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Asphalt Monitoring and Removal Report for Area of Concern C-00-041, Guaje/Barrancas/Rendija Canyons Aggregate

Los Alamos
NATIONAL LABORATORY
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Prepared by the Environmental Programs Directorate

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EXECUTIVE SUMMARY

Area of Concern C-00-041 is the site of a former asphalt batch plant located in the Rendija Watershed within the Guaje/Barrancas/Rendija Canyons Aggregate Area at Technical Area 00. Asphalt was released during plant operations from the late 1940s to 1958 and could be found exposed in the ephemeral stream downgradient of the plant location. The plant was removed and the land transferred in 1969 to the U.S. Forest Service. Sampling was completed in 2007, and visible asphalt and tar were removed from the surface of the site. Because of the potential for continued exposure of additional asphalt or tar by erosion during storms or other runoff events, biennial surveys are conducted for exposed asphalt and tar within the main drainage channel. The first biennial survey was conducted in October 2009.

The activities included visual inspections of the entire site and removal and dispositioning of visible asphalt or tar. The inspections consisted of dividing the AOC into small, manageable areas, performing numerous walkovers within the areas to identify any asphalt or tar and disposal of the waste. Inspections focused on the main drainage channel at the site, but the entire site was inspected.

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Acronyms and Abbreviations

AOC	area of concern
asl	above sea level
bgs	below ground surface
DOE	Department of Energy (U.S.)
ER ID	Environmental Restoration Project identification number

GSA	General Services Administration
IDW	investigation-derived waste
LANL	Los Alamos National Laboratory
NMED	New Mexico Environment Department
RPF	Records Processing Facility
SOP	standard operating procedure
SWMU	solid waste management unit
TA	technical area
USFS	U.S. Forest Service
WCSF	waste characterization strategy form

1.0 INTRODUCTION

Los Alamos National Laboratory (LANL or the Laboratory) is a multidisciplinary research facility owned by the U.S. Department of Energy (DOE) and managed by Los Alamos National Security, LLC. The Laboratory is located in north-central New Mexico approximately 60 mi northeast of Albuquerque and 20 mi northwest of Santa Fe. The Laboratory site covers 40 mi^2 of the Pajarito Plateau, which consists of a series of finger-like mesas separated by deep canyons containing perennial and intermittent streams running from west to east. Mesa tops range in elevation from approximately 6200 to 7800 ft above sea level (asl).

The site addressed in this report, Area of Concern (AOC) C-00-041, may be contaminated with hazardous constituents. The New Mexico Environment Department (NMED), pursuant to the New Mexico Hazardous Waste Act, regulates cleanup of hazardous wastes and hazardous constituents. Corrective actions at the Laboratory are subject to the March 1, 2005, Compliance Order on Consent (the Consent Order). This report describes the work activities executed and completed in accordance with the Consent Order.

1.1 General Site Information

The Guaje/Barrancas/Rendija Canyons Aggregate Area consists of solid waste management units (SWMUs) and AOCs that were formerly part of Operable Unit 1071 within Technical Area 00 (TA-00). The Laboratory began operations at TA-00 in 1943 and had largely ceased using this area by 1986. Figure 1.1-1 shows the Guaje/Barrancas/Rendija Canyons Aggregate Area SWMUs and AOCs with respect to the Laboratory boundary and surrounding land holdings. AOC C-00-041, the site of a former asphalt batch plant located in the Rendija Watershed, is shown in Figure 1.1-2.

1.2 Report Objectives

In 2007, characterization sampling and hand removal of surface asphalt were conducted at AOC C-00-041, and the nature and extent of contamination have been defined (LANL 2007, 098670). However, additional asphalt and tar may be unearthed by erosion during storms or other runoff events (e.g., snowmelt) within the active channel at AOC C-00-041. The objective of the report is to implement the requirements of the NMED-approved asphalt monitoring and removal plan (LANL 2008, 102726; NMED 2008, 102289) and to provide the results of the biennial monitoring and removal activities at AOC C-00-041.

2.0 SITE DESCRIPTION AND OPERATIONAL HISTORY

AOC C-00-041 is approximately 50 ft wide × 600 ft long and is located in a portion of a side slope and ephemeral stream drainage channel that flows into Rendija Canyon on U.S. Forest Service (USFS) land. Aerial photographs indicate the asphalt plant operated from the late 1940s to 1958 (LANL 1996, 054925, p. 1). In 1969, after the plant had been removed, the land was transferred from the Atomic Energy Commission to USFS to manage as public land (LANL 1996, 054925, p. 1).

Figure 2.0-1 is a site map of AOC C-00-041. Currently, the site is undeveloped and is located in a grassy open meadow that is bisected south to north by an ephemeral stream. A hiking trail, Rendija Trail, is located to the east of AOC C-00-041, and the Guaje Pines Cemetery is located to the west.

3.0 SITE CONDITIONS

3.1 Surface Conditions

Rendija Canyon is located immediately north of the Los Alamos townsite and has a drainage area of 9.5 mi^2. The canyon heads on the flanks of the Sierra de los Valles just west of the townsite at an elevation of 9826 ft asl. The channel extends approximately 9 mi east to its confluence with Guaje Canyon. The lowest elevation of the watershed is approximately 6300 ft asl (LANL 1997, 055622, p. 3-2). Rendija Canyon crosses USFS and General Services Administration (GSA) lands. Four tributaries are present in the Rendija Canyon Watershed. Rendija Canyon and its tributaries contain ephemeral streams, arising from stormwater runoff and snowmelt. The watershed drains portions of Los Alamos townsite, GSA land, and USFS land. As the surface water flows downstream, it infiltrates the alluvium and the underlying formations or is lost to evapotranspiration. Stormwater data for the drainage at AOC C-00-041 are provided in Appendix B.

3.2 Subsurface Conditions

The stratigraphy in the Guaje/Barrancas/Rendija Canyons Aggregate Area consists of the Quaternary Cerro Toledo interval and the Tshirege Member of the Bandelier Tuff overlain by a thin layer of alluvium and soil. Sampling at the site did not exceed 3.0 ft below ground surface (bgs), and the only stratigraphic unit encountered at the site was surface soil. Saturated conditions were not encountered at the site and no subsurface structures are known to exist at the site.

4.0 SCOPE OF ACTIVITIES

All activities took place on USFS land, with access through Los Alamos County land. All the work was subject to approval by the applicable land owner(s) through access agreements and/or special-use permits.

4.1 Site Inspection

AOC C-00-041 was inspected in October 2009, per NMED's approval with direction of the of the revised investigation report (LANL 2007, 099954; NMED 2007, 099632), for remnants of tar and asphalt exposed at the surface by runoff or erosion. The inspection was performed by traversing the site on foot and visually inspecting the ground surface. The site was divided into smaller areas, and multiple sweeps (or sweeps by multiple people) were performed in each area to ensure all newly exposed asphalt was identified.

4.2 Asphalt Collection

In October 2009, exposed asphalt fragments were found and removed during the site inspection. Asphalt was removed only if it was visible at the surface and involved no excavation or significant soil disturbance. Asphalt pieces were collected in buckets and transferred to 55-gal. drums. A total of seven drums were filled with the removed asphalt and tar from the site during this monitoring effort.
Figures 4.2-1 through 4.2-5 are premonitoring and postmonitoring photographs of the site. The asphalt was recycled at the Los Alamos County Eco-Station. Management of waste is discussed in Appendix A.

5.0 REFERENCES AND MAP DATA SOURCES

5.1 References

The following list includes all documents cited in this report. Parenthetical information following each reference provides the author(s), publication date, and ER ID. This information is also included in text citations. ER IDs are assigned by the Environmental Programs Directorate's Records Processing Facility (RPF) and are used to locate the document at the RPF and, where applicable, in the master reference set.

Copies of the master reference set are maintained at the NMED Hazardous Waste Bureau and the Directorate. The set was developed to ensure that the administrative authority has all material needed to review this document, and it is updated with every document submitted to the administrative authority. Documents previously submitted to the administrative authority are not included.

LANL (Los Alamos National Laboratory), March 1996. "Voluntary Corrective Action Completion Report for Potential Release Site C-0-041, Former Asphalt Batch Plant Site," Los Alamos National Laboratory document LA-UR-96-434, Los Alamos, New Mexico. (LANL 1996, 054925)

LANL (Los Alamos National Laboratory), April 1997. "Core Document for Canyons Investigations," Los Alamos National Laboratory document LA-UR-96-2083, Los Alamos, New Mexico. (LANL 1997, 055622)

LANL (Los Alamos National Laboratory), August 2007. "Investigation Report for Guaje/Barrancas/Rendija Canyons Aggregate Area at Technical Area 00," Los Alamos National Laboratory document LA-UR-07-5326, Los Alamos, New Mexico. (LANL 2007, 098670)

LANL (Los Alamos National Laboratory), November 2007. "Investigation Report for Guaje/Barrancas/Rendija Canyons Aggregate Area at Technical Area 00, Revision 1," Los Alamos National Laboratory document LA-UR-07-7820, Los Alamos, New Mexico. (LANL 2007, 099954)

LANL (Los Alamos National Laboratory), April 2008. "Asphalt Monitoring and Removal Plan for Area of Concern C-00-041, Guaje/Barrancas/Rendija Canyons Aggregate," Los Alamos National Laboratory document LA-UR-08-2666, Los Alamos, New Mexico. (LANL 2008, 102726)

NMED (New Mexico Environment Department), December 20, 2007. "Approval with Direction, Investigation Report for Guaje/Barrancas/Rendija Canyons, Revision 1," New Mexico Environment Department letter to D. Gregory (DOE-LASO) and D. McInroy (LANL) from J.P. Bearzi (NMED-HWB), Santa Fe, New Mexico. (NMED 2007, 099632)

NMED (New Mexico Environment Department), July 2, 2008. "Notice of Approval, Asphalt Monitoring and Removal Plan for Area of Concern C-00-041, Guaje/Barrancas/Rendija Canyons Aggregate," New Mexico Environment Department letter to D. Gregory (DOE-LASO) and D. McInroy (LANL) from J.P. Bearzi (NMED-HWB), Santa Fe, New Mexico. (NMED 2008, 102289)

5.2 Map Data Sources

Drainage. Modeled Surface Drainage, 1991; Los Alamos National Laboratory, ENV Environmental Remediation and Surveillance Program, ER2002-0591; 1:24,000 Scale Data; Unknown publication date. NHD Route Drainage; National Hydrography Dataset Program, United States Geological Survey; Quadrangle 13020101; 08 October 2004.

Hypsography. Los Alamos National Laboratory, ENV Environmental Remediation and Surveillance Program; 1991.

Los Alamos National Laboratory Boundaries. LANL Areas Used and Occupied; Los Alamos National Laboratory, Site Planning & Project Initiation Group, Infrastructure Planning Division; 19 September 2007. Technical Area Boundaries; Los Alamos National Laboratory, Site Planning & Project Initiation Group, Infrastructure Planning Division; 19 September 2007.

Point Feature Locations of the Environmental Restoration Project Database. Los Alamos National Laboratory, Waste and Environmental Services Division, EP2008-0189; 11 April 2008.

Potential Release Sites. Los Alamos National Laboratory, Waste and Environmental Services Division, Geotechnical Services Group, EP2008-0095; 1:2,500 Scale Data; 04 April 2008.

Roads and Trails. Forest Roads; County of Los Alamos, Information Services; as published 16 May 2006. Los Alamos County Land Parcels; County of Los Alamos, Information Services, as published 17 January 2008. Road Centerlines for the County of Los Alamos; County of Los Alamos, Information Services; as published 03 December 2007. Streets; County of Los Alamos, Information Services; as published 16 May 2006. Trails; County of Los Alamos, Information Services; as published 16 May 2006.

Structures. Approximate Location of Former Batch Plant; Investigation Work Plan for Guaje/Barrancas/Rendija Canyons Aggregate Area at Technical Area 00; Los Alamos National Laboratory Report LA-UR-05-3869; Figure 2.1-14 AOC C-00-041 site map; Map m201440; July 2005. Structures; County of Los Alamos, Information Services; as published 29 October 2007.

Watersheds. Los Alamos National Laboratory, ENV Environmental Remediation and Surveillance Program; EP2006-0942; 1:2,500 Scale Data; 27 October 2006.

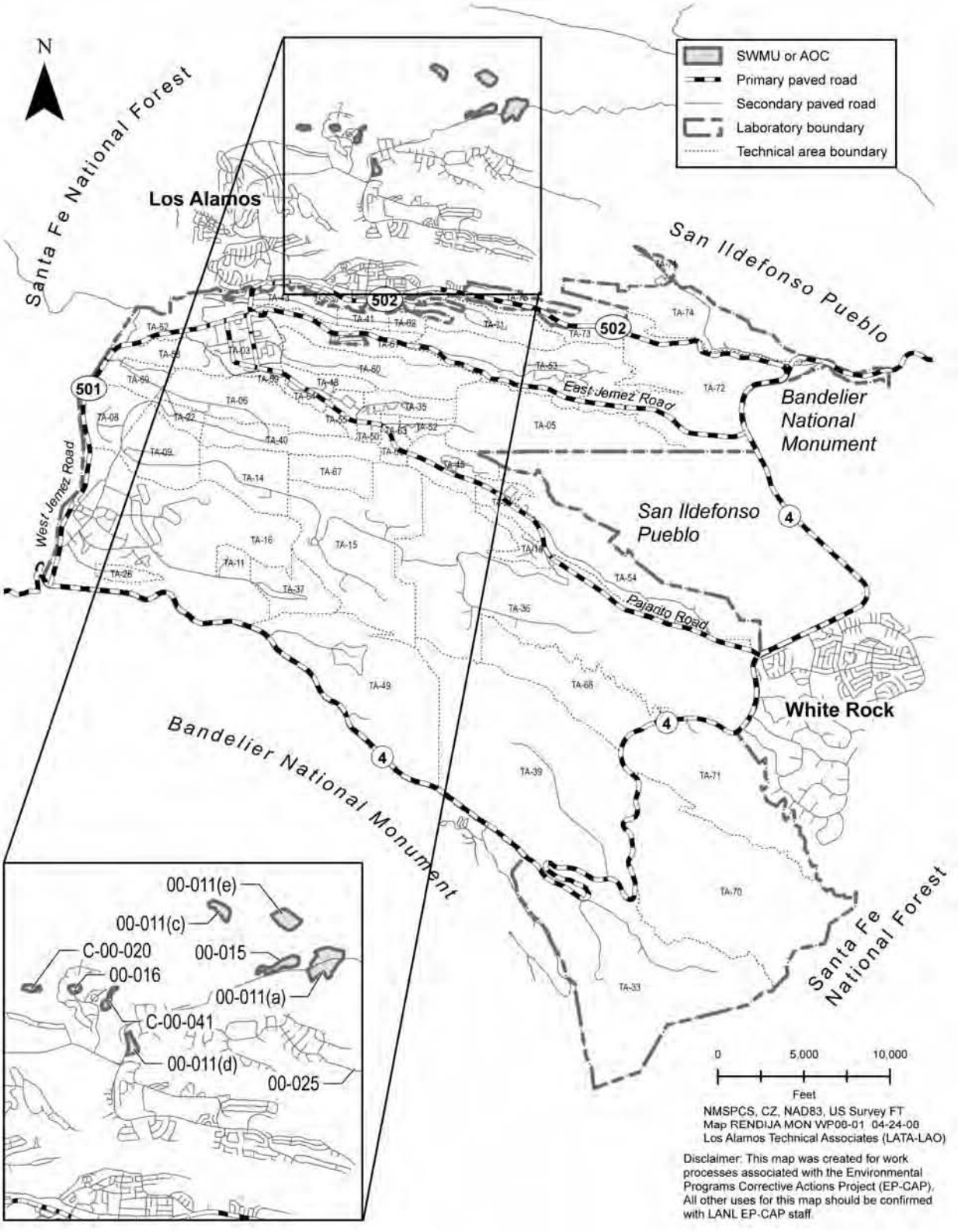

Figure 1.1-1 Guaje/Barrancas/Rendija Canyons Aggregate Area SWMUs and AOCs

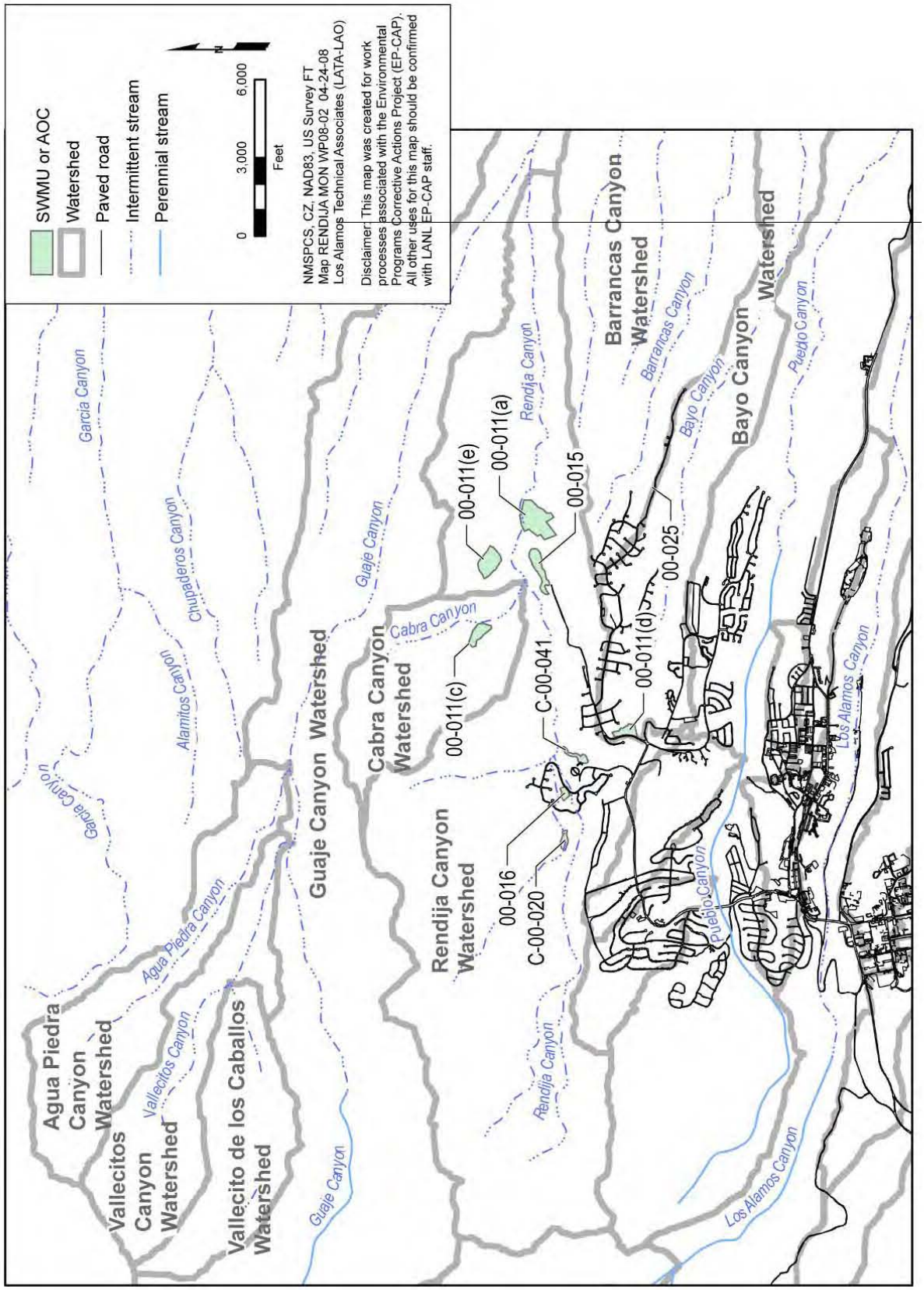

Figure 1.1-2 Location of AOC C-00-041 within the Rendija Canyon Watershed

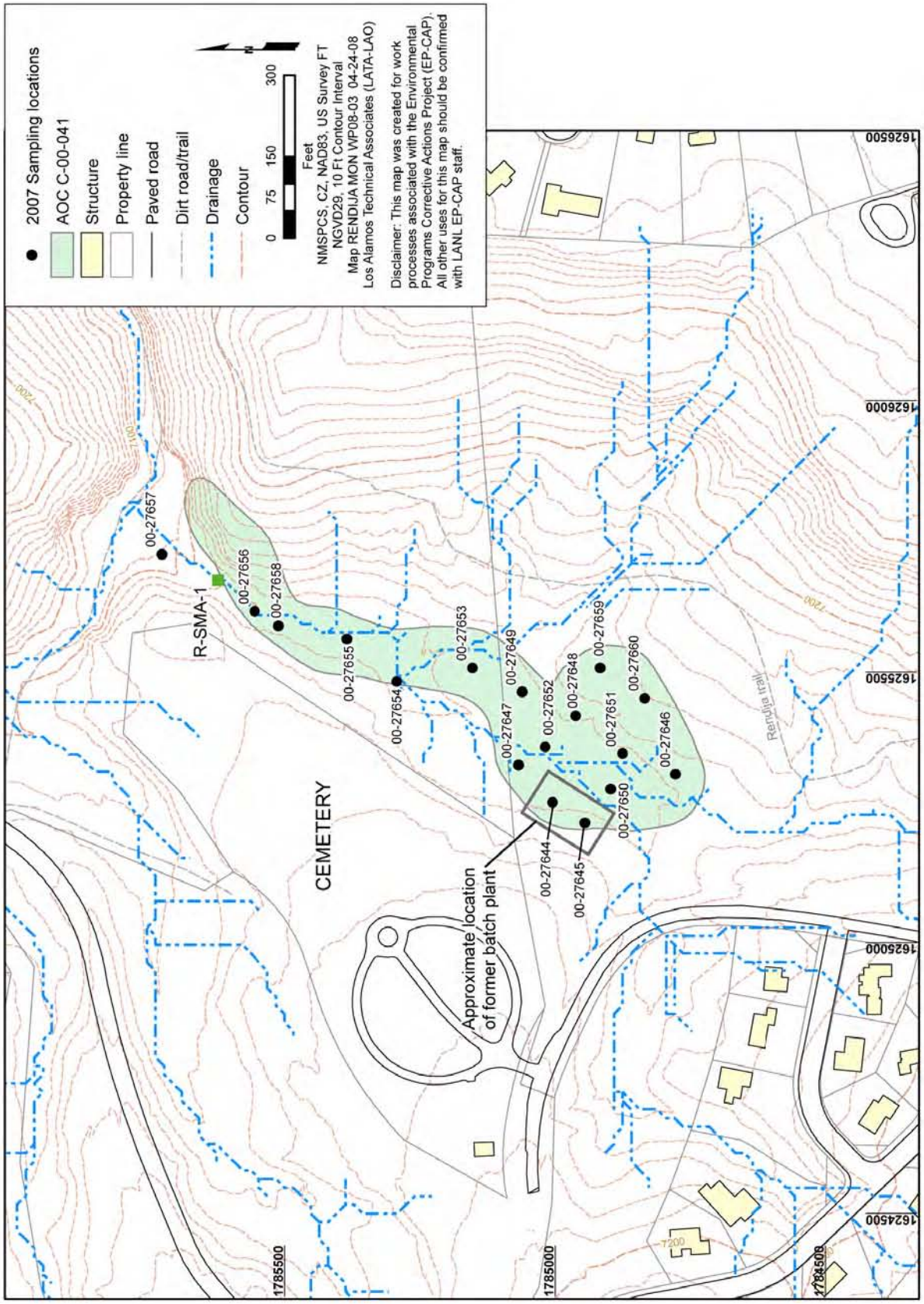

Figure 2.0-1 AOC C-00-041 site map

Figure 4.2-1 Before and after photographs of an asphalt piece in the stream bed

Figure 4.2-2 Before and after photographs of asphalt removal

Figure 4.2-3 Before and after photographs of asphalt removal in the stream bed

Note: The lighter gray pieces are native rock.

Figure 4.2-4 Before and after photographs of asphalt removal from the drainage

Figure 4.2-5 Before and after photographs of large asphalt boulder in the drainage removal

Appendix A

Investigation-Derived Waste Management

The investigation-derived waste (IDW) resulting from the monitoring and removal activities by Los Alamos National Laboratory (the Laboratory) at Area of Concern (AOC) C-00-041 in the Guaje/Barrancas/Rendija Canyons Aggregate Area includes asphalt, tar, and incidental soil. These materials were recycled at the Los Alamos County Eco-Station.

All IDW generated during the investigation was managed to protect human health and the environment, comply with applicable regulatory requirements, and adhere to Laboratory waste-minimization goals. All IDW generated during field-investigation activities was managed in accordance with the applicable standard operating procedure (SOP), which incorporates the requirements of all applicable U.S. Environmental Protection Agency and New Mexico Environment Department (NMED) regulations, U.S. Department of Energy orders, and Laboratory implementation requirements. The SOP applicable to the characterization and management of IDW is

- SOP-5238, Characterization and Management of Environmental Program Waste.

A waste characterization strategy form (WCSF) and WCSF addendum were prepared and approved per the requirements of SOP 5238. The WCSF and addendum provided detailed information on IDW characterization, management, containerization, and possible volumes. The guidance described in the most recent version of the Laboratory's Hazardous Waste Minimization Plan was implemented during field activities to minimize waste generation.

The following waste streams were generated during the inspection and removal activities:

- *Asphalt/Tar-Contaminated Soil and Asphalt/Tar*—the asphalt/tar-contaminated soil and the asphalt/tar collected were stored in plastic-lined 55-gal. drums. Based on acceptable knowledge, this material was designated as nonhazardous/nonradioactive and was recycled at the Los Alamos County Eco-Station. A total of seven drums of material was generated.

Immediately following containerization, each waste container was individually labeled with a unique identification number and with information regarding classification, item(s), and date generated. The material was contained in a clearly marked and appropriately constructed accumulation area. Container and storage requirements were detailed in the WCSF and WCSF addendum and approved before the wastes were generated.

Appendix B

R-SMA-1 Stormwater Data

Table B-1
Detected Data from Filtered Stormwater Samples, Station R-SMA-1, in AOC C-00-041

Sample Date	Alkalinity-CO3+HCO3	Aluminum	Arsenic	Barium	Cadmium	Calcium	Chromium	Cobalt	Copper	Dissolved Organic Carbon	Hardness	Iron	Lead	Magnesium	Manganese	Molybdenum	Nickel	Potassium	Sodium	Vanadium	Zinc
May 3, 2005		5.8		0.0724	0.0002	19	0.0042	0.0115	0.0051	8.95	60.4	2.9		3.15	0.0319		0.0035	5.68	57.8	0.0068	0.0277
August 12, 2005		1.9		0.0304		6.16			0.0035	19.2	19.7	1.01	0.0011	1.04	0.0083		0.0018	4.24	13	0.0041	0.0418
August 24, 2005		0.903		0.0227		5.64	0.0012		0.0032	11.2	17.3	0.503	0.00063	0.793	0.0221		0.0018	3.21	11.1	0.0032	
September 29, 2005		2.09		0.0323		7.79	0.0017		0.0054	14.1	24.5	1.18	0.0013	1.22	0.0096		0.0024	3.78	19.7	0.0044	0.014
August 1, 2006	26.8	0.289		0.0273		5.81	0.0012			12.6	18.5	0.205	0.00053	0.957	0.0034		0.0018	3.95	11.2		
September 11, 2006	26.3	0.678		0.025		6.91		0.0011		8.81	21.8	0.379		1.1	0.0034		0.0011	2.71	2.58	0.003	0.0062
October 15, 2006	31.2	0.303		0.021		6.3				8.68	19.7	0.183		0.969	0.0052		0.00093	2.86	8.86	0.0017	0.004
May 8, 2007		1.42		0.0525		17.3	0.0034		0.0049		53.8	0.718	0.00074	2.6	0.0153	0.0025	0.0031	4.66	42.3	0.0041	0.0072
May 13, 2007		0.0713		0.05		16.2	0.003				49.6	0.0538		2.21	0.0044		0.0017	4.67	35.1		
June 3, 2007		1.85		0.0281		9.98	0.0023	0.0027	0.0043		31	0.963	0.00098	1.47	0.0272		0.003	3.79	25.1	0.0037	0.0068
June 11, 2007		0.145		0.0188		5.52					16.8	0.0917		0.726	0.0056		0.00085	2.35	7.38	0.0041	0.0024
July 7, 2008		0.548	0.0015			8.95			0.0015		28.1	0.3		1.4						0.0073	0.0074
July 21, 2008		1.1				4.13			0.0019		13.5	0.659		0.779							0.0202
August 7, 2008		0.0575				9.73			0.0016		29.7	0.0696		1.31							
August 31, 2008		0.578	0.0021			21.2			0.0031		63.1	0.311		2.45						0.0036	0.0075

Note: Data are in units of mg/L.

Table B-2
Detected Results from Unfiltered Stormwater Samples, Station R-SMA-1, in AOC C-00-041

Sample Date	Alkalinity-CO3+HCO3	Alkalinity-HCO3	Aluminum	Ammonia as Nitrogen	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chemical Oxygen Demand	Chromium	Cobalt	Copper	Cyanide (Total)	Diesel Range Organics	Hardness	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Potassium	Silver	Sodium	Suspended Sediment Concentration	Thallium	Vanadium	Zinc
May 3, 2005	68	68	65.8		0.018	0.605	0.0052	0.001	34.3	194		0.0183	0.0586	0.006	0.13	138	51.2	0.11	12.7	1.85		0.0021	0.0194	16	0.0003	64.7	1600		0.0814	0.316
August 12, 2005	76.6		7.58	0.112		0.134		0.00037	11.3	60.2	0.0055	0.0023	0.0102		0.18	37.8	4.44	0.0277	2.32	0.266			0.0085	5.84		25.8	4520		0.0138	0.06
August 24, 2005	28.2		39.2	0.124	0.007	0.232	0.0025	0.00069	10.8	136	0.0248	0.007	0.0235		0.22	52.3	27.6	0.0477	6.12	0.577			0.0146	9.42		12.7	3940	0.00041	0.0433	0.153
September 29, 2005	39.1		16	0.104		0.104		0.00024	9.45	75.6	0.0095	0.0021	0.0213		0.14	35.6	9.13	0.0188	2.91	0.159			0.0073	6.06		22.2	688		0.0167	0.0818
August 1, 2006			24.9			0.22	0.0016	0.00028	5.69	132	0.0132	0.0057	0.0144		0.0484	30.7	16.6	0.0242	4	0.458			0.0122	6.82	0.00034	2.13	658		0.0295	0.0929
September 11, 2006			17	0.115		0.155	0.0011	0.00026	9.9	49.8	0.0064	0.0034	0.0111		0.165	37.6	10.7	0.0265	3.13	0.323			0.0064	6.8		4.43	1360		0.0192	0.0657
October 15, 2006			14.1	0.124		0.319	0.0024	0.00052	15.1	222	0.0085	0.0083	0.0184		0.119	52.1	8.81	0.0637	3.52	1	0.00065		0.0133	6.26		9.85	1460		0.0237	0.116
May 8, 2007			43.3		0.0065	0.367	0.003	0.0004	26.1		0.0197		0.0321		0.185	102	30.2	0.0409	9.04	0.473	0.00019	0.0027	0.0149	10.4		42.8	2570		0.0459	0.147
May 13, 2007			96.8		0.0198	0.789	0.0071	0.0011	35.7		0.0561	0.021	0.076		0.124	163	71.5	0.116	18	1.73	0.00085		0.0466	18.3		35.5	9980	0.00091	0.109	0.361
June 3, 2007			101		0.0194	0.882	0.0082	0.0016	38.6		0.0513	0.019	0.0751		0.311	172	68.1	0.115	18.4	1.77	0.00078		0.0461	18.6	0.00041	27.9	2110		0.115	0.346
June 11, 2007			46.1			0.392	0.0036	0.00064	15.5		0.0338	0.0103	0.0327			72.3	35.8	0.0612	8.16	0.912	0.00029		0.0265	9.35	0.00027	8.87	1400		0.053	0.172
July 7, 2008			18		0.0033			0.00028	12.1		0.0109		0.0107			44.8	9.66	0.0229	3.52								2850		0.0256	0.0899
July 21, 2008			9.37					0.00015	5.79		0.0053		0.0072		0.23	22.7	6.37	0.0126	2								739		0.0165	0.0688
August 7, 2008			125		0.0186			0.0019	38.9		0.0713		0.0946			196	103	0.198	24						0.00081		5140	0.0015	0.164	0.835
August 31, 2008			139		0.0224			0.0024	22.5		0.0809		0.0985			154	105	0.214	23.7						0.001		7020		0.166	0.637
October 4, 2008															0.122												2190			

Note: Data are in units of mg/L.