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EMLA-2022-BF145-02-001

September 27, 2022

Mr. Rick Shean
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Subject: Submittal of Twomile Canyon Aggregate Area Progress Report

Dear Mr. Shean:

Enclosed please find two hard copies with electronic files of the "Twomile Canyon Aggregate Area Progress Report." This report fulfills the fiscal year 2022 Milestone #15 in Appendix B of the 2016 Compliance Order on Consent under the Pajarito Watershed Campaign.

If you have any questions, please contact Darrik Stafford at (505) 551-2957 (darrik.stafford@em-la.doe.gov) or Cheryl Rodriguez at (505) 414-0450 (cheryl.rodriguez@em.doe.gov).

Sincerely,

**ARTURO
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Enclosure(s):

1. Two hard copies with electronic files:
 Twomile Canyon Aggregate Area Progress Report (EM2022-0579)

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September 2022
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Twomile Canyon Aggregate Area Progress Report



Newport News Nuclear BWXT-Los Alamos, LLC (N3B), under the U.S. Department of Energy Office of Environmental Management Contract No. 89303318CEM000007 (the Los Alamos Legacy Cleanup Contract), has prepared this document pursuant to the Compliance Order on Consent, signed June 24, 2016. The Compliance Order on Consent contains requirements for the investigation and cleanup, including corrective action, of contamination at Los Alamos National Laboratory. The U.S. government has rights to use, reproduce, and distribute this document. The public may copy and use this document without charge, provided that this notice and any statement of authorship are reproduced on all copies.


Twomile Canyon Aggregate Area Progress Report

September 2022

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1.0 PURPOSE OF REPORT

This progress report fulfills fiscal year (FY) 2022 Milestone #15 of the 2016 Compliance Order on Consent (Consent Order), Appendix B, under the Pajarito Watershed Campaign. Milestone #15 is a progress report summarizing the fieldwork implementation and status of site investigations conducted under the approved 2010 "Investigation Work Plan for Twomile Canyon Aggregate Area, Revision 1" (IWP) (LANL 2010, 109520; NMED 2010, 109652). The Twomile Canyon Aggregate Area is one of four aggregate areas in the Pajarito Watershed Campaign. All solid waste management units (SWMUs) and areas of concern (AOCs) within the Twomile Canyon Aggregate Area are located at Technical Areas (TAs-) 03, 06, 22, 40, 50, 59, and 69, and former TA-07. The SWMUs and AOCs proposed for sampling in the IWP for Twomile Canyon Aggregate Area are listed below:

- SWMU 03-001(k) – Storage Area
- SWMU 03-003(a) – Storage Area
- SWMU 03-003(b) – Storage Area
- AOC 03-003(k) – Storage Area
- AOC 03-003(p) – Storage Area
- AOC 03-014(a2) – Drain Associated with Former WWTP
- SWMU 03-014(t) – Lift Station Associated with Former WWTP
- AOC 03-022 – Former Sump
- AOC 03-025(c) – Oil/Water Separator
- SWMU 03-033 – Former Tanks and Sumps
- AOC 03-038(f) – Drainline
- AOC 03-042 – Soil Contamination from Former Sump
- SWMU 03-043(c) – Soil Contamination from Former Manhole
- SWMU 03-050(a) – Soil Contamination from TA-03 Exhaust Emissions
- SWMU 03-050(d) – Soil Contamination from TA-03 Exhaust Emissions
- SWMU 03-050(f) – Soil Contamination from TA-03 Exhaust Emissions
- SWMU 03-050(g) – Soil Contamination from TA-03 Exhaust Emissions
- AOC 03-051(a) – Soil Contamination from Leaking Compressor
- AOC 03-051(b) – Soil Contamination from Leaking Compressor
- SWMU 03-052(a) – Storm Drain
- SWMU 03-054(a) – Outfall Associated with Cooling Tower 03-19
- SWMU 03-054(b) – Outfall from Building 03-38
- SWMU 03-054(d) – Outfall from Building 03-16
- SWMU 03-055(a) – Outfall from Building 03-16
- SWMU 06-001(a) – Septic System
- SWMU 06-001(b) – Septic System

- SWMU 06-002 – Septic System
- SWMU 06-003(a) – Firing Site
- SWMU 06-003(d) – Firing Site
- SWMU 06-003(e) – Firing Site
- SWMU 06-003(f) – Firing Site
- SWMU 06-003(h) – Firing Site
- SWMU 06-005 – Firing Site
- SWMU 06-006 – Storage Area
- SWMU 06-007(a) – MDA F
- SWMU 06-007(b) – Landfill
- SWMU 06-007(c) – Landfill
- SWMU 06-007(d) – Landfill
- SWMU 06-007(e) – Landfill
- SWMU 06-007(f) – Surface Disposal
- SWMU 06-007(g) – Soil Contamination from Former Building 06-12
- AOC 06-008 – Soil Contamination from Former Underground Storage Tank
- AOC C-06-001 – Soil Contamination from former storage magazine 06-4
- AOC C-06-005 – Soil Contamination from Former Building 06-13
- AOC C-06-019 – Soil Contamination from Former Building 06-38
- SWMU 07-001(a) – Firing Site
- SWMU 07-001(b) – Firing Site
- SWMU 07-001(c) – Firing Site
- SWMU 07-001(d) – Firing Site
- SWMU 22-010(a) – Septic System
- SWMU 22-014(a) – Septic System
- SWMU 22-014(b) – Sump System
- SWMU 22-015(a) – Drainlines and Dry Wells
- SWMU 22-015(b) – Sump and Outfall
- SWMU 40-001(b) – Septic System
- SWMU 40-005 – Sump
- AOC 40-007(e) – Storage Area
- AOC C-50-001 – Former Transformer
- AOC 59-004 – Outfall from Building 59-1
- SWMU 69-001 – Twomile Incinerator Facility

2.0 OVERVIEW

This progress report summarizes the field investigations conducted by the U.S. Department of Energy (DOE) Environmental Management Los Alamos Field Office (EM-LA) and Newport News Nuclear BWXT-Los Alamos, LLC (N3B) in accordance with the approved IWP (LANL 2010, 109520; NMED 2010, 109652). This progress report presents the status of fieldwork implementation and site investigations completed to date for the Twomile Canyon Aggregate Area.

Sampling was initiated at SWMUs 06-007(g) and 07-001(a) (Figure 2.0-1). Additional sampling and required remediation will occur once analytical data have been received and evaluated.

2.1 Mobilization and Investigations

Collection of the approximately 1500 samples specified in the Twomile Canyon Aggregate Area IWP, as well as additional samples needed to define nature and extent of contamination and evaluate risk, began in April 2022 and is scheduled to take approximately 20 months. Further sampling to define nature and extent of contamination and/or required corrective actions to address site contamination will occur following an evaluation of analytical data.

N3B mobilized and collected the samples at SWMU 06-007(g) in April 2022 per a request from Triad National Security, LLC (Triad).

Site mobilization by the subcontractor occurred August 17 and 18, and sampling activities began on August 31, 2022.

3.0 SUMMARY OF FIELDWORK COMPLETED IN FISCAL YEAR 2022

The following sections summarize the status of fieldwork initiated at SWMUs 06-007(g) and 07-001(a) in FY 2022.

3.1 SWMU 06-007(g) – Soil Contamination from former Building 06-12

3.1.1 Site Description and Operational History

SWMU 06-007(g) is an area of potential soil contamination associated with former building 06-12, a high explosives (HE) press building located north of Twomile Mesa Road (Figure 2.0-1). This SWMU also includes soil contamination from a small former surface disposal area located next to former building 06-12. Exploded detonator housings were found discarded over an approximate 5 ft² area next to the former location of building 06-12 and were removed.

3.1.2 Previous Investigations

Previous investigations at SWMU 06-007(g) were conducted in 1994 and were reported in the “RFI Report for Potential Release Sites at TAs -6, -8, -22, and -40 (located in former Operable Units 1157 and 1111)” (LANL 1997, 056664). Samples were collected from two depths at three locations in the footprint of the former location of building 06-12. Sampling locations were field screened for radioactivity, volatile organic compounds (VOCs), and HE before samples were collected. All field-screening results were negative or at background levels. Samples were submitted for analysis of metals, cyanide, semivolatiles organic compounds (SVOCs), HE (not including pentaerythritol tetranitrate [PETN]), cesium-137, and strontium-90. Subsurface samples were also analyzed for VOCs. Data collected in 1994 are screening-level data;

however, the data showed metals detected above background values (BVs), detected organic chemicals, and cesium-137 above fallout value (FV).

3.1.3 Investigation Objectives

The primary objective of the investigation at SWMU 06-007(g) is to implement the approved IWP and collect 21 samples from 7 locations (LANL 2010, 109520; NMED 2010, 109652). A secondary objective is to ensure a sufficient number of samples are collected to define nature and extent of contamination at SWMU 06-007(g), and to determine if the site poses a potential unacceptable risk to human health or the environment. To meet both objectives, a total of 69 samples from 23 locations were collected at SWMU 06-007(g). At each location, samples were collected from 0–1 ft, 3–4 ft, and 6–7 ft below ground surface (bgs).

3.1.4 Fieldwork Completed

Fieldwork at SWMU 06-007(g) occurred April 5–11, 2022, and was performed by N3B personnel because Triad had planned construction in the area. A total of 69 investigation samples were collected from 23 locations at 3 depth intervals (0–1 ft, 3–4 ft, and 6–7 ft bgs). Samples were analyzed for target analyte list (TAL) metals, cyanide, nitrate, perchlorate, pH, VOCs, SVOCs, explosive compounds, gamma-emitting radionuclides, isotopic uranium, and strontium-90. Fifteen samples were analyzed for polychlorinated biphenyls (PCBs). Figure 2.0-1 shows the sample locations at SWMU 06-007(g).

3.2 SWMU 07-001(a), Firing Site

3.2.1 Site Description and Operational History

SWMU 07-001(a) is an inactive firing pit located near the east end of TA-06 (Figure 2.0-1). The site consists of a circular depression, surrounded by an annular berm about 4 ft high and approximately 30 ft in diameter. The firing pit was used in the 1950s to destroy scrap detonators and explosives. The materials to be destroyed were mixed with Composition B scraps or flaked 2,4,6-trinitrotoluene (TNT) and the mixture was detonated. A 1959 memorandum states this method was very effective in destroying detonators, with no intact detonators thrown out of a pit and no undestroyed detonators found during a site survey, although pellets of unexploded plastic-bonded explosive (PBX) were found (Spaulding 1959, 004574). The base explosives of the PBX historically used at the Laboratory include 1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX); royal demolition explosive (RDX); and triaminotrinitrobenzene (TATB) (LANL 1993, 020948, p. D-3). In 1959, this method of destroying detonators was discontinued at this site.

3.2.2 Previous Investigations

Previous investigations at SWMU 07-001(a) were conducted in 1994 and were reported in the “RFI Report for Potential Release Sites at TAs -6, -8, -22, and -40 (located in former Operable Units 1157 and 1111)” (LANL 1997, 056664). Samples were collected from two depths at three central locations inside the annular berm and three locations away from the center of the site (two locations outside the berm and one location inside the berm) (LANL 1997, 056664). Samples were submitted for analysis of metals, cyanide, HE, isotopic uranium, cesium-137, and strontium-90. Data collected in 1994 are screening-level data; however, the data showed metals detected above BVs.

All samples from the 1994 investigation at SWMU 07-001(a) were to have been submitted for analysis of SVOCs, but SVOCs were omitted from the list of requested analyses. For this reason, and because holding times were exceeded for the samples submitted for HE analysis, the locations and depths

sampled in 1994 were resampled in 1996 with all samples submitted for analysis of SVOCs and HE. Data from the 1996 resampling effort are decision-level data and showed detected organic chemicals.

3.2.3 Investigation Objectives

The primary objective of the investigation at SWMU 07-001(a) is to implement the approved IWP and collect 18 samples from 6 locations (LANL 2010, 109520; NMED 2010, 109652). A secondary objective is to ensure a sufficient number of samples are collected to define nature and extent of contamination at SWMU 07-001(a), and to determine if the site poses a potential unacceptable risk to human health or the environment. To meet both objectives, a total of 57 samples from 19 locations were collected at SWMU 07-001(a). At each location, samples were collected from 0–1 ft, 3–4 ft, and 6–7 ft bgs.

3.2.4 Fieldwork Completed

An unexploded ordnance survey was conducted on July 29, 2022, by Triad personnel. Sampling at SWMU 07-001(a) occurred August 31–September 13, 2022. A total of 57 investigation samples were collected at 3 depth intervals (0–1 ft, 3–4 ft, and 6–7 ft bgs) from 19 locations. Samples are being analyzed for TAL metals, cyanide, nitrate, perchlorate, pH, SVOCs, explosive compounds, gamma-emitting radionuclides, isotopic uranium, and strontium-90. Twelve samples are being analyzed for PCBs. Figure 2.0-1 shows the sample locations at SWMU 07-001(a).

4.0 FY 2022 MILESTONE

The requirement of a progress report summarizing the fieldwork implementation and status of site investigations in the Twomile Canyon Aggregate Area has been met by completion and submittal of this progress report. Section 3.0 describes the fieldwork completed.

5.0 PLANNED WORK IN FY 2023

Fieldwork at Twomile Canyon Aggregate Area will continue in FY 2023 to complete the sampling planned in accordance with the approved IWP (LANL 2010, 109520; NMED 2010, 109652) as well as additional samples needed to define nature and extent of contamination and evaluate risk. Further sampling and/or required corrective actions to address unacceptable levels of contamination may be required following an evaluation of analytical data and preliminary risk assessments.

6.0 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), July 1993. "RFI Work Plan for Operable Unit 1082," Los Alamos National Laboratory document LA-UR-93-1196, Los Alamos, New Mexico. (LANL 1993, 020948)

LANL (Los Alamos National Laboratory), September 1997. "RFI Report for Potential Release Sites at TAs -6, -8, -22, and -40 (located in former Operable Units 1157 and 1111)," Los Alamos National Laboratory document LA-UR-97-3316, Los Alamos, New Mexico. (LANL 1997, 056664)

LANL (Los Alamos National Laboratory), May 2010. "Investigation Work Plan for Twomile Canyon Aggregate Area, Revision 1," Los Alamos National Laboratory document LA-UR-10-2899, Los Alamos, New Mexico. (LANL 2010, 109520)

NMED (New Mexico Environment Department), June 3, 2010. "Notice of Approval, Twomile Canyon Aggregate Area Investigation Work Plan, Revision 1," New Mexico Environment Department letter to G.J. Rael (DOE-LASO) and M.J. Graham (LANL) from J.P. Bearzi (NMED-HWB), Santa Fe, New Mexico. (NMED 2010, 109652)

Spaulding, R.L., November 18, 1959. "Scrap Disposal," Los Alamos Scientific Laboratory memorandum to R.W. Drake from R.L. Spaulding (GMX-7), Los Alamos, New Mexico. (Spaulding 1959, 004574)

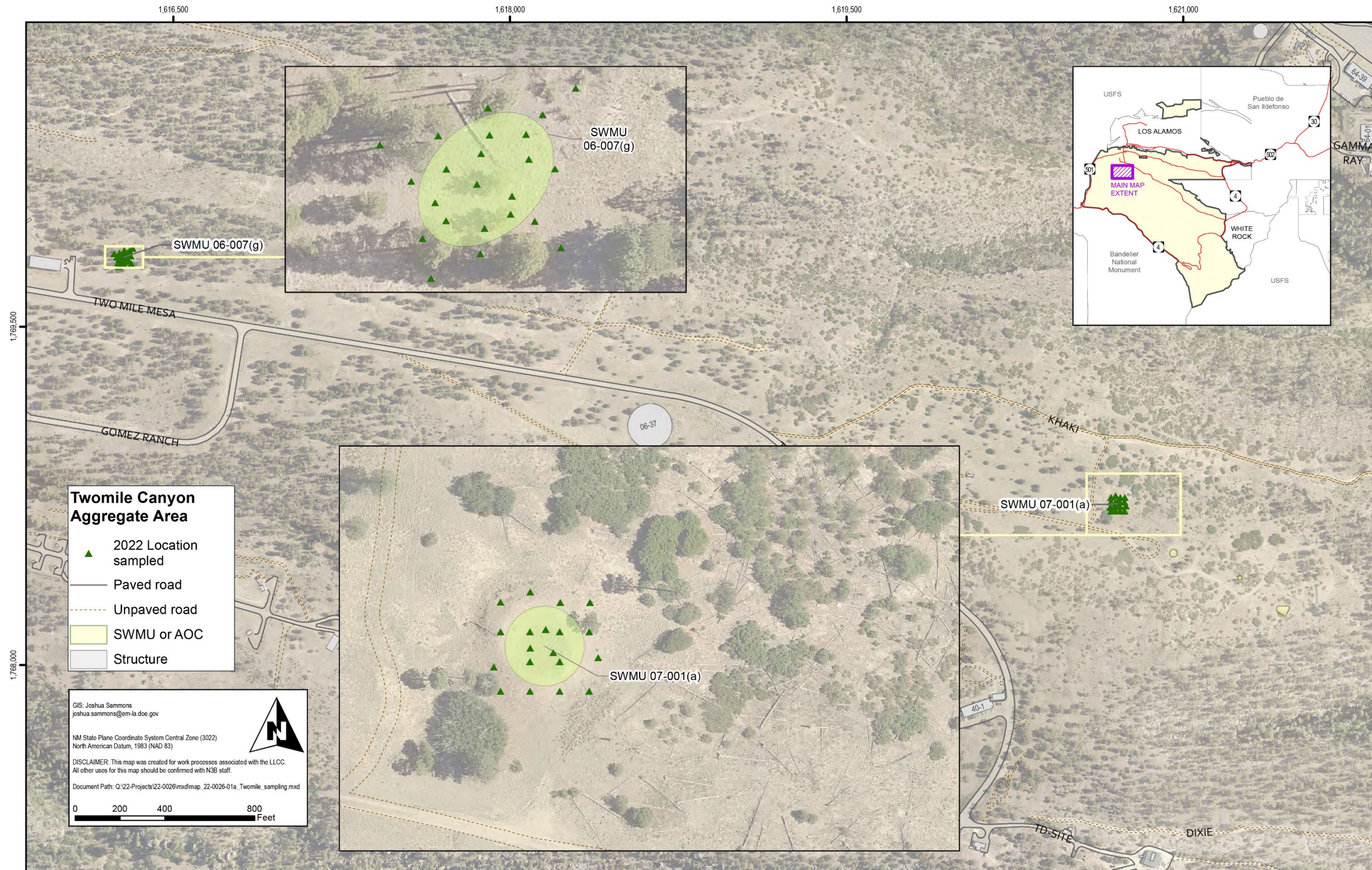


Figure 2.0-1 Twomile Canyon Aggregate Area site

