NA	

* "R"

J = Estimated
U = Not Detected
UJ = Not Detected, Estimated
R = Unusable

Check (√) = Acceptable
Shaded Cells = Not Applicable (also "NA")
NP = Not Provided
Other: * Neg Bias Data rej. by lab

Reviewed By: [signature] Date: 02.05.04

nJ 1 of 2 soil

Volatile Organics (SW 846 Method 8260)

Site/Project: J-74, CWL AR/COC #: 607039 # of Samples: 3 Matrix: Soil

Laboratory: GEL SDG #: 104198 Laboratory Sample IDs: 104198-001 → -003

Methods: SW-846 8260B Batch #s: 299598

IS	CAS #	Name	TCL	Min. RF	Intercept	Calib. RF >.05	Calib. RSD/ R^2 <20%/ 0.99	CCV %D 1. 20%	CCV %D 2. 20%	Method Blks (x2)	12/22 LCS SA 182	12/23 LCS SA 3	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	104201-001 Trip Blanks		
1	71-55-6	1,1,1-trichloroethane	✓	0.10	NA	✓	✓	✓	✓	✓	✓	✓	NA	✓	✓	✓	NA		✓		
2	79-34-5	1,1,2,2-tetrachloroethane		0.30																	
2	79-00-5	1,1,2-trichloroethane		0.10																	
1	75-34-3	1,1-dichloroethane		0.10																	
1	75-35-4	1,1-dichloroethene		0.20																	
1	107-06-2	1,2-dichloroethane		0.10																	
1	540-59-0	1,2-dichloroethene(total)		0.01																	
1	78-87-5	1,2-dichloropropane	✓	0.01																	
1	78-93-3	2-butanone (MEK) (10xblk)	✓	0.01																	
1	110-75-8	2-chloroethyl vinyl ether																			
2	591-78-6	2-hexanone (MBK)	✓	0.01																	
2	108-10-1	4-methyl-2-pentanone (MIBK)		0.10																	
1	67-64-1	acetone(10xblk)		0.01																	
1	71-43-2	benzene		0.50																	
1	75-27-4	bromodichloromethane		0.20																	
3	75-25-2	bromoform		0.10																	
1	74-83-9	bromomethane		0.10																	
1	75-15-0	carbon disulfide		0.10																	
1	56-23-5	carbon tetrachloride		0.10																	
2	108-90-7	chlorobenzene		0.50																	
1	75-00-3	chloroethane		0.01																	
1	67-66-3	chloroform		0.20																	
1	74-87-3	chloromethane		0.10																	
1	10061-01-5	cis-1,3-dichloropropene		0.20																	
2	124-48-1	dibromochloromethane		0.10																	
2	100-41-4	ethylbenzene		0.10																	
1	75-09-2	methylene chloride (10xblk)		0.01				-25.6				74	(77-108)								
2	100-42-5	styrene		0.30				✓				✓									
2	127-18-4	tetrachloroethene		0.20																	
2	108-88-3	toluene(10xblk)		0.40																	
2	10061-02-6	trans-1,3-dichloropropene		0.10																	
1	79-01-6	trichloroethene		0.30																	
1	75-01-4	vinyl chloride		0.10																	
2	1330-20-7	xylenes(total)		0.30																	
	cis-1,2-Dichloroethene																				
	trans-1,2-Dichloroethene																				

Comments: Vinyl acetate 108-05-4

Notes: Shaded rows are RCRA compounds.

6 163 261 LT

Reviewed By: [illegible] Date: 01.29.04

CCV & LCS same for both days

WS lot 2 soil

Volatile Organics

Site/Project: _____ AR/COC #: 607039 Batch #s: _____

Laboratory: _____ SDG #: _____ # of Samples: _____ Matrix: _____

Surrogate Recovery and Internal Standard Outliers (SW 846 Method 8260)

Sample	SMC 1	SMC 2	SMC 3	IS 1 area	IS 1 RT	IS 2 area	IS 2 RT	IS 3 area	IS 3 RT
IN CRITERIA									

SMC 1: Bromofluorobenzene
SMC 2: Dibromofluoromethane
SMC 3: Toluene-d8

IS 1: Fluorobenzene
IS 2: Chlorobenzene-d5
IS 3: 1,4-Dichlorobenzene-d4

Comments:

VOA 7

I Cal 11/18 23.26 →
11/19 6.42

		BFB	7.14	
		CCV	8.00 ✓	Tol d8 - 25
	12.22	ACS	8.00	
		MB	10.06	
		PJS PJD	11.31 }	Vinyl meta. ↓
1.	12.22	13.48	11.59 }	
2.		14.15		
3.	12.23	14.58		
		7.37	ACS - MeCl2	
		9.42	MB	
		7.37	CCV	✓ mach Tol d8 ↓ BFB ↓
		6.53	BFB	

Sa - 003 MeCl "UJ, A"

Sa - 001, -002, -003 Vinyl metal "UJ R, A2, P1" LT.

WS 2 of 2 Aqueous

Volatile Organics (SW 846 Method 8260)

Site/Project: 5-74 CWL AR/COC #: 607039 # of Samples: 1 Matrix: Aqueous

Laboratory: GEL SDG #: 104198 (104201) Laboratory Sample IDs: 104201-001

Methods: SW846 8260B Batch #s: 299669

IS	CAS #	Name	TCL	Min. RF	Intercept	Calib. RF >.05	Calib. RSD/ R^2 <20%/ 0.99	CCV %D 20%	Method Blks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Trip Blanks		
1	71-55-6	1,1,1-trichloroethane	✓	0.10		✓	✓	✓	✓	✓	NA		✓	✓	✓	NA				
2	79-34-5	1,1,2,2-tetrachloroethane		0.30																
2	79-00-5	1,1,2-trichloroethane		0.10																
1	75-34-3	**1,1-dichloroethane**		0.10																
1	75-35-4	**1,1-dichloroethene**		0.20																
1	107-06-2	**1,2-dichloroethane**		0.10																
1	540-59-0	**1,2-dichloroethene(total)**		0.01																
1	78-87-5	**1,2-dichloropropane**	✓	0.01																
1	78-93-3	**2-butanone (MEK) (10xblk)**	✓	0.01																
1	110-75-8	2-chloroethyl vinyl ether																		
2	591-78-6	2-hexanone (MBK)	✓	0.01																
2	108-10-1	4-methyl-2-pentanone (MIBK)		0.10																
1	67-64-1	**acetone(10xblk)**		0.01				-22												
1	71-43-2	**benzene**		0.50	✓	✓	✓	✓												
1	75-27-4	bromodichloromethane		0.20																
3	75-25-2	bromoform		0.10																
1	74-83-9	bromomethane		0.10																
1	75-15-0	carbon disulfide		0.10																
1	56-23-5	**carbon tetrachloride**		0.10																
2	108-90-7	**chlorobenzene**		0.50																
1	75-00-3	chloroethane		0.01																
1	67-66-3	**chloroform**		0.20																
1	74-87-3	chloromethane		0.10																
1	10061-01-5	cis-1,3-dichloropropene		0.20																
2	124-48-1	dibromochloromethane		0.10																
2	100-41-4	ethylbenzene		0.10																
1	75-09-2	methylene chloride (10xblk)		0.01	✓	✓	✓													
2	100-42-5	styrene		0.30																
2	127-18-4	**tetrachloroethene**		0.20																
2	108-88-3	toluene(10xblk)		0.40																
2	10061-02-6	trans-1,3-dichloropropene		0.10																
1	79-01-6	**trichloroethene**		0.30																
1	75-01-4	**vinyl chloride**		0.10																
2	1330-20-7	xylenes(total)		0.30																
	cis-1,2-Dichloroethene												* ~~✓~~ NA	~~✓~~ NA	~~✓~~ NA					
	trans-1,2-Dichloroethene												✓	✓	✓					

Comments: Vinyl Acetate

Notes: Shaded rows are RCRA compounds.

Reviewed By: [illegible] Date: 01.29.04

RJ/PSD 103956 JNL SOG * not tested for cis-1,2-Dich... JK - no data qualified

Then Can Plan...

WS 2 of 2 Agrow

Volatile Organics

Site/Project: _____ AR/COC #: 607039 Batch #s: _____

Laboratory: _____ SDG #: _____ # of Samples: _____ Matrix: _____

Surrogate Recovery and Internal Standard Outliers (SW 846 Method 8260)

Sample	SMC 1	SMC 2	SMC 3	IS 1 area	IS 1 RT	IS 2 area	IS 2 RT	IS 3 area	IS 3 RT
IN CRITERIA									

SMC 1: Bromofluorobenzene
SMC 2: Dibromofluoromethane
SMC 3: Toluene-d8

IS 1: Fluorobenzene
IS 2: Chlorobenzene-d5
IS 3: 1,4-Dichlorobenzene-d4

Comments:

18.52 BFB ✓
19.19 CCV ✓
12.22 21.37 MB
12.22 19.47 LCS
VOA 97
I Cal 12/15 9.31 → 16.24 12.23 01.33 SA NO
12.23 7.36 LCS
9.59 MB
16.07 PS 103956-003

CCV preceding PS/PSD
Requested from Lab ✓

Semivolatile Organics (SW 846 Method 8270)

Site/Project: S-74, CWL AR/COC #: 607039 Laboratory Sample IDs: 104198 - 004, -005, -006

Laboratory: GEL SDG #: 104198

Methods: SW-846 8270C

# of Samples: 3 Matrix: Soil Batch #s: 299392

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blanks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks		
							>.05	<20% / 0.99	±20%												
2	BN	120-82-1	1,2,4-Trichlorobenzene	✓	0.20		✓	✓	✓ ✓	✓	✓	NA		✓	✓	✓	NA				
1	BN	95-50-1	1,2-Dichlorobenzene		0.40																
1	BN	541-73-1	1,3-Dichlorobenzene		0.60																
1	BN	106-46-7	1,4-Dichlorobenzene		0.50																
3	A	95-95-4	2,4,5-Trichlorophenol		0.20																
3	A	88-06-2	2,4,6-Trichlorophenol		0.20																
2	A	120-83-2	2,4-Dichlorophenol		0.20																
2	A	105-67-9	2,4-Dimethylphenol		0.20																
3	A	51-28-5	2,4-dinitrophenol		0.01	✓	✓	.988 = .99													
3	BN	121-14-2	2,4-Dinitrotoluene		0.20			✓													
3	BN	606-20-2	2,6-Dinitrotoluene		0.20																
3	BN	91-58-7	2-Chloronaphthalene		0.80																
1	A	95-57-8	2-Chlorophenol		0.80																
2	BN	91-57-6	2-Methylnaphthalene		0.40																
1	A	95-48-7	2-Methylphenol (o-cresol)		0.70																
3	BN	88-74-4	2-Nitroaniline		0.01			LT ~~+49.5~~	+49.5 +23.5												
2	A	88-75-5	2-Nitrophenol		0.10				✓ ✓												
5	BN	91-94-1	3,3'-Dichlorobenzidine		0.01																
3	BN	99-09-2	3-Nitroaniline		0.01			LT ~~+39.6~~	+39.6 ✓												
4	A	534-52-1	4,6-Dinitro-2-methylphenol		0.01	✓	✓	.986 = .99	✓												
4	BN	101-55-3	4-Bromophenyl-phenylether		0.10			✓													
3	BN	7005-72-3	4-Chlorophenyl-phenylether		0.40																
2	A	59-50-7	4-Chloro-3-methylphenol		0.20																
2	BN	106-47-8	4-Chloroaniline		0.01																
1	A	N22	3,4-Methylphenol (m,p-cresol)		0.60																

Notes: Shaded rows are RCRA compounds.

Comments:

Reviewed By: [signature] Date: 01.29.04

Semivolatile Organics

Site/Project: _____ AR/COC #: 607039 Batch #s: _____

Laboratory: _____ SDG #: _____ # of Samples: _____ Matrix: _____

I.S.	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blanks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks		
							>.05	<20% / 0.99	20%												
3	BN	100-01-6	4-Nitroaniline	✓	0.01		✓	✓	+32.6 ✓	✓	✓	NA		✓	✓	✓	NA				
3	A	100-02-7	4-Nitrophenol		0.01	✓	✓	✓	✓												
3	BN	83-32-9	Acenaphthene		0.90																
3	BN	208-96-8	Acenaphthylene		0.90																
4	BN	120-12-7	Anthracene		0.70																
5	BN	56-55-3	Benzo(a)anthracene		0.80																
6	BN	50-32-8	Benzo(a)pyrene		0.70																
6	BN	205-99-2	Benzo(b)fluoranthene		0.70																
6	BN	191-24-2	Benzo(g,h,i)perylene		0.50				-26												
6	BN	207-08-9	Benzo(k)fluoranthene		0.70				✓												
2	BN	111-91-1	bis(2-Chloroethoxy)methane		0.30				-23.9												
1	BN	111-44-4	bis(2-Chloroethyl)ether		0.70				-43												
1	BN	108-60-1	bis(2-chloroisopropyl)ether		0.01				-28.5	-23.8											
5	BN	117-81-7	bis(2-Ethylhexyl)phthalate		0.01	✓	✓	✓	✓ ✓	41.5											
5	BN	85-68-7	Butylbenzylphthalate		0.01					✓											
4	BN	86-74-8	Carbazole		0.01																
5	BN	218-01-9	Chrysene		0.70					LT											
6	BN	53-70-3	Dibenzo(a,h)anthracene		0.40				-29.5	~~-29.5~~											
3	BN	132-64-9	Dibenzofuran		0.80				✓												
3	BN	84-66-2	Diethylphthalate		0.01																
3	BN	131-11-3	Dimethylphthalate		0.01																
4	BN	84-74-2	Di-n-butylphthalate		0.01																
6	BN	117-84-0	Di-n-octylphthalate		0.01																
4	BN	206-44-0	Fluoranthene		0.60																
3	BN	86-73-7	Fluorene		0.90																
4	BN	118-74-1	Hexachlorobenzene		0.10																
2	BN	87-68-3	Hexachlorobutadiene		0.01																
3	BN	77-47-4	Hexachlorocyclopentadiene		0.01	✓	✓	.9980 = .99						O	O	✓					
1	BN	67-72-1	Hexachloroethane		0.30			✓						✓	✓	✓					

Comments:

Semivolatile Organics

Site/Project: _____ AR/COC #: 607039 Batch #s: _____

Laboratory: _____ Laboratory Report #: _____ # of Samples: _____ Matrix: _____

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blanks	LCS	LCS D	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks		
							>.05	<20% / 0.99	20%												
6	BN	193-39-5	Indeno(1,2,3-cd)pyrene	✓	0.50	NA	✓	✓	25.6 ✓	✓	✓	NA		✓	✓	✓	NA				
2	BN	78-59-1	Isophorone		0.40				✓												
2	BN	91-20-3	Naphthalene		0.70																
2	BN	98-95-3	Nitrobenzene		0.20																
4	BN	86-30-6	N-Nitrosodiphenylamine (1)		0.01																
1	BN	621-64-7	N-Nitroso-di-propylamine		0.50				21												
4	A	87-86-5	Pentachlorophenol		0.05				✓												
4	BN	85-01-8	Phenanthrene		0.70																
1	A	108-95-2	Phenol		0.80																
5	BN	129-00-0	Pyrene		0.60																
4	BN	122-39-4	Diphenylamine		0.01																

MSD 5

Surrogate Recovery Outliers

Sample	SMC 1	SMC 2	SMC 3	SMC 4	SMC 5	SMC 6	SMC 7	SMC 8
IN CRITERIA								

SMC 1: Nitrobenzene-d5 (BN)
SMC 2: 2-Fluorobiphenyl (BN)
SMC 3: p-Terphenyl-d14 (BN)
SMC 4: Phenol-d5 (A)
SMC 5: 2-Fluorophenol (A)
SMC 6: 2,4,6-Tribromophenol (A)
SMC 7: 2-2-Chlorophenol-d4 (A)
SMC 8: 1,2-Dichlorobenzene-d4 (BN)

Comments:

All samples
Hexa. "R, A_2"
5, 6 bis....
< RL < 10X MB
"333 U, B"

Internal Standard Outliers

Sample	IS 1-area	IS 1-RT	IS 2-area	IS 2-RT	IS 3-area	IS 3-RT	IS 4-area	IS 4-RT	IS 5-area (384162)	IS 5-RT	Is 6-area (283154)	IS 6-RT
- 00H	IN CRITERIA								365630	IN CRITERIA	180439	IN CRITERIA
MS									365523		176059	
MSD									—		245634	

IS 1: 1,4-Dichlorobenzene-d4 (BN) ✓
IS 2: Naphthalene-d8 (BN) ✓
IS 3: Acenaphthene-d10 (BN) ✓
IS 4: Phenathrene-d10 (BN) ✓
IS 5: Chrysene-d12 (BN)
IS 6: Perylene-d12 (BN)

< 50% but > 25%
Detects J - None
NDs UJ.

I Cal 11/5 19.16 → 12/1
12.27 OFPP 16.40
CCV 16.55 17.21
MB 17.41
LCS 18.01
H 21.27
MS 21.47
MSD 22.08

12.29 OFPP 13.54
CCV 14.10, 14.30
5 15.29 bis J

PCBs (SW 846 - Method 8082)

Site/Project: 3-74, CWL AR/COC #: 60 7039 Laboratory Sample IDs: 104198 - 004, -005, -006

Laboratory: GEL SDG #: 104198

Methods: SW-846 8082

# of Samples: 3 Matrix: Soils Batch #s: 299765

CAS #	Name	TCL	Intercept	Calib RSD / R^2 <20% / 0.99	CCV %D 20%	Method Blanks	LCS	LCSD	LCS RPD 20%	MS	MSD	MS RPD 20%	Field Dup. RPD	Equip. Blanks	Field Blanks		
12674-11-2	Aroclor-1016	✓	NA	✓	✓	✓	✓	NA		228	281	✓	NA				
11104-28-2	Aroclor-1221	✓		✓		✓											
11141-16-5	Aroclor-1232	✓				✓											
53469-21-9	Aroclor-1242	✓		✓		✓											
12672-29-6	Aroclor-1248	✓				✓											
11097-69-1	Aroclor-1254	✓		✓		✓											
11096-82-5	Aroclor-1260	✓		✓	✓	✓	✓			✓	✓	✓					

Sample	SMC % REC	SMC RT	Sample	SMC % REC	SMC RT
IN CRITERIA					

Comments:

"16/60" ECO 8.
CCV. 10.23. 14.28 16.
10.48 "42" mB 10.36 "54"
14.40
ACW 14.5
4. 1102 15.05
5. 15.4
6. 15.5

Confirmation

Sample	CAS #	RPD > 25%	Sample	CAS #	RPD > 25%
IN CRITERIA					

Reviewed By: [signature] Date: 01.30.04

Inorganic Metals

Site/Project: 574, CWL AR/COC #: 607039 Laboratory Sample IDs: 104198 - -004, -005, -006

Laboratory: GEL SDG #: 104198

Methods: SW-846 7471A (Hg) SW-846 6010B (ICP-AES)

# of Samples: 3 Matrix: Soils Batch #s: 299367 (Hg) 299403 (Metals)

CAS #/ Analyte	QC Element																			
				ug/L		mg/kg														
	TAL	ICV	CCV	ICB	CCB	Method Blanks	LCS	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilution	Field Dup. RPD	Equip. Blanks	Field Blanks		
7429-90-5 Al								NA							%D RPD		NA			
7440-39-3 Ba	✓	✓	✓	✓	.960	✓	✓			✓	✓	✓	✓	✓	11.6 / 11.1					
7440-41-7 Be	✓	✓	✓	✓			✓			✓	✓	✓	NA	✓	✓					
7440-43-9 Cd	✓	✓	✓	0.679J	.852	✓	✓			✓	✓	✓	NA	✓	NA					
7440-70-2 Ca																				
7440-47-3 Cr	✓	✓	✓	✓	2.66	0.210J	✓			✓	✓	✓	✓	✓	NA					
7440-48-4 Co																				
7440-50-8 Cu	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓					
7439-89-6 Fe																				
7439-95-4 Mg																				
7439-96-5 Mn																				
7440-02-0 Ni	✓	✓	✓	[-1.45]	✓	✓	✓			✓	✓	✓	✓	✓	✓					
7440-09-7 K																				
7440-22-4 Ag	✓	✓	✓	1.46J	2.96	0.193J	✓			✓	✓	✓	NA	✓	NA					
7440-23-5 Na																				
7440-62-2 V																				
7440-66-6 Zn																				
7439-92-1 Pb	✓	✓	✓	✓	[-3.36]	✓	✓			✓	✓	✓	✓	✓	NA					
7782-49-2 Se	✓	✓	✓	1.91	[-1.66]	✓	✓			✓	✓	✓	NA	✓	NA					
7440-38-2 As	✓	✓	✓	✓	✓	✓	✓			0	0	✓	181	✓	✓					
7440-36-0 Sb																				
7440-28-0 Tl																				
7439-97-6 Hg	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	29V		NA					
													OK Soils 35%							
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 / l

Comments: Metals. Std dx

No end ICS - AB

Reviewed By: [signature] Date: 01. 30. 04

All Sa As J, A2

All Sa Ba J all > 500 ppl

-004 fine brown soil c rock & plant matter

00 1034

MB = B			-00~~4~~6	-00~~5~~4	-005
.210x5	1.05 mg/kg	Cr	>	>	>
.193x5	.965 mg/kg	Ag	< J, B ✓	< J, B ✓	< J, B ✓

ICB/CCB B3

.96x5	4.8 ug/L	Ba	>	>	>
.852x5	4.26 ug/L	Cd	< J, B3 ✓	< J, B3 ✓	< J, B3 ✓
2.66x5	13.3 ug/L	Cr	>	>	>
[ ] 5x DL		Ni	>	>	>
2.96x5	14.8 ug/L	Ag	< J, B3 ✓	< J, B3 ✓	< J, B3 ✓
[ ] 5x DL		Pb	>	>	>
1.91x5	9.55 ug/L	Se	< J, B3 ✓	< J, B3 ✓	ND ✓
[ ] 5x DL		Se	< J, B3 ✓	< J, B3 ✓	UJ, B3

mg/kg → ug/L (x 10)

prep 1g → 50mL

General Chemistry

Site/Project: 5-74, CWL AR/COC #: 607039 Laboratory Sample IDs: 104198 -004, -005, -006

Laboratory: GEL SDG #: 104198

Methods: SW-846 7196A

# of Samples: 3 Matrix: Soils Batch #s: 300219

CAS #	Analyte	QC Element																		
		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	
18540-29-9	Hexavalent Chromium	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	NA	NA	✓	NA	→	→	→	→	

Comments:

6011 12/11 XT 12/30 Anal 12/31
16.35 11.52
224 hours 12.00
12.06

-005, -006 2x

Reviewed By: [signature] Date: 12.30.01 LT

Radiochemistry

Site/Project: S-74 CWL AR/COC #: 607039 Laboratory Sample IDs: 104198 - 007, -008, -009 (H^3)
- 10, -11, -12 (γ spec)

Laboratory: GEL SDG #:

Methods: GL-RAD-A-002 (H^3) DOE EML HASL 300 (γ)

# of Samples: 6 Matrix: Soil Batch #s: 299836 (H^3) 299912 (γ)

Analyte	QC Element												
	Method Blanks	LCS	MS	Rep RER	Equip. Blanks	Field Dup. RER	Field Blanks	Sample ID	Isotope	IS/Trace	Sample ID	Isotope	IS/Trace
Criteria	U	20%	25%	<1.0	U	<1.0	U	NA		50-105			50-105
H3	✓	✓	✓	✓	NA								
U-238													
U-234													
U-235/-236													
Th-232													
Th-228													
Th-230													
Pu-239/-240													
Gross Alpha													
Nonvolatile Beta													
Ra-226													
Ra-228													
Ni-63													
Gamma Spec. Am-241 ✓	✓	✓	NA	✓	NA								
Gamma Spec. Cs-137 ✓	✓	✓	⊥	✓									
Gamma Spec. Co-60 ✓	✓	✓	⊥	✓									

Parameter	Method	Typical Tracer	Typical Carrier
Iso-U	Alpha spec.	U-232	NA
Iso-Pu	Alpha spec.	Pu-242	NA
Iso-Th	Alpha spec.	Th-229	NA
Am-241	Alpha spec.	Am-242	NA
Sr-90	Beta	Y ingrowth	NA
Ni-63	Beta	NA	Ni by ICP
Ra-226	Deamination	NA	NA
Ra-226	Alpha spec.	Ba-133 or Ra-225	NA
Ra-228	Gamma spec.	Ba-133	NA

Gamma spec. LCS contains: Am-241, Cs-137, and Co-60

Comments: 063804-003 1 of 3 rec. broken H^3 contained in plastic wrapper

-10 Sb-124 -.023 (MDA = .0185) "R" (abs value & -ve bias > MDA)

X Data rej by lab due to int, low abundance, no valid peak.

Reviewed By: [signature] Date: 02.15.08 LT

Sample Findings Summary

Site: S-74, Chem Waste Landfill **AR/COC:** 607040,041,042 **Organic, Inorganic, Radiochem**

Sample ID	Method/CAS Number (Analysis/Analyte)																
	VOCs (EPA8260):	All VOC analytes, except:	67-67-1 (acetone)	75-09-2 (methylene chloride)	127-18-4 (tetrachloroethene)	106-46-7 (1,4-dichlorobenzene)	SVOCs (EPA8270):	All SVOC acid-fraction analytes	PCBs (EPA8082):		Gamma Spec (DOE RP-730):	13967-73-2 (Sr-85)	13982-39-3 (Zn-65)	15623-47-9 (Th-227)	Tritium (EPA906.0)		
063923-001 74-CB-H006-N010			20UJ,B	J						All Acceptance criteria met. No sample data will be qualified.						All Acceptance criteria met. No sample data will be qualified.	
063923-002 74-CB-H006-N010								P2									
063923-004 74-CB-H006-N010												R	R	UJ			
063924-001 Decon Pad-1		UJ	39UJ,B	J	J	J											
063924-002 Decon Pad-1								P2									
063924-004 Decon Pad-1													R	UJ			
063925-001 Decon Pad-2			20UJ,B	UJ													
063925-002 Decon Pad-2								P2									
063925-004 Decon Pad-2														UJ			
063928-001 74-SB-E002-F154			49UJ,B	J													
063928-002 74-SB-E002-F154								P2									
063928-004 74-SB-E002-F154												R		UJ			
063928-005 74-SB-E002-F154-TB			20UJ,B	UJ													
063929-001 74-SB-E002-F170			20UJ,B	J													
063929-002 74-SB-E002-F170								P2									
063929-004 74-SB-E002-F170														J			
063923-005 74-CB-H006-N010-TB			20UJ,B	UJ													
063806-001 74-SB-E002-F090			20UJ,B	J													
063806-002 74-SB-E002-F090								P2									
063806-004 74-SB-E002-F090												R		UJ			
063807-001 74-SB-E002-F106			20UJ,B	J													
063807-002 74-SB-E002-F106								P2									
063807-004 74-SB-E002-F106														UJ			
063808-001 74-SB-E002-F122			20UJ,B	J													
063808-002 74-SB-E002-F122								P2									
063808-004 74-SB-E002-F122														UJ			

Validated By: David Schwent

Mr. David Schwent

Date: 03/04/04

Sample Findings Summary

Site: S-74, Chem Waste Landfill **AR/COC:** 607040,041,042 **Organic, Inorganic, Radiochem**

Sample ID	ICP Metals (EPA6010B):	7440-22-4 (Ag)	7440-41-7 (Be)	7440-43-9 Cd)	7782-49-2 (Se)	7440-47-3 (Cr)	7439-92-1 (Pb)	CVAA Metals (EPA7471A):	7439-97-6 (Hg)	Hexavalent Cr (EPA7196A):							
	Method/CAS Number (Analysis/Analyte)																
063923-002 74-CB-H006-N010		J,B3	J,B3	J,B3	J,B3,A2	J,A2	J,A2		J,A2		All Acceptance criteria met. No sample data will be qualified.						
063924-002 Decon Pad-1			J,B3	J,B3	UJ,A2	J,A2	J,A2		J,A2								
063925-002 Decon Pad-2			J,B3		UJ,A2	J,A2	J,A2		J,A2								
063928-002 74-SB-E002-F154			J,B3	J,B3	UJ,A2	J,A2	J,A2		J,A2								
063929-002 74-SB-E002-F170			J,B3		UJ,A2	J,A2	J,A2		J,A2								
063806-002 74-SB-E002-F090			J,B3	J,B3	UJ,A2	J,A2	J,A2		J,A2								
063807-002 74-SB-E002-F106		J,B3	J,B3	J,B3	UJ,A2	J,A2	J,A2		J,A2								
063808-002 74-SB-E002-F122			J,B3	J,B3	UJ,A2	J,A2	J,A2		J,A2								

Validated By: David Schwent

Mr. David Schwent

Date: 03/04/04

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Memorandum

Date: March 2, 2004

To: File

From: David Schwent

Subject: Organic Data Review and Validation - SNL
Site: S-74, Chem Waste Landfill
AR/COC: 607040, 607041, and 607042
SDG/Lot#: F4A160124
Laboratory: STSL
Project/Task No. 7221.02.02.03

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

All samples were prepared and analyzed with approved procedures using methods EPA8260B (VOCs), EPA8270C (SVOC), and EPA8082 (PCBs). Problems were identified with the data package that result in the qualification of data.

VOC Analysis:

Calibration: For acetone and methylene chloride, the initial calibration relative standard deviations (RSDs) (43.81% and 54.91%, respectively) were >40% but <60%. All associated sample detects will be qualified "J" and non-detects (NDs) will be qualified "UJ." For methylene chloride of batch 4020148, the continuing calibration verification (CCV) percent difference (%D) (35.47%) was >20 % but <40%. All associated sample detects will be qualified "J."

Blanks: Acetone was detected in the method blank (MB). The associated result of Sample F4A160124-005 was a detect <10X the MB concentration and > the reporting limit (RL) and will be qualified "39U,B" at the sample result (39 µg/kg). The associated result of Sample -015 was a detect <10X the MB concentration and > the RL and will be qualified "49U,B" at the sample result (49 µg/kg). All other associated sample results were detects <10X the MB concentration and ≤ the RL and will be qualified "20U,B" at the RL (20 µg/kg). It should be noted that the acetone results of the trip blanks (TBs) (Samples -019 and -024) will be qualified "U" (ND) due to MB contamination and, therefore, cannot affect other field sample results.

Internal Standards (ISs): The area counts of IS1 (fluorobenzene), IS2 (chlorobenzene-d5), and IS3 (1,4-dichlorobenzene-d4) were < QC acceptance criteria for Sample F4A160124-005. All associated sample detects will be qualified "J" and NDs will be qualified "UJ."

SVOC Analysis:

MS/MSD: The recoveries of acid-fraction surrogate 2,4,6-tribromophenol for the MS QC sample (F72M11A9) and the MSD QC sample (F72M11CA) were 0%. Because the recoveries for the acid-fraction surrogate were 0%, the MS/MSD acid-fraction results will not be applied to field sample data. As a result, no measure of laboratory precision exists for the acid-fraction analytes of the field samples. Therefore, all associated acid-fraction sample results will be flagged "P2" due to lack of precision information.

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

VOC Analysis: All initial and continuing calibration QC acceptance criteria were met, except as noted above in the summary section and the following. For bromomethane and chloromethane, the initial calibration RSDs (23.47% and 20.52%, respectively) were >20% but < 40% and for chloromethane of batch 4020148, the CCV %D (38.59%) was >20% but <40%. However, all associated sample results were NDs and will not be qualified.

SVOC Analysis: All initial and continuing calibration QC acceptance criteria were met, except the following. For 2,4-dinitrophenol, the initial calibration RSD (25.43%) was >20% but <40%. However, all associated sample results were NDs and will not be qualified.

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

Blanks

VOC Analysis: No target analytes were detected in the MB or TBs, except as noted above in the summary section.

All Other Analyses: No target analytes were detected in the MBs.

Internal Standards (ISs)

VOC Analysis: All IS area and retention time (RT) QC acceptance criteria were met, except as noted above in the summary section and the following. The area counts of IS1 (fluorobenzene) and IS2 (chlorobenzene-d5) were < QC acceptance criteria for Sample F4A160124-025. However, the area counts for both ISs were < the associated QC acceptance limits by very small margins (much <1%) and, based on professional judgment, no sample data will be qualified as a result.

SVOC Analysis: All IS area and RT QC acceptance criteria were met.

PCB Analysis: No IS analyses were required for this method.

Surrogates

SVOC Analysis: All surrogate recovery and retention time QC acceptance criteria were met, except the following. The recoveries of surrogate 2,4,6-tribromophenol for QC samples F72M11A9 (MS) and F72M11CA (MSD) were

0%. Thus, the acid-fraction results of the MS/MSD samples will not be used to evaluate field sample results (see summary section).
All Other Analyses: All surrogate recovery and retention time QC acceptance criteria were met.

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

VOC Analysis: All LCS/LCSD QC acceptance criteria were met, except the following. The LCS/LCSD relative percent differences (RPDs) of 7 analytes were > QC acceptance criteria (see Data Validation Worksheets). However, all the RPDs of these analytes were ≤30% and the matrix of the samples is soil. Therefore, based on professional judgment, no sample data will be qualified as a result.

All Other Analyses: All LCS QC acceptance criteria were met. No LCSD analyses were performed. The MSD analyses were used as the measure of laboratory precision. No sample data will be qualified as a result.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

VOC Analysis: All MS/MSD QC acceptance criteria were met.

SVOC Analysis: All MS/MSD QC acceptance criteria were met, except as noted above in the summary section. It should be noted that the MS/MSD analyses were performed on a QC sample of similar matrix from another SNL Sample Lot. No sample data will be qualified as result.

PCB Analysis: All MS/MSD QC acceptance criteria were met. It should be noted that the MS/MSD analyses were performed on a QC sample of similar matrix from another SNL Sample Lot. No sample data will be qualified as result.

Laboratory Replicates

All Analyses: No laboratory replicate analyses were required for these methods.

Target Compound Identification/Confirmation

PCB Analysis: All confirmation QC acceptance criteria were met.

All Other Analyses: No confirmation analyses were required for these methods.

Detection Limits/Dilutions

PCB Analysis: All detection limits were reported correctly. Sample F4A160124-030 was diluted 4X due to high target analyte concentrations. No other samples required dilution.

All Other Analyses: All detection limits were reported correctly. No samples required dilution.

Other QC

All Analyses: No field duplicates (FDs), field blanks (FBs) or equipment blanks (EBs) were submitted on the AR/COC.

SVOC Analysis: Tentatively Identified Compound (TIC) reports were included for each sample in the raw data of the SVOC analysis. However, TIC reports were not requested by the client and were not evaluated for data validation.

No other specific issues were identified which affect data quality.

Analytical Quality Associates, Inc.
616 Maxine NE
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Memorandum

Date: March 3, 2004

To: File

From: David Schwent

Subject: Radiochemical Data Review and Validation – SNL
Site: S-74, Chem Waste Landfill
AR/COC: 607040, 606041,and 606042
SDG/Lot#: F4A160124
Laboratory: STSL
Project/Task: 7221.02.02.03

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 DOE RP-730 (Gamma Spec) and EPA906.0 (Tritium). Problems were identified with the data package that result in the qualification of data.

Gamma Spec Analysis:

Negative Bias: For Samples F4A160124-004, -018, and -028, the Sr-85 results were negative with absolute values > the MDC and will be qualified "R." For Samples -004 and -008, the Zn-65 results were negative with absolute values > the MDC and will be qualified "R."

Replicates: For Th-227, the laboratory replicate relative error ratio (RER) (1.32) was >1 but <3. The associated result of Sample F4A160124-023 was a detect and will be qualified "J"; all other associated sample results were non-detects (NDs) and will be qualified "UJ."

Data are acceptable except as noted above and reported 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 calibration QC acceptance criteria were met.

Negative Bias

Gamma Spec Analysis: All negative bias QC acceptance criteria were met, except as noted above in the summary section.

Tritium Analysis: All negative bias QC acceptance criteria were met.

Blanks

All Analyses: No target analytes were detected in the method blanks.

Tracer/Carrier Recovery

All Analyses: No tracer/carrier analyses were required for these methods.

Laboratory Control Sample (LCS)

All Analyses: All LCS QC acceptance criteria were met.

Matrix Spike (MS)

Gamma Spec Analysis: No MS analysis was required for this method.

Tritium Analysis: No MS analysis was performed. The laboratory replicate analysis was used as a measure of laboratory precision. No sample data will be qualified as a result.

Replicates

Gamma Spec Analysis: All laboratory replicate QC acceptance criteria were met, except as noted above in the summary section.

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

Detection Limits/Dilutions

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

Other QC

All Analyses: No field duplicates (FDs), field blank (FBs), or equipment blanks (EBs), were submitted on the AR/COC.

No other specific issues were identified which affect data quality.

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Memorandum

DATE: March 4, 2004

TO: File

FROM: David Schwent

SUBJECT: Inorganic Data Review and Validation - SNL
Site: S-74, Chem Waste Landfill
AR/COC: 607040, 607041, and 607042
SDG/Lot#: F4A160124
Laboratory: STSL
Project/Task: 7221.02.02.03

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), EPA7471A (CVAA mercury), and EPA7196A (Hexavalent Cr). Problems were identified with the data package that result in the qualification of data.

ICP Analysis:

Blanks: Ag, Be, Cd, and Se were detected in the initial calibration blank (ICB) and the continuing calibration blanks (CCBs) at concentrations < the reporting limit (RL). All associated sample detects <5X the highest calibration blank concentration will be qualified "J,B3."

MS: For Cr and Se, the MS recoveries (69% and 51%, respectively) were <75% but >30%. All associated sample detects and will be qualified "J,A2" and non-detects (NDs) will be qualified "UJ,A2." For Pb, the MS recovery (16%) was <30%. All associated sample results were detects and will be qualified "J,A2."

CVAA Analysis:

MS: For Hg, the MS recovery (163%) was >125%. All associated sample results were detects and will be qualified "UJ,A2."

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

ICP Analysis: No target analytes were detected in the blanks, except as noted above in the summary section and the following. Many target analytes were detected in one of more of the blanks at concentrations < the RL (see Data Validation Worksheets). However, all associated sample detects >5X the highest calibration blank and/or method blank concentration and all associated sample NDs 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)

ICP/CVAA Analyses: All MS QC acceptance criteria were met, except as noted above in the summary section. No MSD analyses were performed. The replicate analyses were used as measures of laboratory precision. No sample data will be qualified as a result.

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

Replicates

ICP Analysis: All replicate QC acceptance criteria were met. It should be noted that 35% was used as the QC acceptance limit for replicate relative percent differences (RPDs) due to the matrix being soil.

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

ICP Serial Dilution

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

All Other Analyses: No serial dilution was required for these methods.

ICP Interference Check Sample (ICS)

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

All Other Analyses: No ICS was required for these methods.

Detection Limits/Dilutions

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

Other QC

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

No other specific issues were identified which affect data quality.

Chem Waste Landfill

Data Validation Summary

Site/Project: SNL/ S-74, (CWL) Project/Task #: 7221.02.02.03 # of Samples: 36 Matrix: Soil

AR/COC #: 606040, 041, 042 Laboratory Sample IDs: F4A160124-001 thru -036

Laboratory: STSL

SDG #: F4A160124
(Lot #)

QC Element	Analysis									
	Organics				Inorganics				RAD	Other (general chemistry)
	VOC	SVOC	Pesticide/ PCB	HPLC (HE)	ICP/AES	GFAA/ AA	CVAA (Hg)	CN		
1. Holding Times/Preservation	✓	✓	✓		✓		✓		✓	✓
2. Calibrations	J, UJ	↓	↓		↓		↓		↓	↓
3. Method Blanks	20U, B/ 39U, B/ 49U, B	↓			J, B3		↓			
4. MS/MSD	✓	P2			J, UJ, A2		J, A2			
5. Laboratory Control Samples	↓	✓	↓		✓		✓		↓	
6. Replicates					↓		↓		J, UJ	↓
7. Surrogates	✓	✓	✓							
8. Internal Standards	J, UJ	↓								
9. TCL Compound Identification	✓ (NA)	✓ (NA)								
10. ICP Interference Check Sample					✓					
11. ICP Serial Dilution					↓					
12. ~~Carrier/Chemical Tracer Recoveries~~ (NA) Negative Bias									R	
13. Other QC Confirmation RPD	NA	NA	✓		NA		NA		NA	NA

J = Estimated
U = Not Detected
UJ = Not Detected, Estimated
R = Unusable

Check (√) = Acceptable
Shaded Cells = Not Applicable (also "NA")
NP = Not Provided
Other: _____

Reviewed By: David Schwartz Date: 2-27-04

Holding Time and Preservation

Site/Project: SNL / S-M CWL AR/COC #: 607040, 041, 042 Laboratory Sample IDs: F4A160124-001 thru -036

Laboratory: STSL SDG #: F4A160124

# of Samples: 36 Matrix: Soil

Sample ID	Analytical Method	Holding Time Criteria	Days Holding Time was Exceeded	Preservation Criteria	Preservation Deficiency	Comments

No Outliers

Reviewed By: David Schwent Date: 3-04-04

Volatile Organics (SW 846 Method 8260)

Site/Project: SNL/S-74 CWL AR/COC #: 607040, 041, 042 # of Samples: 10 Matrix: Soil / DIW (TBs)

Laboratory: STSL SDG #: F4A160124 Laboratory Sample IDs: F4A160124-001, -005-009, -015, -019, -020, -024, -025, -029, -033.

Methods: EPA 8260B (VOC) Batch #s: 4020148 (soil) ; 4020143 (DIW)

IS	CAS #	Name	TCL	Min. RF	Intercept	Calib. RF >.05	Calib. RSD/ R^2 <20% / 0.99	CCV %D 20%	Method Blks ug/L	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Trip Blanks (-004/-004) ug/L	
1	71-55-6	1,1,1-trichloroethane	✓	0.10	NA	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	
2	79-34-5	1,1,2,2-tetrachloroethane	✓	0.30															
2	79-00-5	1,1,2-trichloroethane	✓	0.10															
1	75-34-3	**1,1-dichloroethane**	✓	0.10															
1	75-35-4	**1,1-dichloroethene**	✓	0.20								23							
1	107-06-2	**1,2-dichloroethane**	✓	0.10								✓							
1	540-59-0	**1,2-dichloroethene(total)**	✓	0.01															
1	78-87-5	**1,2-dichloropropane**	✓	0.01															
1	78-93-3	**2-butanone (MEK) (10xblk)**	✓	0.01	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
1	110-75-8	2-chloroethyl vinyl ether																	
2	591-78-6	2-hexanone (MBK)	✓	0.01	NA	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	
2	108-10-1	4-methyl-2-pentanone (MIBK)	✓	0.10															
1	67-64-1	**acetone(10xblk)**	✓	0.01			43.81		35			29						62/2.6	
1	71-43-2	**benzene**	✓	0.50			✓		✓			✓						✓	
1	75-27-4	bromodichloromethane	✓	0.20															
3	75-25-2	bromoform	✓	0.10															
1	74-83-9	bromomethane	✓	0.10			25.47					26							
1	75-15-0	carbon disulfide	✓	0.10			✓					24							
1	56-23-5	**carbon tetrachloride**	✓	0.10															
2	108-90-7	**chlorobenzene**	✓	0.50															
1	75-00-3	chloroethane	✓	0.01								27							
1	67-66-3	**chloroform**	✓	0.20								✓							
1	74-87-3	chloromethane	✓	0.10			20.52	38.59*			~~30~~	30							
1	10061-01-5	cis-1,3-dichloropropene	✓	0.20			✓	✓				✓							
2	124-48-1	dibromochloromethane	✓	0.10															
2	100-41-4	ethylbenzene	✓	0.10															
1	75-09-2	methylene chloride (10xblk)	✓	0.01			54.91	35.47*											
2	100-42-5	styrene	✓	0.30			✓	✓											
2	127-18-4	**tetrachloroethene**	✓	0.20															
2	108-88-3	toluene(10xblk)	✓	0.40															
2	10061-02-6	trans-1,3-dichloropropene	✓	0.10															
1	79-01-6	**trichloroethene**	✓	0.30															
1	75-01-4	**vinyl chloride**	✓	0.10								28							
2	1330-20-7	xylenes(total)	✓	0.30															
	95-50-1	1,2-dichlorobenzene	✓																
	541-73-1	1,3-dichlorobenzene	✓																
	106-46-7	1,4-dichlorobenzene	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	

Comments: Notes: Shaded rows are RCRA compounds.

* Only applies to Samples of batch 4020148

Reviewed By: David Schwartz Date: 3-1-04

Volatile Organics

Site/Project: _____ AR/COC #: 607040, 041, 042 Batch #s: 4020148

Laboratory: _____ Laboratory Report #: _____ # of Samples: _____ Matrix: _____

Surrogate Recovery and Internal Standard Outliers (SW 846 Method 8260)

Sample	SMC 1	SMC 2	SMC 3	IS 1 Area (Fluorobenzene)	IS 1 RT	IS 2 area (Chlorobenzene-d5)	IS 2 RT	IS 3 area (1,4-dichlorobenzene-d4)	IS 3 RT
FYA160124-005	✓	✓	✓	1130581	✓	1048081	✓	649287	✓
↓ -025	↓	↓	↓	1169804	↓	1093835	↓	✓	↓

SMC 1: 4-Bromofluorobenzene
SMC 2: Dibromofluoromethane
SMC 3: Toluene-d8

IS 1: Fluorobenzene
IS 2: Chorobenzene-d5
IS 3: 1,4-Dichlorobenzene-d4

Comments: IS1 Area Range =(4682580 - 1170645)
IS2 =(4375962 - 1093991)
IS3 =(2620714 - 655179)

Semivolatile Organics (SW 846 Method 8270)

Site/Project: SNL/S-24, CWL AR/COC #: 604040, 041, 042 Laboratory Sample IDs: F4A160124-002, -006, -010, -016, -021, -026, -030, -034.

Laboratory: STSL SDG #: F4A160124

Methods: EPA 8270C (SVOC)

# of Samples: 8 Matrix: Soil Batch #s: 401644

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blanks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks		
							>.05	<20% / 0.99	20%												
1	A	108-95-2	Phenol	✓	0.80	NA	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	NA	NA	NA		
1	BN	111-44-4	bis(2-Chloroethyl)ether	✓	0.70																
1	A	95-57-8	2-Chlorophenol	✓	0.80																
1	BN	541-73-1	1,3-Dichlorobenzene	✓	0.60																
1	BN	106-46-7	1,4-Dichlorobenzene	✓	0.50																
1	BN	95-50-1	1,2-Dichlorobenzene	✓	0.40																
1	A	95-48-7	o-cresol		0.70																
1	BN	108-60-1	bis(2-chloroisopropyl)ether		0.01																
1	A	N22	m,p-cresols		0.60					✓	✓	NA	NA				NA	NA	NA	B	
1	BN	621-64-7	N-Nitroso-di-n-propylamine	✓	0.50	NA	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	NA	NA	NA		
1	BN	67-72-1	Hexachloroethane	✓	0.30																
2	BN	98-95-3	Nitrobenzene	✓	0.20																
2	BN	78-59-1	Isophorone	✓	0.40																
2	A	88-75-5	2-Nitrophenol	✓	0.10									17	13						
2	A	105-67-9	2,4-Dimethylphenol	✓	0.20									✓	✓						
2	BN	111-91-1	bis(2-Chloroethoxy)methane	✓	0.30																
2	A	120-83-2	2,4-Dichlorophenol	✓	0.20																
2	BN	120-82-1	1,2,4-Trichlorobenzene	✓	0.20																
2	BN	91-20-3	Naphthalene	✓	0.70																
2	BN	106-47-8	4-Chloroaniline	✓	0.01																
2	BN	87-68-3	Hexachlorobutadiene	✓	0.01																
2	A	59-50-7	4-Chloro-3-methylphenol	✓	0.20																
2	BN	91-57-6	2-Methylnaphthalene	✓	0.40																
3	BN	77-47-4	Hexachlorocyclopentadiene	✓	0.01																
3	A	88-06-2	2,4,6-Trichlorophenol	✓	0.20									3.4	2.3						
3	A	95-95-4	2,4,5-Trichlorophenol	✓	0.20									13	9.5						

Comments:

Notes: Shaded rows are RCRA compounds.

Reviewed By: David Schwartz Date: 3-1-04

Semivolatile Organics

Site/Project: _____ AR/COC #: 607040, 041, 042 Batch #s: 4016424

Laboratory: _____ SDG #: _____ # of Samples: _____ Matrix: _____

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blanks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks		
							>.05	<20% / 0.99	20%												
3	BN	91-58-7	2-Chloronaphthalene	✓	0.80	N/A	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	NA	NA	NA		
3	BN	88-74-4	2-Nitroaniline	✓	0.01																
3	BN	131-11-3	Dimethylphthalate	✓	0.01																
3	BN	208-96-8	Acenaphthylene	✓	0.90																
3	BN	606-20-2	2,6-Dinitrotoluene	✓	0.20																
3	BN	99-09-2	3-Nitroaniline	✓	0.01																
3	BN	83-32-9	Acenaphthene	✓	0.90																
3	A	51-28-5	2,4-Dinitrophenol	✓	0.01			25.43						0	0						
3	A	100-02-7	4-Nitrophenol	✓	0.01			✓						0	0						
3	BN	132-64-9	Dibenzofuran	✓	0.80									✓	✓						
3	BN	121-14-2	2,4-Dinitrotoluene	✓	0.20																
3	BN	84-66-2	Diethylphthalate	✓	0.01																
3	BN	7005-72-3	4-Chlorophenyl-phenylether	✓	0.40																
3	BN	86-73-7	Fluorene	✓	0.90																
3	BN	100-01-6	4-Nitroaniline	✓	0.01																
4	A	534-52-1	4,6-Dinitro-2-methylphenol	✓	0.01									4.7	2.6						
4	BN	122-39-4	Diphenylamine		0.01									✓	✓						
4	BN	101-55-3	4-Bromophenyl-phenylether	✓	0.10																
4	BN	118-74-1	Hexachlorobenzene	✓	0.10																
4	A	87-86-5	Pentachlorophenol	✓	0.05									0	0						
4	BN	85-01-8	Phenanthrene	✓	0.70									✓	✓						
4	BN	120-12-7	Anthracene	✓	0.70																
4	BN	86-74-8	Carbazole	✓	0.01																
4	BN	84-74-2	Di-n-butylphthalate	✓	0.01																
4	BN	206-44-0	Fluoranthene	✓	0.60																
5	BN	129-00-0	Pyrene	✓	0.60																
5	BN	85-68-7	Butylbenzylphthalate	✓	0.01									✓	✓						
5	BN	91-94-1	3,3'-Dichlorobenzidine	✓	0.01									7.9	9.7						
5	BN	56-55-3	Benzo(a)anthracene	✓	0.80	↓	↓	↓	↓	↓	↓	↓	↓	✓	✓	↓	↓	↓	↓		

Comments:

Semivolatile Organics

Site/Project: _____ AR/COC #: 607040, 041, 042 Batch #s: 4016424

Laboratory: _____ SDG #: _____ # of Samples: _____ Matrix: _____

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blanks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks		
							>.05	<20% / 0.99	20%												
5	BN	218-01-9	Chrysene	✓	0.70	NA	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	NA	NA	NA		
5	BN	117-81-7	bis(2-Ethylhexyl)phthalate	✓	0.01																
6	BN	117-84-0	Di-n-octylphthalate	✓	0.01																
6	BN	205-99-2	Benzo(b)fluoranthene	✓	0.70																
6	BN	207-08-9	Benzo(k)fluoranthene	✓	0.70																
6	BN	50-32-8	Benzo(a)pyrene	✓	0.70																
6	BN	193-39-5	Indeno(1,2,3-cd)pyrene	✓	0.50																
6	BN	53-70-3	Dibenz(a,h)anthracene	✓	0.40																
6	BN	191-24-2	Benzo(g,h,i)perylene	✓	0.50																
1	A	?	2-methylphenol	✓																	
1	BN	?	2,2'-oxybis(1-chloropropane)	✓																	
1	A	106-44-5	4-methylphenol	✓																	
4	BN	86-30-6	N-nitrosodiphenylamine	✓																	

Surrogate Recovery Outliers

Sample	SMC 1	SMC 2	SMC 3	SMC 4	SMC 5	SMC 6	SMC 7	SMC 8	
F72MHA9	✓	✓	✓	✓	✓	0%	NA	NA	MS
F72MHCA	✓	✓	✓	✓	✓	0%	✓	✓	MSD

SMC 1: Nitrobenzene-d5 (BN) SMC 2: 2-Fluorobiphenyl (BN) SMC 3: Terphenyl-d14 (BN)
SMC 4: Phenol-d5 (A) SMC 5: 2-Fluorophenol (A) SMC 6: 2,4,6-Tribromophenol (A)
SMC 7: 2-2-Chlorophenol-d4 (A) SMC 8: 1,2-Dichlorobenzene-d4 (BN)

Comments: The QC sample used for the MS/MSD analyses was from another SRL sample lot (F4A150177) of similar matrix

Internal Standard Outliers

Sample	IS 1-area	IS 1-RT	IS 2-area	IS 2-RT	IS 3-area	IS 3-RT	IS 4-area	IS 4-RT	IS 5-area	IS 5-RT	Is 6-area	IS 6-RT
				No Outliers								

IS 1: 1,4-Dichlorobenzene-d4 (BN) IS 2: Naphthalene-d8 (BN) IS 3: Acenaphthene-d10 (BN)
IS 4: Phenathrene-d10 (BN) IS 5: Chrysene-d12 (BN) IS 6: Perylene-d12 (BN)

PCBs (SW 846 - Method 8082)

-014,

Site/Project: SWL/S-74, CWL AR/COC #: 607840, 041, 042 Laboratory Sample IDs: F4A160124-002, -006, -010/-016, -021, -026, -030, -034.

Laboratory: STSL SDG #: F4A160124

Methods: EPA 8082 (PCBs)

# of Samples: 8 Matrix: Soil Batch #s: 4016280

CAS #	Name	TCL	Intercept	Calib RSD / R^2 <20% / 0.99	CCV %D 20%	Method Blanks	LCS	LCSD	LCS RPD 20%	MS	MSD	MS RPD 20%	Field Dup. RPD	Equip. Blanks	Field Blanks		
12674-11-2	Aroclor-1016	✓	NA (NA)	✓ (✓)	✓ (✓)	✓ (✓)	✓ (✓)	NA	NA	✓ (✓)	✓ (✓)	✓ (✓)	NA	NA	NA		
11104-28-2	Aroclor-1221	✓															
11141-16-5	Aroclor-1232	✓															
53469-21-9	Aroclor-1242	✓															
12672-29-6	Aroclor-1248	✓															
11097-69-1	Aroclor-1254	✓															
11096-82-5	Aroclor-1260	✓	(NA)	(✓)	(✓)	(✓)	(✓)			(✓)	(✓)	(✓)					
37324-23-5	Aroclor-1262	✓															
11100-14-4	Aroclor-1268	✓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		

Surrogates

Sample	SMC % REC	SMC RT	Sample	SMC % REC	SMC RT
		No	Outliers		

Comments: All target analytes represented by Aroclor-1016 and -1260 as indicated by "(✓)."

Confirmation

Sample	CAS #	RPD > 25%	Sample	CAS #	RPD > 25%
		No	Outliers		

The QC Sample for the MS/MSD analyses was from another SWL sample lot (F4A150234) of similar matrix.

Reviewed By: David Schwent Date: 3-1-04

Radiochemistry

Site/Project: SNL/S-74, CWL AR/COC #: 607040, 041, 042 Laboratory Sample IDs: F4A160124-004, -008, -012, -018, -023, -028, -032, -036

Laboratory: STSL Laboratory Report #: F4A160124

Methods: DOE RP-730 Mod (Gamma Spec); EPA 906.0 Mod (tritium)

# of Samples: 8 Matrix: Soil Batch #s: 4020170; 4016321

Analyte	QC Element													
	Method Blanks	LCS	MS	Rep RER	Equip. Blanks	Field Dup. RER	Field Blanks	Sample ID	Isotope	IS/Trace	Sample ID	Isotope	IS/Trace
Criteria	U	20%	25%	<1.0	U	<1.0	U	NA*		50-105			50-105
H3 ✓	✓	✓	NA*	✓	NA	NA	NA						
U-238													
U-234													
U-235/-236													
Th-232													
Th-228													
Th-230													
Pu-239/-240													
Gross Alpha													
Nonvolatile Beta													
Ra-226													
Ra-28													
Ni-63													
Gamma Spec. Am-241 ✓	✓	✓	NA	✓	NA	NA	NA						
Gamma Spec. Cs-137 ✓	↓	↓	↓	↓	↓	↓	↓						
Gamma Spec. Co-60 ✓	↓	↓	↓	↓	↓	↓	↓						
Gamma Spec. Th-227 ✓	↓	↓	↓	1.32	↓	↓	↓						

Parameter	Method	Typical Tracer	Typical Carrier
Iso-U	Alpha spec.	U-232	NA
Iso-Pu	Alpha spec.	Pu-242	NA
Iso-Th	Alpha spec.	Th-229	NA
Am-241	Alpha spec.	Am-242	NA
Sr-90	Beta	Y ingrowth	NA
Ni-63	Beta	NA	Ni by ICP
Ra-226	Deamination	NA	NA
Ra-226	Alpha spec.	Ba-133 or Ra-225	NA
Ra-228	Gamma spec.	Ba-133	NA

Gamma spec. LCS contains: Am-241, Cs-137, and Co-60

Comments: *Tracer Analysis not required for these methods.

* MS analysis not performed by lab for H-3 even though it is normally required.

Reviewed By: David Schwartz Date: 3-03-04

Inorganic Metals

Site/Project: SAL/S-74, CWL AR/COC #: 607040, 041, 042 Laboratory Sample IDs: F4A160124-002, -006, -010, -016, -021, -026, -030, and -034

Laboratory: GFSL SDG #: F4A160124

Methods: EPA 6010B (ICP); EPA 7471A (CVAA)

# of Samples: 8 Matrix: Soil Batch #s: 4019156 (CVAA); 4019177 (ICP) or

CAS #/ Analyte	QC Element																			
	TAL	ICV	CCV	☆ ICB µg/L	☆ CCB µg/L	Method Blanks mg/kg	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	✓	✓	✓	2.5	3.3/4.0	✓	✓	NA	NA	✓	NA	NA	✓	✓	✓	NA	NA	NA		
7440-41-7 Be	✓	↓	↓	2.6	2.9/4.0	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
7440-43-9 Cd	✓	↓	↓	2.4	2.7/3.5	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
7440-70-2 Ca																				
7440-47-3 Cr	✓	✓	✓	2.3	3.1/4.1	0.083	✓	NA	NA	69	NA	NA	✓	✓	✓	NA	NA	NA		
7440-48-4 Co																				
7440-50-8 Cu	✓	✓	✓	1.9	2.2/2.6	✓	✓	NA	NA	✓	NA	NA	✓	✓	✓	NA	NA	NA		
7439-89-6 Fe																				
7439-95-4 Mg																				
7439-96-5 Mn																				
7440-02-0 Ni	✓	✓	✓	2.2	3.4/3.9	✓	✓	NA	NA	✓	NA	NA	✓	✓	✓	NA	NA	NA		
7440-09-7 K																				
7440-22-4 Ag	✓	✓	✓	0.4	0.6/0.8	✓	✓	NA	NA	✓	NA	NA	✓	✓	✓	NA	NA	NA		
7440-23-5 Na																				
7440-62-2 V																				
7440-66-6 Zn																				
7439-92-1 Pb	✓	✓	✓	1.4	2.6/3.1	✓	✓	NA	NA	16	NA	NA	✓	✓	✓	NA	NA	NA		
7782-49-2 Se	✓	↓	↓	2.6/✓	3.7/✓	↓	↓	↓	↓	51	↓	↓	↓	↓	↓	↓	↓	↓		
7440-38-2 As	✓	↓	↓	✓	✓	↓	↓	↓	↓	✓	↓	↓	↓	↓	↓	↓	↓	↓		
7440-36-0 Sb																				
7440-28-0 Tl																				
7439-97-6 Hg	✓	✓	✓	✓	✓	✓	✓	NA	NA	163	NA	NA	✓	NA	NA	NA	NA	NA		
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 / l

Comments: * RPD QC acceptance limit of 38% was used due to the matrix being Soil.

☆ First entry applies to Sample -002 only; Second entry applies to all other samples. If only one entry, it applies to all samples.

Reviewed By: David Schwartz Date: 3-03-04

General Chemistry

Site/Project: S-74, CWL AR/COC #: 607040, 041, 042 Laboratory Sample IDs: F4A160124-002, -006, -010, -016, -021, -026, -030, -034

Laboratory: STSL SDG #: F4A160124

Methods: EPA 7196A (hexavalent Cr)

# of Samples: 8 Matrix: Soil Batch #s: 4021354

CAS #	Analyte	QC Element																		
		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	
18540-29-9	Hexavalent Cr	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	NA	NA	✓	NA	NA	NA	NA	NA	

Comments:

Reviewed By: David Schwart Date: 3-04-04

Sample Findings Summary

Site: S-74, Chem Waste Landfill **AR/COC:** 607147 **Data Type:** Organic & Inorganic

	EPA8082 PCB	12674-11-2 (Aroclor-1016)	11097-69-1 (Aroclor-1254)
063825-001 74-SB-E002-F106-R		J, A2	J, A2
063826-001 74-SB-E002-F122-R		J, A2	

Metals analysis met QC acceptance criteria. No data will be qualified.

Validated By: Kevin A Lambert

Date: 02/10/04

Analytical Quality Associates, Inc.
616 Maxine NE
Albuquerque, NM 87123
Phone: 505-299-5201
Fax: 505-299-6744
Email: minteer@aol.com

MEMORANDUM

DATE: February 10, 2004

TO: File

FROM: Kevin Lambert

SUBJECT: Inorganic Data Review and Validation – SNL
Site: S-74, Chem Waste Landfill
AR/COC: 607147
SDG: F4A270101
Laboratory: STSL
Project/Task: 7221.02.02.03

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM ER Project AOP 00-03 Rev 1.

Summary

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

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

Holding Times/Preservation

The samples were analyzed within the prescribed holding times and properly preserved.

Calibration

The initial and continuing calibration data met QC acceptance criteria.

Blanks

No target analytes were detected in the blanks.

Laboratory Control Sample (LCS)

The LCS met QC acceptance criteria except as follows.

ICP metals:

It should be noted that no laboratory control sample duplicate (LCSD) was provided with the SDG. No data will be qualified as a result. Laboratory precision was assessed using the replicate.

Matrix Spike (MS)

The MS met QC acceptance criteria.

Replicate

The replicate met QC acceptance criteria.

ICP Serial Dilution

The serial dilution met QC acceptance criteria.

ICP Interference Check Sample (ICS)

The ICS data met QC acceptance criteria.

Detection Limits/Dilutions

All detection limits were properly reported; no dilutions were required.

Other QC

No equipment blank (EB), field blank (FB), or field duplicate pair was submitted on the AR/COC.

No other specific issues were identified which affect data quality.

Analytical Quality Associates, Inc.
616 Maxine NE
Albuquerque, NM 87123
Phone: 505-299-5201
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Email: minteer@aol.com

MEMORANDUM

DATE: February 10, 2004

TO: File

FROM: Kevin Lambert

SUBJECT: Organic Data Review and Validation – SNL
Site: S-74 Chem Waste Landfill
AR/COC: 607147
SDG: F4A270101
Laboratory: STSL
Project/Task: 7221.02.02.03

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM ER Project AOP 00-03 Rev 1.

Summary

All samples were prepared and analyzed with accepted procedures using method EPA8082 (PCB). All compounds were successfully analyzed. Problems were identified with the data package that result in the qualification of data.

1. PCB:
   The MS and MSD percent recovery (%R) for aroclor-1016 (201% and 152% respectively) and aroclor-1260 (402% and 382% respectively) were > the upper QC acceptance limit (150%). All associated detects will be qualified "J, A2" and non-detects (NDs) will not be qualified.

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

Holding Times

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

Calibration

The initial calibration and continuing calibration data met QC acceptance criteria.

Blanks

No target analytes were detected in the blanks.

Internal Standards

Not Applicable

Surrogates

The surrogate recoveries met QC acceptance criteria.

Laboratory Control Sample (LCS)

The LCS met QC acceptance criteria except as follows.

PCB:
It should be noted that no laboratory control sample duplicate (LCSD) was provided with the SDG. Laboratory precision was assessed using the MS/MSD, which met QC acceptance criteria.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The MS/MSD met QC acceptance criteria except as noted above in the summary section.

Confirmation

The confirmation analysis met QC acceptance criteria.

Detection Limits/Dilutions

All detection limits were properly reported; no dilutions were required.

Other QC

No equipment blank (EB), field blank (FB), or field duplicate pair was submitted on the AR/COC.

No other specific issues were identified which affect data quality.

Data Validation Summary

Site/Project: S-74, Chem Waste LF Project/Task #: 7221.02.02.03 # of Samples: 3 Matrix: Soil

AR/COC #: 607147 Laboratory Sample IDs: F4A270101

Laboratory: STSL

SDG #: F4A270101

QC Element	Analysis									
	Organics				Inorganics				RAD	Other
	VOC	SVOC	Pesticide/ PCB	HPLC (HE)	ICP/AES	GFAA/ AA	CVAA (Hg)	CN		
1. Holding Times/Preservation			✓		✓					
2. Calibrations			✓		✓					
3. Method Blanks			✓		✓					
4. MS/MSD			J		✓					
5. Laboratory Control Samples			✓		✓					
6. Replicates					✓					
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		NA					

J = Estimated
U = Not Detected
UJ = Not Detected, Estimated
R = Unusable

Check (√) = Acceptable
Shaded Cells = Not Applicable (also "NA")
NP = Not Provided
Other: _____

Reviewed By: Kevin A Lambert Date: 02/10/04

Inorganic Metals

Site/Project: S-74, Chem Waste LF AR/COC #: 607147 Laboratory Sample IDs: F4A270101-001

Laboratory: STSL SDG #: F4A270101

Methods: EPA6010B (ICP metals)

# of Samples: 1 Matrix: soil Batch #s: 4027169/4027049

CAS #/ Analyte	QC Element																			
	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																				
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 Tl																				
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 / l

Comments:

Reviewed By: Kevin A Lambert Date: 02/10/04

PCBs (SW 846 - Method 8082)

Site/Project: S-74, Chem Waste LF AR/COC #: 607147 Laboratory Sample IDs: F4A270101-002, -003

Laboratory: STSL SDG #: F4A270101

Methods: EPA 8082 (PCB)

# of Samples: 2 Matrix: Soil Batch #s: 4029313/4029150

CAS #	Name	TCL	Intercept	Calib RSD / R^2 <20% / 0.99	CCV %D 20%	Method Blanks	LCS	LCSD	LCS RPD 20%	MS (1)	MSD	MS RPD 20%	Field Dup. RPD	Equip. Blanks	Field Blanks		
12674-11-2	Aroclor-1016	✓	NA	✓	✓	✓	✓			201 (150)	152	✓					
11104-28-2	Aroclor-1221	✓		✓													
11141-16-5	Aroclor-1232	✓		✓													
53469-21-9	Aroclor-1242	✓		✓													
12672-29-6	Aroclor-1248	✓		✓													
11097-69-1	Aroclor-1254	✓		✓													
11096-82-5	Aroclor-1260	✓		✓	✓		✓			402 (150)	382	✓					
37324-23-5	Aroclor-1262	✓		✓													
11100-14-4	Aroclor-1268	✓	✓	✓		✓	✓ KAL										

Sample	SMC % REC	SMC RT	Sample	SMC % REC	SMC RT
Met Criteria					

Comments: (1) The MS & MSD %R were > the upper QC limit due to matrix interference. Detects will be qualified "J, A2" and NDs will not be qualified

Confirmation

Sample	CAS #	RPD > 25%	Sample	CAS #	RPD > 25%
Met Criteria					

Reviewed By: Kevin A Lambert Date: 02/10/04