DEPARTMENT OF ENERGY
Environmental Management Los Alamos Field Office (EM-LA)
Los Alamos, New Mexico 87544

EMLA-24-BF041-2-1

December 20, 2023

Mr. Rick Shean
Designated Agency Manager
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505-6313

Subject: Submittal of the 2023 Biennial Asphalt Monitoring and Removal Report for Area of Concern C-00-041, Guaje/Barrancas/Rendija Canyons Aggregate Area

Reference(s): 1. Los Alamos National Laboratory document LA-UR-08-2666, "Asphalt Monitoring and Removal Plan for Area of Concern C-00-041, Guaje/Barrancas/Rendija Canyons Aggregate," dated April 2008

Dear Mr. Shean:

Enclosed please find two hard copies with electronic files of the "2023 Biennial Asphalt Monitoring and Removal Report for Area of Concern C-00-041, Guaje/Barrancas/Rendija Canyons Aggregate Area."

According to the approved 2008 asphalt monitoring and removal plan, "Asphalt Monitoring and Removal Plan for Area of Concern C-00-041, Guaje/Barrancas/Rendija Canyons Aggregate" (Reference 1), the need to continue inspection and asphalt removal activities will be reevaluated with the U.S. Forest Service (USFS) and the New Mexico Environment Department (NMED) every third inspection (i.e., every 6 yr) beginning with the first biennial inspection and removal activity in the fall of 2009.

The quantity of asphalt removed in 2015 was two to three 55-gal. drums. Since 2015, the amount of asphalt and tar removed from Area of Concern (AOC) C-00-041 has decreased with each subsequent walkdown. In 2017, an equivalent of two 55-gal. drums were removed, and in 2019, an equivalent of one and one-half 55-gal. drums were removed. In 2021, the total amount collected was three-quarters of a 55-gal. drum, a significant decrease from the quantities collected in the 2015, 2017, and 2019 walkdowns, and in 2023 the total quantity collected was two-thirds of a 55-gal. drum, continuing the decreasing trend in the quantity of material removed.

Based on the decreasing quantity of asphalt material removed from the five pervious biennial cleanup activities covering a ten-year period, the U.S. Department of Energy Environmental Management Los Alamos Field Office (EM-LA) recommends reducing the frequency of the asphalt monitoring and removal activities from a biennial basis to a triennial basis starting in calendar year 2026.

If you have any questions, please contact Victoria Chadwick at (505) 695-6602 (Victoria.Chadwick@em-la.doe.gov) or Cheryl Rodriguez at (505) 414-0450 (cheryl.rodriguez@em.doe.gov).

Sincerely,

Digitally signed by Brian G. Harcek
Date: 2023.12.19 15:04:35 -07'00'

Arturo Q. Duran For
Compliance and Permitting Manager
U.S. Department of Energy
Environmental Management
Los Alamos Field Office

Enclosure(s):

1. Two hard copies with electronic files:
   2023 Biennial Asphalt Monitoring and Removal Report for Area of Concern C-00-041, Guaje/Barrancas/Rendija Canyons Aggregate Area (EM2023-0778)

cc (letter with hard-copy enclosure[s]):
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December 2023
EM2023-0778

2023 Biennial Asphalt Monitoring and Removal Report for Area of Concern C-00-041, Guaje/Barrancas/Rendija Canyons Aggregate Area

N3B Los Alamos

EM2023-0778

2023 Biennial Asphalt Monitoring and Removal Report for Area of Concern C-00-041, Guaje/Barrancas/Rendija Canyons Aggregate Area

December 2023

Responsible N3B program director:

Printed Name	Signature	Title	Organization	Date
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Responsible N3B representative:

Printed Name	Signature	Title	Organization	Date
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Responsible DOE EM-LA representative:

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Arturo Q. Duran		Digitally signed by Brian G. Harcek Date: 2023.12.19 15:04:07 -07'00'	Compliance and Permitting Manager	Office of Quality and Regulatory Compliance	

EXECUTIVE SUMMARY

Area of Concern (AOC) C-00-041 is the site of a former asphalt batch plant located in the Rendija Canyon 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. After the plant was removed, a portion of the area was transferred to Los Alamos County in 1965, and the remainder of the area was transferred to the U.S. Forest Service (USFS) in 1969. In 2007, investigation sampling was completed, and visible asphalt and tar were removed from the surface of the main drainage channel that crosses AOC C-00-041. Because of the potential for continued exposure of additional asphalt or tar by erosion during storms or other runoff events, the New Mexico Environment Department (NMED) requires biennial surveys for, and removal of, exposed asphalt and tar within the main drainage channel. The first biennial survey was conducted in October 2009; the second and third in November 2011 and 2013; and the fourth, fifth, sixth, seventh, and eighth in October 2015, 2017, 2019, 2021, and 2023.

The 2023 activities included a pre-job briefing, visual inspections of the entire site, and removal and disposal of visible asphalt or tar. The inspections consisted of dividing the AOC into small manageable areas, performing numerous walkovers within the areas to identify and remove any visible asphalt or tar, and disposing of the material for recycling. Inspections focused primarily on the main drainage channel at AOC C-00-041, spreading outward so that the entire site was inspected.

According to the approved 2008 asphalt monitoring and removal plan, “Asphalt Monitoring and Removal Plan for Area of Concern C-00-041, Guaje/Barrancas/Rendija Canyons Aggregate,” the need to continue inspection and asphalt removal activities will be reevaluated with the USFS and NMED every third inspection (i.e., every 6 yr) beginning with the first biennial inspection and removal activity in the fall of 2009. The 2015 inspection and asphalt removal activities presented the first opportunity to reevaluate the need to continue the biennial inspection and removal activities. The quantity of asphalt removed in 2015 was two to three 55-gal. drums. Since 2015, the amount of asphalt and tar removed from AOC C-00-041 has decreased with each subsequent walkdown. In 2017, an equivalent of two 55-gal. drums were removed, and in 2019, an equivalent of one and one-half 55-gal. drums were removed. In 2021, the total amount collected was three-quarters of a 55-gal. drum, a significant decrease from the quantities collected in the 2015, 2017, and 2019 walkdowns; and in 2023 the total quantity collected was two-thirds of a 55-gal. drum, continuing the decreasing trend.

Based on the decreasing quantity of asphalt material removed from the five previous biennial cleanup activities covering a ten-year period, the U.S. Department of Energy Environmental Management Los Alamos Field Office recommends reducing the frequency of the asphalt monitoring and removal activities from a biennial basis to a triennial basis starting in calendar year 2026.

CONTENTS

1.0 INTRODUCTION 1
1.1 General Site Information 1
1.2 Objectives 1
2.0 SITE DESCRIPTION AND OPERATIONAL HISTORY 1
3.0 SITE CONDITIONS 2
3.1 Surface Conditions 2
3.2 Subsurface Conditions 2
4.0 SCOPE OF ACTIVITIES 2
4.1 Site Inspection 2
4.2 Asphalt and Tar Collection 3
4.3 Individual Permit Erosion Control Best Management Practices 3
5.0 CONCLUSIONS 3
6.0 REFERENCES AND MAP DATA SOURCES 4
6.1 References 4
6.2 Map Data Sources 5

Figures

Figure 1.1-1 Location of AOC C-00-041 with respect to the Laboratory boundary and surrounding landholdings 7
Figure 2.0-1 AOC C-00-041 site map, locations of asphalt and tar removed in 2023, and location of Individual Permit stormwater erosion controls, 2023 8
Figure 4.0-1 AOC C-00-041 site conditions on USFS property looking northeast 9
Figure 4.0-2 AOC C-00-041 site conditions and crew on LAC property looking west 9
Figure 4.0-3 AOC C-00-041 site conditions and crew on LAC property, north view main drainage area within AOC C-00-041 10
Figure 4.2-1 Example of asphalt debris collected in 5-gal. buckets 11
Figure 4.2-2 Example of tar and asphalt in the banks of the drainage channel 12
Figure 4.2-3 Field crew collecting asphalt debris in drainage channel within AOC C-00-041 12
Figure 4.2-4 Asphalt debris removed from AOC C-00-041 in 2023. 13

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 Triad 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 approximately 36 mi^2 of the Pajarito Plateau, which consists of a series of fingerlike mesas separated by deep canyons containing perennial and intermittent streams running from west to east.

Corrective actions for solid waste management units (SWMUs) and areas of concern (AOCs) at the Laboratory are subject to the Compliance Order on Consent (Consent Order). This report describes the work activities executed and completed at AOC C-00-041 in accordance with the Consent Order.

1.1 General Site Information

The Guaje/Barrancas/Rendija Canyons Aggregate Area consists of SWMUs and AOCs that were formerly part of Operable Unit 1071 within Technical Area 00 (TA-00). Figure 1.1-1 shows AOC C-00-041 with respect to the Laboratory boundary and surrounding landholdings. AOC C-00-041 is the site of a former asphalt batch plant.

1.2 Objectives

The objective of this report is to provide the results of the 2023 biennial asphalt monitoring and removal activities at AOC C-00-041, as required under the approved asphalt monitoring and removal plan (LANL 2008, 102726). Characterization sampling and hand removal of surface asphalt were conducted at AOC C-00-041 in 2007 as part of the Guaje/Barrancas/Rendija Canyons Aggregate Area investigation. The investigation report concluded that the nature and extent of contamination have been defined and the site poses no unacceptable human-health risk for the residential scenario and no unacceptable ecological risk (LANL 2007, 099954). However, additional asphalt and tar may be unearthed by erosion during storms or other runoff events (e.g., snowmelt) within the main drainage channel that crosses AOC C-00-041. The New Mexico Environment Department's (NMED's) approval with direction for the aggregate area investigation report requires biennial inspection and removal of asphalt and tar exposed by storm events or erosion (NMED 2007, 099632).

2.0 SITE DESCRIPTION AND OPERATIONAL HISTORY

AOC C-00-041 is located on Los Alamos County (LAC) land and U.S. Forest Service (USFS) land in a portion of a side slope and ephemeral stream drainage channel that flows into Rendija Canyon. Aerial photographs indicate that the asphalt plant operated from the late 1940s to 1958, and the site history suggests that the plant was removed sometime between 1958 and 1965 (LANL 1996, 054925, p. 1). After the plant was removed, a portion of the land was transferred from the U.S. Atomic Energy Commission (AEC) to LAC in 1965, and another portion was transferred from AEC to USFS in 1969 to manage as public land (Figure 2.0-1).

The Laboratory conducted a voluntary corrective action (VCA) at AOC C-00-041 in 1995 to remove asphalt from the stream channel, where the asphalt was confined, and to break up and remove concrete blocks. Samples collected during the VCA included one sample of tar, three samples of soil beneath asphalt, one sample of water from upstream of the asphalt deposit, and one sample of water from downstream of the asphalt deposit. A total of 300 yd^3 of asphalt material was excavated and disposed of at the LAC landfill.

A USFS representative inspected the site, and the VCA was declared complete to USFS's satisfaction. The VCA report requested completion concurrence from DOE (LANL 1996, 054925, p. 2).

The site is located in a grassy open meadow bisected south to north by an ephemeral stream and is currently undeveloped. A hiking trail (the Dot Grant Trail) is located to the east of AOC C-00-041, and another hiking trail (the Perimeter Trail) and Guaje Pines Cemetery are located to the west (Figure 2.0-1).

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 above sea level (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 land and DOE land. 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, DOE land, and USFS land. As the surface water flows downstream, it infiltrates the alluvium and the underlying formations or is lost to evapotranspiration.

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. The 2007 sampling at the site did not exceed 3.0 ft below ground surface, and the only stratigraphic unit encountered at the site was surface soil. Saturated conditions were not encountered, and no subsurface structures are known to exist at the site (LANL 2007, 098670).

4.0 SCOPE OF ACTIVITIES

The 2023 activities at AOC C-00-041 took place on both USFS property and LAC property (Figures 4.0-1 through 4.0-3). The site was accessed through LAC property, and all work was subject to approval by the applicable property owner(s) through access agreements or the functional equivalent.

4.1 Site Inspection

AOC C-00-041 was inspected on October 10, 2023, per the approved asphalt monitoring and removal plan (LANL 2008, 102726; NMED 2008, 102289), to identify remnants of asphalt and tar that have been exposed at the surface by runoff or erosion since the 2021 monitoring and removal activities. 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 that all newly exposed asphalt and tar were identified and removed. Several photographs were taken and a global positioning system unit was used to record all locations where asphalt and tar were collected within and directly adjacent to AOC C-00-041 (Figure 2.0-1).

4.2 Asphalt and Tar Collection

On October 10, 2023, exposed asphalt debris and tar fragments were found and removed during the site inspection of AOC C-00-041. Asphalt or tar was removed only if it was visible at the surface and involved no excavation or significant soil disturbance. The majority of material found and removed within AOC C-00-041 was asphalt debris (Figures 2.0-2 and 4.2-1). A few pieces of tar were found and removed from the same location within AOC C-00-041 as in 2019 (Figure 4.2-2). The tar pieces were less than 3 in. long, 1 in. wide, and less than 0.25 in. thick. The asphalt pieces ranged in size from less than 1 in. to 1 ft. long and up to 6 in. wide. Asphalt and tar pieces were collected in buckets and transferred to the bed of a pickup truck. The total quantity of material removed, approximately two-thirds of a 55-gal. drum, was less than the quantity removed in 2021 (three-quarters of a 55-gal. drum) and in 2019 (one and one-half 55-gal. drums). Overall, the pieces were similar in size to those from prior asphalt removals. As in 2019, larger pieces of asphalt were predominantly discovered towards the end of the channel along AOC C-00-041 in the highly eroded banks before the tributary reaches the main Rendija Canyon drainage. Figure 2.0-1 highlights the two primary locations where asphalt was collected and the varied sizes of asphalt that were observed at each area. The asphalt and tar removed were containerized for disposition at the LAC Eco Station for recycling. Figures 4.2-1 through 4.2-4 are photographs of asphalt and tar samples and collection activities.

4.3 Individual Permit Erosion Control Best Management Practices

In March of 2016, stormwater erosion controls were installed upstream of stormwater sampler R-SMA-1 to address headcutting erosion near the site of the former asphalt batch plant within AOC C-00-041. The work was performed under the U.S. Environmental Protection Agency National Pollutant Discharge Elimination System Individual Permit (IP) for LANL. The additional controls consist of riprap areas and turf reinforcement matting in accordance with IP stormwater and erosion-control construction specifications. Excavated soils were placed within the boundary of AOC C-00-041. The riprap controls installed at R-SMA-1 are shown in Figure 2.0-1.

Work crews were directed to collect, track, and report the volume of any asphalt encountered during construction activities. No asphalt was removed from AOC C-00-041 during construction of the stormwater erosion controls.

5.0 CONCLUSIONS

In 2007, approximately thirty-seven 55-gal. drums of asphalt and tar were removed from AOC C-00-041. Following this large initial removal, the overall quantity of asphalt debris and tar removed from AOC C-00-041 decreased over each of the next several biennial walkdowns. In 2009, seven 55-gal. drums filled with asphalt and tar were removed; in 2011, four 55-gal. drums were removed; and in 2013, one-half of a 55-gal. drum was removed.

Rain events that occurred between late 2013 through 2015 increased the erosion amount in the northernmost part of the channel allowing for more material to be accessible for clean-up. In 2015, an equivalent of two to three 55-gal. drums filled with asphalt and tar were removed from AOC C-00-041, a significant increase from the quantity removed in 2013. Since 2015, the amount of asphalt and tar removed from AOC C-00-041 has decreased with each subsequent biennial walkdown. In 2017, an equivalent of two 55-gal. drums were removed, and in 2019, an equivalent of one and one-half 55-gal. drums were removed. In 2021, although far more small pieces of asphalt were found compared with the 2019 walk-down, the total amount collected was three-quarters of a 55-gal. drum, a significant decrease from the quantities collected in the 2015, 2017, and 2019 walkdowns. In 2023 the current year, the pieces

of asphalt collected were similar in size to the materials recovered in 2021, but the quantity collected was slightly less, at two-thirds of a 55-gal. drum.

According to the approved 2008 asphalt monitoring and removal plan (LANL 2008, 102726), the need to continue inspection and asphalt removal activities will be reevaluated with the USFS and NMED every third inspection (i.e., every 6 yr) beginning with the first biennial inspection and removal activity in fall of 2009. The 2015 inspection and asphalt removal activities presented the first opportunity to reevaluate the need to continue the biennial inspection and removal activities. Since 2015, the amount of immediately collectable asphalt and tar removed has decreased with each biennial walkdown, and has been less than a single 55-gal. drum for the last two walkdowns. Based on the decreasing quantity of asphalt material removed from the five previous biennial cleanup activities covering a ten-year period, the U.S. Department of Energy Environmental Management Los Alamos Field Office recommends reducing the frequency of the asphalt monitoring and removal activities from a biennial basis to a triennial basis starting in calendar year 2026.

6.0 REFERENCES AND MAP DATA SOURCES

6.1 References

The following reference list includes documents cited in this report. Parenthetical information following each reference provides the author(s), publication date, and ERID, ESHID, or EMID. ERIDs were assigned by Los Alamos National Laboratory's (the Laboratory's) Associate Directorate for Environmental Management (IDs through 599999); ESHIDs were assigned by the Laboratory's Associate Directorate for Environment, Safety, and Health (IDs 600000 through 699999); and EMIDs are assigned by N3B (IDs 700000 and above).

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)

6.2 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, Environmental Restoration Project; 1991.

Los Alamos National Laboratory Boundaries. LANL Areas Used and Occupied; Los Alamos National Laboratory, KSL Engineering Services (Survey Department). Bureau of Land Management (BLM) April 2013 (northern boundary that touches the town site).

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

Asphalt: Point Feature Locations. GPS locations gathered utilizing Leica Zeno 20 GPS units. 18 October 2017.

Potential Release Sites. Los Alamos National Laboratory, Waste and Environmental Services Division, Geotechnical Services Group, EP2008-0095; 1:2,500 Scale Data; 02 February 2011

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.

Pan-sharpened ortho-photograph. Los Alamos National Laboratory and surrounding area, a total of 386 square miles. The scope of work involved LiDAR acquisition, data processing and classification of point cloud, and the development of canopy (DSM) and ground (DEM) digital raster models. Classified Point Cloud LiDAR (LAS v1.2 format), Canopy-DSM (TIFF formats), Ground -DEM (TIFF formats); as published 2014.

New Mexico Landownership: U.S. Bureau of Land Management - New Mexico State Office. Current delineation of the surface ownership and/or surface management in the state of New Mexico. As published 2012.

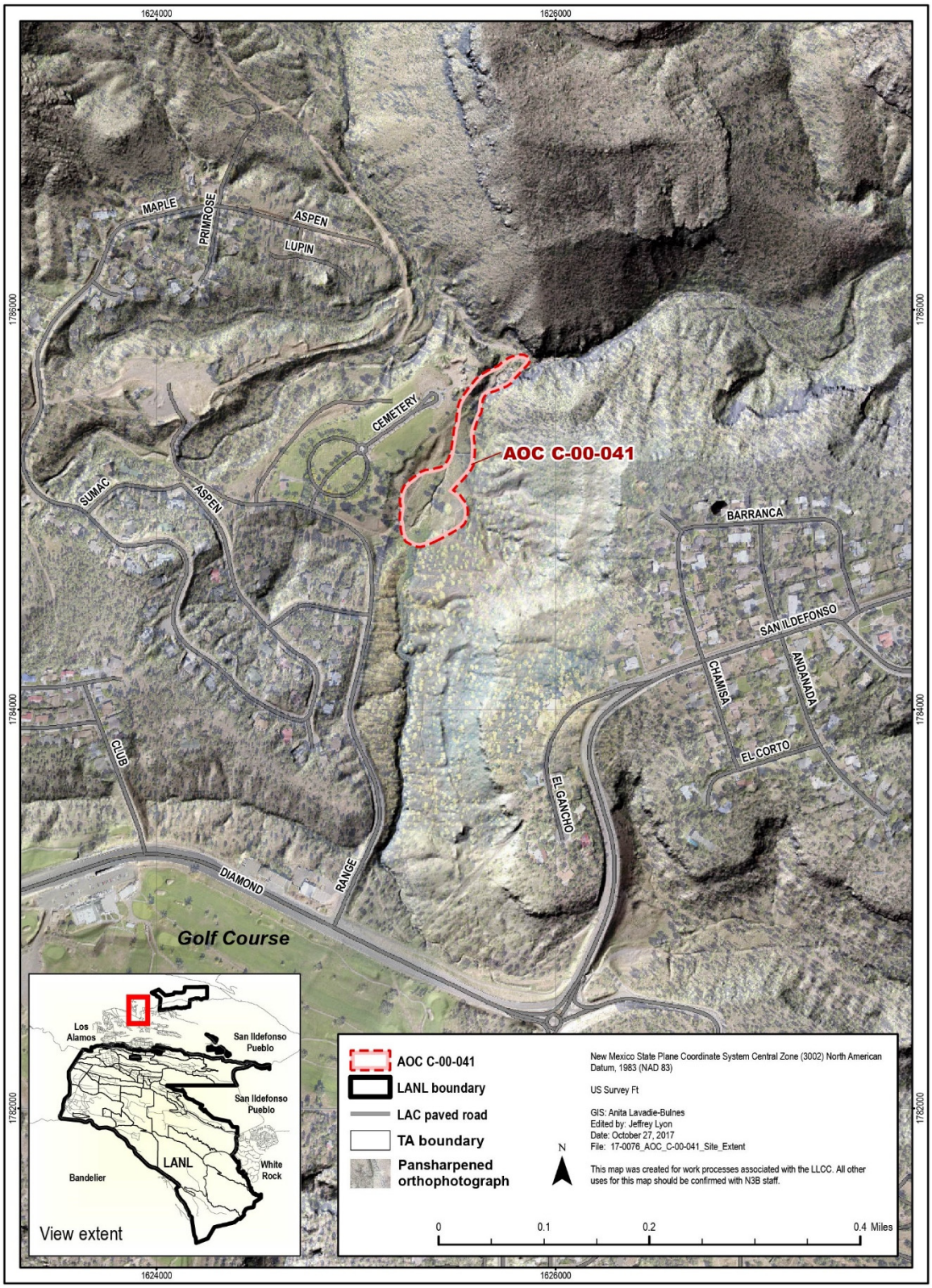

Figure 1.1-1 Location of AOC C-00-041 with respect to the Laboratory boundary and surrounding landholdings

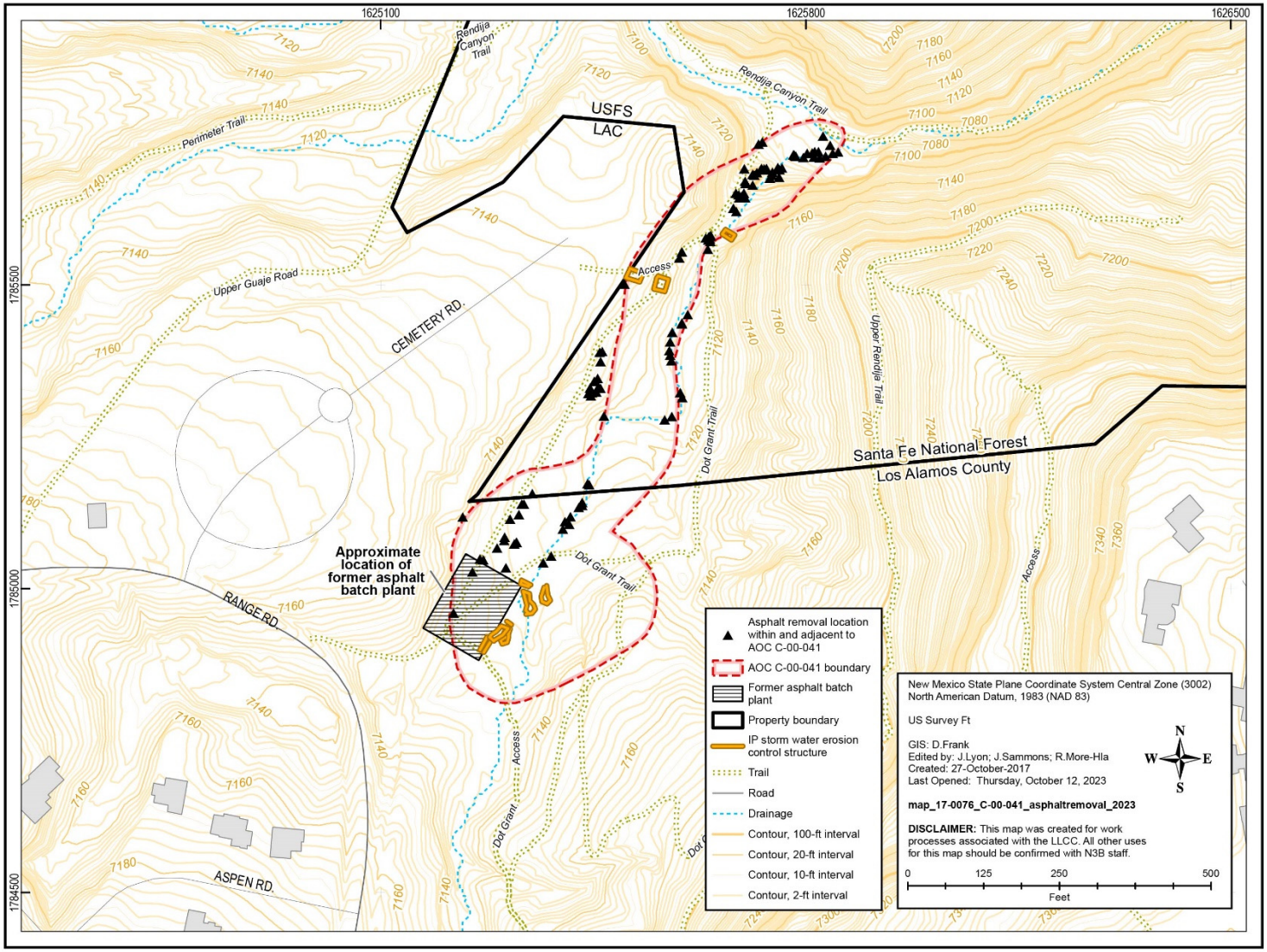

Figure 2.0-1 AOC C-00-041 site map, locations of asphalt and tar removed in 2023, and location of Individual Permit stormwater erosion controls, 2023

Figure 4.0-1 AOC C-00-041 site conditions on USFS property looking northeast

Figure 4.0-2 AOC C-00-041 site conditions and crew on LAC property looking west

Figure 4.0-3 AOC C-00-041 site conditions and crew on LAC property, north view main drainage area within AOC C-00-041

Figure 4.2-1 Example of asphalt debris collected in 5-gal. buckets

Figure 4.2-2 Example of tar and asphalt in the banks of the drainage channel

Figure 4.2-3 Field crew collecting asphalt debris in drainage channel within AOC C-00-041

Figure 4.2-4 **Asphalt debris removed from AOC C-00-041 in 2023. The asphalt pieces were generally similar in size compared with the asphalt pieces removed in 2021, but the quantity removed in 2023 was less than the quantity removed in 2021.**