1-1-2008

Justification for Class III Permit Modification January 2008 DSS Site 1101 Operational Unit 1295 Building 885 Septic System (TA-l)

Sandia National Laboratories/NM

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Sandia National Laboratories

AOC 1101
Drain and Septic System (Building 885)

Environmental Restoration Project

Site History

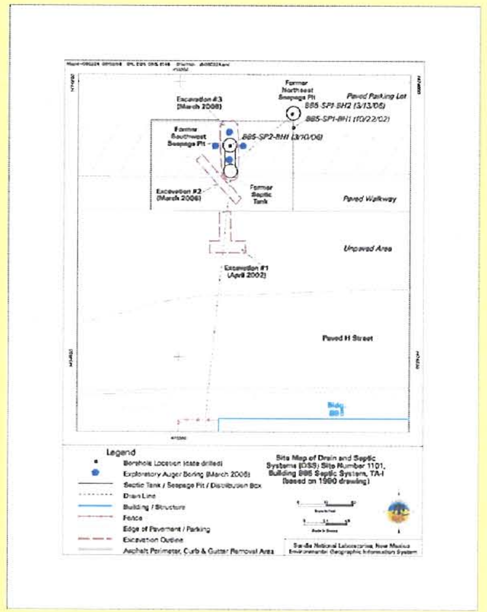
- Bldg. 885 was constructed as a building materials warehouse in 1953, and it is assumed that the septic system (septic tank and one or two seepage pits) was also constructed at that time.
- A June 1980 SNL/NM Facilities Engineering drawing indicates that the Building 885 septic system was situated approximately 100 ft north of the northwestern corner of Building 885. The drawing shows that the abandoned septic system consisted of a septic tank and distribution box that emptied to a 5-ft-diameter by an estimated 25-ft-deep seepage pit (referred to as the northeast seepage pit). An older drawing (1963) indicates that a second seepage pit (referred to as the southwest seepage pit) may have been located approximately 3 ft north of the septic tank.
- This location is now beneath a large asphalt parking lot. In 1988, Building 885 was connected to the City of Albuquerque sanitary sewer system. It is assumed that the septic system was abandoned and paved over at about that time.

Depth to Groundwater

- The shallow groundwater system and regional aquifer are approximately 310 and 560 ft beneath the site, respectively.

Constituents of Concern

- VOCs
- SVOCs
- PCBs
- HE Compounds
- RCRA Metals
- Hexavalent Chromium
- Total Cyanide
- Radionuclides



Auger drilling at the DSS Site 1101. Building 885 septic system seepage pit was located in the parking lot north of Building 885. View to the southwest. October 21, 2002.

Backhoe Excavation #2 completed in the asphalt, curb, and gutter removal area at DSS Site 1101 to locate the buried drain line from Building 885. View to the southeast. March 3, 2006.

Summary of Investigations

- In March 2002, an initial backhoe excavation attempted to locate the old drain line shown in the engineering drawings to run north from Building 885 to the septic tank. The line was located at an average depth of 5 ft bgs and was followed north until it passed under the asphalt walkway and parking lot. The excavation was stopped in order to avoid damaging the walkway.
- In June 2002, a ground penetration radar survey was conducted at the apparent location of the septic system beneath the parking lot. The results of the survey were inconclusive; no definitive remains of the buried system were identified.
- In October 2002, an initial borehole (885-SP1-BH1) was drilled in the center of the northeast seepage pit as shown on the 1980 drawing. At a depth of 23 ft bgs, a subsurface obstruction caused auger refusal and was assumed at the time to be the remains of the northeast seepage pit. To avoid a lodged auger string due to the obstruction, a second borehole was drilled 5 ft south of the first boring.
- Soil samples were successfully collected from the 2002 borehole from both an upper interval (approximately 25 ft bgs) and from a deeper interval (approximately 30 ft bgs).
- Soil samples were analyzed for VOCs, SVOCs, PCBs, HE compounds, RCRA metals and hexavalent chromium, total cyanide, radionuclides, and gross alpha/beta activity.
- In March 2006, a section of the parking lot was removed and two additional excavations were completed to determine if remains of the tank or southwest seepage pit were still present at the site. No indication, or remains, of a septic tank, seepage pit, seepage pit aggregate, or a northeast-trending drain line was found. It was concluded that the system components had been completely removed from the site before the parking lot and walkway were constructed.
- Also in March 2006, four exploratory borings were drilled around the center of the southwest seepage pit as it was shown on the 1980 drawing. No buried aggregate or seepage pit remains were detected.
- Two additional soil borings were advanced at the site during the March 2006 activities. The first borehole (885-SP2-BH1) was advanced in the theoretical center of the southwest seepage pit and the second (885-SP1-BH2) was advanced in the theoretical center of the northeast seepage pit. Soil samples were collected from the two 2006 boreholes at 25 ft bgs and 30 ft bgs.
- The March 2006 soil samples were analyzed at off-site laboratories for VOCs, SVOCs, PCBs, HE compounds, RCRA metals, hexavalent chromium, cyanide, and gross alpha/beta activity, and at an on-site laboratory for radionuclides by gamma spectroscopy.

Summary of Data Used for NFA Justification

- A total of 6 soil samples were collected during the 2002 and 2006 sampling events. The analytical results from both sampling events were used for the CAC justification.
- No VOCs were detected above the MDL in any of the soil samples.
- Low J-value concentrations of six SVOCs were detected in the two 2002 soil samples collected from the northeast seepage pit. There were no SVOCs detected in the 2006 soil samples.
- No PCBs and no HE compounds were detected in any of soil samples collected in 2002 and 2006.
- There were no RCRA metals detected above the NMED-approved background concentrations in any of the soil samples from 2002 and 2006. Hexavalent chromium was detected at 0.0844 J mg/kg in one soil sample collected from the southwest seepage pit in 2006.
- Cyanide was detected at 0.184 J mg/kg in one 2002 soil sample collected from the northeast seepage pit.
- No activities above the NMED-approved background levels for the four representative radionuclides were detected in any of the samples. However, although not detected, the MDAs for two of the uranium-235 and one of the uranium-238 samples collected in March 2006 exceeded their representative background activities. Gross alpha/beta results for the 2002 and 2006 soil samples collected did not exceed the background activities.

Photograph showing Backhoe Excavation #3 and the broken northern end of the old drain line running north from Building 885 and which marks the presumed location of the southern end of the former septic tank. View to the south. March 4, 2006.

Recommended Future Land Use

- Industrial land use is established for DSS Site 1101.

Results of Risk Analysis

- Risk assessment results for industrial and residential land-use scenarios are calculated per NMED risk assessment guidance as presented in "Supplemental Risk Document Supporting Class 3 Permit Modification Process.
- Because COCs were present in concentrations greater than background-screening levels or because constituents were present that did not have background-screening levels, it was necessary to perform risk assessments for the site. The risk assessment analysis evaluated the potential for adverse health effects for the residential land-use scenario.
- The total human health HI was 0.0 for the residential land-use scenario, which is lower than the NMED guideline of 1. For the residential land-use scenario the total estimated excess cancer risk was 5E-9 which is below the NMED guideline of 1E-5.
- The incremental human health TEDE for the industrial land-use scenario is 6.2E-2 mrem/yr, which is below the EPA numerical guideline of 15 mrem/yr. The incremental human health TEDE for the residential land-use scenario is 1.7E-1 mrem/yr which is below the EPA numerical guideline of 75 mrem/yr. Therefore, this site is eligible for unrestricted radiological release.
- Using the SNL predictive ecological risk methodology, it was concluded that there is not a complete ecological pathway at this site. Thus, a more detailed ecological risk assessment to predict the level of risk was not necessary.
- In conclusion, human health risks under a residential land-use scenario and ecological risks are acceptable per NMED guidance. Thus, DSS AOC 1101 is proposed for CAC without institutional controls.

Risk Assessment Values for DSS AOC 1101 Nonradiological COCs

COC Name	Maximum Concentration (mg/kg)	Residential Land Use Scenario[a] Hazard Index	Residential Land Use Scenario[a] Cancer Risk
Inorganics			
Chromium VI	0.0844 J	0.00	4E-10
Cyanide	0.184 J	0.00	--
Mercury	0.00459 J	0.00	--
Selenium	0.613 J	0.00	--
Silver	0.0487[b]	0.00	--
Organics			
Acenaphthene	0.0107 J	0.00	--
2-Chlorophenol	0.0169 J	0.00	--
Chrysene	0.0185 J	0.00	3E-10
Di-n-octylphthalate	0.15 J	0.00	--
Bis (2-ethylhexyl) phthalate	0.182 J	0.00	4E-9
Fluoranthene	0.0174 J	0.00	--
Fluorene	0.0104 J	0.00	--
Total		**0.00**	**5E-9**

[a]From EPA (1989).
[b]Maximum concentration was 0.5 detection limit.

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Sandia National Laboratories

Justification for Class III Permit Modification

January 2008

DSS Site 1101
Operable Unit 1295
Building 885 Septic System

NFA (SWMU Assessment Report) Submitted December 2003
RSI Response Submitted June 2006

Environmental
Restoration
Project

United States Department of Energy
Sandia Site Office

Sandia National Laboratories/New Mexico
Environmental Restoration Project

SWMU ASSESSMENT REPORT AND PROPOSAL FOR NO FURTHER ACTION DRAIN AND SEPTIC SYSTEMS SITE 1101, BUILDING 885 SEPTIC SYSTEM

December 2003

United States Department of Energy
Sandia Site Office

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ACRONYMS AND ABBREVIATIONS

AOC	Area of Concern
AOP	Administrative Operating Procedure
BA	butyl acetate
bgs	below ground surface
COC	constituent of concern
DSS	Drain and Septic Systems
EB	equipment blank
ER	Environmental Restoration
FIP	Field Implementation Plan
GPR	ground penetrating radar
HE	high explosive(s)
HI	hazard index
HWB	Hazardous Waste Bureau
KAFB	Kirtland Air Force Base
MDL	method detection limit
NFA	no further action
NMED	New Mexico Environment Department
OU	Operable Unit
PCB	polychlorinated biphenyl
QC	quality control
RCRA	Resource Conservation and Recovery Act
RPSD	Radiation Protection Sample Diagnostics
SAP	Sampling and Analysis Plan
SNL/NM	Sandia National Laboratories/New Mexico
SVOC	semivolatile organic compound
SWMU	Solid Waste Management Unit
TA	Technical Area
TB	trip blank
VOC	volatile organic compound

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1.0 PROJECT BACKGROUND

Environmental characterization of Sandia National Laboratories/New Mexico (SNL/NM) drain and septic systems (DSS) started in the early 1990s. These units consist of either septic systems (one or more septic tanks plumbed to either drainfields or seepage pits), or other types of miscellaneous drain units without septic tanks (including drywells or french drains, seepage pits, and surface outfalls). Initially, 23 of these sites were designated as Solid Waste Management Units (SWMUs) under Operable Unit (OU) 1295, Septic Tanks and Drainfields. Characterization work at 22 of these 23 SWMUs has taken place since 1994 as part of SNL/NM Environmental Restoration (ER) Project activities. The twenty-third site did not require any characterization, and an administrative proposal for no further action (NFA) was granted in July 1995.

Numerous other DSS sites that were not designated as SWMUs were also present throughout SNL/NM. An initial list of these non-SWMU sites was compiled and summarized in an SNL/NM document dated July 8, 1996; the list included a total of 101 sites, facilities, or systems (Bleakly July 1996). For tracking purposes, each of these 101 individual DSS sites was designated with a unique four-digit site identification number starting with 1001. This numbering scheme was devised to clearly differentiate these non-SWMU sites from existing SNL/NM SWMUs, which have been designated by one- to three-digit numbers. As work progressed on the DSS site evaluation project, it became apparent that the original 1996 list was in need of field verification and updating. This process included researching SNL/NM's extensive library of facilities engineering drawings and conducting field-verification inspections jointly with SNL/NM ER personnel and New Mexico Environment Department (NMED)/ Hazardous Waste Bureau (HWB) regulatory staff from July 1999 through January 2000. The goals of this additional work included the following:

- Determine to the degree possible whether each of the 101 systems included on the 1996 list was still in existence, or had ever existed.

- For systems confirmed or believed to exist, determine the exact or apparent locations and components of those systems (septic tanks, drainfields, seepage pits, etc.).

- Identify which systems would, or would not, need initial shallow investigation work as required by NMED.

- For systems requiring characterization, determine the specific types of shallow characterization work (including passive soil-vapor sampling and/or shallow soil borings) that would be required by NMED.

A number of additional drain systems were identified from the engineering drawings and field inspection work. It was also determined that some of the sites on the 1996 list actually contained more than one individual drain or septic system that had been combined under one four-digit site number. In order to reduce confusion, a decision was made to assign each individual system its own unique four-digit number. A new site list containing a total of 121 individual DSS sites was generated in 2000. Of these 121 sites, NMED required environmental assessment work at a total of 61. No characterization was required at the remaining 60 sites because the sites either were found not to exist, were the responsibility of other non-SNL/NM organizations, were already designated as individual SWMUs, or were considered by NMED to pose no threat to human health or the environment. Subsequent backhoe excavation at DSS Site 1091 confirmed that the system did not exist, which decreased the number of DSS sites requiring characterization to 60.

Concurrent with the field inspection and site identification work, NMED/HWB and SNL/NM ER Project technical personnel worked together to reach consensus on a staged approach and specific procedures that would be used to characterize the DSS sites, as well as the remaining OU 1295 Septic Tanks and Drainfield SWMUs that had not been approved for NFA. These procedures are described in detail in the "Sampling and Analysis Plan [SAP] for Characterizing and Assessing Potential Releases to the Environment From Septic and Other Miscellaneous Drain Systems at Sandia National Laboratories/New Mexico" (SNL/NM October 1999), which was approved by the NMED/HWB on January 28, 2000 (Bearzi January 2000). A follow-on document, "Field Implementation Plan [FIP], Characterization of Non-Environmental Restoration Drain and Septic Systems" (SNL/NM November 2001), was then written to formally document the updated DSS site list and the specific site characterization work required by the NMED for each of the 60 DSS sites. The FIP was approved by the NMED in February 2002 (Moats February 2002).

2.0 DSS SITE 1101: BUILDING 885 SEPTIC SYSTEM

2.1 Summary

The SNL/NM ER Project conducted an assessment of DSS Site 1101, the Building 885 septic system. There are no known or specific environmental concerns at this site. The assessment was conducted to determine whether environmental contamination was released to the environment via the septic system present at the site. This report presents the results of the assessment and, based upon the findings, recommends a risk-based proposal for NFA for DSS Site 1101. This NFA proposal provides documentation that the site was sufficiently characterized, that no significant releases of contaminants to the environment occurred via the Building 885 septic system, and that it does not pose a threat to human health or the environment under either an industrial or residential land-use scenario. Current operations at the site are conducted in accordance with applicable laws and regulations that are protective of the environment, and septic system discharges are now directed to the City of Albuquerque sewer system.

Review and analysis of all relevant data for DSS Site 1101 indicate that concentrations of constituents of concern (COCs) at this site were found to be below applicable risk assessment action levels. Thus DSS Site 1101 is proposed for an NFA decision based upon sampling data demonstrating that COCs released from the site into the environment pose an acceptable level of risk under current and projected future land uses as set forth by Criterion 5, which states: "The SWMU/AOC [Area of Concern] has been characterized or remediated in accordance with current applicable state or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use" (NMED March 1998).

2.2 Site Description and Operational History

2.2.1 Site Description

DSS Site 1101 is located on the north side of SNL/NM Technical Area (TA)-I on federally owned land controlled by Kirtland Air Force Base (KAFB) and permitted to the U.S. Department of Energy (Figure 2.2.1-1). An SNL/NM Facilities Engineering drawing indicates that the Building 885 septic system was situated approximately 100 feet north of the northwest corner of Building 885. This location is now beneath a large asphalt parking lot that is north of Building 885, on the north side of "H" Street. The abandoned septic system consisted of a septic tank and distribution box that emptied to a 5-foot-diameter by an estimated 25-foot-deep seepage pit located approximately 45 feet northeast of the septic tank (Figure 2.2.1-2).

Construction details for this system are based solely on an SNL/NM engineering drawing (SNL/NM June 1980) because no surface expression of this system remains. No backhoe excavation was conducted to locate the system at this site, which has been paved. An attempt to locate the seepage pit using ground penetrating radar (GPR) equipment was completed on June 21, 2002. However, the survey results were inconclusive as to the actual location of the system. The GPR investigation is described in Section 3.3.

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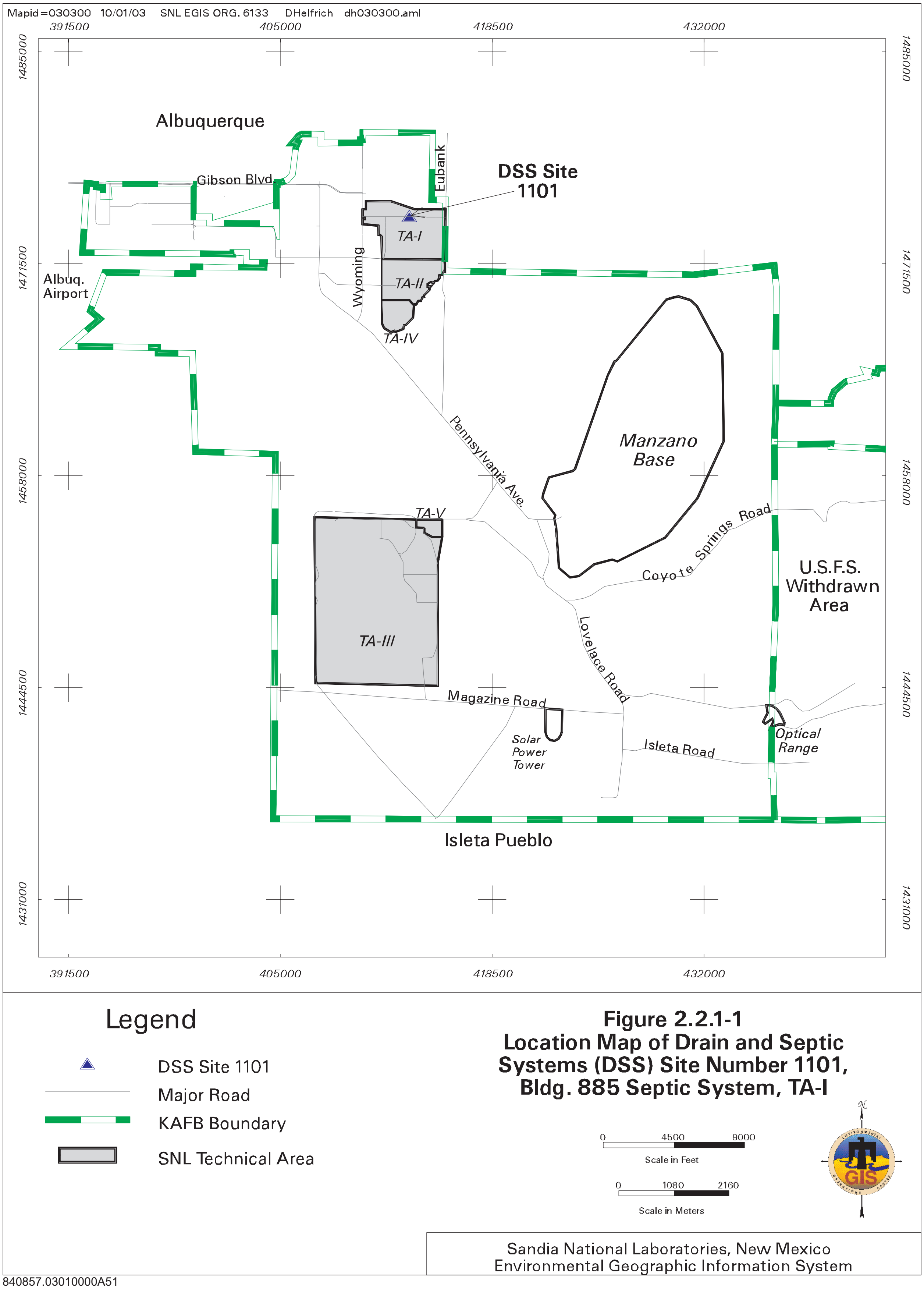

Figure 2.2.1-1
Location Map of Drain and Septic Systems (DSS) Site Number 1101, Bldg. 885 Septic System, TA-I

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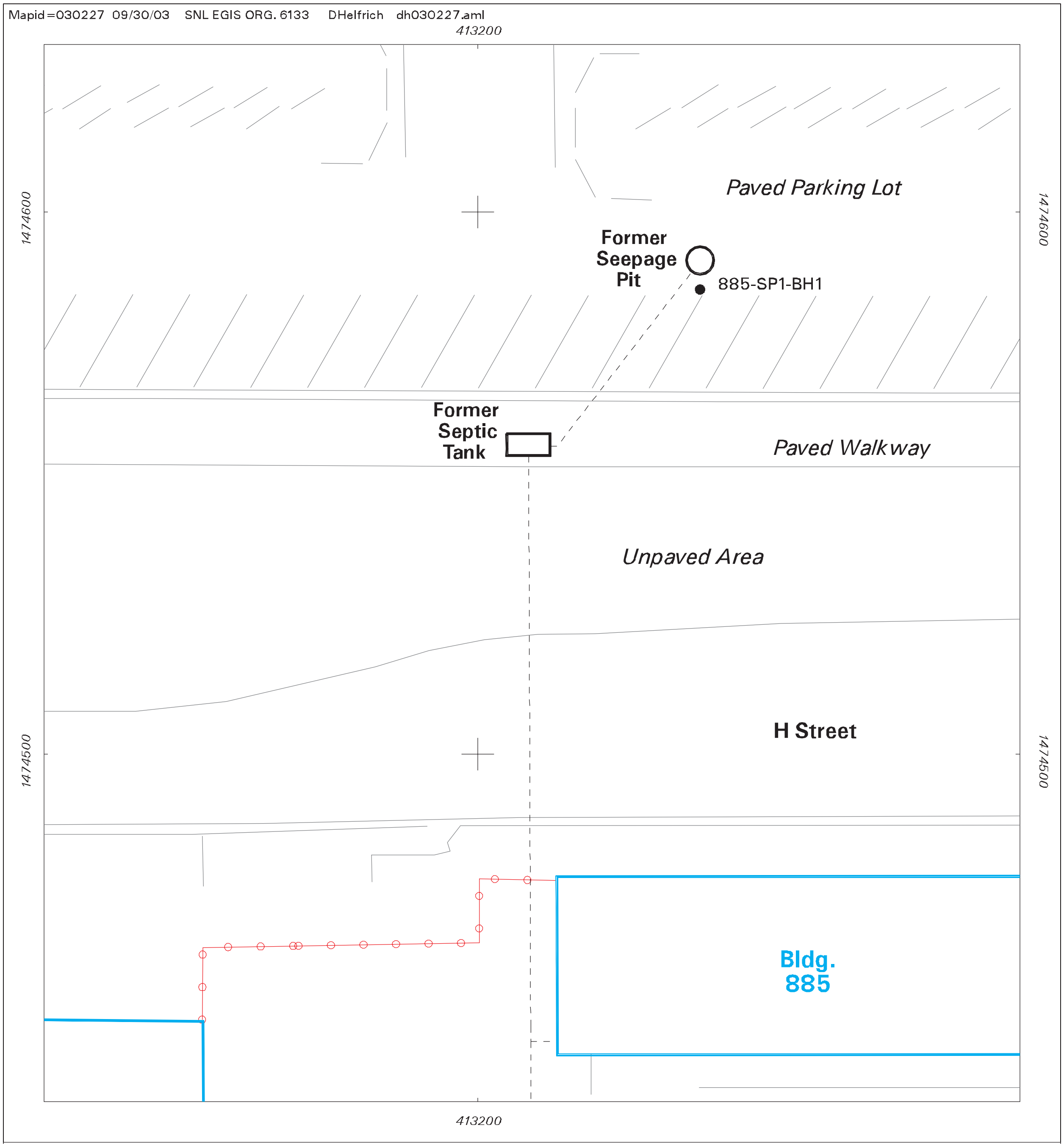

Legend

- Borehole Location
- Septic Tank / Seepage Pit
- Drain Line
- Building / Structure
- Fence
- Edge of Pavement / Parking

Figure 2.2.1-2
Site Map of Drain and Septic Systems (DSS) Site Number 1101, Building 885 Septic System, TA-I

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

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DSS Site 1101 is located on a partially dissected piedmont surface formed by coalescing Holocene and Pleistocene alluvial fans originating in the Sandia and Manzanita Mountains. These deposits are underlain by the Upper Santa Fe Group, which is composed primarily of two interfingering facies: alluvial fan and fluvial facies. Both facies are less than 5 million years old and are composed of unconsolidated to poorly cemented gravel, sand, silt, and clay. These deposits extend to, and probably far below, the water table at this site. The alluvial fan deposits are derived from Tijeras Canyon, which bisects the Sandia and Manzanita Mountains to the east. The fluvial facies are derived from the ancestral Rio Grande and are typically well-sorted with relatively high hydraulic conductivities (SNL/NM June 2003).

The ground surface in the vicinity of DSS Site 1101, which is mostly paved, is very slightly inclined to the west. Precipitation drains from the parking lot to subsurface storm drains on the south and west sides of the parking lot. Storm water is then conveyed in a southerly direction via a subsurface storm drain into an open storm-water channel that discharges to Tijeras Arroyo approximately 1.5 miles south of the site. No perennial surface-water bodies are present in the vicinity of the site. Average annual rainfall in the SNL/NM and KAFB area, as measured at Albuquerque International Sunport, is 8.1 inches (NOAA 1990). Infiltration of precipitation is essentially nonexistent as virtually all of the moisture either drains away from the site or evaporates. The estimates of evapotranspiration rates for the KAFB area range from 95 to 99 percent of the annual rainfall (Thompson and Smith 1985, SNL/NM March 1996).

The site lies at an average elevation of approximately 5,432 feet above mean sea level (SNL/NM April 1995). Two water-bearing zones, a shallow groundwater system and the regional aquifer, underlie the site. Depth to the shallow groundwater system, which has a limited lateral extent and is present beneath the north-central part of KAFB, is approximately 310 feet below ground surface (bgs) at the site. The shallow groundwater system is not used as a water supply source. Depth to the regional groundwater aquifer is approximately 560 feet bgs. Both the City of Albuquerque and KAFB use the regional groundwater aquifer as a water supply source. Groundwater flow in the shallow groundwater system is to the southeast, while that in the regional aquifer is to the northwest beneath DSS Site 1101 (SNL/NM June 2003). The nearest production wells to DSS Site 1101 are KAFB-1 and KAFB-11 which are approximately 1.1 miles southwest and 1.3 miles southeast of the site, respectively. The nearest groundwater monitoring wells are the perched and regional aquifer well pair TA1-W-08 and TA1-W-05, which are located approximately 800 feet north of the site.

2.2.2 Operational History

Available information indicates that Building 885 was constructed in 1953 (SNL/NM March 2003) as a building materials warehouse, and it is assumed the septic system was constructed at that time. Because operational records are not available, the investigation of the site was planned to be consistent with other DSS site investigations and to sample for the COCs most commonly found at similar facilities. In 1988, Building 885 was connected to the City of Albuquerque sanitary sewer system, and it is assumed that the septic system was abandoned and paved over at that time (SNL/NM August 1988).

2.3 Land Use

2.3.1 Current Land Use

The current land use for DSS Site 1101 is industrial.

2.3.2 Future/Proposed Land Use

The projected future land use for DSS Site 1101 is industrial (DOE et al. September 1995).

3.0 INVESTIGATORY ACTIVITIES

3.1 Summary

Three assessment investigations have been conducted at this site. In 2002, a backhoe was used to physically locate a portion of the buried drain line running north from Building 885 to the septic system (Investigation 1). In June 2002, a GPR survey was conducted to attempt to locate the position of the septic system seepage pit (Investigation 2). In October 2002, subsurface soil samples were collected from a boring drilled through the parking lot asphalt at a location approximately 5 feet south of the presumed center of the seepage pit (Investigation 3). These three investigations were required by the NMED/HWB to adequately characterize the site and were conducted in accordance with procedures presented in the SAP (SNL/NM October 1999) and FIP (SNL/NM November 2001) described in Chapter 1.0. These investigations are discussed in the following sections.

3.2 Investigation 1—Backhoe Excavation

On March 26, 2002, a backhoe was used to locate and expose the septic system drain line shown on the engineering drawing (SNL/NM June 1980) running north from the northwest corner of Building 885 to the former septic system. The line was located at an average depth of approximately 5 feet in the unpaved strip between “H” Street and the south side of the parking lot. The line was followed north to the point where it continued under the paved pedestrian walkway on the south side of the parking lot (Figure 2.2.1-2). The backhoe work was stopped at this point in order to prevent damage to the concrete curb and gutter and asphalt pavement and evaluate noninvasive methods that might be used to locate the seepage pit beneath the pavement. The location of the trench excavated to expose the drain line in this area is marked by orange pinflags shown in Figure 3.2-1. No visible evidence of stained or discolored soil indicating possible leakage from the drain line was observed during the excavating procedure. No samples were collected during the backhoe excavation at the site.

3.3 Investigation 2—GPR Survey

On June 21, 2002, a GPR survey was conducted at the site to attempt to precisely determine the location and depth of the septic system seepage pit. A 70- by 40-foot area centered on the presumed location of the seepage pit, indicated on the SNL/NM engineering drawing (SNL/NM June 1980), was surveyed with the GPR equipment. The technique identified a 70- by 10-foot rectangular area of “subsurface structure,” but it was not possible to locate specific structures within the rectangular area. However, two possible seepage pit locations, including the location indicated on the engineering drawing, were identified as a result of the survey (IE-T June 2002). Given the inconclusive and ambiguous results of this survey, it was concluded that the engineering drawing provided the best available information showing the location of the unit.

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Figure 3.2-1
Two orange pinflags mark the location of the DSS Site 1101, Building 885 septic system, drain line running north from Building 885 (upper left of photo) and beneath “H” Street. View to the south. March 26, 2002

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3.4 Investigation 3—Soil Sampling

Soil sampling was conducted at this site in accordance with the rationale and procedures in the SAP (SNL/NM October 1999) approved by the NMED. On October 21, 2002, an initial borehole was drilled at the center of the seepage pit location (Figure 3.4-1) shown on the June 1980 engineering drawing. At a depth of 23 feet, concrete or metal assumed to be remains of the seepage pit was encountered causing auger refusal. Because further attempts to drill deeper at this location could have resulted in a stuck drill string and lost tools, it was decided to abandon this initial borehole and relocate to an offset location 5 feet south of the first boring. On October 22, a second borehole was drilled at the offset location (shown on Figure 2.2.1-2), and soil samples were successfully collected from an upper depth interval starting at the estimated base of the seepage pit at 25 feet bgs and a second deeper interval starting at 30 feet bgs. A summary of the boreholes, sample depths, sample analyses, analytical methods, laboratories, and sample dates are presented in Table 3.4-1.

3.4.1 Soil Sampling Methodology

An auger drill rig was used to sample the borehole at two depth intervals. In the borehole drilled on the south side of the seepage pit, the shallow sample interval started at the estimated base of the gravel aggregate in the bottom of the seepage pit, and the lower (deep) interval started 5 feet beneath the top of the upper interval. Once the auger rig had reached the top of the sampling interval, a 3-foot-long by 1.5-inch inside diameter Geoprobe™ sampling tube lined with a butyl acetate (BA) sampling sleeve was inserted into the borehole and hydraulically driven downward 3 feet to fill the tube with soil.

Once the sample tube was retrieved from the borehole, the sample for volatile organic compound (VOC) analysis was immediately collected by slicing off a 3- to 4-inch section from the lower end of the BA sleeve and capping the section ends with Teflon film, then a rubber end cap, and finally sealing the tube with tape.

For the non-VOC analyses, the soil remaining in the BA liner was emptied into a decontaminated mixing bowl, and aliquots of soil were transferred into appropriate sample containers for analysis. On occasion, the amount of soil recovered in the first sampling run was insufficient for sample volume requirements. In this case, additional sampling runs were completed until an adequate soil volume was recovered. Soil recovered from these additional runs was emptied into the mixing bowl and blended with the soil already collected. Aliquots of the blended soil were then transferred into sample containers and submitted for analysis.

All samples were documented and handled in accordance with applicable SNL/NM operating procedures and transported to on- and off-site laboratories for analysis. The area sampled, analytical methods, and laboratories used for the DSS Site 1101 soil samples are summarized in Table 3.4-1.

3.4.2 Soil Sampling Results and Conclusions

Analytical results for the soil samples collected at DSS Site 1101 are presented and discussed in this section. Samples were collected from the borehole location shown on Figure 2.2.1-2.

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Figure 3.4-1
Auger drilling at the DSS Site 1101, Building 885 septic system seepage pit location in the parking lot north of Building 885, shown in the center-left side of the photo.
View to the southwest. October 21, 2002

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Table 3.4-1
Summary of Area Sampled, Analytical Methods, and Laboratories Used for DSS Site 1101,
Building 885 Septic System Soil Samples

Sampling Area	Number of Borehole Locations	Top of Sampling Intervals in each Borehole (ft bgs)	Total Number of Soil Samples	Total Number of Duplicate Samples	Analytical Parameters and EPA Methods[a]	Analytical Laboratory	Date Samples Collected
Seepage Pit	1	25, 30	2	0	VOCs EPA Method 8260	GEL	10-22-02
	1	25, 30	2	0	SVOCs EPA Method 8270	GEL	10-22-02
	1	25, 30	2	0	PCBs EPA Method 8082	GEL	10-22-02
	1	25, 30	2	0	HE EPA Method 8330	GEL	10-22-02
	1	25, 30	2	0	RCRA Metals EPA Methods 6020/7000	GEL	10-22-02
	1	25, 30	2	0	Hexavalent Chromium EPA Method 7196A	GEL	10-22-02
	1	25, 30	2	0	Total Cyanide EPA Method 9012A	GEL	10-22-02
	1	25, 30	2	0	Gamma Spectroscopy EPA Method 901.1	RPSD	10-22-02
	1	25, 30	2	0	Gross Alpha/Beta Activity EPA Method 900.0	GEL	10-22-02

[a]EPA November 1986.
bgs = Below ground surface.
DSS = Drain and Septic Systems.
EPA = U.S. Environmental Protection Agency.
ft = Foot (feet).
GEL = General Engineering Laboratories, Inc.
HE = High explosive(s).
PCB = Polychlorinated biphenyl.
RCRA = Resource Conservation and Recovery Act.
RPSD = Radiation Protection Sample Diagnostics Laboratory.
SVOC = Semivolatile organic compound.
VOC = Volatile organic compound.

VOCs

VOC analytical results for the two soil samples collected from the seepage pit borehole are summarized in Table 3.4.2-1. The method detection limits (MDLs) for the VOC analyses are presented in Table 3.4.2-2. No VOCs were detected in either of the soil samples collected from this site, or in the trip blank (TB) associated with these samples.

SVOCs

Semivolatile organic compound (SVOC) analytical results for the two soil samples collected from the seepage pit borehole are summarized in Table 3.4.2-3. The MDLs for the SVOC analyses are presented in Table 3.4.2-4. As shown in Table 3.4.2-3, a total of six SVOCs were detected in the shallow sample and only two SVOCs were detected in the deep sample. Also, because two of the six SVOCs detected in the shallow sample were detected in the deep sample, this suggests that the contamination is limited to the area immediately beneath the seepage pit and has not migrated beyond the unit.

PCBs

Polychlorinated biphenyl (PCB) analytical results for the two soil samples collected from the seepage pit borehole are summarized in Table 3.4.2-5. The MDLs for the PCB analyses are presented in Table 3.4.2-6. No PCBs were detected in either of the samples collected from this site.

HE Compounds

High explosive (HE) compound analytical results for the two soil samples collected from the seepage pit borehole are summarized in Table 3.4.2-7. The MDLs for the HE compound analyses are presented in Table 3.4.2-8. No HE compounds were detected in either of the samples collected from this site. The HE samples from this site were reanalyzed, as explained in Section 3.4.3.

RCRA Metals and Hexavalent Chromium

Resource Conservation and Recovery Act (RCRA) metals and hexavalent chromium analytical results for the two soil samples collected from the seepage pit borehole are summarized in Table 3.4.2-9. The MDLs for the metals analyses are presented in Table 3.4.2-10. None of the metal concentrations detected in these samples exceeded the corresponding NMED-approved background concentrations.

Total Cyanide

Total cyanide analytical results for the two soil samples collected from the seepage pit borehole are summarized in Table 3.4.2-11. The MDLs for the cyanide analyses are presented in Table 3.4.2-12. As shown in Table 3.4.2-11, cyanide was detected in the 25-foot-bgs sample; cyanide was not detected in the 30-foot-bgs sample from the borehole.

Table 3.4.2-1
Summary of DSS Site 1101, Building 885 Septic System
Confirmatory Soil Sampling, VOC Analytical Results
October 2002
(Off-Site Laboratory)

Sample Attributes			VOCs (EPA Method 8260[a]) (µg/kg)
Record Number [b]	ER Sample ID	Sample Depth (ft)	
605786	885-SP1-BH1-25-S	25	ND
605786	885-SP1-BH1-30-S	30	ND
Quality Assurance/Quality Control Samples (all in µg/L)			
605786	885-SP1-TB	NA	ND

[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
BH = Borehole.
DSS = Drain and Septic Systems.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
ID = Identification.
µg/kg = Microgram(s) per kilogram.
µg/L = Microgram(s) per liter.
NA = Not applicable.
ND = Not detected.
S = Soil sample.
SP = Seepage pit.
TB = Trip blank.
VOC = Volatile organic compound.

Table 3.4.2-2
Summary of DSS Site 1101, Building 885 Septic System
Confirmatory Soil Sampling, VOC Analytical MDLs
October 2002
(Off-Site Laboratory)

Analyte	EPA Method 8260[a] Detection Limit (µg/kg)
Acetone	3.52
Benzene	0.45
Bromodichloromethane	0.49
Bromoform	0.49
Bromomethane	0.5
2-Butanone	3.74
Carbon disulfide	2.36
Carbon tetrachloride	0.49
Chlorobenzene	0.41
Chloroethane	0.81
Chloroform	0.52
Chloromethane	0.37
Dibromochloromethane	0.5
1,1-Dichloroethane	0.47
1,2-Dichloroethane	0.43
1,1-Dichloroethene	0.5
cis-1,2-Dichloroethene	0.47
trans-1,2-Dichloroethene	0.53
1,2-Dichloropropane	0.48
cis-1,3-Dichloropropene	0.43
trans-1,3-Dichloropropene	0.25
Ethylbenzene	0.38
2-Hexanone	3.77
4-Methyl-2-pentanone	4.03
Methylene chloride	1.35
Styrene	0.39
1,1,2,2-Tetrachloroethane	0.91
Tetrachloroethene	0.38
Toluene	0.34
1,1,1-Trichloroethane	0.53
1,1,2-Trichloroethane	0.54
Trichloroethene	0.45
Vinyl acetate	1.78
Vinyl chloride	0.56
Xylene	0.39

[a]EPA November 1986.
DSS = Drain and Septic Systems.
EPA = U.S. Environmental Protection Agency.
MDL = Method detection limit.
µg/kg = Microgram(s) per kilogram.
VOC = Volatile organic compound.

Table 3.4.2-3
Summary of DSS Site 1101, Building 885 Septic System, Confirmatory Soil Sampling
SVOC Analytical Results, October 2002
(Off-Site Laboratory)

Sample Attributes			SVOCs (EPA Method 8270[a]) (µg/kg)						
Record Number[b]	ER Sample ID	Sample Depth (ft)	Acenaphthene	2-Chlorophenol	Chrysene	Di-n-octyl phthalate	bis(2-Ethylhexyl) phthalate	Fluoranthene	Fluorene
605786	885-SP1-BH1-25-S	25	**10.7 J (33.3)**	**16.9 J (333)**	**18.5 J (33.3)**	ND (30.3)	**31.7 J (333)**	**17.4 J (33.3)**	**10.4 J (33.3)**
605786	885-SP1-BH1-30-S	30	ND (8)	ND (15.3)	ND (16.7)	**150 J (333)**	**182 J (333)**	ND (16.7)	ND (4)

Note: Values in **bold** represent detected analytes.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
BH = Borehole.
DSS = Drain and Septic Systems.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
ID = Identification.
J ( ) = The reported value is greater than or equal to the MDL but is less than the practical quantitation limit, shown in parentheses.
MDL = Method detection limit.
µg/kg = Microgram(s) per kilogram.
ND ( ) = Not detected above the MDL, shown in parentheses.
S = Soil sample.
SP = Seepage pit.
SVOC = Semivolatile organic compound.

Table 3.4.2-4
Summary of DSS Site 1101, Building 885 Septic System
Confirmatory Soil Sampling, SVOC Analytical MDLs
October 2002
(Off-Site Laboratory)

Analyte	EPA Method 8270[a] Detection Limit (µg/kg)
Acenaphthene	8
Acenaphthylene	16.7
Anthracene	16.7
Benzo(a)anthracene	16.7
Benzo(a)pyrene	16.7
Benzo(b)fluoranthene	16.7
Benzo(ghi)perylene	16.7
Benzo(k)fluoranthene	16.7
4-Bromophenyl phenyl ether	34
Butylbenzyl phthalate	28.7
Carbazole	16.7
4-Chlorobenzenamine	167
bis(2-Chloroethoxy)methane	12.3
bis(2-Chloroethyl)ether	37.3
bis-Chloroisopropyl ether	11
4-Chloro-3-methylphenol	167
2-Chloronaphthalene	13.7
2-Chlorophenol	15.3
4-Chlorophenyl phenyl ether	19.7
Chrysene	16.7
o-Cresol	26
Dibenz(a,h)anthracene	16.7
Dibenzofuran	17
1,2-Dichlorobenzene	10
1,3-Dichlorobenzene	11.3
1,4-Dichlorobenzene	15.7
3,3'-Dichlorobenzidine	167
2,4-Dichlorophenol	20.7
Diethylphthalate	17.7
2,4-Dimethylphenol	167
Dimethylphthalate	18.3
Di-n-butyl phthalate	24
Dinitro-o-cresol	167
2,4-Dinitrophenol	167
2,4-Dinitrotoluene	25.3
2,6-Dinitrotoluene	33.3
Di-n-octyl phthalate	30.3
Diphenyl amine	22.3
bis(2-Ethylhexyl) phthalate	30
Fluoranthene	16.7
Fluorene	4
Hexachlorobenzene	20
Hexachlorobutadiene	12.7

Refer to footnotes at end of table.

Table 3.4.2-4 (Concluded)
Summary of DSS Site 1101, Building 885 Septic System
Confirmatory Soil Sampling, SVOC Analytical MDLs
October 2002
(Off-Site Laboratory)

Analyte	EPA Method 8270[a] Detection Limit (µg/kg)
Hexachlorocyclopentadiene	167
Hexachloroethane	22
Indeno(1,2,3-cd)pyrene	16.7
Isophorone	16
2-Methylnaphthalene	16.7
4-Methylphenol	33.3
Naphthalene	16.7
2-Nitroaniline	167
3-Nitroaniline	167
4-Nitroaniline	37
Nitrobenzene	20.3
2-Nitrophenol	17
4-Nitrophenol	167
n-Nitrosodipropylamine	22.7
Pentachlorophenol	167
Phenanthrene	16.7
Phenol	12.7
Pyrene	16.7
1,2,4-Trichlorobenzene	12.7
2,4,5-Trichlorophenol	17.3
2,4,6-Trichlorophenol	27.3

[a]EPA November 1986.
DSS = Drain and Septic Systems.
EPA = U.S. Environmental Protection Agency.
MDL = Method Detection Limit.
µg/kg = Microgram(s) per kilogram.
SVOC = Semivolatile organic compound.

Table 3.4.2-5
Summary of DSS Site 1101, Building 885 Septic System
Confirmatory Soil Sampling, PCB Analytical Results
October 2002
(Off-Site Laboratory)

Sample Attributes			PCBs (EPA Method 8082[a]) (µg/kg)
Record Number[b]	ER Sample ID	Sample Depth (ft)	
605786	885-SP1-BH1-25-S	25	ND
605786	885-SP1-BH1-30-S	30	ND

[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
BH = Borehole.
DSS = Drain and Septic Systems.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
ID = Identification.
µg/kg = Microgram(s) per kilogram.
ND = Not detected.
PCB = Polychlorinated biphenyl.
S = Soil sample.
SP = Seepage pit.

Table 3.4.2-6
Summary of DSS Site 1101, Building 885 Septic System
Confirmatory Soil Sampling, PCB Analytical MDLs
October 2002
(Off-Site Laboratory)

Analyte	EPA Method 8270[a] Detection Limit (µg/kg)
Aroclor-1016	1
Aroclor-1221	2.82
Aroclor-1232	1.67
Aroclor-1242	1.67
Aroclor-1248	1
Aroclor-1254	0.5
Aroclor-1260	1

[a]EPA November 1986.
DSS = Drain and Septic Systems.
EPA = U.S. Environmental Protection Agency.
MDL = Method detection limit.
µg/kg = Microgram(s) per kilogram.
PCB = Polychlorinated biphenyl.

Table 3.4.2-7
Summary of DSS Site 1101, Building 885 Septic System
Confirmatory Soil Sampling, HE Compounds Analytical Results
October 2002
(Off-Site Laboratory)

Sample Attributes			HE (EPA Method 8330[a]) (µg/kg)
Record Number [b]	ER Sample ID	Sample Depth (ft)	
605786	885-SP1-BH1-25-S	25	ND H
605786	885-SP1-BH1-30-S	30	ND

[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
BH = Borehole.
DSS = Drain and Septic Systems.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
H = The holding time was exceeded for the associated sample analysis.
HE = High explosive(s).
ID = Identification.
µg/kg = Microgram(s) per kilogram.
ND = Not detected.
S = Soil sample.
SP = Seepage pit.

Table 3.4.2-8
Summary of DSS Site 1101, Building 885 Septic System
Confirmatory Soil Sampling, HE Compounds Analytical MDLs
October 2002
(Off-Site Laboratory)

Analyte	EPA Method 8330[a] Detection Limit (µg/kg)
2-Amino-4,6-dinitrotoluene	18.1
4-Amino-2,6-dinitrotoluene	34.1
1,3-Dinitrobenzene	34.1
2,4-Dinitrotoluene	55
2,6-Dinitrotoluene	48
HMX	48
Nitrobenzene	48
2-Nitrotoluene	24
3-Nitrotoluene	24
4-Nitrotoluene	24
RDX	48
Tetryl	22.1
1,3,5-Trinitrobenzene	29
2,4,6-Trinitrotoluene	48

[a]EPA November 1986.
DSS = Drain and Septic Systems.
EPA = U.S. Environmental Protection Agency.
HE = High explosive(s).
HMX = Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine.
MDL = Method detection limit.
µg/kg = Microgram(s) per kilogram.
RDX = Hexahydro-1,3,5-trinitro-1,3,5-triazine.
Tetryl = 2,4,6-trinitrophenylmethylnitramine.

Table 3.4.2-9
Summary of DSS Site 1101, Building 885 Septic System
Confirmatory Soil Sampling, Metals Analytical Results
October 2002
(Off-Site Laboratory)

Sample Attributes			Metals (EPA Methods 6020/7000/7196A[a]) (mg/kg)								
Record Number[b]	ER Sample ID	Sample Depth (ft)	Arsenic	Barium	Cadmium	Chromium	Chromium (VI)	Lead	Mercury	Selenium	Silver
605786	885-SP1-BH1-25-S	25	1.97	56.2 J	0.187 J (0.481)	11.8	ND (0.0533)	4.29	0.00124 J (0.00897)	0.613 J	ND (0.0867)
605786	885-SP1-BH1-30-S	30	2.15	85.7 J	0.158 J (0.495)	7.44	ND (0.0533)	4.68	0.00459 J (0.00913)	0.288 J (0.495)	ND (0.0893)
Background Concentration—North Area Supergroup[c]			4.4	200	0.9	12.8	NC	11.2	<0.1	<1	<1

[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]Dinwiddie September 1997.
BH = Borehole.
DSS = Drain and Septic Systems.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
ID = Identification.
J ( ) = The reported value is greater than or equal to the MDL but is less than the practical quantitation limit, shown in parentheses.
J = Analytical result was qualified as an estimated value during data validation.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
NC = Not calculated.
ND ( ) = Not detected above the MDL, shown in parentheses.
S = Soil sample.
SP = Seepage pit.

Table 3.4.2-10
Summary of DSS Site 1101, Building 885 Septic System
Confirmatory Soil Sampling, Metals Analytical MDLs
October 2002
(Off-Site Laboratory)

Analyte	EPA Method 6020/7000/7196A[a] Detection Limit (mg/kg)
Arsenic	0.198–0.204
Barium	0.0641–0.066
Cadmium	0.046–0.0473
Chromium	0.155–0.16
Chromium (VI)	0.0533
Lead	0.273–0.281
Mercury	0.000882–0.000898
Selenium	0.156–0.16
Silver	0.0867–0.0893

[a]EPA November 1986.
DSS = Drain and Septic Systems.
EPA = U.S. Environmental Protection Agency.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.

Table 3.4.2-11
Summary of DSS Site 1101, Building 885 Septic System
Confirmatory Soil Sampling, Total Cyanide Analytical Results
October 2002
(Off-Site Laboratory)

Sample Attributes			Total Cyanide (EPA Method 9012[a]) (mg/kg)
Record Number[b]	ER Sample ID	Sample Depth (ft)	Total Cyanide
605786	885-SP1-BH1-25-S	25	**0.184 J (0.244)**
605786	885-SP1-BH1-30-S	30	ND (0.0378)

Note: Values in **bold** represent detected analytes.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
BH = Borehole.
DSS = Drain and Septic Systems.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
ID = Identification.
J ( ) = The reported value is greater than or equal to the MDL but is less than the practical quantitation limit, shown in parentheses.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
ND ( ) = Not detected above the MDL, shown in parentheses.
S = Soil sample.
SP = Seepage pit.

Table 3.4.2-12
Summary of DSS Site 1101, Building 885 Septic System
Confirmatory Soil Sampling, Total Cyanide Analytical MDLs
October 2002
(Off-Site Laboratory)

Analyte	EPA Method 9012A[a] Detection Limit (mg/kg)
Total Cyanide	0.0378–0.0409

[a]EPA November 1986.
DSS = Drain and Septic Systems.
EPA = U.S. Environmental Protection Agency.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.

Radionuclides

Radionuclide analytical results for the gamma spectroscopy analysis of the two soil samples collected from the seepage pit borehole are summarized in Table 3.4.2-13. No activities above NMED-approved background levels were detected in the samples from this site.

Gross Alpha/Beta Activity

Gross alpha/beta analytical results for the two soil samples collected from the seepage pit borehole are summarized in Table 3.4.2-14. No gross alpha or beta activity above the New Mexico-established background levels (Miller September 2003) was detected in either of the samples. These results indicate no significant levels of radioactive material are present in the soil at the site.

3.4.3 Soil Sampling Quality Assurance/Quality Control Samples and Data Validation Results

Quality assurance/quality control (QC) samples were collected at an approximate frequency of 1 per 20 field samples. These typically included duplicate, equipment blank (EB), and TB samples. Typically, samples were shipped to the laboratory in batches of 20, so that any one shipment might contain samples from several sites. Aqueous EB samples were collected at an approximate frequency of 1 per 20 samples and sent to the laboratory. The EB samples were analyzed for the same analytical suite as the soil samples in that shipment. Aqueous TB samples were used for VOC analysis only and were included in every sample cooler containing VOC soil samples. The analytical results for the EB and TB samples appear only on the data tables for the last site sampled in any one shipment, although the results were used in the data validation process for all the samples in that batch.

An aqueous TB sample was included in the sample cooler containing the VOC soil samples collected from the Building 885 septic system and other DSS sites in October 2002. As shown in Table 3.4.2-1, no VOCs were detected in this TB sample. No duplicate or EB samples were collected at this site.

Table 3.4.2-13
Summary of DSS Site 1101, Building 885 Septic System Confirmatory Soil Sampling
Gamma Spectroscopy Analytical Results, October 2002
(On-Site Laboratory)

Sample Attributes			Activity (EPA Method 901.1[a]) (pCi/g)							
Record Number[b]	ER Sample ID	Sample Depth (ft)	Cesium-137		Thorium-232		Uranium-235		Uranium-238	
			Result	Error[c]	Result	Error[c]	Result	Error[c]	Result	Error[c]
605791	885-SP1-BH1-25-S	25	ND (0.0264)	--	0.564	0.265	ND (0.159)	--	ND (0.386)	--
605791	885-SP1-BH1-30-S	30	ND (0.0286)	--	0.617	0.29	ND (0.172)	--	ND (0.419)	--
Background Activity—North Area Supergroup[d]			0.084	NA	1.54	NA	0.18	NA	1.3	NA

[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]Two standard deviations about the mean detected activity.
[d]Dinwiddie September 1997.
BH = Borehole.
DSS = Drain and Septic Systems.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
ID = Identification.
MDA = Minimum detectable activity.
NA = Not applicable.
ND ( ) = Not detected above the MDA, shown in parentheses.
pCi/g = Picocuries per gram.
S = Soil sample.
SP = Seepage pit.
-- = Error not calculated for nondetected results.

Table 3.4.2-14
Summary of DSS Site 1101, Building 885 Septic System
Confirmatory Soil Sampling, Gross Alpha and Beta Analytical Results
October 2002
(Off-Site Laboratory)

Sample Attributes			Activity (EPA Method 900.0[a]) (pCi/g)			
Record Number[b]	ER Sample ID	Sample Depth (ft)	Gross Alpha		Gross Beta	
			Result	Error[c]	Result	Error[c]
605786	885-SP1-BH1-25-S	25	5.91	1.34	16.8	2.23
605786	885-SP1-BH1-30-S	30	10.3	1.69	17.7	1.29
Background Activity[d]			17.4	NA	35.4	NA

[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]Two standard deviations about the mean detected activity.
[d]Miller September 2003.
BH = Borehole.
DSS = Drain and Septic Systems.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
ID = Identification.
NA = Not applicable.
pCi/g = Picocuries per gram.
S = Soil sample.
SP = Seepage pit.

All laboratory data were reviewed and verified/validated according to Data Verification/Validation Level 3 (SNL/NM July 1994) or Data Validation Procedure for Chemical and Radiochemical Data in SNL/NM ER Project Data Validation Procedure for Chemical and Radiochemical Data, AOP [Administrative Operating Procedure] 00-03, Rev. 0 (SNL/NM December 1999). In addition, SNL/NM Department 7713 (RPSD Laboratory) reviewed all gamma spectroscopy results according to "Laboratory Data Review Guidelines," Procedure No. RPSD-02-11, Issue No. 2 (SNL/NM July 1996). Annex A contains the data validation reports for the samples collected at this site.

As shown in Annex A, the HE compound HMX was initially detected in the HE sample from the 25-foot depth interval. However, internal laboratory QC procedures suggested that the compound was not actually present; as a result, a reanalysis was requested by SNL/NM sample management personnel. The reanalysis was performed, and HMX was not detected the second time. However, by then the holding time for the HE analysis (14 days for extraction) of the original sample had expired. Therefore, the revised HE results for the 25-foot sample were qualified "H" to indicate a missed holding time (Table 3.4.2-7). Aside from this problem, the data are acceptable for use in this NFA proposal.

3.5 Site Sampling Data Gaps

Analytical data from the site assessment were sufficient for characterizing the nature and extent of possible COC releases. There are no further data gaps regarding characterization of DSS Site 1101.

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4.0 CONCEPTUAL SITE MODEL

The conceptual site model for DSS Site 1101, the Building 885 septic system, is based upon the COCs identified in the soil samples collected from beneath the seepage pit at this site. This chapter summarizes the nature and extent of contamination and the environmental fate of the COCs.

4.1 Nature and Extent of Contamination

Potential COCs at DSS Site 1101 are VOCs, SVOCs, PCBs, HE compounds, cyanide, RCRA metals, hexavalent chromium, and radionuclides. There were no VOCs, PCBs, HE compounds, or hexavalent chromium detected in any of the soil samples collected at this site. Up to seven SVOCs were detected in the SVOC samples, and cyanide was detected in one of the two cyanide samples collected from the site. None of the eight RCRA metals were detected at concentrations above the approved maximum background concentrations for SNL/NM North Area Supergroup soil (Dinwiddie September 1997). However, when a metal concentration exceeded its maximum background screening value or the nonquantifiable background value, it was carried forward in the risk assessment process. None of the four representative gamma spectroscopy radionuclides were detected at activities exceeding the corresponding background levels. Finally, gross alpha/beta activity indicated no significant radioactive contamination at the site.

4.2 Environmental Fate

Potential COCs may have been released into the vadose zone via aqueous effluent discharged from the septic system seepage pit. Possible secondary release mechanisms include the uptake of COCs that may have been released into the soil beneath the seepage pit (Figure 4.2-1). The depth to groundwater at the site (approximately 310 and 560 feet bgs to the shallow and regional aquifers, respectively) precludes migration of potential COCs into the groundwater system. The potential pathways to receptors include soil ingestion, dermal contact, and inhalation, which could occur as a result of receptor exposure to contaminated subsurface soil at the site. No intake routes through plant, meat, or milk ingestion are considered appropriate for either the industrial or residential land-use scenarios. Annex B provides additional discussion on the fate and transport of COCs at DSS Site 1101.

Table 4.2-1 summarizes the potential COCs for DSS Site 1101. All potential COCs were retained in the conceptual model and were evaluated in both the human health and ecological risk assessments. The current and future land use for DSS Site 1101 is industrial (DOE et al. September 1995).

The potential human receptors at the site are considered to be an industrial worker and resident. The exposure routes for the receptors are dermal contact and ingestion/inhalation; however, these are realistic possibilities only if contaminated soil is excavated at the site. The major exposure route modeled in the human health risk assessment is soil ingestion for COCs. The inhalation pathway is included because of the potential to inhale dust and volatiles; the

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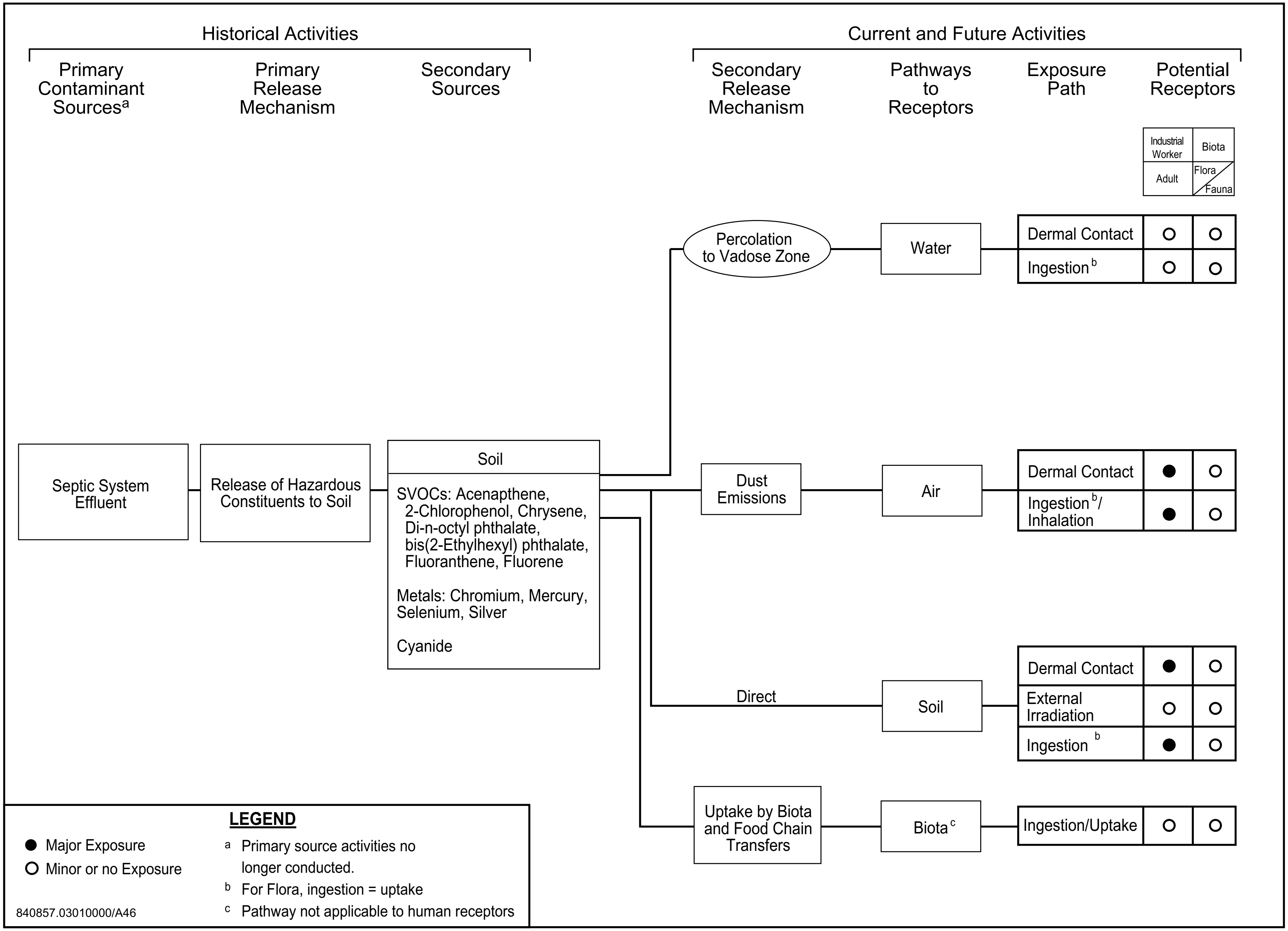

Figure 4.2-1

Conceptual Site Model Flow Diagram for DSS Site 1101, Building 885 Septic System

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Table 4.2-1
Summary of Potential COCs for DSS Site 1101, Building 885 Septic System

COC Type		Number of Samples[a]	COCs Greater than Background	Maximum Background Limit/North Area Supergroup[b] (mg/kg)	Maximum Concentration[c] (mg/kg)	Average Concentration[d] (mg/kg)	Number of Samples Where Background Concentration Exceeded[e]
VOCs		2	None	NA	NA	NA	None
SVOCs		2	Acenapthene	NA	0.0107 J	0.0074	1
		2	2-Chlorophenol	NA	0.0169 J	0.0123	1
		2	Chrysene	NA	0.0185 J	0.0134	1
		2	Di-n-octyl phthalate	NA	0.150 J	0.0826	2
		2	bis(2-Ethylhexyl) phthalate	NA	0.182 J	0.1069	2
		2	Fluoranthene	NA	0.0174 J	0.0129	1
		2	Fluorene	NA	0.0104 J	0.0062	1
PCBs		2	None	NA	NA	NA	None
HE		2	None	NA	NA	NA	None
RCRA Metals		2	None	NA	NA	NA	None
Hexavalent Chromium		2	None	NA	NA	NA	None
Cyanide		2	Cyanide	NA	0.184 J	0.101	1
Radionuclides (pCi/g)	Gamma Spectroscopy	2	None	NA	NA	NC[f]	None
	Gross Alpha	2	None	NA	10.3	NC[f]	None
	Gross Beta	2	None	NA	17.7	NC[f]	None

[a]Number of samples includes duplicates and splits.
[b]Dinwiddie September 1997.
[c]Maximum concentration is either the maximum amount detected, or the maximum MDL or MDA if nothing was detected.
[d]Average concentration includes all samples except blanks. The average is calculated as the sum of detected amounts and one-half of the MDLs for nondetected results, divided by the number of samples.
[e]See appropriate data table for sample locations.
[f]An average MDA is not calculated because of the variability in instrument counting error and the number of reported nondetected activities for gamma spectroscopy.

COC = Constituent of concern.
DSS = Drain and Septic Systems.
HE = High explosive(s).
J = Estimated concentration.
MDA = Minimum detectable activity.
mg/kg = Milligram(s) per kilogram.
NA = Not applicable.
NC = Not calculated.
PCB = Polychlorinated biphenyl.
pCi/g = Picocurie(s) per gram.
RCRA = Resource Conservation and Recovery Act.
SVOC = Semivolatile organic compound.
VOC = Volatile organic compound.

dermal pathway is included because of the potential for receptors to be exposed to the contaminated soil. No pathways to groundwater and no intake routes through flora or fauna are considered appropriate for either the industrial or residential land-use scenarios. Annex B provides additional discussion of the exposure routes and receptors at DSS Site 1101.

4.3 Site Assessment

Site assessment at DSS Site 1101 included risk assessments for both human health and ecological risk. This section briefly summarizes the site assessment results, and Annex B discusses the risk assessment performed for DSS Site 1101 in more detail.

4.3.1 Summary

The site assessment concluded that DSS Site 1101 poses no significant threat to human health under either the industrial or residential land-use scenarios. Ecological risks were found to be insignificant because no pathways exist.

4.3.2 Risk Assessments

Risk assessments were performed for both human health and ecological risk at DSS Site 1101. This section summarizes the results.

4.3.2.1 Human Health

DSS Site 1101 has been recommended for an industrial land-use scenario (DOE et al. September 1995). Because SVOCs, total cyanide, and metals are present, it was necessary to perform a human health risk assessment analysis for the site, which included all COCs detected. Annex B provides a complete discussion of the risk assessment process, results, and uncertainties. The risk assessment process provides a quantitative evaluation of the potential adverse human health effects from constituents in the site's soil by calculating the hazard index (HI) and excess cancer risk for both industrial and residential land-use scenarios.

The HI calculated for the COCs at DSS Site 1101 is 0.00 under the industrial land-use scenario, which is lower than the numerical standard of 1.0 suggested by risk assessment guidance (EPA 1989). The incremental HI risk, determined by subtracting risk associated with background from potential nonradiological COC risk (without rounding), is 0.00. The excess cancer risk for DSS Site 1101 COCs under an industrial land-use scenario is 1E-9. 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. The incremental excess cancer risk is 1.05E-9. Both the incremental HI and excess cancer risk are below NMED guidelines.

The HI calculated for the COCs at DSS Site 1101 is 0.00 under the residential land-use scenario, which is lower than the numerical standard of 1.0 suggested by risk assessment guidance (EPA 1989). The incremental HI risk, determined by subtracting risk associated with background from potential nonradiological COC risk (without rounding), is 0.00. The excess cancer risk for DSS Site 1101 COCs is 5E-9 for a residential industrial land-use scenario. 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. The incremental excess cancer risk is 4.54E-9. Both the incremental HI and incremental excess cancer risk are below NMED guidelines.

For the radiological COCs, none of the constituents had a minimum detectable activity or reported value greater than the corresponding background values; therefore no risk was calculated.

The nonradiological and radiological carcinogenic risks are tabulated and summed in Table 4.3.2-1.

Table 4.3.2-1
Summation of Radiological and Nonradiological Risks from
DSS Site 1101, Building 885 Septic System Carcinogens

Scenario	Nonradiological Risk	Radiological Risk	Total Risk
Industrial	1.05E-9	0.0	1.05E-9
Residential	4.54E-9	0.0	4.54E-9

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

4.3.2.2 Ecological

An ecological assessment that corresponds with the procedures in the U.S. Environmental Protection Agency's Ecological Risk Assessment Guidance for Superfund (EPA 1997) also was performed as set forth by the NMED Risk-Based Decision Tree in the "RPMP Document Requirement Guide" (NMED March 1998). An early step in the evaluation compared COC concentrations and identified potentially bioaccumulative constituents (see Annex B, 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 the "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.

All COC s at DSS Site 1101 are located at depths greater than 5 feet bgs. Therefore, no complete ecological pathways exist at this site, and a more detailed ecological risk assessment is not necessary.

4.4 Baseline Risk Assessments

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

4.4.1 Human Health

Because the results of the human health risk assessment summarized in Section 4.3.2.1 indicate that DSS Site 1101 poses insignificant risk to human health under both the industrial and residential land-use scenarios, a baseline human health risk assessment is not required for this site.

4.4.2 Ecological

Because the results of the ecological risk assessment summarized in Section 4.3.2.2 indicate that no complete pathways exist at DSS Site 1101, a baseline ecological risk assessment is not required for the site.

5.0 NFA PROPOSAL

5.1 Rationale

Based upon field investigation data and the human health and ecological risk assessment analyses, an NFA decision is recommended for DSS Site 1101 for the following reasons:

- The soil has been sampled for all potential COCs.
- No COCs are present in the soil at levels considered hazardous to human health for either an industrial or residential land-use scenario.
- None of the COCs warrant ecological concern because no complete pathways exist at the site.

5.2 Criterion

Based upon the evidence provided in Section 5.1, DSS Site 1101 is proposed for an NFA decision according to Criterion 5, which states, “the SWMU/AOC has been characterized or remediated in accordance with current applicable state or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use” (NMED March 1998).

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ANNEX A
DSS Site 1101
Soil Sample Data Validation Results

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ANNEX B
DSS Site 1101
Risk Assessment

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DSS SITE 1101: RISK ASSESSMENT REPORT

I. Site Description and History

Drain and Septic Systems (DSS) Site 1101, the Building 885 Septic System, at Sandia National Laboratories/New Mexico (SNL/NM), is located in Technical Area (TA)-I on federally owned land controlled by Kirtland Air Force Base (KAFB) and permitted to the U.S. Department of Energy (DOE). The septic system consisted of a septic tank connected to a seepage pit. Available information indicates that Building 885 was constructed in 1953 (SNL/NM March 2003), and it is assumed that the septic system was also constructed at that time. By 1988, the septic system discharges were being routed to the City of Albuquerque sanitary sewer system (SNL/NM August 1988).

Environmental concern about DSS Site 1101 is based upon the potential for the release of constituents of concern (COCs) in effluent discharged to the environment via the seepage pit at this site. Because operational records are not available, the investigation of DSS Site 1101 was planned to be consistent with other DSS site investigations and to sample for the COCs most commonly found at similar facilities.

The ground surface in the vicinity of the site is flat to very slightly inclined to the west. The closest major drainage is Tijeras Arroyo, located approximately 1 mile southeast of the site. No springs or perennial surface-water bodies were located within 3 miles of the site. Average annual rainfall in the SNL/NM and KAFB area, as measured at Albuquerque International Sunport, is 8.1 inches (NOAA 1990). Because most of the area in the vicinity of this site is paved, precipitation that falls in and around the site drains to a storm-water channel that discharges to Tijeras Arroyo. Infiltration of precipitation at the site is essentially nonexistent, and virtually all of the moisture either drains away from the site or evaporates.

DSS Site 1101 lies at an average elevation of approximately 5,432 feet above mean sea level. The groundwater beneath the site occurs in both a shallow and regional aquifer in unconfined conditions in essentially unconsolidated silts, sands, and gravels. Depth to the shallow groundwater system, which has a limited lateral extent and is present beneath the north-central part of KAFB, is approximately 310 feet below ground surface (bgs) at the site. The shallow groundwater system is not used as a water supply source. Depth to the regional groundwater aquifer is approximately 560 feet bgs. Both the City of Albuquerque and KAFB use the regional groundwater aquifer as a water supply source. Groundwater flow in the shallow groundwater system is to the southeast, while that in the regional aquifer is to the northwest beneath the site (SNL/NM June 2003). The nearest production wells to DSS Site 1101 are KAFB-1 and KAFB-11 which are approximately 1.1 miles southwest and 1.3 miles southeast of the site, respectively. The nearest groundwater monitoring wells are the perched and regional aquifer well pair TA1-W-08 and TA1-W-05, which are located approximately 800 feet north of the site.

II. Data Quality Objectives

The Data Quality Objectives (DQOs) presented in the "Sampling and Analysis Plan [SAP] for Characterizing and Assessing Potential Releases to the Environment From Septic and Other Miscellaneous Drain Systems at Sandia National Laboratories/New Mexico" (SNL/NM October 1999) and "Field Implementation Plan [FIP], Characterization of Non-Environmental Restoration

Drain and Septic Systems" (SNL/NM November 2001) identified the site-specific sample locations, sample depths, sampling procedures, and analytical requirements for this and many other DSS sites. The DQOs outlined the quality assurance (QA)/quality control (QC) requirements necessary for producing defensible analytical data suitable for risk assessment purposes. The baseline sampling conducted at this site was designed to:

- Determine whether hazardous waste or hazardous constituents were released at the site.
- Characterize the nature and extent of any releases.
- Provide analytical data of sufficient quality to support risk assessments.

Table 1 summarizes the rationale for determining the sampling locations at this site. The source of potential COCs at DSS Site 1101 is effluent discharged to the environment from the seepage pit at this site.

Table 1
Summary of Sampling Performed to Meet DQOs

DSS Site 1101 Sampling Areas	Potential COC Source	Number of Sampling Locations	Sample Density (samples/acre)	Sampling Location Rationale
Soil beneath the septic system seepage pit	Effluent discharged to the environment from the seepage pit	1	NA	Evaluate potential COC releases to the environment from effluent discharged from the seepage pit

COC = Constituent of concern.
DQO = Data Quality Objective.
DSS = Drain and Septic Systems.
NA = Not applicable.

The baseline soil samples were collected at one location at DSS Site 1101 with a Geoprobe™ from two 3-foot-long sampling intervals at each boring location. The seepage pit sampling intervals started at 25 and 30 feet bgs in the boring. The soil samples were collected in accordance with the procedures described in the SAP (SNL/NM October 1999) and FIP (SNL/NM November 2001). Table 2 summarizes the types of confirmatory and QA/QC samples collected at the site and the laboratories that performed the analyses.

The DSS Site 1101 baseline soil samples were analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), high explosive (HE) compounds, polychlorinated biphenyls (PCBs), Resource Conservation and Recovery Act (RCRA) metals, hexavalent chromium, cyanide, radionuclides, and gross alpha/beta activity. The samples were analyzed by an off-site laboratory (General Engineering Laboratories, Inc.) and the on-site SNL/NM Radiation Protection Sample Diagnostics (RPSD) Laboratory.

Table 2
Number of Confirmatory Soil and QA/QC Samples Collected from DSS Site 1101

Sample Type	VOCs	SVOCs	PCBs	HE	RCRA Metals	Hexavalent Chromium	Cyanide	Gamma Spectroscopy Radionuclides	Gross Alpha/Beta Activity
Confirmatory	2	2	2	2	2	2	2	2	2
Duplicates	0	0	0	0	0	0	0	0	0
EBs and TBs (VOCs only)	1	0	0	0	0	0	0	0	0
Total Samples	3	2	0	0	0	0	0	0	0
Analytical Laboratory	GEL	GEL	GEL	GEL	GEL	GEL	GEL	RPSD	GEL

DSS = Drain and Septic Systems.
EB = Equipment blank.
GEL = General Engineering Laboratories, Inc.
HE = High explosive(s).
PCB = Polychlorinated biphenyl.
QA = Quality assurance.
QC = Quality control.
RCRA = Resource Conservation and Recovery Act.
RPSD = Radiation Protection Sample Diagnostics Laboratory.
SVOC = Semivolatile organic compound.
TB = Trip blank.
VOC = Volatile organic compound.

Table 3 summarizes the analytical methods and the data quality requirements from the SAP (SNL/NM October 1999) and FIP (SNL/NM November 2001).

Table 3
Summary of Data Quality Requirements for DSS Site 1101

Analytical Method[a]	Data Quality Level	GEL	RPSD
VOCs EPA Method 8260	Defensible	2	None
SVOCs EPA Method 8270	Defensible	2	None
PCBs EPA Method 8082	Defensible	2	None
HE Compounds EPA Method 8330	Defensible	2	None
RCRA metals EPA Method 6020/7000	Defensible	2	None
Hexavalent Chromium EPA Method 7196A	Defensible	2	None
Total Cyanide EPA Method 9012A	Defensible	2	None
Gamma Spectroscopy Radionuclides EPA Method 901.1	Defensible	None	2
Gross Alpha/Beta Activity EPA Method 900.0	Defensible	2	None

Note: The number of samples does not include QA/QC samples such as duplicates, trip blanks, and equipment blanks.
[a]EPA November 1986.
DSS = Drain and Septic Systems.
EPA = U.S. Environmental Protection Agency.
GEL = General Engineering Laboratories, Inc.
HE = High explosive(s).
PCB = Polychlorinated biphenyl.
QA = Quality assurance.
QC = Quality control.
RCRA = Resource Conservation and Recovery Act.
RPSD = Radiation Protection Sample Diagnostics Laboratory.
SVOC = Semivolatile organic compound.
VOC = Volatile organic compound.

QA/QC samples were collected during the baseline sampling effort according to the Environmental Restoration (ER) Project Quality Assurance Project Plan. The QA/QC sampling at this site consisted of one trip blank for VOCs only. No significant QA/QC problems were identified in this QA/QC sample.

All of the baseline soil sample results were verified/validated by SNL/NM according to Data Verification/Validation Level 3 (SNL/NM July 1994) or SNL/NM ER Project Data Validation Procedure for Chemical and Radiochemical Data, AOP [Administrative Operating Procedure] 00-03, Rev. 0 (SNL/NM December 1999). The data validation reports are presented in the associated DSS Site 1101 proposal for no further action (NFA). The gamma spectroscopy data from the RPSD Laboratory were reviewed according to “Laboratory Data Review Guidelines,” Procedure No. RPSD-02-11, Issue No. 02 (SNL/NM July 1996). The gamma spectroscopy results are presented in the NFA proposal. The reviews confirmed that the analytical data are defensible and therefore acceptable for use in the NFA proposal. Therefore, the DQOs have been fulfilled.

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

III.1 Introduction

The determination of the nature, migration rate, and extent of contamination at DSS Site 1101 was based upon an initial conceptual model validated with confirmatory sampling at the site. The initial conceptual model was developed from archival site research, site inspections, and soil sampling. The DQOs contained in the SAP (SNL/NM October 1999) and FIP (SNL/NM November 2001) identified the sample locations, sample density, sample depth, and analytical requirements. The sample data were subsequently used to develop the final conceptual model for DSS Site 1101, which is presented in Section 4.0 of the associated NFA proposal. The quality of the data used to specifically determine the nature, migration rate, and extent of contamination is described in the following sections.

III.2 Nature of Contamination

Both the nature of contamination and the potential for the degradation of COCs at DSS Site 1101 were evaluated using laboratory analyses of the soil samples. The analytical requirements included analyses for VOCs, SVOCs, HE compounds, PCBs, RCRA metals, hexavalent chromium, cyanide, radionuclides by gamma spectroscopy, and gross alpha/beta activity. The analytes and methods listed in Tables 2 and 3 are appropriate to characterize the COCs and potential degradation products at DSS Site 1101.

III.3 Rate of Contaminant Migration

The septic system at DSS Site 1101 was deactivated by 1988, at which time Building 885 was connected the City of Albuquerque sanitary sewer system. The migration rate of COCs that may have been introduced into the subsurface via the septic system at this site was therefore dependent upon the volume of aqueous effluent discharged to the environment from this system when it was operational. Any migration of COCs from this site after use of the septic system was discontinued would have been predominantly dependent upon infiltrating precipitation. However, it is highly unlikely that sufficient precipitation would have reached the depth at which COCs may have been discharged to the subsurface because the immediate area surrounding the site is covered by pavement. Analytical data generated from the soil sampling conducted at the site are adequate to characterize the rate of COC migration at DSS Site 1101.

III.4 Extent of Contamination

Subsurface baseline soil samples were collected from a borehole drilled at one location beneath the effluent release point (seepage pit) at the site to assess whether releases of effluent from the septic system caused any environmental contamination.

The baseline soil samples were collected at sampling depths starting at 25 and 30 feet bgs in the seepage pit borehole. Sampling intervals started at the depths at which effluent discharged from the seepage pit would have entered the subsurface environment at the site. This sampling procedure was required by New Mexico Environment Department (NMED) regulators and has been used at numerous DSS sites at SNL/NM. The baseline soil samples are considered to be representative of the soil potentially contaminated with the COCs at this site and are sufficient to determine the vertical extent, if any, of COCs.

IV. Comparison of COCs to Background Screening Levels

Site history and characterization activities are used to identify potential COCs. The DSS Site 1101 NFA proposal describes the identification of COCs and the sampling conducted in order to determine the concentration levels of those COCs across the site. Generally, COCs evaluated in this risk assessment included all detected organic and all inorganic and radiological COCs for which samples were analyzed. When the detection limit of an organic compound was too high (i.e., could possibly cause an adverse effect to human health or the environment), the compound was retained. Nondetected organic compounds not included in this assessment were determined to have detection limits low enough to ensure protection of human health and the environment. In order to provide conservatism in this risk assessment, the calculation used only the maximum concentration value of each COC found for the entire site. The SNL/NM maximum background concentration (Dinwiddie September 1997) was selected to provide the background screen listed in Tables 4 and 5.

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

Table 4 lists the nonradiological COCs and Table 5 lists the radiological COCs for the human health risk assessment at DSS Site 1101. All samples were collected at depths greater than 5 feet bgs; therefore, evaluation of ecological risk was not performed. Both tables show the associated SNL/NM maximum background concentration values (Dinwiddie September 1997). Section VI.4 discusses the results presented in Tables 4 and 5.

V. Fate and Transport

The primary releases of COCs at DSS Site 1101 occurred in the subsurface soil resulting from the discharge of effluents from Building 885 to the septic tank and seepage pit. Wind, water, and biota are natural mechanisms of COC transport from the primary release point. Because the discharge was to the subsurface and because the ground surface at this site is currently covered by asphalt pavement, wind, surface water, and biota are not considered to be viable transport mechanisms at this site.

Table 4
Nonradiological COCs for Human Health Risk Assessment at DSS Site 1101 with Comparison to the Associated SNL/NM Background Screening Value, BCF, and Log K_{ow}

COC	Maximum Concentration (All Samples) (mg/kg)	SNL/NM Background Concentration (mg/kg)[a]	Is Maximum COC Concentration Less Than or Equal to the Applicable SNL/NM Background Screening Value?	BCF (maximum aquatic)	Log K_{ow} (for organic COCs)	Bioaccumulator?[b] (BCF>40, Log K_{ow}>4)
Inorganic						
Arsenic	2.15	4.4	Yes	44[c]	–	**Yes**
Barium	85.7 J	200	Yes	170[d]	–	**Yes**
Cadmium	0.187 J	0.9	Yes	64[c]	–	**Yes**
Chromium, total	11.8	12.8	Yes	16[c]	–	No
Chromium VI	0.02665[e]	NC	**Unknown**	16[c]	–	No
Cyanide	0.184 J	NC	**Unknown**	NC	–	**Unknown**
Lead	4.68	11.2	Yes	49[c]	–	**Yes**
Mercury	0.00459 J	<0.1	**Unknown**	5,500[c]	–	**Yes**
Selenium	0.613 J	<1	**Unknown**	800[f]	–	**Yes**
Silver	0.04465[e]	<1	**Unknown**	0.5[c]	–	No
Organic						
Acenaphthene	0.0107 J	NA	**NA**	389[g]	3.92[g]	**Yes**
2-Chlorophenol	0.0169 J	NA	**NA**	214[h]	2.15[h]	**Yes**
Chrysene	0.0185 J	NA	**NA**	18,000[g]	5.91[g]	**Yes**
Di-n-octyl phthalate	0.15 J	NA	**NA**	9,334[g]	5.22[g]	**Yes**
bis(2-Ethylhexyl) phthalate	0.182 J	NA	**NA**	851[h]	7.6[g]	**Yes**
Fluoranthene	0.0174 J	NA	**NA**	12,302[g]	4.90[g]	**Yes**
Fluorene	0.0104 J	NA	**NA**	2,239[g]	4.18[g]	**Yes**

Note: **Bold** indicates the COCs that exceed the background screening values and/or are bioaccumulators.
[a]Dinwiddie September 1997, North Area Supergroup.
[b]NMED March 1998.
[c]Yanicak March 1997.
[d]Neumann 1976.
[e]Parameter was not detected. Concentration is one-half the detection limit.

Table 4 (Concluded)
Nonradiological COCs for Human Health Risk Assessment at DSS Site 1101 with Comparison to the Associated SNL/NM Background Screening Value, BCF, and Log K_{ow}

[f]Callahan et al. 1979.
[g]Micromedex 1998.
[h]Howard 1989.

BCF	= Bioconcentration factor.
COC	= Constituent of concern.
DSS	= Drain and Septic Systems.
J	= Estimated concentration.
K_{ow}	= Octanol-water partition coefficient.
Log	= Logarithm (base 10).
mg/kg	= Milligram(s) per kilogram.
NA	= Not applicable.
NC	= Not calculated.
NMED	= New Mexico Environment Department.
SNL/NM	= Sandia National Laboratories/New Mexico.
–	= Information not available.

Table 5
Radiological COCs for Human Health Risk Assessment at DSS Site 1101 with Comparison to the Associated SNL/NM Background Screening Value and BCF

COC	Maximum Activity (All Samples) (pCi/g)	SNL/NM Background Activity (pCi/g)[a]	Is Maximum COC Activity Less Than or Equal to the Applicable SNL/NM Background Screening Value?	BCF (maximum aquatic)	Is COC a Bioaccumulator?[b] (BCF >40)
Cs-137	ND (0.029)	0.084	Yes	900[c]	**Yes**
Th-232	0.62	1.54	Yes	900[c]	**Yes**
U-235	ND (0.17)	0.18	Yes	3,000[c]	**Yes**
U-238	ND (0.42)	1.3	Yes	3,000[c]	**Yes**

Note: **Bold** indicates COCs that exceed the background screening values and/or are bioaccumulators.
[a]Dinwiddie September 1997, North Area Supergroup.
[b]NMED March 1998.
[c]Baker and Soldat 1992.
BCF = Bioconcentration factor.
COC = Constituent of concern.
DSS = Drain and Septic Systems.
MDA = Minimum detectable activity.
ND ( ) = Not detected above the MDA, shown in parentheses.
NMED = New Mexico Environment Department.
pCi/g = Picocurie(s) per gram.
SNL/NM = Sandia National Laboratories/New Mexico.

Water at DSS Site 1101 is received as precipitation (approximately 8.1 inches annually [NOAA 1990]). Because the site is paved, infiltration at the site is essentially nonexistent. The depth to groundwater at this site is approximately 310 feet bgs; therefore, the potential for COCs to reach groundwater through the unsaturated zone above the water table is extremely low.

COCs at DSS Site 1101 include nonradiological inorganic and organic constituents. No radiological analytes exceeded background screening values. With the exception of cyanide, the inorganic COCs are elemental in form and not considered to be degradable. Transformations of these inorganic COCs could 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). Cyanide can be metabolized by soil biota. However, because of the aridity of the environment at this site, the asphalt pavement, and the consequent lack of potential contact with biota, none of these mechanisms is expected to result in significant losses or transformations of the inorganic COCs.

The organic COCs at DSS Site 1101 may be degraded through 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. Again, because of the arid environment, the asphalt pavement, and the lack of contact with biota at this site, none of these mechanisms is expected to result in significant losses or transformations of the organic COCs.

Table 6 summarizes the fate and transport processes that can occur at DSS Site 1101. The COCs at this site include nonradiological inorganic and organic analytes. Wind, surface water, and biota are not considered to be potential transport mechanisms at this site. Significant leaching into the subsurface soil is unlikely, and leaching into the groundwater at this site is highly unlikely. The potential for transformation of the COCs is insignificant.

Table 6
Summary of Fate and Transport at DSS Site 1101

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

DSS = Drain and Septic Systems.

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 incremental estimated 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 U.S. Environmental Protection Agency (EPA), NMED, and the 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 DSS Site 1101. 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

DSS Site 1101 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 and volatiles. 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 DSS Site 1101 is approximately 310 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 model flow diagram for DSS Site 1101.

Pathway Identification

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

VI.4 Step 3. Background Screening Procedure

This section discusses Step 3, the background screening procedure, which compares the maximum COC concentration to the background screening level. The methodology and results are described in the following sections.

VI.4.1 Methodology

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 4 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 radiological COCs that exceeded the SNL/NM background screening levels, background values were subtracted from the individual maximum radionuclide concentrations. Those that did not exceed these background levels were 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 a background value and were detected above the analytical minimum detectable activity (MDA) were 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 4 and 5 show DSS Site 1101 maximum COC concentrations that were compared to the SNL/NM maximum background values (Dinwiddie September 1997) for the human health risk assessment. For the nonradiological COCs, five constituents did not have quantified background screening concentrations. Seven constituents were organic compounds that do not have corresponding background screening values. For the radiological COCs, no constituent exhibited an MDA greater than its background value.

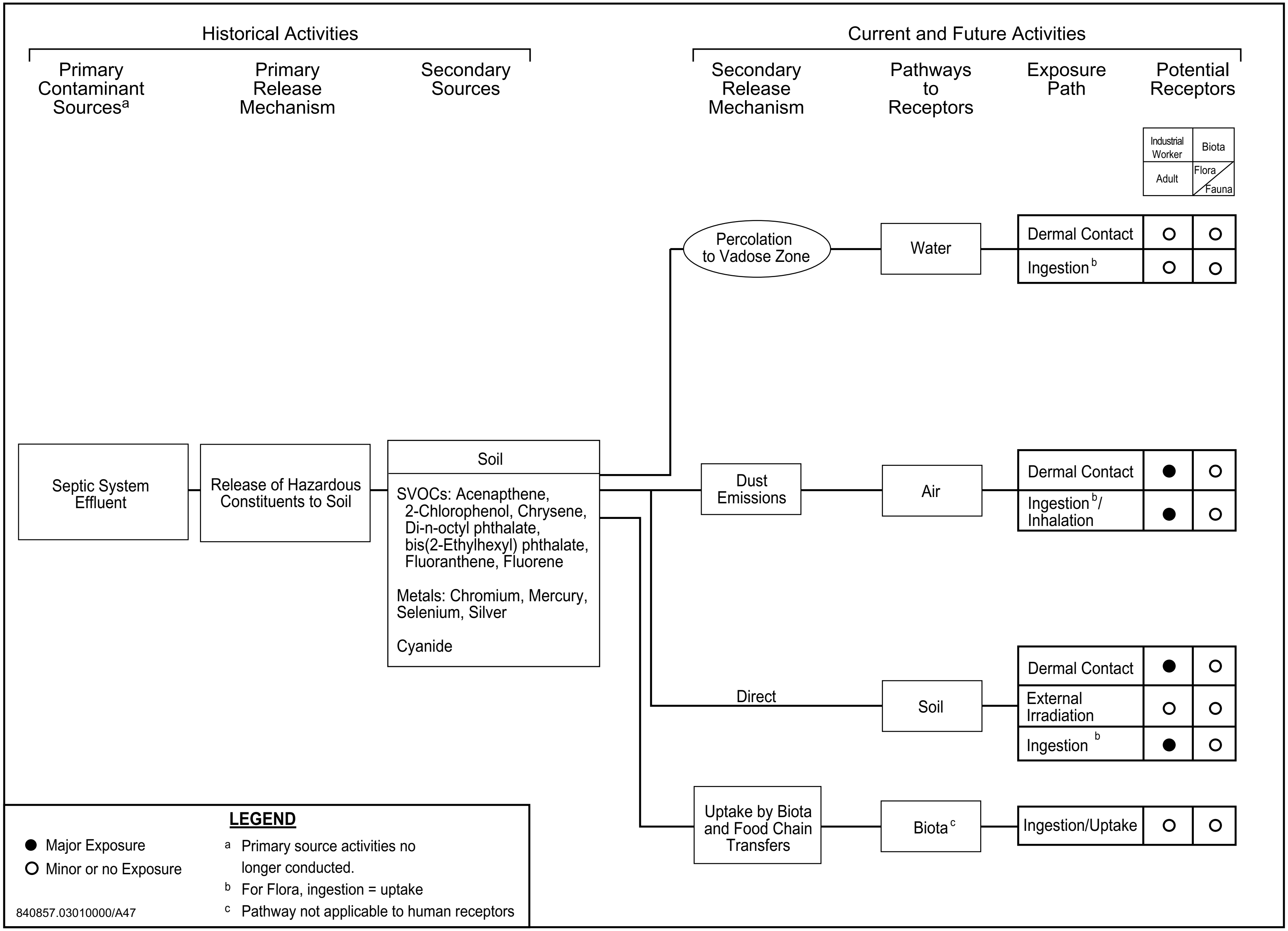

Figure 1

Conceptual Site Model Flow Diagram for DSS Site 1101, Building 885 Septic System

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VI.5 Step 4. Identification of Toxicological Parameters

Table 7 lists the COCs retained in the risk assessment and the values for the available toxicological information. The toxicological values for the nonradiological COCs presented in Table 7 were from the Integrated Risk Information System (IRIS) (EPA 2003), the Health Effects Assessment Summary Tables (HEAST) (EPA 1997a), the Technical Background Document for Development of Soil Screening Levels (NMED December 2000), and the EPA Region 6 (EPA 2002a), EPA Region 9 (EPA 2002b) and the Risk Assessment Information System (ORNL 2003) electronic databases.

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

VI.6.1 Exposure Assessment

Appendix 1 provides the equations and parameter input values used in calculating intake values and subsequent HI and excess cancer risk values for the individual exposure pathways. The appendix shows parameters for both 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 December 2000), as well as other EPA and NMED guidance documents, and reflect the reasonable maximum exposure (RME) approach advocated by the RAGS (EPA 1989). 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 8 shows an HI of 0.00 for the DSS Site 1101 nonradiological COCs and an estimated excess cancer risk of 1E-9 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 9 shows that for DSS Site 1101 associated background constituents, there is neither a quantifiable HI nor an estimated excess cancer risk for the designated industrial land-use scenario.

For the radiological COCs, no constituents exceeded the corresponding background values. Therefore, no risk was calculated for the industrial land-use scenario.

For the nonradiological COCs under the residential land-use scenario, the HI is 0.00 with an estimated excess cancer risk of 5E-9 (Table 8). The numbers in the table include exposure

Table 7
Toxicological Parameter Values for DSS Site 1101 Nonradiological COCs

COC	RfD$_o$ (mg/kg-d)	Confidence[a]	RfD$_{inh}$ (mg/kg-d)	Confidence[a]	SF$_o$ (mg/kg-d)$^{!1}$	SF$_{inh}$ (mg/kg-d)$^{!1}$	Cancer Class[b]	ABS
Inorganic								
Chromium VI	3E-3[c]	L	2.3E-6[c]	L	–	4.2E+1[c]	A	0.01[d]
Cyanide	2E-2[c]	M	–	–	–	–	D	0.1[d]
Mercury	3E-4[e]	–	8.6E-5[c]	M	–	–	D	0.01[d]
Selenium	5E-3[c]	H	–	–	–	–	D	0.01[d]
Silver	5E-3[c]	L	–	–	–	–	D	0.01[d]
Organic								
Acenaphthene	6E-2[c]	L	6E-2[f]	–	–	–	–	0.13[d]
2-Chlorophenol	5E-3[c]	L	5E-3[f]	–	–	–	–	0.01[g]
Chrysene	–	–	–	–	7.3E-3[f]	3.1E-3[f]	B2	0.13[d]
Di-n-octylphthalate	2E-2[e]	–	2E-2[f]	–	–	–	–	0.1[h]
bis(2-Ethylhexyl) phthalate	2E-2[f]	–	2E-2[f]	–	1.4E-2[f]	1.4E-2[f]	–	0.01[g]
Fluoranthene	4E-2[c]	L	4E-2[f]	–	–	–	D	0.13[d]
Fluorene	4E-2[c]	L	4E-2[f]	–	–	–	D	0.1[d]

[a]Confidence associated with IRIS (EPA 2003) database values. Confidence: L = low, M = medium, H = high.
[b]EPA weight-of-evidence classification system for carcinogenicity (EPA 1989) taken from IRIS (EPA 2003):
A = Human carcinogen.
B2 = Probable human carcinogen. Sufficient evidence in animals and inadequate or not evidence in humans.
D = Not classifiable as to human carcinogenicity.
[c]Toxicological parameter values from IRIS electronic database (EPA 2003).
[d]Toxicological parameter values from NMED December 2000.
[e]Toxicological parameter values from HEAST (EPA 1997a).
[f]Toxicological parameter values from EPA Region 6 (EPA 2002a).
[g]Toxicological parameter values from Risk Assessment Information System (ORNL 2003).
[h]Toxicological parameter values from EPA Region 9 (EPA 2002b).

ABS = Gastrointestinal absorption coefficient.
COC = Constituent of concern.
DSS = Drain and Septic Systems.
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-d)$^{-1}$ = Per milligram per kilogram day.
NMED = New Mexico Environment Department.
RfD$_{inh}$ = Inhalation chronic reference dose.
RfD$_o$ = Oral chronic reference dose.
SF$_{inh}$ = Inhalation slope factor.
SF$_o$ = Oral slope factor.
– = Information not available.

Table 8
Risk Assessment Values for DSS Site 1101 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					
Chromium VI	0.02665[b]	0.00	6E-11	0.00	1E-10
Cyanide	0.184 J	0.00	–	0.00	–
Mercury	0.00459 J	0.00	–	0.00	–
Selenium	0.613 J	0.00	–	0.00	–
Silver	0.04465[b]	0.00	–	0.00	–
Organic					
Acenaphthene	0.0107 J	0.00	–	0.00	–
2-Chlorophenol	0.0169 J	0.00	–	0.00	–
Chrysene	0.0185 J	0.00	9E-11	0.00	3E-10
Di-n-octylphthalate	0.15 J	0.00	–	0.00	–
bis(2-Ethylhexyl) phthalate	0.182 J	0.00	9E-10	0.00	4E-9
Fluoranthene	0.0174 J	0.00	–	0.00	–
Fluorene	0.0104 J	0.00	–	0.00	–
Total		**0.00**	**1E-9**	**0.00**	**5E-9**

[a]EPA 1989.
[b]Maximum concentration was one-half the detection limit.

COC = Constituent of concern.
DSS = Drain and Septic Systems.
EPA = U.S. Environmental Protection Agency.
J = Estimated concentration.
mg/kg = Milligram(s) per kilogram.
– = Information not available.

Table 9
Risk Assessment Values for DSS Site 1101 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
Chromium VI	NC	–	–	–	–
Cyanide	NC	–	–	–	–
Mercury	<0.1	–	–	–	–
Selenium	<1	–	–	–	–
Silver	<1	–	–	–	–
Total		**–**	**–**	**–**	**–**

[a]Dinwiddie September 1997, North Area Supergroup.
[b]EPA 1989.

COC = Constituent of concern.
DSS = Drain and Septic Systems.
EPA = U.S. Environmental Protection Agency.
mg/kg = Milligram(s) per kilogram.
NC = Not calculated.
– = Information not quantified.

from soil ingestion, dermal contact, and dust and volatile inhalation. Although the EPA (EPA 1991) generally recommends 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, subsequently, for dust to be present in predominantly residential areas. Because of the nature of the local soil, other exposure pathways are not considered (see Appendix 1). Table 9 shows that for the DSS Site 1101 associated background constituents, there is no quantifiable HI or estimated excess cancer risk.

For the radiological COCs, no constituents exceeded the corresponding background values for either the residential or industrial land-use scenario. Therefore, no calculation of risk was performed.

VI.7 Step 6. Comparison of Risk Values to Numerical Guidelines

The human health risk assessment analysis evaluated the potential for adverse health effects for both the industrial (the designated land-use scenario for this site) and residential land-use scenario.

For the nonradiological COCs under the industrial land-use scenario, the HI is 0.00, which is lower than the numerical guideline of 1 suggested in the RAGS (EPA 1989). The estimated excess cancer risk is 1E-9. 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 determined risks considering background concentrations of the potential nonradiological COCs for both the industrial and residential land-use scenarios. Assuming the industrial land-use scenario, for nonradiological COCs there is neither a quantifiable HI nor an estimated excess cancer risk. 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 quantifiable background screening values are assumed to have a hazard quotient of 0.00. For background concentrations of the nonradiological COCs, there is neither a quantifiable HI nor an estimated excess cancer risk. The incremental HI is 0.00, and the incremental estimated excess cancer risk is 1.05E-9 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, no constituents exceeded the corresponding background values. Therefore, no calculation of risk was performed for the industrial land-use scenario.

For the nonradiological COCs under the residential land-use scenario, the calculated HI is 0.00, which is below the numerical guidance. The estimated excess cancer risk is 5E-9. 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. For background concentrations of the nonradiological COCs, there is neither a quantifiable HI nor an estimated excess cancer risk. The incremental HI is 0.00 and the incremental estimated cancer risk is 4.54E-9 for the residential land-use scenario. These incremental risk calculations indicate insignificant risk to human health from nonradiological COCs considering a residential land-use scenario.

For the radiological COCs, no constituents exceeded the corresponding background values. Therefore, no calculation of risk was performed for the residential land-use scenario.

VI.8 Step 7. Uncertainty Discussion

The determination of the nature, rate, and extent of contamination at DSS Site 1101 was based upon an initial conceptual model that was validated with baseline sampling conducted at the site. The baseline sampling was implemented in accordance with the SAP (SNL/NM October 1999) and FIP (SNL/NM November 2001), and the DQOs contained in these two documents are appropriate for use in risk assessments. The data from soil samples collected at effluent release points are representative of potential COC releases to the site. The analytical requirements and results satisfy the DQOs, and data quality was verified/validated in accordance with SNL/NM procedures. Therefore, there is no uncertainty associated with the quality of the data used to perform the risk assessment at DSS Site 1101.

Because of the location, history of the site, and future industrial land use (DOE et al. September 1995), there is low uncertainty in the land-use scenario and the potentially affected populations that were considered in performing the risk assessment analysis. Because the COCs are found in near-surface soil and because of the location and physical characteristics of the site, there is little uncertainty in the exposure pathways relevant to the analysis.

An RME approach was used to calculate the risk assessment values. This means that the parameter values in the calculations are conservative and that calculated intakes are probably overestimated. Maximum measured values of COC concentrations are used to provide conservative results.

Table 7 shows the uncertainties (confidence level) in nonradiological toxicological parameter values. There is a mixture of estimated values and values from the IRIS (EPA 2003), HEAST (EPA 1997a), the Technical Background Document for Development of Soil Screening Levels (NMED December 2000), and the EPA Region 6 (EPA 2002a), EPA Region 9 (EPA 2002b) and the Risk Assessment Information System (ORNL 2003) electronic databases. Where values are not provided, information is not available from the HEAST (EPA 1997a), IRIS (EPA 2003), Technical Background Document for Development of Soil Screening Levels (NMED December 2000), the Risk Assessment Information System (ORNL 2003) or the EPA regions (EPA 2002a, 2002b, 2002c). 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.

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

For 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 millirem/year received by the average U.S. population (NCRP 1987).

The overall uncertainty in all of the steps in the risk assessment process is considered not significant with respect to the conclusion reached.

VI.9 Summary

DSS Site 1101 contains identified COCs consisting of some 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 included soil ingestion, dermal contact, and dust and volatile inhalation for chemical COCs and soil ingestion, dust inhalation, and direct gamma exposure for radionuclides. The same exposure pathways were applied to the residential land-use scenario.

Using conservative assumptions and an RME approach to risk assessment, calculations for nonradiological COCs show that for the industrial land-use scenario the HI (0.00) is significantly lower than the accepted numerical guidance from the EPA. The estimated excess cancer risk is 1E-9. 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 0.00, and the incremental excess cancer risk is 1.05E-9 for the industrial land-use scenario. The 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 nonradiological COCs show that for the residential land-use scenario the HI (0.00) is also below the accepted numerical guidance from the EPA. The estimated excess cancer risk is 5E-9. Thus excess cancer risk is also below the acceptable risk value provided by the NMED for a residential land-use scenario (Bearzi January 2001). The incremental HI is 0.00, and the incremental excess cancer risk is 4.54E-9 for the residential land-use scenario. The incremental risk calculations indicate insignificant risk to human health for the residential land-use scenario.

For the radiological COCs, no constituents exceeded the corresponding background values. Therefore, no calculation of risk was performed for industrial or residential land-use scenarios.

The summation of the nonradiological and radiological carcinogenic risks is tabulated in Table 10.

Table 10
Summation of Radiological and Nonradiological Risks from DSS Site 1101, Building 885 Septic System Carcinogens

Scenario	Nonradiological Risk	Radiological Risk	Total Risk
Industrial	1.05E-9	0.0	1.05E-9
Residential	4.54E-9	0.0	4.54E-9

Uncertainties associated with the calculations are considered small relative to the conservatism of the risk assessment analysis. Therefore, it is concluded that this site poses insignificant risk to human health under 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 the soil at DSS Site 1101. A component of the NMED Risk-Based Decision Tree (NMED March 1998) is to conduct an ecological risk assessment that corresponds with that presented in EPA's Ecological RAGS (EPA 1997b). The current methodology is tiered and contains an initial scoping assessment which is followed by a more detailed risk assessment if warranted by the results of the scoping 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. At the end of the scoping assessment, a determination is made as to whether a more detailed examination of potential ecological risk is necessary.

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 with respect to the existence of complete ecological exposure pathways, an evaluation of bioaccumulation potential, and a summary of fate and transport potential. A scoping risk-management decision (Section VII.2.4) involves summarizing the scoping results and determining whether further examination of potential ecological impacts is necessary.

VII.2.1 Data Assessment

As indicated in Section IV, all COCs at DSS Site 1101 are at depths greater than 5 feet bgs. Therefore, no complete ecological exposure pathways exist at this site, and no COCs are considered to be COPECs.

VII.2.2 Bioaccumulation

Because no COPECs are associated with this site, bioaccumulation potential was not evaluated.

VII.2.3 Fate and Transport Potential

The potential for the COCs to migrate from the source of contamination to other media or biota is discussed in Section V. As noted in Table 6 (Section V), wind, surface water, and biota (food chain uptake) are not considered to be viable transport mechanisms for COCs at this site. Degradation and transformation of the COCs are expected to be of low significance.

VII.2.4 Scoping Risk-Management Decision

Based upon information gathered through the scoping assessment, it was concluded that complete ecological pathways are not associated with COCs at this site. Therefore, no COPECs exist at the site, and a more detailed risk assessment was not deemed necessary to predict the potential level of ecological risk associated with the site.

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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 four 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 December 2000). 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 December 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).

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Sandia National Laboratories/New Mexico
Environmental Restoration Project

RESPONSE TO REQUEST FOR SUPPLEMENTAL INFORMATION AND PROPOSAL FOR CORRECTIVE ACTION COMPLETE, DRAIN AND SEPTIC SYSTEMS SITE 1101 BUILDING 885 SEPTIC SYSTEM, ADDITIONAL EXCAVATION AND SOIL SAMPLING

June 2006

United States Department of Energy
Sandia Site Office

Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.

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ACRONYMS AND ABBREVIATIONS

AOC	Area of Concern
BA	butyl acetate
bgs	below ground surface
CAC	Corrective Action Complete
COC	constituent of concern
DOE	U.S. Department of Energy
DSS	Drain and Septic Systems
EB	equipment blank
EPA	U.S. Environmental Protection Agency
HE	high explosive
HI	hazard index
HWB	Hazardous Waste Bureau
MDA	minimum detectable activity
MDL	method detection limit
mg/kg	milligram(s) per kilogram.
mrem	millirem
NFA	No Further Action
NMED	New Mexico Environment Department
PCB	polychlorinated biphenyl
QA	quality assurance
QC	quality control
RCRA	Resource Conservation and Recovery Act
RPD	relative percent difference
RPSD	Radiation Protection and Sample Diagnostics
RSI	Request for Supplemental Information
SAR	SWMU Assessment Report
SNL/NM	Sandia National Laboratories/New Mexico
SVOC	semivolatile organic compound
SWMU	Solid Waste Management Unit
TB	trip blank
TEDE	total effective dose equivalent
VOC	volatile organic compound
yr	year

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1.0 DSS SITE 1101 SITE DESCRIPTION AND INVESTIGATION HISTORY

Drain and Septic Systems (DSS) Area of Concern (AOC) Site 1101, the Building 885 Septic System, is located on the northern side of Sandia National Laboratories/New Mexico (SNL/NM) Technical Area I on federally owned land controlled by Kirtland Air Force Base and permitted to the U.S. Department of Energy (DOE) (Figure 1-1). A June 1980 SNL/NM Facilities Engineering drawing (SNL/NM June 1980) indicates that the Building 885 septic system was situated approximately 100 feet north of the northwestern corner of Building 885. This location is now beneath a large asphalt parking lot that is north of Building 885, on the northern side of H Street. The June 1980 engineering drawing shows that the abandoned septic system consisted of a septic tank and distribution box that emptied to a 5-foot-diameter by an estimated 25-foot-deep seepage pit (referred to as the northeast seepage pit in this report) located approximately 45 feet northeast of the septic tank (Figure 1-2). An older engineering drawing (SNL/NM July 1963) also indicates that a second seepage pit (the southwest seepage pit in this report) may have been located approximately 3 feet northern of the north end of the septic tank at this site. In 1988, Building 885 was connected to the City of Albuquerque sanitary sewer system, and it is assumed that the septic system was abandoned and paved over at about that time (SNL/NM August 1988).

The initial backhoe excavation (Excavation #1) in the unpaved dirt strip between H Street and the asphalt walkway was completed in March 2002 to attempt to locate the old drain line shown in engineering drawings to run north from Building 885 to the septic tank (Figure 1-2). The line was located at an average depth of 5 feet below ground surface (bgs) and was followed north until it passed under the asphalt walkway. The backhoe work was stopped at this point in order to avoid damaging the walkway. Following completion of the initial backhoe work at the site, a ground penetrating radar survey was conducted at the apparent location of the septic system on June 21, 2002. The results of this survey were inconclusive, and no buried remains of the system were found (SNL/NM December 2003a).

On October 21, 2002, an initial borehole was drilled in the center of the northeast seepage pit location shown in the June 1980 engineering drawing. At a depth of 23 feet bgs, a subsurface obstruction that caused auger refusal was encountered and was assumed at the time to be the remains of the seepage pit. Because of the concern that further attempts to drill deeper at this location could result in a lodged auger string and lost tools, it was decided to abandon this initial borehole and relocate to an offset location 5 feet south of the first boring. On October 22, 2002, a second borehole was drilled at the offset location (885-SP1-BH1 in Figure 1-2), and soil samples were successfully collected from both an upper depth interval starting at the estimated base of the seepage pit at 25 feet bgs and a second deeper interval starting at 30 feet bgs.

A Solid Waste Management Unit (SWMU) Assessment Report (SAR) and Proposal for No Further Action (NFA) that summarized the results of the intrusive and nonintrusive investigations completed at DSS Site 1101 was submitted to the New Mexico Environment Department (NMED)/Hazardous Waste Bureau (HWB) in December 2003 (SNL/NM December 2003a). In a letter dated June 8, 2004, the NMED stated that Site 1101 and a number of other DSS sites were suitable for NFA (NMED June 2004). Site 1101 was therefore petitioned for removal from the DOE/Sandia Corporation Resource Conservation and Recovery Act (RCRA) permit for SNL/NM in June 2004 (Wagner June 2004). However, in response to a public comment

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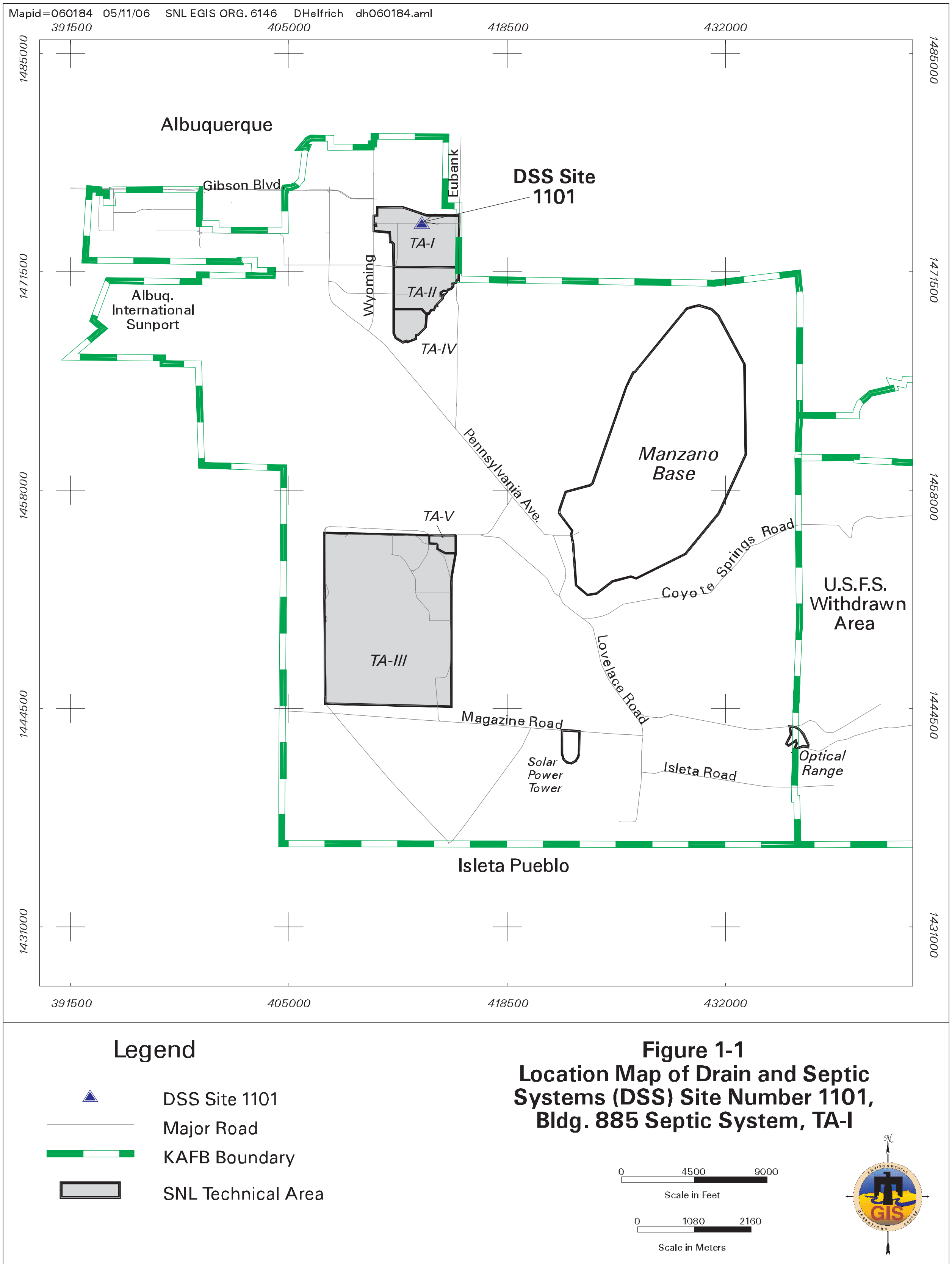

Figure 1-1
Location Map of Drain and Septic Systems (DSS) Site Number 1101, Bldg. 885 Septic System, TA-I

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

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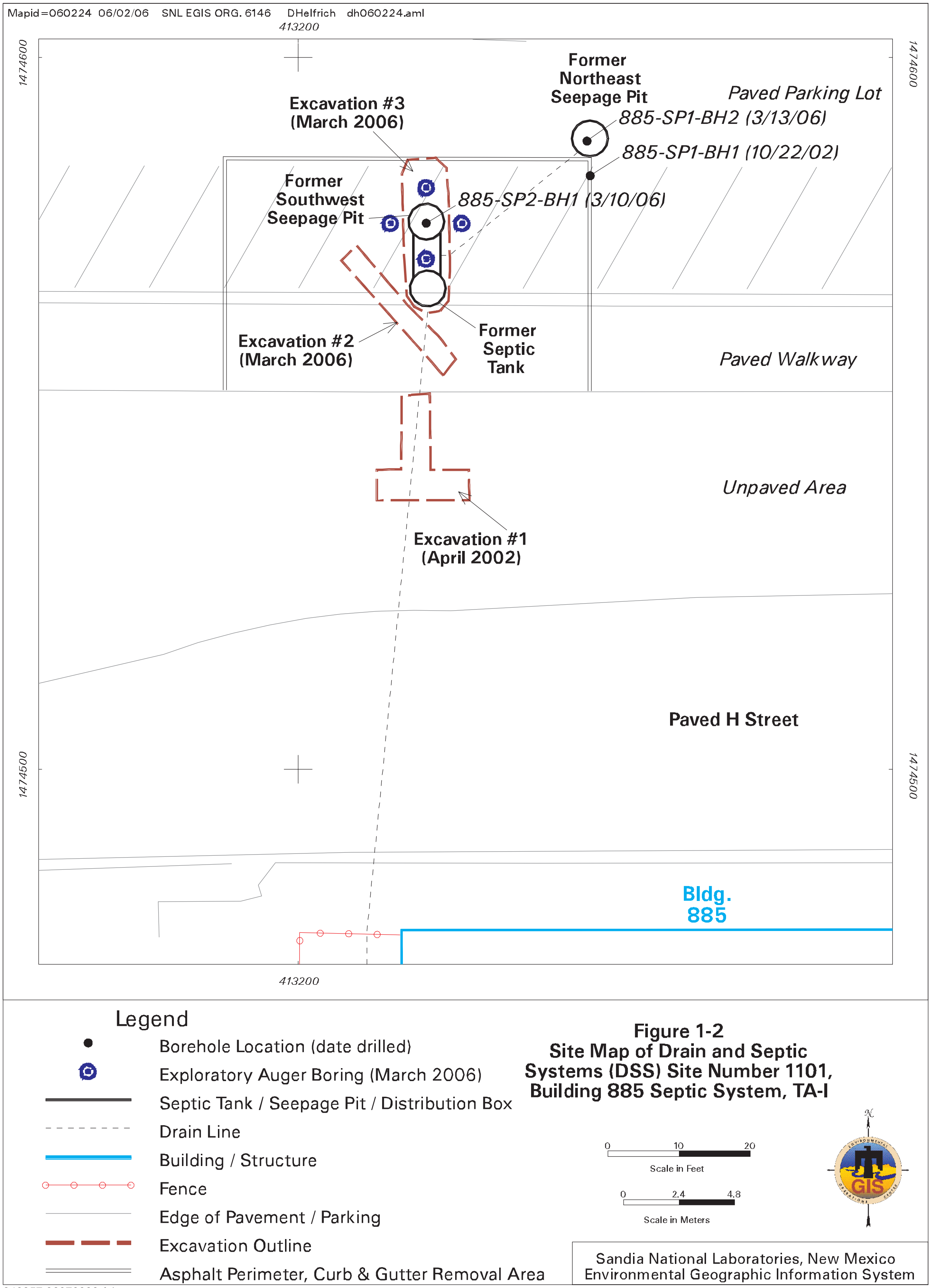

Figure 1-2
Site Map of Drain and Septic Systems (DSS) Site Number 1101, Building 885 Septic System, TA-I

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received after the SAR/NFA proposal was reviewed and approved, the NMED stated in a final decision, dated November 9, 2005, that the decision to approve DSS Site 1101 for NFA status was reversed, and the Certificate of Completion previously issued for the site was withdrawn. Furthermore, the NMED required that the following additional work be completed at the site:

> The Permittees must take the following actions before AOC 1101 may again be petitioned for NFA. The Permittees must either locate the septic tank in order to verify that the contents were removed and that the tank was properly backfilled, or definitely prove by means of excavation that the tank does not exist. Additionally, the Permittees must excavate the area where the seepage pit is presumed to be located to verify: 1) the precise location of the seepage pit and 2) whether there is only one seepage pit or other type of drainage structure associated with AOC 1101. These actions will require the excavation of the paved parking area under which the system is (or was) presumably located. (NMED November 2005)

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2.0 DSS SITE 1101 ADDITIONAL EXCAVATIONS

The additional DSS Site 1101 site investigation work required by the NMED Request for Supplemental Information (RSI) (NMED November 2005) was completed in March 2006. As shown in Figure 1-2 and the photograph in Figure 2-1, an approximate 30- by 50-foot area of asphalt parking lot, concrete curb and gutter, and asphalt walkway was first removed by a paving contractor. Following removal of the cover materials, a backhoe was used to dig two additional exploratory excavations at the site on March 3 and 4, 2006. The locations of these two backhoe excavations (Excavations #2 and #3) are also shown in Figure 1-2.

Excavation #2 was completed on March 3, 2006. It consisted of an approximate 3-foot-wide by 20-foot-long, 8-foot-deep, northwest-southeast–trending trench. The trench was excavated to intercept the old drain line immediately north of the point where it had been found in Excavation #1 in March 2002 (Figure 2-1). The old Building 885 drain line was also found in this second excavation, at a depth of 6 feet bgs. At this point, it was decided to dig a third trench starting at the northern edge of the asphalt-cleared area. This excavation continued to the south toward the point where the drain line had been found in Excavation #2 to determine whether either the septic tank or southwest seepage pit, or any remains could be found. Excavation #3 was also positioned to intercept a potential second drain line shown in engineering drawings to have run northeast from the distribution box, between the septic tank and southwest seepage, to the northeast seepage pit (Figure 1-2). Excavation #2 was backfilled before Excavation #3 was begun in order to position the backhoe at this somewhat restricted area to excavate the third trench.

Excavation #3 was completed on March 4, 2006. Digging started at the northern edge of the asphalt-cleared area and proceeded south toward the location of the drain line where it was found in Excavation #2. This trench was excavated to the maximum depth possible with the backhoe (approximately 13 feet bgs), and digging continued until the northern end of the old Building 885 drain line was encountered (Figure 2-2). No indication, or remains, of either a septic tank, seepage pit, seepage pit aggregate, or a northeast-trending drain line running toward the northeast seepage pit were found in this excavation. It was therefore concluded that the septic system components (septic tank and one or two seepage pits) had been completely removed from the site before the parking lot and walkway were constructed.

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Figure 2-1
Backhoe Excavation #2 completed in the asphalt, curb, and gutter removal area at DSS Site 1101 to locate the buried drain line from Building 885.
View to the southeast. March 3, 2006.

Figure 2-2
Excavation #3 showing the broken northern end of the old drain line running north from Building 885 and which marks the presumed location of the southern end of the former septic tank. View to the south. March 4, 2006.

3.0 DSS SITE 1101 ADDITIONAL SOIL SAMPLING

3.1 Summary

On March 6, 2006, Excavation #3 was inspected by the NMED/HWB regulator (Brian Salem) before being backfilled. He concurred that there was no evidence of an intact septic tank or the remains of any septic system components visible in the excavation, and that the septic system components appeared to have been removed from the site. However, in order to determine whether the remains of a seepage pit, or seepage pit aggregate could possibly still be present at a depth greater than the bottom of Excavation #3 (maximum depth of 13 feet bgs), he requested that SNL/NM complete four additional 30-foot-deep exploratory auger borings at the site. These four borings were to be located 5 feet from, and north, south, east, and west of, the theoretical center of the potential southwest seepage pit as shown in the engineering drawings. If indications of seepage pit aggregate were found, soil samples would be collected from the apparent center of the seepage pit and at a depth starting at the estimated base of the aggregate as determined from the drilling. However, if no indications of aggregate were found in the four exploratory borings, then soil samples would be collected at the center of the theoretical location of the southwest seepage pit as shown in the engineering drawings. In addition, the NMED regulator also requested that another attempt be made to collect samples from directly beneath the northeast seepage pit location shown in the June 1980 engineering drawing, which failed in October 2002. SNL/NM agreed to complete this additional work.

The four exploratory auger borings around the theoretical center of the southwest seepage pit were drilled to depths of 30 feet bgs on March 6, 9, and 10, 2006. Two of the four exploratory borings were located over Excavation #3, which was backfilled before the borings were completed (Figure 1-2). No indications of either buried aggregate or seepage pit remains were detected; therefore, it was concluded that soil samples would be collected from beneath the center of the southwest seepage pit location as shown in engineering drawings. On March 10, 2006, the auger drill rig was used to drill and sample the borehole (885-SP2-BH1 in Figure 1-2) at two depth intervals. An apparent 1-foot-thick rocky layer was encountered from 22 to 23 feet bgs, but was successfully penetrated with the 3-inch-diameter solid augers being used for this drilling activity, versus the 6-inch, hollow-stem augers used in 2002. The shallow sample interval started at 25 feet bgs, the estimated base of the seepage pit aggregate based upon the best available information, and the lower (deep) interval started at 5 feet below the top of the upper sample interval, or 30 feet bgs.

3.2 Procedures for Additional Soil Sampling

On March 13, 2006, the auger rig was positioned over the location of the center of the northeast seepage pit shown in the June 1980 engineering drawing, and at the location where a failed attempt to collect soil samples was made in October 2002 (Figure 3-1) . Once again, an obstruction was encountered at 23 feet bgs. This time, however, it was concluded that this most likely represented the same rocky layer encountered in the southwest seepage pit borehole location, instead of remains of a seepage pit, as was assumed in 2002. This layer was also penetrated with the 3-inch augers, and soil samples were successfully collected at depths starting at 25 and 30 feet bgs at this location (885-SP1-BH2 in Figure 1-2).

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Figure 3-1
Collecting soil samples with the auger rig from beneath the center of the former northeast seepage pit location as indicated in engineering drawings. View to the southwest. March 13, 2006.

At each of the two 2006 soil sampling locations, once the auger reached the top of the sampling interval, a 3-foot-long by 1.5-inch inside diameter Geoprobe™ sampling tube lined with a butyl acetate (BA) sampling sleeve was inserted into the borehole and hydraulically driven downward 3 feet to fill the sleeve with soil. Once the sampling tube was retrieved from the borehole, the sample for the volatile organic compound (VOC) analysis was immediately collected by cutting off a 3- to 4-inch section from the lower end of the BA sleeve and capping the section ends with Teflon® film, then a rubber end cap, and finally sealing the tube with tape. For the non-VOC analyses (including semivolatile organic compounds [SVOCs], polychlorinated biphenyls [PCBs], high explosive [HE] compounds, RCRA metals, hexavalent chromium, and total cyanide), the soil remaining in the BA liner was emptied into, and mixed in, a decontaminated bowl, and aliquots of soil were transferred into appropriate sample containers. The VOC and non-VOC samples were shipped to, and analyzed by, an off-site commercial laboratory (General Engineering Laboratories, Inc.). Samples were also collected and analyzed by the SNL/NM on-site Radiation Protection and Sample Diagnostics (RPSD) Laboratory for radionuclides by gamma spectroscopy, and gross alpha/beta activity. Care was taken in the field to retrieve and utilize only in-place soil, and not borehole slough, from the boreholes in order to obtain representative samples from this site.

All samples were documented and handled in accordance with applicable SNL/NM operating procedures and transported to on- and off-site laboratories for analysis. The areas sampled, analytical methods, and laboratories used for the DSS Site 1101 soil samples are summarized in Table 3-1.

Table 3-1
Summary of Areas Sampled, Analytical Methods, and Laboratories Used for
DSS Site 1101, Building 885 Septic System Soil Samples

Sampling Area	Number of Borehole Locations	Top of Sampling Intervals in each Borehole (ft bgs)	Total Number of Soil Samples	Total Number of Duplicate Samples	Analytical Parameters and EPA Methods[a]	Analytical Laboratory	Date Samples Collected
Northeast Seepage Pit	2 (885-SP1-BH1 and BH2)	25, 30	4	0	VOCs EPA Method 8260	GEL	10-22-02, 03-13-06
	2 (885-SP1-BH1 and BH2)	25, 30	4	0	SVOCs EPA Method 8270	GEL	10-22-02, 03-13-06
	2 (885-SP1-BH1 and BH2)	25, 30	4	0	PCBs EPA Method 8082	GEL	10-22-02, 03-13-06
	2 (885-SP1-BH1 and BH2)	25, 30	4	0	HE Compounds EPA Method 8330	GEL	10-22-02, 03-13-06
	2 (885-SP1-BH1 and BH2)	25, 30	4	0	RCRA Metals EPA Methods 6020/7000	GEL	10-22-02, 03-13-06
	2 (885-SP1-BH1 and BH2)	25, 30	4	0	Hexavalent Chromium EPA Method 7196A	GEL	10-22-02, 03-13-06
	2 (885-SP1-BH1 and BH2)	25, 30	4	0	Total Cyanide EPA Method 9012A	GEL	10-22-02, 03-13-06
	2 (885-SP1-BH1 and BH2)	25, 30	4	0	Gamma Spectroscopy EPA Method 901.1	RPSD	10-22-02, 03-13-06
	2 (885-SP1-BH1 and BH2)	25, 30	4	0	Gross Alpha/Beta Activity EPA Method 900.0	GEL	10-22-02, 03-13-06

Refer to footnotes at end of table.

Table 3-1 (Concluded)
Summary of Areas Sampled, Analytical Methods, and Laboratories Used for
DSS Site 1101, Building 885 Septic System Soil Samples

Sampling Area	Number of Borehole Locations	Top of Sampling Intervals in each Borehole (ft bgs)	Total Number of Soil Samples	Total Number of Duplicate Samples	Analytical Parameters and EPA Methods[a]	Analytical Laboratory	Date Samples Collected
Southwest Seepage Pit	1 (885-SP2-BH1)	25, 30	4	0	VOCs EPA Method 8260	GEL	03-10-06
	1 (885-SP2-BH1)	25, 30	4	0	SVOCs EPA Method 8270	GEL	03-10-06
	1 (885-SP2-BH1)	25, 30	4	0	PCBs EPA Method 8082	GEL	03-10-06
	1 (885-SP2-BH1)	25, 30	4	0	HE Compounds EPA Method 8330	GEL	03-10-06
	1 (885-SP2-BH1)	25, 30	4	0	RCRA Metals EPA Methods 6020/7000	GEL	03-10-06
	1 (885-SP2-BH1)	25, 30	4	0	Hexavalent Chromium EPA Method 7196A	GEL	03-10-06
	1 (885-SP2-BH1)	25, 30	4	0	Total Cyanide EPA Method 9012A	GEL	03-10-06
	1 (885-SP2-BH1)	25, 30	4	0	Gamma Spectroscopy EPA Method 901.1	RPSD	03-10-06
	1 (885-SP2-BH1)	25, 30	4	0	Gross Alpha/Beta Activity EPA Method 900.0	GEL	03-10-06

[a]EPA November 1986.
bgs = Below ground surface.
BH = Borehole.
DSS = Drain and Septic Systems.
EPA = U.S. Environmental Protection Agency.
ft = Foot (feet).
GEL = General Engineering Laboratories, Inc.
HE = High explosive.
PCB = Polychlorinated biphenyl.
RCRA = Resource Conservation and Recovery Act.
RPSD = Radiation Protection Sample Diagnostics Laboratory.
SP = Seepage pit.
SVOC = Semivolatile organic compound.
VOC = Volatile organic compound.

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4.0 DSS SITE 1101 SOIL SAMPLING RESULTS

Analytical results for the soil samples collected from the two boreholes drilled in March 2006 are presented and discussed in this chapter. For convenience and completeness, the analytical results for the soil samples collected from borehole 885-SP1-BH1 in October 2002 are also included and discussed. These results also were presented in the DSS Site 1101 SAR (SNL/NM December 2003a).

VOCs

VOC analytical results for the six soil samples collected from the three boreholes in 2002 and 2006 are summarized in Table 4-1. The method detection limits (MDLs) for the six VOC soil analyses are presented in Table 4-2. No VOCs were detected in any of the six soil samples collected from this site. Very low concentrations of one VOC (methylene chloride) were detected in two of the three trip blank (TB) samples included with the three shipments of VOC soil samples collected from this site. Also, very low concentrations of three VOCs were detected in the single equipment blank (EB) sample collected at the site on March 10, 2006.

SVOCs

SVOC analytical results for the six soil samples collected from the three boreholes in 2002 and 2006 are summarized in Table 4-3. The MDLs for the six SVOC soil analyses are presented in Table 4-4. As shown in Table 4-3, a total of six SVOCs were detected in the shallow sample (25 feet bgs) and two SVOCs were detected in the deep sample (30 feet bgs) collected in October 2002 from borehole 885-SP1-BH1 near the northeast seepage pit. No SVOCs were detected in the four additional soil samples or in the EB sample collected at this site in March 2006.

PCBs

PCB analytical results for the six soil samples collected from the three boreholes in 2002 and 2006 are summarized in Table 4-5. The MDLs for the six PCB soil analyses are presented in Table 4-6. No PCBs were detected in any of the six soil samples collected from this site or in the EB sample collected in March 2006.

HE Compounds

HE compound analytical results for the six soil samples collected from the three boreholes in 2002 and 2006 are summarized in Table 4-7. The MDLs for the six HE compound soil analyses are presented in Table 4-8. No HE compounds were detected in any of the six soil samples collected from this site or in the EB sample collected in March 2006.

Table 4-1
Summary of DSS Site 1101, Building 885 Septic System
Confirmatory Soil Sampling, VOC Analytical Results
October 2002 and March 2006
(Off-Site Laboratory)

Sample Attributes				VOCs (EPA Method 8260[a]) (µg/kg)		
Record Number[b]	ER Sample ID	Sample Date	Sample Depth (ft bgs)	Acetone	Carbon disulfide	Methylene chloride
605786	885-SP1-BH1-25-S	10-22-02	25	ND (3.52)	ND (2.36)	ND (1.35)
605786	885-SP1-BH1-30-S	10-22-02	30	ND (3.52)	ND (2.36)	ND (1.35)
609568	885-SP1-BH2-25-S	03-13-06	25	ND (2.58)	ND (1.25)	ND (2)
609568	885-SP1-BH2-30-S	03-13-06	30	ND (2.58)	ND (1.25)	ND (2)
609565	885-SP2-BH1-25-S	03-10-06	25	ND (2.58)	ND (1.25)	ND (2)
609565	885-SP2-BH1-30-S	03-10-06	30	ND (2.58)	ND (1.25)	ND (2)
Quality Assurance/Quality Control Samples (µg/L)						
605786	885-SP1-TB	10-22-02	NA	ND (4.5)	ND (1.91)	ND (3.3)
609565	885-SP2-EB	03-10-06	NA	**3.43 J (5)**	**33**	**2.73 J (5)**
609565	885-SP2-TB	03-10-06	NA	ND (1.25)	ND (1.25)	**3.48 J (5)**
609568	885-SP1-TB	03-13-06	NA	ND (1.25)	ND (1.25)	**4.54 J (5)**

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

bgs = Below ground surface.
BH = Borehole.
DSS = Drain and Septic Systems.
EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
ID = Identification.
J ( ) = The reported value is greater than or equal to the MDL but is less than the practical quantitation limit, shown in parentheses.
MDL = Method detection limit.
µg/kg = Microgram(s) per kilogram.
µg/L = Microgram(s) per liter.
NA = Not applicable.
ND ( ) = Not detected above the MDL, shown in parentheses.
S = Soil sample.
SP = Seepage pit.
TB = Trip blank.
VOC = Volatile organic compound.

Table 4-2
Summary of DSS Site 1101, Building 885 Septic System
Confirmatory Soil Sampling, VOC Analytical MDLs
October 2002 and March 2006
(Off-Site Laboratory)

Analyte	EPA Method 8260[a] Detection Limit (µg/kg)
Acetone	2.58–3.52
Benzene	0.33–0.45
Bromodichloromethane	0.2–0.49
Bromoform	0.3–0.49
Bromomethane	0.5
2-Butanone	1.7–3.74
Carbon disulfide	1.25–2.36
Carbon tetrachloride	0.2–0.49
Chlorobenzene	0.2–0.41
Chloroethane	0.5–0.81
Chloroform	0.2–0.52
Chloromethane	0.37–0.5
Dibromochloromethane	0.3–0.5
1,1-Dichloroethane	0.3–0.47
1,2-Dichloroethane	0.25–0.43
1,1-Dichloroethene	0.3–0.5
cis-1,2-Dichloroethene	0.3–0.47
trans-1,2-Dichloroethene	0.3–0.53
1,2-Dichloropropane	0.3–0.48
cis-1,3-Dichloropropene	0.2–0.43
trans-1,3-Dichloropropene	0.25–0.3
Ethylbenzene	0.2–0.38
2-Hexanone	1.52–3.77
Methylene chloride	1.35–2
4-Methyl-2-pentanone	1.09–4.03
Styrene	0.2–0.39
1,1,2,2-Tetrachloroethane	0.25–0.91
Tetrachloroethene	0.2–0.38
Toluene	0.29–0.34
1,1,1-Trichloroethane	0.3–0.53
1,1,2-Trichloroethane	0.3–0.54
Trichloroethene	0.25–0.45
Vinyl acetate	1.25–1.78
Vinyl chloride	0.5–0.56
Xylene	0.2–0.39

[a]EPA November 1986.
DSS = Drain and Septic Systems.
EPA = U.S. Environmental Protection Agency.
MDL = Method detection limit.
µg/kg = Microgram(s) per kilogram.
VOC = Volatile organic compound.

Table 4-3
Summary of DSS Site 1101, Building 885 Septic System
Confirmatory Soil Sampling, SVOC Analytical Results
October 2002 and March 2006
(Off-Site Laboratory)

Sample Attributes				SVOCs (EPA Method 8270[a]) (µg/kg)						
Record Number[b]	ER Sample ID	Sample Date	Sample Depth (ft bgs)	2-Chlorophenol	Acenaphthene	Chrysene	Di-n-octyl phthalate	Fluoranthene	Fluorene	bis(2-Ethylhexyl) phthalate
605786	885-SP1-BH1-25-S	10-22-02	25	**16.9 J (333)**	**10.7 J (33.3)**	**18.5 J (33.3)**	ND (30.3)	**17.4 J (33.3)**	**10.4 J (33.3)**	**31.7 J (333)**
605786	885-SP1-BH1-30-S	10-22-02	30	ND (15.3)	ND (8)	ND (16.7)	**150 J (333)**	ND (16.7)	ND (4)	**182 J (333)**
609568	885-SP1-BH2-25-S	03-13-06	25	ND (66.7)	ND (11.1)	ND (10)	ND (66.7 J)	ND (10)	ND (10)	ND (66.7)
609568	885-SP1-BH2-30-S	03-13-06	30	ND (66.7)	ND (11.1)	ND (10)	ND (66.7)	ND (10)	ND (10)	ND (66.7)
609565	885-SP2-BH1-25-S	03-10-06	25	ND (66.7)	ND (11.1)	ND (10)	ND (66.7)	ND (10)	ND (10)	ND (66.7)
609565	885-SP2-BH1-30-S	03-10-06	30	ND (66.7)	ND (11.1)	ND (10)	ND (66.7)	ND (10)	ND (10)	ND (66.7)
Quality Assurance/Quality Control Sample (µg/L)										
609565	885-SP2-EB	03-10-06	NA	ND (2.25)	ND (0.348)	ND (0.225)	ND (3.37)	ND (0.225)	ND (0.225)	ND (2.25)

Note: Values in **bold** represent detected analytes.

[a]EPA November 1986.

[b]Analysis request/chain-of-custody record.

bgs = Below ground surface.
BH = Borehole.
DSS = Drain and Septic Systems.
EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
ID = Identification.
J ( ) = The reported value is greater than or equal to the MDL but is less than the practical quantitation limit, shown in parentheses.
MDL = Method detection limit.
µg/kg = Microgram(s) per kilogram.
µg/L = Microgram(s) per liter.
NA = Not applicable.
ND ( ) = Not detected above the MDL, shown in parentheses.
S = Soil sample.
SP = Seepage pit.
SVOC = Semivolatile organic compound.

Table 4-4
Summary of DSS Site 1101, Building 885 Septic System
Confirmatory Soil Sampling, SVOC Analytical MDLs
October 2002 and March 2006
(Off-Site Laboratory)

Analyte	EPA Method 8270[a] Detection Limit (µg/kg)
Acenaphthene	8–11.1
Acenaphthylene	10–16.7
Anthracene	6.67–16.7
Benzo(a)anthracene	10–16.7
Benzo(a)pyrene	10–16.7
Benzo(b)fluoranthene	10–16.7
Benzo(g,h,i)perylene	10–16.7
Benzo(k)fluoranthene	10–16.7
4-Bromophenyl phenyl ether	33.3–34
Butylbenzyl phthalate	28.7–66.7
Carbazole	10–16.7
4-Chlorobenzenamine	66.7–167
bis(2-Chloroethoxy)methane	12.3–66.7
bis(2-Chloroethyl)ether	37.3–66.7
bis-Chloroisopropyl ether	11–66.7
4-Chloro-3-methylphenol	33.3–167
2-Chloronaphthalene	11.7–13.7
2-Chlorophenol	15.3–66.7
4-Chlorophenyl phenyl ether	19.7–33.3
Chrysene	10–16.7
o-Cresol	26–66.7
m,p-Cresol	133
p-Cresol	33.3
Dibenz[a,h]anthracene	10–16.7
Dibenzofuran	17–66.7
1,2-Dichlorobenzene	10–66.7
1,3-Dichlorobenzene	11.3–66.7
1,4-Dichlorobenzene	15.7–66.7
3,3'-Dichlorobenzidine	100–167
2,4-Dichlorophenol	20.7–66.7
Diethylphthalate	17.7–66.7
2,4-Dimethylphenol	66.7–167
Dimethylphthalate	18.3–66.7
Di-n-butyl phthalate	24–33.3
Dinitro-o-cresol	66.7–167
2,4-Dinitrophenol	127–167
2,4-Dinitrotoluene	25.3–33.3
2,6-Dinitrotoluene	33.3
Di-n-octyl phthalate	30.3–66.7
Diphenyl amine	22.3–66.7
bis(2-Ethylhexyl) phthalate	30–66.7
Fluoranthene	10–16.7

Refer to footnotes at end of table.

Table 4-4 (Concluded)
Summary of DSS Site 1101, Building 885 Septic System
Confirmatory Soil Sampling, SVOC Analytical MDLs
October 2002 and March 2006
(Off-Site Laboratory)

Analyte	EPA Method 8270[a] Detection Limit (µg/kg)
Fluorene	4–10
Hexachlorobenzene	20–66.7
Hexachlorobutadiene	12.7–66.7
Hexachlorocyclopentadiene	66.7–167
Hexachloroethane	22–66.7
Indeno(1,2,3-cd)pyrene	10–16.7
Isophorone	16–66.7
2-Methylnaphthalene	6.67–16.7
Naphthalene	10–16.7
Nitrobenzene	20.3–66.7
2-Nitroaniline	66.7–167
3-Nitroaniline	66.7–167
4-Nitroaniline	37–66.7
2-Nitrophenol	17–33.3
4-Nitrophenol	66.7–167
n-Nitrosodipropylamine	22.7–66.7
Pentachlorophenol	66.7–167
Phenanthrene	10–16.7
Phenol	12.7–66.7
Pyrene	10.5–16.7
1,2,4-Trichlorobenzene	12.7–66.7
2,4,5-Trichlorophenol	17.3–66.7
2,4,6-Trichlorophenol	27.3–66.7

[a]EPA November 1986.
DSS = Drain and Septic Systems.
EPA = U.S. Environmental Protection Agency.
MDL = Method Detection Limit.
µg/kg = Microgram(s) per kilogram.
SVOC = Semivolatile organic compound.

Table 4-5
Summary of DSS Site 1101, Building 885 Septic System
Confirmatory Soil Sampling, PCB Analytical Results
October 2002 and March 2006
(Off-Site Laboratory)

Sample Attributes				PCBs
Record Number[b]	ER Sample ID	Sample Date	Sample Depth (ft bgs)	(EPA Method 8082[a]) (µg/kg)
605786	885/1101-SP1-BH1-25-S	10-22-02	25	ND
605786	885/1101-SP1-BH1-30-S	10-22-02	30	ND
609568	885/1101-SP1-BH2-25-S	03-13-06	25	ND
609568	885/1101-SP1-BH2-30-S	03-13-06	30	ND
609565	885/1101-SP2-BH1-25-S	03-10-06	25	ND
609565	885/1101-SP2-BH1-30-S	03-10-06	30	ND
Quality Assurance/Quality Control Sample (µg/L)				
609565	885/1101-EB	03-10-06	NA	ND

[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
bgs = Below ground surface.
BH = Borehole.
DSS = Drain and Septic Systems.
EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
ID = Identification.
µg/kg = Microgram(s) per kilogram.
µg/L = Microgram(s) per liter.
NA = Not applicable.
ND = Not detected.
PCB = Polychlorinated biphenyl.
S = Soil sample.
SP = Seepage pit.

Table 4-6
Summary of DSS Site 1101, Building 885 Septic System
Confirmatory Soil Sampling, PCB Analytical MDLs
October 2002 and March 2006
(Off-Site Laboratory)

Analyte	EPA Method 8270[a] Detection Limit (μg/kg)
Aroclor-1016	1
Aroclor-1221	2.82
Aroclor-1232	1.67
Aroclor-1242	1.67
Aroclor-1248	1
Aroclor-1254	0.5
Aroclor-1260	1

[a]EPA November 1986.
DSS = Drain and Septic Systems.
EPA = U.S. Environmental Protection Agency.
MDL = Method detection limit.
μg/kg = Microgram(s) per kilogram.
PCB = Polychlorinated biphenyl.

Table 4-7
Summary of DSS Site 1101, Building 885 Septic System
Confirmatory Soil Sampling, HE Compound Analytical Results
October 2002 and March 2006
(Off-Site Laboratory)

Sample Attributes				HE
Record Number[b]	ER Sample ID	Sample Date	Sample Depth (ft bgs)	(EPA Method 8330[a]) (μg/kg)
605786	885/1101-SP1-BH1-25-S	10-22-02	25	ND H
605786	885/1101-SP1-BH1-30-S	10-22-02	30	ND
609568	885/1101-SP1-BH2-25-S	03-13-06	25	ND
609568	885/1101-SP1-BH2-30-S	03-13-06	30	ND
609565	885/1101-SP2-BH1-25-S	03-10-06	25	ND
609565	885/1101-SP2-BH1-30-S	03-10-06	30	ND
Quality Assurance/Quality Control Sample (μg/L)				
609565	885/1101-EB	03-10-06	NA	ND

[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
bgs = Below ground surface.
BH = Borehole.
DSS = Drain and Septic Systems.
EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
H = The holding time was exceeded for the associated sample analysis.
HE = High explosive.
ID = Identification.
μg/kg = Microgram(s) per kilogram.
μg/L = Microgram(s) per liter.
NA = Not applicable.
ND = Not detected.
S = Soil sample.
SP = Seepage pit.

Table 4-8
Summary of DSS Site 1101, Building 885 Septic System
Confirmatory Soil Sampling, HE Compound Analytical MDLs
October 2002 and March 2006
(Off-Site Laboratory)

Analyte	EPA Method 8330[a] Detection Limit (µg/kg)
2-Amino-4,6-dinitrotoluene	18.1–50
4-Amino-2,6-dinitrotoluene	34.1–50
1,3-Dinitrobenzene	34.1–50
2,4-Dinitrotoluene	50–55
2,6-Dinitrotoluene	48–50
HMX	48–50
Nitrobenzene	48–50
2-Nitrotoluene	24–50
3-Nitrotoluene	24–50
4-Nitrotoluene	24–50
RDX	48–50
Tetryl	22.1–50
1,3,5-Trinitrobenzene	29–50
2,4,6-Trinitrotoluene	48–50

[a]EPA November 1986.
DSS = Drain and Septic Systems.
EPA = U.S. Environmental Protection Agency.
HE = High explosive.
HMX = Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine.
MDL = Method detection limit.
µg/kg = Microgram(s) per kilogram.
RDX = Hexahydro-1,3,5-trinitro-1,3,5-triazine.
Tetryl = 2,4,6-trinitrophenylmethylnitramine.

RCRA Metals and Hexavalent Chromium

RCRA metals and hexavalent chromium analytical results for the six soil samples collected from the three boreholes in 2002 and 2006 are summarized in Table 4-9. The MDLs for the six metals soil analyses are presented in Table 4-10. None of the eight RCRA metals concentrations detected in these samples exceeded the corresponding NMED-approved background concentrations. Hexavalent chromium was detected at 0.0844 J milligrams per kilogram (mg/kg) in one of the six soil samples collected from this site. There is no NMED-approved background concentration for hexavalent chromium in the North Area Supergroup. This hexavalent chromium result is therefore treated as a detection above background and is discussed in the updated risk assessment in Chapter 7.0.

Total Cyanide

Total cyanide analytical results for the six soil samples collected from the three boreholes are summarized in Table 4-11. The MDLs for the six cyanide soil analyses are presented in Table 4-12. As shown in Table 4-11, cyanide was detected at 0.184 J mg/kg in one of the October 2002 samples, and cyanide was not detected in the other five samples from this site.

Radionuclides

Radionuclide analytical results for the gamma spectroscopy analyses for the six soil samples collected from the three boreholes are summarized in Table 4-13. No activities above NMED-approved background levels for the four representative radionuclides were detected in any of the samples from this site. However, although not detected, the minimum detectable activities (MDAs) for two of the uranium-235 and one of the uranium-238 March 2006 analyses exceeded their respective background activities because the standard gamma spectroscopy count time for soil samples (6,000 seconds) was not sufficient to reach the NMED-approved background activity established for SNL/NM soil. Even though the MDAs may be slightly elevated, they are still very low, and the risk assessment outcome for the site is not significantly impacted by their use. The complete gamma spectroscopy analytical reports for the March 2006 soil samples are provided in Annex A of this document.

Gross Alpha/Beta Activity

Gross alpha/beta analytical results for the six soil samples collected from the three boreholes are summarized in Table 4-14. No gross alpha or beta activity above the New Mexico-established background levels (Miller September 2003) was detected in any of the six gross alpha/beta samples from this site. These gross alpha and beta results indicate no significant levels of radioactive material are present in the soil at the site.

Table 4-9
Summary of DSS Site 1101, Building 885 Septic System Confirmatory Soil Sampling, Metals Analytical Results October 2002 and March 2006 (Off-Site Laboratory)

Sample Attributes				Metals (EPA Methods 6020/7000/7196A[a]) (mg/kg)								
Record Number[b]	ER Sample ID	Sample Date	Sample Depth (ft bgs)	Arsenic	Barium	Cadmium	Chromium	Chromium (VI)	Lead	Mercury	Selenium	Silver
605786	885-SP1-BH1-25-S	10-22-02	25	1.97	56.2 J	0.187 J (0.481)	11.8	ND (0.0533)	4.29	0.00124 J (0.00897)	0.613 J	ND (0.0867)
605786	885-SP1-BH1-30-S	10-22-02	30	2.15	85.7 J	0.158 J (0.495)	7.44	ND (0.0533)	4.68	0.00459 J (0.00913)	0.288 J (0.495)	ND (0.0893)
609565	885-SP2-BH1-25-S	03-10-06	25	1.33	84.1 J	0.221 J	4.48	**0.0844 J (0.0984)**	5.07	0.00282 J, H	ND (0.487)	ND (0.0971)
609565	885-SP2-BH1-30-S	03-10-06	30	2.43	122 J	0.185 J (0.193)	9.61	ND (0.0281)	7.1	0.00839 J, H	ND (0.483)	ND (0.1)
609568	885-SP1-BH2-25-S	03-13-06	25	1.17	57.4 J	0.16 J (0.198)	4.6	ND (0.0301)	5	0.00384 J, H	ND (0.495)	ND (0.0962)
609568	885-SP1-BH2-30-S	03-13-06	30	2.25	123 J	0.18 J (0.191)	10.2	ND (0.0298)	7.24	0.00763 J, H	ND (0.478)	ND (0.0975)
Background Concentration—North Area Supergroup[c]				4.4	200	0.9	12.8	NC	11.2	<0.1	<1	<1
Quality Assurance/Quality Control Sample (mg/L)												
609565	885-SP2-EB	03-10-06	NA	ND (0.0015)	ND (0.0005)	ND (0.0001)	0.00159 J (0.003)	ND (0.003) H,J	ND (0.0005)	ND (0.00005)	ND (0.0025)	ND (0.0002)

Note: Value in **bold** represents detection of Chromium (VI).

[a]EPA November 1986.

[b]Analysis request/chain-of-custody record.

[c]Dinwiddie September 1997.

bgs = Below ground surface.
BH = Borehole.
DSS = Drain and Septic Systems.
EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
H = The holding time was exceeded for the associated sample analysis.
ID = Identification.
J ( ) = The reported value is greater than or equal to the MDL but is less than the practical quantitation limit, shown in parentheses.
J = Analytical result was qualified as an estimated value during data validation.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
mg/L = Milligram(s) per liter.
NA = Not applicable.
NC = Not calculated.
ND ( ) = Not detected above the MDL, shown in parentheses.
S = Soil sample.
SP = Seepage pit.

Table 4-10
Summary of DSS Site 1101, Building 885 Septic System
Confirmatory Soil Sampling, Metals Analytical MDLs
October 2002 and March 2006
(Off-Site Laboratory)

Analyte	EPA Method 6020/7000/7196A[a] Detection Limit (mg/kg)
Arsenic	0.198–0.297
Barium	0.0641–0.099
Cadmium	0.0191–0.0473
Chromium	0.155–0.198
Chromium (VI)	0.0281–0.0533
Lead	0.0956–0.281
Mercury	0.000882–0.00249
Selenium	0.156–0.495
Silver	0.0867–0.1

[a]EPA November 1986.
DSS = Drain and Septic Systems.
EPA = U.S. Environmental Protection Agency.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.

Table 4-11
Summary of DSS Site 1101, Building 885 Septic System
Confirmatory Soil Sampling, Total Cyanide Analytical Results
October 2002 and March 2006
(Off-Site Laboratory)

Sample Attributes				Total Cyanide (EPA Method 9012[a]) (mg/kg)
Record Number[b]	ER Sample ID	Sample Date	Sample Depth (ft bgs)	
605786	885-SP1-BH1-25-S	10-22-02	25	**0.184 J (0.244)**
605786	885-SP1-BH1-30-S	10-22-02	30	ND (0.0378)
609565	885-SP2-BH1-25-S	03-10-06	25	ND (0.125)
609565	885-SP2-BH1-30-S	03-10-06	30	ND (0.125)
609568	885-SP1-BH2-25-S	03-13-06	25	ND (0.116)
609568	885-SP1-BH2-30-S	03-13-06	30	ND (0.123)
Quality Assurance/Quality Control Sample (mg/L)				
609565	885-SP2-EB	03-10-06	NA	ND (0.0025)

Note: Values in **bold** represent detected analytes.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
bgs = Below ground surface.
BH = Borehole.
DSS = Drain and Septic Systems.
EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
ID = Identification.
J ( ) = The reported value is greater than or equal to the MDL but is less than the practical quantitation limit, shown in parentheses.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
mg/L = Milligram(s) per liter.
NA = Not applicable.
ND ( ) = Not detected above the MDL, shown in parentheses.
S = Soil sample.
SP = Seepage pit.

Table 4-12
Summary of DSS Site 1101, Building 885 Septic System
Confirmatory Soil Sampling, Total Cyanide Analytical MDLs
October 2002 and March 2006
(Off-Site Laboratory)

Analyte	EPA Method 9012A[a] Detection Limit (mg/kg)
Total Cyanide	0.0378–0.125

[a]EPA November 1986.
DSS = Drain and Septic Systems.
EPA = U.S. Environmental Protection Agency.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.

Table 4-13
Summary of DSS Site 1101, Building 885 Septic System
Confirmatory Soil Sampling, Gamma Spectroscopy Analytical Results
October 2002 and March 2006
(On-Site Laboratory)

Sample Attributes				Activity (EPA Method 901.1[a]) (pCi/g)							
				Cesium-137		Thorium-232		Uranium-235		Uranium-238	
Record Number[b]	ER Sample ID	Sample Date	Sample Depth (ft bgs)	Result	Error[c]	Result	Error[c]	Result	Error[c]	Result	Error[c]
605791	885-SP1-BH1-25-S	10-22-02	25	ND (0.0264)	--	0.564	0.265	ND (0.159)	--	ND (0.386)	--
605791	885-SP1-BH1-30-S	10-22-02	30	ND (0.0286)	--	0.617	0.29	ND (0.172)	--	ND (0.419)	--
609569	885-SP1-BH2-25-S	03-13-06	25	ND (0.0268)	--	0.518	0.25	ND (0.148)	--	ND (1.14)	--
609569	885-SP1-BH2-30-S	03-13-06	30	ND (0.0263)	--	0.703	0.325	ND (0.165)	--	1.01	1.01
609566	885-SP2-BH1-25-S	03-10-06	25	ND (0.0316)	--	0.667	0.32	**ND (0.186)**	--	0.766	0.924
609566	885-SP2-BH1-30-S	03-10-06	30	ND (0.0302)		0.782	0.363	**ND (0.207)**	--	**ND (3.52)**	--
Background Activity—North Area Supergroup[d]				0.084	NA	1.54	NA	0.18	NA	1.3	NA

Values in **bold** exceed background soil activity.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]Two standard deviations about the mean detected activity.
[d]Dinwiddie September 1997.
bgs = Below ground surface.
BH = Borehole.
DSS = Drain and Septic Systems.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
ID = Identification.
MDA = Minimum detectable activity.
NA = Not applicable.
ND ( ) = Not detected above the MDA, shown in parentheses.
ND ( ) = Not detected but the MDA, shown in parentheses, exceeds the background activity.
pCi/g = Picocuries per gram.
S = Soil sample.
SP = Seepage pit.
-- = Error not calculated for nondetected results.

Table 4-14
Summary of DSS Site 1101, Building 885 Septic System
Confirmatory Soil Sampling, Gross Alpha and Beta Analytical Results
October 2002 and March 2006
(Off-Site Laboratory)

Sample Attributes				Activity (EPA Method 900.0[a]) (pCi/g)			
				Gross Alpha		Gross Beta	
Record Number[b]	ER Sample ID	Sample Date	Sample Depth (ft bgs)	Result	Error[c]	Result	Error[c]
605786	885-SP1-BH1-25-S	10-22-02	25	5.91	1.34	16.8	2.23
605786	885-SP1-BH1-30-S	10-22-02	30	10.3	1.69	17.7	1.29
609568	885-SP1-BH2-25-S	03-13-06	25	14.9	4.77	28.5	6.08
609568	885-SP1-BH2-30-S	03-13-06	30	9.43	4.08	16.5	4.41
609565	885-SP2-BH1-25-S	03-10-06	25	10	4.15	23.3	5.56
609565	885-SP2-BH1-30-S	03-10-06	30	12.1	4.42	17	5.12
Background Activity[d]				17.4	NA	35.4	NA
Quality Assurance/Quality Control Sample (pCi/L)							
609565	885-SP2-EB	03-10-06	NA	0.166	0.176	0.139	0.494

[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]Two standard deviations about the mean detected activity.
[d]Miller September 2003.

bgs = Below ground surface.
BH = Borehole.
DSS = Drain and Septic Systems.
EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
ID = Identification.
NA = Not applicable.
pCi/g = Picocuries per gram.
pCi/L = Picocuries per liter.
S = Soil sample.
SP = Seepage pit.

5.0 DSS SITE 1101 SOIL SAMPLING QUALITY ASSURANCE/ QUALITY CONTROL SAMPLES AND DATA VALIDATION RESULTS FOR THE ADDITIONAL SAMPLES

Quality assurance (QA)/quality control (QC) samples were collected as part of the March 2006 soil sampling effort. One set of aqueous EB samples were collected and analyzed for the same analytical suite as the soil samples in that shipment, except for the radionuclides by gamma spectroscopy. As shown in Tables 4-1 and 4-14, trace levels of three VOCs (acetone, carbon disulfide, and methylene chloride), and low levels of gross alpha/beta activity were detected in the EB samples collected at this site. As shown in Table 4-1, three aqueous TB samples were included with the three VOC soil sample shipments. The TBs were analyzed for VOCs only, and methylene chloride was detected in two of the three TB samples at low concentrations. No duplicate soil samples were collected as part of the two relatively small soil sampling events at this site.

All laboratory data were reviewed and verified/validated according to “Data Validation Procedure for Chemical and Radiochemical Data,” SNL/NM AOP [Administrative Operating Procedure] 00-03, Rev. 01 (SNL/NM December 2003b). In addition, SNL/NM Department 7713 (RPSD Laboratory) reviewed all gamma spectroscopy results according to “Laboratory Data Review Guidelines,” Procedure No. RPSD-02-11, Issue No. 2 (SNL/NM July 1996). Annex A contains the reports for the samples collected at this site.

The relative percent differences (RPDs) for a number of internal laboratory QA/QC sample analyses associated with the metals analyses performed on the March 2006 samples did not initially meet RPD QA/QC goals. These RPD failures were apparently due to matrix heterogeneity problems, so reanalyses for a number of the metals were requested by SNL/NM. The sample material sent to the laboratory was crushed and homogenized, and the analyses were performed again in an attempt to achieve RPDs that were within QA/QC guidelines. However, RPDs for all four of the barium and one of the four cadmium reanalyses still did not meet RPD goals. Therefore, these values are flagged as estimated “J” concentrations in Table 4-9. Also, the four mercury reanalyses were completed out of, but within, two times the specified method holding time. Therefore, these mercury values are also flagged as estimated “J” concentrations because of the holding time exceedences. The data validation reports for both the March 2006 original analyses and the reanalyses are presented in Annex B. Despite these issues, the data are acceptable for use in this response to the RSI and proposal for Corrective Action Complete (CAC).

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6.0 DSS SITE 1101 SAMPLING DATA GAPS

Analytical data from the site assessment were sufficient for completing characterization of the nature and extent of possible constituent of concern (COC) releases. There are no data gaps regarding characterization of DSS Site 1101.

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7.0 DSS SITE 1101 RISK ASSESSMENTS

The original risk assessments performed for both human health and ecological risk at DSS Site 1101 were presented in the DSS Site 1101 SAR (SNL/NM December 2003a). These risk assessments have been updated to reflect the additional hexavalent chromium detection and the uranium-235 and uranium-238 MDA exceedences above background values (presented in Tables 4-9 and 4-13, respectively) detected in the March 2006 samples. This chapter summarizes the results of these updated risk assessments.

7.1 Human Health

DSS Site 1101 has been recommended for an industrial land-use scenario (DOE et al. September 1995). Because SVOCs, total cyanide, and metals are present and the uranium-235 and uranium-238 MDAs are greater than background values, it was necessary to perform an updated human health risk assessment analysis for the site, which included all COCs that have been detected at the site. The risk assessment process provides a quantitative evaluation of the potential adverse human health effects from constituents in the site's soil by calculating the hazard index (HI) and excess cancer risk for both industrial and residential land-use scenarios.

The HI calculated for the COCs at DSS Site 1101 is 0.00 under the industrial land-use scenario, which is lower than the numerical standard of 1.0 suggested by risk assessment guidance (EPA 1989). The incremental HI risk, determined by subtracting risk associated with background concentrations from potential nonradiological COC risk (without rounding), is 0.00. The excess cancer risk for DSS Site 1101 COCs under an industrial land-use scenario is 1E-9. 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. The incremental excess cancer risk is 1.22E-9. Both the incremental HI and excess cancer risk values are below NMED guidelines.

The HI calculated for the COCs at DSS Site 1101 is 0.00 under the residential land-use scenario, which is lower than the numerical standard of 1.0 suggested by risk assessment guidance (EPA 1989). The incremental HI risk, determined by subtracting risk associated with background from potential nonradiological COC risk (without rounding), is 0.00. The excess cancer risk for DSS Site 1101 COCs is 5E-9 for a residential industrial land-use scenario. 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. The incremental excess cancer risk is 4.80E-9. Both the incremental HI and incremental excess cancer risk values are below NMED guidelines.

The incremental total effective dose equivalent (TEDE) and corresponding estimated cancer risk from radiological COCs are much less than U.S. Environmental Protection Agency (EPA) guidance values; the estimated TEDE is 6.2E-2 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 incremental estimated cancer risk value is 5.76E-7 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 1.7E-1 mrem/yr with an associated risk of 1.67E-6. The guideline for this scenario is 75 mrem/yr (SNL/NM February 1998). Therefore, DSS Site 1101 is eligible for unrestricted radiological release.

The nonradiological and radiological carcinogenic risks are tabulated and summed in Table 7.1-1.

Table 7.1-1
Summation of Nonradiological and Radiological Risks from
DSS Site 1101, Building 885 Septic System Carcinogens

Scenario	Nonradiological Risk	Radiological Risk	Total Risk
Industrial	1.22E-9	5.76E-7	5.30E-7
Residential	4.80E-9	1.67E-6	1.54E-6

DSS = Drain and Septic Systems.

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

7.2 Ecological

An ecological 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 in the "RPMP [RCRA Permits Management Program] Document Requirement Guide" (NMED March 1998). An early step in the evaluation compares COC concentrations and identifies potentially bioaccumulative constituents. This methodology also requires developing a site conceptual model and a food web model, as well as selecting ecological receptors, as presented in the "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.

All COCs at DSS Site 1101 occur at depths greater than 5 feet bgs. Therefore, no complete ecological pathways exist at this site, and a more detailed ecological risk assessment is not necessary.

8.0 RECOMMENDATION FOR CORRECTIVE ACTION COMPLETE WITHOUT CONTROLS DETERMINATION

8.1 Rationale

Based upon field investigation data and the human health and ecological risk assessment analyses, a determination of CAC without controls (NMED April 2004) is recommended for DSS Site 1101 for the following reasons:

- The soil has been sampled for all potential COCs.
- No COCs are present in the soil at levels considered hazardous to human health for either an industrial or residential land-use scenario.
- None of the COCs warrant ecological concern because no complete pathways exist at the site.

8.2 Criterion

Based upon the evidence provided in Section 8.1, DSS Site 1101 is again proposed for NFA, and a determination of CAC without controls (NMED April 2004) is recommended for DSS Site 1101. This is consistent with the NMED's NFA Criterion 5, which states, "the SWMU/AOC has been characterized or remediated in accordance with current applicable state or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use" (NMED March 1998).

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9.0 REFERENCES

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ANNEX A
DSS Site 1101
Complete Gamma Spectroscopy Radionuclide Analytical Reports for the March 2006 Soil Samples Submitted to the SNL/NM RPSD Laboratory

ON-SITE LABORATORY (RPSD)

ANALYSIS REQUEST AND CHAIN OF CUSTODY

Program ID: ER-Environment Rest.

Page 1 of 1

Internal Lab

Batch No. MRSANDE

SAR/WR No. 01-024

AR/COC 609566

Dept. No./Mail Stop:	6146/1089	Date Samples Shipped:	3-13-06	SMO USE Logged By:	
Project/Task Manager:	Mike Sanders	Carrier/Waybill No.:	HC	Project/Task No.:	98043.02.02.01
Project Name:	DSS - NFA	Lab Contact:	Kathye Chavez (505) 844-7088	SMO Authorization:	[illegible] SMO
Record Center Code:		Lab Destination:	RPSD/Bldg.	Location:	Tech Area: Remote
Logbook Ref. No.:		SMO Contact/Phone:	Doug Perry (505) 845 0867	Building: NA	Room: NA
Service Order No.:	CF023-06				

- [ ] Characterization Only
- [x] Waste Characterization
- -RCRA Date =
- -Send preliminary/copy report to:
- [ ] Release to ERCL On-Site Lab
- [ ] Release to Off-Site Lab
- -This COC Number Releases COC No(s).:

Sample No.-Fraction / RPSD No.-Fraction	ER Sample ID or Sample Location Detail / RPSD Remarks/Aliquot Amounts	Beginning Depth (ft) / Screen CPM	ER Site No. / Sample Mass	Date/Time(hr) Collected / Sample Quantity	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Analysis Request
075626-016	885 / 1101-SP2-BH1-25-S	25	1101	031006/1445	S	M	770.89g 500 ml	4C	G	SA	Gamma Spec 3-13-06 RM 770.89g
											Lab 01 ✓
075627-016	885 / 1101-SP2-BH1-30-S	30	1101	031006/1544	S	M	662.81 500 ml	4C	G	SA	Gamma Spec 662.81g
											Lab 02 ✓
LCS 03											Lab 01 ✓
LCS 04											Lab 04 ✓

RMMA [ ] Yes [x] No Ref. No.

Sample Disposal [ ] Return to Client [x] Disposal by Lab

Turnaround Time [x] Normal [ ] Rush

Required Report Date

Sample Tracking Smo Use
Date Entered(mm/dd/yy)
Entered by:
QC inits.

Special Instructions/QC Requirements
EDD [x] Yes [ ] No
Raw Data Package [x] Yes [ ] No

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	William Gibson	William Gibson	WJG	Weston/6134/844-5130/228-0710

*Please send report to:
Mike Sanders, Dept6146/MS 1089,505-284-2478
*Non-release.

Please list as separate report.

		Org.	Date	Time			Org.	Date	Time
1.Relinquished by	William Gibson	6134	3/13/06	1000	4.Relinquished by	BJM lab storage	10321	3-16-06	9:00
1. Received by	[illegible] SMO	6134	3/13/06	1000	4. Received by	[illegible] SMO	6146	3-16-06	0900
2.Relinquished by	[illegible] SMO	6134	3/13/06	1355	5.Relinquished by	[illegible]	6146	3-16-06	1435
2. Received by	[illegible]	10321	3/13/06	1355	5. Received by	William Gibson	6146	3-16-06	1435
3.Relinquished by	[illegible]	10321	3-13-06	1355	6.Relinquished by	William Gibson	6146	3-23-06	1122
3. Received by	Brenda Mais	10321	3.13.06	1621	6. Received by	M R Sanders	6146	3-23-06	1122

```
****************************************************************************
*                      Sandia National Laboratories                        *
*        Radiation Protection Sample Diagnostics Program                   *
*                         3/15/06    4:45:06 PM                            *
****************************************************************************
*                                                                          *
* Analyzed by: Brenda Maes 3.15.06    Reviewed by: RTPreston 3/15/06       *
****************************************************************************
Customer/Org                         : SANDERS, M.    /6146    / MRSANDE
Customer Sample ID                   : 075626-016
Lab Sample ID/Program ID             : C0054401              / ER
Sample Description                   : 885/1101-SP2-BH1-25-S
Sample Quantity/Category             :    770.890   gram       SA
Sample Date/Time                     : 3/10/06     2:45:00 PM
Acquire Start Date/Time              : 3/13/06     4:33:47 PM
Detector Name/Survey#/COC#           : LAB01      /           /609566
Procedure Number                     : RPSD-09-01
Elapsed Live/Real Time, Geometry     :    6000 /    6002 seconds , 1SMAR

Comments:
U-235/Ra-226 peaks not resolved. Either isotope may be overestimated.
****************************************************************************
```

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	7.66E-001	9.24E-001	1.45E+000
RA-226	6.86E-001	4.39E-001	6.76E-001
[illegible]-214	5.77E-001	9.02E-002	5.10E-002
BI-214	4.80E-001	8.65E-002	5.60E-002
PB-210	Not Detected	---------	5.35E+000
TH-232	6.67E-001	3.20E-001	1.79E-001
RA-228	5.34E-001	1.25E-001	1.31E-001
AC-228	6.45E-001	1.39E-001	1.08E-001
TH-228	7.38E-001	2.24E-001	4.25E-001
RA-224	6.49E-001	1.63E-001	8.38E-002
PB-212	5.52E-001	8.42E-002	3.85E-002
BI-212	6.03E-001	2.86E-001	3.99E-001
TL-208	5.00E-001	9.56E-002	7.18E-002
U-235	Not Detected	---------	1.86E-001
TH-231	Not Detected	---------	6.28E+000
PA-231	Not Detected	---------	1.24E+000
TH-227	Not Detected	---------	2.13E-001
RA-223	Not Detected	---------	1.51E-001
RN-219	Not Detected	---------	3.42E-001
PB-211	Not Detected	---------	7.79E-001
TL-207	Not Detected	---------	1.49E+001
AM-241	Not Detected	---------	1.59E-001
PU-239	Not Detected	---------	3.14E+002
NP-237	Not Detected	---------	1.78E+000
PA-233	Not Detected	---------	5.46E-002
[illegible]-229	Not Detected	---------	1.81E-001

[Summary Report] - Sample ID: ID : C0054401 / ER

:lide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	3.59E-002
AG-110m	Not Detected	---------	3.01E-002
BA-133	Not Detected	---------	4.89E-002
BE-7	Not Detected	---------	2.54E-001
CD-115	Not Detected	---------	1.62E-001
CE-139	Not Detected	---------	2.24E-002
CE-141	Not Detected	---------	4.31E-002
CE-144	Not Detected	---------	1.78E-001
CM-243	Not Detected	---------	1.48E-001
CO-56	Not Detected	---------	3.94E-002
CO-57	Not Detected	---------	2.18E-002
CO-58	Not Detected	---------	3.38E-002
CO-60	Not Detected	---------	3.75E-002
CR-51	Not Detected	---------	2.35E-001
CS-134	Not Detected	---------	3.18E-002
CS-137	Not Detected	---------	3.16E-002
EU-152	Not Detected	---------	6.61E-002
EU-154	Not Detected	---------	1.74E-001
EU-155	Not Detected	---------	1.01E-001
FE-59	Not Detected	---------	8.09E-002
GD-153	Not Detected	---------	7.45E-002
HG-203	Not Detected	---------	2.78E-002
:131 (I-131)	Not Detected	---------	3.51E-002
IR- IR-192	Not Detected	---------	2.65E-002
K-40	1.70E+001	2.32E+000	3.61E-001
MN-52	Not Detected	---------	4.83E-002
MN-54	Not Detected	---------	3.68E-002
MO-99	Not Detected	---------	5.16E-001
NA-22	Not Detected	---------	4.75E-002
NA-24	Not Detected	---------	1.05E+000
ND-147	Not Detected	---------	2.23E-001
NI-57	Not Detected	---------	2.10E-001
RU-103	Not Detected	---------	2.96E-002
RU-106	Not Detected	---------	2.95E-001
SB-122	Not Detected	---------	8.26E-002
SB-124	Not Detected	---------	3.01E-002
SB-125	Not Detected	---------	7.67E-002
SN-113	Not Detected	---------	3.52E-002
SR-85	Not Detected	---------	3.74E-002
TA-182	Not Detected	---------	1.59E-001
TA-183	Not Detected	---------	2.06E-001
TL-201	Not Detected	---------	1.61E-001
Y-88	Not Detected	---------	2.62E-002
ZN-65	Not Detected	---------	9.93E-002
ZR-95	Not Detected	---------	5.77E-002

```
*************************************************************************
*                    Sandia National Laboratories                       *
*      Radiation Protection Sample Diagnostics Program                  *
*                     3/15/06    4:56:36 PM                             *
*************************************************************************
*                                                                       *
* Analyzed by: Brenda Moss 3:15:06   Reviewed by:  RT Preston 3/15/06   *
*************************************************************************
Customer/Org                           : SANDERS, M.    /6146   / MRSANDE
Customer Sample ID                     : 075627-016
Lab Sample ID/Program ID               : C0054402              / ER
Sample Description                     : 885/1101-SP2-BH1-30-S
Sample Quantity/Category               :   662.810  gram       SA
Sample Date/Time                       : 3/10/06     3:44:00 PM
Acquire Start Date/Time                : 3/13/06     4:46:00 PM
Detector Name/Survey#/COC#             : LAB02      /          /609566
Procedure Number                       : RPSD-09-01
Elapsed Live/Real Time, Geometry       :   6000 /   6003 seconds , 2SMAR

Comments:
U-235/Ra-226 peaks not resolved. Either isotope may be overestimated.
*************************************************************************
```

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---------	3.52E+000
RA-226	1.67E+000	4.95E-001	6.49E-001
PB-214	6.79E-001	1.03E-001	5.96E-002
BI-214	6.08E-001	9.95E-002	4.94E-002
PB-210	Not Detected	---------	3.54E+001
TH-232	7.82E-001	3.63E-001	1.55E-001
RA-228	8.48E-001	1.57E-001	1.37E-001
AC-228	8.10E-001	1.57E-001	1.10E-001
TH-228	9.80E-001	2.52E-001	4.25E-001
RA-224	8.53E-001	1.83E-001	6.29E-002
PB-212	7.98E-001	1.17E-001	3.66E-002
BI-212	9.61E-001	2.96E-001	3.59E-001
TL-208	7.28E-001	1.20E-001	6.90E-002
U-235	Not Detected	---------	2.07E-001
TH-231	Not Detected	---------	1.19E+001
PA-231	Not Detected	---------	1.29E+000
TH-227	Not Detected	---------	3.47E-001
RA-223	Not Detected	---------	2.25E-001
RN-219	Not Detected	---------	3.67E-001
PB-211	Not Detected	---------	8.20E-001
TL-207	Not Detected	---------	1.23E+001
AM-241	Not Detected	---------	4.91E-001
PU-239	Not Detected	---------	3.80E+002
NP-237	Not Detected	---------	2.33E+000
PA-233	Not Detected	---------	5.33E-002
TH-229	Not Detected	---------	2.36E-001

[Summary Report] - Sample ID: ID : C0054402 / ER

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	----------	3.81E-002
AG-110m	Not Detected	----------	2.83E-002
BA-133	Not Detected	----------	5.08E-002
BE-7	Not Detected	----------	2.29E-001
CD-115	Not Detected	----------	1.66E-001
CE-139	Not Detected	----------	2.69E-002
CE-141	Not Detected	----------	4.72E-002
CE-144	Not Detected	----------	2.04E-001
CM-243	Not Detected	----------	1.58E-001
CO-56	Not Detected	----------	3.44E-002
CO-57	Not Detected	----------	2.80E-002
CO-58	Not Detected	----------	3.06E-002
CO-60	Not Detected	----------	3.41E-002
CR-51	Not Detected	----------	2.23E-001
CS-134	Not Detected	----------	3.85E-002
CS-137	Not Detected	----------	3.02E-002
EU-152	Not Detected	----------	8.35E-002
EU-154	Not Detected	----------	1.78E-001
EU-155	Not Detected	----------	1.38E-001
FE-59	Not Detected	----------	6.56E-002
GD-153	Not Detected	----------	9.72E-002
HG-203	Not Detected	----------	2.95E-002
I-131 (I-131)	Not Detected	----------	3.33E-002
IR - IR-192	Not Detected	----------	2.55E-002
K-40	1.55E+001	2.09E+000	2.64E-001
MN-52	Not Detected	----------	3.70E-002
MN-54	Not Detected	----------	3.16E-002
MO-99	Not Detected	----------	4.97E-001
NA-22	Not Detected	----------	3.82E-002
NA-24	Not Detected	----------	8.24E-001
ND-147	Not Detected	----------	2.20E-001
NI-57	Not Detected	----------	1.23E-001
RU-103	Not Detected	----------	2.59E-002
RU-106	Not Detected	----------	2.56E-001
SB-122	Not Detected	----------	8.36E-002
SB-124	Not Detected	----------	3.02E-002
SB-125	Not Detected	----------	7.77E-002
SN-113	Not Detected	----------	3.69E-002
SR-85	Not Detected	----------	3.78E-002
TA-182	Not Detected	----------	1.46E-001
TA-183	Not Detected	----------	6.37E-001
TL-201	Not Detected	----------	3.49E-001
Y-88	Not Detected	----------	2.65E-002
ZN-65	Not Detected	----------	9.62E-002
ZR-95	Not Detected	----------	5.52E-002

Sandia National Laboratories

Radiation Protection Sample Diagnostics Program

3/14/06 10:43:55 AM

Analyzed by: Brenda Maes 3·14·06 Reviewed by: RTPreston 3/15/06

Customer/Org	:	SANDERS, M. /6146 / MRSANDE
Customer Sample ID	:	LAB_CONTROL_SAMPLE_USING_CG-134
Lab Sample ID/Program ID	:	C0054403 / ER
Sample Description	:	MIXED_GAMMA_STANDARD_CG-134
Sample Quantity/Category	:	1.000 Each LCS
Sample Date/Time	:	11/1/90 12:00:00 PM
Acquire Start Date/Time	:	3/14/06 9:59:46 AM
Detector Name/Survey#/COC#	:	LAB01 / /609566
Procedure Number	:	RPSD-09-01
Elapsed Live/Real Time, Geometry	:	600 / 603 seconds , wMAR

Comments:

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
U-238	Not Detected	---------	6.73E+003
RA-226	Not Detected	---------	5.38E+003
PB-214	Not Detected	---------	6.30E+002
BI-214	Not Detected	---------	5.07E+002
PB-210	Not Detected	---------	7.39E+004
TH-232	Not Detected	---------	2.04E+003
RA-228	Not Detected	---------	1.91E+003
AC-228	Not Detected	---------	1.18E+003
TH-228	Not Detected	---------	1.66E+006
RA-224	Not Detected	---------	7.81E+004
PB-212	Not Detected	---------	1.11E+005
BI-212	Not Detected	---------	8.52E+005
TL-208	Not Detected	---------	2.14E+005
U-235	Not Detected	---------	1.29E+003
TH-231	Not Detected	---------	3.63E+004
PA-231	Not Detected	---------	1.25E+004
TH-227	Not Detected	---------	2.63E+003
RA-223	Not Detected	---------	1.00E+026
RN-219	Not Detected	---------	6.92E+003
PB-211	Not Detected	---------	1.56E+004
TL-207	Not Detected	---------	2.14E+005
AM-241	8.98E+004	1.28E+004	1.92E+003
PU-239	Not Detected	---------	2.12E+006
NP-237	Not Detected	---------	1.13E+004
PA-233	Not Detected	---------	5.79E+002
TH-229	Not Detected	---------	1.15E+003

[Summary Report] - Sample ID: ID : C0054403 / ER

:lide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
AG-108m	Not Detected	----------	2.60E+002
AG-110m	Not Detected	----------	9.56E+009
BA-133	Not Detected	----------	1.11E+003
BE-7	Not Detected	----------	1.00E+026
CD-115	Not Detected	----------	1.00E+026
CE-139	Not Detected	----------	3.16E+014
CE-141	Not Detected	----------	1.00E+026
CE-144	Not Detected	----------	1.07E+009
CM-243	Not Detected	----------	2.07E+003
CO-56	Not Detected	----------	1.00E+026
CO-57	Not Detected	----------	2.67E+008
CO-58	Not Detected	----------	1.00E+026
CO-60	7.84E+004	1.06E+004	9.98E+002
CR-51	Not Detected	----------	1.00E+026
CS-134	Not Detected	----------	4.29E+004
CS-137	7.04E+004	9.02E+003	3.38E+002
EU-152	Not Detected	----------	1.09E+003
EU-154	Not Detected	----------	3.81E+003
EU-155	Not Detected	----------	6.36E+003
FE-59	Not Detected	----------	1.00E+026
GD-153	Not Detected	----------	4.65E+009
HG-203	Not Detected	----------	1.00E+026
31 (I-131)	Not Detected	----------	1.00E+026
IR- 1ʀ-192	Not Detected	----------	1.00E+026
K-40	Not Detected	----------	1.24E+003
MN-52	Not Detected	----------	1.00E+026
MN-54	Not Detected	----------	7.00E+007
MO-99	Not Detected	----------	1.00E+026
NA-22	Not Detected	----------	9.83E+003
NA-24	Not Detected	----------	1.00E+026
ND-147	Not Detected	----------	1.00E+026
NI-57	Not Detected	----------	1.00E+026
RU-103	Not Detected	----------	1.00E+026
RU-106	Not Detected	----------	1.01E+008
SB-122	Not Detected	----------	1.00E+026
SB-124	Not Detected	----------	1.00E+026
SB-125	Not Detected	----------	5.15E+004
SN-113	Not Detected	----------	1.97E+017
SR-85	Not Detected	----------	1.00E+026
TA-182	Not Detected	----------	4.23E+017
TA-183	Not Detected	----------	1.00E+026
TL-201	Not Detected	----------	1.00E+026
Y-88	Not Detected	----------	9.90E+017
ZN-65	Not Detected	----------	5.39E+009
ZR-95	Not Detected	----------	1.00E+026

```
*************************************************************************
*                   Sandia National Laboratories                        *
*          Radiation Protection Sample Diagnostics Program              *
*                    Quality Assurance Report                           *
*************************************************************************
```

Report Date	: 3/14/06 10:09:58 AM
QA File	: C:\GENIE2K\CAMFILES\LCS1.QAF
Analyst	: BJMAES
Sample ID	: C0054403
Sample Quantity	: 1.00 Each
Sample Date	: 11/1/90 12:00:00 PM
Measurement Date	: 3/14/06 9:59:46 AM
Elapsed Live Time	: 600 seconds
Elapsed Real Time	: 603 seconds

Parameter	Mean	1S Error	New Value	< LU : SD : UD : BS
AM-241 ACTIVITY	8.604E-002	2.970E-003	8.984E-002	< : : :
CS-137 Activity	6.841E-002	1.159E-003	7.042E-002	< : : :
CO-60 Activity	7.689E-002	2.374E-003	7.907E-002	< : : :

Flags Key:
LU = Boundary Test (Ab = Above , Be = Below
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action
BS = Measurement Bias Test (In = Investigate, Ac = Action

Reviewed by: Brenda Maes 3.14.06

```
***********************************************************************
*                   Sandia National Laboratories                      *
*     Radiation Protection Sample Diagnostics Program                 *
*                 3/14/06  11:04:22 AM                                *
***********************************************************************
*                                                                     *
* Analyzed by: Brenda Moss 3.14.06   Reviewed by:  RTPreston 3/15/06  *
***********************************************************************
Customer/Org                          : SANDERS, M.    /6146    / MRSANDE
Customer Sample ID                    : LAB_CONTROL_SAMPLE_USING_CG-134
Lab Sample ID/Program ID              : C0054404                / ER
Sample Description                    : MIXED_GAMMA_STANDARD_CG-134
Sample Quantity/Category              :      1.000   Each        LCS
Sample Date/Time                      : 11/1/90    12:00:00 PM
Acquire Start Date/Time               : 3/14/06    10:54:14 AM
Detector Name/Survey#/COC#            : LAB02      /            /609566
Procedure Number                      : RPSD-09-01
Elapsed Live/Real Time, Geometry      :    600 /     603 seconds , wMAR

Comments:
***********************************************************************
```

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
U-238	Not Detected	---------	1.83E+004
RA-226	Not Detected	---------	5.13E+003
PB-214	Not Detected	---------	5.70E+002
BI-214	Not Detected	---------	4.39E+002
PB-210	Not Detected	---------	3.04E+005
TH-232	Not Detected	---------	1.80E+003
RA-228	Not Detected	---------	1.48E+003
AC-228	Not Detected	---------	8.69E+002
TH-228	Not Detected	---------	1.39E+006
RA-224	Not Detected	---------	6.32E+004
PB-212	Not Detected	---------	1.07E+005
BI-212	Not Detected	---------	6.92E+005
TL-208	Not Detected	---------	1.77E+005
U-235	Not Detected	---------	1.30E+003
TH-231	Not Detected	---------	6.18E+004
PA-231	Not Detected	---------	1.15E+004
TH-227	Not Detected	---------	2.58E+003
RA-223	Not Detected	---------	1.00E+026
RN-219	Not Detected	---------	6.21E+003
PB-211	Not Detected	---------	1.40E+004
TL-207	Not Detected	---------	1.55E+005
AM-241	8.53E+004	1.26E+004	3.73E+003
PU-239	Not Detected	---------	2.36E+006
NP-237	Not Detected	---------	1.36E+004
PA-233	Not Detected	---------	4.73E+002
TH-229	Not Detected	---------	1.37E+003

[Summary Report] - Sample ID: ID : C0054404 / ER

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
AG-108m	Not Detected	----------	2.16E+002
AG-110m	Not Detected	----------	8.14E+009
BA-133	Not Detected	----------	9.55E+002
BE-7	Not Detected	----------	1.00E+026
CD-115	Not Detected	----------	1.00E+026
CE-139	Not Detected	----------	3.48E+014
CE-141	Not Detected	----------	1.00E+026
CE-144	Not Detected	----------	1.11E+009
CM-243	Not Detected	----------	1.85E+003
CO-56	Not Detected	----------	1.00E+026
CO-57	Not Detected	----------	2.82E+008
CO-58	Not Detected	----------	1.00E+026
CO-60	8.03E+004	1.06E+004	9.34E+002
CR-51	Not Detected	----------	1.00E+026
CS-134	Not Detected	----------	3.63E+004
CS-137	7.29E+004	9.30E+003	2.91E+002
EU-152	Not Detected	----------	1.14E+003
EU-154	Not Detected	----------	3.16E+003
EU-155	Not Detected	----------	7.84E+003
FE-59	Not Detected	----------	1.00E+026
GD-153	Not Detected	----------	5.44E+009
HG-203	Not Detected	----------	1.00E+026
I-131 (I-131)	Not Detected	----------	1.00E+026
IR- IR-192	Not Detected	----------	1.00E+026
K-40	Not Detected	----------	8.04E+002
MN-52	Not Detected	----------	1.00E+026
MN-54	Not Detected	----------	5.05E+007
MO-99	Not Detected	----------	1.00E+026
NA-22	Not Detected	----------	7.16E+003
NA-24	Not Detected	----------	1.00E+026
ND-147	Not Detected	----------	1.00E+026
NI-57	Not Detected	----------	1.00E+026
RU-103	Not Detected	----------	1.00E+026
RU-106	Not Detected	----------	7.67E+007
SB-122	Not Detected	----------	1.00E+026
SB-124	Not Detected	----------	1.00E+026
SB-125	Not Detected	----------	4.43E+004
SN-113	Not Detected	----------	1.75E+017
SR-85	Not Detected	----------	1.00E+026
TA-182	Not Detected	----------	3.13E+017
TA-183	Not Detected	----------	1.00E+026
TL-201	Not Detected	----------	1.00E+026
Y-88	Not Detected	----------	6.16E+017
ZN-65	Not Detected	----------	4.12E+009
ZR-95	Not Detected	----------	1.00E+026

```
***************************************************************************
*                    Sandia National Laboratories                         *
*         Radiation Protection Sample Diagnostics Program                 *
*                      Quality Assurance Report                           *
***************************************************************************
```

```
Report Date            : 3/14/06  11:04:26 AM
QA File                : C:\GENIE2K\CAMFILES\LCS2.QAF
Analyst                : BJMAES
Sample ID              : C0054404
Sample Quantity        :      1.00 Each
Sample Date            : 11/1/90  12:00:00 PM
Measurement Date       : 3/14/06  10:54:14 AM
Elapsed Live Time      :       600 seconds
Elapsed Real Time      :       603 seconds
```

Parameter	Mean	1S Error	New Value	<	LU	SD	UD	BS
AM-241 Activity	8.237E-002	3.248E-003	8.534E-002	<				
CS-137 Activity	7.155E-002	2.582E-003	7.287E-002	<				
CO-60 Activity	7.969E-002	3.105E-003	8.081E-002	<				

```
Flags Key:   LU = Boundary Test                  (Ab = Above        , Be = Below
             SD = Sample Driven N-Sigma Test     (In = Investigate, Ac = Action
             UD = User   Driven N-Sigma Test     (In = Investigate, Ac = Action
             BS = Measurement Bias Test          (In = Investigate, Ac = Action
```

Reviewed by: Brenda Maes 3.14.06

ANALYSIS REQUEST AND CHAIN OF CUSTODY

ER

Internal Lab

Page 1 of 1

Batch No. C00562 | SAR/WR No. 01-024 | AR/COC 609569

Dept. No./Mail Stop:	6146/1089	Date Samples Shipped:	3-14-06	Logged By:	
Project/Task Manager:	Mike Sanders	Carrier/Waybill No.	HC	Project/Task No.:	98043.02.02.01
Project Name:	DSS-NFA	Lab Contact:	Kathye Chavez (505) 844-7088	SMO Authorization:	SMO
Record Center Code:		Lab Destination:	RPSD/Bldg.	Location:	Tech Area: Remote
Logbook Ref. No.:		SMO Contact/Phone:	Doug Perry (505) 845 0867	Building: NA	Room: NA
Service Order No.:	CF023-06				

☐ Characterization Only
☒ Waste Characterization
-RCRA Date =
-Send preliminary/copy report to:

☐ Release to ERCL On-Site Lab
☐ Release to Off-Site Lab
-This COC Number Releases COC No(s).:

Sample No.-Fraction / RPSD No.-Fraction	ER Sample ID or Sample Location Detail / RPSD Remarks/Aliquot Amounts	Beginning Depth (ft) / Screen CPM	ER Site No. / Sample Mass	Date/Time(hr) Collected / Sample Quantity	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Analysis Request
075628-016	885 / 1101-SP1-BH2-25-S	25	1101	031306/1205	S	M	500 ml	4C	G	SA	Gamma Spec 01 Lab01
											966.82g
075629-016	885 / 1101-SP1-BH2-30-S	30	1101	031306/1408	S	M	500 ml	4C	G	SA	Gamma Spec 02 Lab04
											800.60g
LCS											03 Lab01
LCS											04 Lab04

RMMA	☐ Yes ☑ No	Ref. No.	Sample Tracking / Smo Use
Sample Disposal	☐ Return to Client	☑ Disposal by Lab	Date Entered(mm/dd/yy)
Turnaround Time	☑ Normal	☐ Rush	Entered by:
	Required Report Date		QC inits.

Special Instructions/QC Requirements
EDD ☑ Yes ☐ No
Raw Data Package ☑ Yes ☐ No

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	William Gibson	William Gibson	WG	Weston/6134/844-5130/228-0710
	Robert Lynch	Robert Lynch	RL	Weston/6146/250-7090
	Gilbert Quintana	Gilbert Quintana	GQ	Shaw/6146/284-3309/850-8524

*Please send report to:
Mike Sanders, Dept6146/MS 1089,505-284-2478
*Non-release.

X Normal
L300

Please list as separate report.

1.Relinquished by William Gibson	Org 6146	Date 3/14/06	Time 0900	4.Relinquished by BSM Lab Storage	Org. 10321	Date 3-16-06	Time 9:00
1. Received by SMO	Org. 6146	Date 3/14/06	Time 0900	4. Received by SMO	Org. 6146	Date 3-16-06	Time 0900
2.Relinquished by SMO	Org. 6146	Date 3/14/06	Time 1500	5.Relinquished by	Org. 6146	Date 3-16-06	Time 1435
2. Received by	Org. 10321	Date 3/14/06	Time 1500	5. Received by	Org. 6146	Date 3-16-06	Time 1435
3.Relinquished by to lab storage	Org. 10321	Date 3-14-06	Time 1500	6.Relinquished by William	Org. 6146	Date 3-23-06	Time 1122
3. Received by K Preston	Org. 10321	Date 3/14/06	Time 1700	6. Received by M Sanders	Org. 6146	Date 3-23-06	Time 1122

Accepted with yellow tape per R. Preston
3-14-06 DG

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program
3/15/06 4:48:08 PM

Analyzed by: Brenda Maes 3-15-06 Reviewed by: RT Preston 3/15/06

Customer/Org	:	SANDERS, M. /6146 / MRSANDE
Customer Sample ID	:	075628-016
Lab Sample ID/Program ID	:	C0056201 / ER
Sample Description	:	885/1101-SP1-BH2-25-S
Sample Quantity/Category	:	966.820 gram SA
Sample Date/Time	:	3/13/06 12:05:00 PM
Acquire Start Date/Time	:	3/14/06 5:10:50 PM
Detector Name/Survey#/COC#	:	LAB01 / /609569
Procedure Number	:	RPSD-09-01
Elapsed Live/Real Time, Geometry	:	6000 / 6003 seconds , 1SMAR

Comments:
U-235/Ra-226 peaks not resolved. Either isotope may be overestimated.

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---------	1.14E+000
RA-226	7.86E-001	3.83E-001	5.71E-001
PB-214	4.67E-001	7.47E-002	4.83E-002
BI-214	4.10E-001	7.41E-002	5.07E-002
PB-210	Not Detected	---------	4.63E+000
TH-232	5.18E-001	2.50E-001	1.44E-001
RA-228	5.04E-001	1.13E-001	1.23E-001
AC-228	4.38E-001	9.90E-002	8.18E-002
TH-228	4.61E-001	1.66E-001	3.64E-001
RA-224	5.48E-001	1.35E-001	6.87E-002
PB-212	4.96E-001	7.45E-002	3.08E-002
BI-212	5.44E-001	2.07E-001	2.63E-001
TL-208	5.05E-001	9.22E-002	6.80E-002
U-235	Not Detected	---------	1.48E-001
TH-231	Not Detected	---------	5.27E+000
PA-231	Not Detected	---------	1.07E+000
TH-227	Not Detected	---------	1.70E-001
RA-223	Not Detected	---------	1.11E-001
RN-219	Not Detected	---------	2.89E-001
PB-211	Not Detected	---------	6.30E-001
TL-207	Not Detected	---------	1.20E+001
AM-241	Not Detected	---------	1.36E-001
PU-239	Not Detected	---------	2.73E+002
NP-237	Not Detected	---------	1.54E+000
PA-233	Not Detected	---------	4.49E-002
TH-229	Not Detected	---------	1.56E-001

[Summary Report] - Sample ID: ID : C0056201 / ER

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	----------	2.94E-002
AG-110m	Not Detected	----------	2.52E-002
BA-133	Not Detected	----------	3.93E-002
BE-7	Not Detected	----------	2.08E-001
CD-115	Not Detected	----------	7.20E-002
CE-139	Not Detected	----------	1.85E-002
CE-141	Not Detected	----------	3.34E-002
CE-144	Not Detected	----------	1.52E-001
CM-243	Not Detected	----------	1.22E-001
CO-56	Not Detected	----------	3.19E-002
CO-57	Not Detected	----------	1.89E-002
CO-58	Not Detected	----------	2.55E-002
CO-60	Not Detected	----------	3.16E-002
CR-51	Not Detected	----------	1.88E-001
CS-134	Not Detected	----------	2.66E-002
CS-137	Not Detected	----------	2.68E-002
EU-152	Not Detected	----------	5.63E-002
EU-154	Not Detected	----------	1.43E-001
EU-155	Not Detected	----------	8.95E-002
FE-59	Not Detected	----------	6.19E-002
GD-153	Not Detected	----------	6.38E-002
HG-203	Not Detected	----------	2.28E-002
I- 131	Not Detected	----------	2.41E-002
IR- -192	Not Detected	----------	2.09E-002
K-40	1.38E+001	1.88E+000	2.40E-001
MN-52	Not Detected	----------	3.04E-002
MN-54	Not Detected	----------	2.02E-002
MO-99	Not Detected	----------	2.81E-001
NA-22	Not Detected	----------	3.83E-002
NA-24	Not Detected	----------	1.06E-001
ND-147	Not Detected	----------	1.76E-001
NI-57	Not Detected	----------	7.62E-002
RU-103	Not Detected	----------	2.42E-002
RU-106	Not Detected	----------	2.50E-001
SB-122	Not Detected	----------	4.30E-002
SB-124	Not Detected	----------	2.43E-002
SB-125	Not Detected	----------	6.38E-002
SN-113	Not Detected	----------	2.91E-002
SR-85	Not Detected	----------	3.11E-002
TA-182	Not Detected	----------	1.37E-001
TA-183	Not Detected	----------	1.37E-001
TL-201	Not Detected	----------	8.78E-002
Y-88	Not Detected	----------	2.25E-002
ZN-65	Not Detected	----------	8.71E-002
ZR-95	Not Detected	----------	4.59E-002

```
*************************************************************************
*                    Sandia National Laboratories                       *
*      Radiation Protection Sample Diagnostics Program                  *
*                     3/15/06    4:50:16 PM                             *
*   ********************************************************************
*                                                                       *
* Analyzed by: Brenda Mass 3:15:06  Reviewed by: R Preston 3/15/06      *
*************************************************************************
```

Customer/Org : SANDERS, M. /6146 / MRSANDE
Customer Sample ID : 075629-016
Lab Sample ID/Program ID : C0056202 / ER
Sample Description : 885/1101-SP1-BH2-30-S
Sample Quantity/Category : 800.600 gram SA
Sample Date/Time : 3/13/06 2:08:00 PM
Acquire Start Date/Time : 3/14/06 5:32:15 PM
Detector Name/Survey#/COC# : LAB04 / /609569
Procedure Number : RPSD-09-01
Elapsed Live/Real Time, Geometry : 6000 / 6003 seconds , 4SMAR

Comments:
U-235/Ra-226 peaks not resolved. Either isotope may be overestimated.
****

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	1.01E+000	1.01E+000	1.52E+000
RA-226	1.09E+000	3.89E-001	5.48E-001
PB-214	7.01E-001	1.01E-001	4.87E-002
BI-214	6.00E-001	9.59E-002	4.74E-002
PB-210	Not Detected	---------	7.80E+000
TH-232	7.03E-001	3.25E-001	1.44E-001
RA-228	7.87E-001	1.38E-001	1.02E-001
AC-228	7.38E-001	1.36E-001	8.23E-002
TH-228	5.08E-001	1.67E-001	3.58E-001
RA-224	7.40E-001	1.56E-001	5.27E-002
PB-212	7.06E-001	1.02E-001	2.78E-002
BI-212	6.13E-001	2.17E-001	2.81E-001
TL-208	6.32E-001	1.03E-001	6.19E-002
U-235	Not Detected	---------	1.65E-001
TH-231	Not Detected	---------	8.15E+000
PA-231	Not Detected	---------	1.06E+000
TH-227	Not Detected	---------	2.85E-001
RA-223	Not Detected	---------	1.39E-001
RN-219	Not Detected	---------	3.08E-001
PB-211	Not Detected	---------	6.89E-001
TL-207	Not Detected	---------	1.02E+001
AM-241	Not Detected	---------	1.93E-001
PU-239	Not Detected	---------	2.93E+002
NP-237	Not Detected	---------	1.64E+000
PA-233	Not Detected	---------	4.72E-002
TH-229	Not Detected	---------	1.74E-001

[Summary Report] - Sample ID: ID : C0056202 / ER

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	----------	3.19E-002
AG-110m	Not Detected	----------	2.36E-002
BA-133	Not Detected	----------	5.54E-002
BE-7	Not Detected	----------	2.01E-001
CD-115	Not Detected	----------	7.58E-002
CE-139	Not Detected	----------	2.17E-002
CE-141	Not Detected	----------	3.63E-002
CE-144	Not Detected	----------	1.65E-001
CM-243	Not Detected	----------	1.31E-001
CO-56	Not Detected	----------	2.57E-002
CO-57	Not Detected	----------	2.10E-002
CO-58	Not Detected	----------	2.42E-002
CO-60	Not Detected	----------	2.91E-002
CR-51	Not Detected	----------	1.88E-001
CS-134	Not Detected	----------	4.08E-002
CS-137	Not Detected	----------	2.63E-002
EU-152	Not Detected	----------	6.28E-002
EU-154	Not Detected	----------	1.47E-001
EU-155	Not Detected	----------	9.75E-002
FE-59	Not Detected	----------	5.49E-002
GD-153	Not Detected	----------	7.22E-002
HG-203	Not Detected	----------	2.36E-002
I-131	Not Detected	----------	2.37E-002
IR-192	Not Detected	----------	2.20E-002
K-40	1.21E+001	1.63E+000	2.26E-001
MN-52	Not Detected	----------	2.79E-002
MN-54	Not Detected	----------	2.67E-002
MO-99	Not Detected	----------	2.41E-001
NA-22	Not Detected	----------	3.34E-002
NA-24	Not Detected	----------	9.51E-002
ND-147	Not Detected	----------	1.69E-001
NI-57	Not Detected	----------	7.02E-002
RU-103	Not Detected	----------	2.42E-002
RU-106	Not Detected	----------	2.27E-001
SB-122	Not Detected	----------	4.10E-002
SB-124	Not Detected	----------	2.52E-002
SB-125	Not Detected	----------	6.32E-002
SN-113	Not Detected	----------	2.96E-002
SR-85	Not Detected	----------	2.98E-002
TA-182	Not Detected	----------	1.19E-001
TA-183	Not Detected	----------	1.93E-001
TL-201	Not Detected	----------	1.30E-001
Y-88	Not Detected	----------	2.30E-002
ZN-65	Not Detected	----------	8.16E-002
ZR-95	Not Detected	----------	4.40E-002

```
****************************************************************************
*                      Sandia National Laboratories                        *
*          Radiation Protection Sample Diagnostics Program                 *
*                       3/15/06    8:24:54 AM                              *
****************************************************************************
*                                                                          *
* Analyzed by: Brenda Maes 3.15.06 Reviewed by: RT Preston 3/15/06         *
****************************************************************************
Customer/Org                              : SANDERS, M.    /6146    / MRSANDE
Customer Sample ID                        : LAB_CONTROL_SAMPLE_USING_CG-134
Lab Sample ID/Program ID                  : C0056203                / ER
Sample Description                        : MIXED_GAMMA_STANDARD_CG-134
Sample Quantity/Category                  :     1.000   Each        LCS
Sample Date/Time                          : 11/1/90    12:00:00 PM
Acquire Start Date/Time                   : 3/15/06     8:14:45 AM
Detector Name/Survey#/COC#                : LAB01      /            /609569
Procedure Number                          : RPSD-09-01
Elapsed Live/Real Time, Geometry          :    600 /    603 seconds , wMAR

Comments:
****************************************************************************
```

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
U-238	Not Detected	----------	6.63E+003
RA-226	Not Detected	----------	5.47E+003
PB-214	Not Detected	----------	6.41E+002
BI ~~PT~~-214	Not Detected	----------	5.26E+002
PB- -210	Not Detected	----------	7.21E+004
TH-232	Not Detected	----------	2.08E+003
RA-228	Not Detected	----------	2.01E+003
AC-228	Not Detected	----------	1.16E+003
TH-228	Not Detected	----------	1.69E+006
RA-224	Not Detected	----------	2.28E+004
PB-212	Not Detected	----------	1.09E+005
BI-212	Not Detected	----------	7.75E+005
TL-208	Not Detected	----------	2.23E+005
U-235	Not Detected	----------	1.27E+003
TH-231	Not Detected	----------	3.58E+004
PA-231	Not Detected	----------	1.25E+004
TH-227	Not Detected	----------	2.64E+003
RA-223	Not Detected	----------	1.00E+026
RN-219	Not Detected	----------	7.09E+003
PB-211	Not Detected	----------	1.61E+004
TL-207	Not Detected	----------	2.17E+005
AM-241	8.91E+004	1.27E+004	1.73E+003
PU-239	Not Detected	----------	2.18E+006
NP-237	Not Detected	----------	1.13E+004
PA-233	Not Detected	----------	5.90E+002
TH-229	Not Detected	----------	1.16E+003

[Summary Report] - Sample ID: ID : C0056203 / ER

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
AG-108m	Not Detected	---------	2.34E+002
AG-110m	Not Detected	---------	9.61E+009
BA-133	Not Detected	---------	1.11E+003
BE-7	Not Detected	---------	1.00E+026
CD-115	Not Detected	---------	1.00E+026
CE-139	Not Detected	---------	3.15E+014
CE-141	Not Detected	---------	1.00E+026
CE-144	Not Detected	---------	1.05E+009
CM-243	Not Detected	---------	2.08E+003
CO-56	Not Detected	---------	1.00E+026
CO-57	Not Detected	---------	2.56E+008
CO-58	Not Detected	---------	1.00E+026
CO-60	7.95E+004	1.07E+004	1.14E+003
CR-51	Not Detected	---------	1.00E+026
CS-134	Not Detected	---------	4.30E+004
CS-137	7.00E+004	8.96E+003	3.65E+002
EU-152	Not Detected	---------	1.03E+003
EU-154	Not Detected	---------	3.43E+003
EU-155	Not Detected	---------	6.31E+003
FE-59	Not Detected	---------	1.00E+026
GD-153	Not Detected	---------	4.52E+009
HG-203	Not Detected	---------	1.00E+026
I- I-131	Not Detected	---------	1.00E+026
IR- -192	Not Detected	---------	1.00E+026
K-40	Not Detected	---------	9.88E+002
MN-52	Not Detected	---------	1.00E+026
MN-54	Not Detected	---------	7.20E+007
MO-99	Not Detected	---------	1.00E+026
NA-22	Not Detected	---------	9.96E+003
NA-24	Not Detected	---------	1.00E+026
ND-147	Not Detected	---------	1.00E+026
NI-57	Not Detected	---------	1.00E+026
RU-103	Not Detected	---------	1.00E+026
RU-106	Not Detected	---------	9.64E+007
SB-122	Not Detected	---------	1.00E+026
SB-124	Not Detected	---------	1.00E+026
SB-125	Not Detected	---------	5.21E+004
SN-113	Not Detected	---------	2.02E+017
SR-85	Not Detected	---------	1.00E+026
TA-182	Not Detected	---------	4.29E+017
TA-183	Not Detected	---------	1.00E+026
TL-201	Not Detected	---------	1.00E+026
Y-88	Not Detected	---------	9.59E+017
ZN-65	Not Detected	---------	5.74E+009
ZR-95	Not Detected	---------	1.00E+026

****
*   Sandia National Laboratories   *
*   Radiation Protection Sample Diagnostics Program   *
*   Quality Assurance Report   *
****

Report Date	: 3/14/06 10:09:58 AM
QA File	: C:\GENIE2K\CAMFILES\LCS1.QAF
Analyst	: BJMAES
Sample ID	: C0054403
Sample Quantity	: 1.00 Each
Sample Date	: 11/1/90 12:00:00 PM
Measurement Date	: 3/14/06 9:59:46 AM
Elapsed Live Time	: 600 seconds
Elapsed Real Time	: 603 seconds

Parameter	Mean	1S Error	New Value	< LU : SD : UD : BS
AM-241 ACTIVITY	8.604E-002	2.970E-003	8.984E-002	< : : : >
CS-137 Activity	6.841E-002	1.159E-003	7.042E-002	< : : : >
CO-60 Activity	7.689E-002	2.374E-003	7.907E-002	< : : : >

Flags Key:
LU = Boundary Test (Ab = Above , Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: Brenda Maes 3.14.06

```
*******************************************************************
*                  Sandia National Laboratories                   *
*        Radiation Protection Sample Diagnostics Program          *
*                    3/15/06    8:09:43 AM                        *
*  ***************************************************************
*                                                                 *
* Analyzed by: Brenda Maes 3.15.06  Reviewed by:  RT Preston 3/15/06 *
*******************************************************************
Customer/Org                          : SANDERS, M.    /6146    / MRSANDE
Customer Sample ID                    : LAB_CONTROL_SAMPLE_USING_CG-134
Lab Sample ID/Program ID              : C0056204                / OTH
Sample Description                    : MIXED_GAMMA_STANDARD_CG-134
Sample Quantity/Category              :     1.000  Each       LCS
Sample Date/Time                      : 11/1/90    12:00:00 PM
Acquire Start Date/Time               : 3/15/06     7:59:34 AM
Detector Name/Survey#/COC#            : LAB04     /           /
Procedure Number                      : RPSD-09-01
Elapsed Live/Real Time, Geometry      :    600 /    604 seconds , wMAR

Comments:
*******************************************************************
```

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
U-238	Not Detected	---------	1.65E+004
RA-226	Not Detected	---------	4.63E+003
PB-214	Not Detected	---------	5.70E+002
BI-214	Not Detected	---------	4.30E+002
PB-210	Not Detected	---------	9.98E+004
TH-232	Not Detected	---------	1.79E+003
RA-228	Not Detected	---------	1.50E+003
AC-228	Not Detected	---------	9.01E+002
TH-228	Not Detected	---------	1.43E+006
RA-224	Not Detected	---------	4.39E+004
PB-212	Not Detected	---------	9.94E+004
BI-212	Not Detected	---------	6.03E+005
TL-208	Not Detected	---------	1.70E+005
U-235	Not Detected	---------	1.13E+003
TH-231	Not Detected	---------	4.23E+004
PA-231	Not Detected	---------	1.09E+004
TH-227	Not Detected	---------	2.40E+003
RA-223	Not Detected	---------	1.00E+026
RN-219	Not Detected	---------	5.78E+003
PB-211	Not Detected	---------	1.34E+004
TL-207	Not Detected	---------	1.61E+005
AM-241	8.96E+004	1.27E+004	1.71E+003
PU-239	Not Detected	---------	1.96E+006
NP-237	Not Detected	---------	1.06E+004
PA-233	Not Detected	---------	5.05E+002
TH-229	Not Detected	---------	1.10E+003

[Summary Report] - Sample ID: ID : C0056204 / OTH

ͬ ~clide ame	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
AG-108m	Not Detected	---------	1.82E+002
AG-110m	Not Detected	---------	8.43E+009
BA-133	Not Detected	---------	9.80E+002
BE-7	Not Detected	---------	1.00E+026
CD-115	Not Detected	---------	1.00E+026
CE-139	Not Detected	---------	3.02E+014
CE-141	Not Detected	---------	1.00E+026
CE-144	Not Detected	---------	9.74E+008
CM-243	Not Detected	---------	1.86E+003
CO-56	Not Detected	---------	1.00E+026
CO-57	Not Detected	---------	2.42E+008
CO-58	Not Detected	---------	1.00E+026
CO-60	7.67E+004	1.01E+004	8.84E+002
CR-51	Not Detected	---------	1.00E+026
CS-134	Not Detected	---------	3.53E+004
CS-137	7.30E+004	9.31E+003	3.17E+002
EU-152	Not Detected	---------	9.72E+002
EU-154	Not Detected	---------	2.64E+003
EU-155	Not Detected	---------	5.95E+003
FE-59	Not Detected	---------	1.00E+026
GD-153	Not Detected	---------	4.36E+009
HG-203	Not Detected	---------	1.00E+026
I- 131	Not Detected	---------	1.00E+026
IR- -192	Not Detected	---------	1.00E+026
K-40	Not Detected	---------	8.41E+002
MN-52	Not Detected	---------	1.00E+026
MN-54	Not Detected	---------	5.23E+007
MO-99	Not Detected	---------	1.00E+026
NA-22	Not Detected	---------	7.30E+003
NA-24	Not Detected	---------	1.00E+026
ND-147	Not Detected	---------	1.00E+026
NI-57	Not Detected	---------	1.00E+026
RU-103	Not Detected	---------	1.00E+026
RU-106	Not Detected	---------	7.98E+007
SB-122	Not Detected	---------	1.00E+026
SB-124	Not Detected	---------	1.00E+026
SB-125	Not Detected	---------	4.42E+004
SN-113	Not Detected	---------	1.68E+017
SR-85	Not Detected	---------	1.00E+026
TA-182	Not Detected	---------	3.06E+017
TA-183	Not Detected	---------	1.00E+026
TL-201	Not Detected	---------	1.00E+026
Y-88	Not Detected	---------	5.29E+017
ZN-65	Not Detected	---------	3.98E+009
ZR-95	Not Detected	---------	1.00E+026

```
************************************************************************
*                    Sandia National Laboratories                      *
*          Radiation Protection Sample Diagnostics Program            *
*                    Quality Assurance Report                          *
************************************************************************
```

```
Report Date            : 3/14/06  11:04:26 AM
QA File                : C:\GENIE2K\CAMFILES\LCS2.QAF
Analyst                : BJMAES
Sample ID              : C0054404
Sample Quantity        :      1.00 Each
Sample Date            : 11/1/90  12:00:00 PM
Measurement Date       : 3/14/06  10:54:14 AM
Elapsed Live Time      :       600 seconds
Elapsed Real Time      :       603 seconds
```

Parameter	Mean	1S Error	New Value	< LU : SD : UD : BS >
AM-241 Activity	8.237E-002	3.248E-003	8.534E-002	< : : : >
CS-137 Activity	7.155E-002	2.582E-003	7.287E-002	< : : : >
CO-60 Activity	7.969E-002	3.105E-003	8.081E-002	< : : : >

```
Flags Key:  LU = Boundary Test              (Ab = Above      , Be = Below )
            SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
            UD = User   Driven N-Sigma Test (In = Investigate, Ac = Action)
            BS = Measurement Bias Test      (In = Investigate, Ac = Action)
```

Reviewed by: Brenda Maes 3.14.06

ANNEX B
DSS Site 1101
Data Validation Results for the March 2006 Soil Samples Submitted to General Engineering Laboratories, Inc.

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

Memorandum

Date: May 2, 2006

To: File

From: Kevin Lambert

Subject: Inorganic Data Review and Validation – SNL
Site: DSS NFA
AR/COC: 609565
SDG: 157983 and 157999
Laboratory: GEL
Project/Task: 98043.02.02.01

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM SMO AOP 00-03 Rev 1 and DOE-AL Model Data Validation Procedure Rev. 3.

Summary

The samples were prepared and analyzed with accepted procedures using methods EPA6010B (ICP metals), EPA6020 (ICP-MS metals), EPA7470A (CVAA mercury), EPA9012A (Total Cyanide), and EPA7196A (Hexavalent Chromium). However, it should be noted that no data review and validation was performed on RCRA metals sample results in this SDG due to homogeneity issues with the original analytical results. The samples were relogged under another SDG and crushed and homogenized prior to reanalysis in accordance with client request. Problems were identified with the data package that result in the qualification of data.

1. Hexavalent Chromium:
   For the field QC sample, hexavalent chromium was analyzed outside the holding time but within 2x the method-specified holding time (see Data Validation Worksheets). The associated sample result was a non-detect (ND) and will be qualified "UJ, HT."

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 except as noted above in the summary section.

Calibration

The initial and continuing calibration data met QC acceptance criteria.

Blanks

No target analytes were detected in the blanks.

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

The LCS/LCSD met QC acceptance criteria except as follows.

All analyses:
It should be noted that no LCSD was provided with the SDG. Laboratory precision was assessed using the replicate, which met QC acceptance criteria. No data will be qualified as a result.

Matrix Spike (MS)

The MS met QC acceptance criteria except as follows.

Total Cyanide:
For the field QC sample, it should be noted that the MS was run on a sample of similar matrix from another SNL SDG and met QC acceptance criteria. No data will be qualified as a result.

Hexavalent Chromium:
For the field samples, it should be noted the MS was run on a sample of similar matrix from another SNL SDG and met QC acceptance criteria. No data will be qualified as a result.

Replicate

The replicate met QC acceptance criteria except as follows.

Total Cyanide:
For the field QC sample, it should be noted the replicate was run on a sample of similar matrix from another SNL SDG and met QC acceptance criteria. No data will be qualified as a result.

Hexavalent Chromium:
For the field samples, it should be noted the replicate was run on a sample of similar matrix from another SNL SDG and met QC acceptance criteria. No data will be qualified as a result.

ICP Serial Dilution

Not Applicable

ICP Interference Check Sample (ICS)

Not Applicable

Detection Limits/Dilutions

All detection limits were properly reported. No dilutions were required.

Other QC

No trip blank (TB), equipment blank (EB), field blank (FB), or field duplicate pair was submitted on the AR/COC(s) except as follows.

All analyses:
An EB was submitted on the AR/COC(s).

No other specific issues were identified which affect data quality.

Site: DSS NFA **AR/COC:** 609565 **Data Type:** Organic, Inorganic, & Rad

	VOC	67-64-1 (Acetone)	75-09-2 (Methylene Chloride)	PCB	All target analytes	General Chemistry	18540-29-9 (Hexavalent Chromium)
075630-001 885/1101-EB		J	5.0 U,B				
075631-001 885/1101-TB			5.0 U,B				
075630-003 885/1101-EB					UJ,A1		
075630-014 885/1101-EB							UJ,HT

SVOC, HE, and Radiochemistry analysis met QC acceptance criteria. No data will be qualified.

Validated By: Kevin A Lambert **Date:** 05/02/06

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

Memorandum

Date: May 2, 2006

To: File

From: Kevin Lambert

Subject: Organic Data Review and Validation – SNL
Site: DSS NFA
AR/COC: 609565
SDG: 157983 and 157999
Laboratory: GEL
Project/Task: 98043.02.02.01

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM SMO AOP 00-03 Rev 1.

Summary

All samples were prepared and analyzed with accepted procedures using method EPA8260A/B (VOC), EPA8270C (SVOC), EPA8330 (High Explosives). All compounds were successfully analyzed. Problems were identified with the data package that result in the qualification of data.

1. VOC:
   For the field QC samples, the continuing calibration verification percent difference (CCV %D) for acetone (-27%) was > 20% but ≤ 40%. The associated sample results that were non-detects (NDs) will not be qualified and detects will be qualified "J." Methylene chloride was detected (≥ DL) in the method blank (MB). The associated sample results were detects < 10x the blank concentration and < the RL and, thus will be qualified "U" at the RL (5.0 ug/L) with descriptive flag "B."

2. PCB:
   For the field QC sample, the surrogate recovery for decachlorobiphenyl (46%) was < the lower QC limit (49%). The associated sample results were non-detects (NDs) and will be qualified "UJ, A1."

Data are acceptable and reported 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 except as noted above in the summary section and as follows.

VOC:
The calibration response factor (RF) for trichloroethene (0.24) was < the specified minimum RF (0.30). No data should be qualified based on professional judgment. The CCV %D for 2-butanone (-22%) and bromoform (-21%) were > 20% but ≤ 40%. The associated sample results were NDs and as a result based on professional judgment no data will be qualified.

SVOC:
The CCV %Ds for 2,4-dimethylphenol (28%), 2-nitroaniline (31%), 4-nitroaniline (21%), and 3,3'-dichlorobenzidine (24%) were > 20% but ≤ 40%. The associated sample results were NDs and as a result based on professional judgment no data will be qualified.

Blanks

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

VOC:
Acetone, carbon disulfide, and methylene chloride were detected (≥ DL) in the one or more of the blanks (MB, EB, and TB). The associated sample results were NDs; no data will be qualified as a result.

Internal Standards (ISs)

Internal standards data met QC acceptance criteria.

Surrogates

The surrogate recoveries met QC acceptance criteria except as noted above in the summary section.

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

The LCS/LCSD met QC acceptance criteria except as follows.

All analyses:
It should be noted that no LCSD was provided with the SDG. Laboratory precision was assessed using the MS/MSD. No data will be qualified as a result.

SVOC:
The LCS recovery for hexachlorocyclopentadiene (76%) was > the upper QC acceptance limit (71%). The associated sample result was ND; no data will be qualified as a result.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The MS/MSD met QC acceptance criteria except as follows.

VOC:
For the field QC samples, it should be noted that the MS/MSD was run on a sample of similar matrix from another SNL SDG and met QC acceptance criteria. No data will be qualified as a result.

SVOC:
The MS recovery for 2-nitroaniline (115%) and MSD recovery for 4-chloroaniline (103%) was > the upper QC acceptance limit (112% and 102%, respectively). The associated sample results were NDs; no data will be qualified as a result.

High Explosives (HE) and PCB:
For the field samples, it should be noted that the MS/MSD was run on a sample of similar matrix from another SNL SDG and met QC acceptance criteria. No data will be qualified as a result.

Target Compound Identification/Confirmation

No target compound identification/confirmation analyses were required.

Detection Limits/Dilutions

All detection limits were properly reported. No dilutions were required except as follows.

HE:
The samples were diluted the standard 2x for this analysis.

Other QC

No trip blank (TB), equipment blank (EB), field blank (FB), or field duplicate pair was submitted on the AR/COC(s) except as follows.

All analyses:
An EB was submitted on the AR/COC(s).

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: May 2, 2006

To: File

From: Kevin Lambert

Subject: Radiochemical Data Review and Validation – SNL
Site: DSS NFA
AR/COC: 609565
SDG: 157983 and 157999
Laboratory: GEL
Project/Task: 98043.02.02.01

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM SMO AOP 00-03 Rev 1.

Summary

The samples were prepared and analyzed with accepted procedures using EPA900.0 (Gross Alpha/Beta). 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

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

Calibration

The case narrative stated the instruments used were properly calibrated.

Negative Bias

All sample results met negative bias QC acceptance criteria.

Blanks

No target analytes were detected in the blanks.

Tracer/Carrier Recovery

Not Applicable

Laboratory Control Sample (LCS)

The LCS met QC acceptance criteria.

Matrix Spike (MS)

The MS met QC acceptance criteria except as follows.

Gross Alpha/Beta:
For the field samples, it should be noted the MS was run on a sample of similar matrix from another SNL SDG. No data will be qualified as a result.

Replicate

The replicate met QC acceptance criteria except as noted above in the summary section and as follows.

Gross Alpha/Beta:
For the field samples, it should be noted the replicate was run on a sample of similar matrix from another SNL SDG. No data will be qualified as a result.

Detection Limits/Dilutions

All detection limits were properly reported. No dilutions were required.

Other QC

No trip blank (TB), equipment blank (EB), field blank (FB), or field duplicate pair was submitted on the AR/COC(s) except as follows.

Gross Alpha/Beta:
An EB was submitted on the AR/COC(s).

No other specific issues were identified which affect data quality.

Data Validation Summary

Site/Project: DSS-NFA Project/Task #: 98043.02.02.01 # of Samples: 13 Matrix: 4 soil, 9 aqueous

AR/COC #: 609565 Laboratory Sample IDs: 157999-001 to -004

Laboratory: GEL 157983-001 to -009

SDG #: 157983, 157999

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

J = Estimated R = Unusable NP = Not Provided

U = Not Detected Check (√) = Acceptable Other: ______

UJ = Not Detected, Estimated Shaded Cells = Not Applicable (also "NA")

Reviewed By: Kevin A Lambert Date: 05-02-06

Holding Time and Preservation

Site/Project: DSS NFA   AR/COC #: 609565   Laboratory Sample IDs: 157983-001

Laboratory: GEL   SDG #: 157983

# of Samples: 1   Matrix: aqueous

Sample ID	Analytical Method	Holding Time Criteria	Days Holding Time was Exceeded	Preservation Criteria	Preservation Deficiency	Comments
157983-001	EPA 7196A (CR+6)	24 Hrs	< 1 dy	—	—	sample was analyzed after HT but within 2x method-specified HT, result was ND and will be qualified UJ, HT

Reviewed By: Kevin A Lambert   Date: 05-02-06

Field Samples

Radiochemistry

Site/Project: DSS NFA AR/COC #: 609565 Laboratory Sample IDs: 157999-003, -004

Laboratory: GEL SDG #: 157999

Methods: EPA 900.0 (GA/B)

# of Samples: 2 Matrix: soil Batch #s: 516564

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													
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													
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: QC run on sample from another SNL SDG

Neg Bias met QC criteria

Reviewed By: Kevin A Lambert Date: 05-02-06

Field QC

Radiochemistry

Site/Project: DSS NFA AR/COC #: 609565 Laboratory Sample IDs: 157983-009

Laboratory: GEL SDG #: 157983

Methods: EPA 900.0 (GA/B)

# of Samples: 1 Matrix: aqueous Batch #s: 516597

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													
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													
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: Kevin A Lambert Date: 05-02-06

Field Samples

General Chemistry

Site/Project: DSS NFA　AR/COC #: 609565　Laboratory Sample IDs: 157999-003, -004

Laboratory: GEL　SDG #: 157999

Methods: EPA9012A(TCN), EPA7196A (Cr^{+6})

# of Samples: 2　Matrix: soil　Batch #s: 511873, 512081

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	
	~~TC KAL~~																	✓		
	TCN	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	NA	NA	✓	NA	NA	NA	✓		
	Cr+6	✓	✓	✓	✓	✓	✓	✓	↓	↓	✓	↓	↓	✓	↓	↓	↓	✓		

Comments: QC for Cr+6 run on sample from another SNL SDG

Reviewed By: Kevin A Lambert　Date: 05-02-06

General Chemistry

Field QC

Site/Project: DSS NFA AR/COC #: 609565 Laboratory Sample IDs: 157983-001, -007

Laboratory: GEL SDG #: 157983

Methods: EPA7196A (Cr^{+6}), EPA9012A (TCN)

# of Samples: 2 Matrix: aqueous Batch #s: 511465, 511864

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	
	Cr^{+6}	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	NA	NA	✓						
	TCN	✓	✓	✓	✓	✓	✓	✓	↓	↓	✓	↓	↓	✓						

Comments: QC for TCN run on sample from another SNL SDG

See HT infraction

Reviewed By: Kevin A Lambert Date: 05-02-06

Field Samples

PCBs (SW 846 - Method 8082)

Site/Project: DSS NFA AR/COC #: 609565 Laboratory Sample IDs: 157999-003, -004

Laboratory: GEL SDG #: 157999

Methods: EPA 8082 (PCB)

# of Samples: 2 Matrix: soil Batch #s: ~~513002~~ KAL 513003

CAS #	Name	TCL	Intercept	Calib RSD / R²	CCV %D	Method Blanks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	157983 Equip. Blanks -005	Field Blanks		
				<20% / 0.99	20%				20%			20%					
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
Met	Criteria				

Comments: QC run on sample from another SNL SDG

Confirmation

Sample	CAS #	RPD > 25%	Sample	CAS #	RPD > 25%
Not Required					
			Results NDs		

Reviewed By: Kevin A Lambert Date: 05-02-06

Field QC

PCBs (SW 846 - Method 8082)

Site/Project: DSS NFA AR/COC #: 609565 Laboratory Sample IDs: 157983-005

Laboratory: GEL SDG #: 157983

Methods: EPA 8082 (PCB)

# of Samples: 1 Matrix: aqueous Batch #s: 511724

CAS #	Name	TCL	Intercept	Calib RSD / R^2	CCV %D	Method Blanks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks		
				<20% / 0.99	20%				20%			20%					
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	✓	NA	✓													
11096-82-5	Aroclor-1260	✓	✓	✓	✓	✓	✓			✓	✓	✓					

Sample	SMC % REC	SMC RT	Sample	SMC % REC	SMC RT
157983-005 DCB	49 (46)	✓			

Comments:

Confirmation

Sample	CAS #	RPD > 25%	Sample	CAS #	RPD > 25%
Not	Required				
			Results NDs		

Reviewed By: Kevin A Lambert Date: 05-02-06

Field Samples

High Explosives (SW 846 Method 8330)

Site/Project: DSS NFA AR/COC #: 609565 Laboratory Sample IDs: 157999-003, -004

Laboratory: GEL SDG #: 157999

Methods: EPA 8330 (HE)

# of Samples: 2 Matrix: soil Batch #s: 512166 157983 -006

CAS #	NAME		Intercept	Curve R^2	CCV %D	Method Blanks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks		
				.99	20%	U			20%			20%		U	U		
2691-41-0	HMX	✓	NA	✓	✓	✓	✓			✓	✓	✓		✓			
121-82-4	RDX	✓	✓														
99-35-4	1,3,5-Trinitrobenzene	✓	NA														
99-65-0	1,3-dinitrobenzene	✓															
98-95-3	Nitrobenzene	✓															
479-45-8	Tetryl	✓															
118-96-7	2,4,6-trinitrotoluene	✓															
35572-78-2	2-amino-4,6-dinitrotoluene	✓															
19406-51-0	4-amino-2,6-dinitrotoluene	✓															
121-14-2	2,4-dinitrotoluene	✓															
606-20-2	2,6-dinitrotoluene	✓															
88-72-2	2-nitrotoluene	✓															
99-99-0	4-nitrotoluene	✓	✓														
99-08-1	3-nitrotoluene	✓	✓														
78-11-5	PETN																

Sample	SMC %REC	SMC RT	Sample	SMC %REC	SMC RT
Met Criteria					

Comments: QC run on sample from another SNL SDG

Confirmation

Sample	CAS #	RPD > 25%	Sample	CAS #	RPD > 25%
Not Required					
			Results NDs		

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

Reviewed By: Kevin A Lambert Date: 05-02-06

Field QC

High Explosives (SW 846 Method 8330)

Site/Project: DSS NFA AR/COC #: 609565 Laboratory Sample IDs: 157983-006 (EB)

Laboratory: GEL SDG #: 157983

Methods: EPA8330(HE)

# of Samples: 1 Matrix: aqueous Batch #s: 511611

CAS #	NAME	√	Intercept	Curve R^2	CCV %D	Method Blanks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks		
				.99	20%	U			20%			20%		U	U		
2691-41-0	HMX	✓	NA	✓	✓	✓	✓			✓	✓	✓					
121-82-4	RDX	✓	✓	✓													
99-35-4	1,3,5-Trinitrobenzene	✓	NA	✓													
99-65-0	1,3-dinitrobenzene	✓		✓													
98-95-3	Nitrobenzene	✓		✓													
479-45-8	Tetryl	✓		✓													
118-96-7	2,4,6-trinitrotoluene	✓		✓													
35572-78-2	2-amino-4,6-dinitrotoluene	✓		✓													
19406-51-0	4-amino-2,6-dinitrotoluene	✓		✓													
121-14-2	2,4-dinitrotoluene	✓		✓													
606-20-2	2,6-dinitrotoluene	✓		✓													
88-72-2	2-nitrotoluene	✓		✓													
99-99-0	4-nitrotoluene	✓		✓													
99-08-1	3-nitrotoluene	✓	✓	✓	✓	✓	✓			✓	✓	✓					
78-11-5	PETN																

Sample	SMC %REC	SMC RT	Sample	SMC %REC	SMC RT
Met	Criteria				

Comments:

Confirmation

Sample	CAS #	RPD > 25%	Sample	CAS #	RPD > 25%
	Not	Required			
			Results	NDs	

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

Reviewed By: Kevin A Lambert Date: 05-02-06

Field Samples

Semivolatile Organics (SW 846 Method 8270)

Site/Project: DSS NFA AR/COC #: 609565 Laboratory Sample IDs: 157999-003, -004

Laboratory: GEL SDG #: 157999

Methods: EPA8270C (SVOC)

# of Samples: 2 Matrix: soil Batch #s: 511672

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	157983 Equip. Blanks -004	Field Blanks		
1	A	108-95-2	Phenol	✓	0.80	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		✓	✓													
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	✓	✓	✓	28												
2	BN	111-91-1	bis(2-Chloroethoxy)methane	✓	0.30	NA	✓	✓	✓												
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		✓	✓						✓	103(102)	✓					
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	A	95-95-4	2,4,5-Trichlorophenol	✓	0.20		✓	✓													

Comments:

Notes: Shaded rows are RCRA compounds.

Reviewed By: Kevin A Lambert Date: 05-02-06

Semivolatile Organics

Site/Project: ______ AR/COC #: 609565 Batch #s: ______

Laboratory: ______ SDG #: 157999 # of Samples: ______ Matrix: ______

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	157983 Equip. Blanks -004	Field Blanks		
3	BN	91-58-7	2-Chloronaphthalene	✓	0.80	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	✓	✓	✓													
3	A	100-02-7	4-Nitrophenol	✓	0.01	✓	✓	✓													
3	BN	132-64-9	Dibenzofuran	✓	0.80	NA	✓	✓													
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	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	✓	✓	✓													
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		✓	✓													
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: ______ AR/COC #: 609565 Batch #s: ______

Laboratory: ______ SDG #: 157999 # 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	157983 Equip. Blanks -004	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	✓	✓	✓													
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
Met Criteria								

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:

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: Phenanthrene-d10 (BN) IS 5: Chrysene-d12 (BN) IS 6: Perylene-d12 (BN)

Field QC

DSS

Semivolatile Organics (SW 846 Method 8270)

Site/Project: NFA AR/COC #: 609565 Laboratory Sample IDs: 157983-004 (EB)

Laboratory: GEL SDG #: 157983

Methods: EPA8270C (SVOC)

# of Samples: 1 Matrix: aqueous Batch #s: 511734

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 ~~157983 KAL~~ -004 KAL	Field Blanks		
1	A	108-95-2	Phenol	✓	0.80	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		✓	✓													
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		✓	✓													
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		✓	✓			76 (71)										
3	A	88-06-2	2,4,6-Trichlorophenol	✓	0.20		✓	✓			✓										
3	A	95-95-4	2,4,5-Trichlorophenol	✓	0.20		✓	✓			✓										

Comments:

Notes: Shaded rows are RCRA compounds.

Reviewed By: Kevin A Lambert Date: 05-02-06

Semivolatile Organics

Site/Project: ____________ AR/COC #: 609565 Batch #s: ____________

Laboratory: ____________ SDG #: 157983 # of Samples: ____________ Matrix: ____________

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		
3	BN	91-58-7	2-Chloronaphthalene		0.80	NA	✓	✓	✓	✓	✓			✓	✓	✓					
3	BN	88-74-4	2-Nitroaniline		0.01	✓	✓	✓	31					115(112)							
3	BN	131-11-3	Dimethylphthalate		0.01	NA	✓	✓	✓					✓							
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	NA	✓	✓													
3	A	51-28-5	2,4-Dinitrophenol		0.01	✓	✓	✓													
3	A	100-02-7	4-Nitrophenol		0.01	NA	✓	✓													
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	✓	✓	✓	21												
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	✓	✓	✓													
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		✓	✓													
5	BN	85-68-7	Butylbenzylphthalate		0.01		✓	✓	↓												
5	BN	91-94-1	3,3'-Dichlorobenzidine		0.01		✓	✓	24												
5	BN	56-55-3	Benzo(a)anthracene		0.80	↓	✓	✓	✓	↓	↓			↓	↓	↓					

Comments:

Semivolatile Organics

Site/Project: ______________ AR/COC #: 609565 Batch #s: ______________

Laboratory: ______________ SDG #: 157983 # 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	✓	✓	✓	✓	✓			✓	✓	✓					
5	BN	117-81-7	bis(2-Ethylhexyl)phthalate		0.01	✓	✓	✓													
6	BN	117-84-0	Di-n-octylphthalate		0.01	NA	✓	✓													
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
Met								
Criteria								

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:

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)

Field Samples

Volatile Organics (SW 846 Method 8260)

Site/Project: DSS NFA AR/COC #: 609565 # of Samples: 2 Matrix: soil

Laboratory: GEL SDG #: 157999 Laboratory Sample IDs: 157999-001, -002

Methods: EPA8260A (VOC) Batch #s: 513548

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	157983 Equip. Blanks -002	157983 Trip Blanks -003		
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	156-59-2	**cis-1,2-dichloroethene**	✓	0.01		✓	✓													
1	78-87-5	**1,2-dichloropropane**	✓	0.01		✓	✓													
1	78-93-3	2-butanone (MEK) (10xblk)	✓	0.01		✓	✓													
1	156-60-5	**trans-1,2-dichloroethene**	✓			✓	✓													
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	✓	✓	✓										3.43J			
1	71-43-2	**benzene**	✓	0.50	NA	✓	✓										✓			
1	75-27-4	bromodichloromethane	✓	0.20		✓	✓	✓												
3	75-25-2	bromoform	✓	0.10		✓	✓	21												
1	74-83-9	bromomethane	✓	0.10		✓	✓	✓									✓			
1	75-15-0	carbon disulfide	✓	0.10		✓	✓										33.0			
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	✓	✓	✓										5.0U,B	5.0U,B		
1	75-09-2	methylene chloride (10xblk)	✓	0.01	✓	✓	✓										~~2.73J~~	~~3.48J~~ KAL		
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		0.24	✓													
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: Kevin A Lambert Date: 05-02-06

Volatile Organics

Site/Project: ____________ AR/COC #: 609565 Batch #s: ____________

Laboratory: ____________ SDG #: 157999 # 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
	met				met				
	criteria				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:

Volatile Organics (SW 846 Method 8260) Field QC

Site/Project: DSS NFA AR/COC #: 609565 # of Samples: 2 Matrix: aqueous

Laboratory: GEL SDG #: 157983 Laboratory Sample IDs: 157983-002, -003 (EB, TB)

Methods: EPA 8260B (VOC) Batch #s: 512600

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	10x Blk	
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	156-59-2	**cis-1,2-dichloroethene**	✓	0.01		✓	✓													
1	78-87-5	**1,2-dichloropropane**	✓	0.01		✓	✓													
1	78-93-3	2-butanone (MEK) (10xblk)	✓	0.01		✓	✓	-22												
1	156-60-5	**trans-1,2-dichloroethene**	✓			✓	✓	✓												
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	✓	✓	✓	-27												
1	71-43-2	**benzene**	✓	0.50	NA	✓	✓	✓												
1	75-27-4	bromodichloromethane	✓	0.20	NA	✓	✓													
3	75-25-2	bromoform	✓	0.10	✓	✓	✓													
1	74-83-9	bromomethane	✓	0.10	✓	✓	✓													
1	75-15-0	carbon disulfide	✓	0.10	NA	✓	✓													
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	NA	✓	✓													
2	124-48-1	dibromochloromethane	✓	0.10		✓	✓													
2	100-41-4	ethylbenzene	✓	0.10		✓	✓													
1	75-09-2	methylene chloride (10xblk)	✓	0.01	✓	✓	✓		2.61 J										26.1	
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		0.24	✓													
1	75-01-4	**vinyl chloride**	✓	0.10		✓	✓													
2	1330-20-7	xylenes(total)	✓	0.30		✓	✓													
	108-05-4	vinyl acetate	✓			✓	✓													

Comments: QC run on sample from another SNL SDG

Notes: Shaded rows are RCRA compounds.

Reviewed By: Kevin A Lambert Date: 05-02-06

Volatile Organics

Site/Project: ______ AR/COC #: 609565 Batch #s: ______

Laboratory: ______ SDG #: 157983 # 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
	met				met				
	criteria				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:

Contract Verification Review (CVR)

Project Leader LANGKOPF   Project Name DSS-NFA   Case No. 98043_02.02.01

AR/COC No. 609565   Analytical Lab GEL   SDG No. 157983

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

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

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

2.0 Analytical Laboratory Report

Line No.	Item	Complete? Yes	Complete? No	If no, explain	Resolved? Yes	Resolved? No
2.1	Data reviewed, signature	X				
2.2	Method reference number(s) complete and correct	X				
2.3	QC analysis and acceptance limits provided (MB, LCS, Replicate)	X				
2.4	Matrix spike/matrix spike duplicate data provided (if requested)	X				
2.5	Detection limits provided; PQL and MDL (or IDL), MDA and L_c	X				
2.6	QC batch numbers provided	X				
2.7	Dilution factors provided and all dilution levels reported	X				
2.8	Data reported in appropriate units and using correct significant figures	X				
2.9	Radiochemistry analysis uncertainty (2 sigma error) and tracer recovery (if applicable) reported	X				
2.10	Narrative provided	X				
2.11	TAT met	X				
2.12	Hold times met		X	HOLDING TIME EXCEEDED FOR Cr6+ EQUIPMENT BLANK	X	
2.13	Contractual qualifiers provided	X				
2.14	All requested result and TIC (if requested) data provided	X				

3.0 Data Quality Evaluation

Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
3.1 Are reporting units appropriate for the matrix and meet contract specified or project-specific requirements? Inorganics and metals reported as ppm (mg/liter or mg/Kg)? Tritium reported in picocuries per liter with percent moisture for soil samples? Units consistent between QC samples and sample data	X		
3.2 Quantitation limit met for all samples	X		
3.3 Accuracy a) Laboratory control samples accuracy reported and met for all samples		X	HEXACHLOROCYCLOPENTADIENE FAILED RECOVERY LIMITS FOR SVOC LCS
b) Surrogate data reported and met for all organic samples analyzed by a gas chromatography technique		X	SURROGATE FOR PCB SAMPLE # 075630-003 FAILED RECOVERY LIMITS
c) Matrix spike recovery data reported and met		X	2,4,5-TRICHLOROPHENOL & O-NITROANILINE FAILED RECOVERY LIMITS FOR SVOC MATRIX SPIKE O-NITROANILINE FAILED RECOVERY LIMITS FOR SVOC MATRIX SPIKE DUP 4-CHLOROANILINE FAILED RECOVERY LIMITS FOR SVOC MATRIX SPIKE DUP(aq) CHROMIUM FAILED RECOVERY LIMITS FOR MATRIX SPIKE SELENIUM FAILED RECOVERY LIMITS FOR MSD
3.4 Precision a) Replicate sample precision reported and met for all inorganic and radiochemistry samples		X	RPD FOR BARIUM, LEAD AND MERCURY OUTSIDE ACCEPTANCE RANGE
b) Matrix spike duplicate RPD data reported and met for all organic samples	X		
3.5 Blank data a) Method or reagent blank data reported and met for all samples		X	METHYLENE CHLORIDE DETECTED IN BLANK
b) Sampling blank (e.g., field, trip, and equipment) data reported and met		X	ACETONE, CARBON DISULFIDE, METHYLENE CHLORIDE AND CHROMIUM DETECTED IN EQUIPMENT BLANKS METHYLENE CHLORIDE DETECTED IN TRIP BLANK
3.6 Contractual qualifiers provided: "J"- estimated quantity; "B"-analyte found in method blank above the MDL for organic or above the PQL for inorganic; "U"- analyte undetected (results are below the MDL, IDL, or MDA (radiochemical)); "H"-analysis done beyond the holding time	X		
3.7 Narrative addresses planchet flaming for gross alpha/beta	X		
3.8 Narrative included, correct, and complete	X		
3.9 Second column confirmation data provided for methods 8330 (high explosives) and 8082 (pesticides/PCBs)	X		

Contract Verification Review (Continued)

4.0 Calibration and Validation Documentation

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

Contract Verification Review (Concluded)

5.0 Problem Resolution

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

Sample/Fraction No.	Analysis	Problems/Comments/Resolutions

Were deficiencies unresolved? Yes No

Based on the review, this data package is complete. Yes No

If no, provide: nonconformance report or correction request number ________ and date correction request was submitted:-______________

Reviewed by: W. Palencia Date: 4-17-06 Closed by:________________ Date:____________

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab Batch No. N/A

SMO Use

AR/COC **609565**

Dept. No./Mail Stop:	6146/1089	Date Samples Shipped:	3-13-06	Project/Task No.: 98043.02.02.01	☐ Waste Characterization -Send preliminary/copy report to:
Project/Task Manager:	~~Mike Sanders~~ Langkopf, B.	Carrier/Waybill No.	616164	SMO Authorization: [signature]	
Project Name:	DSS - NFA	Lab Contact:	Edie Kent 803/556-8171	Contract #: PO 21671	
Record Center Code:	NA	Lab Destination:	Gel		☐ Released by COC No.:
Logbook Ref. No.:		SMO Contact/Phone:	Pam Puissant/505-284-3124		☑ Validation Required
Service Order No.	CF023-06	Send Report to SMO:	Wendy Palencia(505)844-3132		Bill To: Sandia National Labs (Accounts Payable) P.O. Box 5800 MS 0154 Albuquerque, NM 87185-0154
Location	Tech Area				
Building	Room		Reference LOV(available at SMO) 157983		

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Pump Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
075626-001	885/1101-SP2-BH1-25-S	25	1101	031006/1442	S	SLEEVE G	125 ml	4C	G	SA	VOCs (8260B) 157999	-001
075626-018	885/1101-SP2-BH1-25-S	25	1101	031006/1444	S	AG	500 ml	4C	G	SA	Analysis fraction " 018 "	003
075627-001	885/1101-SP2-BH1-30-S	30	1101	031006/1540	S	SLEEVE G	125 ml	4C	G	SA	VOCs (8260B)	002
075627-018	885/1101-SP2-BH1-30-S	30	1101	031006/1542	S	AG	500 ml	4C	G	SA	Analysis fraction " 018 "	004
075630-001	885/1101-EB	NA	1101	031306/0805	DIW	G	3x40ml	HCL	C	EB	VOCs (8260B) 157983	-002
075630-002	885/1101-EB	NA	1101	031306/0806	DIW	AG	4x1Liter	4C	C	EB	SVOCs (8270C)	004
075630-003	885/1101-EB	NA	1101	031306/0808	DIW	AG	4x1Liter	4C	C	EB	PCBs (8082)	005
075630-007	885/1101-EB	NA	1101	031306/0810	DIW	AG	4x1Liter	4C	C	EB	HE (8330)	006
075630-011	885/1101-EB	NA	1101	031306/0812	DIW	P	500 ml	NAOH	C	EB	Cyanide (9012A)	007
075630-010	885/1101-EB	NA	1101	031306/0813	DIW	P	500ml	HNO3	C	EB	RCRA metals (6020)	008
075630-016	885/1101-EB	NA	1101	031306/0814	DIW	P	1 Liter	HNO3	C	EB	Gross Alpha/Beta (900.0)	009

RMMA ☐ Yes ☑ No Ref. No.

Sample Disposal ☐ Return to Client ☑ Disposal by lab

Turnaround Time ☐ 7 Day ☐ 15 Day ☑ 30 Day

Return Samples By: ☐ **Negotiated TAT**

Sample Tracking Smo Use
Date Entered(mm/dd/yy) 03/16/06
Entered by: RK
QC inits. [initials]

Special Instructions/QC Requirements
EDD ☑ Yes ☐ No
Level D Package ☑ Yes ☐ No
***Send report to:**
Mike Sanders, Dept6146/MS 1089,505-284-2478

" 018 " = SVOCs(8270C),HE(8330),Cyanide (9010), Cr6+(7197), RCRA metals(6020/7000),PCBs(8082) Gross Alpha/Beta(900)
***Please list as separate report.**

Abnormal Conditions on Receipt

Lab Use

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	William Gibson	[signature]	WG	Weston/6146/284-5232/239-7367
	Gilbert Quintana	[signature]	GQ	Shaw/6146/284-3309/850-8524
	Robert Lynch	[signature]	RL	Weston/6146/250-7090

	Org.	Date	Time		Org.	Date	Time
1.Relinquished by [signature]	6146	3/13/06	1000	4.Relinquished by			
1. Received by [signature]	6146	3/13/06	1000	4. Received by			
2.Relinquished by [signature]	6146	3/13/06	1145	5.Relinquished by			
2. Received by				5. Received by			
3.Relinquished by				6.Relinquished by			
3. Received by				6. Received by			

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

AR/COC- 609565

Project Name:	DSS - ~~N/PA~~	Project/Task Manger: Mike Sanders					Project/Task No.: 98043.02.02.01						
Location	Tech Area												
Building	Room	Reference LOV (available at SMO)											Lab use
Sample No-Fraction	ER Sample ID or Sample Location detail	Pump Depth (ft)	ER Site No.	Date/Time (hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested		Lab Sample ID
075630-014	885/1101-EB	NA	1101	031306/0815	DIW	P	250 ml	4C	C	EB	Cr 6+ (7196A)	157983-	001
075631-001	885/1101-TB	NA	1101	031306/0805	DIW	G	3x40ml	HCL	G	TB	VOCs (8260B)		003

Abnormal Conditions on Receipt

LAB USE

Recipient Initials ________

RECORDS CENTER CODE: ______________

SMO ANALYTICAL DATA ROUTING FORM

PROJECT NAME:	DSS-NFA	PROJECT/TASK:	98043_02.02.01
SNL TASK LEADER:	LANGKOPF	ORG/MS/CF0#:	6146/1089/CFO#023-06
SMO PROJECT LEAD:		SAMPLE SHIP DATE:	3/13/2006

ARCOC	LAB	LAB ID	PRELIM DATE	FINAL DATE	EDD	EDD ON Q	Cust CD	RC CD
609565	GEL	157983		4/13/2006	X	X	N/A	X

DATA PACKAGE TAT:	RUSH	X NORMAL
CORRECTIONS REQUESTED BY/DATE:		
PROBLEM #/DATE CORRECTION RECEIVED:		
CVR COMPLETED BY/DATE:	W. Palencia	4-17-06
FINAL TRANSMITTED TO/DATE:	Sanders	4-17-06
SENT TO VALIDATION BY/DATE:	R. Kavanaugh	04-27-06
REVISIONS REQUESTED/REVISIONS RECEIVED (DATE):		
VALIDATION COMPLETED BY/DATE:	KAL	05-02-06
COPY TO WM BY/DATE:		
CD REQUESTED BY/DATE		
CD RECEIVED BY/DATE	R. Kavanaugh	4/13/2006
TO ERDMS OR RECORDS CENTER BY/DATE:		

COMMENTS:

Pass w/ reanalysis SDG 160486 (see email)
- Send back to validation
- Load the EDD that has the reanalysis in ERDMS.

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

Memorandum

Date: April 28, 2006

To: File

From: Kevin Lambert

Subject: Inorganic Data Review and Validation – SNL
Site: DSS NFA
AR/COC: 609565 (RCRA metals reanalysis)
SDG: 160486
Laboratory: GEL
Project/Task: 98043.02.02.01

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM SMO AOP 00-03 Rev 1 and DOE-AL Model Data Validation Procedure Rev. 3.

Summary

The samples were prepared and analyzed with accepted procedures using methods EPA6010B (ICP metals), EPA6020 (ICP-MS metals), and EPA7470A (CVAA mercury). It should be noted that the samples in this SDG were relogs for RCRA metals due to homogeneity issues with the original analytical results. The samples were crushed and homogenized prior to reanalysis in accordance with client request. Problems were identified with the data package that result in the qualification of data.

1. ICP-MS metals:
   The MSD recovery for cadmium (131%) was > the upper QC acceptance limit (125%). The associated sample results were detects and will be qualified "J, A2."

   The replicate RPD for barium (99%) was outside of QC acceptance criteria (35%). The associated sample results were detects and will be qualified "J, P1."

2. CVAA mercury:
   The samples were analyzed outside the holding time but were within 2x the method-specified holding time (see Data Validation Worksheets). The associated sample result were detects and will be qualified "J, HT." Also, mercury was detected (≥ DL) in one or more of the blanks (ICB, CCB, MB). The associated sample results were detects and will be qualified "J, B." However, it should be noted that the associated sample results have already been qualified due to a holding time infraction; no further qualification is necessary. The descriptive flag "B" will be included to indicate MB contamination.

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 except as noted above in the summary section.

Calibration

The initial and continuing calibration data met QC acceptance criteria.

Blanks

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

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

The LCS/LCSD met QC acceptance criteria except as follows.

All analyses:
It should be noted that no LCSD was provided with the SDG. Laboratory precision was assessed using the replicate, which met QC acceptance criteria. No data will be qualified as a result.

Matrix Spike (MS)

The MS met QC acceptance criteria except as noted above in the summary section and as follows.

All analyses:
An MS/MSD was run and used for target analytes with sample concentrations < 2 to 3x the spike concentrations (see Data Validation Worksheets). No data will be qualified as a result.

ICP metals:
It should be noted the MS was run on a sample of similar matrix from another SNL SDG and met QC acceptance criteria. No data will be qualified as a result.

ICP-MS metals:
It should be noted the MS was run on a sample of similar matrix from another SNL SDG and met QC acceptance criteria. No data will be qualified as a result. Also, it should be noted that the MS recovery limits do not apply for target analytes with sample concentrations > 4x the spike concentrations (see Data Validation Worksheets). No data will be qualified as a result.

Replicate

The replicate met QC acceptance criteria except as noted above in the summary section and as follows.

All analyses:
An MS/MSD was run and used to assess precision instead of the replicate for target analytes with sample concentrations < 2 to 3x the spike concentrations (see Data Validation Worksheets). No data will be qualified as a result.

ICP metals and ICP-MS metals:
It should be noted the replicate was run on a sample of similar matrix from another SNL SDG and met QC acceptance criteria. No data will be qualified as a result.

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 except as follows.

ICP-MS metals:
The samples were diluted the standard 2x for this analysis.

Other QC

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

No other specific issues were identified which affect data quality.

Site: DSS NFA **AR/COC:** 609565 (Reanalysis) **Data Type:** Inorganic

	ICP-MS metals	7440-39-3 (Barium)	7440-43-9 (Cadmium)	CVAA Hg	7439-97-6 (Mercury)
075626-R18 885/1101-SP2-BH1-25-S		J,P1	J,A2		J,HT,B
075627-R18 885/1101-SP2-BH1-30-S		J,P1	J,A2		J,HT,B

Validated By: Kevin A Lambert

Date: 04/28/06

Data Validation Summary

Site/Project: DSS NFA Project/Task #: 98043.02.02.01 # of Samples: 2 Matrix: soil

AR/COC #: 609565 (RCRA metals reanalysis) Laboratory Sample IDs: 160486-001, -002

Laboratory: GEL

SDG #: 160486

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

J = Estimated R = Unusable NP = Not Provided

U = Not Detected Check (√) = Acceptable Other: ____________

UJ = Not Detected, Estimated Shaded Cells = Not Applicable (also "NA")

Reviewed By: Kevin A Lambert Date: 04-28-06

Holding Time and Preservation

Site/Project: DSS NFA AR/COC #: 604565 Laboratory Sample IDs: 160486-001, -002

Laboratory: GEL SDG #: 160486

# of Samples: 2 Matrix: aqueous

Sample ID	Analytical Method	Holding Time Criteria	Days Holding Time was Exceeded	Preservation Criteria	Preservation Deficiency	Comments
160486-001	EPA 7471A (CVAA Hg)	28 days	11 days	—	—	Samples were analyzed after HT had expired
↓ -002	↓	↓	↓	—	—	but within 2 x the
						method-specified
						HT; results were detects and will be
						qualified "J, HT"

Reviewed By: Kevin A Lambert Date: 04-28-06

Inorganic Metals

Site/Project: DSS NFA AR/COC #: 609565 Laboratory Sample IDs: 160486-001, -002

Laboratory: GEL SDG #: 160486

Methods: EPA6010B(ICP), EPA6020(ICP-MS), EPA7471A(CVAA Hg)

# of Samples: 2 Matrix: soil Batch #s: 520844, 520871, 520908

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	5x ~~Field~~ KH Blanks	
7429-90-5 Al																			
7440-39-3 Ba	✓	✓	✓	✓	✓	✓	✓			N/A	NA	NA	99 (35)	✓	✓				
7440-41-7 Be																			
7440-43-9 Cd	✓	✓	✓	✓	✓	✓	✓			✓	131 (125)	✓	NA	✓	✓				
7440-70-2 Ca																			
7440-47-3 Cr	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	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																			
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	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	NA	✓	✓				
7782-49-2 Se	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	NA	✓	✓				
7440-38-2 As	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	NA	✓	✓				
7440-36-0 Sb																			
7440-28-0 Tl																			
7439-97-6 Hg	✓	✓	✓	✓	✓	0.00634J	✓			✓	✓	✓	NA	NA	NA			0.0317	
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: QC for ICP, ICP-MS run on sample from another SNL SDG.
*replicate used if target analyte > 2-3 x spike [c]
N/A - The MS%R limits don't apply; sample [c] > 4x spike [c]

Reviewed By: Kevin A Lambert Date: 04-28-06

Contract Verification Review (CVR)

Project Leader Langkopf | Project Name DSS-NFA | Case No. 98043_02.02.01

AR/COC No. 609565 (RCRA Met. Re-analysis) | Analytical Lab GEL | SDG No. 160486

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

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

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

2.0 Analytical Laboratory Report

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

Contract Verification Review (Continued)

4.0 Calibration and Validation Documentation

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

SDG 160486
Reanalysis: Only
RCRA Metals (except Hg)

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab Batch No. N/A

SMO Use

AR/COC 609565

Dept. No./Mail Stop:	8146/1089	Date Samples Shipped:	3-13-06	Project/Task No.: 98043.02.02.01	Waste Characterization -Send preliminary/copy report to:
Project/Task Manager:	Mike Sanders	Carrier/Waybill No:	61664	SMO Authorization: [signature] SMO	
Project Name:	DSS - NFA	Lab Contact:	Edie Kent 803/556-8171	Contract #: PO 21671	
Record Center Code:	NA	Lab Destination:	Gel		Released by COC No.:
Logbook Ref. No.:		SMO Contact/Phone:	Pam Puissant/505-284-3124		☑ Validation Required
Service Order No.	CF023-06	Send Report to SMO:	Wendy Palencia(505)844-3132		Bill To: Sandia National Labs (Accounts Payable) P.O. Box 5800 MS 0154 Albuquerque, NM 87185-0154
Location	Tech Area				
Building	Room	Reference LOV(available at SMO)	160486 0/0		

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Pump Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
075626-001	885/1101-SP2-BH1-25-S	25	1101	031006/1442	S	Sleeve G	125 ml	4C	G	SA	VOCs (8260B) 157999-001	
075626-018	885/1101-SP2-BH1-25-S	25	1101	031006/1444	S	AG	500 ml	4C	G	SA	Analysis fraction " 018 " 157999-003	T.001
075627-001	885/1101-SP2-BH1-30-S	30	1101	031006/1540	S	Sleeve G	125 ml	4C	G	SA	VOCs (8260B) 157999-002	
075627-018	885/1101-SP2-BH1-30-S	30	1101	031006/1542	S	AG	500 ml	4C	G	SA	Analysis fraction " 018 " 157999-004	T.002
075630-001	885/1101-EB	NA	1101	031306/0805	DIW	G	3x40ml	HCL	C	EB	VOCs (8260B) 157983-002	
075630-002	885/1101-EB	NA	1101	031306/0806	DIW	AG	4x1Liter	4C	C	EB	SVOCs (8270C)	004
075630-003	885/1101-EB	NA	1101	031306/0808	DIW	AG	4x1Liter	4C	C	EB	PCBs (8082)	005
075630-007	885/1101-EB	NA	1101	031306/0810	DIW	AG	4x1Liter	4C	C	EB	HE (8330)	006
075630-011	885/1101-EB	NA	1101	031306/0812	DIW	P	500 ml	NAOH	C	EB	Cyanide (9012A)	007
075630-010	885/1101-EB	NA	1101	031306/0813	DIW	P	500ml	HNO3	C	EB	RCRA metals (6020)	008
075630-016	885/1101-EB	NA	1101	031306/0814	DIW	P	1 Liter	HNO3	C	EB	Gross Alpha/Beta (900.0)	009

RMMA ☐ Yes ☑ No Ref. No.	Sample Tracking Smo Use	Special Instructions/QC Requirements
Sample Disposal ☐ Return to Client ☑ Disposal by lab	Date Entered(mm/dd/yy)	EDD ☑ Yes ☐ No
Turnaround Time ☐ 7 Day ☐ 15 Day ☑ 30 Day	Entered by:	Level D Package ☑ Yes ☐ No
Return Samples By:	☐ Negotiated TAT QC inits.	*Send report to:

Abnormal Conditions on Receipt

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	William Gibson	[signature]	WG	Weston/6146/284-5232/239-7367
	Gilbert Quintana	[signature]	GQ	Shaw/6146/284-3309/850-8524
	Robert Lynch	[signature]	RL	Weston/6146/250-7090

Mike Sanders, Dept6146/MS 1089,505-284-2478

" 018 " = SVOCs(8270C),HE(8330),Cyanide (9010), Cr6+(7197), RCRA metals(6020/7000),PCBs(8082) Gross Alpha/Beta(900)

*Please list as separate report.

Lab Use

	Org.	Date	Time		Org.	Date	Time
1.Relinquished by [signature]	6146	3/13/06	1000	4.Relinquished by			
1. Received by [signature] SMO	6146	3/13/06	1000	4. Received by			
2.Relinquished by [signature] SMO	6146	3/13/06	1145	5.Relinquished by			
2. Received by [signature]	GEL	3/14/06	720	5. Received by			
3.Relinquished by				6.Relinquished by			
3. Received by				6. Received by			

OFF-SITE LABORATORY

Analysis Request And Chain Of Custody (Continuation)

AR/COC- 609565

Project Name:	DSS - NEA	Project/Task Manger: Mike Sanders					Project/Task No.: 98043.02.02.01					
Location	Tech Area											
Building	Room	Reference LOV (available at SMO)										Lab use
Sample No-Fraction	ER Sample ID or Sample Location detail	Pump Depth (ft)	ER Site No.	Date/Time (hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
075630-014	885/1101-EB	NA	1101	031306/0815	DIW	P	250 ml	4C	C	EB	Cr 6+ (7196A)	157983001
075631-001	885/1101-TB	NA	1101	031306/0805	DIW	G	3x40ml	HCL	G	TB	VOCs (8260B)	003

Abnormal Conditions on Receipt

LAB USE

Recipient Initials: CQ

RECORDS CENTER CODE: ____________

SMO ANALYTICAL DATA ROUTING FORM

PROJECT NAME: DSS-NFA

PROJECT/TASK: 98043_02.02.01

SNL TASK LEADER: LANGKOPF

ORG/MS/CF0#: 6146/1089/CFO#023-06

SMO PROJECT LEAD:

SAMPLE SHIP DATE: 3/13/2006

ARCOC	LAB	LAB ID	PRELIM DATE	FINAL DATE	EDD	EDD ON Q	Cust CD	RC CD
609565	GEL	160486	4/19/2006	4/26/2006	X	X	N/A	X

DATA PACKAGE TAT:	RUSH	X ~~NORMAL~~
CORRECTIONS REQUESTED BY/DATE:	L-Ikenera	04-27-06
PROBLEM #/DATE CORRECTION RECEIVED:	11666	
CVR COMPLETED BY/DATE:	L. Ikenera	04-27-06
FINAL TRANSMITTED TO/DATE:	M. Sanders	04-27-06
SENT TO VALIDATION BY/DATE:	R-Kavanaugh	04-27-06
REVISIONS REQUESTED/REVISIONS RECEIVED (DATE):		
VALIDATION COMPLETED BY/DATE:	KAL	04-28-06
COPY TO WM BY/DATE:		
CD REQUESTED BY/DATE		
CD RECEIVED BY/DATE	R. Kavanaugh	4/26/2006
TO ERDMS OR RECORDS CENTER BY/DATE:		

COMMENTS: REANALYSIS FOR RCRA METALS

Rush

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

Memorandum

Date: May 2, 2006

To: File

From: Kevin Lambert

Subject: Inorganic Data Review and Validation – SNL
Site: DSS NFA
AR/COC: 609568
SDG: 158178 and 158179
Laboratory: GEL
Project/Task: 98043.02.02.01

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM SMO AOP 00-03 Rev 1 and DOE-AL Model Data Validation Procedure Rev. 3.

Summary

The samples were prepared and analyzed with accepted procedures using methods EPA6010B (ICP metals), EPA6020 (ICP-MS metals), EPA7470A (CVAA mercury), EPA9012A (Total Cyanide), and EPA7196A (Hexavalent Chromium). However, it should be noted that no data review and validation was performed on RCRA metals sample results in this SDG due to homogeneity issues with the original analytical results. The samples were relogged under another SDG and crushed and homogenized prior to reanalysis in accordance with client request. 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)/ Laboratory Control Sample Duplicate (LCSD)

The LCS/LCSD met QC acceptance criteria except as follows.

All analyses:
It should be noted that no LCSD was provided with the SDG. Laboratory precision was assessed using the replicate, which met QC acceptance criteria. No data will be qualified as a result.

Matrix Spike (MS)

The MS met QC acceptance criteria.

Replicate

The replicate met QC acceptance criteria.

ICP Serial Dilution

Not Applicable

ICP Interference Check Sample (ICS)

Not Applicable

Detection Limits/Dilutions

All detection limits were properly reported. No dilutions were required.

Other QC

No trip blank (TB), equipment blank (EB), field blank (FB), or field duplicate pair was submitted on the AR/COC(s).

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: May 2, 2006

To: File

From: Kevin Lambert

Subject: Organic Data Review and Validation – SNL
Site: DSS NFA
AR/COC: 609568
SDG: 158178 and 158179
Laboratory: GEL
Project/Task: 98043.02.02.01

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM SMO AOP 00-03 Rev 1.

Summary

All samples were prepared and analyzed with accepted procedures using method EPA8260A/B (VOC), EPA8270C (SVOC), EPA8330 (High Explosives), and EPA8082 (PCB). All compounds were successfully analyzed. Problems were identified with the data package that result in the qualification of data.

1. VOC:
   For the field QC sample, methylene chloride was detected (≥ DL) in the method blank (MB). The associated sample result was a detect < 10x the blank concentration and < the RL and, thus will be qualified "U" at the RL (5.0 ug/L) with descriptive flag "B." Also, no measure of precision was provided with the SDG for the field QC sample. An MS/MSD was not run and no LCSD was run. Therefore, the associated sample results will be flagged "P2" to indicate insufficient QC data to determine laboratory precision.

2. SVOC:
   The internal standard area count for perylene-d12 (IS 6) in sample 158178-003 was < 50% of the average result of the calibration standard but > 25%. The associated sample results were NDs and will be qualified "UJ."

Data are acceptable and reported 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 except as follows.

VOC:
The calibration response factor (RF) for trichloroethene (0.27 and 0.24, respectively) was < the specified minimum RF (0.30). No data should be qualified based on professional judgment. The continuing calibration verification percent differences (CCV %Ds) for 2-hexanone (22%), acetone (37%), bromoform (26% and 21%, respectively), cis-1,3-dichloropropene (25%), styrene (21%), and trans-1,3-dichloropropene were > 20% but ≤ 40%. The associated sample results were NDs and as a result based on professional judgment no data will be qualified.

SVOC:
The CCV %Ds for hexachlorocyclopentadiene (-23%), 2-nitroaniline (28%), and bis(2-ethylhexyl)phthalate (26%) were > 20% but ≤ 40%. The associated sample results were NDs and as a result based on professional judgment no data will be qualified.

Blanks

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

VOC:
It should be noted that methylene chloride was detected (≥ DL) in the TB. However, the TB result for methylene chloride has already been recommended for qualification due MB contamination; no further qualification is necessary.

Internal Standards (ISs)

Internal standards data met QC acceptance criteria except as noted above in the summary section.

Surrogates

The surrogate recoveries met QC acceptance criteria except as noted above in the summary section.

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

The LCS/LCSD met QC acceptance criteria except as follows.

All analyses:
It should be noted that no LCSD was provided with the SDG. Laboratory precision was assessed using the MS/MSD. No data will be qualified as a result.

SVOC:
The LCS recovery for di-n-octylphthalate (132%) was > the upper QC acceptance limit (127%). The associated sample results were NDs; no data will be qualified as a result.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The MS/MSD met QC acceptance criteria except as noted above in the summary section and as follows.

VOC:
For the field samples, it should be noted that the MS/MSD was run on a sample of similar matrix from another SNL SDG and met QC acceptance criteria. No data will be qualified as a result.

SVOC:
The MS recovery for 2-nitroaniline (115%) and MSD recovery for 4-chloroaniline (103%) was > the upper QC acceptance limit (112% and 102%, respectively). The associated sample results were NDs; no data will be qualified as a result.

Target Compound Identification/Confirmation

No target compound identification/confirmation analyses were required.

Detection Limits/Dilutions

All detection limits were properly reported. No dilutions were required except as follows.

High Explosives (HE):
The samples were diluted the standard 2x for this analysis.

Other QC

No trip blank (TB), equipment blank (EB), field blank (FB), or field duplicate pair was submitted on the AR/COC(s) except as follows.

VOC:
A TB was submitted on the AR/COC(s).

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:	May 2, 2006
To:	File
From:	Kevin Lambert
Subject:	Radiochemical Data Review and Validation – SNL Site: DSS NFA AR/COC: 609568 SDG: 158178 and 158179 Laboratory: GEL Project/Task: 98043.02.02.01

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM SMO AOP 00-03 Rev 1.

Summary

The samples were prepared and analyzed with accepted procedures using EPA900.0 (Gross Alpha/Beta). Problems were identified with the data package that result in the qualification of data.

1. Gross Alpha:
   The replicate error ratio (RER) for gross alpha (1.04) was > 1 but ≤ 3. The associated sample results were detects and will be qualified "J, P1."

Data are acceptable and reported 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.

Negative Bias

All sample results met negative bias QC acceptance criteria.

Blanks

No target analytes were detected in the blanks.

Tracer/Carrier Recovery

Not Applicable

Laboratory Control Sample (LCS)

The LCS met QC acceptance criteria.

Matrix Spike (MS)

The MS met QC acceptance criteria except as follows.

Gross Alpha/Beta:
An MS/MSD was run and used for target analytes with sample concentrations < 2 to 3x the spike concentrations (see Data Validation Worksheets). No data will be qualified as a result.

Replicate

The replicate met QC acceptance criteria except as noted above in the summary section and as follows.

Gross Alpha/Beta:
An MS/MSD was run and used to assess precision instead of the replicate for target analytes with sample concentrations < 2 to 3x the spike concentrations (see Data Validation Worksheets). No data will be qualified as a result.

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(s).

No other specific issues were identified which affect data quality.

Site: DSS NFA **AR/COC:** 609568 **Data Type:** Organic, Inorganic, & Rad

	VOC	All target analytes except those already qualified	75-09-2 (Methylene Chloride)	SVOC	117-84-0 (Di-n-octylphthalate)	205-99-2 (Benzo(b)fluoranthene)	207-08-9 (Benzo(k)fluoranthene)	50-32-8 (Benzo(a)pyrene)	193-39-5 (Indeno(1,2,3-cd)pyrene)	53-70-3 (Dibenz(a,h)anthracene)	191-24-2 (Benzo(g,h,i)perylene)	Radiochemistry	70543-60-0 (Gross Alpha)
075632-001 885/1101-TB2		P2	5.0 U,B,P2										
075628-018 885/1101-SP1-BH2-25-S					UJ	UJ	UJ	UJ	UJ	UJ	UJ		J,P1
075629-018 885/1101-SP1-BH2-30-S													J,P1

HE , PCB, and General Chemistry analysis met QC acceptance criteria. No data will be qualified.

Validated By: Kevin A Lambert

Date: 05/02/06

Data Validation Summary

Site/Project: DSS-NFA Project/Task #: 98043.02.02.01 # of Samples: 5 Matrix: 1 aqueous, 4 soil

AR/COC #: 609568 Laboratory Sample IDs: 158179-001

Laboratory: GEL 158178-001, -002, -003, -004

SDG #: 158179, 158178

QC Element	Analysis									
	Organics				Inorganics Cr+6				RAD	Other
	VOC	SVOC	Pesticide/ PCB	HPLC (HE)	ICP/AES	GFAA/ AA	~~CVAA (Hg)~~	CN		
1. Holding Times/Preservation	✓	✓	✓	✓			✓	✓	✓	
2. Calibrations	✓	✓	✓	✓			✓	✓	✓	
3. Method Blanks	U	✓	✓	✓			✓	✓	✓	
4. MS/MSD	P2	✓	✓	✓			✓	✓	J	
5. Laboratory Control Samples	✓	✓	✓	✓			✓	✓	✓	
6. Replicates							✓	✓	NA	
7. Surrogates	✓	✓	✓	✓						
8. Internal Standards	✓	UJ								
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	NA	

J = Estimated R = Unusable NP = Not Provided

U = Not Detected Check (√) = Acceptable Other: ________

UJ = Not Detected, Estimated Shaded Cells = Not Applicable (also "NA")

Reviewed By: Kevin A Lambert Date: 05-02-06

Radiochemistry

Site/Project: DSS NFA AR/COC #: 609568 Laboratory Sample IDs: 158178-003, -004

Laboratory: GEL SDG #: ~~KAL 6~~ 158178

Methods: EPA900.0 (GA/B

# of Samples: 2 Matrix: soil Batch #s: 516564

Analyte	Method Blanks	LCS	MS	Rep RER	~~Equip. Blanks~~ MSD	~~Field Dup.~~ KAL MS/MSD RER	Field Blanks	Sample ID	Isotope	IS/Trace	Sample ID	Isotope	IS/Trace
Criteria	U	20%	25%	<1.0	~~U~~ KAL	<1.0	U			50-105			50-105
H3													
U-238													
U-234													
U-235/-236													
Th-232													
Th-228													
Th-230													
Pu-239/-240													
Gross Alpha	✓	✓	✓	NA	✓	1.04							
Nonvolatile Beta	✓	✓	✓	NA	✓	✓							
Ra-226													
Ra-228													
Ni-63													
Gamma Spec. Am-241													
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: Kevin A Lambert Date: 05-02-06

Field Samples

General Chemistry

Site/Project: DSSNFA AR/COC #: 609568 Laboratory Sample IDs: 158178-003, -004

Laboratory: GEL SDG #: 158178-~~003~~KAL

Methods: EPA9012A (TCN), EPA7196A (Cr^{+6})

# of Samples: 2 Matrix: soil Batch #s: 512519, 512081

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	
	TCN	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	NA	NA	✓	NA	NA	NA	NA	NA	NA
	Cr^{+6}	✓	✓	✓	✓	✓	✓	✓	↓	↓	✓	↓	↓	✓	↓	↓	↓	↓	↓	↓

Comments:

Reviewed By: Kevin A Lambert Date: 05-02-06

Field Samples

PCBs (SW 846 - Method 8082)

Site/Project: DSS NFA AR/COC #: 609568 Laboratory Sample IDs: 158178-003, -004

Laboratory: GEL SDG #: 158178

Methods: EPA8082 (PCB)

# of Samples: 2 Matrix: soil Batch #s: 513003

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
met criteria					

Comments:

Confirmation

Sample	CAS #	RPD > 25%	Sample	CAS #	RPD > 25%
Not Required					
			Results NDs		

Reviewed By: Kurin A Lambert Date: 05-02-06

Field Samples

High Explosives (SW 846 Method 8330)

Site/Project: DSS NFA AR/COC #: 609568 Laboratory Sample IDs: 158178-003, -004

Laboratory: GEL SDG #: 158178

Methods: EPA 8330 (HE)

# of Samples: 2 Matrix: soil Batch #s: 512166

CAS #	NAME	√	Intercept	Curve R^2 .99	CCV %D 20%	Method Blanks U	LCS	LCSD	LCS RPD 20%	MS	MSD	MS RPD 20%	Field Dup. RPD	Equip. Blanks U	Field Blanks U		
2691-41-0	HMX	✓	✓	✓	✓	✓	✓			✓	✓	✓					
121-82-4	RDX	✓															
99-35-4	1,3,5-Trinitrobenzene	✓															
99-65-0	1,3-dinitrobenzene	✓															
98-95-3	Nitrobenzene	✓															
479-45-8	Tetryl	✓															
118-96-7	2,4,6-trinitrotoluene	✓															
35572-78-2	2-amino-4,6-dinitrotoluene	✓															
19406-51-0	4-amino-2,6-dinitrotoluene	✓															
121-14-2	2,4-dinitrotoluene	✓															
606-20-2	2,6-dinitrotoluene	✓															
88-72-2	2-nitrotoluene	✓															
99-99-0	4-nitrotoluene	✓															
99-08-1	3-nitrotoluene	✓	✓	✓	✓	✓	✓			✓	✓	✓					
78-11-5	PETN																

Sample	SMC %REC	SMC RT	Sample	SMC %REC	SMC RT
met	criteria				

Comments:

Confirmation

Sample	CAS #	RPD > 25%	Sample	CAS #	RPD > 25%
	Not	Required			
				Results	NDs

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

Reviewed By: Kevin A Lambert Date: 05-02-06

Field Samples

Semivolatile Organics (SW 846 Method 8270)

Site/Project: DSS NFA AR/COC #: 609568 Laboratory Sample IDs: 158178-003, -004

Laboratory: GEL SDG #: 158178

Methods: EPA8270C (SVOC)

# of Samples: 2 Matrix: soil Batch #s: 513706

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	✓	✓	✓	✓	✓			✓	✓	✓					
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		✓	✓													
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		✓	✓													
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		✓	✓	-23												
3	A	88-06-2	2,4,6-Trichlorophenol	✓	0.20		✓	✓	✓												
3	A	95-95-4	2,4,5-Trichlorophenol	✓	0.20	✓	✓	✓	✓	✓	✓			✓	✓	✓					

Comments:

Notes: Shaded rows are RCRA compounds.

Reviewed By: Kevin A Lambert Date: 05-02-06

Semivolatile Organics

Site/Project: ______ AR/COC #: 609568 Batch #s: ______

Laboratory: ______ SDG #: 158178 # of Samples: ______ Matrix: ______

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		
3	BN	91-58-7	2-Chloronaphthalene	✓	0.80	NA	✓	✓	✓	✓	✓			✓	✓	✓					
3	BN	88-74-4	2-Nitroaniline	✓	0.01	✓	✓	✓	28												
3	BN	131-11-3	Dimethylphthalate	✓	0.01	NA	✓	✓	✓												
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	NA	✓	✓													
3	A	51-28-5	2,4-Dinitrophenol	✓	0.01	✓	✓	✓													
3	A	100-02-7	4-Nitrophenol	✓	0.01	NA	✓	✓													
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	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		✓	✓													
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		✓	✓													
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: ____________ AR/COC #: 609568 Batch #s: ____________

Laboratory: ____________ SDG #: 158178 # of Samples: ____________ Matrix: ____________

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		
5	BN	218-01-9	Chrysene	✓	0.70	NA	✓	✓	✓	✓	✓			✓	✓	✓					
5	BN	117-81-7	bis(2-Ethylhexyl)phthalate	✓	0.01	✓	✓	✓	26		✓										
6	BN	117-84-0	Di-n-octylphthalate	✓	0.01	NA	✓	✓	✓		132	(127)									
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
met criteria								

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
158178-003	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	<50%	✓

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)

Field Samples

Volatile Organics (SW 846 Method 8260)

Site/Project: DSS NFA AR/COC #: 609568 # of Samples: 2 Matrix: soil

Laboratory: GEL SDG #: 158178 Laboratory Sample IDs: 158178-001,-002

Methods: EPA8260A(VOC) Batch #s: 513548

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	156-59-2	cis-1,2-dichloroethene	✓	0.01		✓	✓													
1	78-87-5	1,2-dichloropropane	✓	0.01		✓	✓													
1	78-93-3	2-butanone (MEK) (10xblk)	✓	0.01		✓	✓													
1	156-60-5	trans-1,2-dichloroethene	✓			✓	✓													
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		✓	✓	21												
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	✓	✓	✓											✓	KAL	
1	75-09-2	methylene chloride (10xblk)	✓	0.01	✓	✓	✓											~~4.54J~~	5.0U,B	
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		0.24	✓													
1	75-01-4	vinyl chloride	✓	0.10		✓	✓													
2	1330-20-7	xylenes(total)	✓	0.30		✓	✓													
	108-05-4	vinyl acetate	✓			✓	✓													

Comments: QC run on sample from another SNL SDG

Notes: Shaded rows are RCRA compounds.

Reviewed By: Kevin A. Lambert Date: 05-02-06

Volatile Organics

Site/Project: ______________ AR/COC #: 609568 Batch #s: ______________

Laboratory: ______________ SDG #: 158178 # 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
	met				met				
	criteria				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:

Field QC

Volatile Organics (SW 846 Method 8260)

Site/Project: DSS NFA AR/COC #: 609568 # of Samples: 1 Matrix: aqueous

Laboratory: GEL SDG #: 158179 Laboratory Sample IDs: 158179-001

Methods: EPA 8260B (VOC) Batch #s: 514321

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	10X Blk	
						>.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		✓	✓													
1	107-06-2	1,2-dichloroethane	✓	0.10		✓	✓													
1	156-59-2	cis-1,2-dichloroethene	✓	0.01		✓	✓													
1	78-87-5	1,2-dichloropropane	✓	0.01		✓	✓													
1	78-93-3	2-butanone (MEK) (10xblk)	✓	0.01		✓	✓													
1	156-60-5	trans-1,2-dichloroethene	✓			✓	✓													
2	591-78-6	2-hexanone (MBK)	✓	0.01		✓	✓	22					No							
2	108-10-1	4-methyl-2-pentanone (MIBK)	✓	0.10		✓	✓	✓												
1	67-64-1	acetone(10xblk)	✓	0.01		✓	✓	37					MS/MSD							
1	71-43-2	benzene	✓	0.50		✓	✓	✓												
1	75-27-4	bromodichloromethane	✓	0.20		✓	✓	✓												
3	75-25-2	bromoform	✓	0.10		✓	✓	26												
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		✓	✓	25												
2	124-48-1	dibromochloromethane	✓	0.10		✓	✓	✓												
2	100-41-4	ethylbenzene	✓	0.10		✓	✓	✓												
1	75-09-2	methylene chloride (10xblk)	✓	0.01		✓	✓	✓	3.10J										31.0	
2	100-42-5	styrene	✓	0.30		✓	✓	21	✓											
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		✓	✓	21												
1	79-01-6	trichloroethene	✓	0.30		0.27	✓	✓												
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: Kevin A. Lambert Date: 05-02-06

Volatile Organics

Site/Project: ____________ AR/COC #: 609568 Batch #s: ____________

Laboratory: ____________ SDG #: 158179 # 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
	met				met				
	criteria				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:

Contract Verification Review (Continued)

3.0 Data Quality Evaluation

Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
3.1 Are reporting units appropriate for the matrix and meet contract specified or project-specific requirements? Inorganics and metals reported as ppm (mg/liter or mg/Kg)? Tritium reported in picocuries per liter with percent moisture for soil samples? Units consistent between QC samples and sample data			
3.2 Quantitation limit met for all samples			
3.3 Accuracy a) Laboratory control samples accuracy reported and met for all samples			SVOC LCS recovery failed for Di-n-octylphthalate; Metals LCS recovery failed for Silver
b) Surrogate data reported and met for all organic samples analyzed by a gas chromatography technique			
c) Matrix spike recovery data reported and met			Metals MS recovery failed for Chromium, Selenium
3.4 Precision a) Replicate sample precision reported and met for all inorganic and radiochemistry samples			DUP RPD failed for Barium, Chromium, Lead
b) Matrix spike duplicate RPD data reported and met for all organic samples			
3.5 Blank data a) Method or reagent blank data reported and met for all samples			Methylene Chloride detected in VOC Method Blank (075632-001/158179001)
b) Sampling blank (e.g., field, trip, and equipment) data reported and met			Methylene Chloride detected in TB (075632-001/158179001)
3.6 Contractual qualifiers provided: "J"- estimated quantity; "B"-analyte found in method blank above the MDL for organic or above the PQL for inorganic; "U"- analyte undetected (results are below the MDL, IDL, or MDA (radiochemical)); "H"-analysis done beyond the holding time			
3.7 Narrative addresses planchet flaming for gross alpha/beta			
3.8 Narrative included, correct, and complete			
3.9 Second column confirmation data provided for methods 8330 (high explosives) and 8082 (pesticides/PCBs)	X		

Contract Verification Review (Concluded)

5.0 Problem Resolution

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

Sample/Fraction No.	Analysis	Problems/Comments/Resolutions

Were deficiencies unresolved? Yes No

Based on the review, this data package is complete. Yes No

If no, provide: nonconformance report or correction request number ________ and date correction request was submitted________

Reviewed by: [signature] Date: 04/17/06 Closed by:________ Date:________

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No.

SMO Use

AR/COC 609568

Dept. No./Mail Stop:	6146/1089	Date Samples Shipped:	3-14-06	Project/Task No.: 98043.02.02.01	☐ Waste Characterization -Send preliminary/copy report to:
Project/Task Manager:	~~Mike Sanders~~ Lanskopf, B	Carrier/Waybill No.	616991	SMO Authorization:	
Project Name:	DSS-NFA ✓	Lab Contact:	Edie Kent 803/556-8171	Contract #: PO 21671	
Record Center Code:	NA	Lab Destination:	Gel		☐ Released by COC No.:
Logbook Ref. No.:		SMO Contact/Phone:	Pam Pulssant/505-284-3124		☑ Validation Required
Service Order No	CF023-06 ✓	Send Report to SMO:	Wendy Palencia(505)844-3132		Bill To: Sandia National Labs (Accounts Payable)
Location	Tech Area				P.O. Box 5800 MS 0154
Building	Room	**Reference LOV(available at SMO)**	158178		Albuquerque, NM 87185-0154

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Pump Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
✓ 075628-001 ✓	885/1101-SP1-BH2-25-S	25	1101	031306/1200	S	AC	125 ml	4C	G	SA	VOCs (8260B)	001
075628-018 ✓	885/1101-SP1-BH2-~~30~~ 25-S	~~30~~ 25	1101	031306/1201	S	AG	500 ml	4C	G	SA	Analysis fraction " 018 "	003
✓ 075629-001 ✓	885/1101-SP1-BH2-~~25~~ 30-S	~~25~~ 30	1101	031306/1401	S	AC	125 ml	4C	G	SA	VOCs (8260B)	002
075629-018 ✓	885/1101-SP1-BH2-30-S	30	1101	031306/1402	S	G	500 ml	4C	G	SA	Analysis fraction " 018 "	004
075632-001 ✓	885/1101-TB 2	NA	1101	031306/1200	DIW	G	3x40ml	HCL	G	TB	VOCs (8260B)	158179-001

RMMA ☐ Yes ☑ No Ref. No.

Sample Disposal ☐ Return to Client ☑ Disposal by lab

Turnaround Time ☐ 7 Day ☐ 15 Day ☑ 30 Day

Return Samples By: ☐ Negotiated TAT

Sample Tracking Smo Use
Date Entered(mm/dd/yy) 03/16/06
Entered by: RK
QC inits. VH

Special Instructions/QC Requirements
EDD ☑ Yes ☐ No
Level D Package ☑ Yes ☐ No
*Send report to:
Mike Sanders, Dept6146/MS 1089,505-284-2478

" 018 " = SVOCs(8270C),HE(8330),Cyanide (9010), Cr6+(7197), RCRA metals(6020/7000),PCBs(8082) Gross Alpha/Beta(900)

Please list as separate report.

Abnormal Conditions on Receipt

Lab Use

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	William Gibson	William Gibson	WG	Weston/6146/284-5232/239-7367
	Gilbert Quintana	Gilbert Quintana	GQ	Shaw/6146/284-3309/850-8524
	Robert Lynch	Robert Lynch	RL	Weston/6146/250-7090

1.Relinquished by William Gibson	Org. 6146	Date 3/14/06	Time 0900	4.Relinquished by	Org.	Date	Time
1. Received by	Org. 6146	Date 3/14/06	Time 0900	4. Received by	Org.	Date	Time
2.Relinquished by	Org. 6146	Date 3/14/06	Time 1200	5.Relinquished by	Org.	Date	Time
2. Received by	Org.	Date	Time	5. Received by	Org.	Date	Time
3.Relinquished by	Org.	Date	Time	6.Relinquished by	Org.	Date	Time
3. Received by	Org.	Date	Time	6. Received by	Org.	Date	Time

RECORDS CENTER CODE: ______

SMO ANALYTICAL DATA ROUTING FORM

PROJECT NAME: DSS-NFA

SNL TASK LEADER: LANGKOPF

SMO PROJECT LEAD:

PROJECT/TASK: 98043_02.02.01

ORG/MS/CF0#: 6146/1089/CFO#023-06

SAMPLE SHIP DATE: 3/14/2006

ARCOC	LAB	LAB ID	PRELIM DATE	FINAL DATE	EDD	EDD ON Q	Cust CD	RC CD
609568	GEL	158178		4/14/2006	X	X	N/A	X

DATA PACKAGE TAT:		RUSH	X NORMAL
CORRECTIONS REQUESTED BY/DATE:			
PROBLEM #/DATE CORRECTION RECEIVED:			
CVR COMPLETED BY/DATE:		L. Herrera	04-17-06
FINAL TRANSMITTED TO/DATE:		M. Sanders	04-17-06
SENT TO VALIDATION BY/DATE:		R. Kavanaugh	04-27-06
REVISIONS REQUESTED/REVISIONS RECEIVED (DATE):			
VALIDATION COMPLETED BY/DATE:		KAL	05-02-06
COPY TO WM BY/DATE:			
CD REQUESTED BY/DATE			
CD RECEIVED BY/DATE		R. Kavanaugh	4/14/2006
TO ERDMS OR RECORDS CENTER BY/DATE:			

COMMENTS:

Pair with the reanalysis
SDG 160485
– for metals –

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

Memorandum

Date: April 28, 2006

To: File

From: Kevin Lambert

Subject: Inorganic Data Review and Validation – SNL
Site: DSS NFA
AR/COC: 609568 (RCRA metals reanalysis)
SDG: 160485
Laboratory: GEL
Project/Task: 98043.02.02.01

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM SMO AOP 00-03 Rev 1 and DOE-AL Model Data Validation Procedure Rev. 3.

Summary

The samples were prepared and analyzed with accepted procedures using methods EPA6010B (ICP metals), EPA6020 (ICP-MS metals), and EPA7470A (CVAA mercury). It should be noted that the samples in this SDG were relogs for RCRA metals due to homogeneity issues with the original analytical results. The samples were crushed and homogenized prior to reanalysis in accordance with client request. Problems were identified with the data package that result in the qualification of data.

1. ICP-MS metals:
   The MSD recovery for cadmium (131%) was > the upper QC acceptance limit (125%). The associated sample results were detects and will be qualified "J, A2."

   The replicate RPD for barium (99%) was outside of QC acceptance criteria (35%). The associated sample results were detects and will be qualified "J, P1."

2. CVAA mercury:
   The samples were analyzed outside the holding time but were within 2x the method-specified holding time (see Data Validation Worksheets). The associated sample result were detects and will be qualified "J, HT." Also, mercury was detected ($\geq$ DL) in one or more of the blanks (ICB, CCB, MB). The associated sample results were detects and will be qualified "J, B." However, it should be noted that the associated sample results have already been qualified due to a holding time infraction; no further qualification is necessary. The descriptive flag "B" will be included to indicate MB contamination.

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 except as noted above in the summary section.

Calibration

The initial and continuing calibration data met QC acceptance criteria.

Blanks

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

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

The LCS/LCSD met QC acceptance criteria except as follows.

All analyses:
It should be noted that no LCSD was provided with the SDG. Laboratory precision was assessed using the replicate, which met QC acceptance criteria. No data will be qualified as a result.

Matrix Spike (MS)

The MS met QC acceptance criteria except as noted above in the summary section and as follows.

All analyses:
An MS/MSD was run and used for target analytes with sample concentrations < 2 to 3x the spike concentrations (see Data Validation Worksheets). No data will be qualified as a result.

ICP-MS metals:
It should be noted that the MS recovery limits do not apply for target analytes with sample concentrations > 4x the spike concentrations (see Data Validation Worksheets). No data will be qualified as a result.

CVAA mercury:
It should be noted the MS was run on a sample of similar matrix from another SNL SDG and met QC acceptance criteria. No data will be qualified as a result.

Replicate

The replicate met QC acceptance criteria except as noted above in the summary section and as follows.

All analyses:
An MS/MSD was run and used to assess precision instead of the replicate for target analytes with sample concentrations < 2 to 3x the spike concentrations (see Data Validation Worksheets). No data will be qualified as a result.

CVAA mercury:
It should be noted the replicate was run on a sample of similar matrix from another SNL SDG and met QC acceptance criteria. No data will be qualified as a result.

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 except as follows.

ICP-MS metals:
The samples were diluted the standard 2x for this analysis.

Other QC

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

No other specific issues were identified which affect data quality.

Site: DSS NFA **AR/COC:** 609568 (Reanalysis) **Data Type:** Inorganic

	ICP-MS metals	7440-39-3 (Barium)	7440-43-9 (Cadmium)	CVAA Hg	7439-97-6 (Mercury)
075628-R18 885/1101-SP1-BH2-25-S		J,P1	J,A2		J,HT,B
075629-R18 885/1101-SP1-BH2-30-S		J,P1	J,A2		J,HT,B

Validated By: Kevin A Lambert

Date: 04/28/06

Data Validation Summary

Site/Project: DSS NFA Project/Task #: 98043.02.02.01 # of Samples: 2 Matrix: soil

AR/COC #: 609568 (RCRA metals, ReAnalysis) Laboratory Sample IDs: 160485-001, -002

Laboratory: GEL

SDG #: 160485

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

J = Estimated R = Unusable NP = Not Provided

U = Not Detected Check (√) = Acceptable Other: ________

UJ = Not Detected, Estimated Shaded Cells = Not Applicable (also "NA")

Reviewed By: Kevin A Lambert Date: 04-28-06

Holding Time and Preservation

Site/Project: DSS NFA AR/COC #: 609568 Laboratory Sample IDs: 160485-001, -002

Laboratory: GEL SDG #: 160485

# of Samples: 2 Matrix: soil

Sample ID	Analytical Method	Holding Time Criteria	Days Holding Time was Exceeded	Preservation Criteria	Preservation Deficiency	Comments
160485-001	EPA7471A (CVAA Hg)	28 days	9 days	—	—	Samples were analyzed after HT expired but within 2× method-specified HT; results were detects and will be qualified "J, HT"
↓ -002	↓	↓	↓	—	—	

Reviewed By: Kevin A Lambert Date: 04-28-06

Inorganic Metals

Site/Project: DSS NFA AR/COC #: 609568 Laboratory Sample IDs: 160485-001, -002

Laboratory: GEL SDG #: 160485

Methods: EPA6010B(ICP), EPA6020(ICP-MS), EPA7471A(CVAA Hg)

# of Samples: 2 Matrix: soil Batch #s: 520908, 520844, 520871

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	5x ~~Field~~ Blanks KAL		
7429-90-5 Al																				
7440-39-3 Ba	✓	✓	✓	✓	✓	✓	✓			N/A	NA	NA	99 (35)	✓	✓					
7440-41-7 Be																				
7440-43-9 Cd	✓	✓	✓	✓	✓	✓	✓			✓	131(125)	✓	NA	✓	✓					
7440-70-2 Ca																				
7440-47-3 Cr	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	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																				
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	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	NA	✓	✓					
7782-49-2 Se	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	NA	✓	✓					
7440-38-2 As	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	NA	✓	✓					
7440-36-0 Sb																				
7440-28-0 Tl																				
7439-97-6 Hg	✓	✓	✓	✓	✓	0.00654 J	✓			✓	✓	✓	NA	NA	NA			0.0317		
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: QC for CVAA Hg was run on sample from another SNL SDG.
* replicate used if target analyte > 2-3x spike [c]
N/A - The MS %R limits don't apply; sample [c] > 4x spike [c]

Reviewed By: Kevin A Lambert Date: 04-28-06

Contract Verification Review (CVR)

Project Leader Langkopf

Project Name DSS NFA

Case No. 98043_02.02.01

AR/COC No. 609568 (RCRA Met re-analysis)

Analytical Lab GEL

SDG No. 160485

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

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

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

2.0 Analytical Laboratory Report

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

Contract Verification Review (Continued)

3.0 Data Quality Evaluation

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

ARCOC: 609568

Contract Verification Review (Concluded)

5.0 Problem Resolution

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

Sample/Fraction No.	Analysis	Problems/Comments/Resolutions
Fractional Narrative	Metals	Mercury analyzed out of holding time and not indicated in Holding Time Specifications (page 29)

Were deficiencies unresolved? Yes No

Based on the review, this data package is complete. Yes No

If no, provide: nonconformance report or correction request number 11667 and date correction request was submitted 04/27/06

Reviewed by: [signature] Date: 04/26/06 Closed by: ______ Date: ______

SDG 160485
Reanalysis Only
RCRA metals

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. N/A

SMO Use

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AR/COC 609568

Dept. No./Mail Stop:	6146/1089	Date Samples Shipped:	3-14-06	Project/Task No.: 98043.02.02.01	Waste Characterization -Send preliminary/copy report to:
Project/Task Manager:	Mike Sanders	Carrier/Waybill No.:	61699	SMO Authorization: [signature] SMO	
Project Name:	DSS-NFA	Lab Contact:	Edie Kent 803/556-8171	Contract #: PO 21671	
Record Center Code:	NA	Lab Destination:	Gel		Released by COC No.:
Logbook Ref. No.:		SMO Contact/Phone:	Pam Puissant/505-284-3124		☑ Validation Required
Service Order No.	CF023-06	Send Report to SMO:	Wendy Palencia(505)844-3132	160485	Bill To: Sandia National Labs (Accounts Payable) P.O. Box 5800 MS 0154
Location	Tech Area				
Building	Room	Reference LOV(available at SMO)	~~158178~~		Albuquerque, NM 87185-0154

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Pump Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
075628-001	885/1101-SP1-BH2-25-S	25	1101	031306/1200	S	AC	125 ml	4C	G	SA	VOCs (8260B)	01
075628-018	885/1101-SP1-BH2-~~30~~ 25-S	~~30~~ 25	1101	031306/1201	S	AG	500 ml	4C	G	SA	Analysis fraction " 018 "	03 .2-001
075629-001	885/1101-SP1-BH2-~~25~~ 30-S	~~25~~ 30	1101	031306/1401	S	AC	125 ml	4C	G	SA	VOCs (8260B)	02
075629-018	885/1101-SP1-BH2-30-S	30	1101	031306/1402	S	G	500 ml	4C	G	SA	Analysis fraction " 018 "	04 .2-002
075632-001	885/1101-TB 2	NA	1101	031306/1200	DIW	G	3x40ml	HCL	G	TB	VOCs (8260B) field QC	158179-001

RMMA ☐ Yes ☑ No Ref. No.

Sample Disposal ☐ Return to Client ☑ Disposal by lab

Turnaround Time ☐ 7 Day ☐ 15 Day ☑ 30 Day

Return Samples By: ☐ Negotiated TAT

Sample Tracking — SMO Use
Date Entered(mm/dd/yy):
Entered by:
QC inits.

Special Instructions/QC Requirements
EDD ☑ Yes ☐ No
Level D Package ☑ Yes ☐ No
*Send report to:
Mike Sanders, Dept6146/MS 1089,505-284-2478

" 018 " = SVOCs(8270C),HE(8330),Cyanide (9010), Cr6+(7197), RCRA metals(6020/7000),PCBs(8082) Gross Alpha/Beta(900)
*Please list as separate report.

Abnormal Conditions on Receipt

Lab Use

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	William Gibson	[signature]	WG	Weston/6146/284-5232/239-7367
	Gilbert Quintana	[signature]	GQ	Shaw/6146/284-3309/850-8524
	Robert Lynch	[signature]	RL	Weston/6146/250-7090

1.Relinquished by [signature]	Org. 6146	Date 3/14/06	Time 0900	4.Relinquished by	Org.	Date	Time
1. Received by [signature]	Org. 6146	Date 3/14/06	Time 0900	4. Received by	Org.	Date	Time
2.Relinquished by [signature] SMO	Org. 6146	Date 3/14/06	Time 1200	5.Relinquished by	Org.	Date	Time
2. Received by [signature]	Org. GEL	Date 3-15-06	Time 9:45	5. Received by	Org.	Date	Time
3.Relinquished by	Org.	Date	Time	6.Relinquished by	Org.	Date	Time
3. Received by	Org.	Date	Time	6. Received by	Org.	Date	Time

RECORDS CENTER CODE: ____________________

SMO ANALYTICAL DATA ROUTING FORM

PROJECT NAME: DSS-NFA　　PROJECT/TASK: 98043_02.02.01

SNL TASK LEADER: LANGKOPF　　ORG/MS/CF0#: 6146/1089/CFO#023-06

SMO PROJECT LEAD: ____________　　SAMPLE SHIP DATE: 3/14/2006

ARCOC	LAB	LAB ID	PRELIM DATE	FINAL DATE	EDD	EDD ON Q	Cust CD	RC CD
609568	GEL	160485	4/19/2006	4/26/2006	X	X	N/A	X

DATA PACKAGE TAT:		RUSH	X	NORMAL
CORRECTIONS REQUESTED BY/DATE:		L. Herrera		04-27-06
PROBLEM #/DATE CORRECTION RECEIVED:		11667		
CVR COMPLETED BY/DATE:		L. Herrera		04-26-06
FINAL TRANSMITTED TO/DATE:		M. Sanders		04-26-06
SENT TO VALIDATION BY/DATE:		R. Kavanaugh		04-27-06
REVISIONS REQUESTED/REVISIONS RECEIVED (DATE):				
VALIDATION COMPLETED BY/DATE:		KAC		04-28-06
COPY TO WM BY/DATE:				
CD REQUESTED BY/DATE				
CD RECEIVED BY/DATE		R. Kavanaugh		4/26/2006
TO ERDMS OR RECORDS CENTER BY/DATE:				

COMMENTS: REANALYSIS FOR RCRA METALS

Rush