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Floodplain Assessment for the Sampling and Remediation of Solid Waste Management Units 39-001(a), 39-001(b), 39-006(a), and 39-010 in North Ancho Canyon

N3B Los Alamos

1.0 INTRODUCTION

This floodplain assessment was prepared in accordance with 10 Code of Federal Regulations (CFR) Part 1022, “Compliance with Floodplain and Wetland Environmental Review Requirements,” which was promulgated to implement the U.S. Department of Energy (DOE) requirements under Executive Order 11988, “Floodplain Management.” According to 10 CFR Part 1022, a floodplain is defined as “the lowlands adjoining inland and coastal waters and relatively flat areas and flood prone areas of offshore islands” and has a 1 in 100 chance of being equaled or exceeded by a flood event in any 1-yr period.

DOE Environmental Management Los Alamos Field Office (EM-LA) is proposing characterization/confirmation sampling and remediation activities based on characterization data at North Ancho Canyon Aggregate Area Solid Waste Management Units (SWMUs) 39-001(a), 39-001(b), 39-006(a), and 39-010. SWMUs 39-001(a) and 39-001(b) require plugging and abandonment of existing wells and boreholes, and SWMUs 39-006(a) and 39-010 require soil characterization samples. EM-LA has prepared this floodplain assessment to evaluate the potential impacts of implementing the proposed actions within a floodplain, as required by DOE requirements under Executive Order 11988 and 10 CFR Part 1022.

2.0 PROJECT DESCRIPTION

The North Ancho Canyon Aggregate Area is located at Technical Area 39 (TA-39) of the Los Alamos National Laboratory and consists of 26 SWMUs and areas of concern (AOCs) (see Figure 1). Of these sites, seven have not been previously investigated and/or remediated, or have not been approved for no further action (see Figure 2). Of those seven sites, four sites, SWMUs 39-001(a) (Figure 3), 39-001(b) (Figure 4), 39-006(a) (Figures 5 and 6), and 39-010 (Figure 7), have the potential to impact the North Ancho Canyon floodplain. They are either located in the floodplain or the proposed activities at these sites could impact the floodplain.

2.1 SWMU 39-001(a) History

SWMU 39-001(a) is a former landfill north of the light gas-gun facility (building 39-69) at TA-39. During the 2009 Phase I Compliance Order on Consent (Consent Order) field investigation activities, the landfill at SWMU 39-001(a) was remediated, and during the 2017 accelerated corrective action (ACA) the former waste stockpile area and former capacitor staging areas were remediated. Review of the analytical data collected during the 2009 Phase I Consent Order field investigation activities and of the 2017 ACA resulted in a determination that nature and extent have been defined laterally and vertically for all chemicals of potential concern (COPCs) at SWMU 39-001(a) (LANL 2010, LANL 2018). Removal of contaminated soil during the 2017 ACA met all cleanup objectives for the site. Risk calculations have determined that there is no unacceptable human health or ecological risk at the site. No additional characterization samples are needed at this site and the remaining sampling wells should be retired via plugging and abandonment methods.

2.1.1 SWMU 39-001(a) Well and Borehole Abandonment Preferred Alternative Scope

Three shallow sampling wells (DMB-1, DM-2, and DM-4) and four angled boreholes (ASC-0, ASC-2, ASC-3, and ASC-4) were installed at SWMU 39-001(a) in 1994. The wells were installed vertically and completed with a 4-in.-diameter polyvinyl chloride (PVC) casing. The boreholes were installed at a 45-degree angle and completed with a 2-in.-diameter PVC casing as part of the investigation of SWMU 39-001(a). During the 2009 Phase I Consent Order field investigation and remediation activities at SWMU 39-001(a), the PVC casing of borehole ASC-3 was cut. A bentonite plug was placed over the protruding 2-in. PVC casing. Following the 2009 investigation and remediation activities, water levels were measured in the shallow wells and angled boreholes at SWMU 39-001(a). The remaining angled

boreholes at SWMU 39-001(a) were reported with measurable water (ASC-0, ASC-2, and ASC-4), shallow well DM-4 contained no measurable water, and shallow wells DMB-1 and DM-2 were not measured because they are located downgradient of the site and could not be located during the water level check.

Three shallow wells (DMB-1, DM-2, and DM-4) and three angled boreholes (ASC-0, ASC-2, and ASC-4) will be abandoned. Before abandonment, the wells and boreholes will be measured to determine whether water is present within the casing and at what depth. If water is present, the well and/or borehole will be bailed for 3 casing volumes, or until dry, and then allowed to recharge overnight. Wells with standing water after the recharge period will be sampled using standard alluvial sampling protocols and analyte lists. Sampling will be used to characterize water for disposal and the well and/or borehole will be plugged and abandoned. The wells and boreholes will be overdrilled to total depth. After the well has been overdrilled, the well casing and screen will be removed. (The boreholes have no screens.) The well segments and pieces will be placed on plastic sheeting at the surface. The amount of 2% bentonite grout to fill the open borehole (either 8 in. or 10 in.) will be calculated. Tremie pipe will be installed into the open borehole to pressure grout from the bottom of the borehole to approximately 2 ft below the ground surface. After the grout has cured, the top 2 ft of the borehole will be filled with either concrete or neat cement to ensure a secure surface seal.

Well ASC-3 was damaged during remediation activities in 2009 and a bentonite plug was placed over protruding PVC pipe. The well needs to be overdrilled to 2 ft bgs for proper surface completion. This well has already been abandoned to ground surface, negating the need to be overdrilled to a depth of 20 ft bgs.

2.2 SWMU 39-001(b) History

SWMU 39-001(b) consists of three disposal trenches, also known as Material Disposal Area Y. During the 2009 Phase I Consent Order field investigation activities, the landfill at SWMU 39-001(b) was remediated, and during the 2017 ACA the former waste stockpile area was remediated.

2.2.1 SWMU 39-001(b) Well and Borehole Abandonment Preferred Alternative Scope

Two shallow wells (DM-6 and UM-3) and nine boreholes (ASC-11, ASC-12, ASC-13, ASC-14, ASC-15, ASC-16, ASC-17, ASC-18, and ASC-19) were installed at SWMU 39-001(b) in 1994. The wells were installed vertically and completed with a 4-in.-diameter PVC casing (except for UM-3, which was completed with stainless-steel casing). The boreholes were installed at a 45-degree angle and completed with a 2-in.-diameter PVC casing as part of the investigation of SWMU 39-001(b). Following the 2009 Phase I Consent Order field investigation and remediation activities, water levels were measured in the shallow wells and angled boreholes at SWMU 39-001(b). Eight of the angled boreholes at SWMU 39-001(b) were reported with measurable water (ASC-12, ASC-13, ASC-14, ASC-15, ASC-16, ASC-17, ASC-18, and ASC 19), shallow well DM-6 and angled borehole ASC-11 contained no measurable water, and shallow well UM-3 was not measured.

The wells and boreholes at SWMU 39-001(b) will be abandoned. Before abandonment, the wells and boreholes will be measured to determine whether water is present within the casing and at what depth. If water is present, the well and/or borehole will be bailed for 3 casing volumes, or until dry, and then allowed to recharge overnight. Wells with standing water after the recharge period will be sampled using standard alluvial sampling protocols and analyte lists. The wells and boreholes will be overdrilled to total depth. After the well has been overdrilled, the well casing and screen will be removed. (The boreholes have no screens.) The well segments and pieces will be placed on plastic sheeting at the surface. The amount of 2% bentonite grout to fill the open borehole (either 8 in. or 10 in.) will be calculated. Tremie pipe will be installed into the open borehole to pressure grout from the bottom of the borehole to

approximately 2 ft below the ground surface. After the grout has cured, the top 2 feet of the borehole will be filled with either concrete or neat cement to ensure a secure surface seal.

2.3 SWMU 39-006(a) History

SWMU 39-006(a) consists of a septic system with inactive and active components located east and south of former building 39-2 at TA-39. The inactive portion of the septic system was constructed in 1953 and received discharges from building 39-2. The inactive portion of the septic system included an 1800-gal. septic tank (former structure 39-12), sections of drainlines, a subsurface sand filter, a chemical seepage pit, and an outfall. The septic tank was located 100 ft east of building 39-2 and was connected to a sand filter north of NM 4. The sand filter discharged to an outfall south of NM 4 in North Ancho Canyon. In 1973, the septic tank was enlarged, a new subsurface sand filter was installed on the south side of NM 4, and use of the old sand filter was discontinued. By 1978, the new sand filter south of NM 4 became clogged and was redesigned and replaced. In 1985, the original septic tank (former structure 39-12) was abandoned in place; the septic tank was emptied and filled with sand, and the drainline was rerouted through the abandoned septic tank to a new 2500-gal. concrete septic tank (structure 39-104), which discharged via a drainline to a new sand filter installed south of NM 4 (replacing the sand filter in the location south of NM 4 for the second time). Septic tank 39-104, the new sand filter south of NM 4, and the still active drainlines are part of SWMU 39-006(a) active components. In 1989, the outlet from the new sand filter was plugged, eliminating the discharge to the outfall.

Photographic processing chemicals from building 39-2 were routinely discharged to former septic tank 39-12, eventually causing the septic tank to malfunction. To correct the problem, a seepage pit was installed directly north of former septic tank 39-12 in 1973 to manage the photographic processing chemicals. The seepage pit handled approximately 75 gal./yr until 1992. The chemical seepage pit consisted of an open pit approximately 12.0 ft deep and filled with cobble. A corrugated metal pipe approximately 1 ft in diameter ran vertically through the center of the seepage pit. The inactive septic tank (former structure 39-12), inactive chemical seepage pit, and the original sand filter were removed during 2009 Phase I Consent Order field investigation activities.

2.3.1 SWMU 39-006(a) Sampling Preferred Alternative Scope

Subsurface samples will be collected using hand augers. For any sample locations that are proposed to be collected beneath existing drainlines, manual potholing will be conducted to expose the drainline. A hand auger will then be used to collect the sample from below the drainline.

Four subsurface samples will be collected from two previously sampled locations (locations 39-604869 and 39-604871) at the former chemical seepage pit, extending the depth at each sample location to define the vertical extent of contamination. Samples will be collected from one depth interval 2 ft below and from one depth interval 10 ft below the deepest interval previously sampled at these two sample locations.

Two subsurface samples will be collected from one previously sampled location (location 39-604877) at the former septic tank, extending the depth at this sample location to define the vertical extent of contamination. Samples will be collected from one depth interval 2 ft below and one depth interval 10 ft below the deepest interval previously sampled at this sample location.

Six subsurface samples will be collected from three previously sampled locations (locations 39-604885, 39-604887, and 39-604888) at the former sand filter, extending the depth at each sample location to define the vertical extent of contamination. Samples will be collected from one depth interval 2 ft below

and one depth interval 10 ft below the deepest interval previously sampled at these three sample locations.

A total of 80 subsurface samples will be collected from 20 locations at the inlet and outlet of the former sand filter, inside the former sand filter, and as step outs from the former sand filter. Samples will be collected at 4 depths (3–4, 6–7, 9–10, and 14–15 ft bgs). A total of 9 subsurface samples will be collected from 3 locations along the drainline between former building 39-2 and the former chemical seepage pit. Samples will be collected at 3 depths (0–1, 2–3, and 4–5 ft below the bottom of the drainline).

A total of 75 subsurface samples will be collected from 25 locations along inactive drainlines for the septic system serving former buildings. Locations are at each end of the drainline, at fittings, and every 50 ft along the drainline. A total of 42 subsurface samples will be collected from 14 locations at the two former outfalls. At each outfall, 1 location will be at the outfall and 6 locations will be in 5-ft step outs downgradient. Samples will be collected at 3 depths (0–1, 4–5, and 9–10 ft bgs).

2.4 SWMU 39-010 History

SWMU 39-010 is an area previously used for staging soil excavated during the 1978 construction of a firing site at TA-39. During construction of the firing site, large quantities of soil were removed and deposited in the canyon east of the firing site, creating SWMU 39-010. The site has been inactive since 1978.

2.4.1 SWMU 39-010 Sampling Preferred Alternative Scope

Subsurface samples will be collected using hand augers, small mechanical augers (i.e., Little Beaver post hole digger, or equivalent) or a small track-mounted direct push rig with a split-spoon attachment.

A total of 20 subsurface samples will be collected from 4 previously sampled locations (locations 39-604426, 39-604432, 39-604433, and 39-604442) extending the depth at each sample location to define the vertical extent of contamination. Samples will be collected from 5 depth intervals below the deepest interval previously sampled at these 4 sample locations (4–5, 6–7, 9–10, 14–15, and 19–20 ft bgs). The work plan (LANL 2007) had prescribed taking deep samples at these locations at depth intervals of 2–3 ft and 9–10 ft below the interface of fill and alluvium. This interface is not likely to be readily interpretable in the field, especially if hand-auger technology is used. The maximum thickness of the soils piles is on the order of 10 ft. This project is specifying sample depths that will be below the interface and reduce ambiguity in the field. A total of 49 surface and subsurface samples will be collected from 7 locations across the SWMU. Samples will be collected at 7 depths (0–1, 2–3, 4–5, 6–7, 9–10, 14–15, and 19–20 ft bgs). A total of 140 surface and subsurface samples will be collected from 28 locations across the site and extending west towards Ancho Road and east along the alluvial terrace, and from 1 location downgradient of the site in the main drainage channel. Samples will be collected at 5 depths (0–1, 2–3, 4–5, 6–7, and 9–10 ft bgs).

Preliminary risk calculations using analytical data from the 2009 Phase I Consent Order field investigation activities indicate potentially unacceptable ecological risk to the earthworm and to the generic plant, predominantly driven by copper, mercury, barium, and manganese. One previous sample location (39-604426) had uranium-238 that exceeded the residential screening action level (SAL). No other previously sampled COPCs exceeded soil screening levels or SALs. Some portion of SWMU 39-010 is anticipated to require remediation although that activity is not covered in this proposal or assessment. The additional samples collected during implementation of this plan, and subsequent risk calculations, will determine the extent of remediation necessary.

3.0 FLOODPLAIN IMPACTS

Ground disturbance activities will occur during sampling and well/borehole abandonment. The negative short-term impacts to the floodplain will be from ground disturbance throughout the duration of the project (May 2022 through May 2023).

No negative, long-term impacts are expected for the work at SWMUs 39-001(a) and 39-010. The work at these SWMUs is not in a defined water flow channel and the scope of the work will not leave any permanent disturbance to the floodplain. The project will not impact any buildings or parking areas, and the samples and well abandonment will not increase the potential for erosion, sediment transport, or flooding following completion of the project. No impacts to lives or property associated with the floodplain disturbance are anticipated.

No negative, long-term impacts are expected for the work at SWMUs 39-001(b) and 39-006(a), but the proposed work will occur at least partially in a defined water flow channel for Waters of the United States (WOTUS). For this reason, Clean Water Act Section 404 Nationwide permits and Section 401 permits will be acquired to cover any work that potentially disturbs sedimentation in the WOTUS. Any disturbance will be minimized and remediated after work is complete. The project will not impact any buildings or parking areas, and the samples and well abandonment will not increase the potential for erosion, sediment transport, or flooding following completion of the project. No impacts to lives or property associated with the floodplain disturbance are anticipated.

Long-term, positive impacts to the floodplain are expected from better characterization of type and extent of contamination at SWMUs 39-006(a) and 39-010, which will allow for containment and remediation strategies to be developed appropriate to findings. The plugging and abandonment of wells/boreholes at SWMUs 39-001(a) and 39-001(b) will eliminate potential conduits for surface contamination to enter a well/borehole and contaminate the subsurface.

Negative, short-term impacts from the project will be mitigated and minimized by the implementation of the following best management practices for work in floodplains during construction. Anticipated best management practices include the following:

- Any disturbed areas outside of the identified project areas will be revegetated or stabilized using an appropriate method. Approved stabilization methods include revegetation with native seed mix and planting within 30 days or at the beginning of the growing season after construction is complete.
- Hazardous materials, chemicals, fuels, and oils will not be stored within the floodplain.
- Work in a floodplain will not take place when the soil is too wet to adequately support equipment.
- Equipment will be refueled at least 100 ft from any drainage, including dry arroyos.

Compliance with the Migratory Bird Treaty Act restricts vegetation removal during the peak bird breeding season, May 15 through July 31, unless Newport News Nuclear BWXT-Los Alamos, LLC, biological resources subject matter experts have conducted a nest check to ensure that there are no nesting birds present. If active nests are found, the nest tree or shrub will be left in place until nesting is complete. Any bollards or open pipes will be capped to ensure birds are not caught inside.

4.0 ALTERNATIVES

The only alternative evaluated for floodplain impacts was a no-action alternative. The no-action alternative would prevent sufficient data from being gathered to determine nature and extent of contamination for four of the remaining sites in the North Ancho Aggregate Area. Without nature and extent data it is impossible to assess risk to human health and the environment and any necessary remediation needed to address that risk. In addition, the wells/boreholes that are not correctly plugged and abandoned provide the potential for surface contaminants to penetrate further into the ground.

Proposed sampling locations were identified for each site based on engineering drawings, surveyed locations of existing structures, previous sampling locations, and topography or other features identified in the field, such as drainage channels and sediment accumulation areas. The need to thoroughly characterize extent and type of contamination for known historical structures and activities necessitated the proposed sampling plan. Similarly, the capping and abandonment of wells are constrained by location and engineering requirements. Due to the risks to human health and the environment from potential uncharacterized waste, the no-action alternative was not selected.

5.0 CONCLUSIONS

This project will not result in long-term, adverse impacts to the floodplain. Temporary disturbance within the floodplain will cease following completion of activities in May 2023. Best management practices will be implemented to minimize and mitigate any impacts to the floodplain. This proposed project will not significantly modify existing elevations and flow paths within the floodplain upstream or downstream of the project sites. Therefore, post-project conditions will not significantly deviate from pre-project conditions or result in other long-term, negative impacts to the floodplain and its functionality. No impacts to lives and property associated with floodplain modifications are anticipated.

EM-LA will take into account all substantive comments received on this floodplain assessment before executing the proposed action. In accordance with 10 CFR Part 1022, and before implementing the proposed action, EM-LA will provide a Statement of Findings to state, tribal, and local governments, and other public stakeholders who submit comments on the proposed floodplain action. This statement will include a brief description of the proposed project, an explanation of why it is located in a floodplain, the alternatives considered, a statement indicating if the project activities conform to state and local floodplain requirements, and a brief description of the steps to be taken to minimize potential harm within the floodplain.

6.0 REFERENCES

LANL (Los Alamos National Laboratory), December 2007. "Investigation Work Plan for North Ancho Canyon Aggregate Area, Revision 1," Los Alamos National Laboratory document LA-UR-07-8272, Los Alamos, New Mexico. (LANL 2007)

LANL (Los Alamos National Laboratory), January 2010. "Investigation Report for North Ancho Canyon Aggregate Area, Revision 1," Los Alamos National Laboratory document LA-UR-10-0125, Los Alamos, New Mexico. (LANL 2010)

LANL (Los Alamos National Laboratory), January 2018. "Accelerated Corrective Action Report for North Ancho Canyon Aggregate Area," Los Alamos National Laboratory document LA-UR-17-31388, Los Alamos, New Mexico. (LANL 2018)

N3B (Newport News Nuclear BWXT-Los Alamos, LLC), January 2022. "Field Implementation for North Ancho Canyon Aggregate Area Phase II Investigation," Newport News Nuclear BWXT-Los Alamos, LLC, document EM2021-0842, Los Alamos, New Mexico. (N3B 2022)

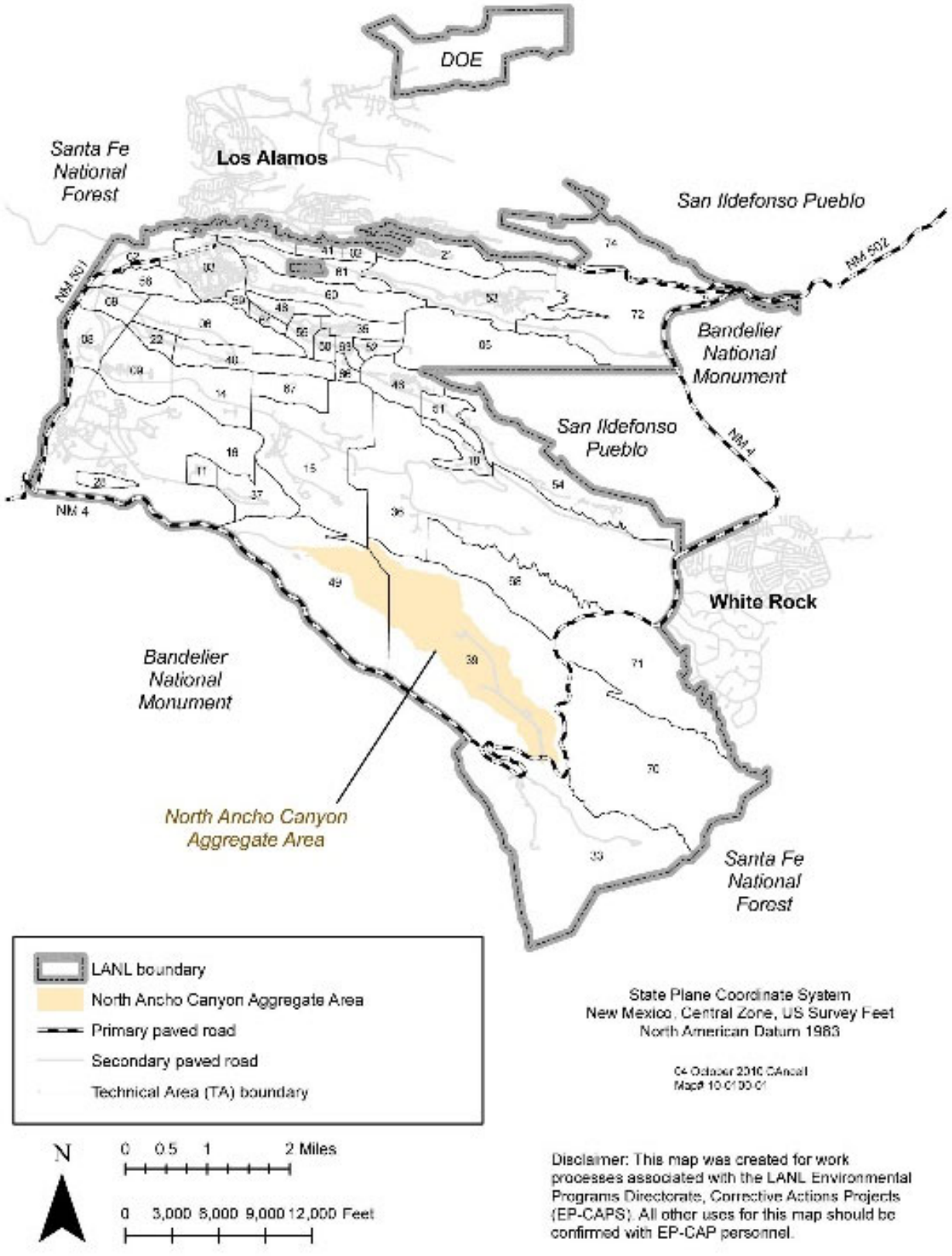

Figure 1: Location of North Ancho Canyon Aggregate Area with respect to surrounding landholdings

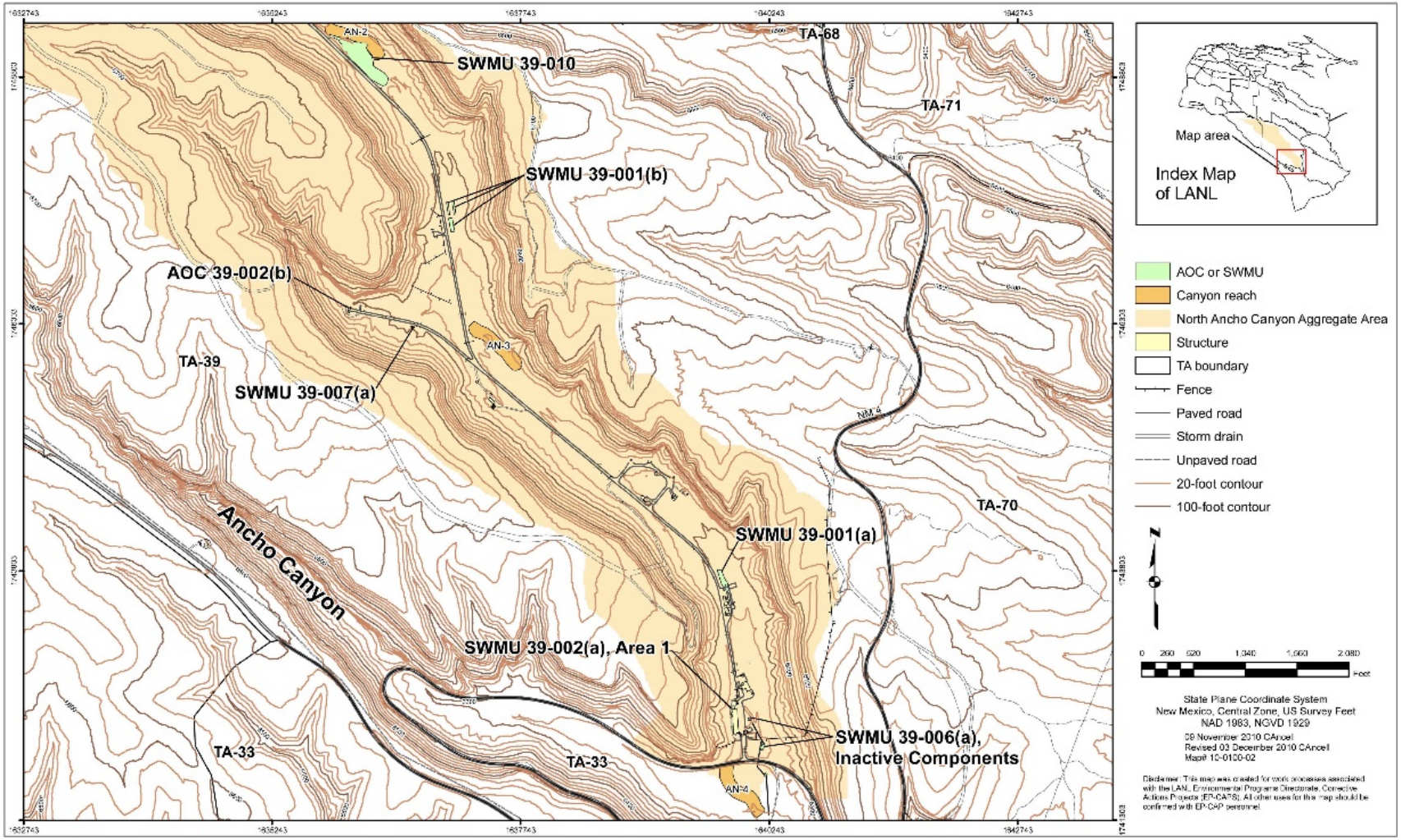

Figure 2: Location of remaining SWMUs and AOCs to be investigated in North Ancho Canyon Aggregate Area

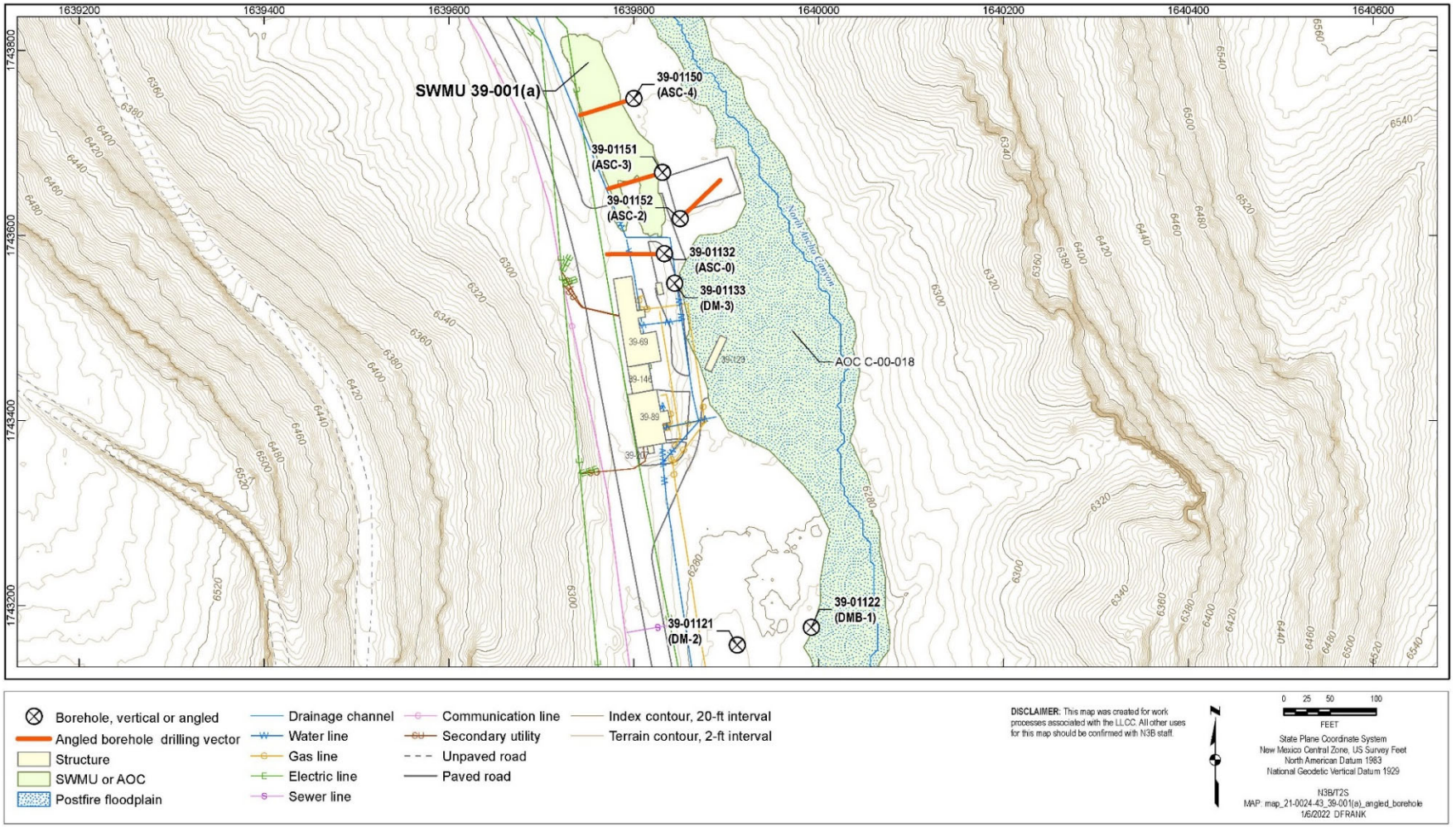

Figure 3: SWMU 39-001(a)

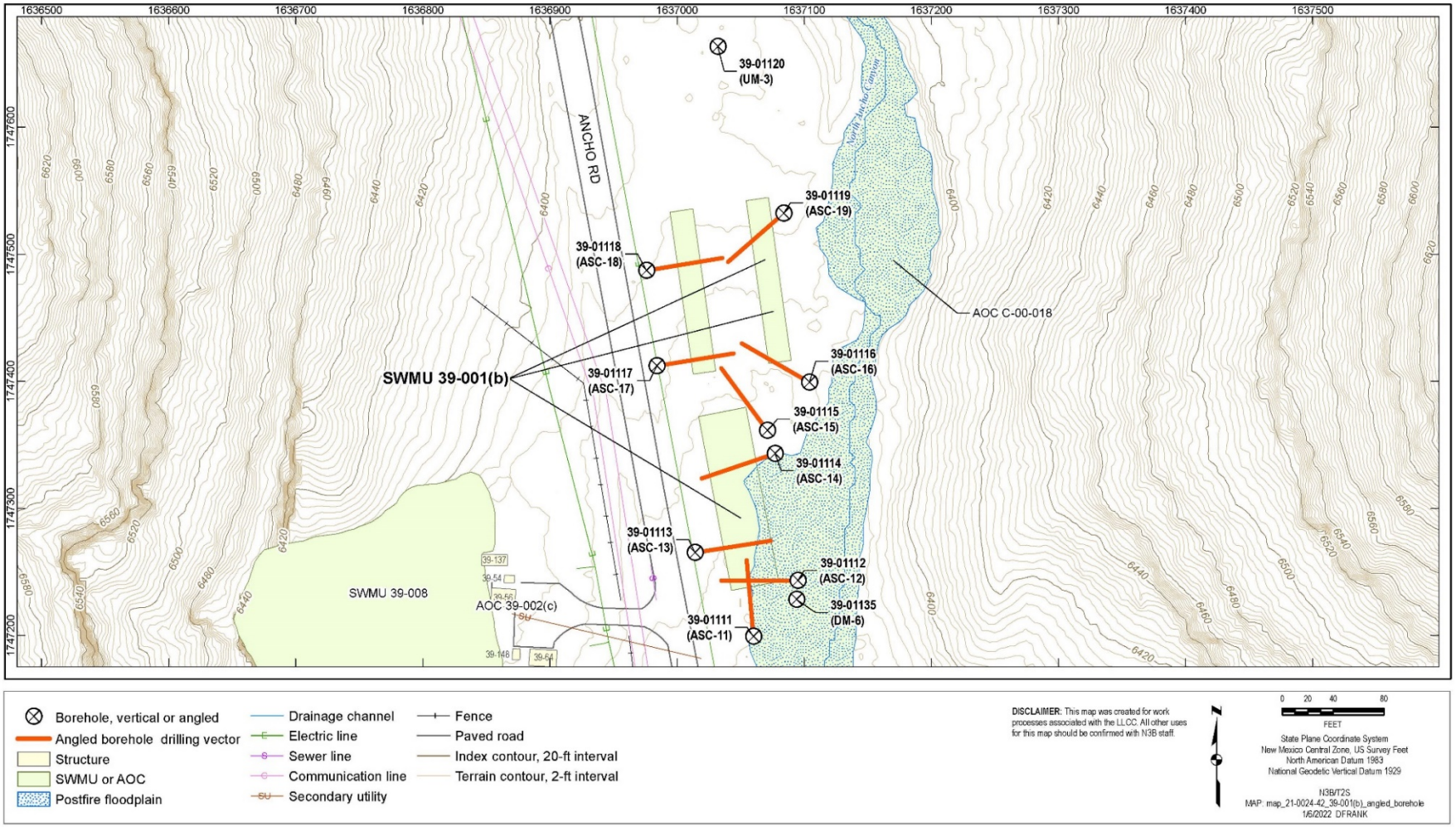

Figure 4: SWMU 39-001(b)

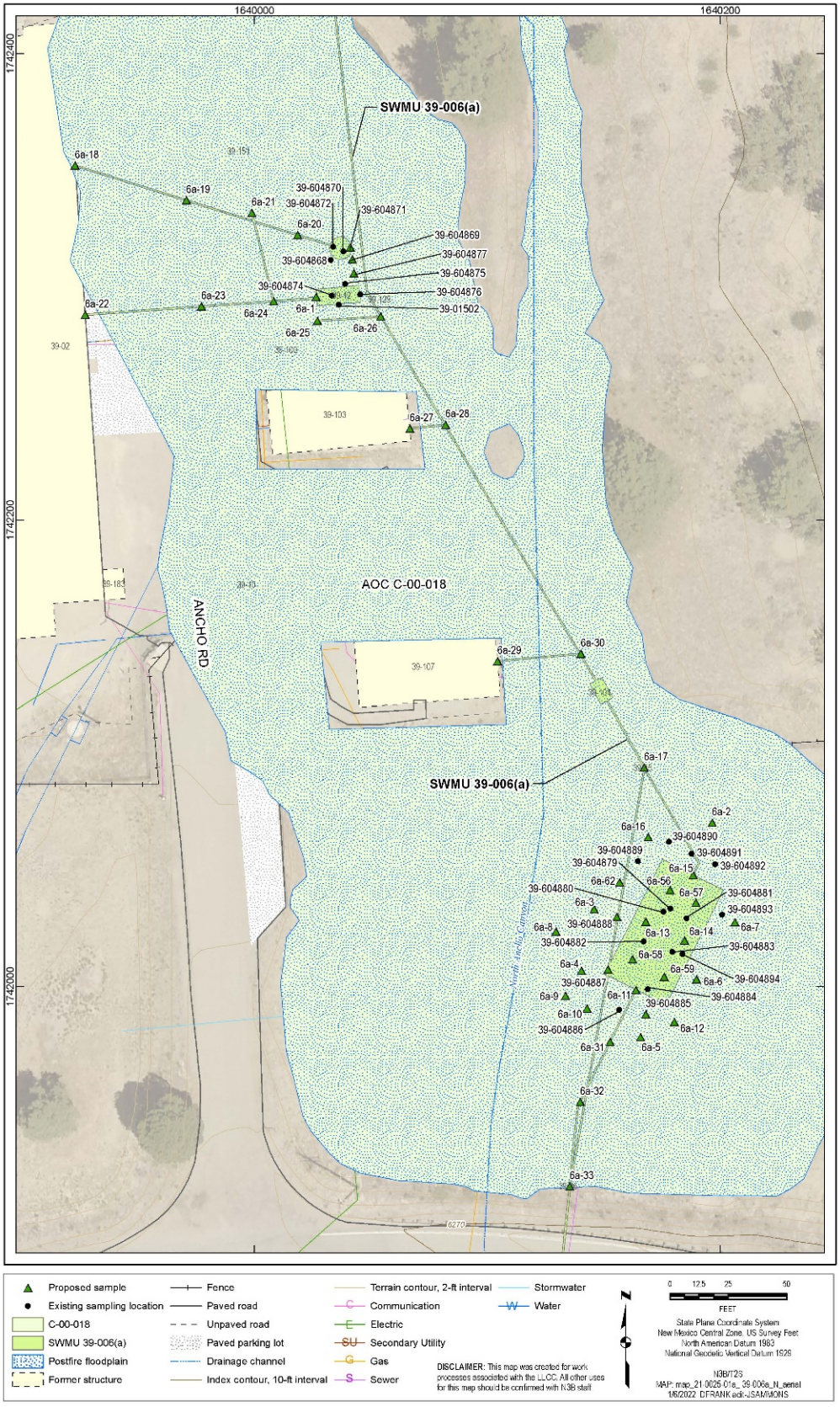

Figure 5: SWMU 39-006(a) north

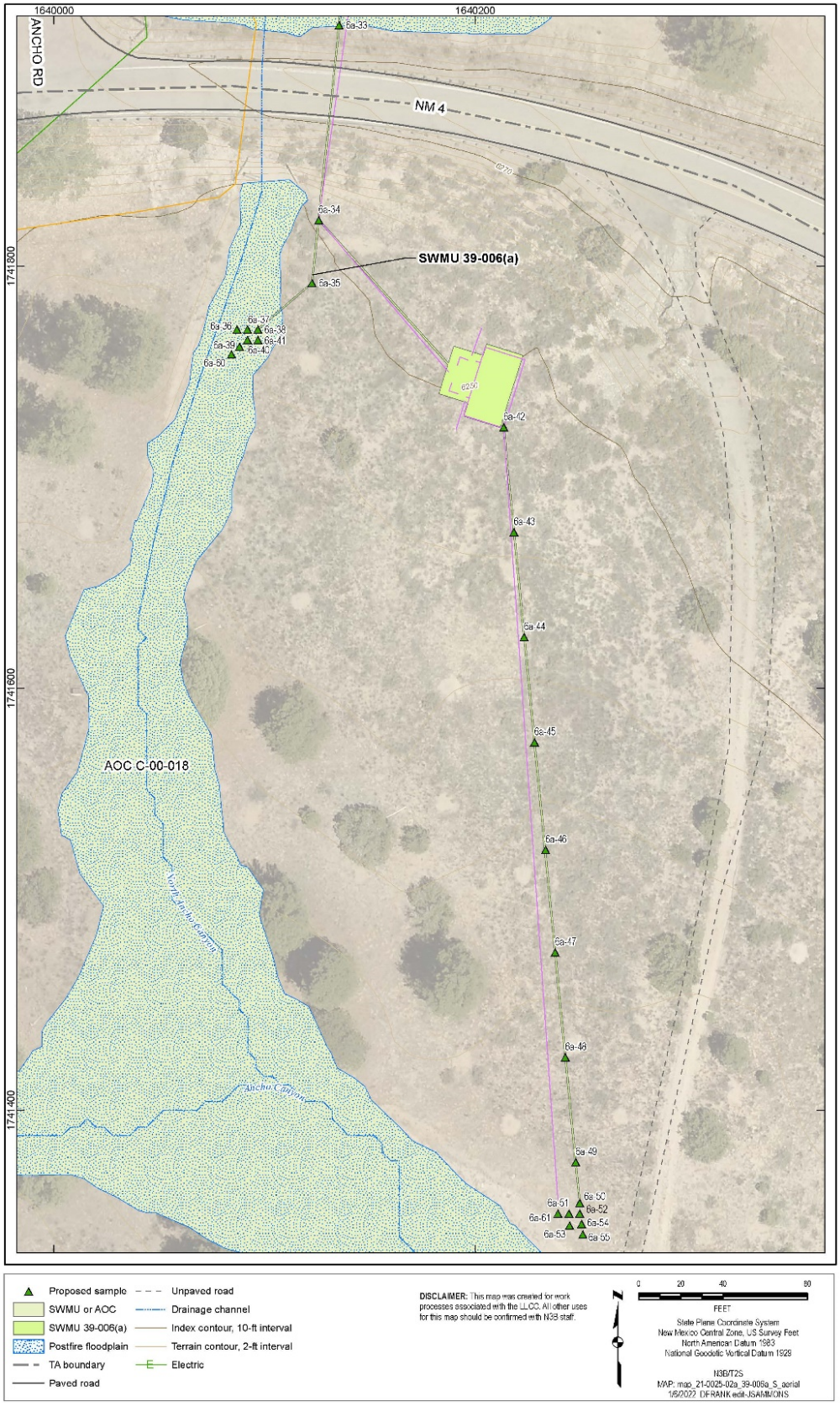

Figure 6: SWMU 39-006(a) south

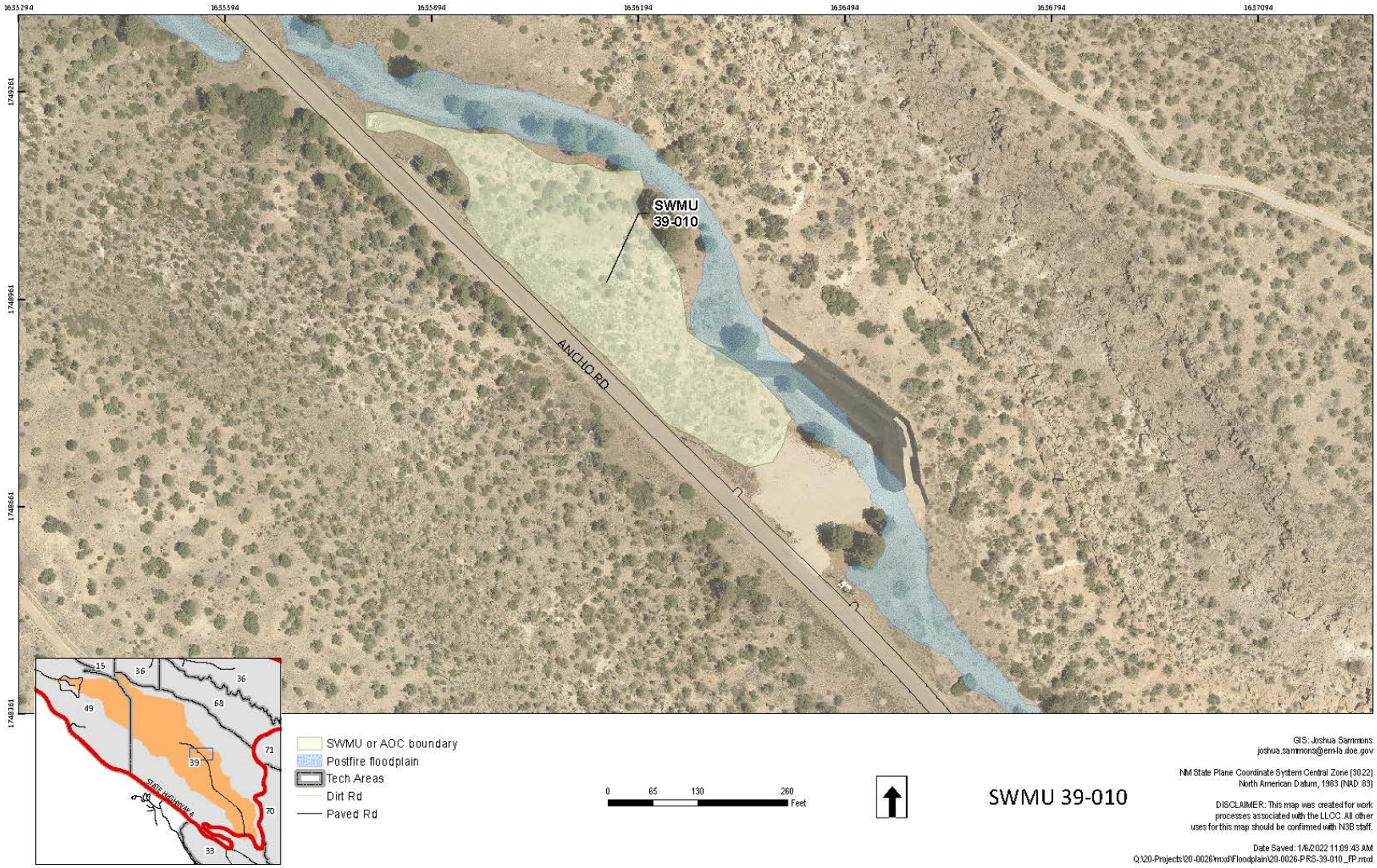

Figure 7: SWMU 39-010