Environmental Assessment
Yankee Canyon Coal Mine Safeguarding Project Colfax County, New Mexico

Prepared for

New Mexico Energy, Minerals, and Natural Resources Department
Abandoned Mine Land Program

Prepared by

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DB21.1363

August 21, 2024

Table of Contents

List of Figures

List of Tables

List of Appendices

1. Introduction

Daniel B. Stephens & Associates, Inc. (DBS&A) has prepared this environmental assessment (EA) for the proposed Yankee Canyon Safeguard Project (herein referred to as the Proposed Project or Proposed Action).

1.1 Summary of Proposed Project

The New Mexico Energy, Minerals, and Natural Resources Department (NMEMNRD) Abandoned Mine Land (AML) Program, in partnership with the U.S. Department of Interior, Office of Surface Mining Reclamation and Enforcement (OSMRE), is proposing to safeguard hazardous abandoned mine features throughout the Yankee Canyon area (Project Area) located near the City of Raton, Colfax County, New Mexico (Figure 1). Coal was first discovered in the Raton region in 1821, but full-scale mine production did not begin until the arrival of the railroad in 1879 (AML, 1998). Mine production in the Sugarite and Yankee Canyon area began in the 1870s, eventually shutting down in the early 1940s after the rail lines ceased operation and the town of Yankee was dismantled.

The Project Area consists of private land and land administered by the New Mexico State Land Office (SLO) (Figure 2). The Proposed Project is needed as a result of the numerous historical mining features that pose a threat to public safety and may also represent environmental hazards.

The Proposed Project focuses on safeguarding and repairing the most dangerous mining hazards in the Project Area, specifically a section of County Road A-25 where it passes through the Project Area. Safeguarding measures would include the investigation and repair of subsidence on County Road A-25, stabilization of steep slopes on coal gob piles, and construction of structural barriers designed to restrict human access to mine openings. Gates, cupolas, or other wildlife-compatible barriers would be installed site-wide where the dangerous features are located.

Existing roads would be used wherever possible to access the mine features proposed for closure. Construction staging areas would be located near existing roads in areas that are already disturbed.

1.2 Project Location

The Proposed Project is located approximately 8 miles northeast of Raton, New Mexico, within Colfax County, north of NM Highway 72 on the east- and south-facing slopes of Horse Mesa below the mesa rim down to near the bottom of Yankee Canyon (Project Area) (Figures 1 and 2). County Road A-25 crosses the Project Area as it traverses the canyon bottom at County Road A-27 to the top of Horse Mesa.

The Project Area is located within Township 31 N, Range 24 E, Sections 1 and 2, and Township 32 N, Range 24 E, Sections 35 and 36, as shown on the Yankee, NM, 7.5 minute U.S. Geological Survey (USGS) topographic quadrangle (Figure 2).

1.3 Purpose and Need for Proposed Project

The purpose of the Proposed Project is to safeguard against the hazards associated with historical mining features—including adits, shafts, subsidence features, and other mine openings—throughout the Project Area and with a special focus on County Road A-25. The purpose of the Proposed Project also includes reclaiming coal waste piles. All safeguarding measures would be taken while preserving cultural resources and wildlife habitat to the extent possible.

The unpaved County Road A-25 appears to be experiencing a loss of bearing capacity due to historical mining activity in the area. Based on evidence of subsidence observed and documented in the road, the Colfax County Road Department has temporarily closed the road due to dangerous, unstable conditions for vehicle passage in this area. There is therefore a need to stabilize the road where subsidence has been observed, and to thoroughly investigate and repair all potential areas of subsidence along the roadway. There are other areas of unprotected mine features throughout the Project Area that are hazardous and yet remain accessible to the public. Mine safeguarding is needed to reduce or eliminate these safety hazards. In addition, the coal waste gob piles located throughout the Project Area are exposed to weathering and erosion that can lead to leaching of coal waste into nearby waterways. Therefore, reclamation of the gob piles is also needed.

1.4 Project History/Background

The Surface Mining Control and Reclamation Act (SMCRA), enacted on May 2, 1977 (amended in 2006), created the nationwide AML reclamation program. It places fees on active coal mines to fund the reclamation of coal mines abandoned before 1977. OSMRE distributes funds to the

state and tribal abandoned mine land programs, which rank abandoned mine land problems on a priority scale of 1 to 3 (P1, P2, and P3) as defined by federal law. High priority (P1 and P2) indicates a need for the protection of public health and safety from the adverse effects of coal mining practices prior to 1977, including restoration of land, water, and the environment, and mine pollution problems ranked 1 and 2 are addressed first. Yankee Canyon is characterized by a variety of all three priority categories, including P1 for the road subsidence hazard, P2 for gob piles associated with a dangerous opening (i.e., adit), and P3—the lowest danger category—covering the waste/gob piles not associated with other features.

The Yankee Canyon Project Area encompasses a total of approximately 580 acres, consisting of about 300 acres of private land and approximately 280 acres of land administered by the New Mexico SLO. Mining operations first started in the Raton area in the late 1870s and quickly expanded with the arrival of the railroads in the early 1900s. Coal mining spread throughout the region, and towns such as Sugarite and Yankee were established for miners and their families. As other energy sources such as oil and gas became prevalent, the need for coal dropped. The coal mines of the area declined and by the late 1930s to early 1940s, coal production ceased and towns such as Yankee were shut down and disassembled.

The Project Area and surrounding region have largely remained rural, with ranching and hunting as the main economic drivers. Sugarite Canyon State Park, established in 1985, is located on the west side of Horse Mesa. It has supported recreational opportunities for hunting, fishing, boating, camping, and hiking for decades (McLemore, 2010).

1.5 Project Decision

This EA for the Proposed Project was prepared in accordance with the National Environmental Policy Act of 1969 (NEPA) (42 U.S.C. 4321, et seq.) and Council on Environmental Quality (CEQ) guidelines (40 CFR 1500-1508), which require a systematic, interdisciplinary approach to project planning and implementation and emphasize that the environmental impacts of federally funded projects be seriously considered in the decision-making process.

DBS&A prepared this EA for the AML Program to evaluate the environmental consequences of implementing the Proposed Project and project alternatives. A public meeting introducing the project was conducted on March 9, 2023, and input on the project was solicited. A second public meeting took place on June 8, 2023, at which time a draft of the EA was made available to the public for review, comment, and consideration. The AML Program is seeking a finding of no significant impact (FONSI), which will be prepared describing the findings of the analysis in the

final EA. As the federal lead, OSMRE will be the Deciding Official for the Proposed Project as the signatory on the FONSI.

In September 2023, the U.S. Fish and Wildlife Service (USFWS) notified the AML Program of the need to consider potential project impacts to the tricolored bat (*Perimyotis subflavus*), proposed for listing under the Endangered Species Act (ESA) (MacPhee, 2023). The draft EA was amended in May 2024 to incorporate information about the status, distribution, and natural history of that species, together with an impact analysis. An amended biological assessment/biological evaluation (BA/BE) was also sent to USFWS on November 20, 2023 pursuant to Section 7 of the ESA. On January 29, 2004, USFWS issued a letter of concurrence for an effect determination for the Proposed Action of "*may affect, not likely to jeopardize*" for the tricolored bat.

1.6 Relevant Statutes and Regulations

The Proposed Project does not conflict with any known state or local planning or zoning ordinances. It is required to conform and comply with the following applicable and relevant regulations and statutes:

- American Indian Religious Freedom Act of 1978 (42 United States Code [USC] 1996)
- Archaeological Resources Protection Act (ARPA) of 1979 (16 USC 470)
- Clean Air Act (CAA) of 1972, as amended (42 USC 7401 et seq.)
- Clean Water Act (CWA) of 1972, as amended (33 USC 1251 et seq.)
- ESA of 1973, as amended (16 USC 1531 et seq.)
- Environmental Justice (Executive Order [EO] 12898)
- Floodplain Management (EO 11988)
- Invasive Species (EO 13112)
- NEPA of 1969, as amended (42 USC 4321 et seq.)
- Regulations for Implementing the Procedural Provisions of NEPA (40 CFR 1500 et seq.)
- Migratory Bird Treaty Act (MBTA) of 1918, as amended (16 USC 703–712)
- National Historic Preservation Act (NHPA) of 1966, as amended (16 USC 470 et seq.)
- National Pollutant Discharge Elimination System (NPDES), as amended (33 USC 1251 et seq.)
- Native American Graves Protection and Repatriation Act (NAGPRA) of 1990 (25 USC 3001 et seq.)
- Protection and Enhancement of the Cultural Environment (EO 11593)

- Protection of Wetlands (EO 11990)
- Secretarial Order 3206, American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act

2. Proposed Action and Appropriate Alternatives

2.1 No Action

The No Action alternative would not allow for proposed safeguarding activities to protect the general public from the hazards associated with historical mining features—including adits, shafts, subsidence features, and other mine openings, in addition to gob piles—located throughout the Project Area.

The No Action alternative does not satisfy the Proposed Project's purpose and need because it does not allow for the following:

- Protection of public health, safety, general welfare, and property from extreme danger resulting from the adverse effects of past mineral mining practices
- Protection of public health, safety, and general welfare from adverse effects of past mineral mining and processing practices that do not constitute an extreme danger

2.2 Proposed Action

The Proposed Action is designed to investigate and mitigate hazardous mine features (Figure 3) in the Project Area, including a section of County Road A-25 where subsidence features (tension cracks) have been identified. The scope of work also includes safeguarding of other related hazardous mine openings and features identified throughout the Project Area, while allowing for open access and continued use of underground habitat by smaller wildlife species, including bats. The following safeguarding measures are being evaluated for implementation in priority areas:

- *County Road A-25:* Geotechnical exploration and backfilling through drilling and injection of a water, sand, and cement grout mixture are proposed to mitigate subsidence impacting County Road A-25. Voids that are identified beneath and adjacent to the County Road A-25 alignment would be mapped then injected with the grout mixture. The grouting work may take place concurrently with the drilling investigation. The goal of the grout injection is to

stabilize the road and prevent additional subsidence in the area. The drill holes would be spaced every 30 feet along the County Road A-25 alignment, with an increased drilling density of every 20 feet around the existing subsidence features.

- *Gates:* Gates would be installed over mine shafts and in mine adits or portals, as well as in other mine entryways where they are determined to be the best method for blocking access to mine features. The gates would be designed in accordance with the latest industry standards and would be modified as necessary to fit the specific entryway, occasionally using steel culverts to support them. The basic gate design generally used consists of a vertical to horizontally placed flat grid of welded steel cross bars anchored in place over the mine entryway. The cross bars would be oriented horizontally and welded onto vertical supports spaced widely. Spacing of the horizontal cross bars would be 6 inches, designed to allow passage of bats in flight, as well as access for other small mammals and for birds, but not spaced widely enough to allow human entry. Gates are typically constructed of 2-inch by 4-inch and 2-inch-square tubular weathering steel that is anchored into the surrounding rock using 1-inch steel rods. Gates are designed to not inhibit air flow into or out of the mine feature and constructed of angled steel oriented with the apex up to maximize the airflow through the gate.

  The gates would be installed at all features identified for closure that have been surveyed by Bat Conservation International (BCI) and documented for historical purposes (Okun, 2023). Closure and construction timing would be in accordance with the recommendations of BCI. Any recommendations, such as pre-construction wildlife surveys, resulting from the BA/BE conducted in the Project Area (DBS&A, 2023) would be followed.

- *Rock/concrete bulkhead with culvert gate:* At some locations, gates would consist of a bulkhead constructed of a 2- to 4-foot-thick section of rocks cemented together with concrete; a 3- to 4-foot steel culvert with a steel gate would be constructed inside.

- *Cupolas:* Cupolas are a type of gate designed to fit over a vertical mine shaft if it is determined to be an appropriate measure for safeguarding a feature in the Project Area. Locations and construction timing would be in accordance with the recommendations of BCI and pre-construction surveys of wildlife usage of mine features.

- *Backfill:* Mine openings may be backfilled with adjacent coal gob or waste rock piles.

- *Other structural closures:* Polyurethane foam (PUF) plugs and other structures may be used to safeguard mine openings.

- *Coal Gob Pile Reclamation:* Stabilization of steep slopes on coal gob piles may be needed to prevent mine waste from entering adjacent ephemeral stream channels. Work may include in situ burial of coal gob, establishment of vegetation, and installation of various erosion control structures on the gob piles as necessary to facilitate effective stormwater management.

Photographs representing examples of the mine safety features being considered as part of the Proposed Project are included in Appendix A. Implementation of the Proposed Project is anticipated to begin at the earliest in fall 2023. The Proposed Project ground disturbance footprint would be focused on the hazardous mine features identified throughout the Project Area. Colfax County Roads A-25 and A-26 would serve as the main access roads, along with former two-track, unpaved mine roads that would serve as access for geotechnical drilling activities and to access other areas situated away from the county roads. Existing disturbed and flat areas adjacent to the road may also be used for geotechnical drilling activities and staging of drilling, construction equipment, and materials.

The Proposed Project would be implemented in two phases. During the first phase, the road would be repaired and the adits located nearest the road would be closed. During Phase 2, all other mine openings would be closed, and gob piles would be reclaimed on at least SLO lands. Gob piles on private lands would only be reclaimed where agreement is reached with property owners.

2.3 Alternatives Considered but Eliminated from Detailed Analysis

One additional alternative was identified for the Yankee Canyon area early in the planning process. It would consist of safeguarding all of the mine features of the 580-acre Project Area. This alternative was eliminated from detailed analysis due to the prohibitive cost of construction, especially as material supply and demand drove construction costs up over the last few years. This alternative is therefore not considered for further analysis.

Another alternative considered during early planning but later discounted consisted of only repairing the road. Under this alternative, mine openings would have continued to represent public safety hazards in the Project Area. This alternative was also not considered for further analysis.

3. Affected Environment

3.1 General Project Setting

Outside of the small town of Raton, the area remains relatively undeveloped across the natural landscape. Land use includes livestock grazing, logging, mining, and outdoor recreational activities such as hunting, fishing, and camping. Development of the region consists mostly of scattered ranch houses, hunting lodges, and small communities. Sugarite State Park is located just west of the Yankee Canyon Project Area, and contains one of the few perennial creeks in the area.

The region is located within mid-elevation (8,000 to 10,000 feet above mean sea level [feet msl]) forests on crystalline and metamorphic substrates. It is on the edge of the lower-elevation portion of the Southern Rocky Mountains, where there is a transition from the higher-elevation forests to drier and lower plains and plateaus (Griffith et al., 2006).

The Project Area lies on the eastern and southern slopes of Horse Mesa, at elevations that range from approximately 7,150 to 8,100 feet msl. The slopes are generally steep and rugged, as the area is composed of unconsolidated alluvial and colluvium deposits. Drainages in the Project Area are ephemeral. The vegetation communities of the Project Area have been altered by wildfire, specifically the Track Fire that burned through the region in 2011. Much of the area that was formerly a mosaic of ponderosa pine, mixed conifer forest, and oak shrubland is now covered almost exclusively by Gambel's oak shrub on the side slopes of the mesa.

The mean temperatures of the area are 9°/36°F (minimum/maximum) in January and 42°/76°F in July (Griffith et al., 2006). Annual precipitation ranges from 18 to 28 inches.

3.2 Cultural Resources

3.2.1 History of Yankee Canyon

Raton's economy came to be dominated by coal mining in the late 1800s and early 1900s. Coal had been discovered on the Miranda and Beaubien Land Grant in the 1840s, but the industry did not develop in Colfax County until the arrival of the railroad allowed for easy transport. At this point, a series of company coal mining towns—usually owned by a company that also constructed railroads—developed along the lower canyons of the Sangre de Cristo Mountains, and Colfax County quickly became one of the largest coal-producing regions in the western United States. The AT&SF Railroad began coal prospecting in Dillon Canyon in 1880, and the

Raton Coal and Coke Company was established (Appendix B). Formal mining operations began in 1881, and significant settlement occurred between 1880 and 1882 at Blossburg, the first official coal camp in Colfax County and one of the oldest mining towns in New Mexico. As demand for coal increased, immigrants from Europe (particularly Italy) flocked to the area. Blossburg had 500 residents by 1885 and nearly 1,200 by 1890 (Appendix B).

Coal mining began in Yankee Canyon in 1905 and continued as late as the 1960s (Appendix B). Systematic corporate mining took place at the Yankee Mines from 1905 to 1913, with all subsequent mining conducted as small-scale family operations. Much of the following discussion is derived from Moiola (1998), who provides an excellent history of Yankee Canyon compiled from Territorial and State Mine Inspectors Reports from 1906 to 1922, a Lees (1924) summary of the Raton Coal Field, a Nickelson (1979) evaluation for the New Mexico Bureau of Mines and Mineral Resources, and other local accounts. Ranchers had mined small amounts of coal on Johnson Mesa for domestic fuel in the late 1800s, but the Llewellyn and Turner Mines established in 1901 were the first formal mines in the area. By 1905, the Yankee Mines had been established, and a joint venture by several corporate interests backed the construction of the Santa Fe, Raton, and Eastern Railroad to link the coal mining areas of Sugarite, Yankee, and Carrisbrooke to Raton (Pratt, 1986). The town site of Yankee was laid out, and it grew into a local boomtown with a post office by 1906 and as many as 2,000 residents by 1907-1908 (Moiola, 1998).

The Yankee Fuel Company constructed three mine entrances (Mines No. 1, 2, and 3), a three-rail gravity incline, tipple, ventilation furnace and fan, and other mining infrastructure 1 mile west of town. In 1906, the mine had 75 coal cars, 80 men working underground, and 30 additional workers; mules hauled coal from the underground rooms to a junction where it was loaded onto the gravity incline that carried it to the canyon below (Sheridan, 1906). In 1908, the mines operated for 228 days, employed 92 men underground, and produced 60,341 tons of coal. According to Moiola (1998), the peak years of large-scale corporate mining in Yankee Canyon were 1907-1909.

In 1909, the mine operations were suspended, and although they resumed in 1910, production began to decline and two of the entries were permanently abandoned in 1911. According to Lee (1924), all the Yankee Mines had been abandoned and were inaccessible when he visited in 1913. The New Mexico and Colorado Coal and Mining Company took over operations that year, constructed a new tipple and gravity incline, and opened new mines in the Kellogg Bed farther to the north. However, this coal bed was not as productive, and the new mines were sold to the

Superior Coal Company in 1917 and abandoned by 1921. The town of Yankee followed the fortunes of the mines, and it began losing population after 1910. The railroad line was abandoned in the 1930s, and only a few ranching families remained in the area into the 1950s. During these later periods, small-scale family mining operations continued sporadically, with some operations occasionally reopening portions of the previous Yankee Mines or developing new locations. These later, family-scale mining efforts continued until at least 1963 (Moiola, 1998), and resulted in the development of several of the mining sites documented during the current project.

The decline of Yankee Canyon mirrored developments in the broader region, as the town of Raton declined along with the coal and railroad industries after 1920. First, the construction of new railroads, including the Belen Cutoff, decreased the importance of the route through Raton as a major transcontinental freight line. Diesel began to replace coal as the primary fuel for locomotives and, eventually, most freight was carried on trucks rather than railroads. Coal production declined throughout the 1920s and Great Depression, and most of the coal camps in the region had been abandoned by the 1940s (Barrett, 2007).

3.2.2 Archaeological Resources in the Project Area

A total of 11 historic archaeological sites and 9 isolated occurrences (IOs) were discovered and documented during pedestrian survey of the Project Area (Okun, 2023) (Appendix B). The area of potential effects (APE) for the project was broadly defined by the AML Program to include 581.7 acres of land, which encompasses all areas of potential project implementation and access. All 11 sites are associated with twentieth century coal mining; four are previously recorded but were fully updated, and seven are newly discovered. No prehistoric/aboriginal resources were discovered. All documented resources were fully recorded and evaluated for eligibility to the National Register of Historic Places (NRHP) and project effects.

Based on the National Register Bulletin 15 and other resources for the of evaluation of historic mining sites, the primary considerations impacting Okun's eligibility recommendations were (1) whether a site contained habitation loci with potential for intact subsurface archaeological deposits (Criterion D) and (2) whether a site contained intact or unique mine engineering features with the ability to visually convey an association with the period of historic mining in Yankee Canyon (Criterion A). None of the sites in the Project Area have demonstrable associations with significant historical people that would qualify them for listing under Criterion B, and they do not exhibit the levels of integrity necessary to qualify as excellent examples of a unique engineering style or methods of construction (Criterion C). Overall,

mining features (including underground mine entrances and extraction pits) and supporting infrastructure (transport features, platforms, structures, and other features) in the Project Area tend to exhibit poor integrity due to material salvage efforts in the 1960s after mines were closed, past remediation (including closing of adits) in the 1980s and 1990s, and other, more gradual, forms of disturbance, such as erosion and colluvial slumping (Appendix B).

OCS also considered the eligibility determinations made by the AML Program and subsequent concurrence issued by the State Historic Preservation Officer (SHPO) in 1998 (Historic Preservation Division Log Number [No. 54930]), although all sites were reevaluated during the current project. In 1998, two sites (LA 57200 and LA 120611) were determined not eligible and two sites (LA 119817 and LA 119818) were determined eligible for listing on the NRHP under Criterion D. OCS (2023) agrees with three of these previous determinations but recommends that the eligibility status of LA 120611 be changed from not eligible to eligible under Criterion D (see discussion below). It is also possible that the collection of mining sites in the Project Area—particularly if combined with sites on the valley floor below—could qualify as a historic district, but designation as a historic district was beyond the scope of the current documentation effort and would require a broader spatial scope (Appendix B).

Of the 11 archaeological sites, 4 (LA 119817, LA 119818, LA 120611, and LA 202929) are recommended as eligible for listing on the NRHP under Criteria A or D, and 7 (LA 57200, LA 202927, LA 202928, LA 202930, LA 202931, LA 202932, and LA 202933) are recommended as not eligible for listing on the NRHP due to a lack of integrity and/or historic significance. As a general rule, the 7 sites recommended as not eligible are simple mines that date to the later periods of small-scale mining, lack habitation loci with subsurface information potential, do not contain intact or unique mine engineering features, and lack complexity in their feature types (Okun, 2023) (Appendix B).

3.3 Water Resources

There are no surface waters within the Project Area. Ephemeral drainages are present, and they carry stormwater runoff from the mesa top through tributaries that eventually drain to the East Fork of Chicorica Creek in Yankee Canyon. The nearest perennial Waters of the U.S. navigable water is the Canadian River, approximately 20 miles southwest of the Project Area. The Project Area is within an area in which flood hazards are undetermined, but possible (FEMA, 2010).

Groundwater levels within the Project Area vary from a few feet below surface in the canyon bottom to more than 100 feet on the uppermost slopes and plateaus. The nearest well site to

the Project Area is located on Bartlett Mesa, west of the Project Area; the depth to groundwater at the well was measured at 100 feet (USGS, 2023). This well is likely not representative of the Project Area, as it is on a different mesa at least 3 miles away. The depth would not factor in the topography of mesa slopes within the Project Area. Regional groundwater flow is to the south and southeast toward the East Fork of the Chicorica Creek. Water use in the area would be supplied by domestic wells.

3.4 Vegetation

General vegetation communities in the Project Area vary between north and south aspects, but the most prevalent is classified as Rocky Mountain Gambel Oak-Mixed Montane Shrubland (USGS, 2004) (Figure 4). This ecological system occurs in the mountains, plateaus, and foothills of the southern Rocky Mountains and Colorado Plateau. Representative shrublands are typically found along dry foothills, lower mountain slopes, and at the edge of the western Great Plains from 6,560 to 9,510 feet msl, and are often situated above pinyon-juniper woodlands (Figure 4). The vegetation is typically dominated by Gambel's oak (*Quercus gambelii*) alone or codominant with western serviceberry (*Amelanchier alnifolia*), Utah serviceberry (*A. utahensis*), big sagebrush (*Artemisia tridentate*), mountain mahogany (*Cercocarpus montanus*), chokecherry (*Prunus virginiana*), Stansbury cliffrose (*Purshia stansburiana*), bitterbrush (*P. tridentate*), New Mexico locust (*Robinia neomexicana*), mountain snowberry (*Symphoricarpos oreophilus*), or roundleaf snowberry (*S. rotundifolius*). This ecological system intergrades with lower montane-foothills shrubland systems, with which it shares many of the same site characteristics. Density and cover of Gambel's oak and serviceberry species often increase after fire (NatureServe, 2022).

Scattered throughout the area is Southern Rocky Mountain Ponderosa Pine Woodland, primarily on the less prevalent north-facing aspects of the area. This ecological system is a widespread foothill and montane forest, woodland and savanna group that typically occurs at the lower treeline, with grasslands or shrublands below and relatively mesic forests above. Sites are typically warm, dry, and exposed, ranging from 5,580 to 9,515 feet msl, extending down to 5,000 feet msl in its northern extent. Stands occur on a variety of landforms including bottomlands, elevated plains, cinder cones, piedmont slopes, mesas, foothills, and mountains. The ecological system can be found on all slopes and aspects, but if it occurs on south- or west-facing slopes, it is typically only at higher elevations. It is dominated by ponderosa pine (*Pinus ponderosa*) with many possible tree canopy associates depending on location, including white fir (*Abies concolor*), juniper (*Juniperus* spp.), pinyon pine (*Pinus edulis*), limber pine (*P.s flexilis*), quaking aspen (*Populus tremuloides*), and Douglas fir (*Pseudotsuga menziesii*).

Also on north-facing aspects and near the drainages of the southern parcel is Southern Rocky Mountain Montane Subalpine Grassland. This ecosystem is the prevalent classification for the top of Horse Mesa; however, there are reaches that extend into the Project Area. This ecosystem typically occurs between 7,217 and 9,842 feet msl on flat to rolling plains and parks or on lower side slopes that are dry, but it may extend up to 10,990 feet msl on warm aspects. An occurrence usually consists of a mosaic of two or three plant associations with one of the following dominant bunchgrasses: oatgrass (*Danthonia intermedia*), Parry's oatgrass (*D. parryi*), Idaho fescue (*Festuca idahoensis*), Arizona fescue (*F. arizonica*), Thurber's fescue (*F. thurberi*), and Muhly (*Muhlenbergia filiculmis*). The subdominants include blue grama (*Bouteloua gracilis*) and pine bluegrass (*Poa secunda*). These large-patch grasslands are intermixed with matrix stands of spruce-fir, lodgepole pine, ponderosa pine, and aspen forests (NatureServe, 2022).

The vegetation communities of the Project Area have been altered by the Track Fire, which burned through the area in 2011. Much of the region that was formerly a mosaic of ponderosa pine, mixed conifer forest and oak shrubland is now covered almost exclusively by Gambel's oak shrub on the side slopes of the mesa. Mixed conifer forest persists only in pockets and in the two large drainages of the area that were largely unaffected by the fire. In addition to Gambel's oak, New Mexico locust is common throughout the burned area, as is mountain mahogany.

Noxious weeds were observed during a biological survey of the Project Area on October 6 and 7, 2022 (DBS&A, 2023). One Siberian elm (*Ulmus pumila*), a Class C species, was observed at a gob pile at the southern end of the northern parcel. The elm was observed in an area that is being considered for safety measures taken as part of the Proposed Action.

3.5 Wildlife

The Project Area harbors species adapted to montane and woodland environments. During the October 6 and 7, 2022 biological survey, 31 vertebrate species were directly or indirectly recorded, including 20 species of birds, 9 species of mammals, and 2 species of reptiles (DBS&A, 2023) (Appendix C).

Townsend's solitaires (*Myadestes townsendi*), spotted towhees (*Pipilo maculatus*), and American robins (*Turdus migratorius*) were commonly heard or seen throughout the survey area. Other common birds in the area included the common raven (*Corvus corax*), Woodhouse's scrub jay (*Aphelocoma woodhouseii*), Steller's jay (*Cyanocitta stelleri macrolopha*), mountain chickadee (*Poecile gambeli*), and black-capped chickadee (*P. atricapillus*).

Evidence of mule deer (*Odocoileus hemionus),* elk (*Cervus canadensis nelsoni*), and black bear (*Ursus americanus*) presence was observed throughout the Project Area (Appendix C). Other mammals, including northern pocket gopher (*Thomomys talpoides*) and domestic cow (*Bos taurus*), appeared to be common throughout the area as evidenced by burrows, tracks, or scat. A rock squirrel (*Otospermophilus variegatus*) was observed in the bottom of the main canyon near a dirt access road in an area where dumped trash was present. It appeared that many of the larger mammals such as black bears, cows, and elk use the network of old mining roads that lead to local gob piles. These roads likely enable larger mammals to travel more easily by avoiding the dense oak brush that cover the slopes (DBS&A, 2023). Bats occupy mine features of the Project Area with three hibernating Townsend's big-eared bats (*Corynorhinus townsendii*) observed in two distinct features comprising two openings to the surface (BCI, 2021).

Two reptiles were observed within the Project Area during the survey: the prairie lizard (*Sceloporus undulatus*) and short-horned lizard (*Phrynosoma douglasii*).

BCI (2021) surveyed two unique features located within the Project Area on November 17 and 18, 2021, following standardized protocols and safety procedures. Mapping efforts focused on accessible workings to determine proximity to County Road A-25 and a known subsidence in the middle of the roadway. The field project resulted in bat surveys being conducted on two distinct features, comprising two openings to the surface. Bat habitat assessments and closure recommendations were provided for all features. Of the two unique features that received comprehensive biological surveys, one offered a "good" potential of subterranean habitat with potential for bat use, and the other offered a "moderate" such potential. Of the two features, one was recommended for bat-compatible closure during the warm season and the other was recommended for "destructive closure, warm season" (BCI, 2021).

3.6 Special Status Species

Special status species include those species that are (1) federally listed as threatened or endangered, are candidates for listing as federally threatened or endangered, or are species proposed for listing under the provisions of the ESA, and (2) species listed by the State of New Mexico as threatened or endangered.

Prior to the 2022 biological survey, the USFWS, New Mexico Department of Game and Fish (NMDGF), NMEMNRD Forestry Division, and New Mexico Rare Plant Technical Council (NMRPTC) databases were reviewed to determine potential occurrence of state or federal proposed, threatened, endangered, and candidate species in the Project Area (DBS&A, 2023)

(Appendix C). Specifically, the Information, Planning, and Consultation System (IPaC) planning tool from the USFWS (New Mexico) was used to obtain information on federally listed flora and fauna species (https://ecos.fws.gov/ipac/). The BISON-M database (http://www.bison-m.org/) was searched for state-listed fauna species. The State Endangered Plant Species List was searched for information on potential state endangered flora species within Colfax County (NMEMNRD Forestry Division [state.nm.us]).

The habitat requirements of listed species were compared to ecological conditions found in the Project Area to identify which species were likely to occur. Species considered unlikely to occur and for which suitable habitat does not exist within the Project Area, were removed from further consideration. A list of target species—those species that are likely to occur or have potential habitat within the Project Area—was developed from these comprehensive lists prior to the biological survey. The Project Area does not contain critical habitat for any federally listed threatened or endangered species (DBS&A, 2023).

Based on the BA/BE (Appendix C), the determinations in the following subsections were made for special status species.

3.6.1 Federally Endangered, Threatened, Proposed, and Candidate Species

Among all federally endangered, threatened, proposed, and candidate species analyzed in the BA/BE, only one, the tricolored bat (*Perimyotis subflavus*) was found to have the potential within the Project Area (DBS&A, 2023).

Also called the eastern pipistrelle, the tricolored bat has experienced widespread, drastic population declines during the last three decades in areas where White-nose Syndrome (WNS) is affecting cave dwelling bat species (McCoshum et al., 2023). On September 14, 2022, USFWS issued a proposed rule for the listing of the species as endangered under the ESA (USFWS, 2022). In the proposed rule, USFWS also indicated that designating critical habitat for this species was not prudent.

The tricolored bat occurs in eastern North America south to Nicaragua (McCoshum et al., 2023). At the western edge of its distribution, the species has been found in central Colorado, eastern New Mexico, and southeastern Wyoming (Geluso et al., 2005; McCoshum, 2023). During the summer, tri-colored bats are found in woodlands, where they have their maternity colonies and roost in trees (McCoshum et al., 2023). In Arkansas, all observed roosts were in tree canopies, not trunks, with half of females roosting in pine trees. Large trees and non-linear openings may

be important summer habitat features. Winter habitat includes caves, crevices, mines, bridges, buildings, and culverts (McCoshum, 2023).

3.6.2 State-Listed Species and other Special-Status Species

Of the species (fauna) listed as by the state as endangered or threatened in Colfax County, none were determined to have the potential to occur within the Project Area.

There are no state endangered plant species listed for Colfax County (NMEMNRD, 2023).

Also evaluated were important plant areas (IPAs), specific places in New Mexico that support either a high diversity of sensitive plant species or are the last remaining locations of the state's most endangered plants (NMEMNRD-Forestry Division, 2017). It was determined that there are no IPAs present in the Project Area (DBS&A, 2023). The nearest IPA is east of Raton, identified as an area of moderate significance.

3.7 Topography/Geology/Soils

3.7.1 Topography

The Project Area lies along the east and south-facing slopes below Horse Mesa at elevations that range from approximately 7,400 to 7,700 feet msl. The slopes are generally steep and rugged. The area is within unconsolidated landslide deposits and colluvium.

3.7.2 Geology

During the Laramide age (late Cretaceous and early Tertiary), orogenic episodes in northern and central New Mexico formed six structural synclinal features called basins. The Project Area is in northern New Mexico in the easternmost basin, called the Raton Basin. It is crescent-shaped, and is bordered on the west by the eastern flank of the Sangre de Cristo uplift and on the east by the Great Plains province. The Raton Basin stretches from Las Vegas, New Mexico, to northwest of Trinidad, Colorado (Cather, 2004). As uplifting of the region was taking place, the basin was filling with sediment being deposited in the Cretaceous sea that was receding eastward. Cather (2004) surmised that sediment thicknesses were affected by the rate at which sediment was deposited from the process of mountain building and erosion and no other factor (i.e., not by eustatic changes in sea level). The stratigraphy of the Raton Basin from oldest to youngest in the Project Area consists of upper Pierre Shale, Trinidad Sandstone, Vermejo Formation, Raton Formation, and Tertiary basalt (Cather, 2004; McLemore, 2010).

Streams coming off the highlands carried sand, silt, mud, and clay. The high-energy streams carried sand and larger particles forming sandstones and conglomerates when the stream lost energy near the coast of the Cretaceous sea. The material rapidly accumulated and became compacted. The finer particles were carried beyond the shore to the low-energy environment of the receding sea forming the Pierre Shale. The floodplain deposits contained organic material called peat, which turned to coal and became part of the Raton Formation that is made up of about 1,100 feet of sandstone, siltstone, mudstone, and coal (McLemore, 2010; Moiola,1998). The Raton Formation contains coal-bearing units in the Project Area ranging in thickness from a little more than 2 feet to about 5.5 feet (Nickelson, 1979 in Moiola, 1998).

The Raton Formation (TKr) is one of the three geological formations that outcrops in the Project Area (Figure 5). It dates back to the Upper Cretaceous and Paleocene age. The Vermejo Formation and Trinidad Sandstone (Kvt) also outcrop in the Project Area. The Vermejo Formation is of Upper Cretaceous age. The Trinidad Sandstone was deposited on an eastward-prograding shoreline during the final retreat of the Cretaceous sea from northern New Mexico. Landslide deposits (Ql) include unconsolidated, unsorted, chaotically mixed colluvium and rock debris formed as a result of bedrock failure. This includes rock-fall, mudflow, debris flow, scree, and talus deposits.

3.7.3 Soils

Soils other than the mined areas are almost exclusively Aridic Argiustolls-Rock outcrop association, and are found on the side slopes of mesas at elevations from 6,000 to 10,500 feet msl (NRCS, 2022) (Figure 6). Aridic Argiustoll, approximately 80 percent of the association, is a colluvium derived from igneous and sedimentary rock and/or residuum weathered from igneous and sedimentary rock. The typical profile is composed of very flaggy loam from absent to 23 inches and very flaggy clay loam from 23 to 40 inches, with clay loam beyond. Past mining activities at Yankee Canyon have directly or indirectly impacted historical native soils surrounding the mine features and associated infrastructure.

3.8 Land Use

The Project Area consists of approximately 300 acres of private land and approximately 280 acres of land administered by the SLO. It is an area that is rich in natural resources, with abundant wildlife including game species such as elk and deer. County Road A-25 is used not only by residents in the area, but also by hunters. Lands are also used for livestock grazing.

3.9 Human Health and Safety

Public safety hazards associated with historical mining features in the Project Area include subsidence along County Road A-25, which generated enough concern for the County to close the road. Hazards also include open shafts and horizontal openings resulting from underground mining. These features present serious threats to human health and safety. When many of the underground mines were abandoned, the entries into them were not adequately sealed. Unstable or open portals and shafts on the ground surface can be very hazardous. Dangers within the mines include oxygen deficiencies, flooded sections, unstable roofs, hard-to-see vertical shafts, venomous insects and snakes, and disorienting mazes of mine workings. These problems are compounded by total darkness within underground mines. For inexperienced visitors to abandoned mines, the hazards are not always apparent, posing an even greater safety risk. According to records maintained by the AML Program, numerous injuries, some of them fatal, have occurred in abandoned mines around New Mexico (Dodgson, 2015). In addition, the Project Area contains numerous coal waste gob piles. These waste piles present environmental hazards from leaching toxic materials into waterways and potential spontaneous combustion, creating fire hazards. Stabilization and reclamation would mitigate these hazards.

3.10 Socioeconomic/Environmental Justice

3.10.1 Socioeconomic Issues

The general area's population is centered in the City of Raton, approximately 8 miles southwest of the Project Area. The population in the vicinity of the Proposed Project is scattered, primarily rural ranch residences mostly centered in the former mining town of Yankee and along New Mexico Highway 72 9NM 72). The population of Raton totals 6,047, almost half of the population of Colfax County, which is 12,385. The median household income (MHI) of Raton is $34,233 (U.S. Census Bureau, 2022). Demographic data, including income and minority population data for Raton and, for comparison, Colfax County and the state of New Mexico is summarized in Table 1.

Table 1. Demographic Summary for Raton/Colfax/New Mexico

	New Mexico	Colfax County	City of Raton
Population	2,113,344	12,356	6,047
Native American (%)	11.2	3.1	1.9
Black or African American alone (%)	2.7	1.0	0.8
Asian (%)	1.9	0.8	0.0
Hawaiian/Pacific Islander (%)	0.2	0.2	0.0
White alone (%)	81.3	92.6	77.0
Hispanic or Latino (%)	50.1	49.2	57.6
Economic Data			
Median household income	$54,020	$39,483	$34,233
Percentage of population below poverty level	18.4%	18.8%	26.2%

Source: U.S. Census, QuickFacts, 2022

Economic issues evaluated in this EA include business, employment, and socioeconomic conditions. The number of low-income residents in Raton is higher than in Colfax County or New Mexico as a whole. Social issues that might be affected by the Proposed Action include temporary employment or access during construction.

3.10.2 Environmental Justice

The potential environmental justice (EJ) consequences of the Proposed Action were evaluated using the EJ View tool to generate data to determine the potential for disproportionate effects on minority and/or low-income populations (U.S. EPA, 2023a). The EJ report (Appendix D) shows that the Proposed Project area with an 8-mile radius to include Raton, does not have a higher population of people of color. However, low-income populations are higher relative to the state of New Mexico, the EPA region, and the U.S. (Table 2).

Table 2. Environmental Justice Summary for Area within 8 Miles of Proposed Project

Demographic Indicator	Area within 8 miles of Yankee Canyon	State Average	EPA Region Average	U.S. Average
People of Color	55%	63%	40%	36%
Low Income Population	50%	39%	36%	30%

Source: U.S. EPA, 2023a

4. Environmental Impacts

4.1 Cultural Resources

All four sites recommended as eligible for listing on the NRHP under criteria A or D contain habitation loci with residential masonry foundations and trash middens/artifact concentrations (Appendix B). The four eligible sites would require management during project implementation. The AML Program is currently evaluating the feasibility of engineering various safeguarding options at these mining sites, and activities may include closing mine openings with bat-compatible closures, backfilling features using on-site materials, and regrading or contouring features to facilitate appropriate drainage. Access to these features will be along existing roads. The qualifying characteristics at all four sites include the habitation loci, including masonry foundations and associated middens, privies, or artifact concentrations. Okun recommends that these portions of the sites be avoided with suitable buffers during mine remediation, and that all project activities within these sites be monitored by a permitted archaeologist.

In addition to habitation areas, intact mining infrastructure at LA 119818—including Feature 1 (fan house), Feature 2 (generator room), Feature 5 (loadout), Feature 6 (fan mount), parts of Feature 8 (tramway incline), Feature 12 (adobe administrative building), and Feature 26 (tipple complex)—should be preserved, and suitable avoidance buffers should be established around each of these features during implementation. If the adit is altered, safeguarding materials and methods that minimize intrusive visual elements and changes to the historic setting should be used. In general, it is recommended that the AML Program select safeguarding options that have the least possible impact on the visual aspects of these sites, while still accomplishing the important goal of protecting the public from the significant hazards posed by abandoned mining features. If possible, materials used to close and restrict access to dangerous features

should not obscure aboveground elements or detract from the ability of these features to convey their historic functions. Materials used should be as visually inobtrusive as possible, and materials that are consistent with the mining period should be used to the extent feasible. If these recommendations are followed, the project would have no adverse effect on these historic properties.

Under the No Action Alternative, the Proposed Project would not be implemented. There would be no impacts on any cultural resources present in the Project Area.

4.2 Water Resources

Raton Water Works obtains its raw water prior to treatment from two surface water sources: the Lake Maloya watershed in Sugarite Canyon or the Cimarron River, which is fed from Eagle Nest Lake. In the Project Area, however, there are no perennial surface waters, and all water for consumptive use in the area would be supplied by domestic wells. Groundwater levels within the Project Area vary from a few feet below ground surface in the canyon bottom to more than 100 feet on the uppermost slopes and plateaus.

There would be no negative impacts to surface water as a result of the Proposed Project. Because the Proposed Project would stabilize and reclaim coal gob piles in the Proposed Project area, the impacts would be beneficial to any surface water flows and to groundwater resources because leaching from the piles would be mitigated.

Under the No Action Alternative, groundwater and surface flows (during storms and snowmelt) could continue to be negatively impacted from leaching from the gob piles.

4.3 Vegetation

General vegetation communities in the Project Area have been altered by the Track Fire, which burned through the area in 2011. Much of the region that was formerly a mosaic of ponderosa pine, mixed conifer forest and oak shrubland is now covered almost exclusively by Gambel's oak shrub on the side slopes of the mesa. Mixed conifer forest persists only in pockets and in the two large drainages of the area that were largely unaffected by the fire. In addition to Gambel's oak, New Mexico locust is common throughout the burned area, as is mountain mahogany. Ground disturbance and vegetation removal would be minimal as they would be limited to existing roadways and around mine openings. Gob piles would be reclaimed in place and revegetated with native species such as New Mexico locust. Any vegetation that is disturbed will be reseeded with a native grass and forbs mix. Impacts to vegetation would therefore be

minimal and would be mitigated such that there would be no long-term impact as a result of the Proposed Project. In the longer term, the reclamation of gob piles would reduce the risk of spontaneous combustion and wildfire.

One noxious weed, a Siberian elm (*Ulmus pumila*), was identified at the Proposed Project. Any noxious weed disturbed around mine openings would be removed with proper disposal. In addition, all efforts will be made to limit any introduction of noxious weeds (e.g., using native seed mix certified to be weed-free). Therefore, there would be no long-term impact from the Proposed Project to the spread of noxious weeds.

Under the No Action Alternative, there would be no direct impacts on the vegetation. Gob piles would continue to pose a risk of spontaneous combustion and wildfire.

4.4 Wildlife

The Project Area harbors species adapted to montane and woodland environments (DBS&A, 2023). Surveys were conducted in two unique features for bats (BCI, 2021). Of the two unique features that received comprehensive biological surveys, one offered a "good" potential of subterranean habitat with potential for bat use, and the other offered a "moderate" level.

Wildlife conservation measures will be implemented to minimize any impacts on wildlife of the Proposed Project area. The following actions will be incorporated into the design of the Proposed Project:

- The existing roads and trails in the Project Area would be used as primary access for all vehicles.
- Secondary access would be limited to the extent possible. Once construction is completed, the disturbed areas would be reseeded with native grass and forb species.
- Existing disturbed and flat areas would be used for construction staging of all equipment and materials. The staging areas would be located on or adjacent to the existing roads and trails.
- Surveys for wildlife usage of mine features such as adits would be conducted prior to installation of safeguarding measures.
- If possible, construction activities should all take place outside of the migratory bird nesting season. If not, a pre-construction nesting survey of the Project Area would be conducted

prior to the commencement of construction. Any active nests found will be flagged for avoidance during construction activities.

The recommendations outlined by BCI will be implemented for reducing impacts to any bats from the construction of structural barriers. The 2021 report identified two unique features. Of the two features, one was recommended for bat-compatible closure during the warm season and the other was recommended for "destructive closure, warm season" BCI (2021). For mining features that are not associated with any potential bat habitat, no closure stipulations were recommended (i.e., mining features can be closed at any time by any means deemed necessary). Construction features for gates at mine entrances will be designed in accordance with BCI recommendations to allow access of bats and other small mammals and reptiles, but will not be wide enough to allow human entry. Construction will be timed consistent with BCI recommendations (BCI, 2021).

There would be no long-term impacts to wildlife with the implementation of these conservation measures.

Under the No Action Alternative, there would be no impacts on wildlife.

4.5 Special Status Species

4.5.1 Federally Listed Endangered, Threatened, and Proposed Species

Potential effects on the tricolored bat were analyzed in an amended BA/BE completed in November 2023 (Appendix C). Bat surveys of two mine openings in the Project Area resulted in detection of three hibernating Townsend's big-eared bats in Yankee Adit 1, located in the southern portion of the northern parcel (BCI, 2021). No tricolored bats were observed during the survey conducted in 2019, or during surveys aimed at detecting the species in April 2024 (BCI, 2024). However, tricolored bats have been documented roosting in northern New Mexico in semi-forested areas similar to the Yankee Canyon Project Area (MacPhee, 2023). To the extent that the tricolored bat is present in the Project Area, it would be expected to use tree roosts, but the likelihood of effects on summer roosting habitat from the actions of the Proposed Project are negligible to non-existent, as there would be minimal to no disturbance to any live trees. As an extra level of precaution, the AML Program could nonetheless avoid any project-related actions during the summer maternity season, which would also correspond to the migratory bird breeding season.

No cumulative effects on the tricolored bat are anticipated (DBS&A, 2023). No follow-up actions are planned by the AML Program beyond completion of the Proposed Project. Subsequent activities in the Project Area could include road maintenance or the installation of new signage, none of which would be expected to impact the species.

On the basis of insignificant and discountable effects, the finding of the BA/BE (Appendix C) was that the Proposed Action *may affect, is not likely to jeopardize* the tricolored bat. To minimize any risk of disturbance to the species, the project would not be implemented during the summer, also corresponding to the migratory bird breeding season. Disturbance of live trees would be minimal, and no large trees would be removed (DBS&A, 2023). The USFWS concurred with the BA/BE's effect determination for the tricolored bat in a letter dated January 29, 2024 (Appendix E).

Due to the lack of federal critical habitat, suitable habitat, or occurrence records, it was also determined that no other federally listed endangered, threatened, and proposed species were likely to occur within the Project Area (DBS&A, 2023).

There would be no impacts to the tricolored bat or any other federally endangered, threatened, and proposed species under the No Action Alternative.

4.5.2 State-Listed Species and other Special-Status Species

Of the species (fauna) listed by the state as endangered or threatened in Colfax County, none were determined to have some potential to occur within the Project Area. There are no state endangered plant species listed for Colfax County (NMEMNRD, 2023). The Proposed Project would therefore have no impact on any state listed species. There would be no impacts on state-listed and other special-status species under the No Action Alternative.

4.6 Topography/Geology/Soils

4.6.1 Topography

Spoil banks of waste rock and piles of overburden from the open pit mines are spread over the area and are near the mining features. Some of these materials would be used as backfill, precluding the necessity of bringing in backfill from outside the site. In these areas, the topography may change somewhat as the materials would be removed. However, any removal and reuse of backfill material would serve to bring the landscape back to pre-mining conditions; therefore, there would be a beneficial impact from implementation of the Proposed Action.

There would be no impacts on topography under the No Action Alternative.

4.6.2 Geology /Soils

There are no prime or unique farmland soils as defined by the Farmland Protection Policy Act in the Project Area. Soils other than the mined areas are almost exclusively Aridic Argiustolls-Rock outcrop association, and are found on the side slopes of mesas at elevations from 6,000 to 10,500 feet msl. Past mining activities have directly or indirectly impacted historical native soils surrounding the mine features and associated infrastructure, and the Proposed Project would focus only on those disturbed soils. Vehicle traffic and construction staging areas would largely remain on or adjacent to existing roads. Travel to more remote sites would use smaller equipment and would remain on existing former mine roads. There would be no lasting impact on soil or geologic resources from dust or noise caused by the relocation of the soil as backfill. Dust and wind erosion would be minimized with implementation of sediment fences, straw wattles, and other best management practices (BMPs). Therefore, there would be no impact to geology or native, undisturbed soils of the Project Area as a result of the Proposed Project.

Under the No Action Alternative, geologic formations and soils would not be impacted.

4.7 Land Use

Safeguarding measures would be implemented on county-maintained roads, private property, and state land. Access agreements would be in place prior to construction. The project would change land use by allowing for County Road A-25 to reopen following road stabilization. No other land use would change as a result of the Proposed Project. The Proposed Project would therefore have a beneficial to no impact on land use.

Under the No Action Alternative, land use would be negatively affected, as County Road A-25 would continue to deteriorate or remain closed due to subsidence risks.

4.8 Human Health and Safety

The Proposed Project would mitigate the hazards of the former Yankee Mine. Impacts to health and safety from the Proposed Project would therefore be beneficial.

The No Action alternative would not address any of the hazards related to the mine features of the Project Area. No work would be conducted to stabilize County Road A-25, and none of the mine features would be safeguarded. No coal gob pile reclamation would take place. Thus, public safety hazards would continue to be present in the Project Area.

4.9 Socioeconomic/Environmental Justice

4.9.1 Socioeconomic Issues

Implementation of the Proposed Action would result in a short-term positive and direct economic impact due to the creation of construction jobs and additional local spending and revenue during construction. There would also be a long-term positive direct impact from the implementation of the Proposed Action, as it would provide residents with safe travel along County Road A-25 and mine features of the area would be safeguarded.

No short-term impact on socioeconomics would be expected under the No Action alternative. In the long term, however, negative socioeconomic impacts would occur in the Proposed Project area as County Road A-25 would continue to deteriorate, unsafe conditions for travel along the roadway would persist, and unsafe mine features would continue to be a hazard.

4.9.2 Environmental Justice

The Proposed Project would have no negative, measurable impact on environmental justice indicators. Nearby residents would experience improved access to County Road A-25, safeguarding of hazardous mine features, and potentially improved water quality from reclaimed coal waste piles. The Proposed Action would therefore have a beneficial impact on the region in terms of environmental justice.

Under the No Action alternative, people of low-income populations of the region would experience the continued hazards from the mines around Yankee Canyon. The No Action alternative would therefore have a negative impact on environmental justice.

5. Consultation and Coordination

The following public agencies and tribal entities were contacted or consulted with during the development of this EA (in alphabetical order).

- Colfax County Road Department
- Comanche Nation
- Jicarilla Apache Nation
- Kiowa Tribe
- Mescalero Apache Tribe

- New Mexico Department of Game and Fish (NMDGF) online county species list for state listed species and Environmental Review Tool
- New Mexico State Historic Preservation Office
- New Mexico State Land Office
- New Mexico State Representative
- New Mexico State Senator
- OSMRE Denver Field Branch
- U.S. Fish and Wildlife Service, Ecological Services Field Office, online IPaC report services
- Taos Pueblo

Appendix E provides stakeholder, agency, and tribal outreach or consultation responses. The information sent to these entities is included as an attachment to the meeting summary in Appendix F.

A public scoping meeting was held at the Raton public library on March 9, 2023 to present the Proposed Project, answer questions, and gather input. A second meeting was conducted at the Raton public library on June 8, 2023 to present the findings of the draft EA, including the purpose and need for the Proposed Action, an overview of the affected environment and resource topics, draft findings of impacts, and mitigation measures. Summaries for both meetings are provided in Appendix F. No public meeting was conducted for the release of the amended draft EA, which only incorporated information on the tricolored bat and did not present any new anticipated impact from the proposed project. On September 15, 2023, the SLO concurred with the AMLP's eligibility and management recommendations for the cultural properties on New Mexico State Trust Lands within the Project Area. The SLO's EA review response is included in Appendix E.

References

Bat Conservation International (BCI). 2021. *Report on Yankee Canyon abandoned mine bat surveys*. Prepared for the AML Program. November 17-18, 2021.

BCI. 2024. Memorandum to the AML Program regarding Yankee Canyon tri-colored bat survey, 04/04/2024. April 23, 2024.

Cather, S.M. 2004. Laramide orogeny in central and northern New Mexico and southern Colorado. p. 203-248 in Mack, G.H. and K.A. Giles (eds.), *The geology of New Mexico: A geologic history*. New Mexico Geological Society Special Publication 11.

Daniel B. Stephens & Associates, Inc. (DBS&A). 2023. *Amended biological assessment/biological evaluation, Yankee Canyon Coal Mine Safeguarding Project, Colfax County, New Mexico*. Prepared for the New Mexico Energy, Minerals, and Natural Resources Department Abandoned Mine Land Program. November 20, 2023.

Dodgson, L. 2015. Dirty work: New Mexico struggles to clean up its abandoned mines. *Mining Technology*, December 3, 2015. Available at <https://www.mining-technology.com/features/featuredirty-work-new-mexico-struggles-to-clean-up-its-abandoned-mines-4740031/>. Accessed August 2021.

Federal Emergency Management Agency (FEMA). 2010. Flood Insurance Rate Map. Colfax County, New Mexico and Incorporated Areas. Map Number 35007C0200D. Effective November 4, 2010.

Geluso, K., T.R. Mollhagen, J.M. Tigner, and M.A. Bogan. 2005. Westward expansion of the eastern pipistrelle (*Perimyotis subflavus*) in the United States, including new records from New Mexico, South Dakota, and Texas. *Western North Am. Nat.* 65: 405–409.

Griffith, G.E., J.M. Omernik, M.M. McGraw, G.Z. Jacobi, C.M. Canavan, T.S. Schrader, D. Mercer, R. Hill, and B.C.Moran. 2006. *Ecoregions of New Mexico* (color poster with map, descriptive text, summary tables, and photographs). U.S. Geological Survey. Scale 1:1,400,000.

Lee, W.T. 1924. *Coal resources of the Raton Coal Field, Colfax County, New Mexico*. U.S. Geological Survey (USGS) Bulletin 752.

MacPhee, N. 2023. E-mail sent by Nik MacPhee, U.S. Fish and Wildlife Service, to James Hollen, AML Program. September 5, 2023.

McCoshum, S.M., E.L. Pratt, K.C. Lent, and E.M. Boisen. 2023. Literature review of tri-colored bat natural history with implications to management. *Front. Conserv. Sci.* 4: 1204901. doi: 10.3389/fcosc.2023.1204901.

McLemore, V.T. 2010. Sugarite Canyon State Park. p. 341-345 in Price, L.G. (ed.), *The geology of northern New Mexico's parks, monuments, and public lands*.

Moiola, L. 1998. *A cultural resource survey of four coal mines near Yankee, New Mexico, in the Raton Coal Field, Yankee Project, Colfax County, New Mexico*. New Mexico Abandoned Mine Land Bureau Report No. 1998-1. February 1998.

Natural Resources Conservation Service (NRCS). 2022. *Custom soil resource report for Colfax County, New Mexico*. USDA NRCS online soil report generator Web Soil Survey. <https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>.

New Mexico Bureau of Geology and Mineral Resources (NMBGMR). 2003. *Geologic map of New Mexico, 1:500,000*.

New Mexico Energy Minerals and Natural Resources Division (NMEMNRD). 2022. New Mexico State Endangered Plant Species (19.21.2.8 NMAC). List obtained October 2022 and January 4, 2023. <http://www.emnrd.state.nm.us/SFD/ForestMgt/Endangered.html>.

Nickelsen, H.B. 1979. Reclamation Evaluation for OSM, Raton Field, Yankee Mines, Turner Urtado Mines, and Denton- Colangelo-Strasia-Rodman Mine. On file at the New Mexico Bureau of Mines and Mineral Resources, Santa Fe, New Mexico.

NMEMNRD-Forestry Division. 2017. *New Mexico rare plant conservation strategy*, *Second edition*. Prepared and developed by Daniela Roth and the New Mexico Rare Plant Conservation Strategy Partnership. Santa Fe, New Mexico.

New Mexico Environmental Review Tool (NMERT). 2022. New Mexico Environmental Review Tool (ERT)—An interactive tool for conservation planning and review of important resources for wildlife and habitats. <https://nmert.org/home>.

Okun Consulting Solutions (Okun). 2023. *The Yankee Canyon Historic Mining District cultural resource survey for an EMNRD Abandoned Mine Land Program coal mine safeguarding project, Colfax County, New Mexico*. Prepared for The New Mexico Energy, Minerals and Natural Resources Department, Mining and Minerals Division, Abandoned Mine Land Program. May 2023.

Paul, R.W. 1963. *Mining frontier of the far West: 1848-1880*. Holt, Rinehart, and Winston, New York.

Pratt, B.C. 1986. *Gone but not forgotten: Strategies for the comprehensive survey of the architectural and historic archaeological resources of northeastern New Mexico, Vol. 1*.

National Park Service and New Mexico Historic Preservation Division, Office of Cultural Affairs, New Mexico.

U.S. Census Bureau (U.S. Census). 2022. Quick facts Raton, New Mexico. Accessed May 5, 2023. <https://www.census.gov/quickfacts/silvercitytownnewmexico>.

U.S. Fish and Wildlife Service (USFWS). 2022. Proposed rule: Endangered species status for tricolored bat. Federal Register 87(177), Wednesday, September 14, 2022, pp. 56381-93.

U.S. Geological Survey (USGS). 2004. National Gap Analysis Program, Provisional digital land cover map for the southwestern United States, version 1.0. RS/GIS Laboratory, College of Natural Resources, Utah State University.

USGS. 2023. National Water Information System: Groundwater levels for New Mexico. Accessed January 16, 2023. <https://nwis.waterdata.usgs.gov/nm/nwis/gwlevels>.

Figures

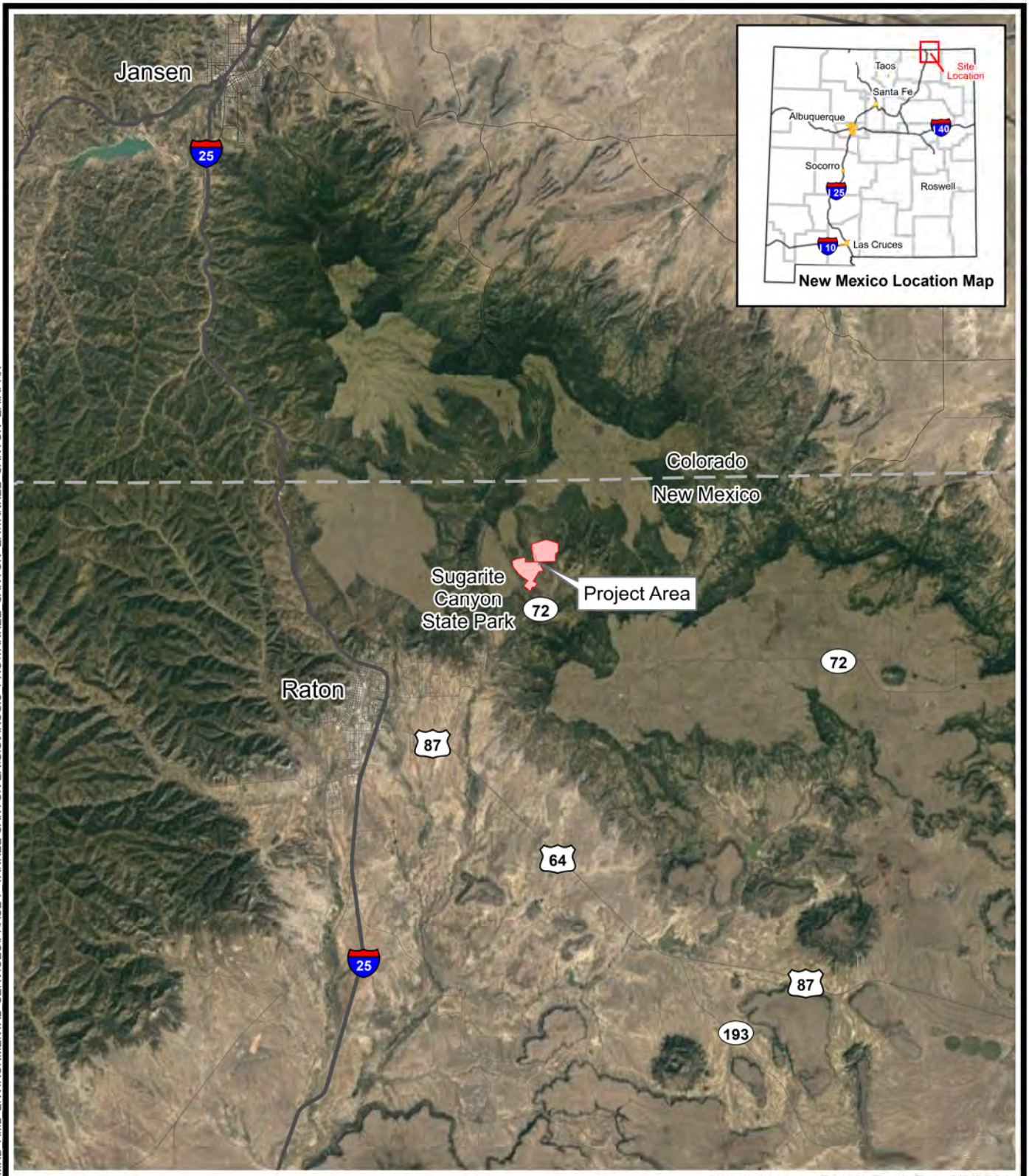

Image source: Google Earth Pro, 5/1/2014

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a Geo-Logic Company

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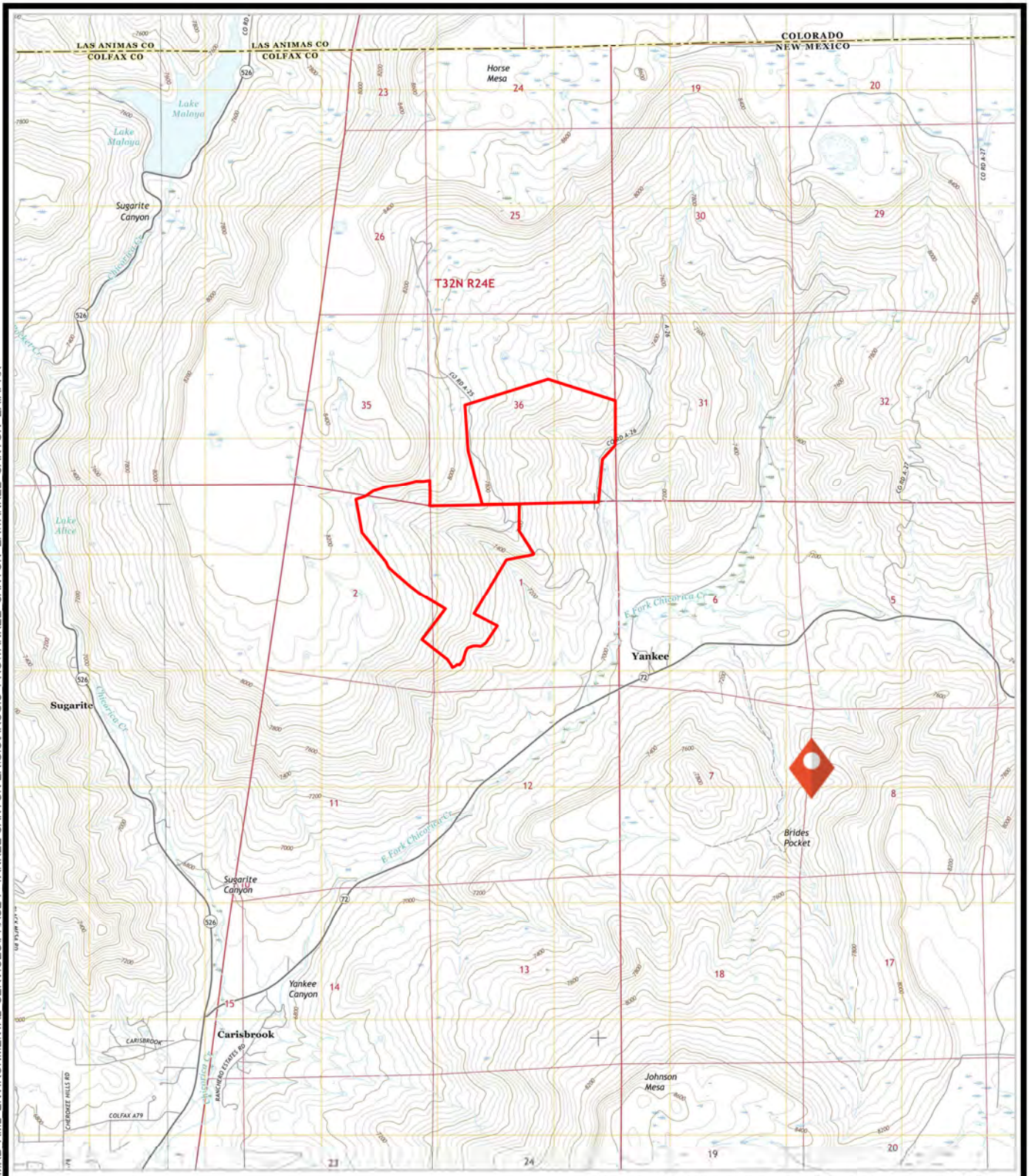
YANKEE CANYON EA
Area Map

Figure 1

\\SS6ABQ\DATAS\PROJECTS\DB21.1363 ENMRD AML ENVIRONMENTAL SERVICES\PHASE 7 YANKEE CANYON EA\GIS\ARCGIS PRO\YANKEE CANYON EA\YANKEE CANYON EA.APRX



Explanation

Proposed Project Area for Phase I and II Safeguarding

N

0 2000 4000 Feet

Topographic data: United Stated Geologic Survey (USGS)
TopoView: 2020 (US Topo) Scale 1:24,000
NM Raton, NM Yankee Canyon
https://ngmdb.usgs.gov/topoview/
Accessed May 22, 2023

DBS&A
a Geo-Logic Company

5/26/2023 DB21.1363

YANKEE CANYON EA
Topographic Map

Figure 2

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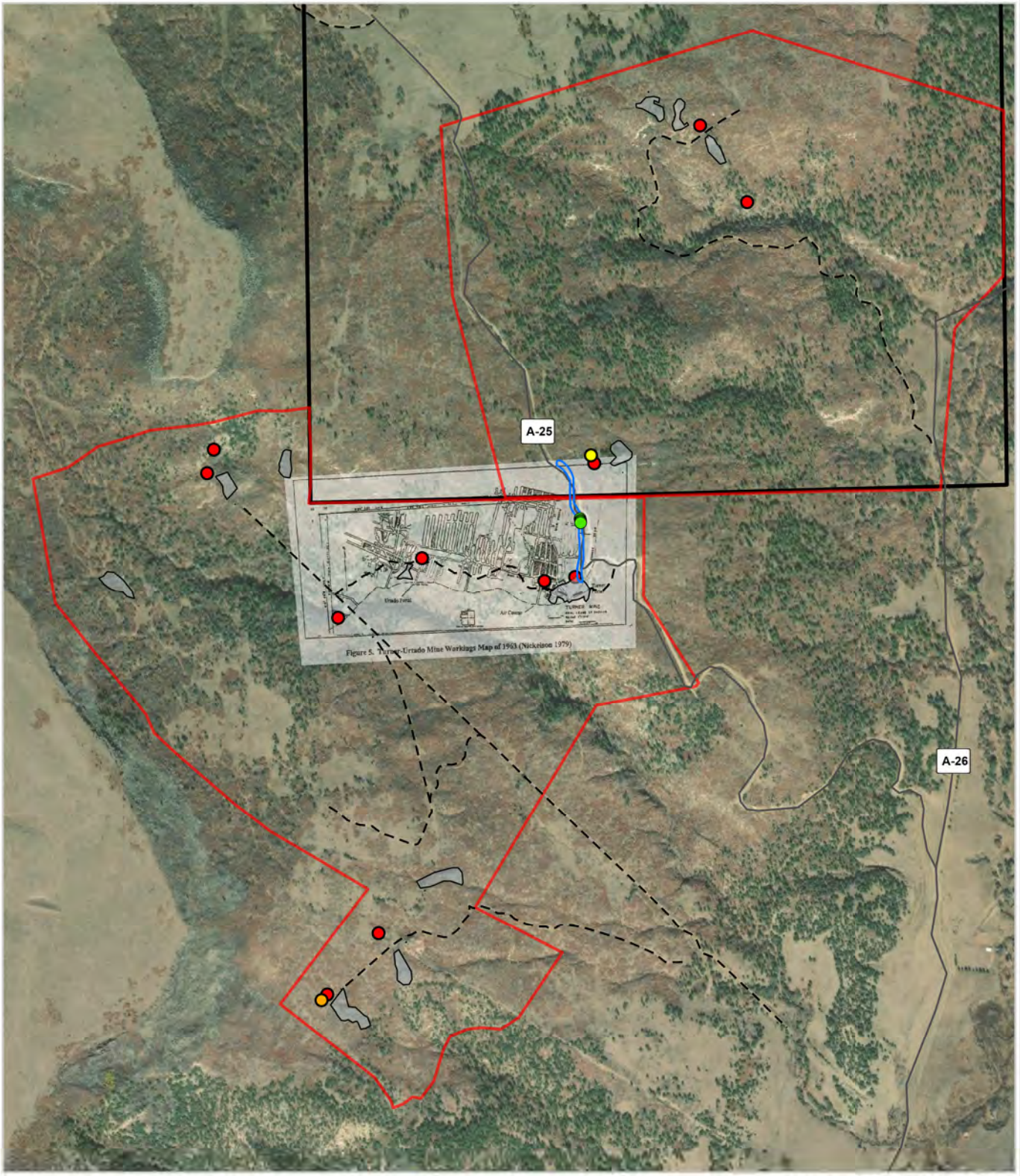

Source: Maxar, Vivid 11/7/2021

Explanation

- Subsidence area
- Adit
- Mine shaft
- Other
- Coal gob pile
- Proposed Project Area for Phase I and II Safeguarding
- State land
- CR A-25 Phase I Safeguarding
- County road
- Former mining road

N

0 540 1080 Feet

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YANKEE CANYON EA
Mine Features Map

Figure 3

\\SS6ABQ\DATAS\PROJECTS\DB21.1363 ENMRD AML ENVIRONMENTAL SERVICES\PHASE 7 YANKEE CANYON EA\GIS\ARCGIS PRO\YANKEE CANYON EA\YANKEE CANYON EA.APRX

Explanation

- Proposed Project Area for Phase I and II Safeguarding
- 148 - Rocky Mountain Aspen Forest and Woodland
- 151 - Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland
- 155 - Southern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest and Woodland
- 158 - Southern Rocky Mountain Ponderosa Pine Woodland
- 189 - Southern Rocky Mountain Pinyon-Juniper Woodland
- 315 - Southern Rocky Mountain Montane-Subalpine Grassland
- 316 - Rocky Mountain Gambel Oak-Mixed Montane Shrubland
- 326 - Western Great Plains Foothill and Piedmont Grassland
- 557 - Pasture/Hay
- 581 - Developed, Open Space

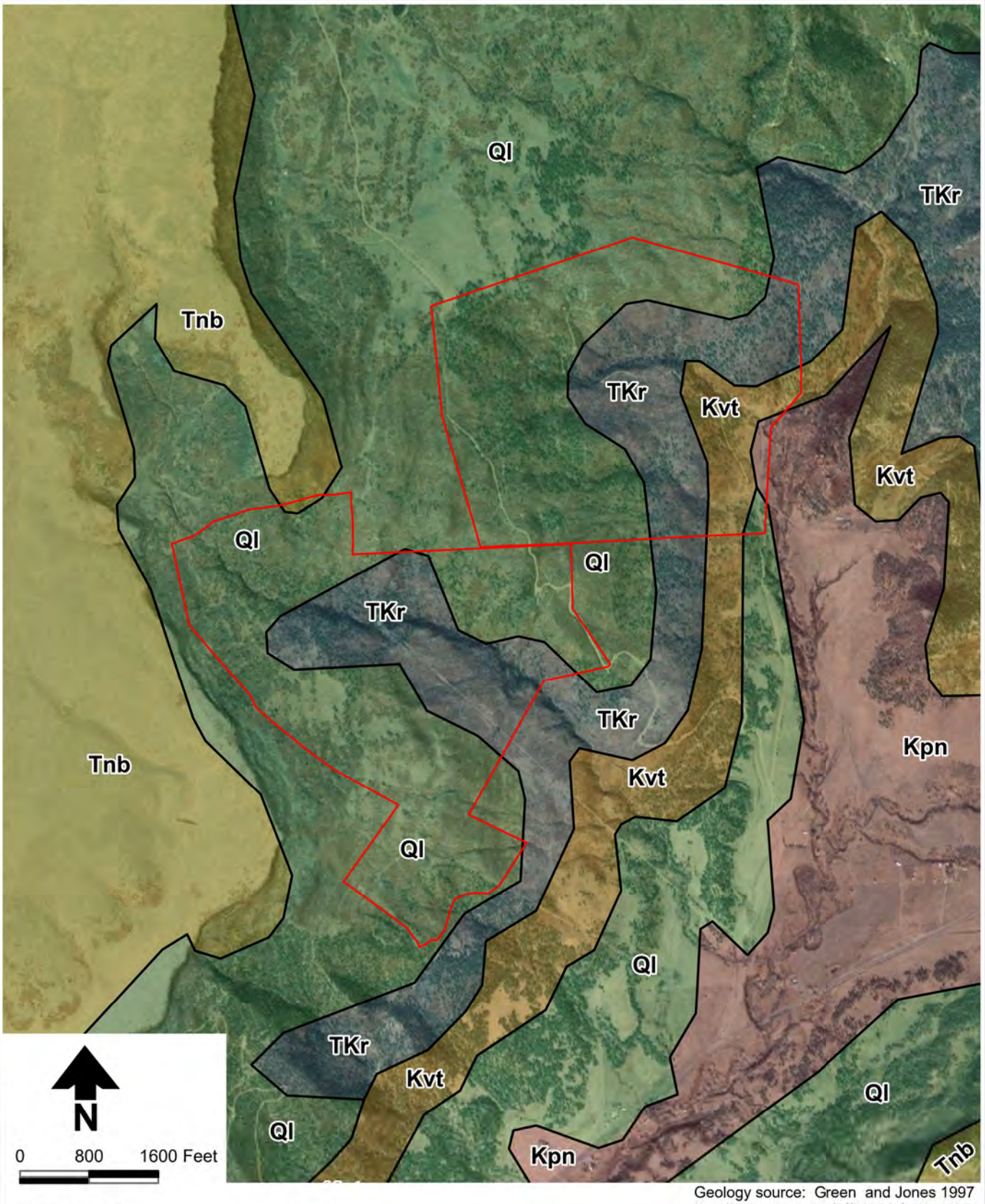
Landcover source: United States Geological Survey(USGS)
Gap Analysis Project
https://www.usgs.gov/programs/gap-analysis-project
Downloaded 14 October 2022

DBS&A
a Geo-Logic Company

5/26/2023 DB21.1363

YANKEE CANYON EA
Vegetation Map

Figure 4



Geology source: Green and Jones 1997
http://pubs.usgs.gov/of/1992/ofr-92-0052.

Explanation

Proposed Project Area for Phase I and II Safeguarding

Geology

- Kpn shale, fine-grained mixed clastic
- Kvt sandstone, shale
- Ql landslide,colluvium
- TKr sandstone,mudstone
- Tnb basalt,andesite

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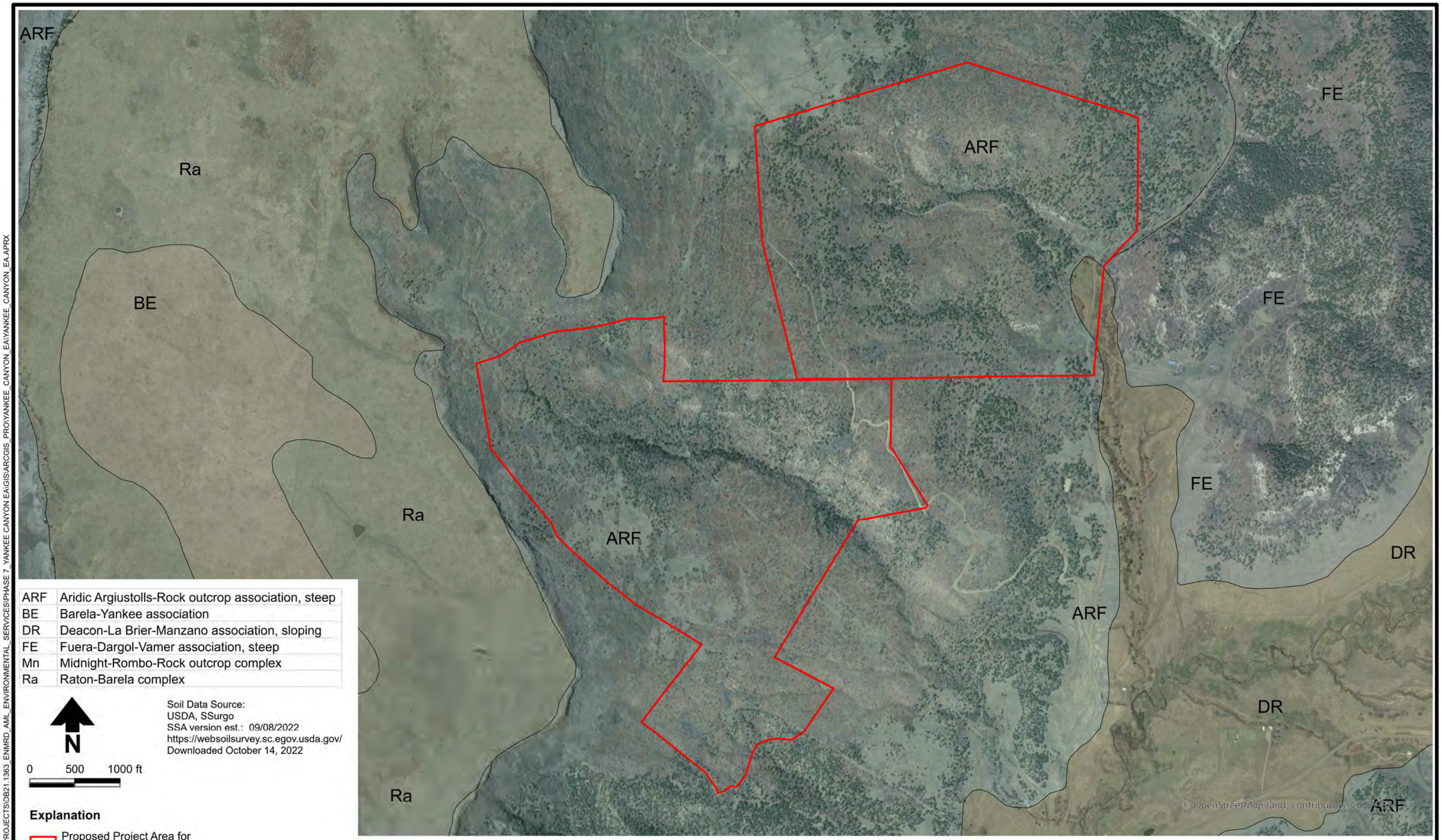
YANKEE CANYON EA
Geology Map

Figure 5

\\SS6ABQ\DATAS\PROJECTS\DB21.1363 ENMRD AML ENVIRONMENTAL SERVICES\PHASE 7 YANKEE CANYON EA\GIS\ARCGIS PRO\YANKEE CANYON EA\YANKEE CANYON EA.APRX



ARF	Aridic Argiustolls-Rock outcrop association, steep
BE	Barela-Yankee association
DR	Deacon-La Brier-Manzano association, sloping
FE	Fuera-Dargol-Vamer association, steep
Mn	Midnight-Rombo-Rock outcrop complex
Ra	Raton-Barela complex

N

0 500 1000 ft

Soil Data Source:
USDA, SSurgo
SSA version est.: 09/08/2022
https://websoilsurvey.sc.egov.usda.gov/
Downloaded October 14, 2022

Explanation

Proposed Project Area for Phase I and II Safeguarding

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5/26/2023 DB21.1363

YANKEE CANYON EA
Soils Map

Figure 6

\\SS6ABO\DATAS\PROJECTS\DB21.1363_ENMRD_AML_ENVIRONMENTAL_SERVICES\PHASE 7_YANKEE CANYON EA\GIS\ARCGIS_PRO\YANKEE_CANYON_EA\YANKEE_CANYON_EA.APRX

Appendix A

Photographs

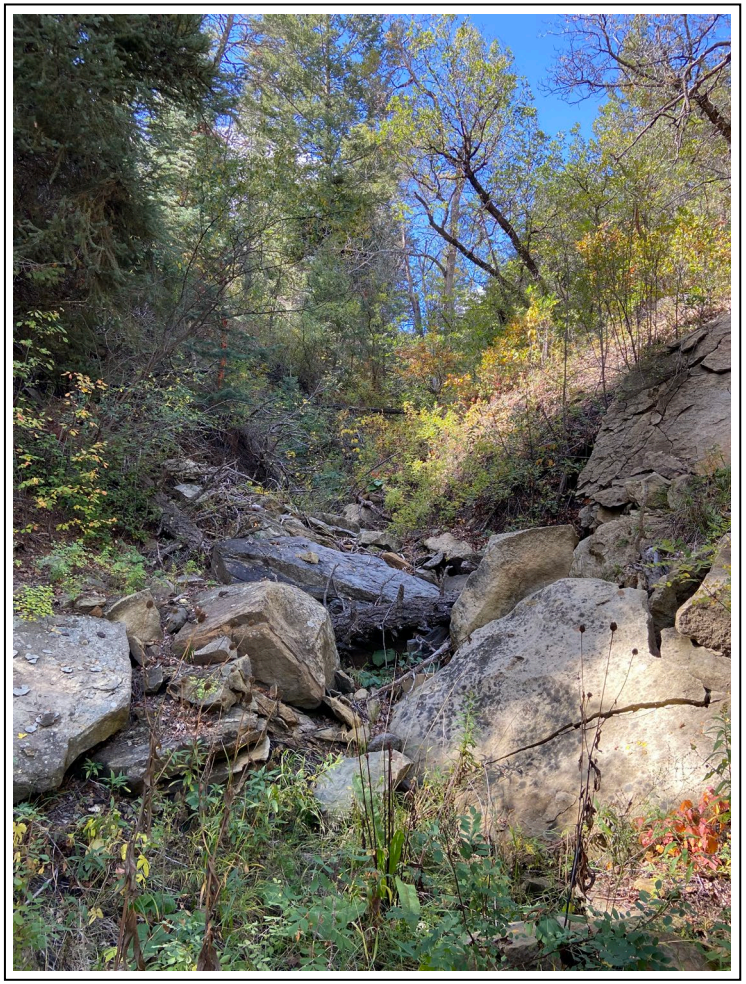
DBS&A
a Geo-Logic Company

1. View from County Road A-25 looking north toward Project Area

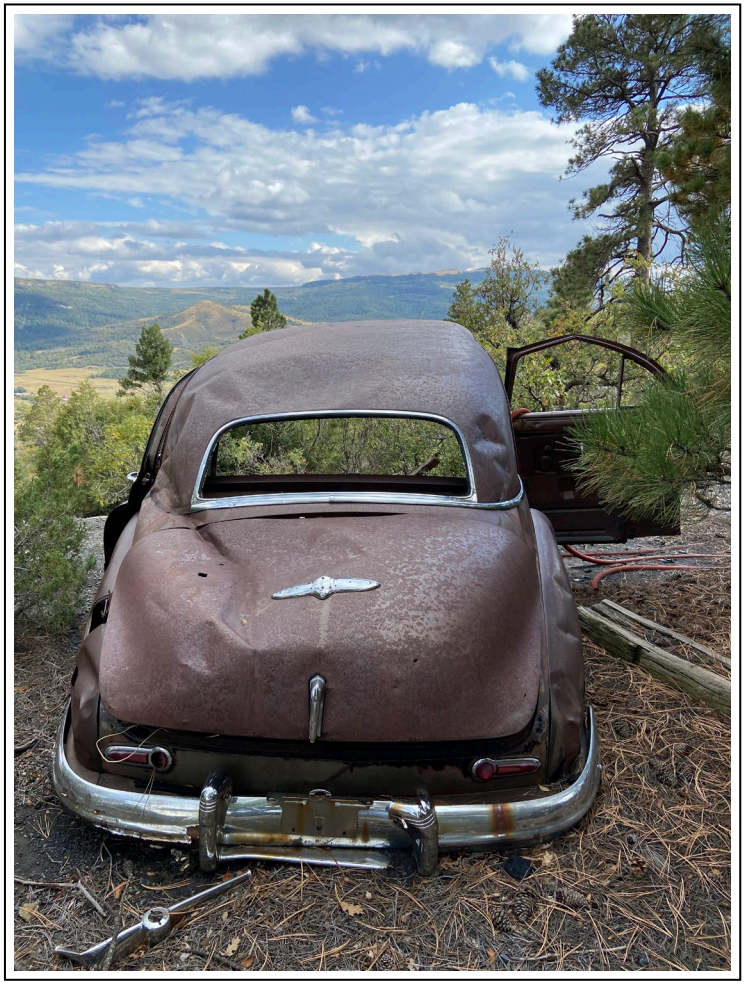
2. Coal waste piles, northern parcel (view to southeast)

3. Mining structure with overgrown vegetation, south end of the northern parcel

4. View to west from old mining road, southern parcel



5. Bottom of main canyon, midway, southern parcel



6. Historic automobile at mine site

7. View from the northern parcel near County Road A-25 looking north toward Horse Mesa

8. View from the northern parcel looking south toward a old mining road

9. View of old mining road that also shows the stand-replacing effect from the 2011 Track Fire

10. View to the east from the northern parcel of the main tributary to the East Fork of the Chicorica Creek and County Road A-26

11. Bear print in the Project Area

Appendix B

Cultural Resources Report

DBS&A
a Geo-Logic Company

THE YANKEE CANYON HISTORIC MINING DISTRICT: CULTURAL RESOURCE SURVEY FOR AN EMNRD ABANDONED MINE LAND PROGRAM COAL MINE SAFEGUARDING PROJECT, COLFAX COUNTY, NEW MEXICO

PREPARED FOR
The New Mexico Energy, Minerals and Natural Resources Department (EMNRD), Mining and Minerals Division, Abandoned Mine Land Program (AML Program)

PREPARED BY
Okun Consulting Solutions

MAY 2023

Okun Consulting Solutions

NMCRIS ACTIVITY NUMBER 151925

THE YANKEE CANYON HISTORIC MINING DISTRICT: CULTURAL RESOURCE SURVEY FOR AN EMNRD ABANDONED MINE LAND PROGRAM COAL MINE SAFEGUARDING PROJECT, COLFAX COUNTY, NEW MEXICO

Prepared for
The New Mexico Energy, Minerals and Natural Resources Department (EMNRD), Mining and Minerals Division, Abandoned Mine Land Program (AML Program)

Prepared by
Adam Okun and Timothy Schoonover

Submitted by
Adam Okun, Principal Investigator
Okun Consulting Solutions
727 Morningside Dr. NE
Albuquerque, NM 87110

Reviewing Agencies
EMNRD AML Program
New Mexico State Land Office
New Mexico Historic Preservation Division

Survey Conducted Under
New Mexico General Archaeological Investigation Permit Number: NM-22-285-S

Okun Consulting Report Number: OCS-2023-01

ABSTRACT

This report presents the results of cultural resource survey and detailed documentation within the Yankee Canyon Coal Mining District in Colfax County, New Mexico. The project area is located along the edge of Horse Mesa approximately 6 miles northeast of Raton and 2 miles east of Sugarite State Park. The State of New Mexico Energy, Minerals and Natural Resources Department (EMNRD), Mining and Minerals Division, Abandoned Mine Land Program (AML Program), with funding from the Office of Surface Mining Reclamation and Enforcement, is proposing a variety of mine safeguarding activities at the site, including manually or mechanically filling mine openings with surrounding waste material or polyurethane foam and building structural barriers that restrict human ingress, such as locking gates, cupolas, high-tensile steel mesh coverings, gated culverts, or other wildlife-compatible closures. The project area contains a combination of privately owned land and State Trust Land managed by the New Mexico State Land Office (SLO). The AML Program is taking the taking the administrative lead for Section 106 compliance on behalf of the OSMRE. The SLO Cultural Resource Office (SLO) is also serving as a reviewing agency.

A total of 11 historic archaeological sites and nine isolated occurrences (IOs) were discovered and documented during pedestrian survey of the Yankee Canyon Mine Safeguard project area. The area of potential effects (APE) for the project was broadly defined by the AML Program to include 581.7 acres of land, which encompasses all areas of potential project implementation and access. The APE includes 299.9 acres of private land and 281.8 acres managed by the SLO. All 11 sites are associated with twentieth century coal mining; four are previously recorded but were fully updated, and seven are newly discovered. No prehistoric/aboriginal resources were discovered. All documented resources were fully recorded and evaluated for eligibility to the National Register of Historic Places (NRHP) and project effects.

Based on the *National Register Bulletin 15* and other resources for the of evaluation of historic mining sites, the primary considerations impacting our eligibility recommendations were: (1) whether a site contained habitation loci with potential for intact subsurface archaeological deposits (Criterion D) and (2) whether a site contained intact or unique mine engineering features with the ability to visually convey an association with the period of historic mining in Yankee Canyon (Criterion A). None of the sites in the project area have demonstratable associations with significant historical people that would qualify them for listing under Criterion B, nor do they exhibit the levels of integrity necessary to qualify as excellent examples of a unique engineering style or methods of construction (Criterion C). Overall, mining features (including underground mine entrances and extraction pits) and supporting infrastructure (transport features, platforms, structures, and other features) in the project area tend to exhibit poor integrity due to material salvage efforts in the 1960s after mines were closed, past remediation (including closing of adits) in the 1980s and 1990s, and other, more gradual, forms of disturbance, such as erosion and colluvial slumping.

We also considered the eligibility determinations made by the AML Program and subsequent concurrence issued by the State Historic Preservation Officer (SHPO) in 1998 (Historic Preservation Division Log Number [No. 54930]), although all sites were reevaluated during the current project. In 1998, two sites (LA 57200 and LA 120611) were determined not eligible and two sites (LA 119817 and LA 119818) were determined eligible for listing on the NRHP under Criterion D. We agree with three of these previous determinations but recommend that the eligibility status of LA 120611 be changed from not eligible to eligible under Criterion D (see discussion below). It is also possible that the collection of mining sites in the project area—particularly if combined with sites on the valley floor below—could qualify as a historic district, but designation as a historic district is beyond the scope of the current documentation effort and would require a broader spatial scope (see Chapter 7 discussion).

Of the 11 archaeological sites, four (LA 119817, LA 119818, LA 120611, and LA 202929) are recommended as eligible for listing on the NRHP under criteria A or D, and seven sites (LA 57200, LA 202927, LA 202928, LA 202930, LA 202931, LA 202932, and LA 202933) are recommended as not eligible for listing on the NRHP due to a lack of integrity and/or historic significance (see summary table below). Pending agency

determinations, no further management considerations or treatment recommendations are warranted for the sites recommended as not eligible. As a general rule, the seven sites recommended as not eligible are simple mines that date to the later periods of small-scale mining, lack habitation loci with subsurface information potential, do not contain intact or unique mine engineering features, and lack complexity in their feature types. Chapter 7 provides additional clarification of how these criteria were applied to individual sites.

All four sites recommended as eligible contain habitation loci with residential masonry foundations and trash middens/artifact concentrations (see Table 14). At some sites, privies or other domestic features are also present. These areas have excellent potential for buried archaeological deposits that could provide important information relating to frontier mining technology and engineering, the spatial organization of historic mining landscapes, and the lifeways, economic status, and participation in broader economic networks of twentieth century miners in Yankee Canyon. As a result, they are recommended as eligible for listing on the NRHP under Criterion D. LA 119817, LA 120611, and LA 202929 do not qualify under Criterion A because their mine engineering features do not exhibit the necessary integrity to convey their historic associations. LA 119818, on the other hand, contains unique and partially intact engineering features, including elements of a gravity tramway incline, tipple complex, and other structural remains that convey an association with locally significant early and mid-twentieth century coal mining, and this site is also recommended as *eligible* under Criterion A for its association with locally significant historic events.

The four eligible sites will require management during project implementation. The AML Program is currently evaluating the feasibility of engineering various safeguarding options at these mining sites, and activities may include closing mine openings with bat-compatible closures, backfilling features using onsite materials, and regrading or contouring features to facilitate appropriate drainage. Access to these features will be along existing roads. The qualifying characteristics at all four sites include the habitation loci, including masonry foundations and associated middens, privies, or artifact concentrations. We recommend that these portions of the sites be avoided with suitable buffers during mine remediation, and that all project activities within these sites be monitored by a permitted archaeologist.

In addition to habitation areas, intact mining infrastructure at LA 119818—including Feature 1 (fan house), Feature 2 (generator room), Feature 5 (loadout), Feature 6 (fan mount), parts of Feature 8 (tramway incline), Feature 12 (adobe administrative building), and Feature 26 (tipple complex)—should be preserved, and suitable avoidance buffers should be established around each of these features during implementation. If the adit is altered, we recommend that materials and methods are utilized that minimize intrusive visual elements and changes to the historic setting. In general, we recommend that the AML Program select safeguarding options that have the least possible impact on the visual aspects of these sites, while still accomplishing the important goal of protecting the public from the significant hazards posed by abandoned mining features. If possible, materials used to close and restrict access to dangerous features should not obscure above-ground elements or detract from the ability of these features to convey their historic functions. Materials used should be as visually inobtrusive as possible, and materials that are consistent with the mining period should be utilized to the extent feasible. If these recommendations are followed, the project would have no adverse effect on these historic properties.

his cultural resource inventory complies with the provisions of the National Historic Preservation Act (NHPA) of 1966, as amended through 1992, the New Mexico Cultural Properties Act (18-6-1 through 18-6-17 New Mexico Statutes Annotated 1978), and all other applicable rules and regulations. It was completed in accordance with §4.10.15 NMAC: Standards for Survey and Inventory and other relevant guidance documents.

Summary of Eligibility and Management Recommendations

Site	Previous Determination	Current Recommendation	Proposed Management
57200	Not Eligible	Not Eligible	None
119817	Eligible (D)	Eligible (D)	Avoid all habitation features and loci; all activities within the site should be monitored by a permitted archaeologist
119818	Eligible (D)	Eligible (A and D)	Avoid all habitation features and loci, and all intact mining features or infrastructure; all activities within the site should be monitored by a permitted archaeologist; project elements should minimize visual impacts and changes to the setting
120611	Not Eligible	Eligible (D)	Avoid all habitation features and loci; all activities within the site should be monitored by a permitted archaeologist
202927	N/A	Not Eligible	None
202928	N/A	Not Eligible	None
202929	N/A	Eligible (D)	Avoid all habitation features and loci; all activities within the site should be monitored by a permitted archaeologist
202930	N/A	Not Eligible	None
202931	N/A	Not Eligible	None
202932	N/A	Not Eligible	None
202933	N/A	Not Eligible	None

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF PHOTOGRAPHS

LIST OF TABLES

CHAPTER 1

INTRODUCTION AND PROJECT DESCRIPTION

This report presents the results of cultural resource survey and detailed documentation within the Yankee Canyon Coal Mining District in Colfax County, New Mexico. The project area is located along the edge of Horse Mesa approximately 6 miles northeast of Raton and 2 miles east of Sugarite State Park (Figure 1). The State of New Mexico Energy, Minerals and Natural Resources Department (EMNRD), Mining and Minerals Division, Abandoned Mine Land Program (AML Program), with funding from the Office of Surface Mining Reclamation and Enforcement (OSMRE), is proposing a variety of mine safeguarding activities at the site, including manually or mechanically filling mine openings with surrounding waste material or polyurethane foam and building structural barriers that restrict human ingress, such as locking gates, cupolas, high-tensile steel mesh coverings, gated culverts, or other wildlife-compatible closures. The project area contains a combination of privately owned land and State Trust Land managed by the New Mexico State Land Office (SLO). The AML Program is taking the taking the administrative lead for Section 106 compliance on behalf of the OSMRE. The SLO Cultural Resource Office (SLO) is also serving as a reviewing agency.

The AML is a federally funded program formed with the passage of the Surface Mining Control and Reclamation Act and funded through a tax on coal production. Its goals are to protect public health and safety from historic mining features and restore and reclaim lands and waters that have been degraded by historic mining. As part of a federally funded program, the project is subject to compliance with Section 106 of the National Historic Preservation Act of 1966 (NHPA; 54 U.S.C. §306108) and its implementing regulations (36 CFR Part 800). This legislation requires the lead federal agency to consider the effects a proposed undertaking may have on historic properties as defined under the NHPA. Due to the SLO lands and state-administered project, the project also needs to comply with the New Mexico SLO's Cultural Resource Protection Rule, the New Mexico Cultural Properties Act (18-6-1 through 18-6-17 NMSA, as amended through 2005), and other state statutes pertaining to the protection of cultural resources.

To satisfy the above requirements, Okun Consulting Solutions (OCS) performed a pedestrian (Class III) cultural resource survey of the area of potential effects (APE) defined for the project and documented and evaluated all visible historic mining features. The APE was broadly defined by the AML Program to include 581.7 acres (235.4 hectares) of land, which encompasses all areas of potential project implementation and access. The APE includes 299.9 acres (121.4 hectares) of private land and 281.8 acres (114.0 hectares) managed by the SLO. The cultural resource survey was completed between October 18 and November 8, 2022, by Okun Consulting Solutions archaeologists Adam Okun, Timothy Schoonover, Steven Velazquez, and Natalia Reeder. Adam Okun served as the principal investigator, developed field methodologies, and authored the report. Timothy Schoonover was the field supervisor and authored portions of the report. The project area is depicted on the *Yankee, New Mexico* (36104-H3), 7.5-minute United States Geological Survey (USGS) quadrangle map and is located within Sections 1 and 2 of Township 31 North, Range 24 East and Sections 35 and 36 of Township 32 North, Range 24 East (Figures 2 and 3).

The inventory was assigned New Mexico Cultural Resource Information System (NMCRIS) Number (No.) 151925 and was performed under New Mexico Archaeological Survey Permit NM-22-285-S. Although field methods and other information are presented throughout this document, a few introductory points are necessary. The cultural resource investigation was conducted in accordance with the state regulations set

forth in *§4.10.15 NMAC: Standards for Survey and Inventory* and the SLO's Cultural Resource Properties Rule. Other documents also provided guidance, including the *National Register Bulletin 42: Guidelines for Identifying, Evaluating, and Registering Historic Mining Properties* (Spude and Noble 1997), the feature definitions in the 2018 *NMCRIS User Guide: Guidelines for Submitting Cultural Records*, and a variety literature produced by historic archaeologists documenting and researching mining districts, particularly Donald Hardesty's *Mining Archaeology in the American West* (Hardesty 2010).

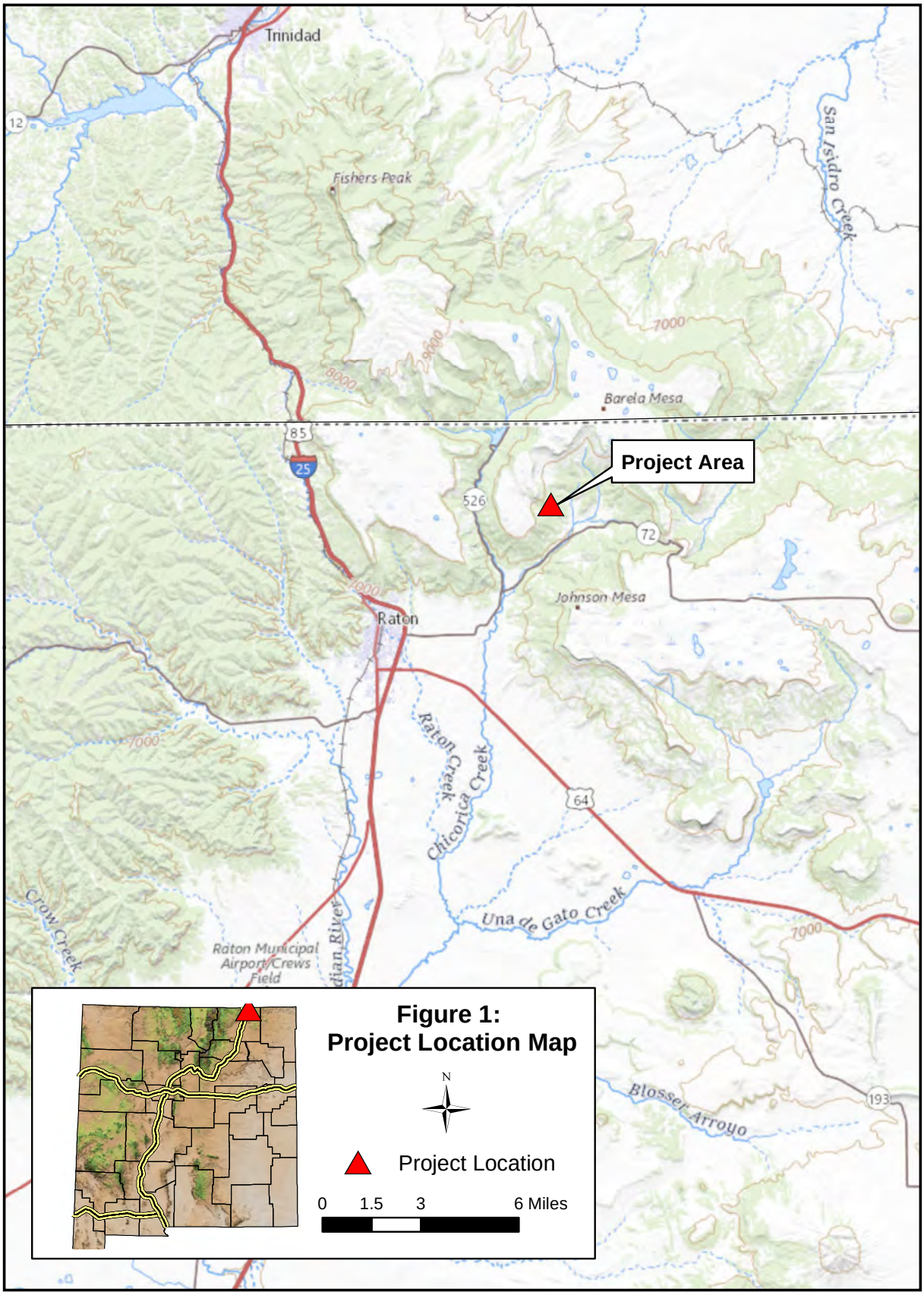


Figure 1. Project Location Map

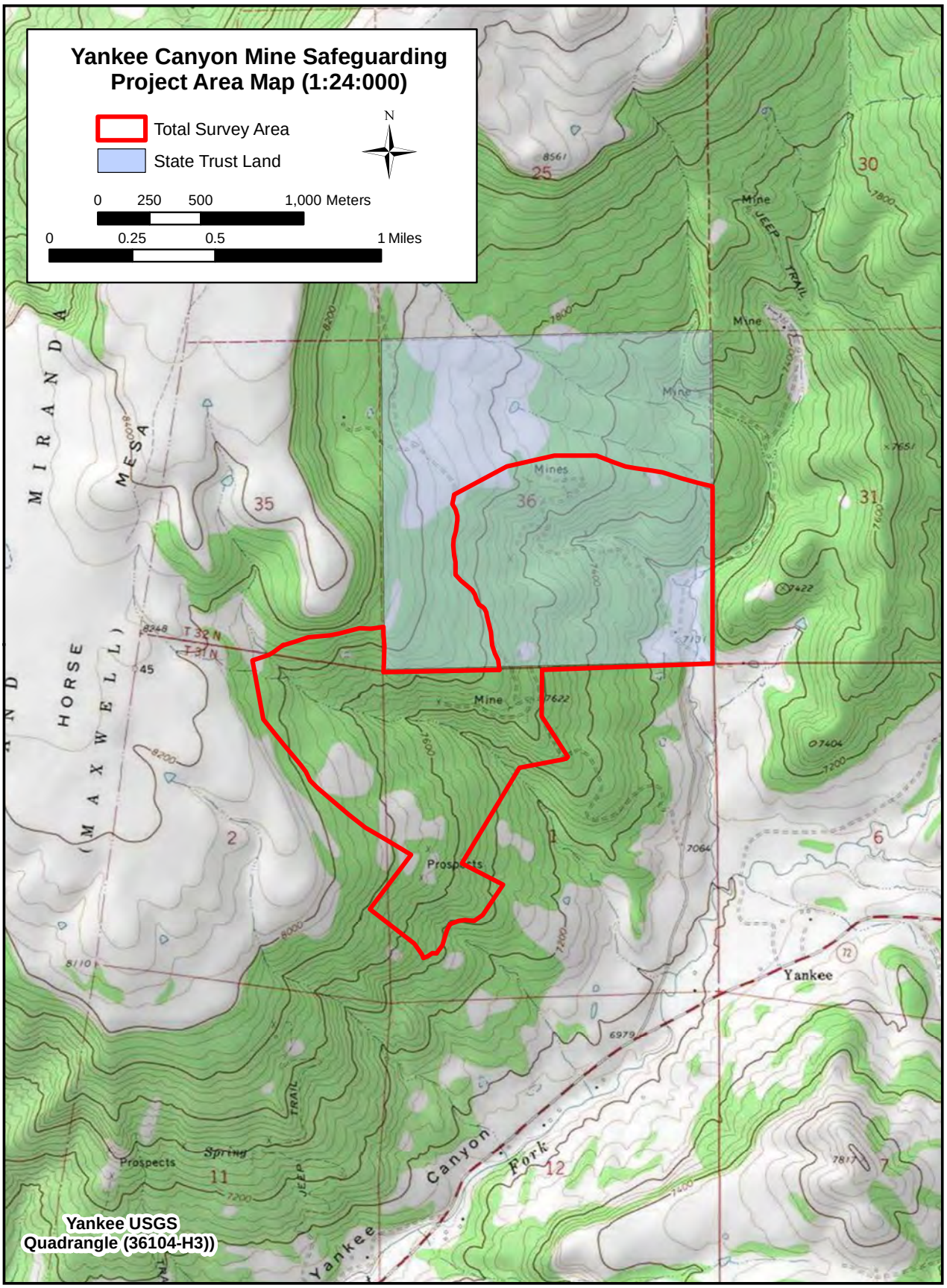


Figure 2. Project Area Map on USGS Quadrangle (1:24:000)

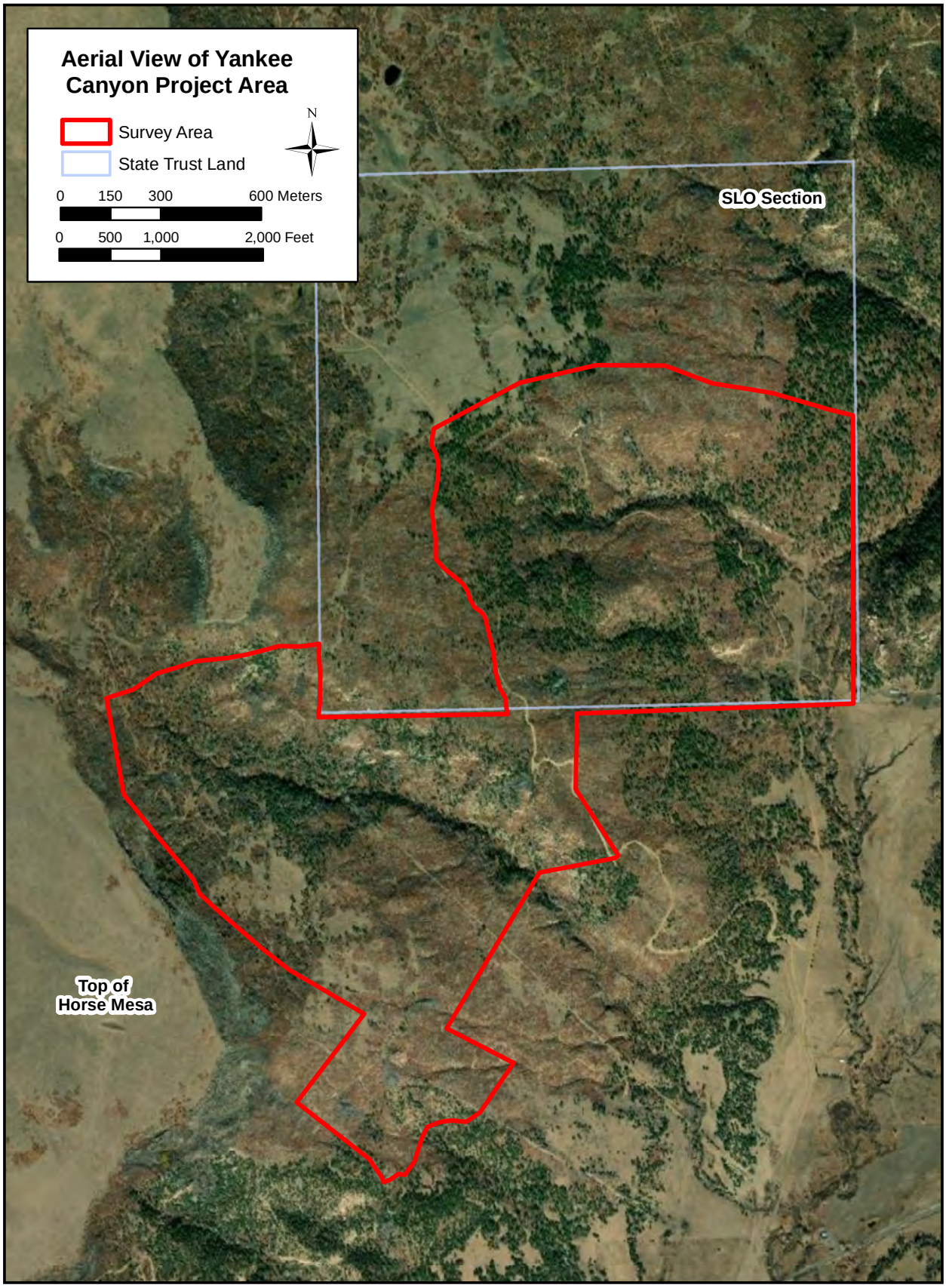


Figure 3. Aerial View of the Abo Mine Project Area

CHAPTER 2

ENVIRONMENTAL SETTING

The project area is northeast of Raton in northeastern Colfax County, near the Colorado/New Mexico state line. It occupies the steep, densely wooded, east-facing slope of Horse Mesa, one of several flat-topped, basalt-capped mesas northeast of Raton, the largest of which is Johnson Mesa to the southeast. Within the project area, Horse Mesa's eastern slope is crossed by several very steep arroyos that form a basin east of the project area that represents a branch of Yankee Canyon. The historic mining village of Yankee is located less than 1 mile southeast of the project area where the various branches come together to form the primary canyon. The project area is characterized by rugged escarpments, steep hillslopes, and narrow canyons that overlook Yankee Canyon to the southeast, interspersed with coal gob (waste) piles and other remnants of historic mining efforts (Photographs 1-5). Elevation ranges from 7,120 feet (ft) above mean sea level (amsl) within a small section of canyon bottom at the eastern edge of the project area to 8,140 ft near the top of the mesa along the western project boundary.

Physiographically, the project area is in the western portion of the Raton Section of the Great Plains Province, which is characterized by high piedmont plains, extensive basalt flows, and deep canyons of the Canadian and Cimarron river systems (Hawley 1986). The area contains Cenezoic volcanic centers, such as Sierra Grande and the Capulin crater, and high plains and tablelands capped with basalt flows or sandstone units. The project area is located within the Raton Basin, an Upper Cretaceous and Tertiary period sedimentary and structural basin bound on the east by the High Plains and to the west by the Sangre de Cristo Mountains (Oakes and Zamora 2010). Hydrologically, Yankee Canyon contains the East Fork of Chicorica Creek, which flows southwest into Chicorica Creek, a south-flowing tributary of the Canadian River that passes approximately 1 mile east of Raton. The Canadian River drains the entire area and flows southeast onto the Great Plains.

Geologically, materials in the project vicinity are mostly sedimentary in origin and Tertiary or Cretaceous in age (Lee 1924). The project area is underlain by the Upper Cretaceous Vermejo Formation, which contains bands of mudstone, shale, and thick coal beds. This formation is overlaid by tertiary materials, while unconsolidated quaternary rocks cap buttes and ridge tops (Lee 1924:6). Surface deposits and escarpments are often basalt or other igneous material. Most importantly for the history of the region, coal-bearing units of the Raton coal field are found in both the Vermejo and Raton formations and have been the target of mining since the late 1800s (Oakes and Zamora 2010). Within the project area, coal occurs within the Raton Formation at two different elevations separated by a thick barren sandstone zone: (1) a lower zone that is 100-300 ft thick and contains thin coal beds within a basal sandstone conglomerate with mudstone, siltstone, and shale; and (2) a thick, upper coal-bearing zone that consists of floodplain deposits of sandstone, siltstone, mudstone, and shale interbedded with thick bands of coal (Moiola 1998:3). The Yankee bed that was accessed historically in the project area is a thin unit near the base of the upper zone near the eastern edge of the Raton field. According to the Natural Resources Conservation Service (NRCS) Web Soil Survey, nearly the entire project area (97 percent) contains Aridic Arguistolls-Rock Outcrop association soils, which can be shallow or deep, consist of colluvium or residuum derived from igneous or sedimentary rocks, and occur on mesas or side slopes interspersed with exposed rock outcrops (NRCS 2023).

The project area is located near the boundary of the Piñon-Juniper Woodland and Lower Montane Coniferous Forest vegetative communities as defined by Dick-Peddie (1993). The principal tree species in these areas are ponderosa pine (*Pinus ponderosa*), piñon (*Pinus edulis*), juniper (*Juniperus spp.*), and various oak species (*Quercus spp.*). Griffith et al. (2006) characterize the project area as part of the Sedimentary Mid-Elevation Forests subregion of the Southern Rockies ecoregion. The Mid-Elevation Forests are dominated

by ponderosa pine, with areas of piñon and juniper. Understory can include dense areas of Gambel oak, mountain mahogany, bitterbrush, and various grasses. A small area of mesa top at the western edge of the project area contains the Grasslands Parks subregion, which is characterized by upland grassy meadows suitable for livestock grazing (see Photograph 5). The eastern edge of the project area within the canyon bottom also contains open grassland meadows, likely due to historic grazing and settlement. Survey observations indicate that mall stands of ponderosa pine, Douglas fir, and spruce trees are distributed along the bottom of the deepest side canyons, while juniper and piñon pine trees are intermixed with oak across benches and slopes. Understory species observed during survey include Gambel oak, locust, wild rose, skunkbush, mountain mahogany, prickly-pear cactus, banana yucca, and various grasses and forbs. The defining characteristic of the project area is the extremely dense and nearly impenetrable community of Gambel oak and locust that blankets much of the project area, including all of its steep side slopes (see Photographs 3 and 4).

The climate in Raton and northeastern New Mexico is temperate and semiarid, with most precipitation occurring during the late summer in the form of monsoon rains. Annual precipitation is 16 inches, and the area receives approximately 130 frost-free days. Climate data collected from the Raton Airport between 1941 and 2016 indicate that July is the warmest month, with an average high temperature of 85.9 degrees Fahrenheit (F) and an average low of 54.3 degrees. January is the coldest month, with an average high of 45.5 degrees and an average low of 12.5 degrees. Approximately half of all precipitation falls from June-August during the monsoon season (Table 1; Western Regional Climate Center 2023).

Table 1. Monthly Historical Climate Data The Raton Airport, New Mexico (1941 to 2016; WRCC 2023)

	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec	Annual
Average Maximum Temp	45.5	48.4	54.9	62.2	72.7	82.9	85.9	83.8	77.8	68.8	54.2	46.9	65.3
Average Minimum Temp	12.5	16.0	21.6	30.6	40.1	49.4	54.3	52.7	45.0	33.5	21.0	14.3	32.6
Total Precipitation (inches)	0.32	0.28	0.49	0.98	1.71	2.00	2.56	2.84	1.45	0.95	0.38	0.30	14.26
Total Snowfall (inches)	4.1	3.4	3.4	3.2	0.3	0.2	0	0	0	1.2	3.9	3.0	22.9

Photograph 1. View of Yankee Canyon from Project Area (Facing Southeast)

Photograph 2. View of Yankee Canyon from Project Area (Facing Northeast)

Photograph 3. Example of Steep Side Slopes and Dense Oak Vegetation

Photograph 4. Areas of Ponderosa Pine and Oak/Locust Understory

Photograph 5. Isolated Grasslands Near Mesa Top

CHAPTER 3

HISTORIC BACKGROUND

This chapter provides a historic context for the Yankee Mining District, which is part of the broader Raton Coal Field. It focuses specifically on the history and development of coal mining within Yankee Canyon and includes a brief summary of northeastern New Mexico in the historic period. Northeastern New Mexico was not a focus of Spanish colonial activity, as settlement from the 1500s through the early 1800s was concentrated in the Rio Grande Valley and its major tributaries. However, the discovery of coal deposits and the arrival of the railroad in the late 1800s resulted in the establishment of Raton as a local economic center and the development of substantial mining communities across the region. After an economic boom, Raton entered a period of economic decline during the twentieth century, and Yankee Canyon was abandoned by the 1960s.

EARLY EXPLORATION

The first Europeans to enter northeastern New Mexico were the members of the Coronado Expedition in 1540–1541, who may have followed the Canadian River eastward onto the Great Plains during their quest for the fabled riches of the Cibola. Many Spanish expeditions entered northeastern New Mexico in subsequent years including those led by Francisco Leyva de Bonilla and Antonio Gutierrez de Humana (1594), Don Juan de Oñate and Vincente de Zaldivar (1596), Don Diego de Vargas (1696), Juan de Ulibarri (1706), Antonio de Valverde (1710), and Don Juan Paez Hurtado (1715). In general, expedition routes into the northeastern portion of the state began at Pecos Pueblo and followed the Canadian River eastward.

Once on the plains, the Spanish explorers encountered two historic Native American groups, the Apache and Comanche, referred to collectively by the Spanish as "Faraones." Archaeological evidence of these residentially mobile Plains nomads is consistent with descriptions in the early historic accounts of the Comanche and Apache. They depended on bison for subsistence, resulting in highly mobile lifestyles as they followed the herds across the plains. Both groups supplemented their economic base by trading with, and raiding, their Pueblo neighbors and later the Spanish and Mexicans. By 1700, the area that today constitutes Colfax County was occupied by the Jicarilla Apache, although the Comanche also used the area for raids and trading trips (Thoms 1976). Although Spanish explorers occasionally crossed the area, no permanent settlement was made by Euro-Americans until the Apache and Comanche were subdued in the mid-to-late nineteenth century.

The early nineteenth century was marked by Mexico's War of Independence, which began in 1810 as a peasant rebellion against the colonial government of Spain. Fighting continued over the next decade until Mexico declared independence from Spain in 1821. Although Mexican rule did not dramatically alter the daily lives of New Mexicans, changes did occur. Sedentary Christian Native Americans were granted citizenship and the right to dispose of their land. Perhaps most importantly, the formerly outlawed trade with the United States was legalized, and by the 1840s, increasing numbers of merchants set out from the east along the Santa Fe Trail established by William Becknell. Hispanic settlement of northeastern New Mexico also intensified following Mexican independence. Unlike their Spanish predecessors, Mexican governors issued grants on large areas of grazing land beyond the major river valleys, and the total area of land grants between 1821 and 1846 exceeded that granted by the Spanish in the preceding 125 years (Bowden 1971; Van Ness and Van Ness 1980).

THE MAXWELL LAND GRANT

Euro-American expansion into northeastern New Mexico began when Charles "Carlos" Beaubien, a French Canadian, established a mercantile in Taos in 1823. In 1841, Beaubian and Guadalupe Miranda received a land grant for almost two million acres of what would later become Colfax County from the Governor of Mexico. The two entrepreneurs planned to explore the rich natural resources of the area, capitalize on the growing trade along the Santa Fe Trail, and encourage settlers to the area, while the Mexican government hoped the land grant would serve as a buffer against American encroachment (Dary 2000; Lamm et al. 2008). Explorer Lucien Bonaparte Maxwell managed the Beaubien and Miranda Land Grant from a headquarters in Cimarron, a small community that had been established in 1841 and became an important stop on the Santa Fe Trail (Lamm et al. 2008). When New Mexico joined the United States, the Beaubian and Miranda Grant became part of Mora County when it was formed from Taos County in 1859.

After Beaubien's death in 1864, Maxwell inherited some of the Beaubien and Miranda Land Grant and was eventually able to purchase the entire 1,700,000-acre grant from family heirs and other partners. Maxwell built a large estate near Cimarron and profited greatly from ranching, trade, mineral prospecting, and other ventures. Gold was discovered near Elizabethtown in 1866, leading to a brief gold rush to the area. By 1869, the grant contained over 500 settlers, who built homes and farms on allotted pieces of land and paid Maxwell in grain or livestock (Montoya 2002). Colfax County was formed in 1869 and encompassed most of the Beaubian and Miranda Grant. Elizabethtown was the first county seat, but in 1872 it was moved to Cimarron. In 1870, Maxwell sold the grant to three Colorado businessmen, who then sold it to English investors, who in turn sold it to a Dutch group that formed the Maxwell Land Grant and Railway Company (Montoya 2002). Maxwell's complicated patrón system was not compatible with the goals of the new owners, who began evicting squatters and pursuing mining and railroad ventures. Years of court cases and land disputes culminated in the Colfax County War of 1875. This conflict pitted the Colfax County Ring (those fighting against expulsion) against the Maxwell Land Grant and Railway Company, which had become associated with the Santa Fe Ring, a corrupt group of politicians, lawyers, and businessmen. Despite this turmoil, the land grant was essential for bringing settlers to northeastern New Mexico, and its ultimate purchase by a variety of investors in the 1870s led indirectly to the establishment of mining communities in the region and the arrival of railroad.

RATON AND THE RAILROAD

Several local and regional historical developments in the late 1800s transformed northeastern New Mexico and led to the development of the current project area: the growth of local commercial centers along the railroad and other transportation routes, the exploration of coal resources and formation of mining boomtowns along the eastern slope of the Sangre de Cristo Mountains, and the construction of local railroads and spur lines. The railroad arrived in New Mexico in 1879 when the Atchison, Topeka, and Santa Fe Railway (AT&SF) crossed over Raton Pass and reached Las Vegas, integrating New Mexico into the growing American market economy. Just as the opening of the Santa Fe Trail brought about major changes in the structure of the Spanish and Mexican borderlands, the arrival of the railroad in 1879 was a watershed moment in the history of New Mexico. The railroad accelerated changes in the population and economy, connected the territory to the eastern and western coasts of the United States, brought an influx of materials and American pioneers and settlers to the territory, and fostered the development of a cash economy by providing the means to ship minerals, beef, wool, timber, and other resources from New Mexico to outside markets (Bryan 1989; Maxwell and Post 1992). The late nineteenth to early twentieth century was a time of rapid industrialization and technological advance, and the increased access to eastern goods and inexpensive transport had profound effects on frontier economies such as that of New Mexico.

After the railroad arrived, a construction camp was established at Otero, south of Raton Pass and the old Willow Springs watering stop along the Santa Fe Trail. The railroad built a roadhouse and shops at Willow Creek; the location was renamed Raton and quickly developed as a railroad boomtown, with repair shops, a railyard and roundhouse, depots, hotels, and businesses. By 1881, the boomtown had 200 buildings and 3,000 residents, and it overtook Cimarron as the largest community in the area. During the early 1880s, the AT&SF built many railroad buildings in Raton, including mechanic and blacksmith shops, a roundhouse, passenger depot, freight room, and restaurant. The first depot was a two-story, gable-roofed, board-and-batten building constructed within the current project area in 1884 (Oakes 1987). In addition to the importance of the railroad, Raton became a trading center for the surrounding ranch lands and headquarters for large-scale coal mining operations west of town. In the 1890s, it became the county seat of Colfax County. Raton billed itself the "Pittsburgh of the West" due to its railroad shops and surrounding coal fields (Julyan 1998).

RATON COAL MINING DISTRICT

The Raton economy came to be dominated by coal mining in the late 1800s and early 1900s. Coal had been discovered on the Miranda and Beaubien Land Grant in the 1840s, but the industry did not develop in Colfax County until the arrival of the railroad allowed for easy transport. At this point, a series of company coal mining towns—usually owned by a company that also constructed railroads—developed along the lower canyons of the Sangre de Cristo Mountains, and Colfax County quickly became one of the largest coal-producing regions in the western United States. The AT&SF Railroad began coal prospecting in Dillon Canyon in 1880, and the Raton Coal and Coke Company was established (Cook and Baxter 1977). Formal mining operations began in 1881 and significant settlement occurred between 1880 and 1882 at Blossburg, the first official coal camp in Colfax County and one of the oldest mining towns in New Mexico (Oakes and Zamora 2010). As demand for coal increased, immigrants from Europe (particularly Italy) flocked to the area. Blossburg had 500 residents by 1885 and nearly 1,200 by 1890.

Other mining towns developed across the Raton Coal Field in the late 1800s and early 1900s. Southeast of Raton, Van Houten was founded in 1902 by the St. Louis, Rocky Mountain, and Pacific Railway Company and named for a representative of the Dutch company that purchased the Maxwell Land Grant (Julyan 1998; Kessel 1966). Koehler was founded in 1906 and named for Henry Koehler, president of the American Brewing Company and the St. Louis, Rocky Mountain and Pacific Company. After the arrival of the large continental railroads, local/regional railroads, spurs, and connecting lines were constructed across New Mexico, including lines in Colfax County to access coal mines and link local population centers (Figure 4). The first of these were constructed by the AT&SF to bring coal from the mines at Blossburg and Gardiner in Dillon Canyon to the railyards in Raton. The Dawson Railway was constructed in 1902, linking the coal claims at Dawson to the El Paso and Northeastern Railway at Tucumcari (Myrick 1990). Colfax County was producing approximately 300,000 tons of coal annually by 1902 and 2 million tons annually by 1909. Coal production peaked between 1910 and 1920, when Colfax County produced 75 percent of all the coal mined in the territory of New Mexico and contributed an estimated 80 percent of the tax revenue for the new state (Barrett 2007). The success of coal mining in the region was largely due to the excellent coking coal produced in the Raton District, which was shipped to fuel copper smelters in Arizona, Colorado, and California.

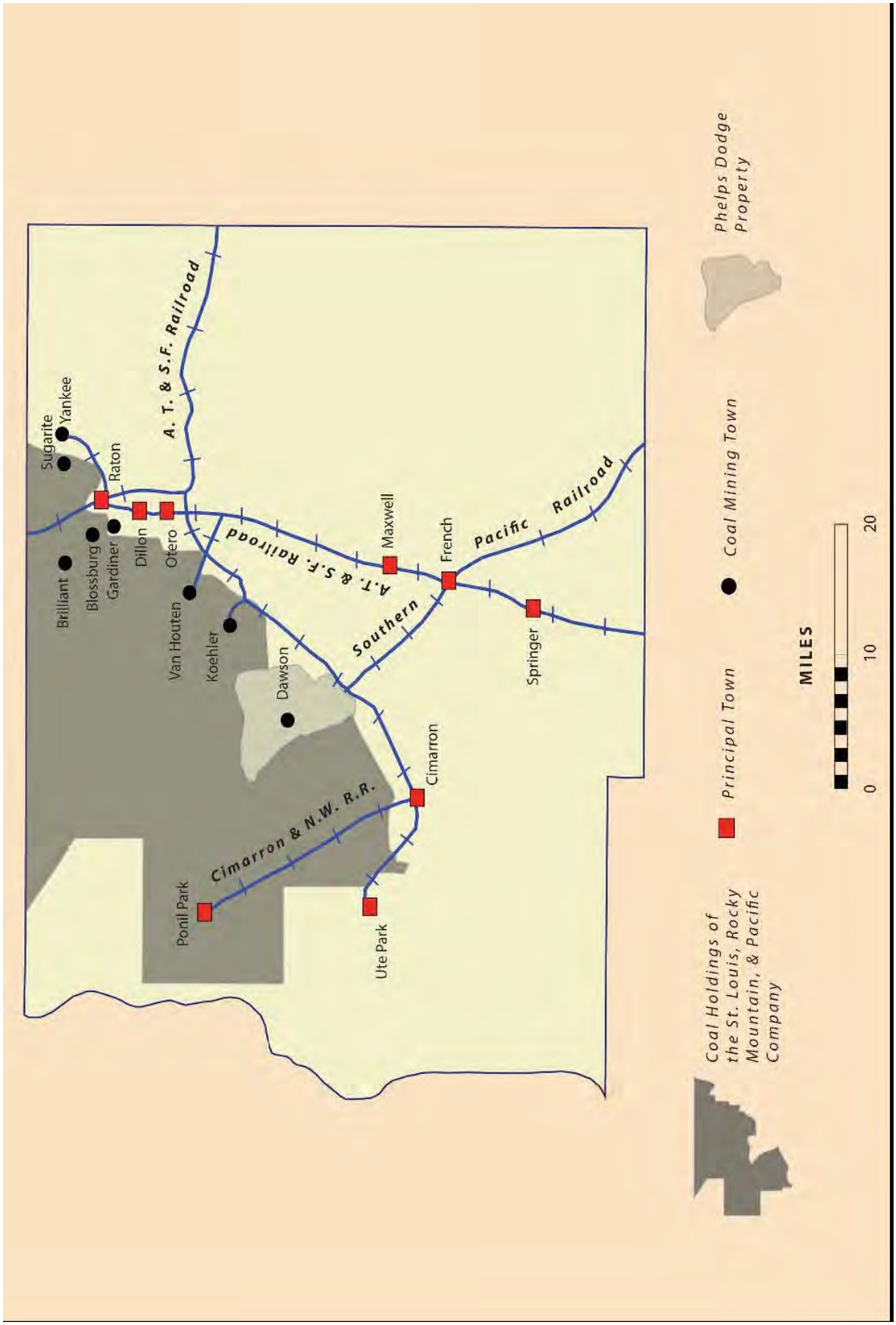


Figure 4. Colfax County Towns, Mines, and Railroad Towns in 1910 (From Kessel 1966:242).

HISTORY OF YANKEE CANYON

Coal mining began in Yankee Canyon in 1905 and continued as late as the 1960s. Systematic corporate mining took place at the Yankee Mines from 1905 to 1913, with all subsequent mining being small-scale family operations. Much of the following discussion is derived from Moiola (1998), who provides an excellent history of Yankee Canyon compiled from Territorial and State Mine Inspectors Reports from 1906 to 1922, Lee's (1924) summary of the Raton Coal Field, Nickelson's (1979) evaluation for the New Mexico Bureau of Mines and Mineral Resources, and other local accounts. Ranchers had mined small amounts of coal on Johnson Mesa for domestic fuel in the late 1800s, but the Llewellyn and Turner mines established in 1901 were the first formal mines in the area. By 1905, the Yankee Mines had been established, and a joint venture by several corporate interests backed the construction of the Santa Fe, Raton, and Eastern Railroad to link the coal mining areas of Sugarite, Yankee, and Carrisbrooke to Raton (Pratt 1986). The town site of Yankee was laid out, and it grew into a local boomtown with a post office by 1906 and as many as 2,000 residents by 1907-1908 (Moiola 1998).

The Yankee Fuel Company constructed three mine entrances (Mines No. 1, 2, and 3), a three-rail gravity incline, tipple, ventilation furnace and fan, and other mining infrastructure 1 mile west of town. In 1906, the mine had 75 coal cars, 80 men working underground, and 30 additional workers; mules hauled coal from the underground rooms to a junction where it was loaded onto the gravity incline that carried it to the canyon below (Sheridan 1906). In 1908, the mines operated for 228 days, employed 92 men underground, and produced 60,341 tons of coal. According to Moiola (1998), the peak years of large-scale corporate mining in Yankee Canyon were 1907-1909.

In 1909, the mine operations were suspended, and although they resumed in 1910, production began to decline and two of the entries were permanently abandoned in 1911. According to Lee (1924), all the Yankee Mines had been abandoned and were inaccessible when he visited in 1913. The New Mexico and Colorado Coal and Mining Company took over operations that year, constructed a new tipple and gravity incline, and opened new mines in the Kellogg Bed farther to the north. However, this coal bed was not as productive, and the new mines were sold to the Superior Coal Company in 1917 and abandoned by 1921. The town of Yankee followed the fortunes of the mines, and it began losing population after 1910. The railroad line was abandoned in the 1930s, and only a few ranching families remained in the area into the 1950s. During these later periods, small-scale family mining operations continued sporadically, with some operations occasionally reopening portions of the previous Yankee Mines or developing new locations. These later, family-scale mining efforts continued until at least 1963 (Moiola 1998) and resulted in the development of several of the mining sites documented during the current project.

The decline of Yankee Canyon mirrored developments in the broader region, as the town of Raton declined along with the coal and railroad industries after 1920. First, the construction of new railroads, including the Belen Cutoff, decreased the importance of the route through Raton as a major transcontinental freight line. Diesel began to replace coal as the primary fuel for locomotives, and eventually, most freight was carried on trucks rather than railroads. Coal production declined throughout the 1920s and Great Depression, and most of the coal camps in the region had been abandoned by the 1940s (Barrett 2007).

CHAPTER 4

PREVIOUS RESEARCH

On September 6, 2022, OCS conducted a pre-field records search of the NMCRIS database to obtain information on all previously conducted surveys and previously documented cultural resources located within 500 meters (m) (1,640 ft) of the project area. Shape files and attributes were obtained from NMCRIS, plotted in ArcGIS, and analyzed for their relationship to the current project. Current listings of the NRHP and New Mexico State Register of Cultural Properties (NMSRCP) were also consulted to determine the presence of any registered properties or districts in the project vicinity, although none were identified. The purpose of these pre-field record searches was to determine the location of known cultural resources within the project area and vicinity, derive expectations regarding the nature and frequency of resources that might be encountered during the field survey, and obtain a better understanding of the previous research in Yankee Canyon. In particular, the record search was used to gather information about local mining history and several historic mining sites that had been previously documented within or near the project area.

Only three previous cultural resource inventories are depicted in the NMCRIS database within 500 m (1,640 m) of the Yankee Canyon Mine Safeguarding Project. Two of the three intersect with the project area but cover only small areas of the APE; as a result, less than 5 percent of the 580-acre project area has been previously inventoried for the presence of cultural resources. In 1987, the Museum of New Mexico Laboratory of Anthropology conducted a survey of 128 acres that targeted documentation of 18 historic coal mine sites for what was then referred to as the Abandoned Mine Land Bureau (Oakes 1987; NMCRIS No. 17961). This survey included two locations in the current project area, as well as numerous mines in the surrounding region. Later, the Abandoned Mine Land Bureau conducted their own documentation of four Yankee Canyon coal mines, all of which are located within the project area (Moiola 1998; NMCRIS No. 58666). Southwest Archaeological Consultants documented additional coal mine sites north of the project area in 2002 (Deyloft 2002; NMCRIS No. 78730). This project did not include any of the sites in the current APE but contributed to our understanding of the history of Yankee Canyon. These data demonstrate that previous cultural resource inventories in the area have been focused exclusively on documentation of historic mining sites for mine clean-up or remediation efforts but have not included block survey of large areas.

Five previously documented archaeological sites are located within the literature review area—four of which (LA 57200, LA 119817, LA 119818, and LA 120611) are located within the project area and were updated during the current investigation and one of which (LA 135651) is located just north of the project area. All five previously documented sites are twentieth century historic coal mining locations. No prehistoric sites have been documented in the area. The four previously recorded sites in the project area are discussed in more detail within Chapter 6. A variety of historic documents were also consulted to understand the development of the Yankee Canyon Mining District. The BLM General Land Office (GLO) online database, historic USGS quadrangle maps, and survey plat maps were consulted during this investigation to gain a better understanding of early settlement in the region. These resources did not contain evidence of other sites or resources in the project area.

CHAPTER 5

METHODOLOGY

A 100-percent, pedestrian cultural resource survey of the APE was conducted in accordance with guidelines presented in *§4.10.15 NMAC: Standards for Survey and Inventory*. The New Mexico SLO's Cultural Resource Protection Rule was not in place at the time of pre-field preparation or survey, but SLO cultural resources staff was consulted about the project. A variety of other resources and references pertaining to the documentation of historic mining districts were also consulted (as discussed in Chapter 1). The following sections summarize the methods used during pre-field preparations, survey, feature recording, and post-field processing and data analysis.

PRE-FIELD INVESTIGATIONS

Prior to conducting the survey, the NMCRIS database was consulted to identify previously recorded archaeological sites, buildings, structures, and surveys in the project area and vicinity (see Chapter 4). Historic documents were evaluated to better understand the history of Yankee Canyon Mining District. Through discussions with Rick Wessel, EMNRD AML Program Cultural Resource Manager, the APE was defined and expectations about field survey, documentation, deliverables, and the overall project approach were outlined. Correspondence about the project and expectations was also conducted with SLO archaeologist David Eck. Field maps were created in ArcGIS for use during survey. Shape files of the project area and locations of known mining features were overlaid on topographic maps and aerial imagery for use in the field. Field maps were produced at various scales to aid in the accurate identification of features during pedestrian survey and to provide field crew members with detailed topographic information for the project area.

SURVEY METHODS

The records review was followed by an intensive, Class III pedestrian cultural resource survey of the APE. An archaeologist who met the Secretary of Interior's Standards and Guidelines for Archaeology and Historic Preservation and was listed as a Field Supervisor under Okun Consulting Solutions' New Mexico State Historic Preservation Officer (SHPO) Archaeological Survey Permit was in the field to lead the crew at all times. Project area maps and Global Positioning System (GPS) receivers were consistently consulted to assure full coverage of the APE and facilitate wayfinding during survey. Notes on vegetation patterns, ground surface visibility, and sources of disturbance and recent use were recorded. Photographs documenting overviews of the project area, sources of disturbance, and specific topographic features were taken throughout the survey.

This survey presented unique challenges due to topography and vegetation. As a general rule, surveys are conducted by archaeologists walking transects that are no more than 15 m (50 ft) apart on cardinal-direction (north-south or east-west) transects across the entire project area. However, contour-based transects at varying orientations were used during the current project to avoid crossing severe slopes on cardinal directions only. In addition, we were often forced to vary transect widths due to stands of very dense vegetation or topographic features such as rock outcrops. Despite these methods, some areas proved impossible to safely survey due to severe slopes and impenetrable vegetation. Although we did not map these specific locations, based on our combination of traditional survey, targeted inspection, and use of aerial imagery to identify potential site locations, we consider this to be a 100-percent pedestrian survey despite evolving field methodologies necessary to keep crew members safe. Furthermore, historic mining

sites occurred only along specific contours or along benches or drainages due to the orientation and depth of coal beds, potential opening options, and the same access difficulties faced by our survey crew.

All cultural materials observed during survey—including all artifacts and features—were closely inspected and evaluated for their age and potential qualification as an archaeological site (criteria are discussed below). Attempts were made to relocate all previously recorded archaeological sites shown as either intersecting with the current survey area or located within the area immediately surrounding the survey area based on the inspection of polygons in the NMCRIS GIS Map Service. Cultural manifestations that were more than 50 years old but did not qualify as archaeological sites were recorded as isolated occurrences (IOs), which usually consist of a location with fewer than 10 artifacts. Locations that result from a single episode of human activity or represent a limited range of activities—such as single-episode roadside dumps or simple features lacking associated artifacts—were also documented as isolates rather than archaeological sites, which are reserved for more purposeful or complex loci of past human activity. Information recorded for IOs includes the area, artifact type and frequency, and sketches or photographs of diagnostic artifacts. UTM coordinates were obtained for all IOs.

CULTURAL RESOURCE DOCUMENTATION

Criteria were used that define sites as physical locations of purposeful human activities or events that resulted in a deposit of cultural material were applied. Generally accepted guidelines for the definition of archaeological sites on state and federal lands in New Mexico were adopted. Archaeological sites were defined as locations that included one of the following:

- One or more features
- One formal tool if associated with other cultural materials
- An occurrence of artifacts (such as pottery sherds, chipped stone, or historic items) that contains one of the following: (a) three or more types of artifacts or materials; (b) two types of artifacts or materials in a density of at least 10 items per 100 square meters; (c) a single type of artifact or material in a density of at least 25 items per 100 square meters.

A Laboratory of Anthropology (LA) Site Record form was completed for all newly discovered sites and all previously documented sites plotted within the APE in the NMCRIS database regardless of whether they were relocated. Previously documented sites were not recorded if they were plotted outside the APE in NMCRIS and confirmed to not intersect with the APE during survey. Site forms and reports associated with previous inventories were utilized during field recording and provided information about the setting, features, and cultural materials on previously recorded sites. Due to the time that has passed since these historic mining sites were last recorded (Moiola's 1998 documentation being the most recent), all previously recorded sites were fully updated, mapped, and described.

Because portions of the project area represent an informal mining "landscape," specific decisions were made about how to document sites and assign resource numbers. Each historic mining locus meeting the above criteria was documented as a separate archaeological site, but these sites are also linked by linear transportation features that were likely constructed historically but often continue to be used today. Many of the sites are linked by a network of roads that may represent coal cart tracks but lack defining historic elements and today function as two-track roads. These linear features were not defined as separate linear resources or individually assigned LA or HCPI numbers, but the segments within mining site boundaries were recorded as features. The site boundaries were not expanded to encompass additional segments of roads. Similarly, vegetation anomalies along possible historic tramway inclines visible on aerial imagery were recorded as features within site boundaries but were not defined as separate resources or fully encompassed by sites unless they retained visible on-the-ground elements. At LA 119818, the gravity incline remains a visible feature with a linear distribution of artifacts, and it was therefore incorporated within an expanded site boundary that included two mining loci and the linear feature.

MAPPING

OCS uses a cloud-based mapping system that integrates our ArcGIS Online account, a sub-meter GPS receiver, and data collection/mapping applications loaded onto hand-held tablets. Sub-meter spatial data are transmitted from the receiver to tablets via Bluetooth technology, while ArcGIS Collector and Survey123 applications are used to map sites, collect spatial data, and complete artifact analysis and other data entry. Included on each site map, at a minimum, are the LA site number, site boundary, survey boundary (if near the site) site datum location, north arrow, scale, and legend. When applicable, maps also depict features, artifact concentrations, diagnostic or other important artifacts, areas of disturbance, and topographic data. Using this system, a polygon with sub-meter accuracy was collected for most features. However, due to the number of features and the logistical challenges posed by accessing every feature with a sub-meter receiver, feature centerpoints were sometimes collected with a hand-held commercial grade GPS unit, and a polygon was later created in ArcMap based on feature notes and dimensions taken in the field.

FEATURES

Feature recording utilized the NMCRIS classification system when possible. Each feature was photographed, and its description included dimensions, morphology, building materials, condition, potential for subsurface cultural deposits, and an interpretation of its function. Loci were defined when clusters of features and/ or artifacts indicated an area of intensive human activity that exhibited specific functional or temporal characteristics. Artifact Concentrations (ACs) were defined in areas of high surface artifact density regardless of whether features were present.

While all features were documented individually, Hardesty's (2010) concept of "feature systems" within mining districts helped structure interpretation and documentation. Feature systems are defined as groups of "archaeologically visible features and objects that are a product of a specific human activity," such as the remains of a single prospecting effort in one location, a network of transportation features spread broadly across the landscape, or a concentration of mining features focused on a particular type of ore. Examples of feature systems in the current project area include an ore transport network and a leach vat processing mill, both of which encompass several individual features.

Attributes recorded for each feature included feature type/function, dimensions, materials, and other descriptive attributes. Dimensions recorded included length (maximum dimension)/width or diameter for all features, estimated depth for subterranean features such as pits and shafts, and height for surface features such as waste rock piles and platforms. If relevant, both maximum and minimum heights or depths were recorded. The opening size and shape were recorded for shafts and adits. Depths were estimated for shafts and adits if possible, but in some cases an estimate could not be made due to a lack of visibility. All feature dimensions were recorded in feet.

Specific attributes recorded for pits/depressions included the overall shape of the feature in plan view and the profile of the feature sides (straight/sheer, steeply sloping, or gradually sloping). The rock size present in waste rock features was documented using subjective categories assigned in the field during recording. Almost all waste rock dumps contain material from multiple size classes, and therefore a range was often recorded for individual features; for example, "earth-small boulders" implies that earth, gravels, cobbles, and small boulders were present. A variety of other descriptive attributes were recorded depending on the specific feature type.

A photograph was taken of most features, including all features with unique characteristics. Sample photographs were taken of very common feature types, such as waste rock piles. All artifacts observed in association with a feature were documented and included in the description. A definition of all feature types encountered and documented in the project area is provided below. Several of these feature types

come directly from NMCRIS (particularly types that are not exclusive to mining sites), but others were drawn from historic mining literature such as National Register Bulletin 15 (Noble and Spude 1997) or were designed specifically for this project.

- **Adit:** Deep, horizontal, formally constructed mine opening with straight sides that is at least 10 ft deep and/or in which the mine workings occurred underground and cannot be viewed
- **Cairn/Mine Claim:** Small mound or pile of rocks that has been intentionally stacked but does not contain formal structural elements (with or without a wooden marker)
- **Car Body:** A complete or large portion of an automobile
- **Concrete Footer:** A concrete foundation that does not contain more specific attributes associated with machine platforms (bolts or metal attachments)
- **Culvert:** Formal linear structure carrying water beneath a road or railroad grade
- **Depression:** General feature category that includes any depression that could not be specifically defined as a tank or extraction/prospecting feature
- **Dugout:** U-shaped depression fully, or partially, excavated into a slope, usually associated with domestic habitation, but also could serve as a storage feature or utility structure
- **Earthen Berm:** Earthen feature lacking waste rock, not clearly resulting from mineral extraction, and exhibiting a length that is at least three times its width
- **Fence:** Any series of wood or steel posts that are connected by a medium to form a barrier
- **Loadout Structure:** Any feature (usually wood) that created a route, ramp, or platform used to facilitate the loading or unloading of coal ore or waste rock
- **Machine Platform:** Foundation that clearly functioned as the mount or platform for a small piece of mining equipment; usually consists of a concrete or cinder-block slab with bolts, anchors, or other direct evidence of equipment attachments
- **Masonry Foundation:** A stone foundation that was likely associated with habitation (non-mining function)
- **Open Cut:** Large mineral extraction pit feature in which the workings are open to the surface; distinguished from prospect pits by greater size and from open trenches by shape in plan view
- **Ore Transportation Feature:** Any feature or system of features that functioned to transport ore or waste rock
- **Post:** Piece of metal, wood, or other material placed upright in the ground
- **Prospect Pit:** Small excavated pit used to test or assay for mineral ore or evaluate the quality of a known ore body; smaller than an open cut and shallower than a mine shaft or adit
- **Railroad Grade:** Linear earthen berm or swale that once contained a railroad track
- **Ramp:** Sloping linear earth or waste-rock feature that provided vehicle access to a specific mining feature such as an open pit or platform
- **Retaining Wall:** A wall specifically designed to retain sediments or waste rock or otherwise prevent erosion
- **Road:** Linear earthen feature that was used by vehicles or heavy equipment
- **Rock concentration:** General feature type that includes any intentionally placed cluster of rocks that is not stacked and does not form linear arrangements
- **Rock Wall:** Any intentionally constructed rock alignment that is more than a single course in height
- **Shaft:** Deep, vertical, formally constructed mine opening with straight sides that is at least 10 ft deep and/or in which the mine workings occurred underground and cannot be viewed
- **Structure (Unspecified):** Concrete, masonry, or wooden alignment or platform that no longer retains its associated superstructure elements and cannot be placed in a more specific category

- **Waste Rock Pile:** Secondary waste rock dump that is unmodified and does not have a linear orientation in plan view
- **Waste Rock Platform:** Waste rock feature that has been intentionally modified or levelled to create a platform or activity area
- **Wood Concentration:** Cluster of milled wood of unknown function

ARTIFACT ANALYSIS

In-field analysis forms were used to record historic artifacts when they were encountered. Summary information was recorded for all historic artifact concentrations, including area, location, and counts of specific artifact types/classes. Depending on the number of artifacts present, these concentrations were either summarized/tallied or subjected to detailed attribute analysis using OCS historic artifact forms. Maker's marks and other diagnostic artifacts were targeted during analysis in order to estimate date ranges for these locations.

Historic artifacts were categorized by material type (glass, metal, ceramic, other), artifact type (e.g., bottle, plate, can), and other characteristics. Dimensions and a variety of other attributes were recorded. Maker's marks were illustrated or recorded, and associated manufacturing dates were used to assign temporal affiliations. All historic-item measurements were taken in US standard measurements to the nearest 1/16 inch. Can attributes included seam and opening characteristics and an assessment of the contents the can likely contained. Four prehistoric artifacts discovered within the site were fully analyzed, but these items did not meet archaeological site criteria on their own, and a prehistoric component was therefore not added to the historic mining site.

DATA ANALYSIS

After the completion of fieldwork, feature descriptions and photograph logs were subjected to quality control procedures and checked for obvious errors and general accuracy. The information was then entered into a master Microsoft Excel table that included all documented features. A variety of editing tasks were performed on this table to ensure accuracy, standardize feature type designations, remove redundant data, and add missing information. Using pivot tables and statistical functions, queries were conducted, and individual tables were created for each site. Photographs were edited as needed and organized by feature type.

Spatial data were downloaded from ArcGIS Online to ArcGIS Desktop programs, where they could be edited and manipulated. Features that were not mapped with a tablet and sub-meter GPS receiver in the field were digitized using recorded GPS coordinates and other field notes. A variety of GIS editing tasks were performed to repair geometry errors, adjust polygon and line vertices, combine polygons when needed, remove redundant records, and edit attribute data. The master feature database shape file was then compared to the Excel table to ensure numbering and feature designation consistency, repair errors, and add missing records to both databases.

ELIGIBILITY AND EFFECTS

All identified resources were evaluated for eligibility to the NRHP and assessed for potential impacts from the proposed undertaking. To qualify for listing on the NRHP, resources must possess historic significance in American history, architecture, archaeology, engineering, or culture, and they must exhibit historic integrity—the ability to convey their significance through the survival of their physical characteristics (Hardesty and Little 2009). Historic properties exhibit significance based on their ability to satisfy one or more of four criteria:

1. Criterion A: association with events important in local, regional, or national history
2. Criterion B: association with lives of important historical persons
3. Criterion C: displaying the characteristics of a specific type, period, or method of construction; the work of a master; possessing high artistic value; or being part of an entity whose components lack individual distinction (such as a historic district)
4. Criterion D: having yielded, or being likely to yield, information important in prehistory or history.

National Register Bulletin 42 and other historic resources were consulted when evaluating the eligibility of historic mining sites. In the current project area, the primary considerations were (1) whether a site contained habitation loci with potential for intact subsurface archaeological deposits and (2) whether a site contained intact or unique mine engineering features with the ability to visually convey an association with the period of historic mining in Yankee Canyon.

The potential effect of the proposed project on any cultural resource that is eligible or potentially eligible (undetermined) for listing on the NRHP under any of these four criteria was evaluated using the criteria defined in *36 CFR Part 800*, within which adverse effects are defined as direct or indirect alteration of the characteristics that qualify a property for inclusion in the NRHP in a manner that diminishes its integrity of location, design, setting, materials, workmanship, feeling, or association.

CHAPTER 6

SURVEY RESULTS

A total of 11 historic archaeological sites and nine IOs were discovered and documented during pedestrian survey of the project area. All 11 sites are associated with twentieth century coal mining; four are previously recorded but were fully updated, and seven are newly discovered. Sites include large corporate mines and small family operations dating from the opening of the Yankee Mines in 1905 through the 1960s (Table 2). No prehistoric/aboriginal resources were discovered in the project area. Site locations are presented in the confidential appendix (Figures A1 and A2). We have chosen to embed site maps and detailed maps of specific loci within the following narratives rather than in the confidential appendix, as the maps to not show specific locational information, and we do not feel these sites are threatened by unauthorized excavation or artifact collection.

Table 2. Overview of Documented Mining Sites

LA No.	Field Site No.	Ownership	Name	Date Range
57200	N/A	Private	Turner-Urtado Mine B	1949-1963
119817	N/A	Private	Turner-Urtado Mine A	1921-1949
119818	N/A	SLO	Denton-Colangelo-Strasia-Rodman Mine	1930-1960
120611	N/A	Private	Yankee Mine No. 3	1905-1913
202927	OCS-2228-1	SLO	Unnamed	1930-1963
202928	OCS-2228-2	SLO	Unnamed	1930-1963
202929	OCS-2228-3	SLO	Unnamed	1930-1963
202930	OCS-2228-4	Private	Kellogg Mine	1914-1921
202931	OCS-2228-5	Private	Unnamed	1930s-1960s
202932	OCS-2228-6	SLO	Unnamed	1940s-1950s
202933	OCS-2228-7	Private	Yankee (Unknown)	1905-1913; 1949-1963

ARCHAEOLOGICAL SITES

LA 57200 (TURNER-URTADO MINE B)

Temporal Affiliation: NM Statehood to Recent Historic
Land Status: Private Landowner
Dimensions: 140 by 71 m; 7,519 sq m
Eligibility Recommendation: Not Eligible

LA 57200 (the Turner-Urtado Mine B) is a medium-sized mid-twentieth century coal mining site containing eight features and a sparse historic artifact scatter. The site is located along the southeastern flank of Horse Mesa in the southern part of the project area, where it occupies a narrow bench on a south-facing slope north of a major southeast-flowing arroyo, at an elevation of 7,600 to 7,680 ft amsl (Figures 5 and A2). Sandstone outcrops ring the northern edges of the site, which overlooks Yankee Canyon to the southeast and the canyon to the south. The site is accessed from the east by a mine road that first runs through LA 119817 (Turner-Urtado Mine B) 220 m to the east and continues west for 75 m to LA 202933 (Photograph 1). Vegetation includes Gambel oak, juniper, ponderosa pine, Douglas fir, piñon pine, locust, skunkbush, prickly pear cactus, and various grasses and forbs. Surface visibility averages less than 25 percent due to dense scrub oak. Overall, the site is in poor condition and estimated to remain less than 25 percent intact.

The primary extraction feature (an adit) has been closed, and all supporting mining equipment has been removed. Erosion has damaged a masonry retaining wall that formerly supported the mine road adjacent to the adit opening, and coal gob is being displaced to the south from the waste rock pile.

Photograph 6. LA 57200 Overview Along Mine Access Road (Feature 8) Facing West

Previous Documentation and Research

Information about this mine was compiled by Nickelson (1979) during work conducted for the Office of Surface Mining, but it was first documented as an archaeological site by the Abandoned Mine Bureau in 1998. The "LA 57200" designation was first assigned by the Laboratory of Anthropology to a location they referred to as Frank's Mine (Oakes 1987), a distinctive site on the valley bottom containing the remains of a tipple structure, tramway segment, and other features. This location was updated by the Abandoned Mine Bureau but later incorporated into the broader recording of LA 119818, which Moiola (1998) referred to as the Denton-Colangelo-Strasia-Rodman Mine. In the confusion, the "LA 57200" number was assigned to a separate location referred to as the Turner-Urtado Mine B. Because the Abandoned Mine Bureau represents the only formal previous documentation, we follow Moiola's (1998) lead and also use LA 57200 to refer to the Turner-Urtado Mine B.

Moiola (1998) described the site as a closed adit, a waste pile, a corral, a loadout retaining wall, three truck body fragments, and a sparse scatter of historic artifacts, including a coal shovel, truck tires, other automotive parts, cans, wire, and milled wood. Using archival research and information provided by Nickelson (1979), Moiola determined that the mine was established in 1949 by Barney Urtado immediately after his purchase and closure of nearby Turner-Urtado Mine A (LA 119817). Mr. Urtado employed two

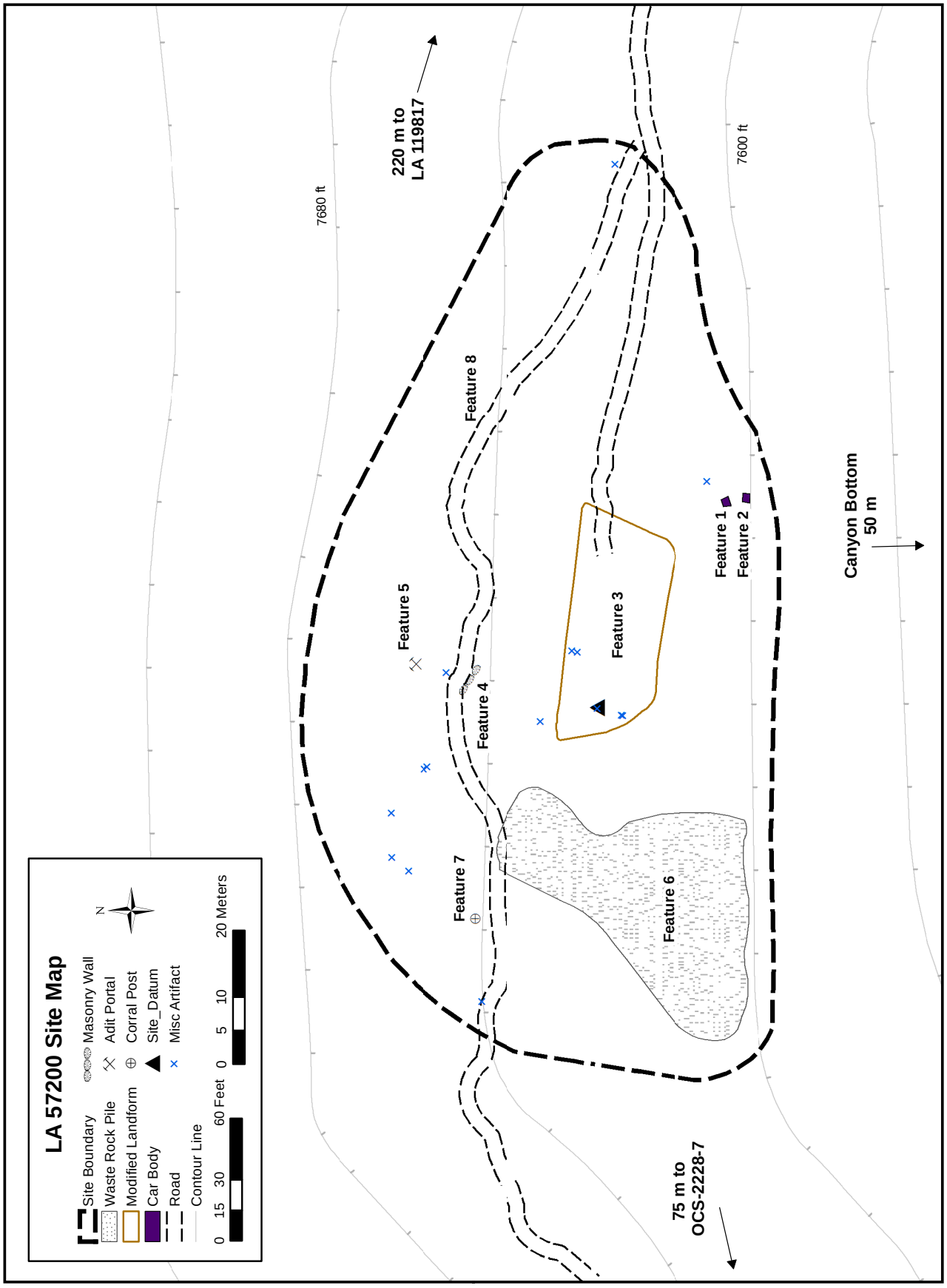


Figure 5. LA 57200 Site Map

or three miners, but the mine was never successful and was abandoned in 1963. Santa Fe Mines later fully closed the mine, and timbers and other equipment were salvaged from the location. Remediation by the AML Program following Moiola's documentation included the use of mechanical equipment, straw bale terracing, netting, and seeding.

Current Recording

The site was revisited, mapped, and fully updated, and a physical site datum (rebar stake with scratch tag) was installed at the center of the site during the current recording. All of the features recorded by Moiola (1998) were relocated, and several new features were discovered. Features now include two car bodies (Features 1 and 2), one modified landform (Feature 3), one loadout retaining wall (Feature 4), one adit (Feature 5), remnants of a corral (Feature 6), one coal waste pile (Feature 7), and one road (Feature 8) (Table 3). Most of the features have significantly deteriorated since the 1998 recording. A small artifact assemblage (n=14) was discovered and fully analyzed.

A historic mine road accesses the site from the east and then splits at the eastern boundary, with a short secondary segment accessing a modified landform (Feature 3) near the center of the site and the primary fork running west to access the adit and waste rock pile (see Photograph 6 above; Photograph 7) Two truck bodies (Features 1 and 2) are just southeast of the modified landform slope and appear to be in similar condition as when documented in 1998, although Feature 1 previously contained intact windows that are now missing (Photographs 8 and 9). In the center of the site are a closed adit (Feature 5) 20 ft north of the road and the poorly preserved remains of a loadout retaining wall (Feature 4) that formerly supported the road (Photograph 10). The adit is little more than a sliver of an opening in a bank of sediments and boulders (Photograph 11). A large coal waste pile (Feature 6) extends down the slope from the adit and west from the platform area, with gob currently being eroded due to channeling and sheetwash (Photograph 12). At the western edge of the site, all that remains of the previously documented corral are a few fallen posts in a densely wooded area north of the road.

Table 3. Summary of Documented LA 57200 Features

No.	Feature Type	L	W	Description
1	Car Body	4	5	Truck cab missing doors, windshield, interior seat, one front-wheel hub, truck bed, and wheels; "502" in yellow paint on right side of cab; two steel handle holds extend from the sides of the cab towards the back; instruments no longer legible
2	Car Body	3	4	Top of a truck cab lying upside-down in dense vegetation
3	Modified Landform	118	49	Artificially leveled area at terminus of a short secondary mine road segment; truck parts and other metal fragments are partially buried along the base of an erosional channel at the southwestern edge; area may represent a work platform or a levelled trash disposal locus
4	Wall	16.4	3	Former timber-and-masonry retaining wall that has deteriorated; the layers of timbers documented by Moiola (1998) have been blown out by erosion, and only a small 1.0-1.5 ft-high section of masonry wall remains at the western end—it is stacked 2-3 courses high and 1-3 courses wide; a 1.5-inch-diameter steel pipe extends from the eroded portion of the wall and likely drained moisture from the nearby adit
5	Adit	1.5	1.3	Adit opening is mostly buried in earth and rock but has been partially reopened by a coyote den; a milled lumber lintel plank is visible within the opening; the surrounding cut is shallow, likely distorted by past closure efforts, and measures roughly 15 ft wide by 3 to 4 ft in depth

No.	Feature Type	L	W	Description
6	Corral	N/A	N/A	Only two 4 x 3-inch rectangular milled lumber posts (both fallen over) remain visible in the area where a corral was identified by Moiola (1998); entire area is densely covered in scrub oak and leaf litter; current extent is unknown
7	Waste Rock Pile	151	115	Large mound (13 ft high) comprised of black and gray earth and gravel-to-small-cobble-sized coal gob; significant erosion along entire mound;
8	Mine Road	470	15	Mine access road also associated with nearby sites; constructed using cut and fill methods; accesses primary features on site

[1] Length and width are presented in ft

Photograph 7. Leveled Platform Area (Feature 3)

Photograph 8. LA 57200 Feature 1 (Truck Body)

Photograph 9. LA 57200 Feature 2 (Truck Body)

Photograph 10. LA 57200 Feature 4 (Retaining Wall)

Photograph 11. LA 57200 Feature 5 (Adit)

Photograph 12. LA 57200 Feature 6 (Waste Rock Pile)

The small artifact assemblage includes 13 metal and one glass item and is scattered around the adit, coal waste pile, and platform. Metal items include five vehicle parts (floor plate, frame fragments, seat spring, and fender), three metal utility containers (one bin, one bucket, and one drum), a drum lid with a pour spout, a metal strap fragment, a coal shovel, and a large sanitary can. The coal shovel is tucked into a niche in a sandstone outcrop near the adit (Photograph 13). The glass artifact is a partially intact clear jar with an applied-color label reading "BAR'S LEAKS" and "HEAD GASKET LEAK REPAIR." It has a screw-top finish and is missing the base.

Photograph 13. Coal Shovel Near Adit Opening

Summary

To summarize, LA 57200 (Turner-Urtado Mine B) is a small coal mine with a single adit, associated coal waste pile that is eroding downslope, a possible work platform, a small corral, and several other features and artifacts. No domestic structures or complex processing features are present. According to Moiola (1998), the mine operated from 1949 to 1963 and employed up to three miners, but poor market conditions, as well as flooding of the mine, led to its closure in 1963. This mine, therefore, is associated with the period of small-scale private mining ventures in the mid-twentieth century and was not associated with the earlier Yankee Canyon mining boom. Santa Fe Mines purchased the property and closed the adit, and timbers and equipment were salvaged from the location in the late 1970s. When it was recorded in 1998, Moiola referred to the adit as "closed", and additional remediation completed after this project has further impacted the location.

Eligibility and Effects

LA 57200 was determined not eligible for listing on the NRHP based on its poor condition following its previous recording, and the SHPO concurred with this determination in January 1998 (HPD Log No. 54930). Since that time, the mining site has further deteriorated, and no new information was obtained that would warrant revisiting this determination. Based on our project-wide evaluation, the site lacks a habitation locus with subsurface information potential, and it does not contain intact or unique mine engineering features that visually convey the period of historic mining in Yankee Canyon. Furthermore, it is unassociated with the early twentieth century mining boom and locally significant development of Yankee and other nearby mining towns. LA 57200 should therefore remain *not eligible* for listing on the NRHP. No further management considerations are warranted for this resource.

LA 119817 (TURNER-URTADO MINE A)

Temporal Affiliation: NM Statehood to Recent Historic (1921-1949)
Land Status: Private Landowner
Dimensions: 162 by 82 m; 11,429 sq m
Eligibility Recommendation: Eligible (D)

LA 119817 is a medium-sized early-to-mid twentieth century coal mine containing an adit, seven associated features, and a low-density historic artifact scatter (Figure 6). The site is located in the central part of the project area along a southeast-trending finger ridge on the south-facing slope of Horse Mesa (Figure A2; Photograph 14). Elevations range from 7,570 to 7,700 ft, and relief is from west to east. The area offers a panoramic view of Yankee Canyon to the southeast, and sheer sandstone outcrops upslope along the ridge bound the site to the north. CR A25 passes just north of the site and provides access to the area, and a mine access road branches from CR A25, runs through the center of the site, and continues west to LA 57200; the county road continues north to the Denton-Colangelo-Strasia-Rodman Mine (LA 119818) 200 m to

Photograph 14. LA 119817 Site Overview Facing Southwest

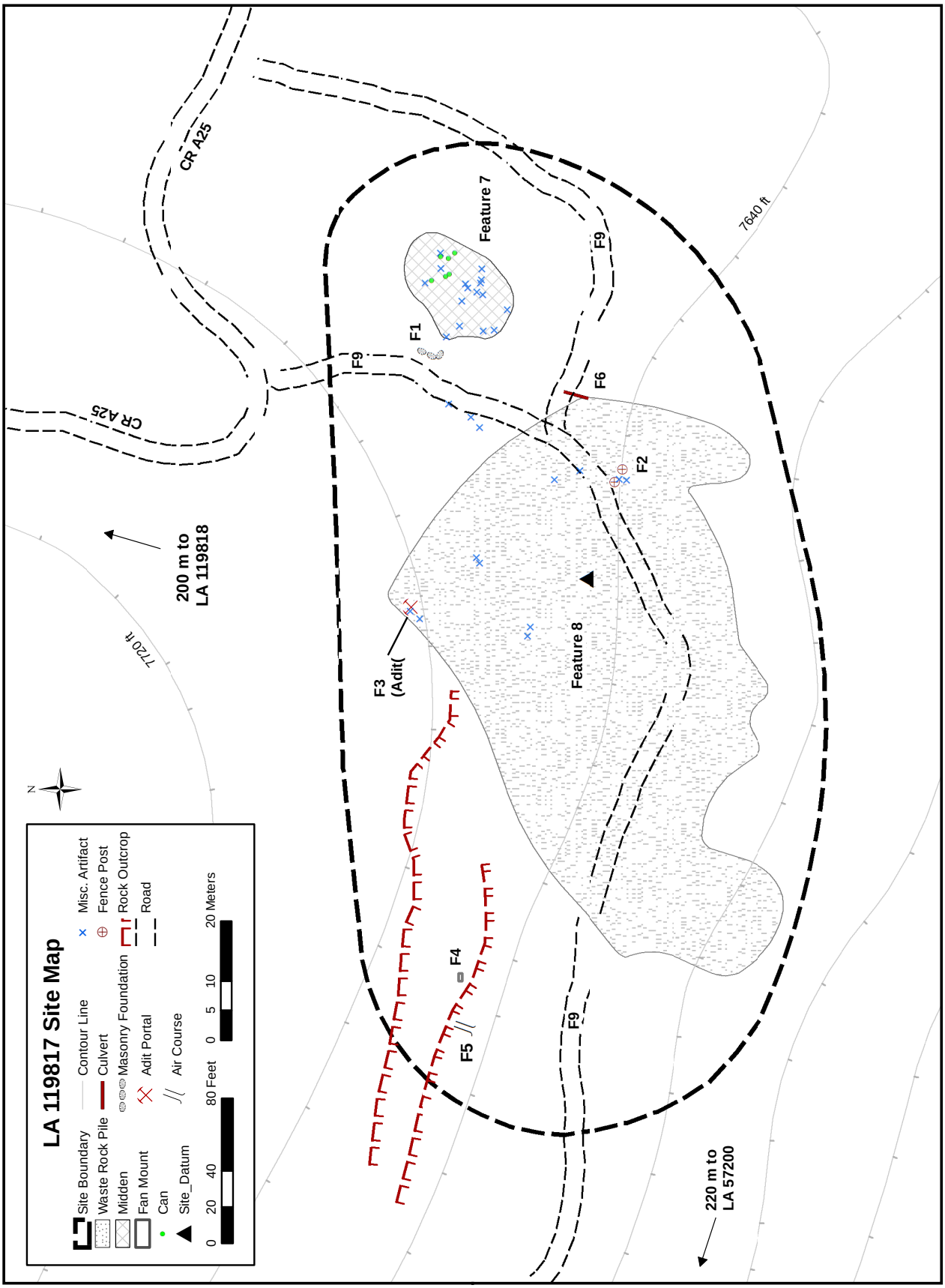


Figure 6. LA 119817 Site Map

the north. Vegetation includes dense Gambel oak and locust, with smaller amounts of juniper, ponderosa pine, skunkbush, prickly-pear cactus, and various grasses and forbs. Surface visibility ranges from 50 to 75 percent, but some areas are fully obscured by oak. Overall, the site is in poor condition and estimated to remain less than 25 percent intact. The primary extraction feature (adit) has been closed, and all machinery and equipment used in support of extraction and processing has been removed.

Previous Documentation and Research

Information about this mine was compiled by Nickelson (1979) during work conducted for the Office of Surface Mining, but it was first documented as an archaeological site by the Abandoned Mine Bureau in 1998. Moiola (1998) reported a closed adit, a waste rock pile, a collapsed air course/entry, a machine mount, a masonry structure foundation, and 100s of associated historic artifacts. Using archival research and information provided by Nickelson (1979), Moiola was able to identify this location as the Turner-Urtado Mine A (Figure 7) and determine that it was named for the initial developer (Thomas Turner), who developed the mine in 1921 to work the coal beds east of the original Yankee Mines. The mine was sold in 1949 to Barney Urtado, then the mine manager, who shuttered it and moved operations to the Turner-Urtado Mine B in 1949. According to Moiola (1998), it is unclear if any mining occurred at this location after 1949.

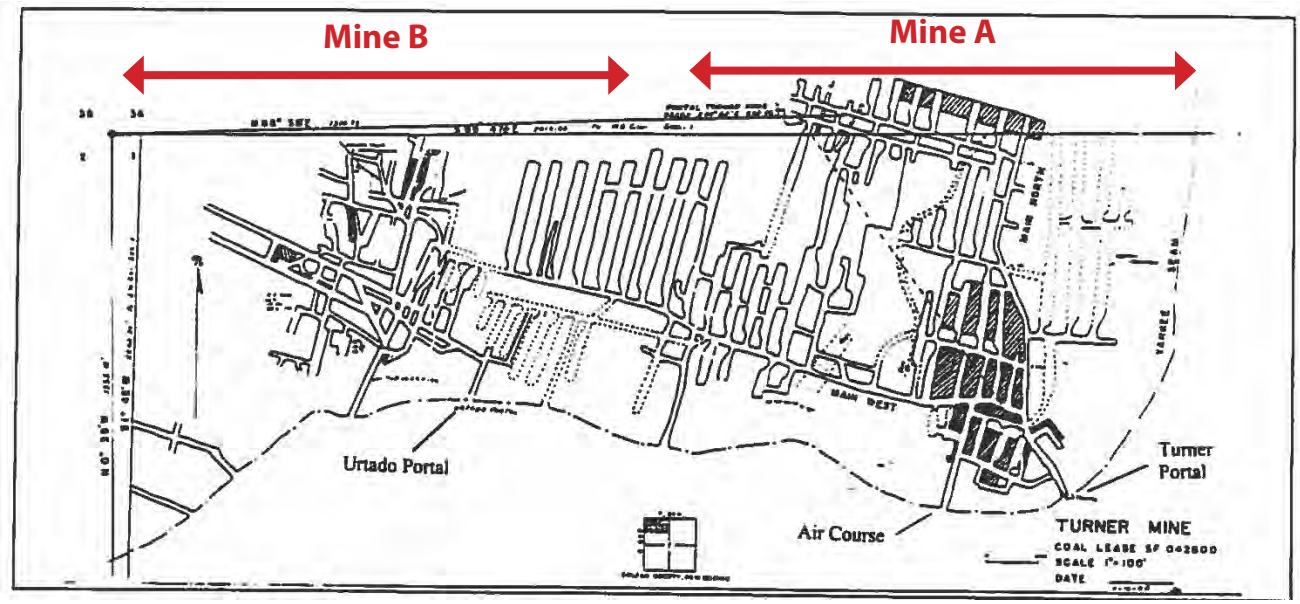


Figure 7. 1963 Mine Map Showing Turner-Urtado Mines A and B

Current Recording

During the current recording, the site was revisited, mapped, and fully updated, and a physical site datum (rebar stake with scratch tag) was installed near the center of the site. All of the features recorded by Moiola (1998) were relocated, four new features were discovered and documented, and a sample of the several hundred historic artifacts on the site was analyzed. Features now include one masonry structure foundation (Feature 1), one fence (Feature 2), one closed adit (Feature 3), one fan mount structure (Feature 4), one closed air course/entry (Feature 5), one roadside feature/pipe culvert (Feature 6), one trash midden (Feature 7), one coal gob pile (Feature 8), and the mine access road (Feature 9) (Table 4). Feature 7 is estimated to contain up to 200 surface artifacts, of which a small sample was analyzed. All artifacts across the rest of the site were also analyzed.

The partial foundation alignment (Feature 1) and trash midden (Feature 7) are located on a finger ridge in the northeastern part of the site, where the mine access roads first enter the area. The foundation is mostly obscured (Photograph 15); the midden stretches to the southeast along the ridge and was noted by Moiola (1998) but not assigned a feature number at that time. In 1998, the foundation remained more clearly visible and was mapped (Figure 8). The adit (Feature 3) is a small opening (Photograph 16) located north of the road at the northern end of a large coal waste pile that stretches downslope to the south and covers a large portion of the site area (Photographs 17 and 18). According to Moiola (1998), the adit had been closed by covering it with earth and boulders, but an opening remains exposed, and boulders currently surrounding the opening appear to be natural. A fan mount (Feature 4) and air course entry (Feature 5) are situated among steep sandstone outcrops and cliffs in the northwestern part of the site, and these features provided mechanical ventilation for the underground mine (Photographs 19 and 20). Other features include a fence line remnant (Feature 2) where a mine road crosses the waste-rock feature (Photograph 21), a road-related drainage pipe (Feature 6; Photograph 22), and the associated mine access road (Feature 9).

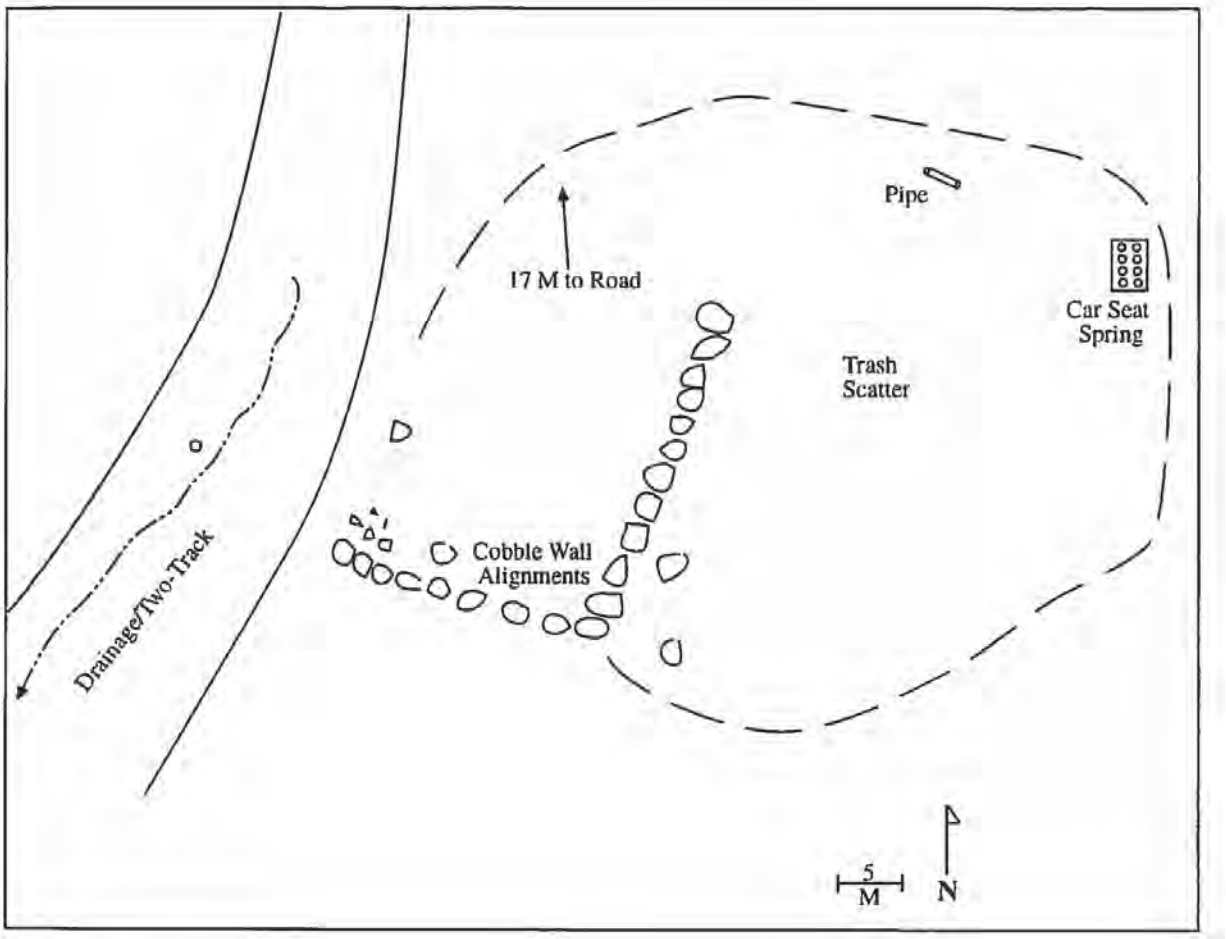


Figure 8. LA 119817 Feature 1 (Foundation) in 1998 (from Moiola 1998)

Photograph 15. LA 119817 Feature 1 (Foundation)

Photograph 16. LA 119817 Feature 3 (Adit)

Photograph 17. LA 119817 Feature 8 (Waste Rock Pile) Facing Upslope to the North

Photograph 18. LA 119817 Feature 8 (Waste Rock Pile) Facing Downslope to the South

Table 4. Summary of LA 119817 Features

No.	Feature Type	L[1]	W[1]	Description
1	Structure Foundation	11	9	L-shaped wall alignment constructed of cobbles and boulders of local basalt and sandstone, stacked 1-2 courses wide; rocks are embedded in the ground and obscured by grasses; no superstructure material; glass is located within the structure, and additional artifacts are within the midden to the east
2	Fence	8.5	1	Short barbed-wire fence with timber crossbeam span; posts comprised of two large rough-finished trees
3	Adit	1.6	1.3	Small, square opening near base of a southeast-facing sandstone outcrop; a steel metal rod protrudes from the opening; had already been closed in 1998
4	Machine Mount	4.2	2.5	Two parallel concrete walls (2-ft in height); south wall has two embedded threaded-steel bolts (machine mounts); walls are 16 inches thick; interior is infilled with sediment but may consist of a floor of concrete connecting the walls; one sheet of corrugated metal encloses eastern edge
5	Air Course/ Vent Entry	4	1.5	Small air course/vent opening near a fan mount structure used as ventilation for the mine; consists of a small opening at the base of a sandstone boulder; square indention in the rock face present above the air course (6 by 6 inches, 4 inches deep); two pieces of milled lumber (2 by 4-inch planks) associated, one with attached threaded bolt fasteners
6	Roadside Feature	16	0.5	Iron pipe drains beneath a mine road; erosion has exposed most of the length of the pipe, but it remains in situ; rock layer covering the pipe remains partially in place along southern periphery
7	Midden	56	46	Trash midden associated with Feature 1; estimated to contain up to 200 items; domestic in nature
8	Waste Rock Pile	328	213	Very large mound (20-30 ft-high) comprised of black earth and gravel to cobble-sized coal gob (95%); Feature 2 fence post embedded in mound; two-track bisects mound running east-west; more artifacts were present on the mound in 1998
9	Road	740	15	Mine access road also associated with nearby sites; constructed using cut and fill methods; accesses primary extraction features on site

[1] Length and width are presented in ft

Photograph 19. LA 119817 Feature 4 (Fan Mount Structure)

Photograph 20. LA 119817 Feature 5 (Vent/Entry)

Photograph 21. LA 119817 Feature 2 (Fence Remnant)

Photograph 22. LA 119817 Feature 6 (Road-Related Drainage Pipe)

The site contains several hundred historic artifacts, most of which are located within the midden east of Feature 1. Cans are the most abundant artifact (n=75-100), and observed types include matchstick-filler evaporated milk cans (two sizes), sanitary cans of varying size, 1-quart all-steel oil cans (two different brands), key-wind and external friction coffee cans, and rectangular solvent cans. Overall, evaporated milk and sanitary cans dominate the can assemblage. Other metal items include fragments of stove pipe, stove parts, corrugated sheet metal, a ¾-inch-diameter steel rod, bed springs, and barrel straps. Glass items include an intact clear drinking glass produced by the Hazel-Atlas Glass Company (1923-1971), one aqua jar body shard, and at least 50 to 75 fragments of clear, milk, and brown glass. Observed ceramic types include decorated and undecorated whiteware, with a minimum of two plates represented. Outside of the midden, artifacts include a partially buried metal wheelbarrow body, iron spikes of varying length, angle-iron and square plates with holes for fastening, ½-inch-diameter braided-steel cable, milled lumber, a vehicle tire, a metal rod, and a woman's high-heel shoe (Photograph 23).

Summary

To summarize, the Turner-Urtado Mine A (LA 119817) is a small coal mine that was established by the Turner family in 1921 after the peak of operations for the nearby Yankee mines. Thomas Turner took over operations of the mine in 1943 and subsequently sold it to Barney Urtado (then the mine manager), who closed the mine in 1949 and moved operations west to the location that came to be known as the Turner-Urtado Mine B (LA 57200). Today, the site contains a single adit, a fan mount and airway opening that provided ventilation, a waste rock mound, a mine road with an associated fence segment and steel pipe culvert, and a small habitation zone represented by a masonry foundation and nearby trash midden. Artifacts in the midden are domestic in nature—including food cans, glass bottles, ceramics, and stove fragments—and are consistent with the date range (1921-1949) provided by the historic record. When

the site was recorded in 1998, the adit had already been closed, the structure consisted only of a stone foundation, and the mining equipment had been removed (including a coal chute once located on the gob pile).

Photograph 23. Sample of LA 119817 Historic Artifacts

Eligibility and Effects

LA 119817 was determined eligible for listing on the NRHP by the AML Program in 1998, and the SHPO concurred with this determination (HPD Log No. 54930). Moiola (1998) noted that although the site was in poor condition and all mining infrastructure had been removed, it retained data potential in the form of archaeological deposits associated with Feature 1 that could provide information about early twentieth century miners in the region. Unlike many nearby sites such as LA 57200, this site contains evidence of residential use, including a habitation structure and trash midden containing domestic debris. As noted during the previous recording, this locus could contain intact subsurface depots with the potential to provide significant information about the period of early twentieth century mining in Yankee Canyon. LA 119817 should therefore remain *eligible* for listing on the NRHP under Criterion D.

Because the qualifying characteristics of this historic property are its masonry foundation and associated midden, we recommend that these areas be avoided during mine remediation. Closure of the adit and vent or remediation of the waste rock pile would not detract from the qualifying characteristics because these features lack information potential and historic integrity. As long as the locus of habitation is avoided and activities within the site are monitored by a permitted archaeologist, project implementation would not adversely affect the site.

LA 119818 (DENTON-COLANGELO-STRASIA-RODMAN MINE)

Temporal Affiliation: NM Statehood to Recent Historic (1931-1960)
Land Status: New Mexico SLO
Dimensions: 778 by 111 m; 11,429 sq m
Eligibility Recommendation: Eligible (A and D)

LA 119818 is a very large, previously documented early-to-mid twentieth century coal mine that stretches from east to west across the center of the project area, at the southern end of the SLO land parcel. It occupies the eastern slope of Horse Mesa between CR A25 and CR A26, and it encompasses two separate loci—one on the canyon bottom and one high on the slope—connected by a 0.33-mile-long tramway grade that descends roughly 600 ft in total elevation from 7,780 to 7,160 ft amsl (Figures 9 and A2). The western locus is previously recorded, occupies a series of narrow benches midway down the mesa slope, and is accessed from the south by a closed mine access road that contours due north along the slope from CR A25 and continues to LA 202929, located 100 m to the north. This part of the site provides a commanding view of Yankee Canyon to the east. The eastern locus was added during the current recording and is on the lower slope of Horse Mesa and an adjacent terrace within Yankee Canyon, with CR A26 just to the east. Due to past fires, understory vegetation is dominant on the mesa and includes very dense stands of Gambel oak, locust, wild rose, skunkbush, mountain mahogany, prickly-pear cactus, banana yucca, and various grasses and forbs. Isolated ponderosa pine, Douglas fir, and spruce trees are distributed along the bottom of the deepest side canyons, while juniper and piñon pine are spread in low density across the benches and intervening slopes of Horse Mesa. Surface visibility is poor (approximately 25 percent) due to vegetation density and leaf litter.

Overall, the site is in poor condition and is estimated to remain less than 25 percent intact. The rail tramway is no longer intact, although it does retain surface elements, including concrete footers, timber ties, rail segments, footers, and posts, while foundational elements of the tipple structure in the eastern locus remain intact. However, these elements represent a small percentage of the equipment and infrastructure that was once on the site. A short rail system associated with mine waste disposal in the western locus now contains only a discontinuous alignment of spikes, narrow-gauge rail fragments, and a few ties, very few of which remain in situ. The primary adit has been closed and is difficult to recognize, and machinery used in support of coal extraction has been removed. Support structures are in poor condition but often retain standing walls or footers. The residential and administrative structures retain standing masonry or adobe walls, but their superstructures have been removed. Modern recreational activity in the eastern locus has resulted in the deposition of trash and use of large metal artifacts for firearm target practice. Erosion is occurring along all waste rock piles.

Previous Documentation and Research

Information about this mine was compiled by Nickelson (1979) during work conducted for the Office of Surface Mining, but it was first documented as an archaeological site by the Laboratory of Anthropology during documentation of 15 mining sites across the Raton Coal Field for the Abandoned Mine Bureau (Oakes 1987). The Laboratory of Anthropology referred to the location as Frank's Mine, designated it as LA 57200, and recorded an adit, the remains of a tipple and tram that included support posts extending "1.4 km

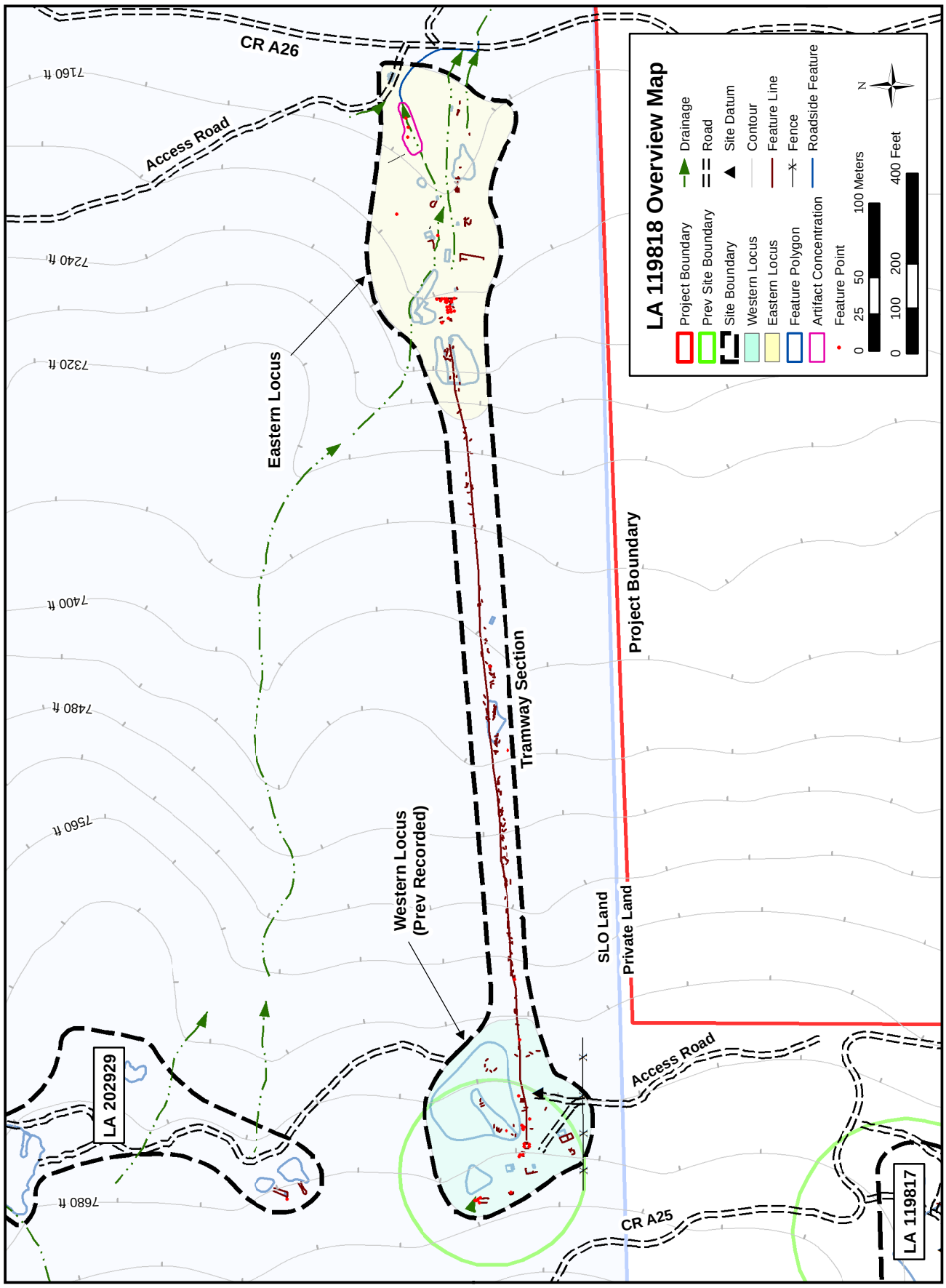


Figure 9. LA 119818 Site Overview Map

downslope to the valley bottom," two cinderblock structures, and a wood-framed residence with a pitched roof (Oakes 1987). The adit opening was narrow, and small poles remained visible from a collapsed roof in the entry. The proposed AML Program remediation at the site included collapsing and sealing off the adit portal using dynamite, although it is unclear if these plans were fully implemented.

In 1997, the site was updated by the AML Program, who for unknown reasons designated it as LA 119818 and assigned "LA 57200" to a separate location farther to the west referred to as the Turner-Urtado Mine B. Because theirs is the most recent and complete and previous recording, we follow Moiola's (1998) lead and use LA 119818 to refer to this location. Using archival research and information provided by Nickelson (1979), Moiola (1998) referred to the site as the Denton-Colangelo-Strasia-Rodman Mine, using the names of the initial developer (Mrs. Lunce Denton) and other owners (Colangelo, Strasia, and Rodman) who operated the mine until it was shuttered. According to the State Mine Inspections Report, the mine was established in 1931, and the various structures were built in 1932. The house was abandoned in 1949, and the Rodmans salvaged all the "machinery, rails, and any usable timbers and other equipment" when closing the mine in 1960 (Moiola 1998). At the time of the 1998 recording, the features previously noted by Oakes were relocated, and an air course/entry, machinery mount foundation, and privy were discovered and documented. Moiola (1998) described the adit opening as being 2.5 ft in height and was unsure if plans to seal this entry were carried out. Actions proposed by the AML Program in 1998 included contouring and revegetation of the coal gob pile, terracing/erosion control measures, and fully closing the adit with dirt, rock, and mine waste.

Current Recording

The site was revisited, mapped, and fully updated, and a physical site datum (rebar stake with scratch tag) was installed during the current investigation. The area recorded by both Oakes (1987) and Moiola (1998)—and that is shown as the site boundary in NMCRIS— represents a distinct extraction and habitation locus where people lived, mined, and disposed of coal waste. This area was updated and is now referred to as the Western Locus. A tramway descends from this area to a second locus on the valley floor with additional transport/processing features that were mentioned in passing by previous researchers but not formally recorded. Because the two loci and the tramway and associated features represent a single, integrated mining system, the entire area was recorded as a single site that extends east to west for nearly 800 m. Including those that have been previously recorded, a total of 41 features were identified and documented, and the historic artifact assemblage across the site is estimated to number in the thousands. Due to high density and previous recording, artifacts directly associated with features in the Western Locus were categorized, while a formal sample was analyzed from the Eastern Locus.

Western Locus

The Western Locus is approximately 10,500 sq m in size and encompasses the previously documented portion of the site (Figure 10). The locus contains an estimated 1000 to 2000 surface artifacts and 12 features, including a residential structure (Feature 3), adit (Feature 10), fan house and fan mount platform (Features 1 and 6), generator/hoist house (Feature 2), privy (Feature 4), two transport features (Features 5 and 8), a modified landform/platform (Feature 7), a waste rock pile (Feature 31), a car body (Feature 9), and a fence remnant (Feature 11). The vent/air course entry reported by Moiola (1998) could not be relocated and was likely filled/closed after 1998. The spatial arrangement of these features reflects their functions as part of residential, extraction, waste rock disposal, ore transport, and supporting infrastructure feature systems. Features within this locus are summarized within Table 5.

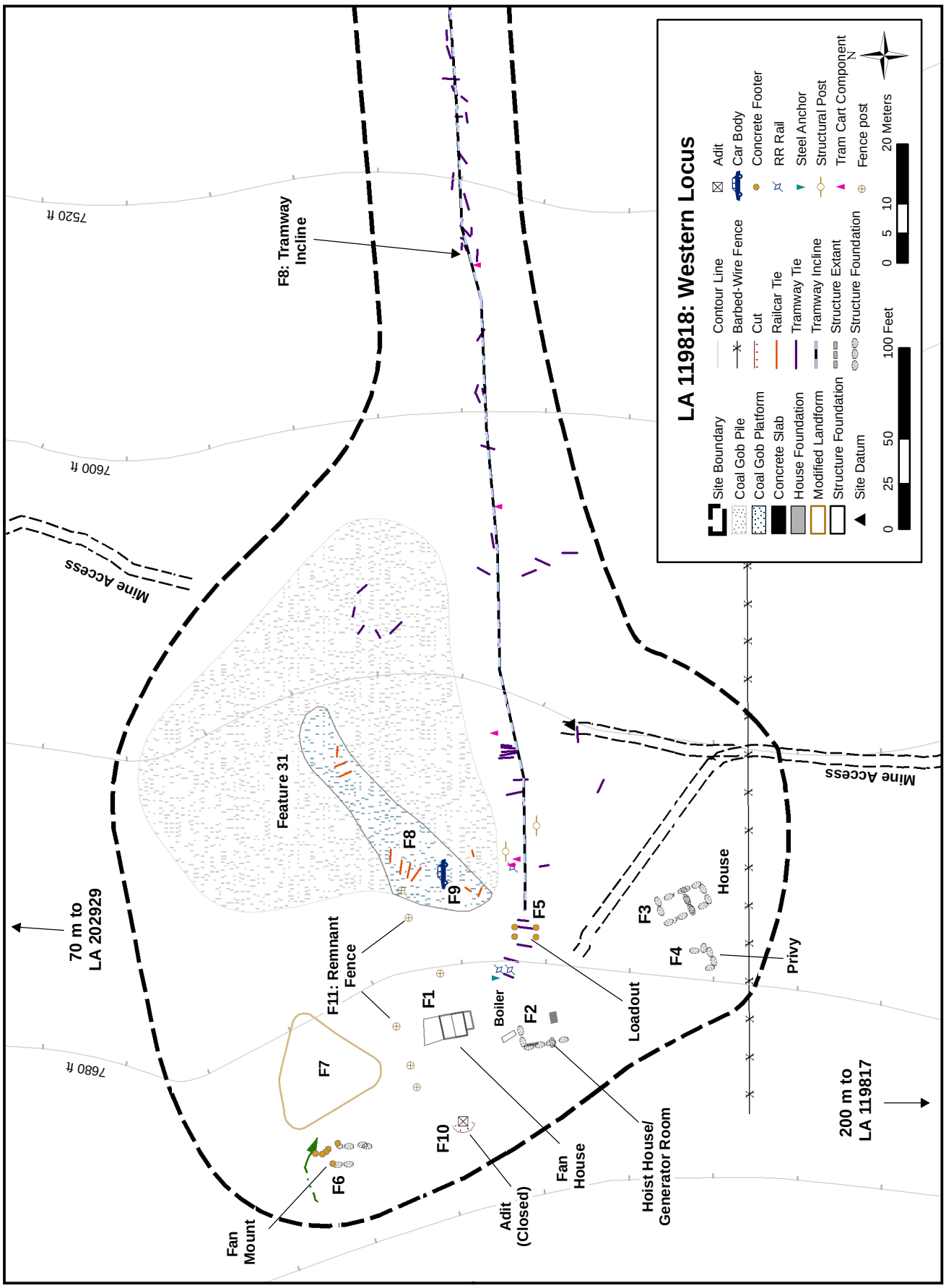


Figure 10. LA 119818 Western (Previously Recorded) Locus

The house (Feature 3) and privy (Feature 4) represent a residential zone located at the southern edge of the locus 150 ft southeast of the adit and directly south of the tramway and coal cob pile. The house was a standing wooden structure with a pitched roof and intact floor in 1987, when Oakes (1987) referred to it as "Structure 3." By 1998, it was a collapsed wooden structure on a stone foundation with a collapsed porch on the eastern side; the roof was constructed of tongue-and-groove lumber and corrugated sheet metal (Moiola 1998). Today, it is a partial stone foundation with scattered construction debris and domestic artifacts associated with food preparation. It contains at least two rooms and an additional area interpreted as a porch. The privy is a square, masonry-lined depression. Numerous artifacts are within and surrounding these features.

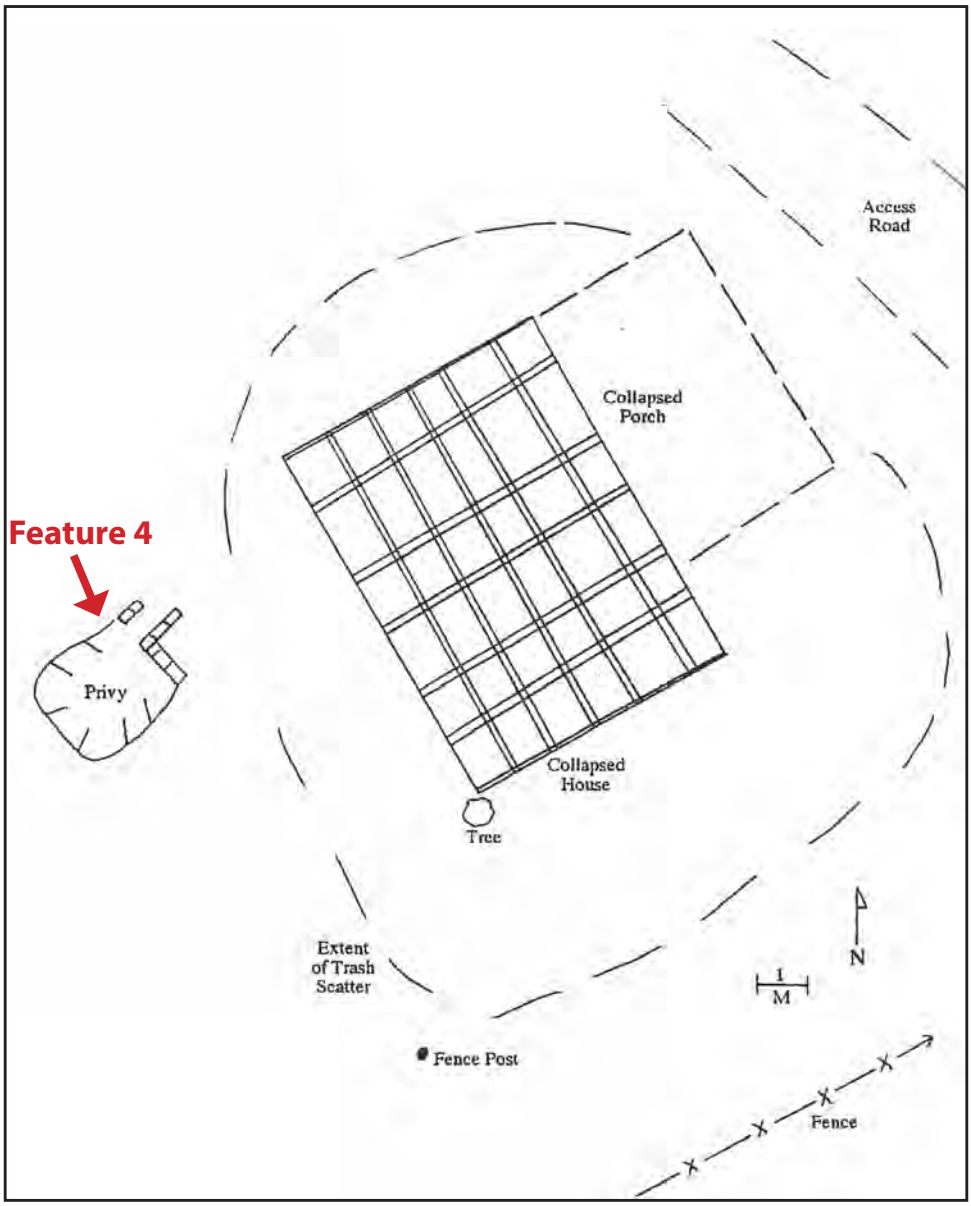
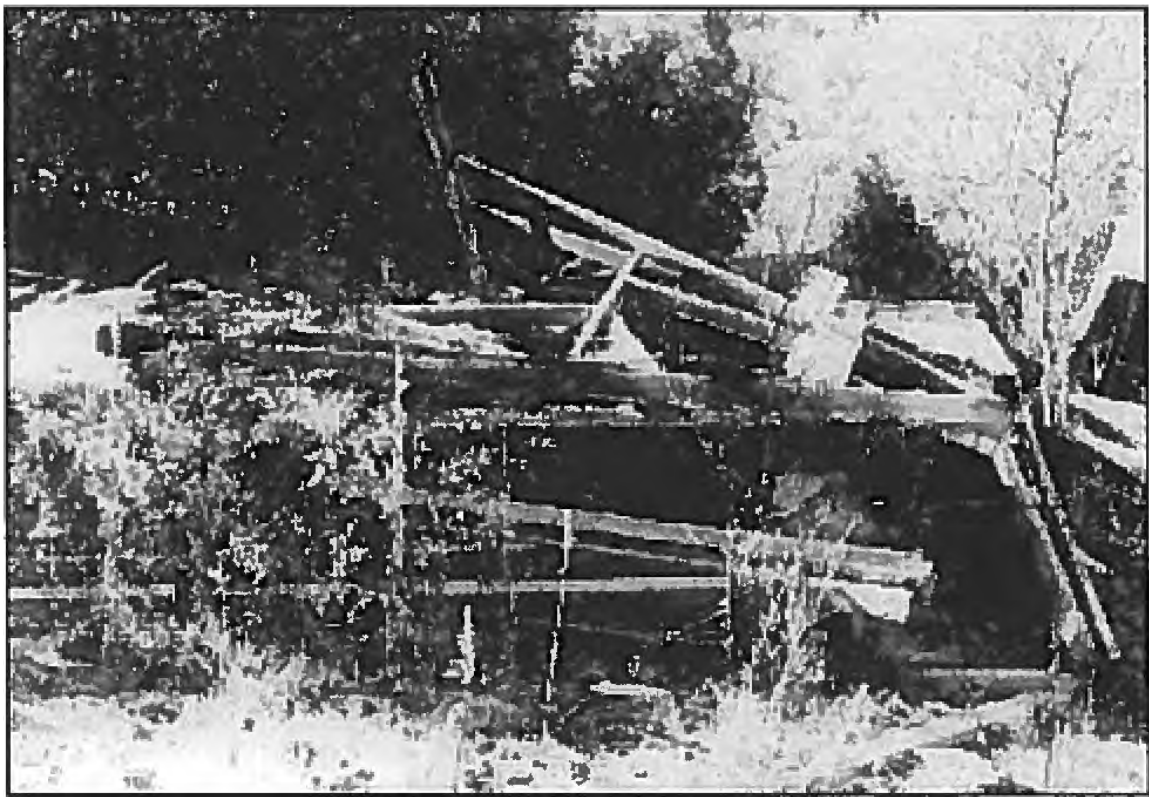


Figure 11. LA 119818 Feature 3 Map (from Moiola 1998)



Photograph 24. Feature 3 in 1998 (with Collapsed Wooden Superstructure)

Photograph 25. LA 119818 Feature 3 (House) Today Showing Intact Foundation Wall

Photograph 26. LA 119818 Feature 3 Porch Area

Photograph 27. LA 119818 Feature 4 (Privy)

The western part of the locus contains the single extraction feature (adit) tucked against the steep slope at the base of a sandstone outcrop and a variety of supporting infrastructure, including the fan house downslope to the east, the fan mount/platform and former vent entry along the outcrop to the north, and a hoist house/generator room to the southeast. The adit appears little-changed from previous descriptions, and retains a small, narrow, opening, suggesting it may not have been closed as previously planned (Figure 12; Photograph 28).

The fan mount and vent provided a vital ventilation system for the mine, but the vent entry has been closed and its location could not be determined. The fan house (Feature 1) and hoist house/generator room (Feature 2) form an industrial area where large mining equipment was stored near the adit, while the modified landform to the north may have been a platform where equipment staging and other activities occurred. These features are constructed of coal-ash cinderblock, and significant wall portions remain intact. Feature 1 was referred to as "Structure 1" by Oakes (1987) and a "Fan House" by Moiola (1998); it is a square or rectangular one-room structure with partially standing walls (Figure 13; Photograph 29). The hoist house/generator room was Oakes' (1987) "Structure 2" and included a substantial, collapsed wooden superstructure in 1998 that has since been removed (Figure 14; Photograph 30). It is a two-room structure with internal concrete pads and an associated boiler just outside the building to the north (Photographs 31 and 32). The significant wooden superstructure elements of these features noted by previous researchers have burned or been salvaged.

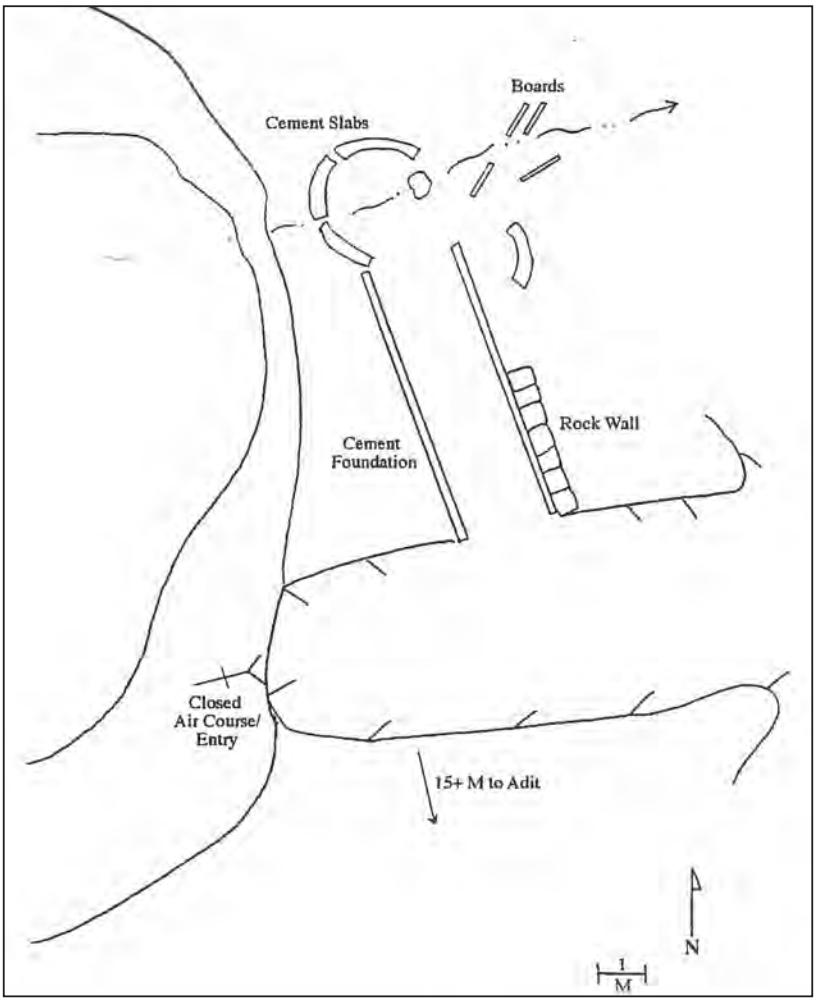


Figure 12. LA 119818 Feature 10 (Adit) Map (from Moiola 1998)

Photograph 28. LA 119818 Feature 10 (Adit Opening)

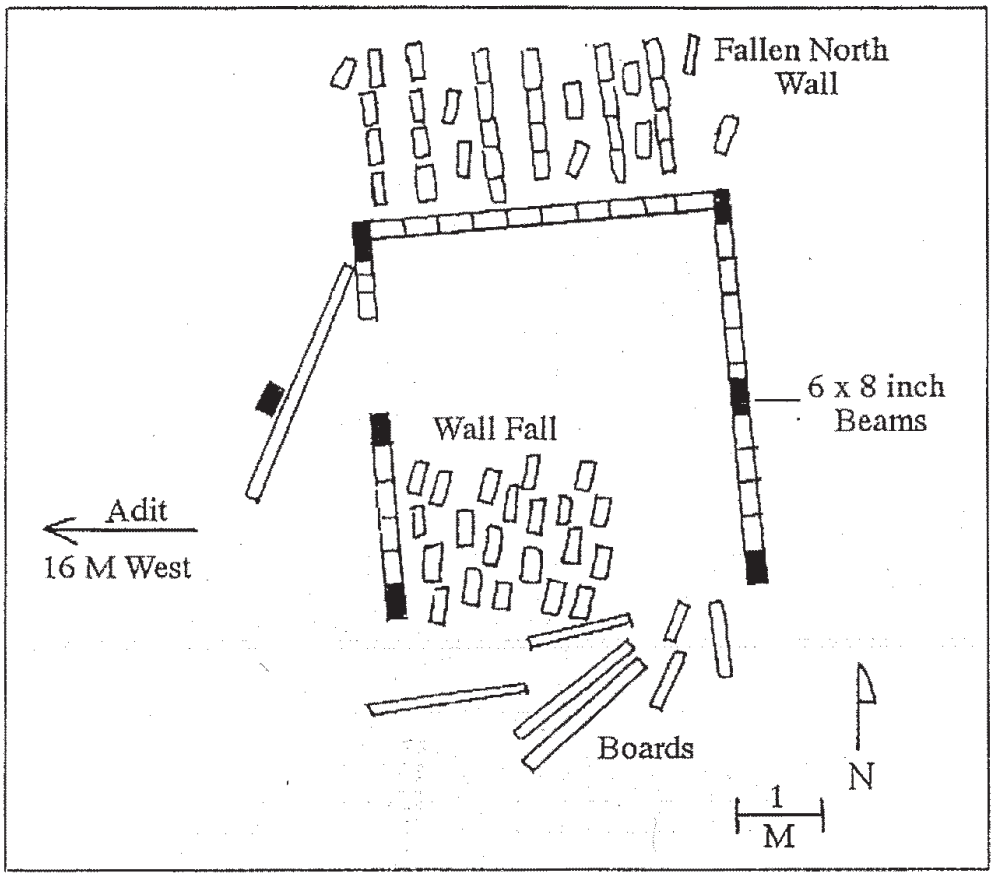


Figure 13. LA 119818 Feature 1 (Fan House) Map (from Moiola 1998)

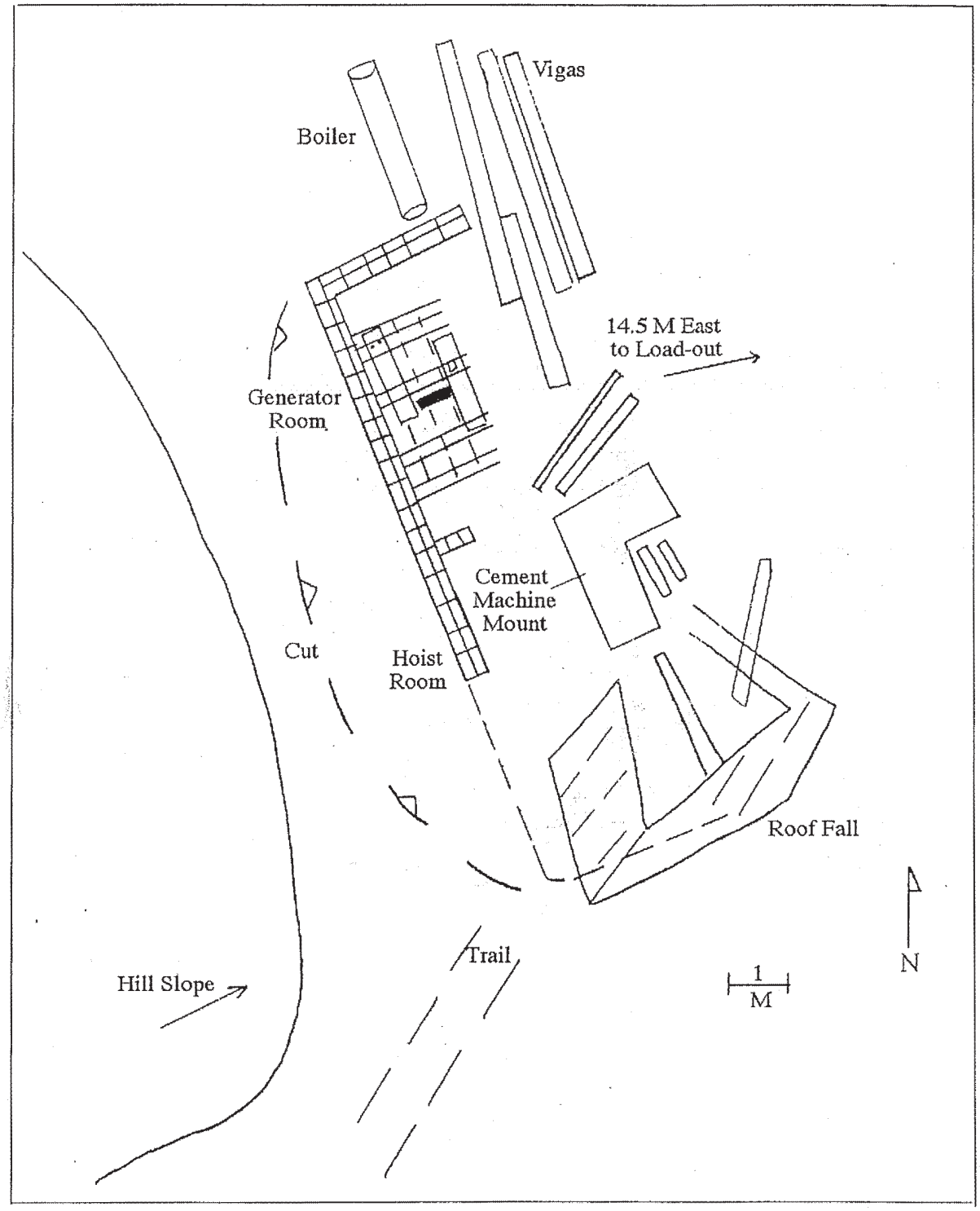


Figure 14. LA 119818 Feature 2 (Hoist/Generator House) Map (from Moiola 1998)

Photograph 29. LA 119818 Feature 1 (Fan House)

A former loadout structure (Feature 5) at the upper terminus of the tramway formed an important transport node for the movement of coal ore and waste. During Moiola's (1998) recording, the feature was a large standing timber structure with tram posts and wooden beams constructed of railroad ties and milled lumber, but due to past fire (and possibly material scavenging) it now contains only a series of concrete footers with embedded steel hardware and scattered support timbers that have been charred by fire (Photographs 33-35). From here, a secondary alignment of railroad ties (Feature 8) suggests that an informal narrow-gauge rail ran out onto the waste pile to facilitate the deposition of coal waste. A section of the narrow-gauge railway led to a chute/hopper at the end of the load out, and from here additional posts and railroad ties continued to the east. This structure would have allowed coal to be loaded onto carts that could then travel east down the tramway. A variety of industrial artifacts and equipment is associated with this feature.

The large waste rock pile (Feature 31) contains a car body (Feature 9; the engine of which reportedly powered the tramway winch system), rail elements (Feature 8), and informal platform areas that could have staged equipment or hosted other mine-related activities such as equipment repair. Artifacts associated with the tramway system downslope from Feature 5 demonstrate the transport function of this part of the locus and include one ore cart axel with track wheels, one curved end rail section used to dump ore from ore cart downslope, one partially vertical railroad tie, and one Stella ore cart body fragment. Other features across the locus are summarized within Table 5 and depicted on Photographs 36-41.

Photograph 30. LA 119818 Feature 2 (Hoist House/Generator Room) in 1998 (From Moiola 1998)

Photograph 31. LA 119818 Feature 2 (Hoist House/Generator Room) Today

Photograph 32. LA 119818 Metal Boiler North of Hoist House/Generator Room (Feature 2)

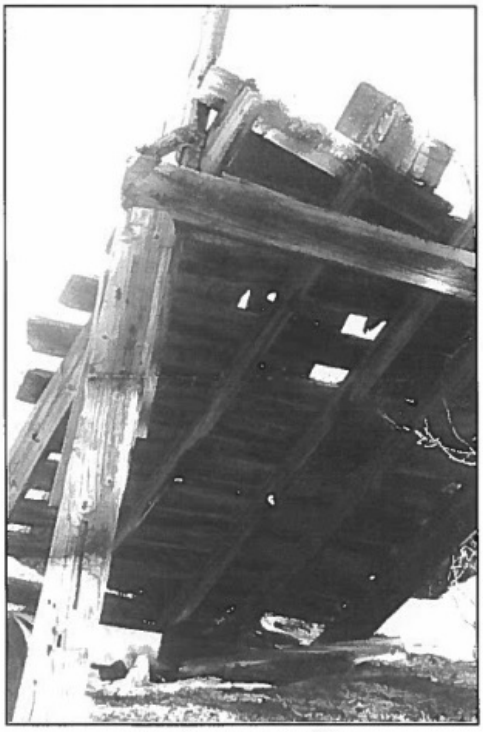
The artifact assemblage in the Western Locus includes a variety of domestic trash (glass, ceramic, metal food containers, silverware, etc.) and mine-related hardware that confirm a 1930s-1950s use period for the mine. Domestic artifacts are concentrated around Features 3 and 4. Amber/brown and clear glass are the most common types, and fragments come from a variety of bottle and jar types. Cans include sanitary, steel-beverage, meat/key-wind, sardine, tobacco, oil, lard and coffee types. Other domestic artifacts include enamelware basins, furniture parts, cast-iron stove fragments, bed springs, leather fragments, and whiteware and stoneware ceramics (including a saucer base). Construction materials include milled lumber, metal roofing, window glass, stove pipe segments, nails, and fasteners. Mine-related hardware and industrial artifacts include railroad spikes, pipe segments, railroad ties, braided steel cable segments, steep anchors, large drums and containers, vehicle parts, tramway cart elements (including an axel with wheels, framing, and bins), narrow-gauge rail fragments, a rotating steel cylinder with mounting brackets, and other debris.

Table 5. Summary of LA 119818 Western Locus Features

No.	Feature Type	L[1]	W[1]	Description
1	Fan House	17	13	Square or slightly rectangular one-room structure with partially standing walls (3-8 ft-high) of coal-ash cinderblock (one course wide) stacked 10 courses high; foundation is intact and two courses wide; remnant timber wall-and-roof framing remains visible; porch debris present off the southern side; northern half of eastern wall remains intact; other walls have collapsed outward or into the structure; associated with insulator glass, amber and colorless bottle glass, sanitary cans, metal bolts, nails, spikes, a metal barrel stove, bedframe, a chair seat with spring bed, a metal cart, and leather fragments
2	Hoist House/ Generator Room	24	18	Rectangular with two rooms and two partially intact walls (3-6 ft-high) of coal-ash cinderblock (two courses wide) stacked up to eight courses high; structure is built into a moderately steep hill slope, with intact walls on the uphill sides; a remnant of the interior dividing wall remains visible; internal features include a partially buried, L-shaped concrete pad (machine mount) in the south room (the "hoist room") and two rectangular concrete pads (one supporting a generator) in the northern room; a second concrete pad reported by Moiola is now buried; a collapsed roof of milled lumber and vigas reported by Moiola is no longer present; a large steel boiler tank (107 x 34 inches) extends north from the structure; associated artifacts include a fuel can, barrel hoop-metal, various spikes and wire nails, metal car seat springs, milled lumber fragments, amber and clear bottle glass, window glass, and sanitary cans
3	House Foundation	26	26	Stone foundation lacking the original wooden superstructure; the western portion is a rectangular two-room outline—eastern wall alignment is 1-ft-high and comprised of large basalt boulders (one course wide, and 3-6 courses high); foundation within other wall alignments buried and barely visible; to the east is a shallow, rectangular depression (1.5-2.0 ft-deep) cut into the slope with construction debris and a 55-gallon drum spread among dense vegetation—this area was previously interpreted as a porch; associated items include a ceramic saucer base, cast-iron stove parts, stove pipe fragments, nails, window glass, a piece of milled lumber, and a metal bedspring
4	Privy	13	10	This feature was interpreted by Moiola (1998) as a privy; it is a square depression (3-ft-deep) lined with dry-laid masonry walls (2.5 ft-high) of tabular-to-rounded basalt cobbles and boulders (1-2 courses wide, 9-15 courses high); well-preserved entrance opening on the east-northeast side facing the house (Feature 3); northern wall is buried/obscured by leaf litter
5	Tramway Loadout	86	28	Former timber load-out that contained a large, intact standing structure with tram posts and wooden beams constructed of railroad ties, and milled lumber in 1998; a section of the railway let to a chute/hopper at the end of the load out; additional posts and railroad ties were to the east, and Moiola (1998) noted that tramway elements continued east for 600 m to the valley bottom; today the feature consists only of four square concrete footings (each measuring 14 by 14 inches) with embedded steel brackets that formerly supported the timber pilings; the rest of the wooden elements have been removed and/or burned in forest fires, as evidenced by several charred wooden beam and piling segments scattered in the area; other surviving elements include several in-situ ties and a steel spike that still anchors a braided cable; associated artifacts include scattered tram cart components (axel with wheels, framing, and bins), narrow-gauge rail fragments, vehicle seat springs, and a rotating steel cylinder with mounting brackets; tram elements continue downslope
6	Fan Mount Platform	20	6	Referred to by Moiola (1998) as a fan mount; two parallel concrete walls (6 inches-wide, 2.5 ft-high) with portion of the eastern wall incorporating a rock wall segment (6 ft-long) stacked one course wide and four courses high; northern end contains a fragmented and partially displaced cement collar footer foundation; according to Moiola, this feature contained a gasoline-powered fan, later powered by electricity in the 1950s, that provided ventilation for the mine; the previously associated vent/air course entry has been filled and is no longer visible
7	Modified Landform	62	56	Levelled earthen platform area along bench (6-8 ft deep); irregularly shaped; no associated artifacts; used for staging or as a platform
8	Waste Transport Feature	115	NA	Coal-waste railcar grade; linear alignment of 9 ties extending northeast across platform of CG1; southern end starts just north of the former tramway loud-out

No.	Feature Type	L[1]	W[1]	Description
				structure; associated artifacts include railroad spikes, curved narrow-gauge rail segment, and cart axel with two steel wheels
9	Car Body	12	5	Buick car body: front half and wheels removed; associated car parts are scattered widely across western locus, but mostly to the south; early 20th century body style (ca. 1930s-1940s); according to Moiola (1998), the missing engine was used to power the tramway winch during mining operations; associated with window glass, chrome and steel parts, and a rubber hose segment
10	Adit	2	2	Adit opening noted by Oakes (1987) and Moiola (1998); in 1987, is was a small opening, but the entry had collapsed and had boulders across it (the AML proposed the use of dynamite to close it); there remained a small 1.0 by 0.3 m opening in 1998; despite boulders in the area, the opening remains present as an east-facing portal at the base of a sandstone outcrop; no visible framing timbers or associated artifacts
11	Fence	125	NA	Six unmilled wooden posts (3-7 ft-high and 9-12 inches in diameter with remnants of wire-and-wood plank-fencing spread across a 125-ft area between the adit, fan house, and coal gob pile; alignment is primarily east-to-west with a north-south; associated with loose wood lathe and scattered wire
31	Waste Rock Pile	240	210	Very large, wedge-shaped coal gob mound (30+ ft high) that covers a large portion of the locus northeast of the extraction/habitation area; it includes a narrow, level platform portion that hosted a narrow-gauge rail grade (Feature 8) that extended from the tram and was likely used to transport coal waste for deposition; additional areas form artificial ridges extending downslope to the east; contains a car body (Feature 9), as well as railroad spikes, rail fragments, milled lumber, construction debris, various mining hardware, sheet metal, car parts, glass and other debris
NR*	Air Course/Entry	NA	NA	The air course/entry recorded by Moiola (1998) was described as being 15 m northwest of F10 (adit) and adjacent to F6 (fan mount foundation), and consisted of a closed/collapsed opening that resembled a rectangular cut in the hillslope; the entry has been closed and is no longer visible

[1] Length and width are presented in ft; *NR=Not Relocated



Photograph 33. LA 119818 Feature 5 (Loadout Ramp) in 1998 (From Moiola 1998)

Photograph 34. LA 119818 Tramway Load-out Overview (Feature 5)

Photograph 35. LA 119818 Detail of Tramway Footer and Burned Wooden Elements (Feature 5)

Photograph 36. LA 119818 Feature 6 (Fan Mount Platform)

Photograph 37. LA 119818 Feature 7 (Modified Landform)

Photograph 38. LA 119818 Feature 8 (Waste Transport Rail Alignment)

Photograph 39. LA 119818 Feature 9 (Buick Car Body)

Photograph 40. LA 119818 Feature 11 (Fence Line Remnants)

Photograph 41. LA 119818 Overview of Waste Rock Pile (Feature 31)

Eastern Locus

The Eastern Locus contains 26 features and a scatter of 200 to 500 historic artifacts on the gently sloping valley floor within a branch of Yankee Canyon at the eastern edge of the project area. It occupies the mount of an east-flowing tributary and adjacent hill slopes at the base of Horse Mesa (Photograph 42; Figure 15). This area was mentioned by Moiola (1998) but not formally recorded. Currently documented features include seven concrete foundations of varying size and morphology (Features 13, 14, 17, 18, 21, 29, and 36), four fence alignments/enclosures (Features 20, 23, 30, and 38), three waste rock piles (Features 32, 34, and 35), two concrete platforms/machine mounts (Features 15 and 19), one depression (Feature 22), one car body (Feature 24), one rail cart (Feature 27), one water-control berm (Feature 28), one pipe well (Feature 39), one car/cart deposition area (Feature 37), one railroad tie concentration (Feature 40), one sled/cart-like feature (Feature 16), and one extant structure with standing adobe walls (Feature 12), and a cluster of footings and other foundation elements of a former tipple structure (Feature 26). Artifact density is highest surrounding Feature 26 (the tipple foundation). Features are summarized within Table 6, but the narrative section below includes a detailed discussion of an adobe residential/administrative building (Feature 12) and the tipple complex (Feature 26), as well as synthetic summaries of other feature types.

Feature 12 is a large, two-room, rectangular adobe structure located 80 ft east of the tipple complex along the southern side of the tributary drainage that flows east across the locus. It has partially intact adobe walls along the eastern, northern, and part of the western sides that stand up to 7 ft tall and are constructed of adobe bricks that are tempered with straw and coal waste and were likely produced locally (Photograph 43). The wall interiors are partially covered with plaster/concrete mortar tempered with fine grave, and the foundation is comprised of concrete blocks (single course) measuring 22 by 12 inches. A single-course alignment of local basalt boulders (20 inches maximum size) divides the building into two rooms. The

Photograph 42. LA 119818 Eastern Locus within the Bottom of Yankee Canyon Facing Northeast

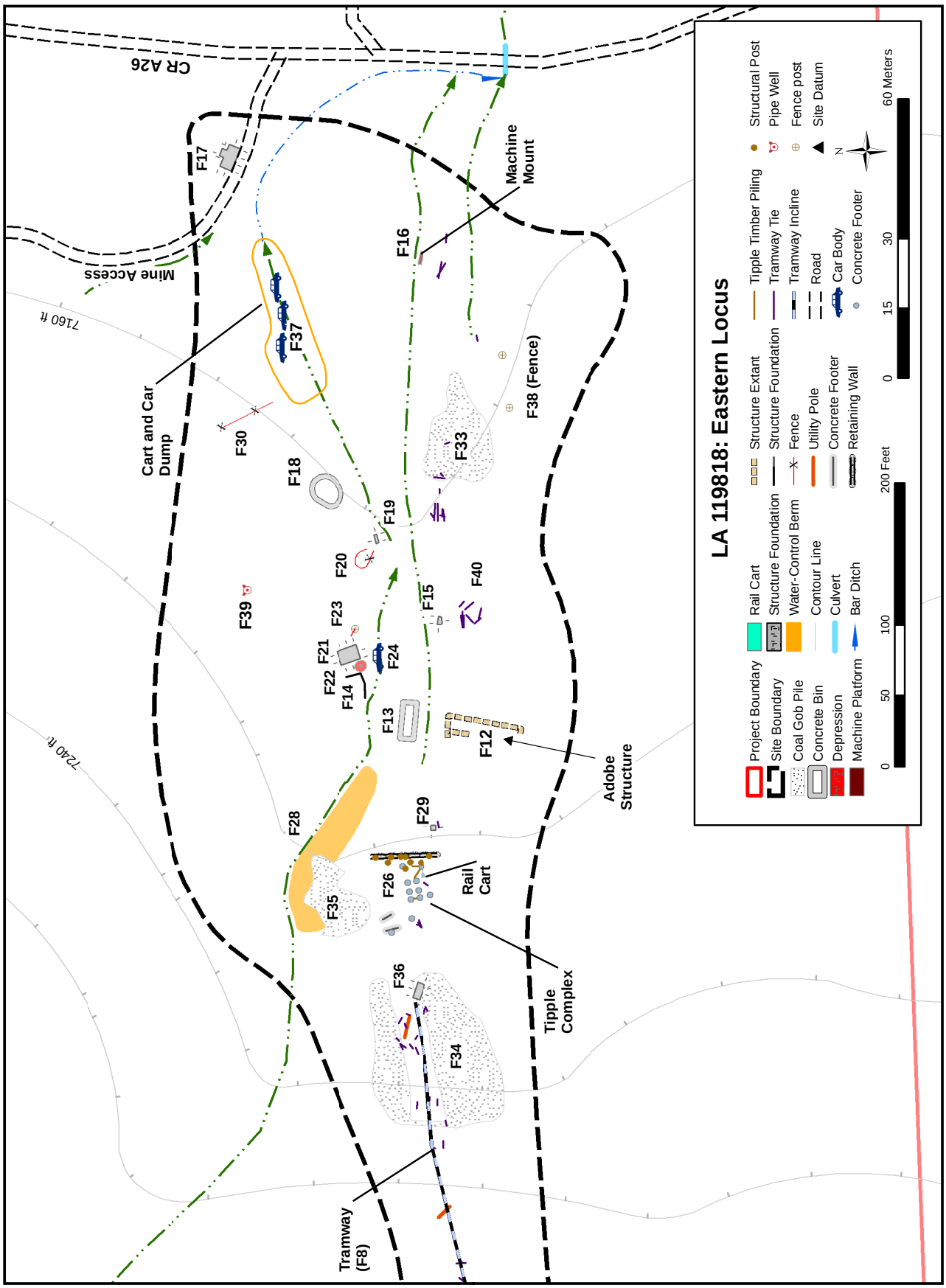


Figure 15. LA 119818 Eastern Locus

northern and eastern walls contain offset 34-by-27-inch wood-framed windows that are partially charred, suggesting the building may have burned. Associated artifacts include 11 bricks ("SFB Pueblo"), a doorknob, two vehicle fenders, and an electrical box with conduit. The lack of domestic debris suggests the building may have served an administrative function.

Feature 26 is a large foundation complex encompassing footers, walls, platforms, and other elements across a 55-by-45-ft area, representing the remains of a tipple structure located at the eastern downhill terminus of the tramway system (Photograph 44). The structural remains include 10 concrete footers, nine timber pilings/poles, two concrete wall footers, one large concrete retaining wall, and one small circular concrete collar that was poured around the base of a timber piling. At the eastern downslope end of the complex is a low poured concrete wall that is 48.0 ft long, 1.3 ft wide, and 1.6 ft tall (Photograph 45). The concrete is deteriorating and partially buried in colluvium. This wall could have formed the outer foundation support for the tipple or functioned to limit erosion and retain sediments. The primary footers (n=8) are distributed in four sets that run parallel from west to east, with each set gently descending in elevation down the mouth of a narrow canyon. The northern footers of each set are often buried, while the southern footers are exposed. Each footer is square in plan, tapers from the base to the tap, is 20 to 28 inches in maximum dimension at the base, and extends 5 to 54 inches in height above ground surface (Photograph 46). The tops have embedded steel hardware that once supported timber pilings and crossbeams. One footer has "Jon" inscribed into the contrate top, and four retain the charred remnants of timber planks. The other two concrete footers are smaller (25 by 25 by 10 inches) and have been displaced by erosion.

Nine timber pilings/poles are distributed from north-to-south along the western edge the retaining wall, while also fronting the eastern edge of one of the other concrete footers. Several of the poles are closely set against the wall, suggesting they may be partially embedded into the interior. Eight of the wooden pilings

Photograph 43. LA 119818 Feature 12 (Two-Room Adobe Structure)

are round (possible utility poles), range from 8 to 11 inches in diameter, and have been cut by a chainsaw to varying heights (up to 33 inches). One is a rectangular plank and measures 8 by 5 by 24 inches, one contains cut fragments of milled lumber planks nailed to the exterior, and some have metal fastening hardware (wire nails and steel bolts) on their sides. The retaining wall contains the imprint of an additional pole that was once set into the concrete along the wall interior at its southern end. To the west, two concrete wall footers are distributed along the slope, roughly 15 ft northwest of the eight primary concrete footers. They are undercut by erosion, partially buried in colluvium, and contain embedded steel hardware along their tops, suggesting they functioned as machine mounts. The wall footers are identical in size and measure 6.5 by 1.5 by 1.0 ft (length by width by height). One rail cart (Feature 27) is located amongst the footers (Photograph 47), while other artifacts scattered among the foundation elements include sheet metal, a machine vent door panel, a long, threaded bolt, loose wire, a segment of braided steel cable, a 5-gallon fuel can with a pour spout, and milled lumber and construction debris. Overall, this feature would have been used to unload ore from carts at the base of the tramway, where they could then be loaded onto trucks or a spur railroad line.

The other structure foundations in the eastern locus are widely distributed and served a range of functions (see Table 6; Photographs 48-64). Feature 17 lies adjacent to CR A26 and defines the northeastern boundary. Based on size and morphology, it could represent the footings of a small administrative building or entrance structure. Feature 36 is situated at the downhill end of the tramway incline at the western end of the locus and represents a substantial machine mount that serviced the tramway. It retains an attached metal frame and is directly along the tramway, upslope from the tipple structure. Feature 29 is 20 ft east of the tipple foundation and mostly buried, except for two pieces of mounting hardware that extend from the ground surface.

Photograph 44. LA 119818 Feature 26 (Tipple) Overview From Above Facing East

Photograph 45. LA 119818 Feature 26 (Tipple) Facing Northwest (Retaining Wall to Right)

Photograph 46. LA 119818 Feature 26 (Tipple) Detailed View of Concrete Footers

Photograph 47. LA 119818 Ore Cart (Feature 27) Associated with Tipple Structure

The other structure foundations (Features 14, 19, and 21) are scattered east of the tipple foundation within a cluster of features that includes a depression (Feature 22) that could be a privy, a mostly buried car body (Feature 24), and two poorly preserved fenced enclosures of chicken-wire-and-post construction (Features 20 and 23) (see Photographs 48-64). Features 14 and 21 are square, shed-sized concrete foundations located near the possible privy, likely representing small outbuildings. Feature 19 is a small, rectangular structure of coal-ash cinderblock that may have served as a machine mount. Two additional small concrete foundations (Features 13 and 18) were likely coal storage bins. Three features are along an inferred transportation corridor that runs from west to east from the tipple: a machine platform (Feature 16) of steel framing and milled lumber with a round flywheel of wood lathe, a small concrete structure foundation (Feature 15) that likely represents a machine mount, and a concentration of railroad ties (Feature 40). Other features include fence segments (Features 30 and 38), a trash midden where car bodies, mining equipment, and other large debris was deposited within a drainage (Feature 37), and a pipe well protruding from the surface (Feature 39). According to Moiola (1998), several car engines were utilized to power the winch system of the tramway, and they were likely dumped along the drainage after use.

The waste rock piles in the eastern locus (Features 33, 34, and 35) are small, low, and irregularly shaped areas that do not reflect large-scale, systematic deposition (see Photographs 59 and 60). These characteristics demonstrate that the Eastern Locus was an administrative, staging, and transport hub where coal was loaded for market and a variety of other activities took place, but it was not an area that contained coal extraction features. As a result, waste rock piles would have formed due to expedient dumping or spillage along the transport and loading system. Feature 34 is the largest of the waste rock features and frames the terminus of the tramway system, immediately upslope from the tipple. This dump may have formed as excess coal waste was dumped during the unloading process at the base of the tramway. Feature 35 covers the toe of the mesa slope just north of the former tipple structure, and some of it was incorporated as building material for a water-control berm (Feature 28) that controlled flows emanating from the nearby

canyon. Feature 33 is in the southeastern part of the locus along a probable transportation corridor where coal was moved to market, suggesting it represents incidental spillage.

The locus contains an estimated 200 to 500 items, most of which are concentrated near the tipple complex (Feature 26), which was likely the center of activity in the eastern part of the site. Artifacts are also common along an inferred east-west ore transport corridor, while car parts and large pieces of equipment are clustered along the drainage in an area defined as Feature 37 (see discussion above). Overall, domestic or food-related artifacts are rare, although a small number of clear and amber glass fragments were noted. The vast majority of artifacts in the locus are associated with industrial, transport, and construction activities, and a sample of 136 items were formally analyzed. This assemblage includes machinery parts (n=37), sheet metal fragments (n=36), construction materials (n=15), wire segments (n=12), ceramic insulators (n=10), nails/fasteners (n=6), tires (n=6), vessels (n=5), household equipment (n=3), rail fragments (n=3), utility pole segments (n=2), and one pipe segment.

Table 6. Summary of LA 119818 Eastern Locus Features

No.	Feature Type	L [1]	W[1]	Description
12	Adobe Structure	52	19	Large, two-room, rectangular adobe; see narrative above for additional information
13	Concrete Foundation	25	10	Rectangular, concrete-lined depression/basin (2.5 ft-deep); eastern wall is wider than other walls, and northern wall has partially collapsed inward; partially in-filled with sediments and vegetation; a metal pipe fragment with external threads on one end and holes drilled into the body is associated; could have served as a cistern or for coal storage
14	Concrete Foundation	18	11	Shed-sized structure foundation; two concrete footer walls are partially exposed, but both are poorly preserved; footers are 5 inches thick; other walls are buried; one rectangular fuel can is associated; function unknown
15	Platform/ Mount	5	3	Rectangular machine mount (1 ft-high) structure consisting of a decaying concrete pad with two embedded metal bolts; slab appears shifted and may no longer be in situ; associated with a metal tank with fittings and a rubber tire
16	Unknown	8	2.5	Object of unknown function along a shallow drainage; two parallel milled lumber planks secured by metal pipe segments and bolts, washer, and nut fasteners; the frame is buried and slightly bent, and wood components are decaying; a metal flywheel comprises of a 6-inch-diameter metal hub covered by wooden lathes fastened with 3-inch bolts and nuts is at the eastern end; possible sled, transport structure, or portable platform
17	Concrete Foundation	17	12	Concrete foundation of a 1-2 room structure; walls are 5 inches thick, 5 inches tall, and deeply embedded; concrete is deteriorating and crumbling, and grasses are growing within the footprint; no associated artifacts; unknown function
18	Concrete Foundation	21	16	Circular depression (1.8 ft-deep) lined by a concrete collar; in-filled with dirt and leaves; exposed concrete is cracking and deteriorating; associated with two pieces of corrugated sheet metal; possible tank/cistern or coal storage feature
19	Platform/ Mount	6	2	Small rectangular machine mount (1.8 ft-high) built of coal-ash cinder block and mortar fabric with an embedded metal strap (45 inches long by 2.5 inches wide); a 6 ft-long milled lumber plank is west of the feature
20	Fence	15	10	Chicken-wire fenced enclosure; only a small section of the fence remains standing (3 ft tall); no fence posts or supports visible
21	Concrete Foundation	14	10	Shed-sized concrete slab foundation (14 inches in max thickness); mostly buried and obscured by vegetation; visible edges are rimmed by a single piece of milled lumber with protruding spike fasteners; unknown function
22	Depression	8	7	Earthen depression (1.5 ft-deep) potentially associated with Features 14 and 21; in-filled with sediments and covered in locust trees and other vegetation; possible tank or privy
23	Fence	6	1	Chicken-wire fence segment (2.75 ft-high); one 5-inch diameter, 4.5-ft-tall timber post; portions of fencing are buried
24	Car Body	6	4	Rusted, crumpled, and partially buried front end of a car body; headlamp remains visible; unknown type

No.	Feature Type	L [1]	W[1]	Description
26	Tipple Foundation	55	45	Large foundation complex encompassing 10 concrete footers, a retaining wall, and various other walls, platforms, and posts representing the remains of a tipple structure located at the eastern terminus of the tramway system; see narrative discussion for additional details
27	Rail Cart	12	2.5	2.5 ft in height; rusted, deteriorating, and missing axels and wheels; a 5.5-ft-long tow-bar extends from one end
28	Earthen Berm	40	6	Linear berm (2-8 ft tall) constructed of earth, coal gob, and stone; diverts and retains water flows from a drainage, either to prevent flooding within the site or retain water in an informal reservoir
29	Concrete Foundation	4	4	Buried concrete slab with two embedded, protruding bolts; likely served as a machine mount associated with the nearby tipple structure (Feature 26) to the west
30	Fence	41	3	Chicken-wire fence line; 1.6 ft-high; currently comprises a single fallen alignment; no visible posts
33	Waste Rock Pile	80	51	Low concentration of coal gob (6 inches-high) on canyon bottom; comprised of mostly black earth and gravel-sized gob; deflated
34	Waste Rock Pile	112	92	Low, irregularly shaped waste mound (3 ft-high) framing the terminus of the tramway incline; comprised of mostly black earth, with some gravel-sized coal gob intermixed; eroding downslope; associated with one piece of sheet metal
35	Waste Rock Pile	59	36	Sheet of coal gob comprised of black earth gravel-sized coal gob; not mounded; gob was used as additional material to bolster a portion of a water control berm; a metal bracket and one piece of sheet metal are associated
36	Concrete Foundation	13	7	Rectangular machine mount structure located at edge of narrow bench that is elevated 50-60 ft above Yankee Canyon; located west of tipple (Feature 26) and east of a waste rock pile (Feature 34) at eastern end of the tramway incline; consists of a 3-ft-thick concrete pad with a steel frame bolted to the top; two poles previously embedded at southeast and northeast corners (currently missing)
37	Midden	118	36	Equipment and vehicle dump located within a narrow drainage; includes three car bodies, one rail cart frame, milled lumber planks, three machinery body components, miscellaneous car parts, four tires, segments of braided steel cables and chicken wire, and sheet metal
38	Fence	39	0.5	Two decayed wooden fence posts; no evidence of fencing material
39	Pipe Well	0.5	0.2	Thick metal pipe with internal threads embedded in ground; extends 0.2 ft high
40	Railroad Tie Concentration	20	15	Scatter of approximately 10 railroad ties located along an inferred transport corridor extending from tipple to the bottom of Yankee Canyon

[1] Length and width are presented in ft

Photograph 48. LA 119818 Feature 13 (Concrete Foundation)

Photograph 49. LA 119818 Feature 14 (Structure Foundation)

Photograph 50. LA 119818 Feature 15 (Concrete Platform)

Photograph 51. LA 119818 Feature 16 (Sled/Cart-type Item)

Photograph 52. LA 119818 Feature 17 (Concrete Foundation)

Photograph 53. LA 119818 Feature 18 (Concrete Foundation)

Photograph 54. LA 119818 Feature 19 (Concrete Platform)

Photograph 55. LA 119818 Feature 23 (Fence)

Photograph 56. LA 119818 Feature 24 (Car Body)

Photograph 57. LA 119818 Feature 28 (Earthen Berm)

Photograph 58. LA 119818 Feature 29 (Concrete Platform)

Photograph 59. LA 119818 Feature 33 (Waste Rock Concentration)

Photograph 60. LA 119818 Feature 34 (Waste Rock Pile)

Photograph 61. LA 119818 Feature 36 (Concrete Platform) Overview

Photograph 62. LA 119818 Feature 36 (Concrete Platform) Profile View

Photograph 63. LA 119818 Feature 37 (Car/Equipment Dump)

Photograph 64. LA 119818 Feature 40 (Railroad Tie Concentration)

Artifacts classified as machinery parts consist primarily of fragments of automobiles and ore carts, with specific examples including wheel fragments, vehicle body parts (including hoods, fenders, and doors), pulleys, hitch and bracket assemblies, and other pieces of machinery. Construction materials include wooden beams, milled boards, posts, and brick fragments. Insulators are disc-shaped ceramic items, often attached to wire segments or posts (one embossed with "GP C, and the associated utility pole segments often have wires or cables attached, indicating the presence of electric or telephone utility lines. Household equipment in the locus includes a metal tank/basin, a doorknob, and an electrical box with conduit. Vessels include a galvanized metal can, three fuel cans (two 5-gallon size), and an aerosol can. Fasteners consist of railroad spikes, nails, brackets, and large bolts. Wire is primarily braided steel cable (often galvanized). Other metal artifacts include a vent door panel, sheet metal of varying type, fencing materials, and a galvanized steel garbage can. The area also contains abundant modern trash from recreational activity.

Tramway Segment

The tramway incline was defined as Feature 8. It is 0.33 miles in length, descends roughly 600 ft in total elevation, and links the upper Western Locus where mining occurred with the administrative and transport-focused Eastern Locus (Photograph 65). More specifically, it travels from a waste rock pile (Feature 31) and loadout structure (Feature 5) within the Western Locus to the tipple complex (Feature 26) within the Eastern Locus, where coal ore was removed from carts and transferred to market. For most of its length, the incline is defined by a linear depression that is 6 to 12 ft wide and 1 to 5 ft deep. The morphology is highly variable and ranges from a faint, shallow swale to a deeper trench cut through the steep east-facing slope (Photographs 66 and 67).

A 400-ft-long segment near the center of the alignment is defined as a raised bed/grade rather than a depression in an area where it traverses a broad bench (Photograph 68). Part of this segment is constructed of coal gob likely derived from Feature 33, a waste rock pile located along the line. The raised segment is approximately 12 to 20 ft in width and 6 tall. The entire tramway incline is littered with discarded timber ties (at least 215 were mapped) that range from 1 to 8 ft in length based on their level of preservation (see Photographs 66 and 67). Most of these ties are displaced and fragmented, but approximately 15 remain in place, and four of these are still attached to segments of narrow-gauge rail along the edge of the grade (Photograph 69). Overall, these remnants demonstrate the original materials and morphology of the tramway incline.

Two additional features are located along the tramway incline. Feature 33 is a waste rock pile located mid-slope near the middle of the corridor. It is crossed by the tramway line, and some of the waste material was utilized as fill for a raised bed segment. The dump measures 98 by 40 ft, is 6 ft tall, and is comprised mostly of black or dark grey gob, with small amounts of sandstone cobbles and gravels intermixed. This feature may have developed at a transfer or staging area at the midway point along the line. Farther downslope to the east, Feature 25 is a nearly intact tram cart. It measures 15 by 5 ft and retains both sets of wheels. The body may have been sheet metal, based on the presence of a large fragment that is present in the interior. Other cart elements include robust steel bolts, support struts, and framing (Photograph 70).

A variety of artifacts, construction debris, and infrastructure are scattered along the tramway incline, including a series of disc-shaped ceramic insulators (n=10) often still attached to lengths of wire or cut utility posts (see Photograph 67). Moiola (1998) notes that electricity arrived at the mine in the 1950s to power the fan ventilation system, and these items likely represent remnants of an electrical line that followed the tramway corridor. Other artifacts include 6-inch-long metal rods (n=10), various rail cart fragments, including wheels and axles (n=14), sheet metal fragments (n=5), railroad spikes (n=3), narrow-gauge rail fragments (n=3), braided-steel cable segments (n=3), an "Armstrong Heatmaster" vehicle tire, an aerosol can, and a post and embedded spike that was likely utilized as tramway tie replacement.

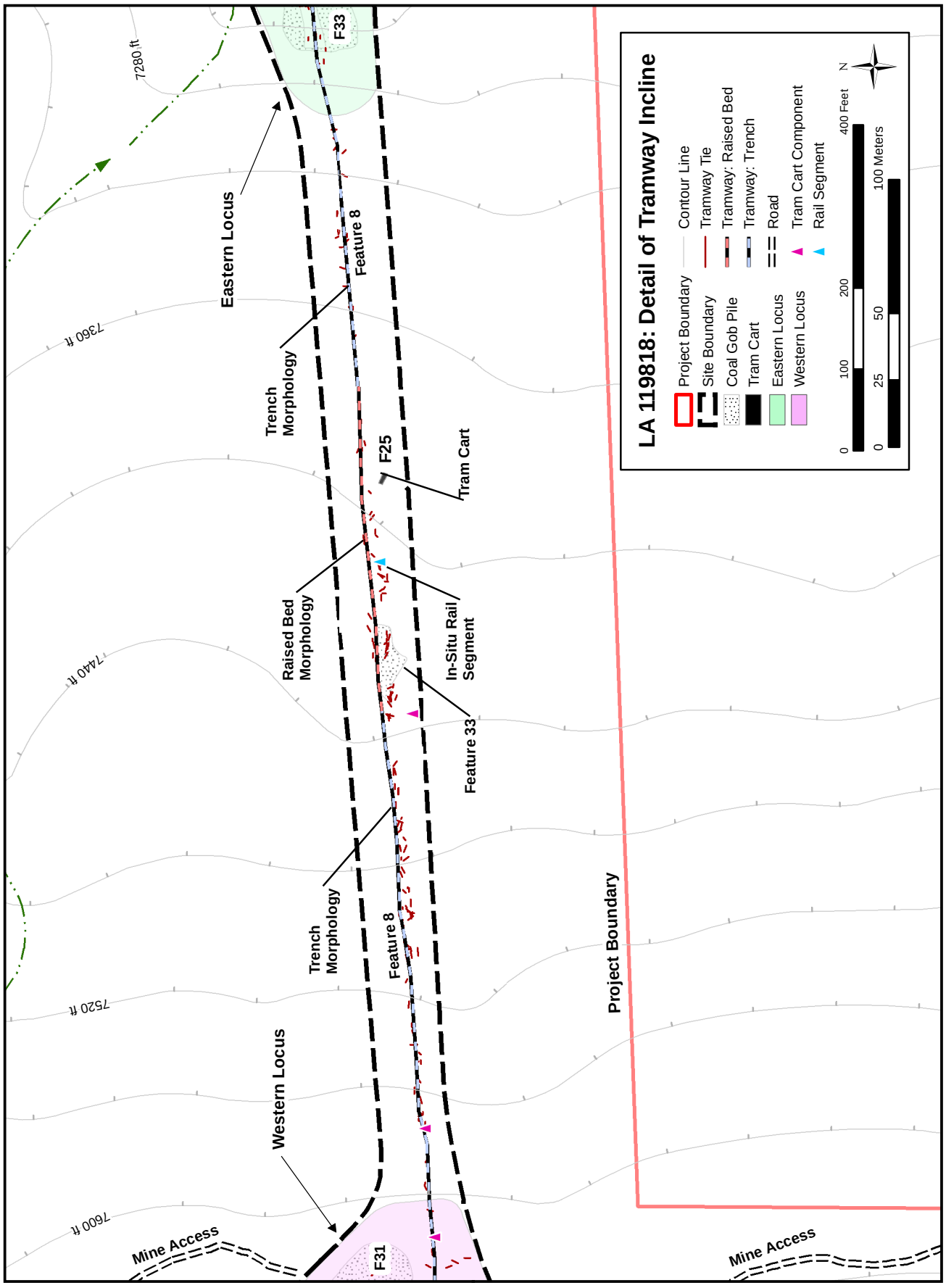


Figure 16. Detail of LA 119818 Tramway Incline Segment

Photograph 65. Overview of LA 119818 Tramway Incline (Feature 8) Facing East with Yankee Canyon Below

Photograph 66. Typical Swale/Trench Tramway Morphology (Facing Upslope)

Photograph 67. Typical Swale/Trench Tramway Morphology (Facing Downslope)

Photograph 68. Typical Tramway Segment with Raised Bed Morphology

Photograph 69. Segment of Intact Railroad Ties and Narrow-gauge Rail along the Tramway

Photograph 70. Feature 70 (Ore Cart along Tramway)

Summary

In summary, LA 119818 (the Denton-Colangelo-Strasia-Rodman Mine) is a very large coal mine that developed from efforts to access the Yankee Bed from the north, long after the initial period of mining in Yankee Canyon (1905-1913). The site contains two separate loci connected by a tramway incline that descends 600 ft from high on the slope of Horse Mesa to the valley below. The Western Locus contains a single mine entrance (a closed adit) and a suite of infrastructure features that provided ventilation, equipment storage, waste rock disposal and ore transport support for the mine. This locus also includes a small habitation zone with a two-room structure, privy, and artifact concentration, suggesting temporary residence by miners. The Eastern Locus on the valley floor contains a tipple complex, large administrative building, ore transport corridor, and a variety of machine mounts, outbuildings, and other equipment. This area was not associated with habitation or mineral extraction.

Moiola (1998) provides an excellent historical overview of the mine. According to a State Mine Inspections Report, the mine was established in 1931 by Lunce Denton and had one opening without ventilation, a loadout, and a gravity operated tram; the mine employed 11 men removing coal by pick-and-shovel methods, and the coal was moved on carts to the tramway and then lowered to the tipple on the valley floor. In 1932, an air course entry and other infrastructure were added, likely including the fan house, generator room, and other features that are still visible today and were documented during this project. Mrs. Denton employed up to 19 miners in the 1930s but sold the mine in 1937 to Pat Colangelo, who operated it until 1949. The mine experienced good and bad years and sometimes only operated for short periods of the year. The Rodman family took over operations in 1950 and added electricity to power generators. A cable system for transporting coal carts within the underground mine added in the 1950s was powered by a Buick engine, and three additional car engines now powered the tramway incline system. On the valley floor, coal was unloaded and transferred to storage bins (likely the concrete foundations documented during the current project) before being sent to market by truck. The Rodmans closed the mine in 1960 and salvaged timbers, machinery, rails, coal carts, and other usable materials.

Eligibility and Effects

LA 119818 was determined eligible for listing on the NRHP by the AML Program in 1998, and the SHPO concurred with this determination (HPD Log No. 54930). Moiola (1998) noted that the site had information potential, and he recommended that intact features in the Western Locus—including the fan house, loadout, and generator room—be protected during mine remediation. Based on our evaluation, the site contains two elements that are rare within the project area and contribute to its eligibility: (1) a habitation locus, including a residential structure and domestic debris that could contain intact subsurface deposits with the potential to provide significant information about the period of mid-twentieth century mining in Yankee Canyon and (2) unique and partially intact engineering features, including elements of a gravity tramway incline, tipple complex, and the intact mining features noted above. As a result, we recommend that LA 119818 remain *eligible* for listing on the NRHP under Criterion D for the information potential exhibited in the habitation locus and under Criterion A for the ability of the site to convey an association with locally significant early and mid-twentieth century coal mining based on the presence of mine engineering features.

The qualifying characteristics of the site are its habitation locus (Features 3 and 4) and intact mining infrastructure, including Feature 1 (fan house), Feature 2 (generator room), Feature 5 (loadout), Feature 6 (fan mount), parts of Feature 8 (tramway incline), Feature 12 (adobe administrative building), and Feature 26 (tipple complex). We recommend that these features be preserved during mine remediation and that suitable avoidance buffers be established around each of these features during implementation. If the adit is further closed, we recommend that materials and methods are utilized that minimize intrusive visual elements and changes to the historic setting. If these recommendations are followed, the project would have no adverse effect on this historic property.

LA 120611 (YANKEE NO. 3 MINE)

Temporal Affiliation: US Territorial to NM Statehood (1905-1913)
Land Status: Private Landowner
Dimensions: 471 by 268 m; 68,916 sq m
Eligibility Recommendation: Eligible (D)

LA 120611 (Yankee No. 3 Mine) is a large, previously recorded mining site that dates to the early period of mining in Yankee Canyon and contains at least 22 features and thousands of historic artifacts. The site is located at the southern end of the project area, where it occupies a portion of the mesa top, a series of benches, and sections of steep hill slope on the southwestern flank of Horse Mesa (Photograph 71; Figures 17 and A2). The area slopes to the east and southeast, and the elevation ranges from 7,570 to 7,780 ft amsl across the site. Several steep drainages flow southeast across the site towards Yankee Canyon, and a fence line runs from northeast to southwest, following the contour of one of the benches (Photograph 72). The landform provides panoramic views of Yankee Canyon to the east and the southern rim of Johnson Mesa to the southeast (Photograph 73). The site is somewhat isolated, with the nearest mine sites located approximately 500 m to the north. Vegetation represents regrowth after a large fire and includes dense stands of Gambel oak and locust, intermixed with juniper, ponderosa pine, and piñon pine. Various grasses and forbs, skunkbush, beargrass, mountain mahogany, prickly-pear cactus, and button cactus comprise the understory. Surface visibility is limited to less than 10 percent on the slopes due to oak brush and locust, although there are some exposures on level or gently sloping areas.

The site is in poor condition and is estimated to remain approximately 25 percent intact. The coal transport systems are no longer intact and only remain recognizable as linear scatters of spikes and narrow-gauge rail fragments. The primary extraction features have been closed, and large machinery used in support of extraction and processing has been removed. The coal gob piles are eroding, and a significant amount of mine waste is being displaced downslope into intermittent drainages, where it may reach the local watershed. However, some features are intact, and the setting remains mostly unchanged since the time mining occurred.

Photograph 71. LA 120611 Overview along the Mesa Top

Photograph 72. LA 120611 Overview Showing Fence Line and Narrow Bench

Photograph 73. View of Yankee Canyon (Facing Northeast from LA 120611)

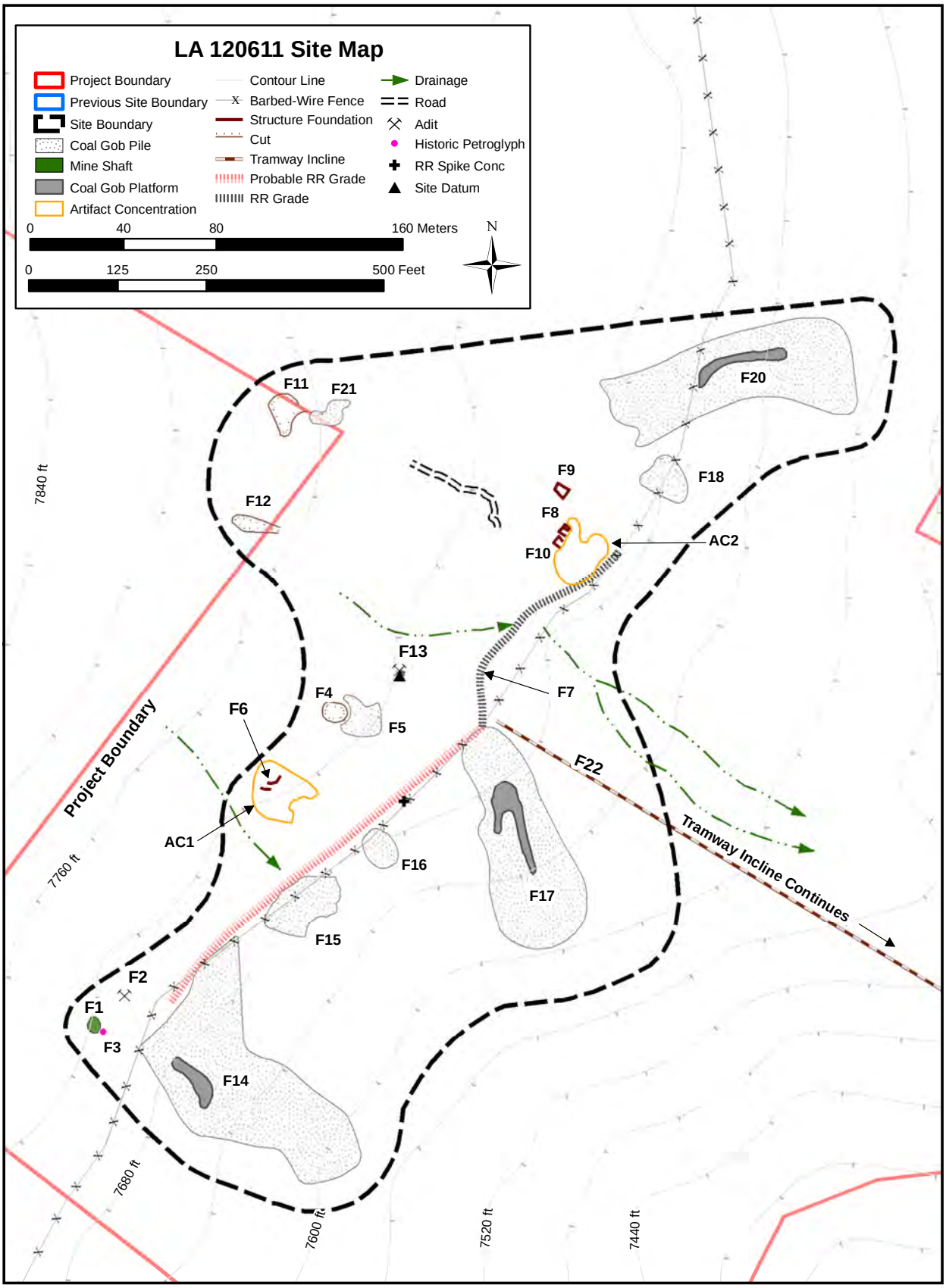


Figure 17. LA 120611 Site Overview Map

Previous Documentation and Research

Information about this mine was compiled by Nickelson (1979) during work conducted for the Office of Surface Mining, but it was first documented as an archaeological site by the Abandoned Mine Bureau in 1998 when they proposed to close the mine shaft (Moiola 1998). The AML Program documented an open shaft, an adit, a coal waste pile, three pieces of scrap metal, a narrow-gauge rail fragment, SCA glass, and the remains of a crushed coal car, all of which were accessed by an "old tram road" (Moiola 1998). Other features were noted in the surrounding area—including coal waste piles and the head of a tramway—but recording was constrained to a small area around the mine shaft and adit.

Utilizing information from Lee (1924), archival research, and the prior work conducted by Nickelson, Moiola (1998) identified the site as the Yankee No. 3 Mine established by the Yankee Fuel Company and operated from 1905 to 1908 (with occasional use possibly continuing until 1913). According to an excerpt in the 1906 Territorial Mine Inspector's Report, the mine was already 600 ft deep in year two of its operation. In 1906, the three Yankee Mines employed 80 men working underground and 30 men above-ground, and coal was being mined by hand utilizing the room-and-pillar method. The Yankee No. 3 Mine had a ventilation furnace and fan with 150-horsepower machinery, and mules hauled coal cars from the rooms outside to load onto a "three-rail gravity incline" tramway that ran for 3,300 ft. The tramway had a double-acting drum at the head and was equipped with 1-1/4-inch diameter "crucible steel rope" that lowered coal cars to a tipple along the Santa Fe, Raton, and Eastern Railroad tracks in the bottom of Yankee Canyon (Moiola 1998:10).

Current Recording

The site was revisited, mapped, and fully updated, and a physical site datum (rebar stake with scratch tag) was installed along the southern side of an adit located just west of the center of the site (see Figure 17) All three features recorded by Moiola (1998) were relocated (the mine shaft, adit, and tramway incline), and a significant number of new features were discovered (n=19) and recorded. Features now include one mine shaft (Feature 1) and two adits (Features 2 and 13), three open pits/cuts (Features 4, 11, and 12), four structure foundations (Features 6, 8, and 10), eight coal gob piles (Features 5 and 14-F21), one historic petroglyph (Feature 3), one railroad grade/road (Feature 7), and one tramway incline segment (Feature 22). The artifact assemblage is widely distributed across the site in low-to-medium density and estimated to number in the 1000s, of which a judgmental sample of several hundred was analyzed.

Features

Table 7 presents a summary of all features on the site. Spatially, the features are arranged within two primary extraction areas in the southwestern (Features 1-3) and center (Feature 13) of the site, two habitation/structure areas along the western boundary (Feature 6 and AC 1) and in the northeastern (Features 8-10 and AC 2) part of the site, a transport system containing a tramway incline (Feature 22) and associated grade/road (Feature 7), a scatter of surface extraction features (prospect pits and open cuts) along the upslope parts of the site, and a series of waste rock piles downslope to the southeast. Each primary extraction area contains a mine shaft and/or adit, while the habitation areas contain one or more masonry structures and an associated artifact scatter that implies domestic use, suggesting these areas contained temporary barracks, camps, or food-preparation facilities. At least two of the structures may have been dugouts based on depressions or subterranean rooms.

The Yankee No. 3 mine shaft (Feature 1) and adit (Feature 2) previously recorded by Moiola (1998) define the southwestern site boundary and are above a sandstone cliff that also contains a historic graffiti panel (Feature 3). This cluster of features represents the primary extraction area on the site, and a large waste rock pile (Feature 14) stretches from here to the east. Neither extraction feature remains open. The shaft

is shallow, infilled with sediments and rock, and covered in dense oak and locust, while the adit entrance has collapsed but remains visible (Photographs 74 and 75). The petroglyph, which contains three images including a "B," may have served as a marker for this opening (Photographs 76 and 77).

Other extraction areas are in the central part of the site where there is a closed adit (Feature 13) that is framed by mortared masonry retention walls. The actual opening has collapsed but was visible when documented in 1998 (Photographs 78 and 79). This adit is directly upslope of the former head of the tramway, as well as a

Photograph 74. LA 120611 Feature 1 General Location (Infilled Mine Shaft)

Photograph 75. LA 120611 Feature 2 (Adit)

Photograph 76. LA 120611 Overview of Sandstone Outcrop Containing Feature 3 (Petroglyph/Marker)

Photograph 77. LA 120611 Feature 3 (Petroglyph/Marker) Detailed View

very large platform mound (Feature 17) of coal gob and sandstone waste rock. The northern part of the site also contains a large waste rock platform mound (Feature 20), suggesting it may have originally contained an adit or shaft opening that is no longer visible. The large circular pit (Feature 4) and two large open cuts (Features 11 and 12) appear to represent prospecting or shallow extraction efforts (Photographs 80-82).

Photograph 78. LA 120611 Feature 13 (Adit) when Previously Recorded (Moiola 1998)

Photograph 79. LA 120611 Feature 13 (Closed Adit)

Photograph 80. LA 120611 Feature 4 (Prospect Pit/Open Cut)

Photograph 81. LA 120611 Feature 11 (Open Cut)

Photograph 82. LA 120611 Feature 12 (Open Cut)

Photograph 83. LA 120611 Feature 7 (Road/Trail)

Historically, the site was likely accessed by a tramway incline system (similar to LA 119818) that extended from the valley floor below at a northwestern orientation. This feature can be discerned on aerial imagery, but it was not clearly visible on the ground within the site boundary. The alignment was designated as Feature 22 and its terminus is likely immediately north of Feature 17, the large coal waste pile in the east-central part of the site. No footers or other structural elements were noted, but a faint linear vegetation anomaly extends to the southeast. Continuing north from the head of the tramway is a linear swale accompanied by a scatter of railroad spikes, tie fragments, and rail segments (Photograph 83). This alignment is interpreted as Moiola's (1989) "old tram road" that connected the Yankee Mine openings to the tramway. The transportation system likely facilitated the transfer of coal and coal waste to the central part of the site, where it could be deposited on the waste rock platform or transferred to the tramway for transport to the valley below.

The four masonry foundations (Feature 6, 8, 9, and 10) are poorly preserved, discontinuous foundations constructed of local tabular sandstone (Photographs 84-86). They contained one or two rooms and are spatially associated with an artifact concentration—Feature 6 with AC 1 and Features 8, 9, and 10 with AC 2. Based on the insignificant foundations, the structures were likely short-term residences used for a single mining season or a span of several years.

Coal waste features range widely in size and morphology. Features 14, 17, and 20 represent the primary disposal areas for coal gob and waste rock on the site and are evenly spaced downslope from the habitation and extractions zones. These mounds formed from systematic downslope dumping that eventually created narrow, flat platforms that extend linearly through the center of the mounds (Photographs 87-89). These

Table 7. Summary of Documented LA 120611 Features

No.	Feature Type	L[1]	W[1]	Description
1	Mine Shaft	18	22	Shallow, vertical shaft (7 ft-deep); round opening surrounded by a berm of earth and boulders that are collapsing into depression; associated with F3, a petroglyph immediately to southeast; infilled during AML remediation following Moiola (1998) recording; no associated artifacts
2	Adit	6	5	Irregular, boulder-filled, vertical opening on northeast-facing outcrop; irregular depth due to past closure (5 ft max); 10-inch diameter axe-cut log is within opening
3	Petroglyph	0.8	0.5	Two petroglyphs (pecked/scraped) on sandstone cliff immediately below Feature 1: (1) three-pronged fork pointing downward and (2) a "B" with a quarter crescent above; possibly a form of mine claim marker
4	Prospect Pit/ Open Cut	43	36	Circular, shallow depression (4-6 ft deep) with waste rock deposited to the east; interpreted as a prospect pit; one isolated narrow-gauge rail fragment located 70 ft to the northwest
5	Waste Rock Pile	75	59	Mounded fill (1-2 ft-high) displaced east and downslope from Feature 4; comprised of both coal gob and sandstone (gravel-to-boulder sized)
6	Masonry Foundation	15	20	Poorly preserved masonry foundation containing two visible wall alignments - one linear and the other curved; constructed of local tabular sandstone and basalt cobbles and boulders ranging from 8 to 28 inches in maximum dimension; linear wall is stacked two courses high, while the curved wall contains two to four stacked courses; likely contained two rooms; directly associated with AC 1
7	Road/Rail Grade	908	8	Narrow linear swale interpreted as a rail transport feature; coal carts likely transported ore from openings to the head of a tramway incline (Feature 22); the grade is visible along a 340 ft-stretch north of Feature 17; south of Feature 17 the grade is not visible but likely defined by a 550-ft long scatter of railroad spikes, a rail tie fragment, several narrow-gauge rail fragments, rail cart parts, and other miscellaneous artifacts
8	Masonry Foundation	10	10	Two-room stone foundation; Room 1 is a U-shaped rock alignment surrounding a 1-ft-deep depression that opens to the southeast and has walls of rounded sandstone cobbles/boulders (maximum dimension of 28 inches); rocks are stacked one to three courses high and are one or two courses wide; Room 2 extends to the northeast, exhibits similar construction, and contains four single-course wall

No.	Feature Type	L[1]	W[1]	Description
				alignments; may have been partially a subterranean dugout; associated with two other structures (Features 9 and 10) and AC 2
9	Masonry Foundation	13	13	Likely one-room structure that is poorly defined and obscured by vegetation; interior is a shallow (0.5 ft) depression partially lined with cobbles along the northwestern and southwestern walls; associated rock is local unshaped sandstone; associated with two other structures (Features 8 and 10) and AC 2
10	Masonry Foundation	10	10	One-room structure adjected to Feature 8; U-shaped rock alignment framing a shallow (0.5 ft) depression that opens to the southeast; alignment is poorly preserved and partially displaced; associated rock is local unshaped sandstone
11	Open Cut	66	52	Irregularly shaped cut in an east-facing slope; extends to a maximum depth of 7 ft at the back wall; the center of the cut has slumped inward; associated fill is deposited immediately to the east (Feature 21); may result from prospecting efforts; associated artifacts include a milled lumber with embedded spikes and large nails
12	Open Cut	72	29	U-shaped trench-like cut in an east-facing slope; extends to a maximum depth of 5.5 ft; bedrock is exposed near the base of the southern wall but there is no evidence of a shaft opening; absence of spoil pile suggests fill carried out and disposed of elsewhere; no associated artifacts
13	Adit	13	8	Closed adit comprised of a horizontal cut into a southeast-facing slope; cut reaches a maximum depth of 5.5 ft and is reinforced with masonry walls of shaped sandstone and mortar (20-inch maximum); large, threaded steel bars protrude from both side walls; the actual opening along the back wall is buried in sediments and not visible; spoil material deposited in associated waste rock pile (Feature 17)
14	Waste Rock Platform	362	211	Large platform mound (50+ ft in maximum height) resulting from systemic eastward dumping of material removed from Features 1 and 2; comprised almost entirely of black earth coal gob; waste material is eroding downslope from shallow channeling; several railroad spikes and a length of anchor chain directly associated; top of mound contains a linear platform
15	Waste Rock Pile	121	66	Oval/irregularly shaped mound (10 ft in maximum height) comprised of coal gob intermixed with 20 percent sandstone gravels to boulders; narrow-gauge rail fragments and loose spikes distributed across northwestern edge
16	Waste Rock Pile	56	43	Surface concentration of black earth to gravel-sized coal gob and sandstone gravels/boulders; associated with narrow-gauge rail fragments and spikes distributed across northwestern edge in association with F7
17	Waste Rock Platform	323	123	Platform mound (50+ ft in maximum height); produced from systemic eastward dumping of material removed from F13; comprised of black earth to gravel-sized coal gob (75%) and gravel-sized sandstone (25%) - sandstone waste rock forms eastern quarter of feature; waste material eroding well-downslope of main platform; directly associated with RR spikes, rails, a tie fragment, steel rods, a mule shoe, a coal shovel, and a cast iron rail car fragment
18	Waste Rock Pile	66	50	Low mound (1 ft-high) of black earth to gravel-sized coal gob (75%) and sandstone gravels (25%); metal bracket and barrel hoop associated
20	Waste Rock Platform	353	137	Large platform mound (50+ ft in maximum height) produced from systemic eastward dumping; comprised of black earth/coal gob (85%) and sandstone cobbles and boulders (15%); directly associated with a narrow-gauge rail fragment; linear platform extends along top of mound
21	Waste Rock Pile	59	33	Low mound (1.0-1.5 ft-high) of black earth to gravel-sized coal gob located downslope of a large cut (Feature 11) associated with prospecting activity
22	Tramway	284	6	Upper terminus of a 0.63-mile-long (3,330 ft) gravity tramway incline visible only as a linear vegetation pattern on aerial imagery entering the site from the southeast; 0.2 miles (1,076 ft) of the incline is within the project area, and 284 ft are within the LA 120611 boundary, which was not extended to encompass the entire alignment; associated artifacts include steel rope, milled lumber with wire-cut nails, railroad spikes, rail fragments, cast iron mine car parts (braces, straps, and rod), steel plates with fastener holes, and SCA glass

[1]Length and width presented in ft

Photograph 84. LA 120611 Feature 6 (Masonry Foundation) Facing Northeast

Photograph 85. LA 120611 Feature 8 (Masonry Foundation)

Photograph 86. LA 120611 Feature 10 (Masonry Foundation

Photograph 87. LA 120611 Feature 14 (Platform Mound)

Photograph 88. LA 120611 Feature 17 (Platform Mound)

Photograph 89. LA 120611 Feature 20 (Platform Mound)

linear platforms likely served as grades for short narrow-gauge rail extensions that allowed coal waste railcars to more efficiently deposit waste as the mounds grew in size. They may have also served as activity or staging areas or contained other mining equipment. The remainder of the waste rock features are lower mounds with smaller footprints that represent short-term or incidental, rather than systematic, waste deposition, or they are associated with a specific prospect pit. The two piles directly associated with prospect pits (Features 5 and 21) contain primarily sandstone gravels rather than coal waste, suggesting these pits did not successfully access coal seams.

Artifacts

The site contains several thousand historic artifacts, of which samples were analyzed from three areas—AC 1, AC 2, and the linear scatter of mining and transport items along the rail grade (Feature 7). A total of 394 artifacts were analyzed, representing an estimated 10 percent sample from across the entire site. Photograph 90 presents a sample of domestic artifacts from AC 1 and AC 2, while Photography 90 depicts mining and transport-related items from along the rail grade. AC 1 contains approximately 500 artifacts within an 85-by-70-ft area surrounding a masonry foundation (Feature 6) along the western site boundary. A total of 80 glass, 69 metal, and 15 ceramic items were analyzed. Glass colors include aqua (n=45), SCA (n=23), and olive (n=12), with shards derived from a minimum of five aqua bottles, two SCA bottles, one SCA decorative jar, one embossed SCA jar lid, one olive bottle, and one aqua insulator. Bottle types are dominated by soda and beer styles. Diagnostic maker's marks include two different William Franzen and Sons marks (1898-1920 and 1915-1921; Lockhart et al. 2020:256), two different American Bottle Company marks (1906-1916 and 1906-1909; Lockhart et al. 2021:347-355), one SCA jar lid from 1898, and one "R G Co / 1" mark that likely represents a Root Bottle Company symbol used from 1901 to 1907 (possibly as late 1912; Lockhart et al. 2018:263). Metal items include wire-cut nails ranging from 1-3/16 to 6 inches in length (n=46), railroad spikes (n=4), cast-iron stove parts (n=3), barrel straps (n=2), one belt buckle, and one metal bed frame fragment. Cans include hole-in-cap (food or liquid), rectangular meat tins, sanitary, and one bucket-like vessel opened with can-opener and embossed with "PACIFIC MILL 25LBS" on the base (likely flour). Ceramics consist of undecorated whiteware (n=14) and decorated whiteware (n=1) from a minimum of two vessels.

AC 2 contains 100 to 200 artifacts in an 82-by-58-ft area southeast of two structure foundations (Features 8 and 10) in the northern part of the site. A small sample of 29 pieces of glass, seven metal items, and seven ceramics were analyzed. Glass colors include SCA (n=18), olive (n=9), aqua (n=1), and amber (n=1). Metal artifacts include barrel straps (n=2), stove parts (n=2), a 5-gallon bucket with a wire handle, and one railroad spike. Ceramics consist of five sherds from the same undecorated whiteware saucer and two porcelain insulators. One insulator is rectangular, and the other contains an eye-hole. Additional artifacts in the surrounding area include two undecorated whiteware sherds, two milk glass shards, one SCA body shard, and a lattice of riveted steel straps that has been cut to a circular shape (possibly a potholder; see Photograph 90).

A total of 109 artifacts along Feature 7 were analyzed to delineate this poorly preserved linear transportation feature. The sample is dominated by railroad-related items, such as railroad spikes (n=54), various cast-iron and steel elements of rail cars, including straps, braces, plates, and angle-iron implements (n=22), partially buried narrow-gauge rail segments (n=6), large nails and steel bolts (n=5), steel rope (n=1), and a railroad tie fragment (n=1). Several miscellaneous items are clustered along the stretch of Feature 7 that passes just southeast of AC 1, likely representing an area of industrial/domestic intermixing. Other miscellaneous items include barrel straps (n=3) and brown-glazed earthenware (n=1).

Photograph 90. Sample of Domestic Artifacts within AC 1 and AC 2

Photograph 91. Sample of Industrial and Mining/Transport-Related Artifacts

Summary

To summarize, LA 120611 is the Yankee No. 3 Mine, a large mining site with three mine openings, three large coal waste platforms, two separate short-term habitation loci, remains of a narrow-gauge rail system and tramway incline, and a scatter of waste rock and surface extraction/prospecting features. The mine does not contain machinery or intact openings, indicating efforts were made to scavenge materials and close most of the entrances after the mine was abandoned. The only open feature as late as 1997 was Feature 2, but it also has since been closed/infilled. Moiola (1998) previously assigned a temporal affiliation of 1905 to 1913, and most of the diagnostic artifacts fit well with this timeframe, particularly the maker's marks, SCA, olive, and aqua glass, and hole-in-cap cans. There may also be some evidence for activity

occurring from between 1915 and 1921 around AC 2/Feature 6 based on a small number of later artifacts. The Yankee No. 3 Mine likely corresponds with Feature 1, and it is possible that Feature 13 represents one of the other numbered Yankee Mines (No. 1, No. 2, or No. 4). All are said to have used the same tramway incline (Feature 22) to lower coal to the bottom of Yankee Canyon, and their openings were likely along the tram road (Feature 7) that crosses the site. According to archival research by Moiola (1998), the No. 1 and No. 2 mines were operated concurrently with No. 3, while the No. 4 Mine was opened in 1910 and operated until 1911 or 1912. By 1913, the Yankee Mines were abandoned, and mining shifted to the north under different corporate management to exploit the Kellogg Bed in 1914.

Eligibility and Effects

The mine was determined not eligible for listing on the NRHP after the previous recording, and the SHPO concurred with this determination in 1998 (HPD Log No. 54930). However, we recommend that this status be revisited based on our current project-wide evaluation. Although the mining infrastructure and equipment have been removed and engineering features lack integrity, the site exhibits information potential in the form of possible archaeological deposits within the habitation areas of Feature 6/AC 1 and Features 8/9/10/AC 2 that could provide information about early twentieth century miners in the region. These areas contain concentrations of early glass and can types (including SCA and olive glass) and are associated with the locally significant early period of coal mining in Yankee Canyon (1905-1913). As a result, we recommend that LA 120611 be reevaluated as *eligible* for listing on the NRHP under Criterion D The site does not qualify under Criterion A because its mine engineering features do not exhibit the necessary integrity to convey their historic associations.

Because the qualifying characteristics of this historic property are its masonry foundations and associated artifact concentrations, we recommend that these areas be avoided during the project. Closure of the openings and remediation of the waste rock piles would not detract from the qualifying characteristics because these features lack information potential and historic integrity. As long as the areas of habitation are avoided (with appropriate buffers) and activities within the site are monitored by a permitted archaeologist, project implementation would not adversely affect the site.

LA 202927 (OCS-2228-1)

Temporal Affiliation: NM Statehood to Recent Historic (1930-1963)
Land Status: NM State Land Office
Dimensions: 268 by 97 m; 18,569 sq m
Eligibility Recommendation: Not Eligible

LA 202927 (OCS-2228-1) is a newly discovered early-to-mid twentieth century coal mine containing 10 features and a sparse scatter of historic artifacts. The site is located in the northern part of the project area on a broad southeast facing bench and adjacent hillslope along the eastern edge of Horse Mesa (Figures 18 and A2). From southeast-to-northwest, elevation ranges from 7,520 to 7,730 ft amsl. The landform provides excellent views in all directions, including of Yankee Canyon to the southeast and the southern rim of nearby Barela Mesa to the north (Photograph 92). The mining area is at the base of a sandstone outcrop and is accessed from the west by an old mine road that first passes through LA 202928, located 120 m to the southwest and LA 202932 located 70 m to the southeast (Photograph 93). The site area contains dense stands of Gambel oak, locust, and wild rose, with small amounts of ponderosa pine, juniper, Douglas fir, skunkbush, banana yucca, and mixed grasses and forbs. Surface visibility is good along the road and coal gob waste piles but averages 25 percent across the site due to dense vegetation. The site is estimated to remain less than 50 percent intact. At the time of recording, a small reservoir exhibited signs of recent cattle grazing, while severe erosion has resulted in channeling along the flanks of the larger waste rock piles and sections of the old road.

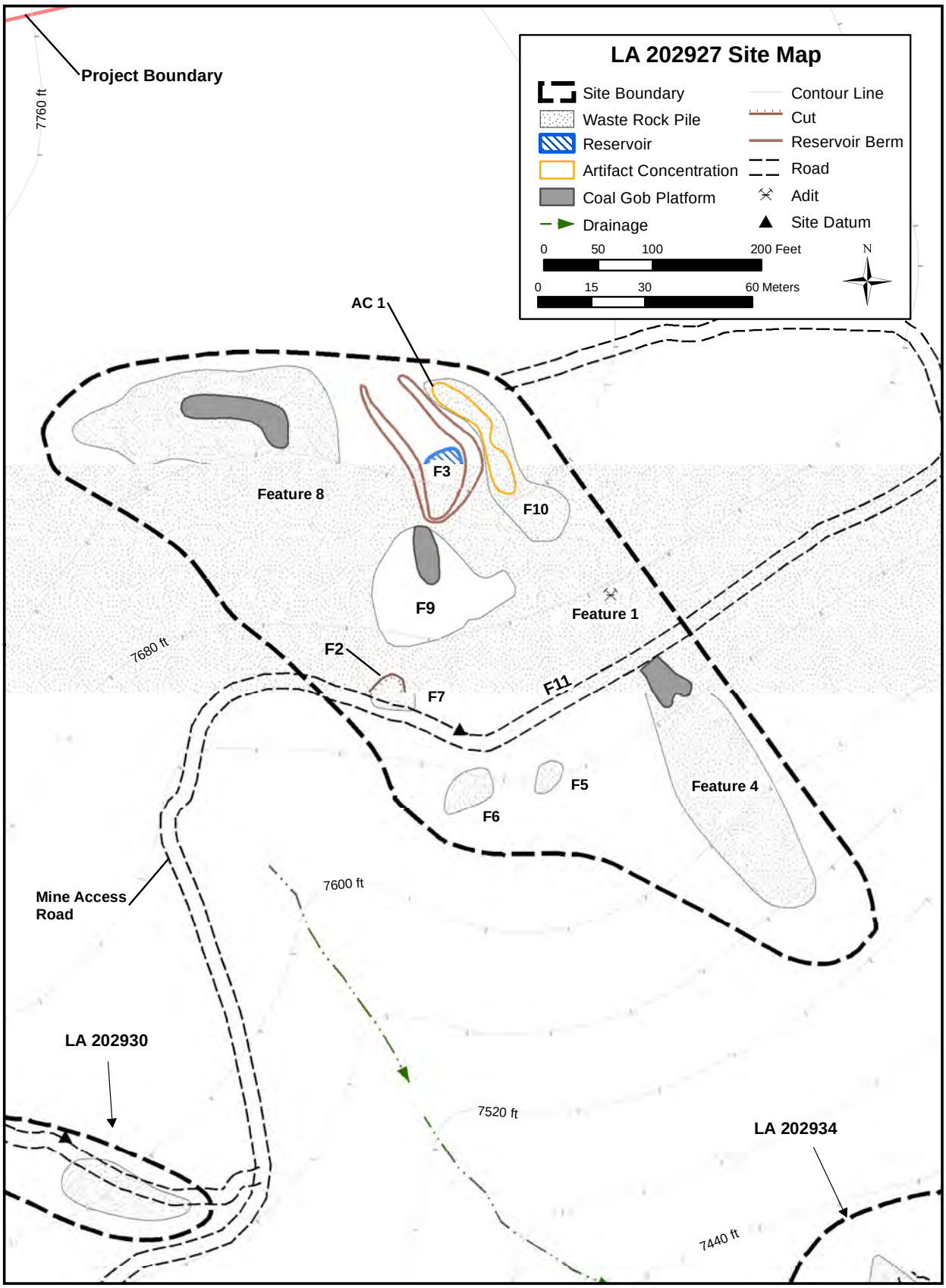


Figure 18. LA 202927 Site Map

Photograph 92. View to the Southeast of Yankee Canyon from LA 202929

Photograph 93. LA 202927 Facing West along Mine Access Road

All observed features (n=10) and artifacts (n=96) were recorded, the site was fully mapped and described, and a physical datum (rebar stake with scratch tag) was established along the mine road during the current investigation. Features include seven waste rock piles (Features 4-10), one adit (Feature 1), one open cut (Feature 2), one small reservoir (Feature 3), and the mine road (Feature 11) (Table 8). Artifacts are concentrated along the bench in the northeastern part of the site. The adit and cut are located close to the mine road, which was documented as a feature within the site but was not used to extend the site by the site boundary beyond the area containing other cultural materials. The adit is slightly elevated above a waste rock pile (Feature 4) in the eastern part of the stie and has a collapsed opening (Photograph 94). The open cut is farther to the southwest and could represent a former air course/entry that has since collapsed (Photograph 95). The small reservoir (Photograph 96) is nestled between two large waste rock piles in the

Photograph 94. LA 202927 Feature 1 (Adit)

Photograph 95. LA 202927 Feature 2 (Open Cut/Collapsed Entry)

Photograph 96. LA 202927 Feature 3 (Reservoir)

northern part of the site; it does not appear to represent a prospect feature and may have functioned to retain water and prevent flooding of the mine road and mining features downslope to the south.

Most of the coal waste has been deposited within three large platform mounds distributed across the site from northwest to southeast (Features 4, 8, and 9). These mounds were generated by systemic dumping in a single direction, are tall and extend across large areas, and contain linear platforms on their tops that likely represent makeshift roads or staging areas used to access the mound to deposit waste and possibly store equipment or conduct other activities (Photographs 97-99). Smaller concentrations of coal gob are located along the mine road and could result from incidental spillage or short-term expedient dumping (Photograph 100). One large, shallow waste rock concentration along the northeastern site boundary (Feature 10) contains moderate amounts of coal waste intermixed with sandstone gravels, machinery parts, and domestic debris, much of which was defined as AC 1. This area could represent the location of a structure that is no longer visible or a short-term encampment associated with mining.

Table 8. Summary of Documented LA 202927 Features

No.	Feature Type	L[1]	W[1]	Description
1	Adit	3	1.5	Collapsed opening (narrow slit) facing southeast and elevated 10-15 ft above Feature 4 (waste rock pile); adit interior is 6-9 ft in width with no visible framing and contains a shaft extending 70 degrees towards the north-northwest
2	Cut	36	20	U-shaped cut into a bedrock slope, with large sandstone slabs displaced into the cut; Feature located within and eroding downslope of the cut; may represent a closed air course/entry
3	Reservoir	115	33	Excavated into a bench; natural wall of sediment defines eastern side, low and eroding 15-ft-wide berm encloses western side; southern end capped by severely eroded berm; runoff entered from the north; heavily infilled and currently favored by cattle
4	Waste Rock Platform	262	89	Platform mound (10-15 ft in maximum height) located along the southern edge of the mine road; produced from systemic southward dumping from the road; Feature 1 (adit) is 25 m to the northwest and likely the source of material; comprised of black coal gob with a few sandstone gravels and cobbles; waste material eroding downslope along channels
5	Waste Rock Pile	33	21	Small, low mound (1-3 ft in height) along southern edge of mine road; eroding downslope; comprised of black earth to cobble-sized coal gob; obscured by oak
6	Waste Rock Pile	52	31	Low mound (0.5 ft in height) along southern edge of a mine road; eroding downslope; comprised of mixture of black earth to cobble-sized coal gob with occasional sandstone gravels; obscured by oak
7	Waste Rock Pile	41	30	Low mound (1 ft in height) north a mine road and associated with Feature 2 (cut/collapsed entry); comprised of mixture of black earth to gravel-sized coal gob, with sandstone gravels and cobbles intermixed
8	Waste Rock Platform	262	108	Platform mound (10-15 ft in maximum height) located along the southern edge of a bench comprised of a series of low berms and concentrations, suggesting systemic dumping to the south along the bench; comprised of black earth and gravel-sized coal gob with occasional sandstone gravels and cobbles; dense oak scrub obscures half of the feature; waste material is being displaced by erosional channeling along flanks of platform mound
9	Waste Rock Platform	103	126	Narrow platform mound (10-15 ft in maximum height) extending from the southern edge of a bench, with material extending downslope; comprised of black earth to cobble-sized coal gob with occasional sandstone cobbles/gravels; minor erosional channeling along flanks
10	Waste Rock Concentration	180	59	Linear swath of coal gob intermixed with domestic and industrial debris; associated with AC 1 and possibly the location of a former activity area or processing feature based on presence of metal gears and small machine parts, nails, window glass, and a few fragments of milled lumber; not mounded
11	Road	380	15	Linear alignment created through cut-and-fill method; earthen mine road used to access mining features (and nearby sites) and carry ore to the canyon bottom; not extended beyond site boundary

[1]Length and width presented in ft

Photograph 97. LA 202927 Feature 4 (Waste Rock Platform Mound)

Photograph 98. LA 202927 Feature 8 (Waste Rock Platform Mound)

Photograph 99. LA 202927 Feature 9 (Waste Rock Platform Mound)

Photograph 100. LA 202927 Feature 6 (Example of Small Waste Rock Dump)

Most of the artifacts are concentrated within AC 1, which extends across a low waste rock concentration in the northeastern part of the site. Artifacts include construction debris (n=74), mining/transport-related hardware and tools (n=12), and a few domestic/food-related items (n=5). Construction debris includes 39 pieces of aqua window glass, 15 nails, 10 small fragments of milled lumber, five square-headed bolts, and five small fragments of sheet metal. Mine-related items include three metal chain links, three jigsaw blades, a broken shovel, a 55-gallon barrel, a vehicle body with chrome molding, a round metal collar and bearing, and a metal strap. Domestic/food-related items consist of two sanitary cans, one steel-beverage can, one olive wine bottle base (no marker's mark), and one whiteware body sherd. Artifacts noted outside of AC 1 include one wire-cut nail, one metal spike, one metal wash basin, one aluminum manifold cover, one tan brick (no markings), and one steel plate/bracket.

Summary

To summarize, LA 202927 is a small coal mining site with one primary extraction feature (a closed adit) possible closed air course/entry, evidence of water management, and a series of waste rock platforms and smaller mounds. A small artifact concentration may represent an activity or short-term habitation area that once had a temporary structure. Although the assemblage includes few temporally diagnostic items, the presence of a sanitary can and flat-top steel-beverage cans suggests the site was likely operational in the mid-twentieth century (1930-1970), a date range that is contemporaneous with two nearby mining sites accessed by the same mine road on this portion of Horse Mesa. A single piece of olive glass may be associated with earlier prospecting or travel through the area.

Eligibility and Effects

LA 202927 is a mid-twentieth century coal mining site that lacks intact engineering features. It contains a small artifact concentration, but this area is spread along a waste rock pile and lacks a structure or clear evidence of permanent habitation or domestic use. Based on topography and general characteristics, the presence of intact cultural deposits in this area is unlikely. Furthermore, the site dates to the later period of small-scale, mid-century coal mining in the region and is not associated with the locally significant period of intensive mining in Yankee Canyon during the early 1900s. LA 202927, therefore, lacks information potential and clear associations with significant historic events or developments and is recommended as *not eligible* for listing on the NRHP. No further management considerations are warranted for this resource.

LA 202928 (OCS-2228-2)

Temporal Affiliation: NM Statehood to Recent Historic (1930-1963)
Land Status: NM State Land Office
Dimensions: 217 by 86 m; 9,895 sq m
Eligibility Recommendation: Not Eligible

LA 202928 (OCS-2228-2) is a newly discovered early-to-mid twentieth century coal mine containing one extraction feature, several waste rock piles, and an associated artifact concentration. The site is located 120 m southwest of LA 202927 along the same mine access road, in the northern part of the project area (Figures 18 and A2). It occupies the eastern slope of Horse Mesa, within a topographically rugged area of steep slopes, southeast-facing benches, southeast-flowing drainages, and sandstone bedrock outcrops, at an elevation of 7,560 to 7,700 ft amsl. Drainages that flow across the site join a larger canyon to the east that descends to the bottom of Yankee Canyon. A secondary road branches from the primary mine access road, enters the site near the northeastern boundary, curves to the west and then south, and terminates at the primary cluster of mine features at the southern end of the site (Photograph 101). Vegetation includes dense stands of Gambel oak and locust, along with ponderosa pine, juniper, wild rose, skunkbush, and mixed grasses and forbs. Surface visibility is excellent (75 percent) along the mine road but extremely limited elsewhere (10

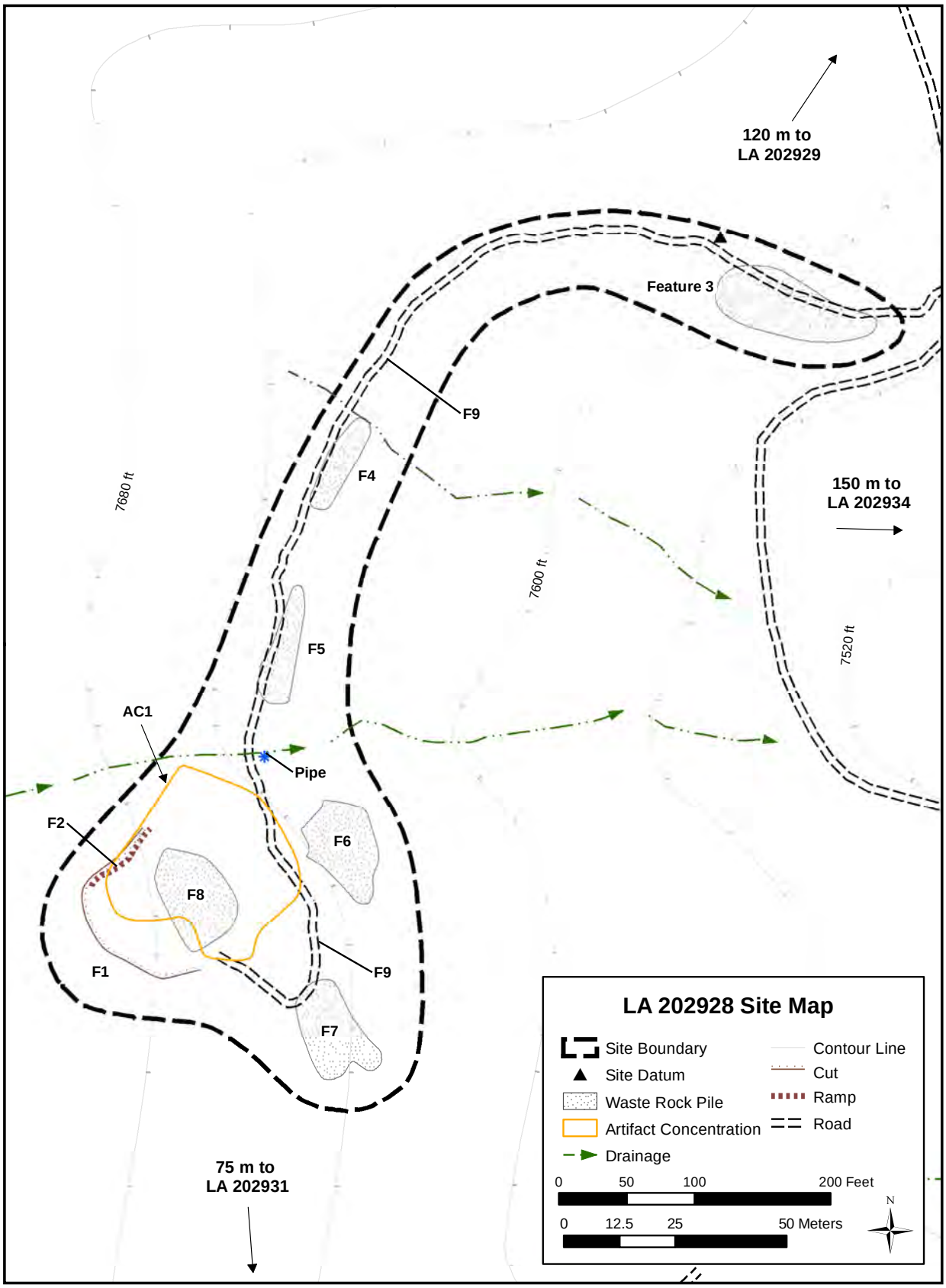


Figure 19. LA 202928 Site Map

Photograph 101. LA 202928 Overview with Mine Access Road (Facing North)

percent). The site is estimated to remain approximately 50 percent intact. Sources of disturbance include water erosion resulting in channeling and wash-outs along the mine road and additional erosion of waste rock piles downslope into drainages. The northern of the two intermittent drainages crossing the site may have once contained a bridge crossing, but the area is now washed out.

All observed features (n=8) and a sample of artifacts were recorded, the site was fully mapped and described, and a physical datum (rebar stake with scratch tag) was established along the mine road in the northeastern part of the site. Features include one open cut (Feature 1), one ramp (Feature 2), the mine access road (Feature 9), and five waste rock piles/concentrations (Features 3-8) (Table 9). The cut is excavated into a steep east-facing slope near the southwestern site boundary and contains an internal ramp running along the northern wall (vegetation obscures both features). This feature appears to represent an example of open pit mining. The former presence of a support structure near the cut is suggested by the associated AC 1 artifact assemblage, which includes window glass, corrugated metal siding, roofing material, and milled lumber (Photograph 102). As discussed above, the mine road (Feature 9) runs the length of the site, providing access to mining features and likely facilitating the removal of coal ore when the mine was in use. It is a linear alignment that averages 15 ft and width and was constructed using cut-and-fill methods, often incorporating coal waste rock (see Photograph 101 above). A displaced drainage pipe downstream from an eroded drainage crossing may represent the location of a former bridge or culvert, and several other areas along the road are down-cut (including one location with exposed bedrock similar in appearance to a retaining wall).

Photograph 102. AC 1 with Feature 1 (Open Cut in Background); Ramp (Feature 2) Not Visible

Of the six waste rock piles, Features 6-8 are in the far southern part of the site surrounding Features 1 and 2 and AC 1. Their large size is indicative of systemic disposal activity (Photographs 103 and 104) associated with primary mineral extraction The remainder of the waste rock features (Features 3-5) are small and/or shallow, badly eroded concentrations of coal gob distributed along the mine road. These features result from less systematic disposal and could represent areas of incidental spillage during transport or expedient dumping activity.

Photograph 103. LA 202928 Feature 6 (Waste Rock Pile)

Photograph 104. LA 202928 Feature 8 (Waste Rock Pile)

Table 9. Summary of Documented LA 202928 Features

No.	Feature Type	L[1]	W[1]	Description
1	Open Cut	114	60	Large U-shaped cut (30-40 ft-deep at back wall) excavated into east-facing slope; contains an internal ramp (Feature 2) along the northern wall; large waste rock pile (F8) is immediately to east; AC 1 stretches across part of the feature - corrugated sheet metal, milled lumber fragments, and window glass associated
2	Ramp	62	13	Linear platform climbs from the mouth up the northern side of Feature 1 and terminates near the back wall roughly 10 ft above the floor; descends at 10–15-degree pitch; constructed of earth/gravels/cobbles/boulders; associated with scattered corrugated sheet metal
3	Waste Rock Concentration	121	49	Low, linear coal gob concentration (0.5 ft in height) located within and along the southern edge of the mine road; eroding to the south; comprised of black earth to gravel-sized coal gob and sparse sandstone gravels/cobbles
4	Waste Rock Concentration	75	23	Low, linear coal gob concentration (0.5 ft in height) along the eastern edge of the mine road; eroding to the east; comprised of black earth to gravel-sized coal gob and sparse sandstone gravels/cobbles
5	Waste Rock Concentration	89	26	Low, linear concentration (4 inches in height) located along eastern side of a mine road; eroding to the east; comprised of black earth and coal gob
6	Waste Rock Pile	82	52	Large mound (6 ft in height) located immediately east of (downslope) another large waste rock pile (Feature 8) and AC 1; comprised of black earth to cobble-sized coal gob; minor erosional channeling along eastern flank
7	Waste Rock Pile	79	49	Large mound (1 ft in height) located south of the mine road; material displaced to southeast by erosion; comprised of black earth to large boulder-sized coal gob with 20% sandstone gravels and cobbles; corrugated sheet metal, milled lumber, one vehicle part, and one piece of window glass are associated
8	Waste Rock Pile	72	49	Large mound (4 ft in height) located immediately east of Feature 1 and associated with AC 1; deflated; comprised of black earth to cobble-sized coal gob and sparse sandstone gravels and cobbles
9	Road	1,025	15	Meandering mine road running mostly northeast-southwest and used historically to access feature cluster at southern end of site; constructed using cut-and-fill methods, often incorporating waste rock; badly eroded in many areas; likely contained additional road features—culverts, short bridges, etc.

The artifact assemblage includes glass, metal, and wood items and is concentrated on a narrow bench surrounding Features 1 and 2. Construction debris is most common, including corrugated sheet metal (n=46), window glass (n=72), milled lumber (n=8) and railroad ties (n=6). Large fuel containers are the second most common artifact type, with examples including 55-gallon barrels (n=8), all-steel, 1-quart oil cans (n=8), pour-spout rectangular cans (n=2), and one round 5-gallon can with a spout, side-lugs, and a screw-cap (Photograph 105). Miscellaneous metal items include "Chevrolet" vehicle parts (n=4), a galvanized steel wash tub, a large bucket with side lugs and handle fragments, an elbow-pipe (possibly from a stove), a short segment of ¼-inch braided-steel cable, a spring, and a large bolt (attached to washers, a nut, a spacer, and a spring). Food-related items include two lard pails, two sanitary cans, and one colorless glass jar body fragment.

Photograph 105. Example of Fuel Containers and Industrial/Structural Debris within AC 1

Summary

In summary, LA 202928 is a small open-pit coal mine containing a surface extraction feature with a ramp, six waste rock features, a mine access road, and an artifact concentration suggesting the former presence of a structure or mining equipment. The use duration of the mine was likely short based on the size of the open cut and relatively small amount of waste material. Previous researchers have noted that most of the coal mining in the area was carried out by small family-run operations after the 1920s, and this may be an example of these information mining efforts. Based on the presence of metal oil cans and other artifacts, the site was likely operational in the mid-twentieth century (1930-1970), a date range that is contemporaneous with two nearby mining sites accessed by the same mine road on this portion of Horse Mesa.

Eligibility and Effects

LA 202928 is a mid-twentieth century coal mining site that lacks intact engineering features or a habitation locus. The small artifact concentration is likely associated with a temporary structure or piece of equipment associated with mineral extraction that has since been removed. The site dates to the later period of small-scale, mid-century coal mining in the region and is not associated with the locally significant period of intensive mining in Yankee Canyon during the early 1900s. The activities on the site are not likely to result in the accumulation of buried cultural materials, and the potential for subsurface deposits is low. LA 202928, therefore, lacks information potential and clear associations with significant historic events or developments and is recommended as not eligible for listing on the NRHP. No further management considerations are warranted for this resource.

LA 202929 (OCS-2228-3)

Temporal Affiliation: NM Statehood to Recent Historic (1930-1963)
Land Status: NM State Land Office
Dimensions: 241 by 84 m; 14,672 sq m
Eligibility Recommendation: Eligible (D)

LA 202929 (OCS-2228-3) is a large, newly discovered early-to-mid twentieth century coal mine containing ten features (including habitation structures) and a high-density artifact scatter. The site is on a broad east-facing bench along the eastern slope of Horse Mesa in the northern half of the project area, at an elevation of 7,630 to 7,700 ft amsl (Figures 20 and A2). A large east-flowing drainage borders the area to the north, and two smaller drainages cut through central and southern portions of the site. This part of the landform overlooks Yankee Canyon to the east and exhibits moderate slope gradients, except for an area of steeper slope above the drainage in the northern part of the site. Several small mine roads access the area, and LA 119818 (the Denton-Colangelo-Strasia-Rodman Mine) is 75 m to the south along the same road system (Photograph 106). Other contemporaneous sites to the north are accessed by a separate part of the road

Photograph 106. LA 202929 Mine Road and Overview Facing East

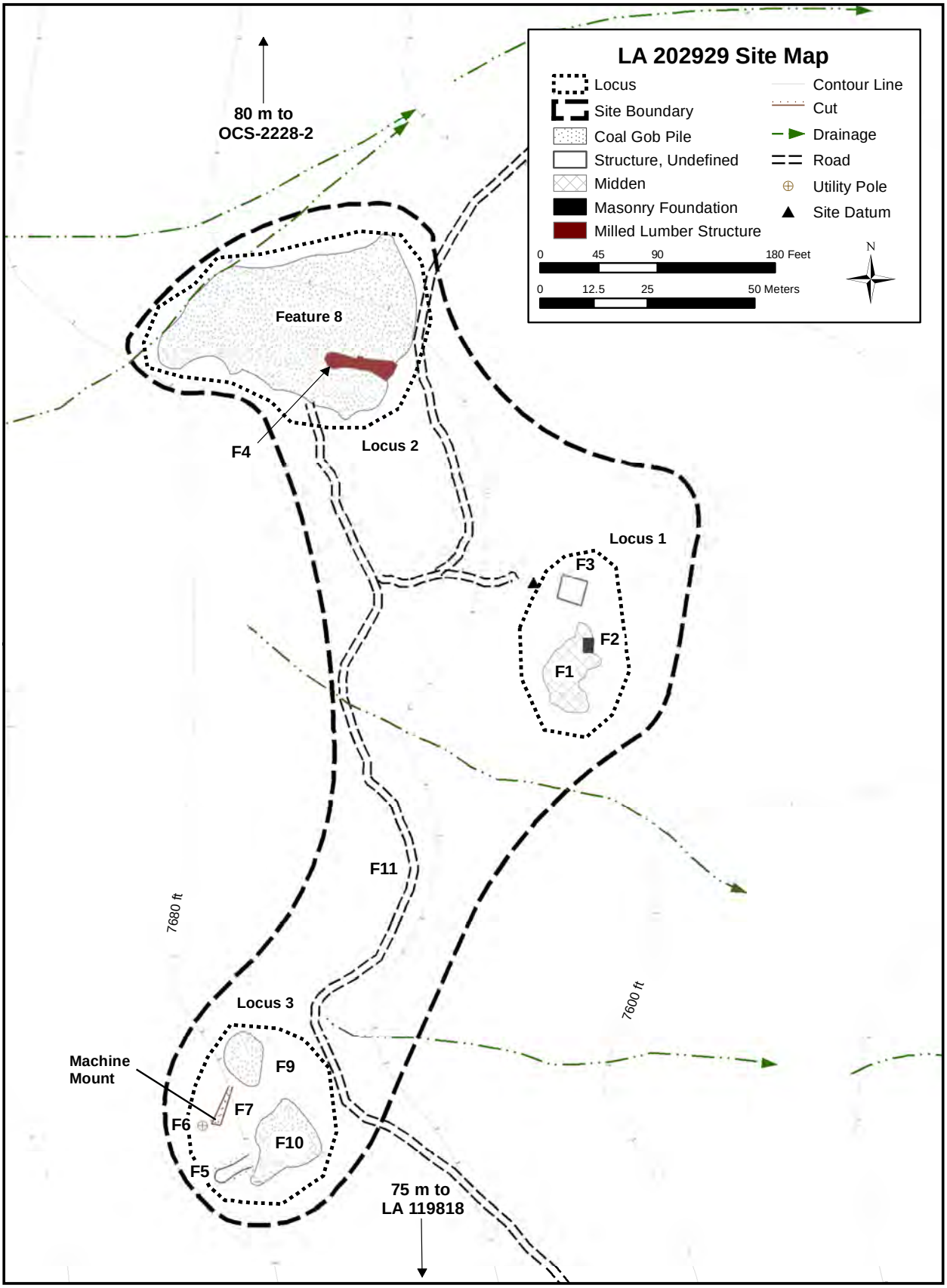


Figure 20. LA 202929 Site Map

system. Vegetation includes Gambel oak, locust, ponderosa pine, Douglas fir, white pine, juniper, wild rose, skunkbush, and mixed grasses and forbs. Surface visibility is less than 10 percent in heavily vegetated areas but over 75 percent surrounding waste rock piles and roads. The site is estimated to remain less than 50 percent intact. Erosional channeling is displacing coal gob from the large mound at the northern end of the site, and a drainage has removed sections of other mounds. Past fire events have burned two structures, leaving only charred foundations elements intact.

Features

All observed features (n=11) were described, a sample of artifacts from a midden and the general scatter were recorded, the site was fully mapped and described, and a physical datum was established along the mine road in the center of the site. Features include three waste rock piles (Features 8-10), two open cuts (Features 5 and 7), two structure foundations (Features 2 and 3), one midden (Feature 1), one wooden structure (Feature 4), one utility pole (Feature 6), and the mine access road (Feature 11) (Table 10). Features are clustered in three loci, each associated with a different range of activities.

Locus 1 is a habitation area containing two structure foundations (Features 2 and 3) and an associated trash midden (Feature 1). Feature 2 is a small, rectangular masonry foundation and sheet metal concentration among dense trees (Photograph 107), surrounded by a midden containing at least 1,000 food cans, bottle and jar glass, and fragments of ceramic plates and other vessels (Photograph 108). The structure could be a small habitation or storage/outbuilding. To the north, Feature 3 is likely a burned structure of unknown size, possibly a small habitation (Photograph 109).

Locus 2 is at the northern end of the site and contains a large waste rock pile (Feature 8) and collapsed ramp-like timber structure (Feature 4) that was part of the waste deposition system, possibly functioning as a loadout ramp (Photographs 110 and 111). The slope immediately to the west must have contained an adit or other opening based on the amount of coal waste, but such a feature is not visible. The waste rock pile has a leveled platform-like top that likely served to facilitate access (Photograph 112).

Photograph 107. LA 202929 Feature 2 (Masonry Foundation)

Locus 3 is at the southern end of the site and is associated with prospecting activity and/or short-term surface mining, and it contains two open cuts (Features 5 and 7), two waste-rock piles (Features 9 and 10), and a utility pole (Feature 6). The trench-like open cuts lack visible adits or openings along their back walls (Photographs 113 and 114). Their associated waste rock and mounds (Feature 9 and 10) are smaller than the large-scale deposition at the northern end of the site. Feature 7 contains an associated utility pole and metal pipe, suggesting it received electricity, as well as the displaced concrete footings of a former machine mount.

Photograph 108. LA 202929 Feature 1 (Midden)

Photograph 109. LA 202929 Feature 3 (Structure of Unknown Type)

Photograph 110. LA 202929 Feature 4 (Timber Loadout Ramp/Structure) and Feature 8 (Waste Rock Pile)

Photograph 111. LA 202929 Detailed View of Feature 4

Photograph 112. LA 202929 Detailed View of Feature 8

Table 10. Summary of Documented LA 202929 Features

No.	Feature Type	L[1]	W[1]	Description
1	Midden	66	36	Estimated 500-700 cans, 50-100 historic ceramics, and 150-200 glass items; 10s of other miscellaneous items; artifacts are mostly fragmented; associated with two structures (Features 2 and 3)
2	Structure Foundation	11	8	Rectangular, dry-laid masonry foundation of local tabular sandstone stacked 1-2 courses wide and 5-6 courses high to a max height of 1 ft; entrance at northwestern corner; walls have collapsed; superstructure incorporated corrugated sheet metal which remains scattered across the feature; located among dense scrub oak
3	Structure Undefined	20	17	Burned structure foundation consisting of a low mound of ashy soils with oxidized sandstone foundation remnants at the corners and a few upright posts; eastern edge is a linear earthen berm (1 ft in height); associated artifacts include a spoon, a wash pan, nails, door hinges, a steel chimney pipe fragment, corrugated sheet metal, window glass, and a milled lumber fragment with attached metal hinge
4	Timber Structure	56	16	Collapsed linear ramp-like wooden structure comprised of two layers of planks laid perpendicular to one another on top of Feature 8; bottom layer (sitting directly on coal gob) comprised of 12-inch planks laid parallel, while the top layer contains 2 x 10-inch planks laid perpendicular to the long axis; fasteners include steel bolts, spikes, and nails (6-14”); lumber planks are decaying, some are missing, and most have been displaced; likely a loadout structure for depositing waste rock
5	Open Cut	20	7	Linear cut (5-7 ft in depth) excavated into a northeast-facing slope; located immediately upslope of Feature 10; no evidence of an adit in the back wall; all walls are slumping into the interior; copper wire segment associated
6	Utility Pole	1.5	0.7	Two 9-inch diameter poles (6 ft in height) fastened together with wire and two bolted brackets; located along southwest corner of Feature 7 (open cut); attached electrical box (empty) is embossed “Murray Service Equipment”; other electrical components have fallen off the pole and into the open cut
7	Open Cut	34	12	Linear cut (7 ft max depth) located immediately south of Feature 9; walls contain corrugated sheet metal; no evidence of an adit in the back wall; interior of cut contains two concrete slabs measuring 2.0 x 2.0 x 0.6 ft and 5.0 x 5.0 x 0.5 ft; one has threaded bolts fastening a piece of milled lumber—likely represents a machine mount foundation; corrugated sheet metal, electrical conduit, 7-gallon fuel can, oil cans, and milled lumber are located within cut

Photograph 113. LA 202929 Detailed View of Feature 5 (Open Cut)

Photograph 114. LA 202929 Detailed View of Feature 7 (Open Cut)

Artifacts

The site is estimated to contain over 1,000 artifacts, at least 90 percent of which are located within the Locus 1 midden (Feature 1), associated with two likely habitation structures (Features 2 and 3). The midden was preferentially sampled for diagnostic glass and cans and generally characterized by artifact type, while all other observed artifacts from across the site were recorded. The site-wide assemblage ranges in character from mining and industrial artifacts—including sheet metal, electrical components, and structural debris—to domestic items associated with habitation, including food-related vessels, tableware, and silverware.

Within the midden, cans include Type 18 evaporated milk cans (1935-1950s; Merritt 2014:8), sanitary cans of varying size, fish/sardine tins, flat-top steel-beverage cans, external friction and key-wind coffee cans, lard pails with lugged wire handles, pocket-style tobacco tins, and rectangular fuel cans. Other metal items include a tin pot that has been modified into a strainer, a shovel head, a silver spoon, and corrugated sheet metal fragments. The glass assemblage includes beverage and perfume bottles, food jars, and window glass in colors of green, amber, clear, and aqua (only one example of aqua glass). Maker's marks include Owens-Illinois (1929-1954), Hazel-Atlas (1923-1971), and Obear-Nester (1915-1978; Lockhart and Hoenig 2018:299-300) examples. Several bottles have "FEDERAL LAW FORBIDS SALE OR RE USE OF THIS BOTTLE" embossed either on the heel or shoulder (1935-1964; Merritt 2014:12). Ceramics in the midden consist of green-glazed and undecorated whiteware from a variety of dish types. Artifacts from the rest of the site include lengths of braided steel cable, 5-inch-diameter, brown-glazed earthenware pipe fragments, undecorated whiteware sherds, 55-gallon barrel fragments, corrugated metal roofing, and milled lumber.

Summary

To summarize, LA 202929 is a medium-sized coal mine containing three feature clusters associated with short-term habitation (Locus 1), intensive mining and waste rock deposition (Locus 2), and shallow prospecting/open pit mining (Locus 3). The site is notable for the specialized loadout infrastructure associated with a very large coal gob pile and the electrification associated with Locus 3. Diagnostic artifacts indicate an occupation between 1935 and the 1950s. The site is connected by road to the nearby Denton-Colangelo-Strasia-Rodman Mine (LA 119818) that operated from 1931 to 1963, and their spatial proximity and general similarity of infrastructure and artifact types suggest they are contemporaneous and associated. The site is along the same road network and likely represents an outlying component of LA 119818 that housed additional miners and hosted sporadic mining efforts.

Eligibility and Effects

LA 202929 contains two residential features and 1000s of historic artifacts, a much larger assemblage than nearby sites that suggests an extended period of habitation. Although mining infrastructure and equipment have been removed, engineering features lack integrity, and the site is not associated with the locally significant period of intensive mining in Yankee Canyon during the early 1900s, Locus 1 almost certainly contains intact cultural deposits within the structures and/or midden. These deposits offer a unique opportunity to study a mid-twentieth century family-operated Yankee Canyon mining site in more detail. As a result, we recommend LA 202929 as *eligible* for listing on the NRHP under Criterion D. The site does not qualify under Criterion A because its mine engineering features do not exhibit the necessary integrity to convey their historic associations.

Because the qualifying characteristics of this historic property are its masonry foundations and associated midden, we recommend that this area be avoided during the project. Remediation of waste rock piles and open pits would not detract from the qualifying characteristics because these features lack information potential and historic integrity. As long as the area of habitation is avoided (with an appropriate buffer) and activities within the site are monitored by a permitted archaeologist, project implementation would not adversely affect the site.

LA 202930 (OCS-2228-4)

Temporal Affiliation: NM Statehood to World War II (1914-1921)
Land Status: Private Landowner
Dimensions: 243 by 140 m; 27,396 sq m
Eligibility Recommendation: Not Eligible

LA 202930 (OCS-2228-4) is a large, newly discovered, early twentieth century coal mine containing eight features and a low-density historic artifact scatter. The site is located in the western portion of the project area, near the northern edge of the private-land section (Figures 21 and A2). It occupies the steep northern slope of a large canyon that flows southeast off Horse Mesa and is situated less than 200 m from the mesa rim within rugged south-east sloping terrain, with elevations ranging across the site from 7,880 to 8,070 ft amsl (Photograph 115). Other nearby mines include LA 202931 (250 m southwest) and LA 202933 (Turner-Urtado Mine) 250 m to the southeast. The setting provides a panoramic view of Yankee Canyon to the east and Johnson Mesa to the southeast, with Eagle Tail Mesa distantly visible to the south-southwest. Vegetation represents regrowth after a large fire, including dense stands of Gambel oak and locust and scattered juniper, ponderosa pine, grasses, and banana yucca. Surface visibility is approximately 25 percent. The extraction features are closed and severely eroded, and channels have formed along the flanks of the waste-rock features. A former railroad grade or road along the northern boundary has eroded away, and other materials have been removed. As a result, the site is estimated to remain only 30 percent intact.

All observed features (n=8) were described, all artifacts other than brick fragments were analyzed, the site was fully mapped and described, and a physical datum was established near a closed adit in the northwestern part of the site. Features include two mine openings (Features 3 and 4), two large waste-rock piles (Features 6 and 7), one modified landform (Feature 1), one open cut (Feature 2), one railroad grade (Feature 5), and one tramway incline visible only on aerial imagery (Feature 8) (Table 11). The artifact assemblage is estimated to number in the hundreds, although most of these items are brick fragments.

Photograph 115. LA 202930 Site Location Overview Facing South

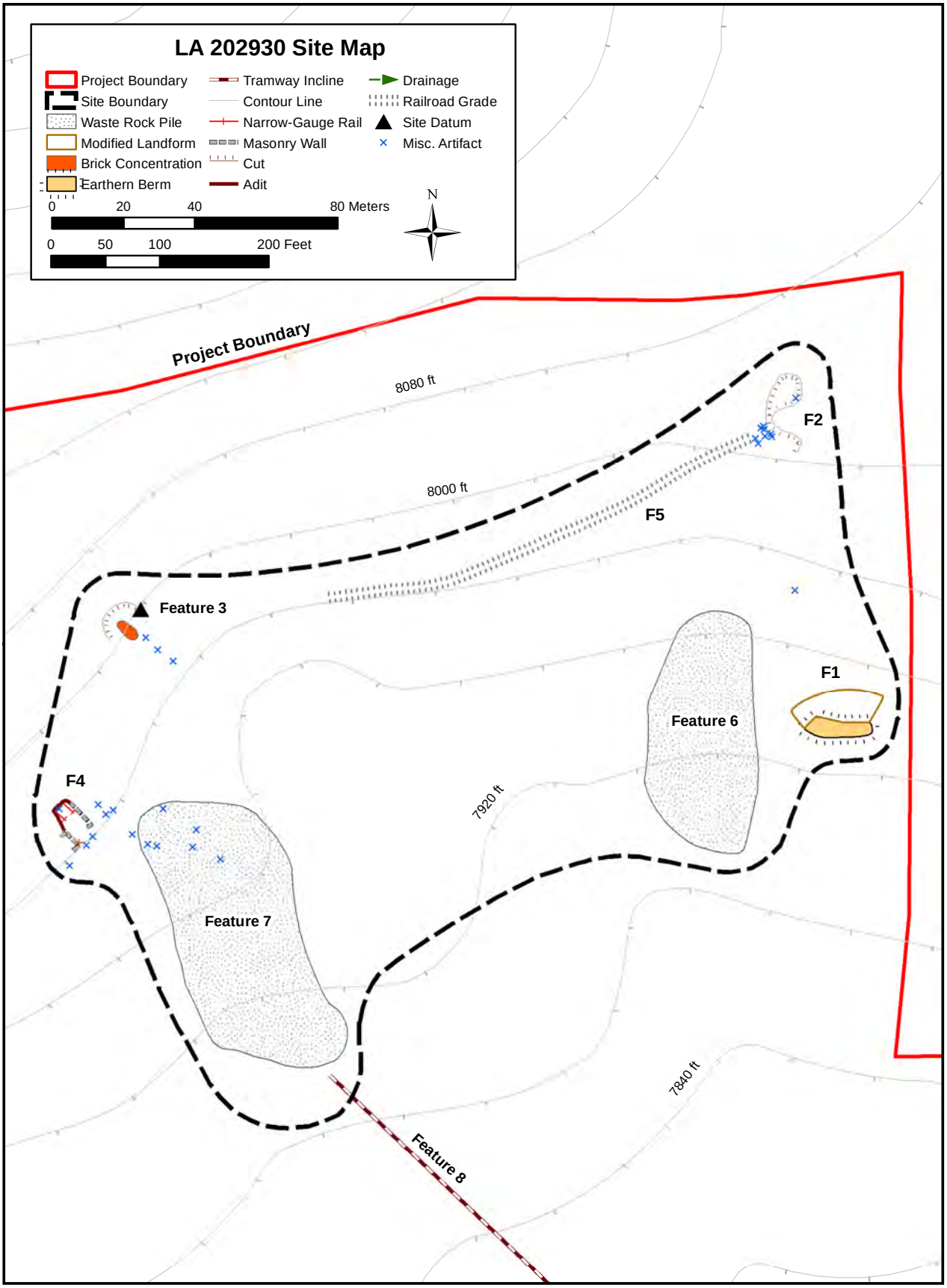


Figure 21. LA 202930 Site Map

The three extraction features are distributed in the northeastern (Feature 2), northwestern (Feature 3) and western (Feature 4) parts of the site (Photographs 116-118). Features 2 and 3 are at the same elevation on the upper slope (8,060-8,080 ft), while Feature 4 is at a lower contour (see Figure 21). Feature 4 is the best preserved and consists of a closed adit surrounded by retaining walls and supporting infrastructure (see Photograph 118).

Features 3 and 4 on the upper level were likely connected by a narrow-gauge rail line that is visible as a faint swale with occasional rail fragments and industrial debris at both ends (Photograph 119). Based on aerial imagery, a gravity tramway line that began on the bottom of Yankee Canyon and also accessed LA 202933 likely continued into the southern part of this site, running for a total of 1.25 miles. The line is not visible on the ground but was designated as Feature 7 after recording. Aerial imagery shows the linear feature terminating at a large waste rock pile (Feature 7), but it likely continued to the primary adit (Feature 4), and we assume that all features on the site were linked by the narrow-gauge rail line (Feature 5) that carried coal to a connecting point where it could be loaded on the incline. Two very large waste rock piles (Features 5 and 6) are located downslope from the extraction features (Photograph 120).

Table 11. Summary of Documented LA 202930 Features

No.	Feature Type	L	W	Description
1	Modified Landform	85	36	Excavated and leveled area along a slope immediately east of Feature 5 (waste rock pile); fill placed along southern edge (6 ft in height); may represent a machine platform; dense oak prevented detailed recording or photography
2	Cut	62	40	Irregular cut excavated into mixed earthen and bedrock slope; 6 ft in maximum depth at back walls; associated with orange and tan bricks, cast-iron rail track segments, and supports/footers that likely represent terminus of a railroad grade
3	Adit	46	26	Location of probable closed adit or air course entry at base of bedrock escarpment; no visible opening, but numerous large boulders and bedrock fragments are strewn at base of escarpment, possibly removed during blasting; 100s of brick fragments are scattered immediately downslope of piled boulders
4	Adit	40	27	Closed adit at the back of a rectangular depression (1.5-3.0 ft in depth) enclosed with two masonry and concrete retention walls; concrete box along intact western retention wall includes inset iron piping (possibly to facilitate drainage away from the opening); eastern wall is deteriorating; two rail segments extend directly from former opening, possibly representing the end of a track for ore carts; Feature 7 (waste rock pile) is downslope to southeast; aqua glass associated
5	Railroad Grade	321	3	Narrow, linear cut/swale that alternates from mostly level to slumping due to slope; rail fragments, iron footings, and brick fragments are at eastern end associated with Feature 2 (open cut/possible adit); brick fragments also at western end at Feature 3 (closed adit); may have continued to Feature 4 based on rail segments at this feature, but no evidence of alignment; interpreted narrow-gauge railroad grade system that linked mining activities in different parts of the site
6	Waste Rock Pile	223	105	Large ovoid coal gob mound (6-12 ft in height) located downslope from Feature 2 and west of Feature 1; comprised of black earth to cobble-sized gob (60%) and gravel-sized sandstone waste rock (40%); no associated artifacts; slumping downslope with erosional along edges of the mound
7	Waste Rock Pile	233	138	Large ovoid coal gob mound (20-30 ft in height) located southeast of Features 3 and 4+; comprised of black earth to cobble-sized coal gob; associated with two narrow-gauge rail fragments (30 ft long); waste material is eroding downslope off the top and flanks of the mound; may have been associated with a tramway incline
7	Tramway Incline	30	NA	Linear 30-ft-long vegetation anomaly visible on aerial imagery (not noted during recording); likely represents the upper end of a gravity tramway system that runs for 1.25 miles from the bottom of Yankee Canyon, also accessed LA 202933, and entered the site from the southeast terminating at Feature 7

Photograph 116. LA 202930 Feature 2 (Open Cut)

Photograph 117. LA 202930 Feature 3 (Collapsed Adit Opening)

Photograph 118. LA 202930 Feature 4 (Closed Adits and Associated Walls and Rail Segments)

Photograph 119. LA 202930 Terminus of Feature 5 (Narrow-gauge Railroad Grade

Photograph 120. LA 202930 Feature 6 (Waste Rock Pile)

Artifacts

The artifact assemblage includes hundreds of bricks and brick fragments and a sparse scatter of other industrial items. The bricks are tan or red/pink, and none observed have a manufacturer's mark. They occur in clusters south of Features 2, 3, and 4—particularly at the two ends of the narrow-gauge rail alignment—and they could represent redeposited adit/air course lining materials or the remains of platforms or other utility structure foundations that are no longer present. Other artifacts (n=24) include eight narrow-gauge rail fragment, four pieces of milled lumber/tie fragments (many with iron spikes still embedded), three displaced steel footers, two steel plates, two pieces of sheet metal, one steel axel, one barrel hoop-strap, one piece of braided steel cable, one nail, and one aqua bottle base (no maker's mark). The site does not contain domestic or food-related artifacts.

Summary

In summary, LA 202930 is a large coal mine with one formal adit opening, two other potential extraction features, two large waste rock piles, and the remnants of a narrow-gauge rail system, all of which were likely served by a tramway incline that lowered coal carts 1.25 miles along a steel cable to the bottom of Yankee Canyon. There are no residential structures or evidence of habitation at the site. Although the mine entrances were closed or have collapsed over the years, the number and size of the rail fragments suggest limited efforts at salvaging usable materials. The only temporally diagnostic artifact discovered is a single aqua glass bottle base (1880-1920); although this is an isolated item, there are other reasons to believe the site was associated with corporate mining efforts in Yankee Canyon between 1905 to 1921 and may represent one or more of the openings within the Kellogg Bed that were operated by the New Mexico and Colorado Coal and Mining Company.

The New Mexico and Colorado Coal and Mining Company was active from 1912 to 1917 and was one of four corporate entities that mined the coal fields near the town of Yankee during this period. On Horse Mesa, these companies focused primarily on the Yankee Bed, but Moiola (1998:11) notes that the New Mexico and Colorado Coal and Mining Company also placed two openings in the Kellogg Bed north of the Yankee mines and made other improvements that included the construction of "a new tipple, powerhouse, store house, and a mile long incline." This geographical reference and the approximate length of the gravity tramway is consistent with the location and associated features found at LA 202930. Corroborating this inference, Lee (1924:Plate XVI) noted that the Kellogg Bed was approximately 350 ft higher in elevation than the Yankee Bed, placing it at a position on the slope that is consistent with this site—at least 300 ft higher in elevation than LA 120611 (the Yankee No. 3 Mine). These various lines of evidence strongly suggest that LA 202930 represents an area of ancillary mining of the Kellogg Bed that was initiated around 1914. The resulting mines were unnamed and short-lived due to poor coal quality (Moiola 1998:11), which is consistent with the lack of habitation features and limited mining infrastructure on the site. The Kellogg Bed workings were sold to the Superior Coal Company by 1917 and fully abandoned by 1921.

Eligibility and Effects

LA 202930 is a large coal mine containing adit openings, associated waste rock and other features, and remnants of ore transport systems that are no longer present. It dates to just after the earliest period of coal mining, as local companies explored new coal beds away from the original Yankee Mines. However, the site lacks structures, dense artifact concentrations, or other evidence of a habitation area or domestic use, and the feature types and activities represented are not likely to result in the accumulation of buried cultural deposits. Furthermore, the adit entrances have been closed or destroyed by blasting, the ore transport system and other infrastructure have been removed, and nearly all materials have been scavenged. As a result, the site no longer visually conveys its association with the period of early twentieth century mining in Yankee Canyon. LA 202930, therefore, lacks information potential and the integrity to convey its associations with significant historic events or developments and is recommended as not eligible for listing on the NRHP. No further management considerations are warranted for this resource.

LA 202931 (OCS-2228-5)

Temporal Affiliation: NM Statehood to Recent Historic (1930s-1960s)
Land Status: Private Landowner
Dimensions: 206 by 84 m; 11,302 sq m
Eligibility Recommendation: Not Eligible

LA 202931 (OCS-2228-5) is a medium-sized, mid-twentieth century coal mining site containing a pit, waste rock pile, and low-density historic artifact scatter. The site is located on a sloping bench that runs along the southern side of a large canyon that drains the southeastern slope of Horse Mesa along the western project boundary (Figure Elevations range from 8,040 to 8,120 ft amsl, and the mesa top is 200 m to the west. The location affords an excellent view of Yankee Canyon to the east and landforms in the surrounding area (Photograph 121). A former mine road enters the site from the north and may link to the separate mining sites outside the project area to the northwest. LA 202930 is located 250 m to the northeast, and LA 202933 (the Turner-Urtado Mine) is 400 m to the east. The area supports an overstory of Gambel oak, juniper, and ponderosa pine, with locust, mixed grasses. and forbs in the understory. Surface visibility is limited to less than 10 percent outside of the footprint of a large waste rock pile, upon which visibility ranges from 75 to 100 percent. The site remains up to 50 percent intact, with moderate erosion being the primary source of disturbance; coal waste is washing downslope, expanding the footprint of the mound.

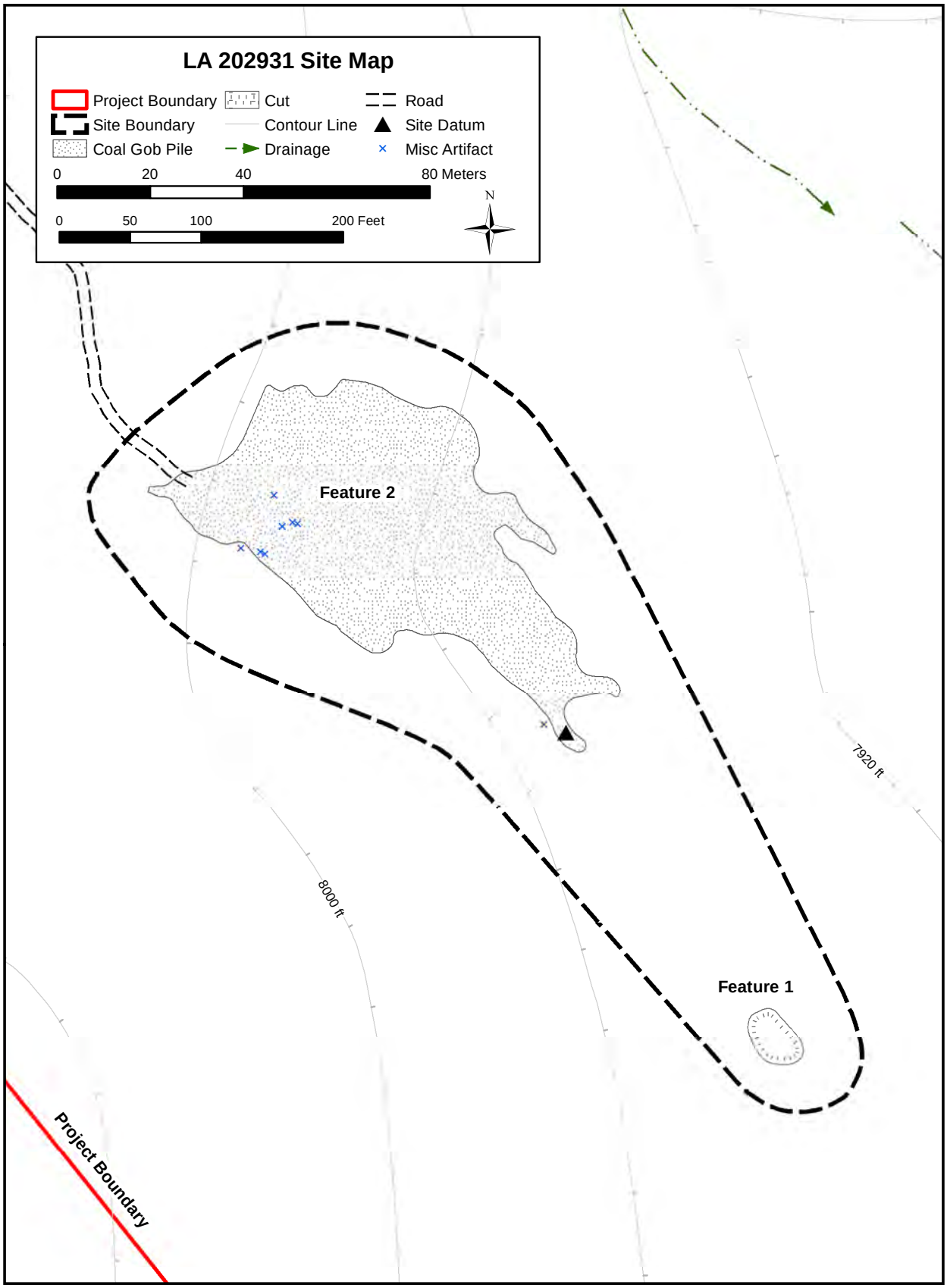


Figure 22. LA 202931 Site Map

Photograph 121. LA 202931 Site Overview Facing East from Waste Rock Pile (Yankee Canyon in Background)

The two features were described, all observed artifacts were analyzed, the site was fully mapped and described, and a physical datum was established near the center of the site. Features include one oval prospect pit (Feature 1) and one waste rock pile (Feature 2). In this case, the road accessing the site was not designated as a feature, as its historic associations are unclear. Efforts to locate an adit or mine opening associated with the large waste rock pile included the use of close-interval transects up to 50 m west and north (upslope) of the feature based on the spatial relationship of mine openings and waste piles on other sites. No formal extraction feature was discovered; if one existed at this location, it could be outside the current project area or obscured by dense vegetation.

Feature 1 is a shallow, ovoid pit near the southern site boundary. It measures 46 by 23 ft, is 4 ft deep, and contains berms of spoil along the northeastern and southeastern margins (Photograph 122). Large boulders and slabs are scattered in the area. This feature is interpreted as a prospect pit or unsuccessful, short-term surface mining effort.

The rest of the site is comprised of Feature 2, a large waste rock pile that measures 367 by 171 by 15 ft (length by width by height) and is comprised of black earth and gravel-to-cobble-sized coal gob (Photograph 123). A two-track road or former grade terminates at the northern end of the mound. The sparse artifact assemblage is scattered across the central and northern portions of the waste-rock pile and includes two narrow-gauge rail fragments, two railroad spikes, one vehicle tire, one mule shoe, one piece of wood framing fastened by wire-cut nails, and one loose piece of milled lumber. The wood framing may be part of a discarded sled-like device (Photograph 124).

Photograph 122. LA 202931 Feature 1 (Prospect Pit/Open Cut)

Photograph 123. LA 202931 Feature 2 (Waste Rock Pile)

Photograph 124. LA 202931 Wood Framing on Waste Rock Pile

To summarize, LA 202931 has evidence of prospecting activity and coal waste disposal. The road that enters the site from the north may lead to an associated extraction feature north of the project area, as the large waste rock pile contains far more coal cob that could have been removed from the prospect pit and must be associated with an unidentified adit or shaft. The artifact assemblage suggests evidence of a narrow-gauge rail system, mule transport, and/or vehicular activity. The site lacks temporally diagnostic artifacts or features and is assigned a NM Statehood to Recent Historic temporal affiliation based on general characteristics and the history of the area.

Eligibility and Effects

LA 202931 is a small, mid-twentieth century coal mining site containing a pit and associated waste rock pile. The small artifact concentration is associated with ore transport or mining infrastructure. No structures or evidence of habitation are present. Further, the site dates to the later period of small-scale, mid-century coal mining in the region and is not associated with the locally significant period of intensive mining in Yankee Canyon during the early 1900s. The activities on the site are not likely to result in the accumulation of buried cultural materials, and the potential for subsurface deposits is low. LA 202931, therefore, lacks *information potential and associations with significant historic events and is recommended as* not eligible for listing on the NRHP. No further management considerations are warranted for this resource.

LA 202932 (OCS-2228-6)

Temporal Affiliation: NM Statehood to Recent Historic (1940s-1950s)
Land Status: NM State Land Office
Dimensions: 87 by 64 m; 4,505 sq m
Eligibility Recommendation: Not Eligible

LA 202932 (OCS-2228-6) is a small, newly discovered, early-to-mid 20th century coal mine comprised of four features and a low-density associated artifact scatter. The site is located 70 m southeast of LA 202927 and 150 m east of LA 202928 along the same mine access road, in the northern part of the project area (Figure A2). It is just north of a large east-flowing drainage along the eastern slope of Horse Mesa, within a topographically rugged area of steep slopes, southeast-facing benches, southeast-flowing drainages, and sandstone bedrock outcrops. The site occupies the south-facing slope and terrace on the northern side of the canyon, with elevations ranging from 7,340 to 7,440 ft amsl and moderate to steep slopes across the site (Figure 23). There are open views to the south of Johnson Mesa and Yankee Canyon. The mine is accessed by a secondary road that splits from a primary mine road roughly 120 m to the east-southeast (Photograph 125). Vegetation includes dense stands of Gambel oak and locust, along with ponderosa pine, juniper, wild rose, skunkbush, and mixed grasses and forbs. Surface visibility is limited to less than 25 percent due to oak density and leaf litter (except for on the waste rock pile). The site is in poor condition and is estimated to remain less than 25 percent intact. An adit opening has collapsed, and an associated brick and concrete structure that framed the entrance has broken apart. The waste rock pile contains rills and shallow channels, and coal gob is being eroded downslope into the canyon bottom. A loadout trail has also been badly eroded.

Photograph 125. LA 202932 Site Overview Facing West

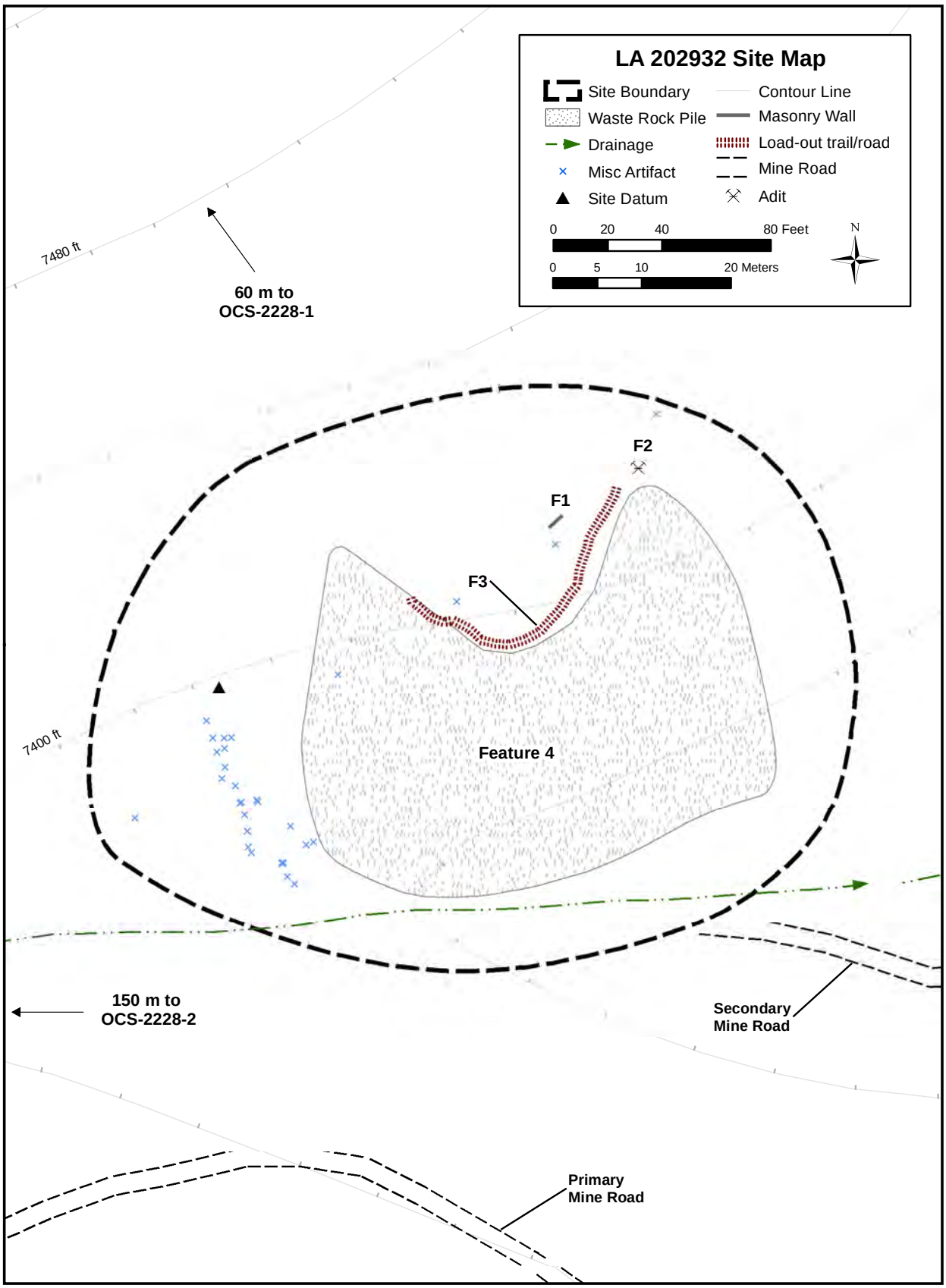


Figure 23. LA 202932 Site Map

All four features were described, all observed artifacts were analyzed, the site was fully mapped and described, and a physical datum was established on the northern edge of the terrace near the northwestern boundary. Features include one masonry retaining wall (Feature 1), one collapsed adit and entrance structure (Feature 2), and one loadout trail/road (Feature 3) located along the northern side of a very large waste rock pile (Feature 4) that covers most of the site area. The small artifact assemblage (n=32) is concentrated on the terrace west of the waste rock pile.

Feature 1 is a low masonry wall with cement mortar that measures 7.2 ft long, 1.5 ft wide, and 4.0 ft tall (Photograph 126). It is constructed of locally available shaped sandstone cobbles and boulders, the largest of which measure up to 20 inches in maximum dimension, and at least one coal-ash cinderblock. The wall is two to three courses in width and rises six to nine courses high. It likely functioned as a retaining wall to support the slope above a loadout trail near the adit.

Feature 2 is an adit opening that is now buried under debris from a concrete-and-brick wall or structure that once surrounded the opening (Photograph 127). Debris includes shaped sandstone, bricks, and blocks of concrete scattered across a 9-by-7-ft area. The largest piece is comprised of a single course of bricks lining the top of a concrete segment, with a fragment of narrow-gauge rail used to reinforce the concrete (Photograph 128). This fragment is currently covering the likely opening location. The fragmented and widely dispersed construction debris suggests the adit may have been closed using explosives.

Photograph 126. LA 202932 Feature 1 (Masonry Wall)

Photograph 127. LA 202932 Feature 2 (Collapsed Adit)

Photograph 128. LA 202932 Feature 2 (Structural Brick and Concrete Debris)

Feature 3 is a linear grade/loadout platform that curves from southwest to northwest while traversing the top of the waste rock pile located immediately to the south (Photograph 129). The grade is 115 ft long, ranges from 7 to 13 ft in width, and consists of a level alignment likely created using mechanical equipment. The eastern edge of the feature extends to the edge of the adit debris field discussed above.

Feature 4 is a large U-shaped waste rock pile that extends downslope from the adit/loadout area towards the drainage below. It is 177 by 151 ft in size, stands 15 ft tall, and is comprised of black earth to gravel-sized coal gob, with roughly 25 percent of the matrix comprised of sandstone waste rock (Photograph 130). Significant erosional downcutting has impacted much of the feature, resulting in the displacement of a large amount of coal waste rock into the drainage immediately to the south.

Photograph 129. LA 202932 Feature 3 (Loadout Platform

Photograph 130. LA 202932 Feature 4 (Waste Rock Pile)

The artifact assemblage includes 17 clear glass shards, 12 metal items, two bricks, and one coal-ash cinderblock. Glass artifacts include 10 intact food jars, two intact food bottles, one nearly intact jar, one jug, and three jar fragments. One jar contains the Hazel-Atlas marker's mark with the code "0-7549 / 5," which Lockhart et al. (2016:85) note is a code pattern commonly used by the company in the 1940s. The rest of the items are Owens-Illinois "Duraglas" vessels that date from 1940 to 1964 (Lockhart and Hoenig 2016:305). Specific Owens-Illinois factory codes include those from Terre Haute, Indiana (operational from 1934 to 1947), Okmulgee, Oklahoma (operational from 1944 to present), Alton, Illinois (post-1929), and Oakland, California (post-1937), suggesting a tight depositional date range of 1944 to 1947. The metal assemblage includes six wash basins of galvanized steel (n=3), tin-enamel (n=2), and sheet metal (n=1); three food cans (two sanitary and one evaporate milk); one miscellaneous metal panel with a handle and vent slits (probably a housing panel for a piece of equipment); and one piece of miscellaneous sheet metal (n=1). A sample of documented artifacts is presented within Photograph 131.

Photograph 131. Sample of Documented LA 202932 Artifacts

Summary

In summary, LA 202932 is a small coal mine with one adit, a waste rock pile, supporting features, and a sparse artifact scatter. Coal was extracted from underground via an adit with a formal concrete and brick entrance structure that was demolished sometime after abandonment. The use duration of the mine was likely short based on the size of the open cut and relatively small amount of associated waste material. Previous researchers have noted that most of the coal mining in the area was carried out by small family-run operations, and this may be an example of these information mining efforts. Based on a tight range of overlapping dates among the glass bottle assemblage, the mine was likely in operation between 1944 and 1947, although activities could have begun as early as the 1930s and continued as late as the 1950s. This date range is contemporaneous with two nearby mining sites accessed by the same mine road on this portion of Horse Mesa, and it is possible that the three sites are part of a single-family operation in the 1940s-1950s.

Eligibility and Effects

LA 202932 is a small, mid-twentieth century coal mining site containing a pit and associated waste rock pile. The small artifact concentration is associated with ore transport, mining infrastructure, and possibly a short-term camp or other activities. However, no structures or clear evidence of habitation is present, and the site dates to the later period of small-scale, mid-century coal mining in the region and is not associated with the locally significant period of intensive mining in Yankee Canyon during the early 1900s. The activities on the site are not likely to result in the accumulation of buried cultural materials, and the potential for subsurface deposits is low. LA 202932, therefore, lacks information potential and associations with significant historic events and is recommended as *not eligible* for listing on the NRHP. No further management considerations are warranted for this resource.

LA 202933 (OCS-2228-7)

Temporal Affiliation: US Territorial (1905-1913); Recent Historic (1949-1963)
Land Status: Private Landowner
Dimensions: 185 by 120 m; 12,812 sq m
Eligibility Recommendation: Not Eligible

LA 202933 (OCS-2228-7) is a newly discovered, medium-sized, early twentieth century coal mine containing 18 features and a medium-density artifact scatter. The site is just 75 m west of LA 57200, but it was documented as a separate site because it is associated with the earlier development of the Yankee Mines, and Moiola (1998) included only the mid-twentieth Turner-Urtado workings to the east as part of LA 57200. LA 202933 wraps around both sides of a major southeast-flowing canyon on the eastern slope of Horse Mesa in the center of the project area (Figures A2 and 24; Photograph 132). It occupies the drainage bottom, gently sloping benches on both sides of the drainage, and surrounding hill slopes at an elevation of 7,580 to 7,680 ft amsl. Views are constricted by the sides of the canyon and prominent sandstone outcrops that line the northern and southwestern site boundaries. The mine is currently accessed from the east by a mine road that also serviced the Turner-Urtado mines to the east (LA 57200 and LA 119817) and wraps around the drainage and crosses the entire length of the site before exiting to the southeast (see Figure 24). Vegetation includes Gambel oak, juniper, ponderosa pine, Douglas fir, white pine, piñon pine, locust, skunkbush, prickly pear cactus, and various grasses and forbs. Surface visibility is excellent along the road and on waste-rock features but averages 10 to 25 percent across the rest of the site due to dense vegetation and leaf litter. Overall, the site is in poor condition and remains less than 25 percent intact. The primary extraction feature has been closed, supporting extraction, prospecting, and transport equipment has been removed, and erosion has damaged numerous features, including elements of a developed spring. The tramway incline is only visible via aerial imagery, and coal gob from the waste rock piles is being displaced downslope into the drainage.

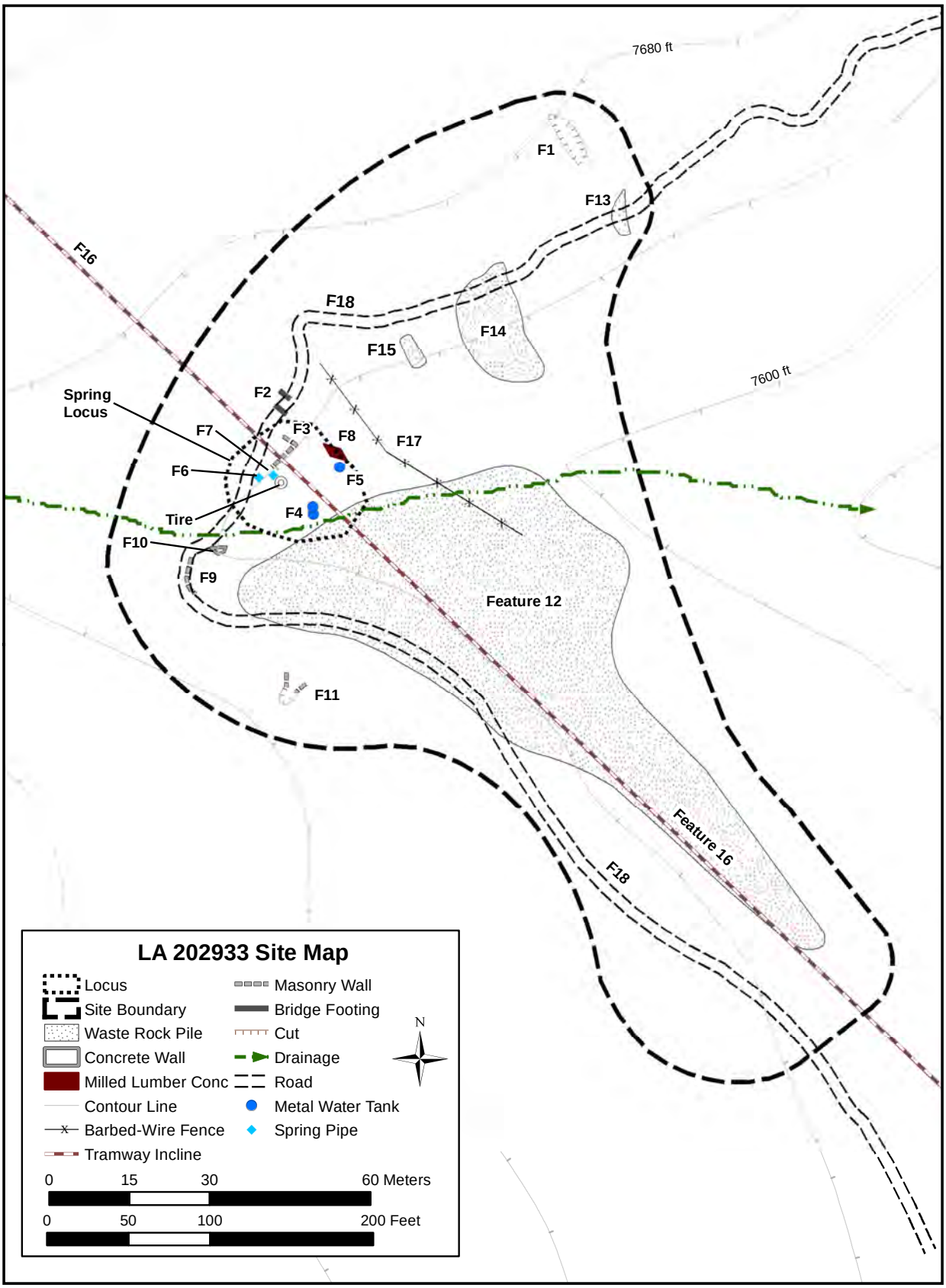


Figure 24. LA 202933 Site Map

Photograph 132. LA 202933 Overview Facing Northwest (Showing Primary Drainage and Rock Wall)

The site was fully mapped and described, all features were recorded, and a sample of artifacts was analyzed, but a physical datum was not established because the site was not separated from LA 57200 until after recording. Features include four waste rock piles (Features 12-15), two walls (Features 9 and 10), two metal water tanks (Features 4 and 5), two drainage pipes (Features 6 and 7), one closed adit (Feature 11), one prospect pit (Feature 1), one mine road (Feature 18), the footings of a former bridge (Feature 2) along the mine road, one developed spring (Feature 3), one wood concentration (Feature 8), one tramway incline (Feature 16), and one barbed-wire fence (Feature 17) (Table 12). The site contains an estimated 200 to 300 artifacts, which are primarily distributed across the western and northwestern portion of the site, around the adit, a large waste rock pile, and the developed spring.

Table 12. Summary of Documented LA 202933 Features

No.	Feature Type	L[1]	W[1]	Description
1	Prospect Pit/ Cut	39	9	Linear, trench-like prospect pit or open cut (8 ft max depth) on slope in northwestern part of site; southern half has basin morphology and may represent the original pit, while the northern half formed from erosion or later activities
2	Bridge	10	9	Former bridge along mine road (Feature 18); consists of eroded masonry and brick bridge footers along both sides of a small drainage that flows across the road; southern footer retains coursed brick and in situ sandstone boulders; the northern footer is a short segment of boulders stacked two courses high; footers supported a series of timber planks scattered to the southeast and recorded and Feature 8
3	Developed Spring	10	21	Masonry retaining wall (5 ft and 7-10 courses high) reinforced with cement mortar and narrow-gauge rail fragments prevents erosion along a bench containing a developed spring; constructed of shaped sandstone cobbles and boulders; wall angles inwards and is a single course wide; portions of the wall are missing

No.	Feature Type	L[1]	W[1]	Description
4	Water Tank	7.5	8.2	Two side-by-side metal water tanks recorded as a single feature; associated with developed spring; stored water for mining, drinking, or domestic use; both are infilled with sediments
5	Water Tank	5 (diam)	NA	Embedded, circular, metal water tank (2 ft-deep) near developed spring; rusted
6	Spring Pipe	0.3 (diam)	0.8 (length)	Embedded steel pipe that originates at a small spring and emerges from the ground adjacent to the base of a retaining wall (Feature 3); dripping water at time of recording; rusted and fragmented where it emerges from the ground
7	Spring Pipe	0.2 (diam)	2.0 (length)	Steel pipe embedded in ground; dry at time of recording; rusted and broken with fragments lying immediately downslope
8	Wood Concentration	17	5	Timber planks displaced from Feature 2: 2x4 (n=3), 2x12 (n=2), 2x6 (n=1) sizes; connected with wire nails
9	Retaining Wall	23	8	Masonry wall running parallel along the eastern edge (downhill side) of the mine road as it crosses the main channel of large canyon; 5 ft-high, single course of dry-laid sandstone cobbles and boulders (50 inches in maximum dimension); two associated milled lumber fragments (similar in size to railroad ties); southern portion of the wall is displaced into the drainage
10	Retaining Wall	9	4	Concrete wall fragment (1 ft thick) in canyon bottom along edge of road; contains wood framing impressions; likely a displaced road-related retaining wall
11	Adit	17	13	Closed adit at base of slope framed by dry-laid masonry retaining walls; associated cut is 8 ft in depth and narrows to 5 ft in width at back wall where the portal is buried; east retaining wall is 3 ft and 2 to 5 courses tall with very large boulders; west retaining wall is 5 ft in height with 16-20-inch-diameter sandstone boulders stacked 2 to 7 courses high
12	Waste Rock Platform	407	141	Primary waste rock platform (15+ ft-high) covers entire center of site downslope from adit (Feature 11); comprised of gravel-sized coal gob (60%) and sandstone waste rock (40%); leveled into a platform along the edge, which may have served as a loadout area; contoured with several semi-level terraces as it extends down the canyon; crossed by likely tramway incline alignment
13	Waste Rock Pile	29	10	Small pile along mine road possibly associated with Feature 1; Mostly coal gob with 5% sandstone
14	Waste Rock Pile	75	39	Medium-sized pile located along the mine road; mostly black/gray earth and gravel to small cobble-sized coal gob
15	Waste Rock Pile	21	11	Small pile of coal gob, gray/black earth, gravels, and cobbles; brick fragments (from a single shattered brick) are scattered immediately upslope, along with a single 1/2-inch diameter steel bar
16	Tramway Incline	576	6	Linear vegetation pattern (visible in satellite imagery); crosses site from northwest-to-southeast; head of tramway was located within LA 202930 to the northwest; tramway extended 1.25 miles to Yankee Canyon; 0.6 miles of the incline lies within current project area; only 576 ft of incline located within the site boundary
17	Fence	166	1	Barbed-wire fence line utilizing a combination of trees, wooden posts, and metal t-posts
18	Mine Road	930	15	Mine access road likely associated with later 1940s-1950s component; associated with several roadside features, including bridge remains and retaining walls to prevent erosion

[1]Length and width presented in ft

Spatially, the extraction (Feature 11) and prospecting (Feature 1) features are located along the slopes at the edges of the site, while coal gob disposal from the adit took place within one very large waste rock pile that dominates the southern side of the drainage in the center of the site and from the prospect pit within three smaller waste rock piles along the northern slope. Feature 11 is at the base of the slope at the western edge of the site, and based on its orientation and elevation, the entry likely accessed underground mine workings that extended southwest along the Yankee Bed. The adit is framed by poorly preserved masonry retention walls and no longer has an opening, either due to collapse or purposeful closure (Photograph 133). Feature 1 is a trench-like open pit across the canyon at the northeastern edge of the site, and it may

Photograph 133. LA 202933 Feature 11 (Adit and Supporting Walls)

Photograph 134. LA 202933 Feature 1 (Open Cut/Prospect Pit)

Photograph 135. LA 202933 Feature 12 (Platform Mound)

Photograph 136. LA 202933 Feature 12 (Terraced Portion of Platform Mound)

result from prospecting for access to additional coal beds (Photograph 134). Coal waste was deposited into Feature 12, a large, formal waste rock platform mound with a leveled area that likely once contained a loadout feature and a series of stepped terraces representing systematic contoured dumping downslope along a bench above the drainage (Photographs 135 and 136). Other waste rock piles are small, isolated features associated with the prospect pit or resulting from expedient dumping or waste spillage along the mine road (Photograph 137).

Photograph 137. LA 202933 Feature 14 (Small Waste Rock Pile)

The site contains a suite of transport features associated with two different systems: (1) a tramway incline that passes through the site from southeast to northwest and was likely part of the early mining of the Yankee Bed and (2) a road and associated features (also discussed above) that likely dates to the later component in the 1950s. Only a few scattered railroad spikes and occasional degraded tie fragments remain as physical evidence of the tramway (Feature 16), which passes directly across the primary waste rock pile. The full tramway route was identified through aerial imagery, which demonstrates that it extends from the bottom of Yankee Canyon, across LA 202933, and northwest to LA 202930 (a total length of 1.25 miles). The road (Feature 18) was likely constructed in the late 1940s or 1950s using cut-and-fill methods along the slope, and it runs through the site for approximately 930 ft along both sides of the drainage (Photograph 138). It is associated with four road-related features: masonry and brick footings of a former bridge crossing (Feature 2; Photograph 139), a wood concentration (Feature 4) that is southeast of Feature 2 and likely represents the displaced materials from the timber bridge (Photograph 140), a masonry retaining wall that supports the road as it crosses the canyon bottom in the far west of the site area (Feature 9; Photograph 141), and a concrete wall segment has been displaced but likely also originated along the road.

Photograph 138. Feature 18 (Mine Road) as it Enters LA 202933 (Facing West)

Photograph 139. LA 202933 Feature 2 (Masonry Bridge Footings)

Photograph 140. LA 202933 Feature 8 (Wood Concentration)

Photograph 141. LA 202933 Feature 9 (Road-Related Retaining Wall)

The northwestern part of the site contains a cluster of features associated with a small, developed spring in the drainage bottom, including a masonry supporting wall (Feature 3), three embedded metal water basins (Features 4 and 5; two side-by-side tanks recorded as a single feature), and two drainage pipes (Features 6 and 7) (Photographs 142-144). The only other feature on the site is a fence line (Feature 17).

Photograph 142. LA 202933 Overview of Developed Spring Area

Photograph 143. LA 202933 Feature 3 (Masonry Wall)

Photograph 144. LA 202933 Feature 4 (Metal Basins)

The site contains an estimated 200 to 300 artifacts distributed in a sparse scatter without clear concentrations. A sample of 73 artifacts that differentially targeted temporally diagnostic and unique items was recorded. The analyzed assemblage includes 38 pieces of glass, 18 brick fragments, 11 metal items, three wooden railroad tie fragments, one tractor tire, one plastic pipe segment, and one insulator molded from a composite rubber/plastic material. The glass assemblage includes aqua, SCA, and amber colors and originates from at least three bottles and one jar. No maker's marks were observed. Metal items consist of railroad spikes, bolt fasteners, plate metal with fastener holes, pipe segments, rolled corrugated sheet metal, one rim fragment from a galvanized steel tub, and one decorative cast-iron stove fragment. Overall, the assemblage is indicative of industrial/mining activities, with possible evidence for short-term habitation.

Summary

To summarize, this medium-sized mining site contains a closed adit, a large associated waste-rock pile, a prospect pit, smaller waste rock piles, two transport systems (a tramway incline and a road), and a suite of features around a small spring. Two different periods of mining appear to be represented. The adit, tramway system, and some of the artifacts are associated with corporate-sponsored mining of the Yankee coal beds between 1905 and 1913. A map produced by Nicholson (1979) suggests the adit (Feature 11) was likely an entry to the underground workings of the Yankee No. 3 Mine (Figure 25), which was active primarily from 1905 to 1908 and fully closed by 1913. This mine was associated with a tramway transportation system for moving coal to the railroad at the bottom of Yankee Canyon that also accessed LA 202932 farther to the northwest. The presence of SCA and aqua glass supports use during this period.

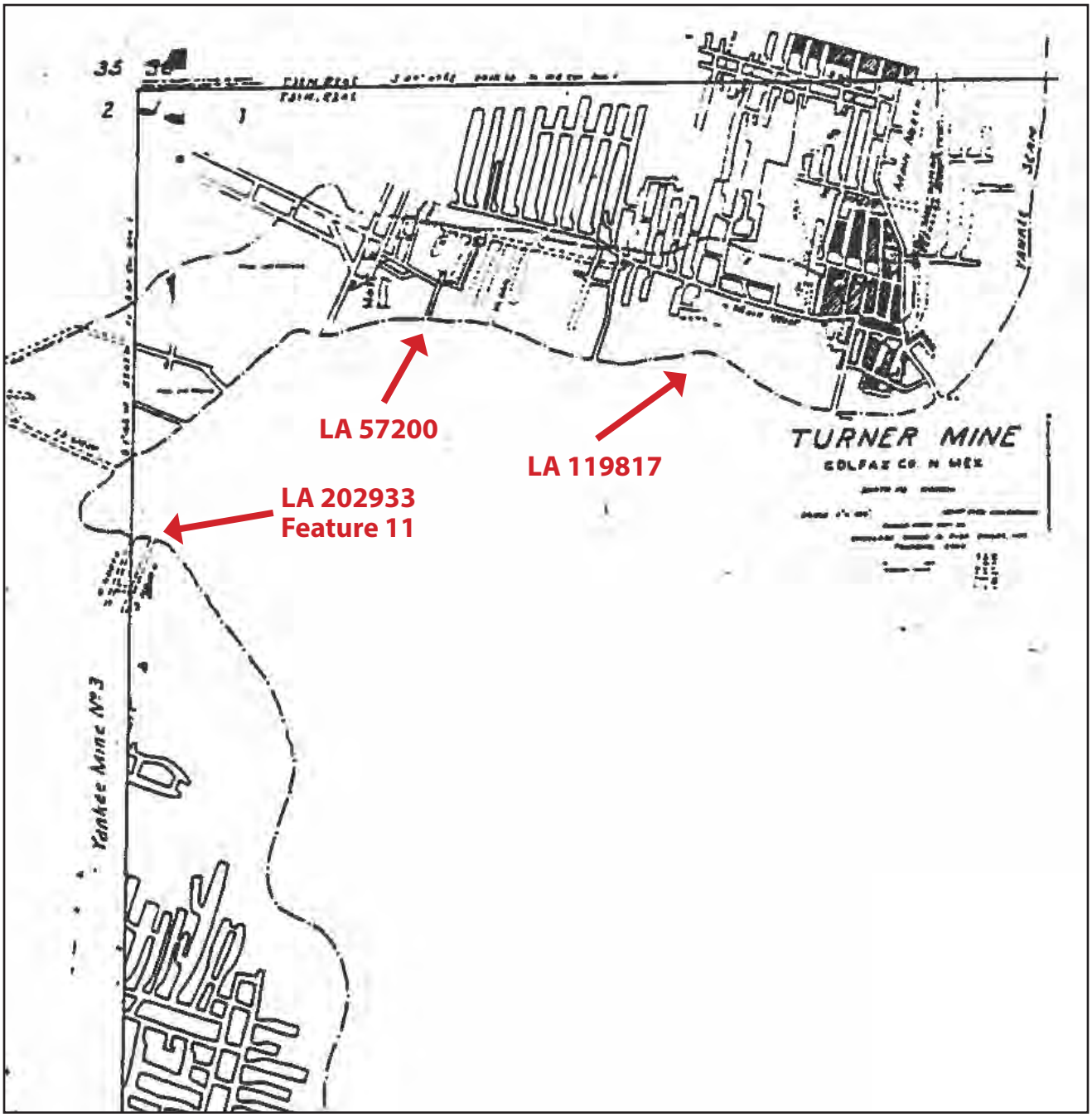


Figure 25. Nicholson (1979) Map Showing an Entrance to the Yankee No. 3 Mine

The second occupation is evidenced by later artifact types and materials incorporated into several features, including metal tanks/basins, plastic, and concrete with a modern appearance. This occupation appears to be associated with the road system (the tramway was no longer in use), developed spring, and possibly the small-scale prospecting/surface mining indicated by the trench-like cut (Feature 1). Use at this time would have been an ancillary extension of operations from the larger Turner-Urtado Mine B (LA 57200) to the east, which occurred from 1949 to 1963. The mine road was likely extended from the Turner-Urtado mines, with the primary goal possibly being development of the spring, as both mines were reportedly plagued by the presence of too much water (Moiola 1998:14). The two drainage pipes at the spring are different sizes and

in varying states of decay, suggesting they may have been installed at different times: the small metal water tanks appear to be of more recent origin, and specific artifacts including piping, a tractor tire, and a rubber/plastic insulator are consistent with a 1949 to 1963 occupation. According to Moiola (1998:14), Mr. Urtado developed his mine to the east (LA 57200), in part, with hopes of finding and recovering 300 loaded coal cars that were supposedly left inside the old Yankee Mine, and ancillary mine prospecting at LA 202933 may have been part of these efforts.

Eligibility and Effects

LA 202933 is a complex site containing a closed adit, associated mining features, and developed spring with evidence of two periods of mining from 1905 to 1913 (associated with the Yankee Mines) and from 1949-1963 (associated with the Turner-Urtado Mines). However, the site lacks structures, dense artifact concentrations, or other evidence of a habitation area or domestic use, and the feature types and activities represented are not likely to result in the accumulation of buried cultural deposits. Furthermore, most of the features on the site are associated with the later, mid-twentieth century of mining, and they also lack integrity: the adit has been closed, no visible evidence remains of the tramway incline, and all of the original equipment and infrastructure have been removed. As a result, the site no longer visually conveys its association with the period of early twentieth century mining in Yankee Canyon. LA 202933, therefore, lacks information potential and the integrity to convey its associations with significant historic events or developments and is recommended as *not eligible* for listing on the NRHP. No further management considerations are warranted for this resource.

ISOLATED OCCURENCES

Nine IOs were documented during pedestrian survey of the Yankee Canyon project area (Table 13). All are historic in age, and they include four locations with multiple artifacts (five or fewer), three isolated features, and two locations containing a single, isolated artifact. Artifacts include cans, milled lumber, and miscellaneous metal. Isolated features include a linear cut, small prospect pit, and isolated concentration of coal waste. These locations do not meet archaeological site criteria and likely result from dispersed prospecting or travel across the project area.

By definition, the nine IOs lack additional data potential and are not likely to increase our understanding of local or regional history or prehistory. No further management considerations are warranted for these resources. Locations for these resources are presented in the report appendix. The descanso will be fully avoided by the project.

INTERPRETIVE SUMMARY

The 11 mining sites in the project area span the entire period of historic mining in Yankee Canyon, beginning with the established of the Yankee Mines No. 1, 2, and 3 in 1905 and continuing through the period of small-scale, family-operated mining that ended by the 1960s. Two sites date to the earliest period of mining in the area: (1) LA 120611 contains the Yankee Mine No. 3 entrance, possibly one of the other Yankee mine entrances, a tramway incline system, and other supporting features constructed around 1905-1906; and (2) LA 202933 is a newly discovered site that may contain an alternative entrance to the underground workings of the Yankee No. 3 Mine (or one of the other Yankee mines). According to Moiola (1998), the Yankee mines were established in 1905 and mostly abandoned by 1908 (with some activity continuing until 1913). Based on the current survey, these mines are at the southern end of the project area (LA 120611), and most of the infrastructure—including the entire tramway incline system—has been removed. Feature 1 at LA 120611 represents one of the original Yankee entrances, while Feature 11 at LA 202933 was an alternative entrance that allowed access to the underground workings from the north.

Table 13. Isolated Occurrences Documented During the Current Investigation

IO No.	Land Status	IO Type	Cultural/Temporal Affiliation	Description
1	SLO	Single Artifact	NM Statehood to World War II	One pocket-style pin-hinge tobacco tin
2	SLO	Single Artifact	NM Statehood to World War II	One tin-enamel shallow-bottomed wash tub, rolled rim, heavily rusted
3	SLO	Multiple Artifacts	NM Statehood to Recent Historic	Two flat-topped, 12-ounce steel beverage cans; one sanitary can
4	SLO	Isolated Feature	NM Statehood to Recent Historic	Isolated depression: 9 ft in diameter and 2.5 ft deep; possible prospect pit
5	SLO	Isolated Feature	NM Statehood to Recent Historic	Linear bladed area 75 m east of LA 202934: swale/road-like feature; possible grade or road segment; no associated artifacts or materials
6	SLO	Multiple Artifacts	NM Statehood to Recent Historic	Two pieces of milled lumber, one piece of miscellaneous sheet metal, and one sanitary can in 20 ft area within drainage
7	Private	Isolated Feature	NM Statehood to Recent Historic	Small concentration of coal waste: 7 ft in diameter; not mounded; incidental spillage (possibly along old tramway route)
8	Private	Multiple Artifacts	NM Statehood to Recent Historic	One rotary opened sanitary can (likely food), one piece of miscellaneous metal along road
9	Private	Multiple Artifacts	NM Statehood to Recent Historic	One piece of milled lumber, one miscellaneous metal fragment, one small meat or fish can (key-wind) fragment

After 1913, activity in the project area shifted north, when the New Mexico and Colorado Coal and Mining Company placed two openings in the Kellogg Bed, higher on the landform north of the Yankee mines. They also constructed a new tipple on the valley floor outside the project area, but the entrances and terminus of their new tramway system were discovered and documented during the current project as LA 202930. The resulting mines were unnamed and short-lived due to poor coal quality, and efforts to mine the Kellogg Bed had been abandoned by 1921. This marked the end of the period of mining by corporate interests in Yankee Canyon, and subsequent mining efforts were family-run (although sometimes substantial) operations.

In 1921, John Turner began mining the side canyon northeast of the Yankee mines in the area now documented as LA 119817. Soon an 800-ft-long entry, additional entrances and ventilation shafts, and a chute for transferring coal to the valley bottom were constructed (Moiola 1998). Farther to the north, Lunce Denton established one opening without ventilation, a loadout, and a gravity-operated tram in the area now known as LA 119818. The Turner Mine (LA 119817) cycled through different owners and continued to operate at lower capacities in the 1930s, but the Denton Mine (now the Denton-Colangelo-Strasia-Rodman Mine; LA 119818) added new infrastructure, including an air course entry, fan house, generator room, and other features that were documented during this project. Likely due to the more recent timeframe, this substantial site has left a larger imprint on today's landscape than the earlier Yankee or Kellogg mines, and the site contains a mine extraction and habitation locus high on the slope, a tipple structure and administrative/transport locus on the valley floor, and a partially intact tramway alignment that collectively represent the largest array of mining features in the project area.

By the 1940s-1950s, the Denton-Colangelo-Strasia-Rodman Mine was in decline, and the Rodman family (who took control of the mine in 1950) closed it and salvaged materials in 1960. Thomas Turner sold his mine (LA 119817) to Barney Urtado (then the mine manager), and Mr. Urtado closed the mine in 1949 and moved operations west to the location that came to be known as the Turner-Urtado Mine B (LA 57200). According to Moiola (1998), the new Turner-Urtado Mine B operated from 1949 to 1963 and employed up to three miners, but poor market conditions, as well as flooding of the mine, led to its closure in 1963. This date marks the end of mining in the area based on historic documents, although small-scale prospecting

may have continued. The efforts by the Turner, Denton, Urtado, Rodman, and other families from the 1920s through 1950s formed a period of large-scale, but family-operated, mining northeast of the former Yankee mines, resulting in sites and systems that rivaled the earlier efforts in scale but were less financially successful.

Six additional mines were established in the 1930s-1950s, mostly on the steep slopes in the northern part of the project area. LA 202927, LA 202928, LA 202929, and LA 202932 are small mining sites connected by a network of graded mining roads extending north from the Denton-Colangelo-Strasia-Rodman Mine. These sites contain either a single adit or several open pits, with associated waste-rock piles, but they lack tramway systems or substantial supporting infrastructure. Based on artifact types, they could date anytime from the 1930s to early 1960s, but they lack the earlier glass and can types found on the pre-1920s mines. Only LA 202929 has a habitation locus, consisting of a few small masonry structures and a large artifact scatter with domestic debris. These sites are connected by road to the nearby Denton-Colangelo-Strasia-Rodman Mine (LA 119818) that operated from 1931 to 1963, and their spatial proximity and general similarities suggest they are contemporaneous and associated. The sites may represent outlying components of LA 119818 that housed additional miners and hosted sporadic mining efforts or could have been independent mines operated by unaffiliated families. During the same period, a similarly small mining site (LA 202931) was established at the far western edge of the project area, and an area originally used to access the Yankee mines (LA 202933) was reutilized, likely as an extension of Urtado's mine at nearby LA 57200. It was during this period that open pits were excavated, the mine road was added, and a spring in the canyon bottom was developed.

Sites throughout the project area contain elements of a variety of mining feature systems, including mineral extraction, ore and waste rock transport, waste rock deposition, utility and supporting infrastructure, and habitation. Extraction occurred primarily within underground mines that were accessed through adit and shaft openings, most of which have been closed or badly damaged since their use. Some prospecting and shallow open pit mining also occurred, but these efforts do not seem to have been successful. Transport features include the remains of several long, gravity operated tramway inclines that carried ore to the valley floor on carts. These were makeshift systems, often operated using a vehicle motor or other expedient source of power. Little remains of these features, but the tramway at LA 119818 retains railroad ties, narrow-gauge rail segments, and utility poles and is clearly visible as an excavated swale or raised grade descending the steep slope.

Within sites, short, narrow-gauge rail grades or, later, road systems were used to transport ore from the mine entrances to the heads of tramways or transfer waste rock to large piles that were sometimes contoured into platforms. These features likely held short rail grade extensions and may have also supported other equipment or mining infrastructure. The remains of timber ramps and loadouts indicate that structures were built to facilitate loading and transfer of ore and waste. Particularly at LA 119818, a suite of other supporting features is present, most of which facilitated ventilation within the underground mine or housed generators or other equipment. On the valley below, a large tipple complex at the base of the tramway incline allowed coal to be unloaded and then reloaded onto trucks or the railway. Other features on the valley below were likely associated with administrative, ore storage, and other functions. Most of the sites in the project area lack evidence for residential use, although LA 119817, LA 119818, LA 120611, and LA 202929 contain small habitation loci with masonry foundations and middens/artifact scatters. The small number of structures suggest miners lived on site for only short periods and in small numbers. Other sites could have also occasionally contained short-term encampments, but most of the mines were operated by workers living in Yankee or nearby towns.

CHAPTER 7

MANAGEMENT SUMMARY

A total of 11 historic archaeological sites and nine IOs were discovered and documented during pedestrian survey of the Yankee Canyon Mine Safeguard project area. All 11 sites are associated with twentieth century coal mining; four are previously recorded but were fully updated, and seven are newly discovered. By definition, the IOs lack additional information potential and are recommended as *not eligible* for listing on the NRHP. No further management considerations are warranted for these resources.

Based on the *National Register Bulletin 15* and other resources for the of evaluation of historic mining sites, the primary considerations impacting our eligibility recommendations were: (1) whether a site contained habitation loci with potential for intact subsurface archaeological deposits (Criterion D) and (2) whether a site contained intact or unique mine engineering features with the ability to visually convey an association with the period of historic mining in Yankee Canyon (Criterion A). None of the sites in the project area have demonstratable associations with significant historical people that would qualify them for listing under Criterion B, nor do they exhibit the levels of integrity necessary to qualify as excellent examples of a unique engineering style or methods of construction (Criterion C). When evaluating under Criterion A, we considered an association with the locally significant period of large-scale mining from 1905 to 1913 when Yankee was established to have the highest weight, although we considered associations with other periods as well. Overall, mining features (including underground mine entrances and extraction pits) and supporting infrastructure (transport features, platforms, structures, and other features) in the project area tend to exhibit poor integrity due to material salvage efforts in the 1960s after mines were closed, past remediation (including closing of adits) in the 1980s and 1990s, and other, more gradual, forms of disturbance, such as erosion and colluvial slumping.

We also considered the eligibility determinations made by the AML Program and subsequent concurrence issued by the SHPO in 1998 (HPD Log No. 54930), although all sites were reevaluated during the current project. In 1998, two sites (LA 57200 and LA 120611) were determined not eligible and two sites (LA 119817 and LA 119818) were determined eligible for listing on the NRHP under Criterion D. We agree with three of these previous determinations but recommend that the eligibility status of LA 120611 be changed from not eligible to eligible under Criterion D (see discussion below)

It is also possible that the collection of mining sites in the project area—particularly if combined with sites on the valley floor below—could qualify as a historic district, described in *National Register Bulletin 15* as a "significant concentration, linkage, or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan or physical development." The designation as a historic district is beyond the scope of the current documentation effort, but brief notes regarding its potential are offered here. Districts are defined by the interrelationships among their contributing properties, which must form a unified entity that visually conveys a significant historic theme or period (Hardesty and Little 2009), with potential themes including mining technology and engineering, the evolution of mining landscapes, the timing of local and national economic boom and bust cycles, the introduction of new mining technologies, and the spatial organization of mining activity in northeastern New Mexico. The period of significance for a potential district could include the entire period of mining in Yankee Canyon from 1905 to the 1960s, or it could be defined more narrowly. Based on the current survey, our informal evaluation is that sites in the project area do not retain the necessary integrity (particularly their visual elements) or continuity to qualify as a historic district due to mine closures, equipment salvaging, and other disturbance.

Of the 11 archaeological sites, four (LA 119817, LA 119818, LA 120611, and LA 202929) are recommended as eligible for listing on the NRHP under criteria A or D, and seven sites (LA 57200, LA 202927, LA 202928, LA 202930, LA 202931, LA 202932, and LA 202933) are recommended as not eligible for listing on the NRHP due to a lack of integrity and/or historic significance (Table 14). Pending agency determinations, no further management considerations or treatment recommendations are warranted for the sites recommended as not eligible.

As a general rule, the seven sites recommended as not eligible are simple mines that date to the later periods of small-scale mining, lack habitation loci with subsurface information potential, do not contain intact or unique mine engineering features, and lack complexity in their feature types. The only examples that do not fully meet these criteria are LA 202929 and LA 202933. LA 202929 dates to the early period of mining when there was an attempt to move north from the Yankee to the Kellogg Bed, and it is a relatively complex site with the adits, the terminus of a gravity incline, and other features. However, the site lacks structures or other evidence of a habitation area or domestic use, the adit entrances have been closed or destroyed by blasting, and the ore transport system and other infrastructure have been removed. LA 202932, therefore, lacks information potential and the integrity to convey its associations with significant historic events or developments and is recommended as *not eligible* for listing on the NRHP. No further management considerations are warranted for this resource. LA 202933 is similarly a complex site with numerous features and an early period of activity associated with the Yankee Mine. However, these early features are obscured by a 1940s-1950s component, and the site lacks habitation loci or intact mine engineering features.

All four sites recommended as eligible contain habitation loci with residential masonry foundations and trash middens/artifact concentrations (see Table 14). At some sites, privies or other domestic features are also present. These areas have excellent potential for buried archaeological deposits that could provide important information relating to frontier mining technology and engineering, the spatial organization of historic mining landscapes, and the lifeways, economic status, and participation in broader economic networks of twentieth century miners in Yankee Canyon. As a result, they are recommended as eligible for listing on the NRHP under Criterion D. LA 119817, LA 120611, and LA 202929 do not qualify under Criterion A because their mine engineering features do not exhibit the necessary integrity to convey their historic associations. LA 119818, on the other hand, contains unique and partially intact engineering features, including elements of a gravity tramway incline, tipple complex, and other structural remains that convey an association with locally significant early and mid-twentieth century coal mining, and this site is also recommended as *eligible* under Criterion A for its association with locally significant historic events.

The four eligible sites will require management during project implementation. The AML Program is currently evaluating the feasibility of engineering various safeguarding options at these mining sites, and activities may include closing mine openings with bat-compatible closures, backfilling features using onsite materials, and regrading or contouring features to facilitate appropriate drainage. Access to these features will be along existing roads. The qualifying characteristics at all four sites include the habitation loci, including masonry foundations and associated middens, privies, or artifact concentrations. We recommend that these portions of the sites be avoided with suitable buffers during mine remediation, and that all project activities within these sites be monitored by a permitted archaeologist.

In addition to habitation areas, intact mining infrastructure at LA 119818—including Feature 1 (fan house), Feature 2 (generator room), Feature 5 (loadout), Feature 6 (fan mount), parts of Feature 8 (tramway incline), Feature 12 (adobe administrative building), and Feature 26 (tipple complex)—should be preserved, and suitable avoidance buffers should be established around each of these features during implementation. If the adit is altered, we recommend that materials and methods are utilized that minimize intrusive visual elements and changes to the historic setting. In general, we recommend that the AML Program

select safeguarding options that have the least possible impact on the visual aspects of these sites, while still accomplishing the important goal of protecting the public from the significant hazards posed by abandoned mining features. If possible, materials used to close and restrict access to dangerous features should not obscure above-ground elements or detract from the ability of these features to convey their historic functions. Materials used should be as visually inobtrusive as possible, and materials that are consistent with the mining period should be utilized to the extent feasible. If these recommendations are followed, the project would have *no adverse effect* on these historic properties.

This cultural resource inventory complies with the provisions of the NHPA of 1966, as amended through 1992, the New Mexico Cultural Properties Act (18-6-1 through 18-6-17 New Mexico Statutes Annotated 1978), and all other applicable rules and regulations. It was completed in accordance with *§4.10.15 NMAC: Standards for Survey and Inventory* and other relevant guidance documents.

Table 14. Summary of Eligibility and Management Recommendations

Site	Previous Determination	Current Recommendation	Proposed Management
57200	Not Eligible	Not Eligible	None
119817	Eligible (D)	Eligible (D)	Avoid all habitation features and loci; all activities within the site should be monitored by a permitted archaeologist
119818	Eligible (D)	Eligible (A and D)	Avoid all habitation features and loci, and all intact mining features or infrastructure; all activities within the site should be monitored by a permitted archaeologist; project elements should minimize visual impacts and changes to the setting
120611	Not Eligible	Eligible (D)	Avoid all habitation features and loci; all activities within the site should be monitored by a permitted archaeologist
202927	N/A	Not Eligible	None
202928	N/A	Not Eligible	None
202929	N/A	Eligible (D)	Avoid all habitation features and loci; all activities within the site should be monitored by a permitted archaeologist
202930	N/A	Not Eligible	None
202931	N/A	Not Eligible	None
202932	N/A	Not Eligible	None
202933	N/A	Not Eligible	None

REFERENCES

Barrett, Heather
2007 *The Raton Original Townsite Historic District*. National Register of Historic Places Nomination Form. On File at Laboratory of Anthropology. Santa Fe.

Bowden, J. J.
1971 Spanish and Mexican Land Grants in the Chihuahuan Acquisition. Texas Western Press, El Paso.

Bryan, Howard
1989 The Coming of the Railroad in Railroads and Railroad Towns. In *New Mexico*, edited by Ree Sheck. New Mexico Magazine. Santa Fe.

Cook, Silvia, and John O. Baxter
1977 *The Raton Downtown Historic District*. National Register of Historic Places Inventory Nomination Form. On File at Laboratory of Anthropology. Santa Fe.

Deyloff, Glenda
2002 *A Cultural Resources Survey of Four Coal Mine Sites for the Yankee/Vukonovich Project in the Raton Coal Field near Yankee, Colfax County, New Mexico*. Southwest Archaeological Consultants, Inc. Report No. SW 462. NMCRIS Activity No. 78730.

Dary, David
2000 *The Santa Fe Trail: its History, Legends, and Lore*. University of Kansas Press, Lawrence.

Dick-Peddie, W.A.
1992 *New Mexico Vegetation: Past, Present, and Future*. University of New Mexico Press, Albuquerque, NM.

Glass Bottle Marks
2023 *Glass Bottle Marks: Collection History of the Glass Manufacturing Industry*. Online resource available at www.glassbottlemarks.com. Electronic data accessed 2023.

Griffith, G. E., J. M. Omernik, M. M. McGraw, G. Z. Jacobi, C. M. Canavan, T. S. Schrader, P. J Mercer, R. Hill, B. C. Moren
2006 *Ecoregions of New Mexico* (color poster with map, descriptive text, summary tables, and photographs). Reston, Virginia. U.S. Geologic Service (map scale 1:1,400,000).

Hardesty, Donald L.
1988 *The Archaeology of Mining and Miners: A View from the Silver State*. Special Publication Series Number 6. Society for Historical Archaeology.
1990 Evaluating Site Significance in Historical Mining Districts. *Historical Archaeology* 24(2):42-51.
2010 *Mining Archaeology in the American West*. University of Nebraska Press and the Society for Historical Archaeology. Lincoln, Nebraska.

Hardesty, Donald L., and Barbara J. Little
2009 *Assessing Site Significance: A Guide for Archaeologists and Historians*. AltaMira Press. Plymouth, UK.

Hawley, John W.
1986 Physiographic Provinces. In *New Mexico in Maps*, edited by John L. Williams, pp. 23-25. University of New Mexico Press, Albuquerque.

Julyan, Robert
1998 *The Place Names of New Mexico*. University of New Mexico Press, Albuquerque.

Kessel, Richard H.
1966 The Raton Coal Field: an Evolving Landscape. *New Mexico Historical Review* 41(3):231–250.

Lamm, Gene, and the Cimarron Historical Society
2008 *A Walking Tour of Old Town, Cimarron, New Mexico in the 1800s*. Electronic document, www.cimarronnm.com/history.htm.

Lee, W. T.
1924 *Coal Resources of the Raton Coal Field, Colfax County, New Mexico*. USGS Bulletin 752.

Lockhart, Bill, and Russ Hoenig
2016 *Owens-Illinois Glass Company– Part 2: The Bewildering Array of Owens-Illinois Glass Company Logos and Codes.* Electronic Document Available at https://sha.org/bottle/pdffiles/OwensIllinois2018Part2.pdf. Accessed January 2023.

Lockhart, Bill, ete Schulz, Bill Lindsey, Carol Serr, David Whitten, and Beau Schreiver
2021 *The American Bottle Company: A Study in Contrasts and Contradictions*. Electronic document available at https://sha.org/bottle/pdffiles/AmericanBottleCo.pdf. Accessed January 2023.

Lockhart, Bill, Beau Schriever, Bill Lindsey, and Carol Serr with contributions by Jay Hawkins
2016 *Hazel-Atlas Glass Company*. Electronic Document Available at https://sha.org/bottle/pdffiles/Hazel-Atlas.pdf. Accessed January 2023

McLemore, Virginia T.
1990 Sugarite Canyon. *New Mexico Geology* 12:2. New Mexico Bureau of Mines and Mineral Resources, Socorro.

Moiola, Floyd A.
1998 *A Cultural Resource Survey of Four Coal Mines near Yankee, New Mexico in the Raton Coal Field.* New Mexico Mine Land Bureau Report No. 1998-1. NMCRIS Activity

Montoya M. E.
2002 *Translating Property: The Maxwell Land Grant and the Conflict over Land in the American West, 1840-1900*. University of California Press, Berkeley.

Murphy, L. R.
1969 *Out in God's Country—a History of Colfax County, New Mexico*. Springer Publishing Company, Springer, New Mexico.

Myrick, David F.
1990 *New Mexico's Railroads*. Revised edition, University of New Mexico Press, Albuquerque.

National Register Bulletin 15
1990 *How to Apply the National Register Criteria for Evaluation*. National Park Service. Washington, DC.

National Resource Conservation Service
2023 *Web Soil Survey*. Available online at http://websoilsurvey.nrcs.usda.gov/. Accessed May 2023.

Nickelsen, H. B.
1979 *Reclamation Evaluation for OSM, Raton Field, Yankee Mines, Turner Urtado Mines, and Denton-Colangelo-Strasia-Rodman Mine*. On File at the New Mexico Bureau of Mines and Mineral Resources, Santa Fe.

NMCRIS
2018 *User's Guide to the New Mexico Cultural Resource Information System: Guidelines for Submitting Cultural Resource Records*. State of New Mexico, Department of Cultural Affairs, Historic Preservation Division. Santa Fe.

Noble, Bruce, and Robert Spude
1997 *Guidelines for Identifying, Evaluating, and Registering Historic Mining Properties*. National Park Service. National Register Bulletin 42. Washington DC.

Oakes, Yvonne R.
1987 *Archaeological Survey of Mine Lands in the Raton Coal Field for the Abandoned Mine Bureau*. Laboratory of Anthropology Notes 386. NMCRIS Activity No. 17961. Office of Archaeological Studies, Museum of New Mexico, Santa Fe.

Oakes, Yvonne R., and Dorothy A. Zamora
2010 *The Coal Camps of Vermejo Park Ranch, Colfax County, New Mexico*. Laboratory of Anthropology Notes 397. Office of Archaeological Studies, Museum of New Mexico. Santa Fe.

Pappas, Mike J.
2003 *Raton: History, Mystery, and More*. Coda Publishing. Raton, New Mexico.

Pike, David
2015 *Roadside New Mexico: A Guide to Historic Markers*. University of New Mexico Press. Albuquerque.

Pratt, B. C.
1986 *Gone But Not Forgotten: Strategies for the Comprehensive Survey of the Architectural and Historic Archaeological Resources of Northeastern New Mexico, Vol. 1*. National Park Service and New Mexico Historic Preservation Division, Office of Cultural Affairs, New Mexico.

Sheridan, J. E.
1906 *1906 Territorial Mine Inspector's Report*. Available at the Mining and Minerals Division, Santa Fe.

Thoms, A.V.
1976 Review of Northeastern New Mexico Archaeology. *Awanyu* 4 (1): 8-35.

Van Ness, J.R. and C.M. Van Ness, Editors
1980 *Land Grants in New Mexico and Colorado*. Sunflower Press, Manhattan, Kansas.

Western Regional Climate Center
2023 *Historical Climate Information*. http://www.wrcc.dri.edu/climatedata.html. Electronic Data Accessed April 2023

APPENDIX A

CULTURAL RESOURCE LOCATIONAL INFORMATION

FOR OFFICIAL USE ONLY

The public disclosure of the location of archaeological sites on state and private lands in the State of New Mexico is prohibited by Section 18-6-11.1 NMSA 1978. Public disclosure of archaeological site locations is federally prohibited by 54 U.S.C. §307103

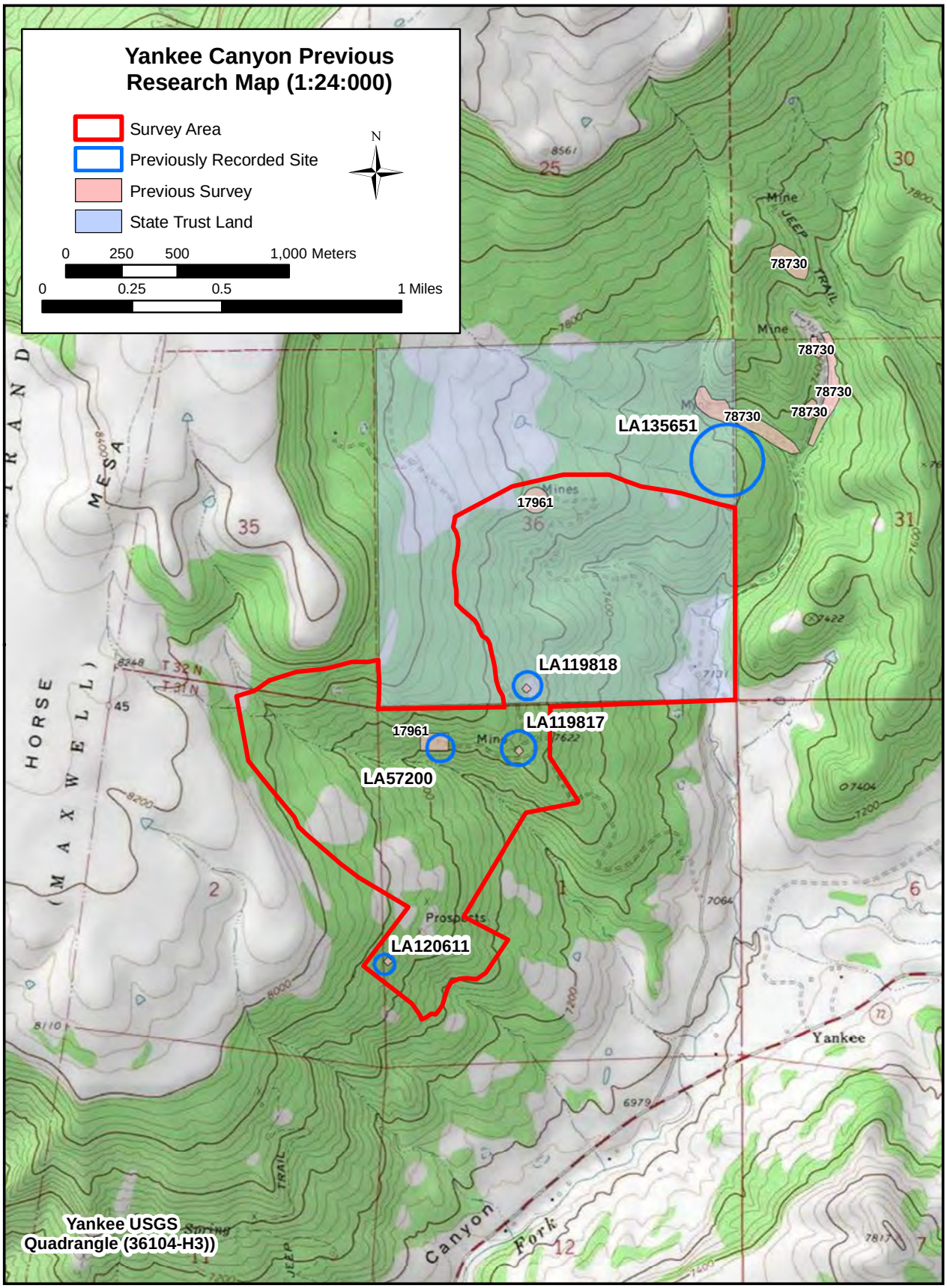


Figure A1. Previous Research Map Showing Previous Investigations and Existing Cultural Resources

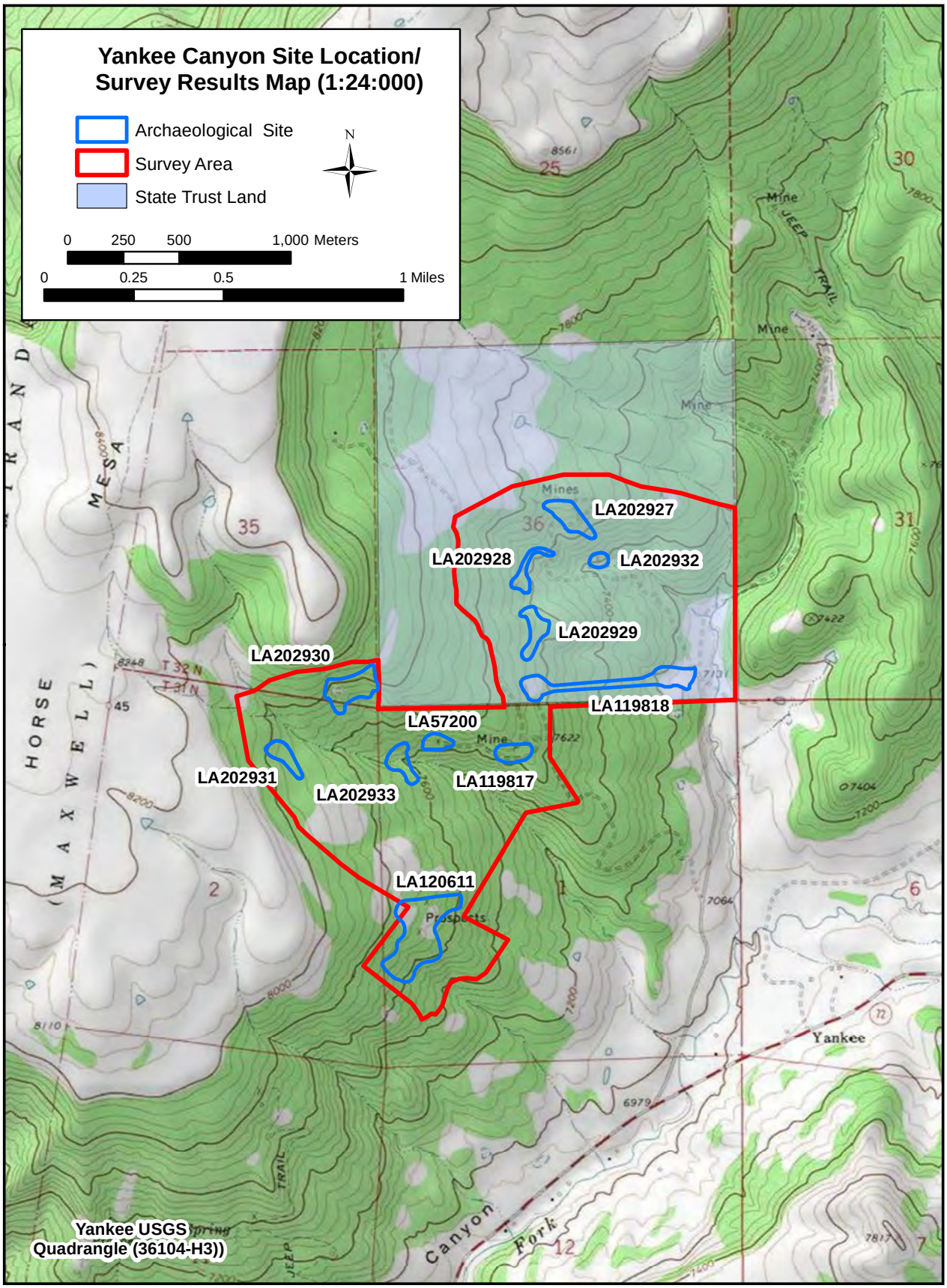


Figure A2. Site Location/Survey Results Map (1:24:000)

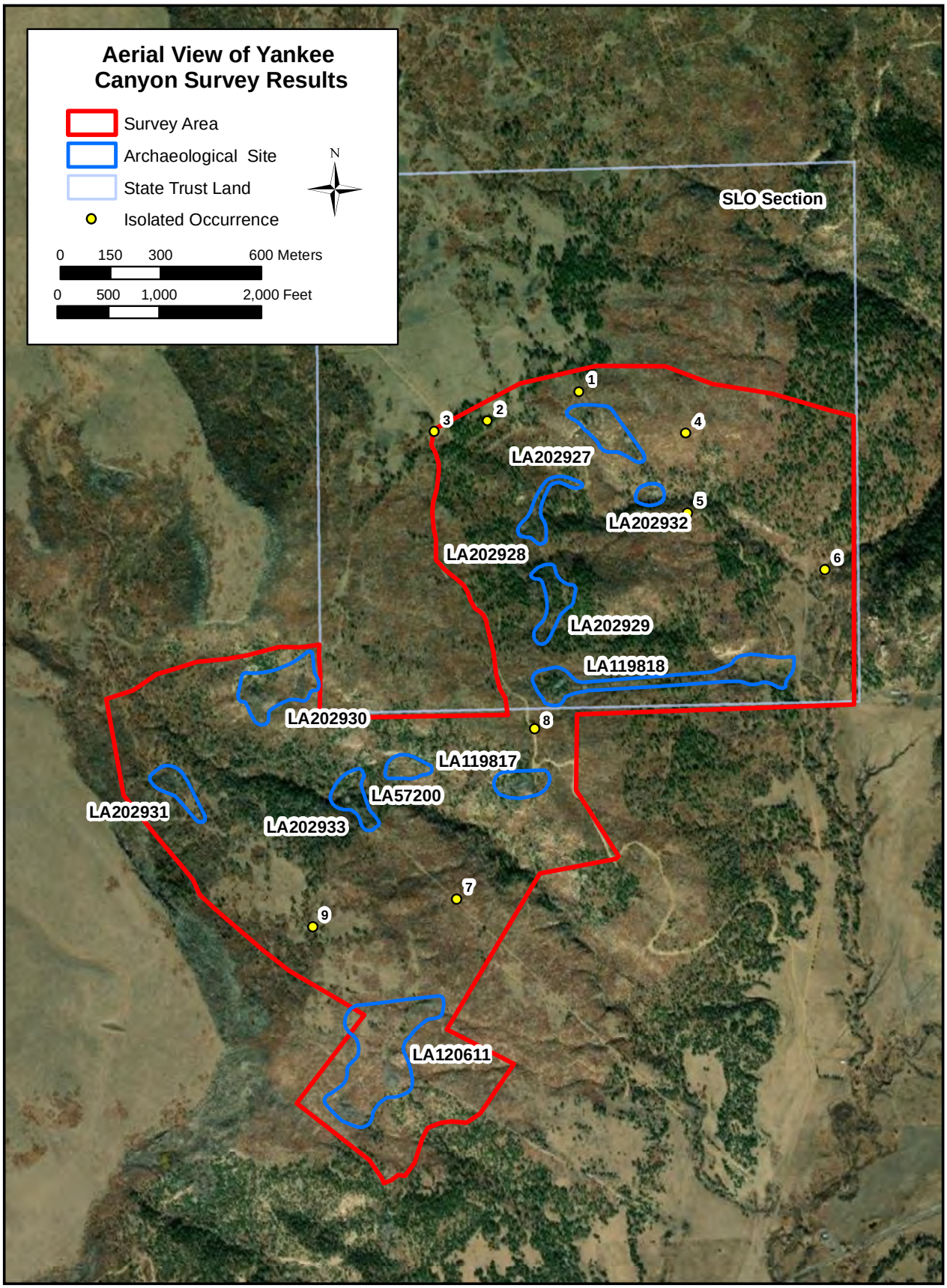


Figure A3. Aerial View of Survey Results

Table A1. Location of Documented Archaeological Sites (NAD 83, Zone 13)

LA No.	Field No.	Land Status	Easting	Northing
57200	N/A	Private	558185	4090266
119817	N/A	Private	558548	4090221
119818	N/A	SLO	558654	4090494
120611	N/A	Private	558092	4089427
202927	OCS-2228-1	SLO	558789	4091250
202928	OCS-2228-2	SLO	558678	4091136
202929	OCS-2228-3	SLO	558660	4090791
202930	OCS-2228-4	Private	557720	4090545
202931	OCS-2228-5	Private	557529	4090190
202932	OCS-2228-6	SLO	558892	4091087
202933	OCS-2228-7	Private	557991	4090202

Table A2. Location of Documented Isolated Occurrences (NAD 83, Zone 13)

IO No.	Land Status	Easting	Northing
1	SLO	558710	4091394
2	SLO	558436	4091307
3	SLO	558278	4091276
4	SLO	559028	4091270
5	SLO	559033	4091033
6	SLO	559444	4090862
7	Private	558344	4089878
8	Private	558576	4090388
9	Private	557914	4089795

Okun Consulting Solutions

Appendix C

Amended Biological Assessment/ Biological Evaluation

DBS&A
a Geo-Logic Company

Amended Biological Assessment/ Biological Evaluation

Yankee Canyon Coal Mine Safeguarding Project Colfax County, New Mexico

Prepared for

New Mexico Energy, Minerals, and Natural Resources Department
Abandoned Mine Land Program

Prepared by

DBS&A a Geo-Logic Company

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November 20, 2023

Table of Contents

List of Figures

List of Tables

List of Appendices

1. Introduction

On behalf of the New Mexico Energy, Minerals, and Natural Resources Department's Abandoned Mine Land (AML) Program, Daniel B. Stephens & Associates, Inc. (DBS&A) has prepared this amended biological assessment/ biological evaluation (BA/BE) to assess the effects of the proposed Yankee Canyon Coal Mine Safeguarding Project (Proposed Action) on state and federal protected natural resources. The Proposed Action is located on the east and south facing slopes of Horse Mesa down to Yankee Canyon (Project Area) within Colfax County, approximately 6 miles northeast of the Town of Raton, New Mexico (USGS Yankee 7.5-minute quadrangle, in Township 31 and 32 N, Range 25 E) (Figures 1 and 2). The Proposed Action is to be undertaken to mitigate historical coal mining within the boundaries of the Project Area, which consists of approximately 580 total acres, including approximately 300 acres of private land and approximately 280 acres of land administered by the New Mexico State Land Office (SLO). The Proposed Action involves measures to repair the area around County Road A-25 where a section of the road is collapsing due to mine features. Additional measures include stabilization of steep slopes on coal gob piles and safeguarding of other hazardous abandoned mine features such as adits and entryways.

Section 7(a)(1) of the Endangered Species Act (ESA) directs all federal agencies to carry out programs for the conservation of threatened and endangered species. Section 7(a)(2) of the ESA requires federal agencies to ensure that any actions authorized, funded, or carried out by the agency are not likely to jeopardize the continued existence of any threatened, endangered, or proposed species or to adversely modify critical habitat. This BA/BE documents the potential effects of the Proposed Action on federally listed and proposed endangered and threatened species that have the potential to occur locally, together with designated or proposed critical habitat for any of these species. It also helps fulfill requirements set forth under the State of New Mexico's Wildlife Conservation Act [17-2-37 NMSA 1978]. Under the Wildlife Conservation Act, it is unlawful to "take" species determined to be endangered within the state as set forth by regulations of the State Game Commission. From Section 3(18) of the ESA, the term "take" means to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." As used in the Wildlife Conservation Act [17-2-37 to 17-2-46 NMSA 1978], "take" or "taking" means to harass, hunt, capture, or kill any wildlife or attempt to do so.

The Yankee Canyon BA/BE was originally completed in April 2023, and was appended to a subsequent Environmental Assessment (EA). Upon review of the EA, the U.S. Fish and Wildlife Service (USFWS) stated in an e-mail on September 5, 2023 that the proposed project likely falls within the potential habitat and geographic range of the tricolored bat (*Perimyotis subflavus*), a species of microbat native to eastern North America (but reaching New Mexico at the western limit of its distribution) now proposed for listing by the USFWS as "endangered" under the ESA. The USFWS indicated that this species should be included and further evaluated in the biological analysis of the project (MacPhee, 2023).

2. Project Description

2.1 Background

Enacted on May 2, 1977 (amended in 2006), the Surface Mining Control and Reclamation Act (SMCRA) created the nationwide Abandoned Mine Land Reclamation Program. It places fees on active coal mines to fund the reclamation of coal mines abandoned before 1977. The Office of Surface Mining Reclamation and Enforcement (OSMRE) distributes funds to the state and tribal abandoned mine land programs, which rank abandoned mine land problems on a priority scale of 1 to 3 as defined by federal law. High priority reflects the degree of need for the protection of public health, safety, and property from the adverse effects of coal mining practices prior to 1977, including restoration of land, water, and the environment. The funds are also allowed for safety closures of mine sites other than coal mines if they have been determined to be a public safety hazard.

Mining was first conducted around Yankee Canyon, as well as the nearby Sugarite Canyon, in the early 1890s. Mining operations continued for over 40 years until the early 1940s, when mining was shut down in the area.

County Road A-25 traverses the slopes from the bottom of Yankee Canyon to the top of Horse Mesa, through the Project Area. The unpaved road appears to be experiencing a loss of bearing capacity due to historical mining activity in the area. Based on evidence of subsidence observed in the road, the Colfax County Road Department has temporarily closed the road due to dangerous, unstable conditions for vehicle passage in this area.

No previous mine reclamation or safeguarding measures have been completed in the Project Area.

2.2 Project Description

The Proposed Action is designed to investigate and repair areas adjacent to County Road A-25 where subsidence features (tension cracks) have been identified along a section of the road. Geotechnical drilling will be performed to characterize subsurface conditions to determine if the subsidence is related to underground mine workings. The scope of work also includes safeguarding of other related hazardous mine openings and features identified throughout the Project Area (Figure 3), while allowing for open access and continued use of the mine features by smaller wildlife species, including bats. The following safeguarding measures are being evaluated for implementation in priority areas:

- *County Road A-25:* Geotechnical exploration and backfilling through drilling and injection of a water, sand and cement grout mixture are proposed to mitigate subsidence impacting the road. Grout would be injected into the voids beneath and adjacent to the A-25 alignment. The grouting work may take place concurrently with the drilling investigation. The goal of drilling and grouting the County Road A-25 subsidence features is to map the voids under and near the road alignment and to fill those voids with grout to stop additional subsidence in the area and stabilize the road. The drill holes would be spaced every 30 feet along the A-25 alignment, with an increased drilling density of every 20 feet around the existing subsidence features (Trihydro, 2023).
- *Gates:* Gates would be installed over mine shafts and in mine adits or portals, as well as in other mine entryways where gates are determined to be the best method for blocking access to mine features. The gates would be designed in accordance with the latest industry standards and would be modified as necessary to fit the specific entryway, occasionally using steel culverts to support the gate. The basic gate design generally used consists of a vertical to horizontally placed flat grid of welded steel cross bars anchored in place over the mine entryway. The cross bars are oriented horizontally and welded onto vertical supports spaced widely. Spacing of the horizontal cross bars would be 6 inches, designed to allow passage of bats in flight, as well as access for other small mammals and for birds, but not spaced widely enough to allow human entry. Gates are typically constructed of 2-inch by 4-inch and 2-inch-square tubular weathering steel that is anchored into the surrounding rock using 1-inch steel rods. Gates are designed to not inhibit air flow into or out of the mine feature and constructed of angled steel oriented with the apex up to maximize the airflow through the gate (Fant et al., 2009; BCI, 2021).

The gates would be installed at all features identified for closure and surveyed by Bat Conservation International (BCI) and following recommendations provided in BCI's 2021 report conducted for the Project Area (BCI, 2021). Additional features may also be identified for safeguarding based on the results of an extensive cultural resources survey completed for the Project Area (Okun, 2023). Construction timing would be in accordance with the recommendations of the BCI report and any recommendations resulting from surveys of the Project Area performed for this BA/BE. Pre-construction wildlife surveys will also be performed as necessary prior to any destructive closures or the installation of safeguarding measures to inspect for wildlife usage of features prior to closure. In addition, on some adit and shaft openings within the open stopes of the Project Area, gates constructed and anchored as described above would be installed.

- *Rock/concrete bulkhead with culvert gate:* At some locations, gates would consist of a bulkhead constructed of a 2- to 4-foot-thick section of rocks cemented together with concrete. A 3- to 4-foot steel culvert with a steel gate would be constructed inside.
- *Cupolas:* Cupolas are a type of gate designed to fit over a vertical mine shaft. Bat-friendly cupolas may be installed over mine shafts if determined to be an appropriate measure for safeguarding a feature in the Project Area. Locations and construction timing would be in accordance with the recommendations of the bat report by BCI (2021) and based on pre-construction surveys of wildlife usage of features.
- *Backfill:* Mine openings may be backfilled with adjacent coal gob or waste rock piles.
- *Other structural closures:* Polyurethane foam (PUF) plugs, gated culverts, and other structures may be used to safeguard mine openings.
- *Coal Gob Pile Reclamation:* Stabilization of steep slopes on coal gob piles to prevent mine waste from entering adjacent ephemeral channels. Proposed work may include in situ burial of coal gob or the establishment of vegetation and installation of various erosion control structures on the gob piles as necessary to facilitate effective stormwater management.

The Proposed Project ground disturbance footprint would be focused on the identified hazardous mine features throughout the Project Area (Figure 3). Colfax County Roads A-25 and A-26 would serve as the main access roads, along with former two-track, unpaved mine roads that would serve as access for geotechnical drilling activities and to access other areas situated away from the county roads. Existing disturbed and flat areas adjacent to the road may also be

used for geotechnical drilling activities and staging of drilling, construction equipment and materials.

Implementation of the Proposed Action is anticipated to begin in spring 2024.

3. Action Area

50 CFR 402 establishes the procedural regulations governing interagency cooperation under Section 7 of the ESA. For species listed under the ESA, the impact analysis must be conducted within the so-called Action Area, defined as all areas that may be affected directly or indirectly by the Proposed Action. This report provides analyses of the environmental baseline and likely impacts from the Proposed Action in the Action Area.

The delineation of the Action Area for this project is primarily based on expected noise from construction. The Action Area includes an approximate 200-foot buffer around the project area where ground disturbance would occur.

4. Environmental Baseline

On October 6 and 7, 2022, three DBS&A biologists conducted a pedestrian survey for mapping and documentation of ecosystem types and sensitive resources (e.g., wetlands) in the Project Area (Figure 4); as well as evaluating habitat for federal and state listed or proposed species. The survey was conducted with a special focus on mine features and the surrounding habitat within the 580-acre Yankee Canyon Project Area. The Project Area boundaries provided by the AML Program were used for general orientation. Prior to the biological survey, old mining roads were mapped using filtering features on a geographic information system (GIS) mapping program and were used for pedestrian access. County Road A-25 divides the northern and southern parcels and the road was used to access the historical mine roads. Fieldwork consisted of the following specific tasks:

- A general botanical survey with an inventory of important or sensitive plant species or plant communities (e.g., milkweed colonies)
- Documentation and mapping of noxious weed infestations

- Documentation of all evidence (e.g., nests) of fauna or observed fauna (including raptors and statutory migratory birds) encountered during fieldwork (notes and photographs)
- Evaluation of habitat types and wildlife corridors to determine the potential for special-status species to occur locally.

Surrounding areas within line of sight were visually inspected using binoculars for the presence of birds, their nests, or past signs of use (e.g., whitewash) within a 200-foot buffer of mine features within the Project Area. Photographs taken during the field survey are provided in Appendix A.

4.1 Soils and Topography

The Project Area lies along the east and south-facing slopes below Horse Mesa at elevations that range from approximately 8,100 feet above mean sea level (feet msl) to 7,150 feet msl. The slopes are generally steep and rugged. The area is within unconsolidated landslide deposits and colluvium.

Soils other than the mined areas are almost exclusively Aridic Argiustolls-Rock outcrop association, and are found on the side slopes of mesas at elevations from 6,000 to 10,500 feet msl (NRCS, 2022) (Figure 5). Aridic Argiustoll, approximately 80 percent of the association, is a colluvium derived from igneous and sedimentary rock and/or residuum weathered from igneous and sedimentary rock. The typical profile consists of very flaggy loam from 0 to 23 inches and very flaggy clay loam from 23 to 40 inches, with clay loam beyond.

4.2 Groundwater

Groundwater levels around the area of the Proposed Action will generally match the topography, ranging from a shallow depth at the tributaries to Yankee Canyon to depths of several hundred feet outside of the drainages on the slopes and up to the top of Horse Mesa. Regional groundwater flow is to the southeast toward the East Fork of Chicorica Creek, the main east to west creek in Yankee Canyon and paralleling NM Highway 72.

4.3 Surface Water

No surface waters, wetlands, or wet riparian areas were observed within the Project Area, with the exception of a small 3-foot by 6-foot area. A pipe that protrudes from the canyon slope of the drainage in the southern parcel of the Proposed Action was observed to be dripping, and

has created a wet area with a very small amount of surface water and mud that flows to the bottom of the drainage, a distance of approximately 30 feet. Seasonally saturated substrates are present in the Project Area (USFWS, 2023a) and, based on the biological survey, there are ephemeral drainages that carry stormwater runoff from the mesa top to the main tributary of the East Fork of Chicorica Creek in Yankee Canyon below.

4.4 Vegetation Communities

The Proposed Action is located on the eastern and southeastern slopes and associated ephemeral drainages of Horse Mesa. The most prevalent ecoregion overlapping the mesa slopes is classified as Rocky Mountain Gambel Oak-Mixed Montane Shrubland (USGS, 2004) (Figure 4). This ecological system occurs in the mountains, plateaus and foothills of the southern Rocky Mountains and Colorado Plateau. These shrublands are most commonly found along dry foothills, lower mountain slopes, and at the edge of the western Great Plains from 6,560 to 9,510 feet msl, and are often situated above pinyon-juniper woodlands. Substrates are variable and include soil types ranging from calcareous, heavy, fine-grained loams to sandy loams, gravelly loams, clay loams, deep alluvial sand, or coarse gravel. The vegetation is typically dominated by Gambel's oak alone or codominant with western serviceberry (*Amelanchier alnifolia*), Utah serviceberry (*Amelanchier utahensis*), big sagebrush (*Artemisia tridentate*), mountain mahogany (*Cercocarpus montanus*), chokecherry (*Prunus virginiana*), Stansbury cliffrose (*Purshia stansburiana*), bitterbrush (*Purshia tridentate*), New Mexico locust (*Robinia neomexicana*), mountain snowberry (*Symphoricarpos oreophilus*), or roundleaf snowberry (*Symphoricarpos rotundifolius*). There may be inclusions of other mesic montane shrublands with Gambel's oak absent or as a relatively minor component. This ecological system intergrades with lower montane-foothills shrubland systems and shares many of the same site characteristics. Density and cover of Gambel's oak and serviceberry species often increase after fire (NatureServe, 2022).

Scattered throughout the area is Southern Rocky Mountain Ponderosa Pine Woodland, primarily on the less prevalent north-facing aspects of the area. This ecoregion is a widespread foothill and montane forest, woodland and savanna group that typically occurs at the lower treeline, with grasslands or shrublands below and relatively mesic forests above. Sites are typically warm, dry, and exposed, ranging from 5,580 to 9,515 feet msl extending down to 5,000 feet msl in its northern extent. Stands occur on a variety of landforms including bottomlands, elevated plains, cinder cones, piedmont slopes, mesas, foothills, and mountains. The ecoregion can occur on all slopes and aspects, but if it occurs on south- or west-facing slopes, it is typically only at higher

elevations. This group is dominated by ponderosa pine (*Pinus ponderosa*) with many possible tree canopy associates depending on location, including white fir (*Abies concolor*), juniper (*Juniperus* spp.), pinyon pine (*Pinus edulis*), limber pine (*Pinus flexilis*), quaking aspen (*Populus tremuloides*), and Douglas fir (*Pseudotsuga menziesii*).

Also on north-facing aspects and near the drainages of the southern parcel is Southern Rocky Mountain Montane Subalpine Grassland. This ecosystem is the prevalent classification for the top of Horse Mesa; however, there are reaches that extend into the Project Area. This ecosystem typically occurs between 7,217 and 9,842 feet msl on flat to rolling plains and parks or on lower side slopes that are dry, but it may extend up to 10,990 feet msl on warm aspects. An occurrence usually consists of a mosaic of two or three plant associations with one of the following dominant bunchgrasses: oatgrass (*Danthonia intermedia*), Parry's oatgrass (*Danthonia parryi*), Idaho fescue (*Festuca idahoensis*), Arizona fescue (*Festuca arizonica*), Thurber's fescue (*Festuca thurberi*), and Muhly (*Muhlenbergia filiculmis*). The subdominants include blue grama (*Bouteloua gracilis*) and pine bluegrass (*Poa secunda*). These large-patch grasslands are intermixed with matrix stands of spruce-fir, lodgepole pine, ponderosa pine, and aspen forests (NatureServe, 2022).

A few scattered reaches, primarily in the lower elevations of the area, consist of Southern Rocky Mountain Pinyon Juniper Woodland. This pinyon-juniper woodland group occurs in the southern Rocky Mountains on dry mountains and foothills primarily in southern Colorado east of the Continental Divide, and is characterized by pinyon pine that dominates or co-dominates the tree canopy with one-seed juniper (*Juniperus monosperma*).

The vegetation communities of the Project Area have been altered by the Track Fire that burned through the area in 2011. Much of the region that was formerly a mosaic of ponderosa pine, mixed conifer forest and oak shrubland is now covered almost exclusively by Gambel's oak shrub on the side slopes of the mesa. Mixed conifer forest persists only in pockets and in the two large drainages of the area that were largely unaffected by the fire. In addition to Gambel's oak, New Mexico locust is common throughout the burned area, as is mountain mahogany.

During the biological survey, riparian vegetation was observed in the bottom of the main canyon bisecting the southern portion of the Project Area. That vegetation was dominated in places by narrowleaf cottonwood (*Populus angustifolia*), Rocky Mountain maple (*Acer glabrum*), and New Mexico locust.

A list of plants recorded during the biological survey is provided in Table 1. No plants on the lists of sensitive species were observed during the site survey (NMEMNRD, 2022; NMRPTC, 2022).

4.5 Noxious Weeds

The U.S. Department of Agriculture's (USDA's) most updated federal noxious weed list, the 2016 New Mexico noxious weed list (Class A, Class B, and Class C species) (NMDA, 2016), and watch lists were all reviewed to determine the current status of noxious weeds and their potential for local occurrence.

Noxious weeds were observed during the biological survey on October 6 and 7, 2022. One Siberian elm (*Ulmus pumila*), a Class C species, was observed at a gob pile at the southern end of the northern parcel. The elm was in an area that could have safety measures taken as part of the Proposed Action.

4.6 Wildlife

The Project Area and Action Area harbor species adapted to higher elevation montane and oak shrubland habitats. Table 2 lists all of the species recorded during the October 6 and 7, 2022 biological survey.

The following subsections describe species known to be present and/or observed during the field survey.

4.6.1 Invertebrates

Among the invertebrates documented during the survey were a lubber grasshopper (*Romalea* sp.), clouded sulphur butterfly (*Colias philodice*), and blue fungus beetle (*Cypherotylus californicus*).

4.6.2 Fish

There were no surface waters (and therefore no fish) within the Project Area.

4.6.3 Amphibians and Reptiles

No amphibians were recorded in the Project Area, but reptiles were observed including the prairie lizard (*Sceloporus undulatus*) and short-horned lizard (*Phrynosoma douglash*).

4.6.4 Birds

A total of 20 bird species were documented during the survey. Townsend's solitaires (*Myadestes townsendi*), spotted towhees (*Pipilo maculatus*), and American robins (*Turdus migratorius*) were commonly heard or seen throughout the survey area. Other common birds in the area included the common raven (*Corvus corax*), Woodhouse's scrub jay (*Aphelocoma woodhouseii*), Steller's jay (*Cyanocitta stelleri macrolopha*), mountain chickadee (*Poecile gambeli*) and black-capped chickadee (*Poecile atricapillus*).

4.6.5 Mammals

Evidence of mule deer (*Odocoileus hemionus),* elk (*Cervus canadensis nelsoni*), and black bear (*Ursus americanus*) presence was observed throughout the Project Area. Other mammals including northern pocket gopher (*Thomomys talpoides*) and domestic cow (*Bos taurus*) appeared to be common throughout the area as evidenced by burrows, tracks, or scat. A rock squirrel (*Otospermophilus variegatus*) was observed in the bottom of the main canyon near a dirt access road in an area where dumped trash was noted. It appeared that many of the larger mammals such as black bears, cows, and elk use the network of old mining roads that lead to local gob piles. These roads likely enable larger mammals to travel more easily by avoiding the dense oak brush that cover the slopes.

The AML Program commissioned a separate survey conducted in mines of Yankee Canyon to assess bat habitat and provide closure recommendations. The survey conducted by BCI resulted in bat surveys on two distinct features comprising two openings to the surface (BCI, 2021). Three hibernating Townsend's big-eared bats (*Corynorhinus townsendii*) were observed in Yankee Adit 1, located in the southern portion of the northern parcel (BCI, 2021). BCI will complete a second bat survey prior to construction, likely in January/February 2024.

5. Species/Critical Habitat Considered

This section evaluates the potential for listed and proposed species to occur in the Project Area or Action Area and be affected by the Proposed Action. For federally listed species, the Information, Planning, and Consultation System (IPaC) planning tool from the USFWS (New Mexico) was used to obtain information on biological resources of the area (USFWS, 2023b) (Appendix B). The state (animal) species list was obtained for Colfax County from the New Mexico Department of Game and Fish (NMDGF) Biota Information System of New Mexico

(BISON-M) website (NMDGF, 2022) (Appendix B). The project was also submitted to the New Mexico Environmental Review Tool (NMERT), a tool used for conservation planning and review of important resources for wildlife and habitats (NMERT, 2022). The state endangered plant species list for Colfax County was obtained from the NMEMNRD and the New Mexico Rare Plants Database.

5.1 Federal Threatened and Endangered Species

The IPaC report obtained for this project lists a total of 6 federally listed (threatened and endangered), proposed, and candidate species, with no designated or proposed critical habitat for the Project Area (USFWS, 2023b) (Appendix B). Though not included in the IPaC report, the tricolored bat was added to the list of species to consider for review of impacts based on the letter from the USFWS dated September 5, 2023 (MacPhee, 2023).

Of the 6 species listed in the IPaC report, all are unlikely to occur in the Project Area. Table 3 contains habitat descriptions for all 6 federally listed species and determination on their potential for occurrence in the Project Area and/or Action Area. No effect determination and no Section 7 consultation are needed for these species. Additional information on the tricolored bat is provided below, together with an analysis of potential impacts, an effects determination, and recommended mitigation measures.

5.2 State-Listed and other Special-Status Species

The list of Colfax County's state threatened or endangered species was also reviewed as part of this evaluation (Appendix C). It consists of 2 fish, 2 mollusks, 11 birds, and 3 mammals, for a total of 18 species. Table 4 provides habitat descriptions for these species and an assessment of their potential for occurrence in the Project Area. None of the 18 species are likely to occur in the Project Area.

No state-listed species were observed during the biological survey on October 6 and 7, 2022 (Table 2).

Important plant areas (IPAs) are specific places in New Mexico that support either a high diversity of sensitive plant species or are the last remaining locations of the state's most endangered plants (NMEMRND, 2017). IPAs and their biodiversity rank were reviewed for the project footprint, and it was determined that there are no IPAs present in the region of Yankee Canyon (NMEMRND, 2017). The nearest IPA is a narrow band of land of approximately

3,621 acres that reaches from Raton east to Sugarite Canyon, beyond the Project Area to the west, and is associated with the Spiny Aster (*Eurybia horrida*).

No state endangered plant species are located within Colfax County (NMEMNRD, 2023) (Table 4). In addition to reviewing state-listed species, DBS&A reviewed the New Mexico Rare Plant Conservation Scorecard (scorecard) for the Project Area. The scorecard provides an analysis of the current conservation status of the 235 strategy rare plants, including threats, degree of protection, and actions needed to conserve species (management actions, inventories, monitoring, taxonomic work, etc.) (NMNHP, 2022). Two rare plant species, New Mexico stickseed (*Hackelia hirsuta*) and spiny aster (*Eurybia horrida*) were determined as having a low potential to occur in the Project Area. New Mexico stickseed is found on dry sites of shaley or igneous soils in lower to upper montane coniferous forest, usually with Gambel oak at 7,700 to 10,200 feet msl. The species often occupies roadcuts or excavations that expose mineral soils. It is not significantly threatened by common land uses within its habitat (NMRP, 2022). The spiny aster is found on sandy shales on mountain and canyon slopes, from upper montane conifer forest down to juniper savanna, often associated with oak scrub at elevations ranging from 4,100 to 10,700 feet msl. This species shows ecological adaptability as it occurs on both dry, south-facing slopes in high mountains and shaded, north-facing slopes at low elevations. This plant is sporadically distributed, but not infrequent within the Canadian River Basin of New Mexico (NMRP, 2022). Table 4 lists Colfax County's state endangered and New Mexico rare plant species, together with a description of their habitats and their potential for occurrence in the Project Area.

Table 1 provides a list of all plant species observed during the biological survey. No special-status species were observed during the biological survey on October 6 and 7, 2022.

6. Listed Species and Critical Habitat Analysis

6.1 Species Listings

This section evaluates the potential for listed or proposed species to occur in the Project Area or Action Area and potentially be affected by the Proposed Action. The IPaC planning tool from the USFWS (New Mexico) was used to obtain information on biological resources of the area (Appendix B). The NMDGF list of state-listed species for Colfax County as accessed from the Biota Information System of New Mexico (BISON-M) website was also reviewed as part of the evaluation (Appendix C). In addition, the New Mexico state endangered plant list (NMEMNRD,

2023) and the USDA noxious weed list (NRCS, 2022) were obtained online and reviewed. Recommendations from the tool are incorporated as appropriate. The following subsections summarize the results of these queries.

6.1.1 U.S. Fish and Wildlife Service

The IPaC report obtained for this project listed a total of 6 federal threatened, endangered, or proposed species, with no designated critical habitat within the Project Area. As previously stated, the tricolored bat was added to the list of species to evaluate.

6.1.2 New Mexico Department of Game and Fish

The list of state-listed species in Colfax County was obtained from the NMDGF website (NMDGF, 2022). A total of 18 state endangered or threatened species have the potential to occur in Colfax County, New Mexico (Appendix C).

6.1.3 New Mexico Endangered Plants

The New Mexico state endangered plant list was reviewed for Colfax County (NMEMNR, 2022). No state endangered plants are listed for the county. In addition, the list of rare plant species in Colfax County was obtained from the NMRPTC website (NMRPTC, 2022). A total of 10 (including state endangered) rare plant species have the potential to occur in the county. Two rare plant species were determined to have a low potential to occur in the Project Area; however, neither one was observed during the biological survey.

6.2 Critical Habitat Analysis

The Project Area was determined to not be located within any designated or proposed critical habitat (USFWS, 2023b). The nearest critical habitat is for the New Mexico meadow jumping mouse (*Zapus hudsonius luteus*), located within Sugarite Canyon, approximately 2.5 miles west of the Proposed Action.

6.3 Listed Species Eliminated from Further Consideration

Table 3 summarizes the findings for federally listed species that have been removed from further evaluation because suitable habitat is not present within the Project Area and Action Area. Table 4 summarizes the findings for state-listed species that have been removed from further evaluation because suitable habitat is not present within the Project Area.

6.4 Tricolored Bat (*Perimyotis subflavus*)

6.4.1 Species Status/Threats

Also called the eastern pipistrelle, the tricolored bat has experienced widespread, drastic population declines during the last three decades in areas where white-nose syndrome (WNS) is affecting cave dwelling bat species (McCoshum et al., 2023). On September 14, 2022, the USFWS issued a proposed rule for the listing of the species as endangered under the ESA (USFWS 2022). In the proposed rule, the USFWS also indicated that designating critical habitat for this species is not prudent. The tricolored bat occurs in eastern North America south to Nicaragua (McCoshum et al., 2023). At the western edge of its distribution, the species has been found in central Colorado, eastern New Mexico, and southeastern Wyoming (Geluso et al., 2005; McCoshum, 2023).

6.4.2 Habitat Use and Condition

During the summer, tri-colored bats are found in woodlands, where they have their maternity colonies and roost in trees (McCoshum et al., 2023). In Arkansas, all observed roosts were in tree canopies, not trunks, with half of females roosting in pine trees. Large trees and non-linear openings may be important summer habitat features. Winter habitat includes caves, crevices, mines, bridges, buildings, and culverts (McCoshum, 2023).

6.4.3 Habitat Remaining in Project Area or Action Area

Bat surveys of two mine openings in the Project Area resulted in the detection of three hibernating Townsend's big-eared bats in Yankee Adit 1, located in the southern portion of the northern parcel (BCI, 2021). No tricolored bats were observed during the survey conducted in 2019. However, tricolored bats have been documented roosting in northern New Mexico in semi-forested areas similar to the Project Area (MacPhee, 2023).

6.4.4 Direct, Indirect, Interrelated, and Interdependent Effects to Species and Critical Habitat

Tricolored bats were not found to use mine openings surveyed by BCI in 2019 (BCI, 2021). To the extent that the tricolored bat is present in the Project Area, it would be expected to use tree roosts, and the likelihood of effects on summer roosting habitat from the actions of the proposed project are negligible to non-existent (i.e., discountable), with the magnitude of such impacts insignificant, as there would be minimal to no disturbance to any live trees. As an extra

level of precaution, AML will nonetheless avoid any project-related actions during the summer maternity season.

6.4.5 Cumulative Effects to Species

No cumulative effects on the tricolored bat are anticipated. No follow-up actions are planned by the AML Program beyond the completion of the proposed project. Subsequent activities in the Project Area could include road maintenance or the installation of new signage, neither of which would be expected to impact the species.

6.4.6 Recommended Mitigation

To minimize any risk of disturbance to the tricolored bat, the project would not be implemented during the summer. Disturbance of live trees will be minimal. No large tree will be removed.

6.4.7 Finding (Proposed Species Effect Determination)

_____ No effect

__X__ May affect, is not likely to jeopardize

_____ May affect, is likely to jeopardize

6.5 Other Wildlife

The NMDGF Environmental Review Tool (ERT) was used by defining the project scope and the Project Area to generate a report for recommendations by the NMDGF (NMDGF, 2022). The ERT provides an initial list of recommendations regarding potential impacts to wildlife or wildlife habitats from the proposed project, and is a preliminary environmental screening assessment tool only, used in conjunction with findings from the biological survey and other evaluation tools. The ERT stated the following:

> [The] proposed project occurs within an area where springs or other important natural water features occur. This may result in the presence of a high use area for wildlife relative to the surrounding landscape. To ensure continued function of these important wildlife habitats, [the] project should consider measures to avoid the following.
>
> - Altering surface or groundwater flow or hydrology,
> - Disturbance to soil that modifies geomorphic properties or facilitates invasion of non-native vegetation. Affecting local surface or groundwater quality.

Creating disturbance to wildlife utilizing these water features. Disturbance to wildlife can be reduced through practices including clustering infrastructure and activity wherever possible, avoiding large visual obstructions around water features, and limiting nighttime project operations or activities.

[The] project occurs within important habitats for wildlife, which could include fawning/calving or wintering areas for species such as deer and elk, or high wildlife movement and activity areas. Management recommendations within these areas may include the following.

- Restrictions on noise-generating activities between December 1 and April 15. These activities would include oil and gas well pad development and operation that exposes wildlife to noises loud noises (at or above 48.6 dB(A) Leq at 400 feet in any direction from the source) from drilling, compressors, and pumping stations.
- Modifying fences along high use areas to make them wildlife friendly and facilitate large animal movement.
- Taking mitigation actions to reduce wildlife-vehicle collisions at high risk locations.

Short-term direct impacts to wildlife in the Project Area would include noise and ground disturbance during construction; however, no loud noise would occur above 48.6 dB(A), 400 feet from the source. No long-term noise impacts are anticipated.

There was a small area of surface water observed during the survey. It was not determined whether it was a natural spring or sourcing from an adit. This area could be temporarily impacted by noise or nearby ground disturbance during construction; however, no long-term impact to any surface water would occur from the project.

Construction activities would likely result in the direct loss of some smaller, less-mobile species of wildlife, such as small mammals and reptiles, and displacement of more mobile species to adjacent undisturbed habitats until construction activities are completed. The most common wildlife responses to noise and the presence of construction equipment and human presence are avoidance or accommodation. Avoidance would result in displacement of animals from an area larger than the actual disturbance area. Overall, avoidance of the Project Area would be relatively short-term and would cease soon after completion of construction activities.

It is very likely that at least some of the adits and other mine features are used by wildlife such as bears in the Project Area. A thorough survey of these mine features would be conducted prior to any disturbance, such as gating of adit openings, in order to ensure that no bears or any other wildlife would be impacted by safeguarding measures. The former mine roads would

likely be used for access during construction, and temporary disturbance would occur for wildlife that use the roads.

No long-term detrimental impacts to wildlife are anticipated. Adits that may have been used by denning bears would no longer be accessible; however, there are other natural features throughout the Project Area (trees, large boulders) that could be used for purposes such as denning. The mining roads that exist throughout the Project Area would largely remain in place following construction activities, allowing for wildlife passage corridors to continue.

6.6 Plants

No federally endangered or threatened plant species are listed for the Project Area within Colfax County. No plants are listed as state endangered for Colfax County.

A total of 10 rare plant species have the potential to occur in the Colfax County. Of these, 2 rare plant species were determined to have a low potential to occur in the Project Area: spiny aster (*Eurybia horrida*) and New Mexico stickseed (*Hackelia hirsuta*) (Table 4).

The Project Area contains soils that are very flaggy loam to very flaggy clay loam on steep, 20 to 40 percent slopes. The parent material is colluvium derived from igneous and sedimentary rock and/or residuum weathered from igneous and sedimentary rock. The biological survey focused especially on areas of proposed disturbance around mine features; the two species were not observed (Table 2).

None of these plant species should be impacted by the Proposed Action even if they were to occur in the Project Area. The biological survey focused especially on areas of proposed disturbance around mine features, and none of these species were documented.

6.7 Cumulative Effects Analysis

As defined under the ESA, "cumulative effects" encompass only effects of future state or private activities reasonably certain to occur within the Project Area. After completion of the Proposed Action, planned future actions may include activities conducted by the County. These activities could include road maintenance or the installation of new signage, neither of which would be expected to impact local plants and wildlife. No additional actions by the AML Program are planned and no cumulative effects to any listed resources are anticipated.

7. Conservation Measures

Although formal consultation or conference under Section 7 of the ESA is not necessary for the Proposed Action, some conservation measures are recommended to minimize any impacts on wildlife and plants of the Project Area. The following actions, some of which were recommended by the NMDGF in its review of the draft Yankee Canyon EA (Wunder, 2023), are incorporated into the design of the proposed action:

- The existing roads and trails in the Project Area would be used as primary access for all vehicles.
- Secondary access would be limited to the extent possible. Once construction is completed, the disturbed areas would be reseeded with native grass and forb species.
- Existing disturbed and flat areas would be used for construction staging of all equipment and materials. The staging areas would be located on or adjacent to the existing roads and trails.
- Surveys for wildlife usage of mine features such as adits would be conducted prior to installation of safeguarding measures.
- In the unlikely event that large tree removal is necessary, the USFWS would be notified and a bat survey would be conducted by BCI.
- If construction activities take place during the migratory bird nesting season, a nesting survey of the Project Area will be conducted prior to the commencement of construction. Any active nests found will be flagged for avoidance during construction activities.
- For post-construction reclamation of the coal gob waste pile sites, the AML Program will use only native plant species with a seed mix designed to enhance local pollinator habitat. Only certified weed-free seed will be used to avoid inadvertently introducing non-native species to the reclamation site. Any alternate seeds used to substitute for primary plant species that are unavailable at the time of reclamation will also be native. If possible, seeds will be sourced from the general Yankee Canyon area to represent potential future climatic conditions at the site.

The NMDGF (Wunder, 2023) has also indicated it is available to consult on the possible design and installation of an appropriate wildlife drinker tank where a dripping pipe had created a wet area with surface water and mud flowing to the bottom of the drainage.

8. Conclusions

The Proposed Action is designed to safeguard dangerous mine features located within the Yankee Canyon Mining District. Conservation measures such as using bat-friendly gates as safeguarding mine features, using existing roads during construction, and conducting pre-construction nesting surveys will be implemented as part of the project.

A biological survey was conducted on October 6 and 7, 2022 to observe field conditions, assess the likelihood of occurrence of special-status (including federal threatened and endangered) species, and evaluate potential impacts.

There is no critical habitat within the Project Area, as noted in the USFWS IPaC report generated for this project (Appendix B). This evaluation finds that the project will have no effect on critical habitat.

The tricolored bat has been proposed for listing as endangered under the ESA. The species has the potential to occur in the Project Area, as it has been recorded in New Mexico and is known to inhabit woodlands during the summer. Because the proposed project will have a footprint limited almost exclusively to segments of the county road, secondary access roads, adits, and gob piles, and will not involve tree removal, no measurable or significant impact from the proposed project is anticipated. Written concurrence from USFWS is needed.

No state-listed species were determined to have the potential to occur within the Action Area or Project Area. No impact to state-listed species is anticipated as a result of the project.

The work will temporarily disturb vegetation, as well as animal species and their habitats, within the Project Area.

Project impacts to non-listed species would include temporary noise impacts, as well as vegetation (but not tree) removal, elimination of burrows and potential nest sites, and ground disturbance. However, if construction is timed outside of the nesting season, project impacts would be negligible.

Humans can spread the fungus that causes White-Nose Syndrome from one hibernaculum to another by accidentally carrying the fungus on shoes, clothing, or gear. Reduced human access to any of the mine features that harbor or could harbor bats in the future is an anticipated benefit of the Proposed Action.

With conservation measures implemented, the project impacts listed above would likely be negligible.

9. Contacts Made

No formal ESA Section 7 consultation or conference is necessary for this project. AML and USFWS have initiated informal conference regarding the tricolored bat. Written concurrence by USFWS is needed for the effect determination provided in this BA/BE.

10. Preparers

This BA/BE documents the findings from biological surveys conducted on October 6 and 7, 2022 and potential impacts from the proposed Yankee Canyon Coal Mine Safeguarding Project. This BA/BE was prepared by DBS&A biologists Dr. Jean-Luc Cartron and Julie Kutz.

References

Bat Conservation International (BCI). 2021. *Report on Yankee Canyon abandoned mine bat surveys*. Prepared for the AML Program. November 17-18, 2021.

Cartron, J.L. (ed.). 2010. *Raptors of New Mexico*. University of New Mexico Press.

Cartron, J.-L.E., and J.K. Frey (eds.). In press. *Wild carnivores of New Mexico*. University of New Mexico Press, Albuquerque, New Mexico.

Cary, S.J. and L.S. DeLay. 2016. *Monarch butterfly (Danaus plexippus) in New Mexico and a proposed framework for its conservation*. Natural Resources Institute, Santa Fe, New Mexico.

Fant, J., J. Kennedy, R. Powers Jr., and W. Elliott. 2009. *Agency guide to cave and mine gates, 2009*. Sponsored by American Cave Conservation Association, Bat Conservation International, and Missouri Department of Conservation.

Geluso, K., T.R. Mollhagen, J.M. Tigner, and M.A. Bogan. 2005. Westward expansion of the eastern pipistrelle (*Perimyotis subflavus*) in the United States, including new records from New Mexico, South Dakota, and Texas. *Western North Am. Nat.* 65: 405–409.

MacPhee, N. 2023. E-mail correspondence from Nik MacPhee, U.S. Fish and Wildlife Service, to James Hollen, AML Program. September 5, 2023.

McCoshum, S.M., E.L. Pratt, K.C. Lent, and E.M. Boisen. 2023. Literature review of tri-colored bat natural history with implications to management. *Front. Conserv. Sci.* 4: 1204901. doi: 10.3389/fcosc.2023.1204901.

Natural Resources Conservation Service (NRCS). 2022. *Custom soil resource report for Colfax County, New Mexico*. USDA NRCS online soil report generator Web Soil Survey. <https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>.

NatureServe Explorer (NatureServe). 2022. Ecological system comprehensive report. <http://explorer.natureserve.org/servlet/NatureServe?searchSystemUid=ELEMENT_GLOBAL.2.722878>. Accessed October 2022.

New Mexico Department of Agriculture (NMDA). 2016. New Mexico noxious weed list. <http://aces.nmsu.edu/ces/seedcert/documents/nm-noxious-weed-list.pdf>. May 1, 2019.

New Mexico Energy Minerals and Natural Resources Division (NMEMNRD). 2023. New Mexico State Endangered Plant Species (19.21.2.8 NMAC). List obtained October 2022 and January 4, 2023. <http://www.emnrd.state.nm.us/SFD/ForestMgt/Endangered.html>.

NMEMNRD. 2017. New Mexico Rare Plant Conservation Strategy. Prepared and developed by Daniela Roth and the New Mexico Rare Plant Conservation Strategy Partnership. Santa Fe, New Mexico. <https://nhnm.unm.edu/botany/ nm_rare_plant_conservation_strategy>.

New Mexico Environmental Review Tool (NMERT). 2022. *New Mexico Environmental Review Tool (ERT)—An interactive tool for conservation planning and review of important resources for wildlife and habitats*. <https://nmert.org/home>.

New Mexico Partners in Flight (NMPF). 2007. *New Mexico Bird conservation plan*, version 2.1. <http://avianconservationpartners-nm.org/wp-content/uploads/2017/01/>.

New Mexico Rare Plant Technical Council (NMRPTC). 1999. *New Mexico rare plants. Albuquerque, NM: New Mexico Rare Plants Home Page.* <http://nmrareplants.unm.edu>. Last updated November 2, 2023.

Trihydro. 2023. *New Mexico Abandoned Mine Land Program, County Road A-25 subsidence, Colfax County, New Mexico, Site characterization and mitigation recommendations report*. Prepared for the Abandoned Mine Lands Program. January 10, 2023.

U.S. Fish and Wildlife Service (USFWS). 2022. Proposed rule: Endangered species status for tricolored bat. Federal Register 87(177), Wednesday, September 14, 2022, pp. 56381-93.

USFWS. 2023a. National Wetland Inventory. <http://www.fws.gov/wetlands/data/mapper.html>. Accessed April 5, 2023.

USFWS. 2023b. New Mexico Ecological Services. Information, Planning, and Conservation System (IPaC). Environmental Conservation Online System. Report for Project Area. <http://ecos.fws.gov/ipac/>.

U.S. Geological Survey (USGS). 2004. National Gap Analysis Program, Provisional digital land cover map for the southwestern United States, version 1.0. RS/GIS Laboratory, College of Natural Resources, Utah State University.

Wunder, M. 2023. Memorandum to the AML Program regarding the Yankee Canyon Coal Mine Safeguarding Project, Environmental Assessment, Colfax County, New Mexico. NMDGF Project No. NMERT-2739. September 7, 2003. New Mexico Department of Game and Fish, Santa Fe.

Figures

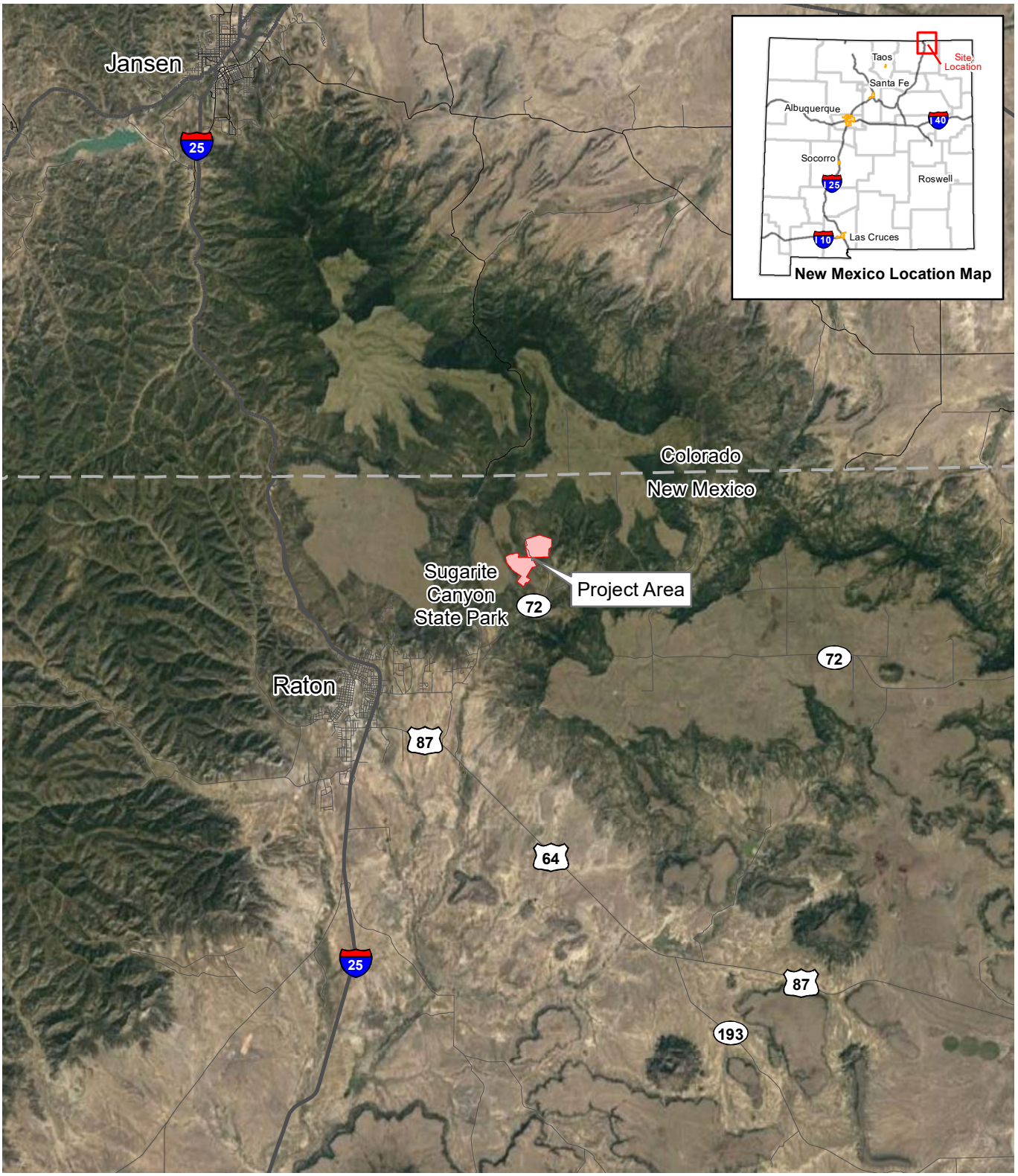

Image source: Google Earth Pro, 5/1/2014

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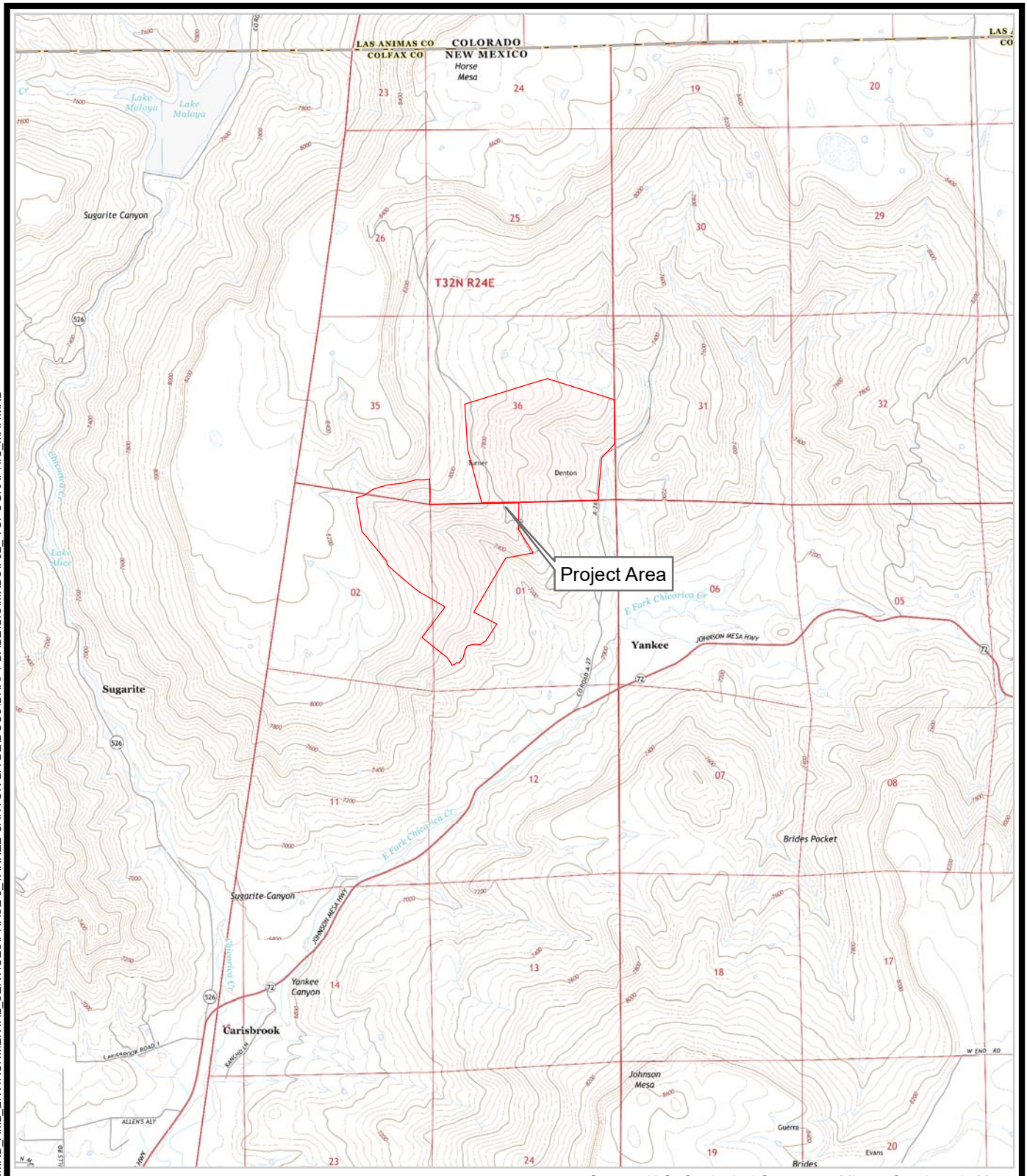
YANKEE CANYON BA-BE
Area Map

Figure 1



Source: U.S. Geological Survey 7.5 Minute Quadrangle Map
NM Raton, NM Yankee
http://rgis.unm.edu/Downloaded 22 Setember 3033

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YANKEE CANYON BA-BE
Topographic Map

Figure 2

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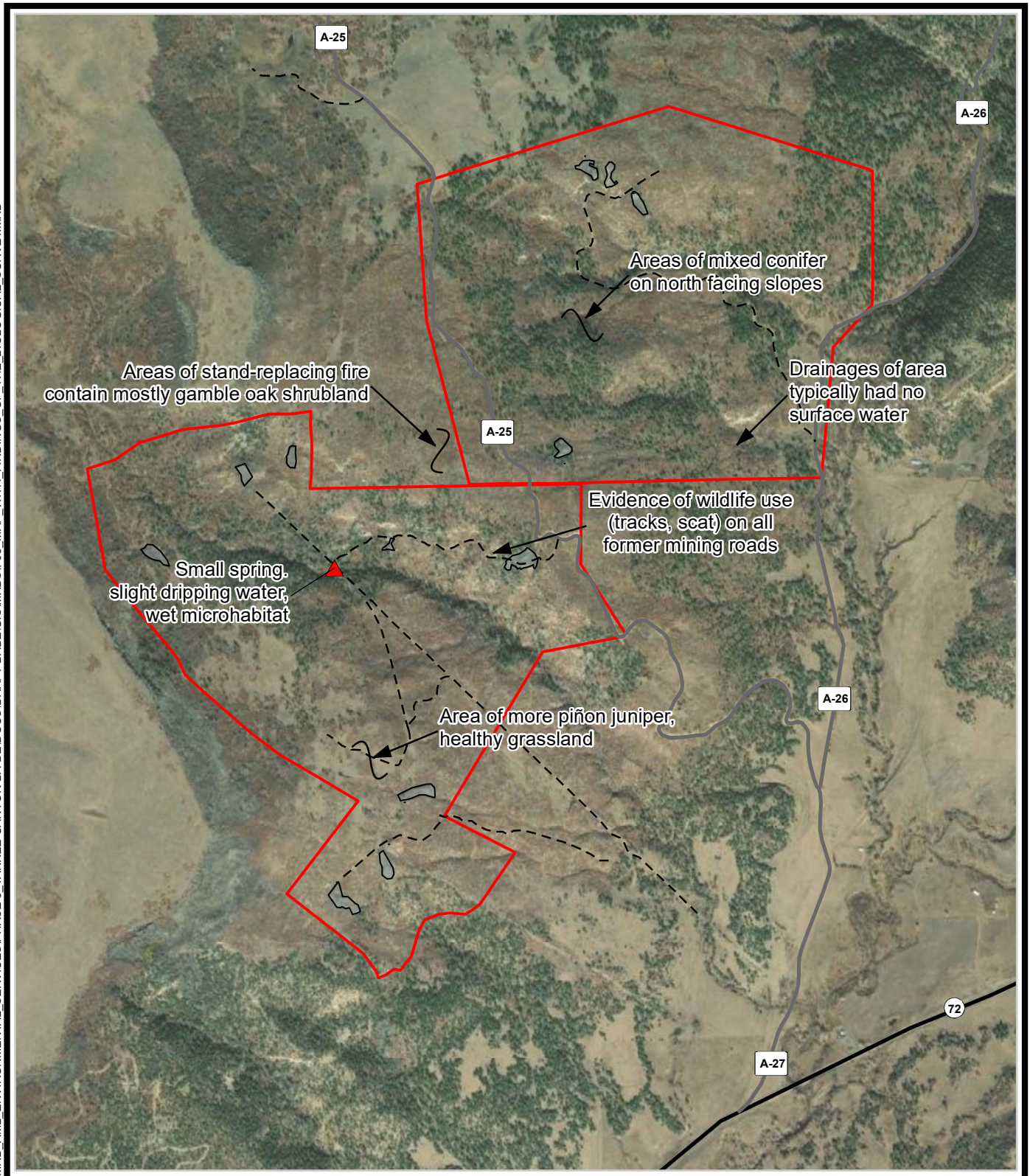

Source: Maxar, Vivid 11/7/2021

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Explanation

- Finding
- Coal gob pile
- Project Area
- Former mining road
- County road
- State road

YANKEE CANYON BA-BE

Map with Findings of the October 6 and 7, 2022 Biological Survey

DBS&A a Geo-Logic Company

1/27/2023 DB21.1363

Figure 3

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N

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Explanation

- Project Area
- 148 - Rocky Mountain Aspen Forest and Woodland
- 151 - Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland
- 155 - Southern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest and Woodland
- 158 - Southern Rocky Mountain Ponderosa Pine Woodland
- 189 - Southern Rocky Mountain Pinyon-Juniper Woodland
- 315 - Southern Rocky Mountain Montane-Subalpine Grassland
- 316 - Rocky Mountain Gambel Oak-Mixed Montane Shrubland
- 326 - Western Great Plains Foothill and Piedmont Grassland
- 557 - Pasture/Hay
- 581 - Developed, Open Space

Landcover source: United States Geological Survey(USGS)
Gap Analysis Project
https://www.usgs.gov/programs/gap-analysis-project
Downloaded 14 October 2022

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1/26/2023 DB21.1363

YANKEE CANYON BA-BE
Vegetation Map

Figure 4

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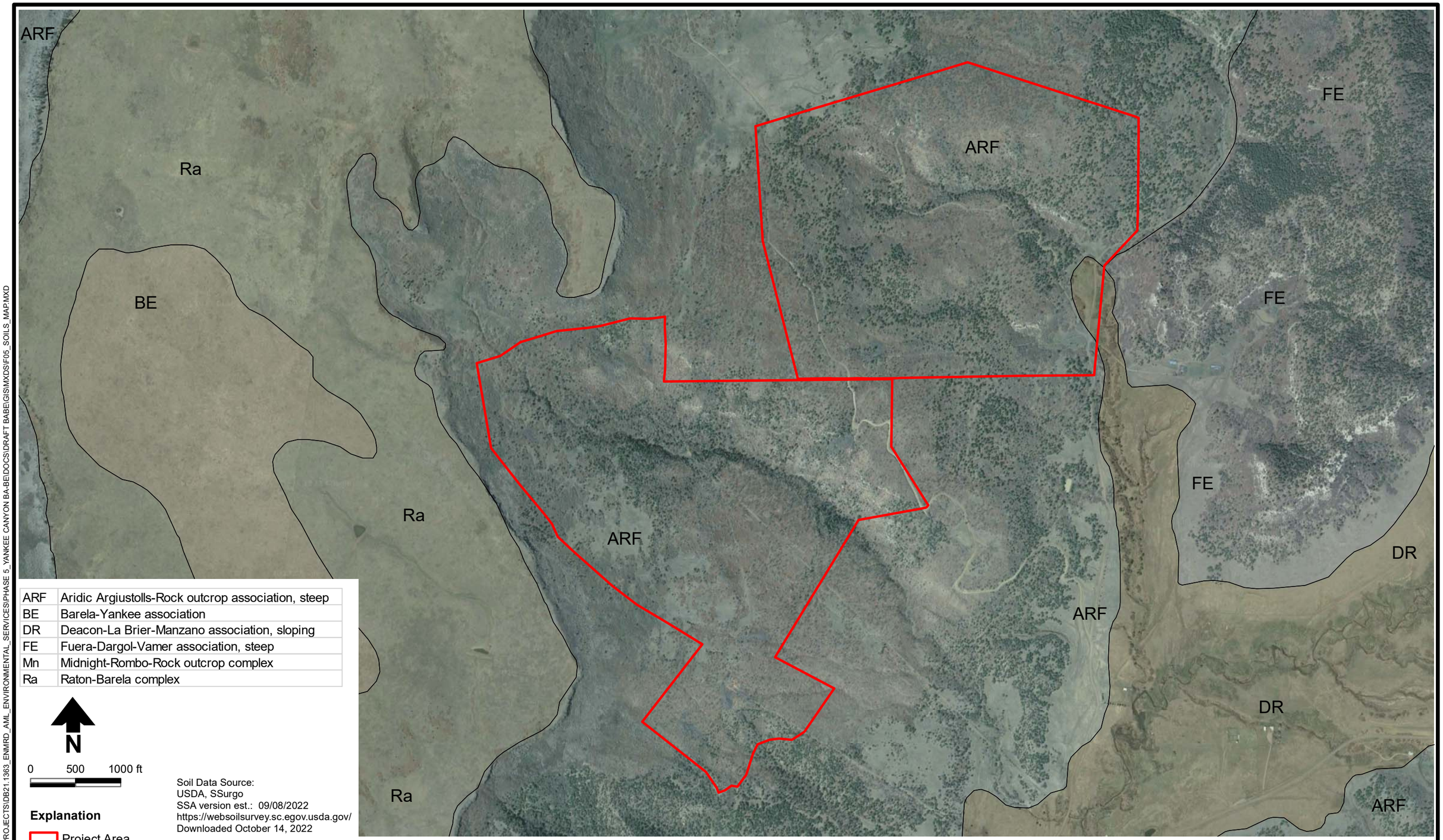

ARF	Aridic Argiustolls-Rock outcrop association, steep
BE	Barela-Yankee association
DR	Deacon-La Brier-Manzano association, sloping
FE	Fuera-Dargol-Vamer association, steep
Mn	Midnight-Rombo-Rock outcrop complex
Ra	Raton-Barela complex

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0 500 1000 ft

Explanation

Project Area

Soil Data Source:
USDA, SSurgo
SSA version est.: 09/08/2022
https://websoilsurvey.sc.egov.usda.gov/
Downloaded October 14, 2022

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1/26/2023 DB21.1363

YANKEE CANYON BA-BE
Soils Map

Figure 5

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Tables

Table 1. Flora Observed During Biological Survey
Page 1 of 4

Family	Common Name/Scientific Name	NM Noxious Weed Class	Abundance/Location
Trees			
Fagaceae	Gambel oak (*Quercus gambelii*)	—	Most abundant plant species in the Project Area. Located throughout, mostly on drier slopes, stand-replacing species in burned areas. Also common as a shrub. Large tree stands in main canyon valley, northern parcel.
Fabaceae	New Mexico locust (*Robina neomexicana*)	—	Abundant. Located throughout; most common in areas with Gambel oak.
Cupressaceae	One-seed juniper (*Juniperus monosperma*)	—	Common, northern and southern parcels, drier slopes.
	Rocky Mountain juniper (*Juniperus scopulorum*)	—	Common throughout, northern and southern parcels.
Pinaceae	Ponderosa pine (*Pinus ponderosa*)	—	Common in unburned areas, uncommon in burned areas throughout northern and southern parcels.
	Douglas fir (*Pseudotsuga menziesii*)	—	Common primarily on steep, unburned slopes of canyons in northern and southern parcels.
	Pinyon pine (*Pinus edulis*)	—	Scattered throughout, primarily on drier slopes, unburned areas.
	Blue spruce (*Picea pungens*)	—	Uncommon, in sheltered canyon bottom, southern parcel.
Ulmaceae	Siberian elm (*Ulmus pumila*)	C	One tree observed at coal pile located at south end of the northern parcel.
Aceraceae	Rocky Mountain maple (*Acer glabrum*)	—	Uncommon, in sheltered canyon bottom, southern parcel.
Salicaceae	Narrowleaf cottonwood (*Populus angustifolia*)	—	Uncommon, in sheltered canyon bottom, upstream of dripping spring in southern parcel.
Shrubs			
Anacardiaceae	Three-leaf sumac (*Rhus trilobata*)	—	Common throughout northern and southern parcels.
Rosaceae	Mountain mahogany (*Cercocarpus ledifolius*)	—	Common throughout northern and southern parcels.
	Wild rose (*Rosa woodsii*)	—	Common in canyons and drainages, both southern and northern parcels.

Table 1. Flora Observed During Biological Survey
Page 2 of 4

Family	Common Name/Scientific Name	NM Noxious Weed Class	Abundance/Location
Shrubs (cont.)			
Fagaceae	Shrub live oak (*Quercus turbinella*)	—	Uncommon, observed in southern parcel.
Chenopodiaceae	Fourwing saltbush (*Atriplex canescens*)	—	Uncommon, one location observed at coal pile in the southern parcel.
Betulaceae	Thinleaf alder (*Alnus incana* ssp. *tenuifolia*)	—	Common in canyons and drainages, both southern and northern parcels.
Caprifoliaceae	Common snowberry (*Symphoricarpos rotundifolius*)	—	Few observed in canyons and drainages, both southern and northern parcels.
Anacardiaceae	Poison ivy (*Toxicodendron rydbergii*)	—	Few observed in canyons and drainages, both southern and northern parcels.
Ranunculaceae	Western red columbine (*Aquilegia elegantula*)	—	Forested slope, northern parcel.
Graminoids			
Poaceae	Blue grama (*Bouteloua gracilis*)	—	Abundant throughout northern and southern parcels.
	Sideoats grama (*Bouteloua curtipendula*)	—	Common throughout northern and southern parcels.
	Scribner's needlegrass (*Achnatherum scribneri*)	—	Common throughout northern and southern parcels.
	Rice grass (*Achnatherum hymenoides*)	—	Uncommon, observed in southern parcel.
	Nodding brome (*Bromus anomalus*)	—	Uncommon, observed in southern parcel.
	Purple three-awn (*Aristida purpurea* var. *longiseta*)	—	Common throughout northern and southern parcels.
	Little bluestem (*Schizachyrium scoparium*)	—	Common throughout northern and southern parcels.

Table 1. Flora Observed During Biological Survey
Page 3 of 4

Family	Common Name/Scientific Name	NM Noxious Weed Class	Abundance/Location
Graminoids (cont.)			
Poaceae (cont.)	Fescue (*Festuca* spp.)	—	Common in forested areas and in canyon bottoms of the northern and southern parcels.
	Western wheatgrass (*Pascopyrum smithii*)	—	Common throughout northern and southern parcels.
	Mountain muhly (*Muhlenbergia montana*)	—	Common throughout northern and southern parcels.
Forbs			
Asteraceae	Hoary aster (*Dieteria canescens*)	—	Uncommon, observed in northern parcel.
	Three-nerved daisy (*Erigeron subtrinervis*)	—	Uncommon, observed in northern parcel.
	Narrow goldenrod (*Solidago simplex*)	—	Uncommon, primarily observed in canyon bottoms southern and northern parcels.
	Snakeweed (*Gutierrezia sarothrae*)	—	Common, scattered throughout northern and southern parcels, drier slopes.
	Gumweed (*Grindelia hirsutula*)	—	Uncommon, northern and southern parcels.
	Wavy-leafed thistle (*Cirsium undulatum*)	—	Observed in one upland area in the northern parcel.
	Prairie sagewort (*Artemisia frigida*)	—	Common, northern and southern parcels.
	Yarrow (*Achillea millefolium*)	—	Common throughout northern and southern parcels.
	Sandsage (*Artemisia filifolia*)	—	Uncommon, drier and disturbed areas, northern and southern parcels.
Liliaceae	Nodding onion (*Allium cernuum*)	—	One location, northern parcel.
	Wild iris (*Iris missouriensis*)	—	Uncommon, canyon bottom, southern parcel.
Convolvulaceae	Field bindweed (*Convolvulus arvensis*)	—	Uncommon, bottom of main valley of Yankee Canyon

Table 1. Flora Observed During Biological Survey
Page 4 of 4

Family	Common Name/Scientific Name	NM Noxious Weed Class	Abundance/Location
Forbs (cont.)			
Fabaceae	Yellow clover (*Melilotus officinalis*)	—	Uncommon, southern parcel.
	Spurred lupine (*Lupinus caudatus* ssp. *argophyllus*)	—	Uncommon, bottom of main valley of Yankee Canyon.
Scrophulariaceae	Woolly mullein (*Verbascum thapsus*)	—	Common throughout northern and southern parcels.
Polygonaceae	James' wild buckwheat (*Eriogonum jamesii*)	—	Common throughout northern and southern parcels.
Amaranthaceae	Lambsquarters (*Chenopodium album*)	—	Uncommon, northern parcel.
Ranunculaceae	Virgin's bower (*Clematis ligusticifolia*)	—	Uncommon, valley bottom, southern parcel.
Lamiaceae	Field mint (*Mentha arvensis*)	—	Uncommon, valley bottom, southern parcel.
Berberidaceae	Creeping Oregon grape (*Mahonia repens*)	—	Uncommon, valleys and forested slopes, northern and southern parcels.
Cyperaceae	Meadow sedge (*Carex microptera*)	—	One location at dripping spring, canyon bottom, southern parcel.
Succulents			
Cactaceae	Plains prickly pear (*Opuntia polyacantha*)	—	Common on drier slopes and meadows, northern and southern parcels.
	Hedgehog (*Echinocereus* spp.)	—	Uncommon, drier meadows, northern and southern parcels.
Agavaceae	Soapweed yucca (*Yucca glauca*)	—	Uncommon, drier, south-facing meadows, southern parcel.
	Banana yucca (*Yucca baccata*)	—	Uncommon, drier, south-facing meadows, southern parcel.

Table 2. Fauna Observed During Biological Survey
Page 1 of 2

Class	Family	Species
Invertebrates	Pieridae	Clouded sulphur butterfly (*Colias philodice*)
	Nymphalidae	Painted lady butterfly (*Vanessa cardui*)
	Romaleidae	lubber grasshopper (*Romalea sp.*)
	Erotylidae	Blue fungus beetle (*Cypherotylus californicus*)
Reptiles	Phrynosomatidae	Prairie lizard (*Sceloporus undulatus*)
		Short-horned lizard (*Phrynosoma douglash*)
Birds	Tyraniidae	Townsend's solitaire (*Myadestes townsendi*)
		Say's phoebe (*Sayornis saya*)
	Turdidae	American robin (*Turdus migratorius*)
		Western bluebird (*Sialia mexicana*)
	Emberizidae	Spotted towhee (*Pipilo maculatus*)
		Dark-eyed junco (*Junco hyemalis*)
	Corvidae	Common raven (*Corvus corax*)
		Woodhouse's scrub jay (*Aphelocoma woodhouseii*)
		Steller's jay (*Cyanocitta stelleri macrolopha*)
		Black-billed magpie (*Pica hudsonia*)
	Fringillidae	Lesser goldfinch (*Spinus psaltria*)
	Aegithalidae	American bushtit (*Psaltriparus minimus*)
	Picidae	Northern flicker (*Colaptes auratus*)
		Downy woodpecker (*Picoides pubescens*)
	Sittidae	White-breasted nuthatch (*Sitta carolinensis*)
	Paridae	Mountain chickadee (*Poecile gambeli*)
		Black-capped chickadee (*Poecile atricapillus*)
	Phasianidae	Wild turkey (*Meleagris gallopavo*)
	Accipitridae	Red-tail hawk (*Buteo jamaicensis*)
		Cooper's hawk (*Accipiter cooperii*)
Mammals	Cervidae	Mule deer (*Odocoileus hemionus)*
		Elk (*Cervus canadensis nelsoni*)
	Canidae	Coyote (*Canis latrans*)
	Sciuridae	Rock squirrel (*Otospermophilus variegatus*)
		Least chipmunk (*Neotamias minimus*)
	Ursidae	Black bear (*Ursus americanus*)

Table 2. Fauna Observed During Biological Survey
Page 2 of 2

Class	Family	Species
Mammals (cont.)	Leporidae	Mountain cottontail (*Sylvilagus nuttallii grangeri*)
	Geomyidae	Northern pocket gopher (*Thomomys talpoides*)
	Bovidae	Domestic cow (*Bos taurus*)

Table 3. Federally Listed Species Included in the Analysis and Likelihood of Occurrence in the Project Area/Action Area, Page 1 of 3

Species Category	Species	Status	Habitat Associations	Potential for Presence in Project Area and/or Action Area
Birds	Southwestern willow flycatcher (*Empidonax trailii extimus*)	FE	Habitat consists of dense riparian vegetation growing on saturated soils along rivers, streams, or other wetlands, where its diet consists primarily of insects. Vegetation includes dense growth of willows (*Salix* spp.), arrow weed (*Pluchea sericea*), alder (*Alnus* spp.), and saltcedar (*Tamarix ramosissima*).	Unlikely to occur in the Project Area/Action Area, which do not contain any dense riparian vegetation, saturated soils, or surface water.
	Mexican spotted owl (*Strix occidentalis*)	FT	Primarily within shaded, mesic, and cool canyons with steep sides that have mixed conifer, pine-oak, and riparian forest types. Forests used for roosting or nesting often contain moderate to high canopy closure, a wide range of tree sizes suggestive of uneven-age stands, large overstory trees of various species, and high plant species richness with adequate levels of residual plant cover to maintain fruits, seeds, and regeneration to provide for the needs of prey species for the owl. In New Mexico, occurs in mountain ranges in the western two-thirds of the state; not recorded east of the Sangre de Cristo in the northern part of the state,	Unlikely to occur in the Project Area/Action Area. Yankee Canyon is outside the distribution of the Mexican spotted owl
	Piping Plover (*Charadrius melodus*)	FT	Piping plovers breed along ocean shores in the Northeast and along lakeshores and alkali wetlands in the northern Great Plains and Great Lakes. They, at all times, occur on sandflats or along bare shorelines of rivers, lakes, or coasts.	Unlikely to occur in the Project Area/Action Area, which do not contain any sandflats, bare shorelines of rivers, lakes, or coasts.
Mammals	New Mexico meadow jumping mouse (*Zapus hudsonius luteus*)	FE	Habitat specialist using persistent emergent herbaceous wetlands and scrub-shrub wetlands on wet soil along perennial streams. Also uses patches of herbaceous vegetation dominated by sedges along water edges within willow and alder dominated habitats.	Unlikely to occur in the Project Area/Action Area, which do not contain emergent herbaceous wetlands, scrub-shrub wetlands, or willow and alder habitat containing sedges.

Table 3. Federally Listed Species Included in the Analysis and Likelihood of Occurrence in the Project Area/Action Area, Page 2 of 3

Species Category	Species	Status	Habitat Associations	Potential for Presence in Project Area and/or Action Area
Mammals (cont.)	Tricolored bat (*Perimyotis subflavus*)	FP	During the summer, tricolored bats are found in woodlands, where they have their maternity colonies and roost in trees (McCoshum et al., 2023). In Arkansas, all observed roosts were in tree canopies, not trunks, with half of females roosting in pine trees. Large trees and non-linear openings may be important summer habitat features. Winter habitat includes caves, crevices, mines, bridges, and culverts.	May occur in trees in the Project Area/Action Area on the basis of a few occurrence records in eastern New Mexico and southeastern Colorado during the last few decades (Geluso et al., 2005; McCoshum et al., 2023).
Reptiles	None			
Amphibians	None			
Fish	Rio Grande cutthroat trout *Oncorhynchus clarkii virginalis*	FC	The Rio Grande cutthroat trout is a subspecies of cutthroat trout, endemic to the Rio Grande, Pecos, and possibly the Canadian River Basins in New Mexico and Colorado.	Unlikely to occur in the Project Area/Action Area, which do not contain any surface water.

Table 3. Federally Listed Species Included in the Analysis and Likelihood of Occurrence in the Project Area/Action Area, Page 3 of 3

Species Category	Species	Status	Habitat Associations	Potential for Presence in Project Area and/or Action Area
Invertebrates	Monarch butterfly (*Danaus plexippus*)	FC	During breeding and migration, adult monarchs require a diversity of blooming nectar resources, which they feed on throughout their migration routes and breeding grounds (spring through fall). During breeding, monarchs also need milkweed (for both oviposition and larval feeding) embedded within this diverse nectaring habitat. The correct phenology, or timing, in the life cycle of monarchs and blooming of nectar plants and milkweed is important for monarch survival. There are two migrating populations, eastern and western. New Mexico contains spring breeding areas primarily in the eastern third of the state, where the species reaches higher latitudes (Cary and DeLay, 2016; USFWS, 2020). Spring monarchs can reach elevations exceeding 9,000 feet (Cary and DeLay, 2016). During fall migration, monarchs vacate higher terrain in late August into September. Later in the fall, most monarch reports are from southern New Mexico counties.	Unlikely to occur within the Project Area and/or Action Area. Yankee Canyon is located within the eastern third of the state where spring breeding areas have been documented. However, the potential for milkweed plant species to be present is low. No milkweed was observed during the site survey. Unlikely to occur in fall migration when downslope movements seem to favored (Cary and DeLay 2016).

FE = Federal endangered
FT = Federal threatened
FC = Federal candidate
FP = Federal proposed

Table 4. Non-Federal Special-Status Species Identified for Project Area and/or Action Area, Page 1 of 6

Species Category	Species	Status	Habitat Associations	Potential for Presence in Project Area
Plants [a]	One-flowered milkvetch (*Astragalus wittmannii*)	—	The one-flowered milkvetch is endemic of northeastern New Mexico, where it is found in Greenhorn limestone hills and knolls in shortgrass prairie at 5,900 to 6,600 feet.	Unlikely to occur in the Project Area. The Project Area is not within Greenhorn limestone hills and knolls.
	Pecos mariposa lily (*Calochortus gunnisonii var. perpulcher*)	—	The Pecos mariposa lily is found in meadows and aspen glades in upper montane coniferous forest at 9,500 to 11,200 feet.	Unlikely to occur in the Project Area. The Project Area is outside of the elevational range for the species.
	Yellow lady's slipper (*Cypripedium parviflorum var. pubescens*)	—	Mesic deciduous and coniferous forest, openings, thickets, prairies, meadows, fens. In New Mexico sporadic in moist conifer forests, at elevations between 5,750 and 11,000 ft.	Unlikely to occur in the Project Area. As a result of the Track Fire in 2011, most of the Project Area has transitioned to drier, warmer habitat with much less conifer forest.
	Robust larkspur (*Delphinium robustum*)	—	The robust larkspur is found in canyon bottoms and aspen groves in lower and upper montane coniferous forest at 7,200 to 11,200 feet.	Unlikely to occur in the Project Area. The Project Area contains canyon bottoms; however, the canyon bottoms are dry, and there are no aspen groves. The Project Area contains much less coniferous forest due to the 2011 Track Fire.
	Sapello Canyon larkspur (*Delphinium sapellonis*)	—	The Sapello Canyon larkspur is found in canyon bottoms and aspen groves in lower and upper montane coniferous forest at 2,450 to 3,500 m (8,000 to 11,500 feet)	Unlikely to occur in the Project Area. The Project Area contains canyon bottoms; however, there are no aspen groves and the Project Area is outside of the species' elevational range.

Table 4. Non-Federal Special-Status Species Identified for Project Area and/or Action Area, Page 2 of 6

Species Category	Species	Status	Habitat Associations	Potential for Presence in Project Area
Plants [a] (cont.)	Cimarron wild buckwheat (*Eriogonum aliquantum*)	—	The Cimarron wild buckwheat is presently known only from the Cimarron, Vermejo, and Canadian River basins where the shortgrass prairie meets the foot of the Sangre de Cristo Mountains. Dry, eroded, shaley slopes with stands of low shrubs in otherwise shortgrass steppe or low, clayey flats in alkali sacaton (*Sporobolus airoides*) grassland at 6,000 to 6,700 feet.	Unlikely to occur in the Project Area. The Project Area is not within dry, eroded, shaley slopes and is outside of the elevational range for the species.
	Spiny aster (*Eurybia horrida*)	—	Sandy shales on mountain and canyon slopes, from upper montane conifer forest down to juniper savanna; often associated with oak scrub; (4,100 to 10,700 feet). This species has great ecological amplitude occurring on dry, south-facing slopes in high mountains and shaded, north-facing slopes at low elevations.	There is a potential for the spiny aster to be present in the Project Area. However, the species was not observed during the biological survey.
	New Mexico stickseed (*Hackelia hirsuta*)	—	The New Mexico stickseed is found on dry sites of shaley or igneous soils in lower to upper montane coniferous forest, usually with Gambel oak at 7,700 to 10,200 feet.	There is a potential for the New Mexico sitckseed to be present in the Project Area. However, the species was not observed during the biological survey.
	Wood lily (*Lilium philadelphicum var. andinum*)	—	Moist woodlands and meadows in mixed conifer forests and canyon bottoms, between 7,550 and 10,000 feet.	Unlikely to occur in the Project Area. Most of the Project Area has transitioned to drier, warmer habitat with much less conifer forest habitat due to the large scale forest fire in 2011. Canyon bottoms contain almost no surface water/ moist habitat.
	San Juan Mountains Starwort (*Stellaria sanjuanensis*)	—	The San Juan Mountains Starwort is narrowly restricted to dry, exposed alpine scree slopes of usually volcanic origin.	Unlikely to occur in the Project Area. The Project Area does not overlap with any alpine scree slopes.

Table 4. Non-Federal Special-Status Species Identified for Project Area and/or Action Area, Page 3 of 6

Species Category	Species	Status	Habitat Associations	Potential for Presence in Project Area
Mammals	Least shrew (*Cryptotis parvus*)	ST	The least shrew is restricted to damp, mesic areas, such as the borders of streams or lakes, within otherwise relatively arid habitat.	Unlikely to occur in the Project Area. The Project Area does not contain streams or lakes.
	Pacific marten (*Martes caurina*)	ST	The Pacific marten prefers late successional stands of mesic, conifer-dominated forest. Optimum habitat appears to be mature old-growth spruce-fir communities with more than 30 percent canopy cover, well-established understory of fallen logs and stumps, and lush shrub and forb vegetation supporting microtine and sciurid prey. Their elevational range is from 7,000 to 13,000 feet, primarily above 9,000 feet. The species' distribution consists of disjunct areas in Rio Arriba, Taos, and Santa Fe, as well as extreme western Colfax, Mora, and San Miguel counties (Cartron and Frey, in press)	Unlikely to occur in the Project Area. The Project Area is outside the species' distribution
	New Mexico meadow jumping mouse (*Zapus hudsonius luteus*)	SE/FE	Habitat specialist using persistent emergent herbaceous wetlands and scrub-shrub wetlands on wet soil along perennial streams. Also uses patches of herbaceous vegetation dominated by sedges along water edges within willow and alder dominated habitats.	Unlikely to occur in the Project Area. The Project Area does not contain emergent herbaceous wetlands, scrub-shrub wetlands, or willow and alder habitat containing sedges.
Birds	Piping Plover (*Charadrius melodus*)	ST/FT	Piping Plovers breed along ocean shores in the Northeast and along lakeshores and alkali wetlands in the northern Great Plains and Great Lakes. They, at all times, occur on sandflats or along bare shorelines of rivers, lakes, or coasts.	Unlikely to occur in the Project Area. The Project Area does not contain any sandflats, bare shorelines of rivers, lakes or coasts.

Table 4. Non-Federal Special-Status Species Identified for Project Area and/or Action Area, Page 4 of 6

Species Category	Species	Status	Habitat Associations	Potential for Presence in Project Area
Birds (cont.)	White-tailed ptarmigan (*Lagopus leucura*)	SE	This species presently is resident in the Sangre de Cristo Mountains, where populations occur on Costilla, Latir, Wheeler, Truchas, and associated peaks.	Unlikely to occur in the Project Area. The Project Area is not within the elevational range of the species in New Mexico.
	Least tern (*Sternula antillarum*)	SE	This species uses sandbars, beaches, and spits in coastal areas. In New Mexico and other parts of the southern Great Plains, alkali flats are selected as nesting areas.	Unlikely to occur in the Project Area. The Project Area does not contain beaches, sandbars, or alkali flats.
	Neotropic cormorant (*Phalacrocorax brasilianus*)	ST	The cormorant is found within lakes and river systems.	Unlikely to occur in the Project Area. The Project Area does not overlap with any major river systems or lakes.
	Brown pelican (*Pelecanus occidentalis*)	SE	The brown pelican occurs near river systems, lakes, stream and canals.	Unlikely to occur in the Project Area. The Project Area does not overlap with any major river systems, canals or lakes.
	Bald eagle (*Haliaeetus leucocephalus*)	ST	The bald eagle is usually found along seacoasts, lakes, and rivers. Nesting sites are usually isolated high in trees, on cliffs, or on pinnacles.	Unlikely to occur in the Project Area. The Project Area is not located near any seacoasts, lakes, or rivers.
	Common black hawk (*Buteogallus anthracinus anthracinus)*	ST	The black hawk is found within forested habitat along permanent streams	Unlikely to occur in the Project Area. The Project Area contains no riparian forest.
	Boreal owl (*Aegolius funereus*)	ST	The boreal owl inhabits old growth forests of spruce-fir primarily within the Rocky Mountain range.	Unlikely to occur in the Project Area. The Project Area is not within old-growth spruce-fir mountain forests

Table 4. Non-Federal Special-Status Species Identified for Project Area and/or Action Area, Page 5 of 6

Species Category	Species	Status	Habitat Associations	Potential for Presence in Project Area
Birds (cont.)	Peregrine falcon (*Falco peregrinus*)	ST	Habitat of the peregrine falcon is primarily located in open wetlands near cliffs. In New Mexico, the breeding territories center on cliffs that are in wooded/forested habitats with large "gulfs" of air nearby in which these predators can forage.	Unlikely to occur in the Project Area. The Project Area is not within an area that contains cliffs near wetlands.
	Southwestern willow flycatcher (*Empidonax traillii extimus*)	FE, SE	Habitat for the southwestern willow flycatcher consists of dense riparian vegetation growing on saturated soils along rivers, streams, or other wetlands, where its diet consists primarily of insects. Vegetation includes dense growth of willows (*Salix* spp.), arrow weed (*Pluchea sericea*), alder (*Alnus* spp.), and saltcedar (*Tamarix ramosissima*).	Unlikely to occur in the Project Area. The Project Area does not contain any dense riparian vegetation, saturated soils, or surface water.
	Baird's sparrow (*Ammodramus bairdii*)	ST	The Baird's sparrow breeds in a fairly small geographic area of south-central Canada, Montana, and North and South Dakota. It winters on grasslands of the northern Mexican plateau, primarily in Chihuahua and Durango but including portions of bordering states. The winter range extends into small portions of southeast Arizona, southern New Mexico, and southwest Texas. In New Mexico, Baird's Sparrow has been found on Otero Mesa and in the Animas Valley, and may occur in other areas of suitable winter habitat, particularly in the southeast portion of state (NM Avian Conservation Partners, 2014; BISON-M, USGS distribution map).	Unlikely to occur in the Project Area. The Project Area is north of the known winter range of the Baird's sparrow and far outside the breeding distribution.
Reptiles	None			
Amphibians	None			

Table 4. Non-Federal Special-Status Species Identified for Project Area and/or Action Area, Page 6 of 6

Species Category	Species	Status	Habitat Associations	Potential for Presence in Project Area
Fish	Southern redbelly dace (*Phoxinus erythrogaster*)	SE	The dace is found in the upper Mora River drainage, in Coyote Creek, and in the tributaries of Black Lake in Colfax and Mora counties	Unlikely to occur in the Project Area. The Project Area does not overlap with any of the tributaries occupied by the species, nor does it contain enough surface water to sustain fish populations.
	Suckermouth minnow (*Phenacobius mirabilis*)	ST	The suckermouth minnow is found in the Dry Cimarron River, the Canadian drainage (Cimarron to Conchas Lake), and in the upper Pecos River from Sumner Lake to Fort Sumner.	Unlikely to occur in the Project Area. The Project Area does not contain any streams or river systems.
Mollusks	Lake fingernailclam (*Musculium lacustre*)	ST	The southernmost occurrence of the lake fingernailclam is in the Sangre de Cristo Mountains, within Colfax County. It is known within a localized distribution in upper Clenegville Creek (T25N, R16E), southeast of Angel Fire.	Unlikely to occur in the Project Area. The Project Area is not within the known distribution of the fingernail clam.
	Star gyro snail (*Gyraulus crista*)	ST	The star gyro snail has been found only in Coyote Creek, which is a tributary of Black Lake in Colfax County.	Unlikely to occur in the Project Area. The Project Area is not near Coyote Creek or Black Lake.
Invertebrates	None			

[a] Includes species on the New Mexico Rare Plants list for Colfax County and NMNHP.
SE = State endangered
ST = State threatened
FE = Federal endangered
FT = Federal threatened

Appendix A

Photographs

DBS&A
a Geo-Logic Company

1. From County Road A25 looking north toward Project Area

2. View from County Road A25 northern parcel upslope to the west of burned habitat that has regenerated in gambel oak scrub, mixed with ponderosa pine that survived the 2011 fire.

3. View to northeast of non-burned forest habitat from CR A25, northern parcel

4. Wild turkey bone observed in northern parcel

5. View from northwest corner of the northern parcel looking east/northeast

6. Gambel oak shrub above coal waste piles, northern parcel

7. Coal waste piles, northern parcel, looking southeast

8. Old mining road, northern parcel

9. Main canyon bottom, eastern boundary, northern parcel

10. Mining structure with overgrown vegetation, south end of the northern parcel

11. View to southeast from old mining road located on the north side of the southern parcel

12. View upslope from old mining road located at north side of the southern parcel

13. View to west from old mining road, southern parcel

14. View to south from old mining road, toward the southern project area in the southern parcel, showing the extensive burned area from the 2011 forest fire with a dense vegetation cover of gambel oak and locust shrubs

15. Coal waste pile, southern parcel, looking south

16. Surface water from a dripping pipe, located on the north slope of the upper main canyon in the southern parcel

17. Dense vegetation in bottom of canyon below the dripping spring

18. Coal waste pile on the south slope above the canyon bottom where dripping spring is located

19. View to north from the southern parcel, southern end of the Project Area

20. Coal waste piles, far southern end of the Project Area

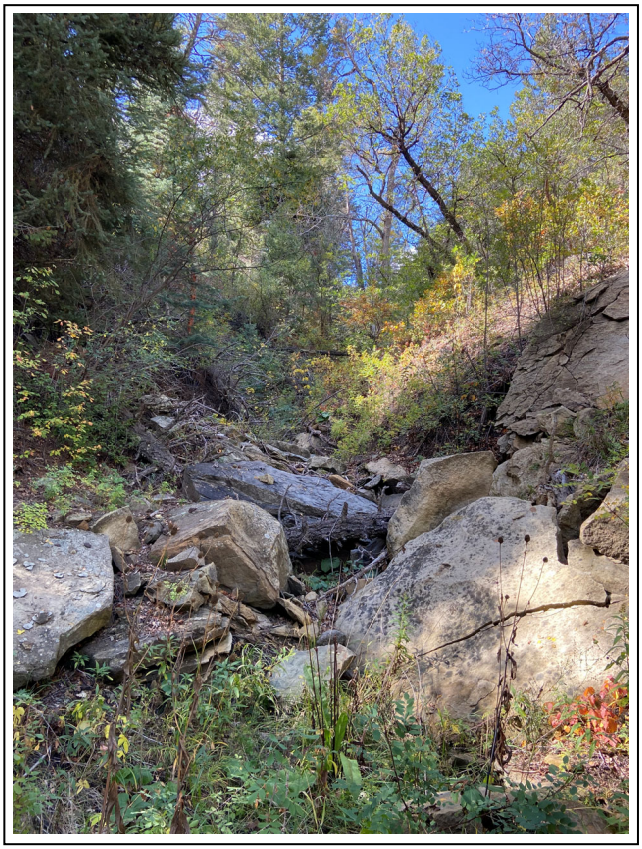
21. Old mining road, far southern end of Project Area (southern parcel)

22. View to west toward coal waste pile at the upper reach of the main canyon in the Project Area, southern parcel

23. View to south from the coal waste piles at the upper reach of the main canyon

24. View of the upper main canyon, southern parcel

25. View upstream in the main canyon, showing narrow-leaf cottonwoods and dry stream bed



26. Bottom of main canyon, midway, southern parcel

27. View of habitat showing typical stand-replacing effects from the 2011 Track Fire

28. Rock squirrel

29. Least chipmunk

30. Prairie lizard

31. Baby horned lizard

32. Bear paw print

33. Wavy-leaf thistle, northern parcel

Appendix B

U.S. Fish and Wildlife Information for Planning and Consultation Report

DBS&A
a Geo-Logic Company

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New Mexico Ecological Services Field Office
2105 Osuna Road Ne
Albuquerque, NM 87113-1001
Phone: (505) 346-2525 Fax: (505) 346-2542

In Reply Refer To: November 02, 2023
Project Code: 2024-0011999
Project Name: Yankee Canyon Mine Sageguarding project

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

Thank you for your recent request for information on federally listed species and important wildlife habitats that may occur in your project area. The U.S. Fish and Wildlife Service (Service) has responsibility for certain species of New Mexico wildlife under the Endangered Species Act (ESA) of 1973 as amended (16 USC 1531 et seq.), the Migratory Bird Treaty Act as amended (16 USC 701-715), and the Bald and Golden Eagle Protection Act as amended (16 USC 668-668(c)). We are providing the following guidance to assist you in determining which federally imperiled species may or may not occur within your project area, and to recommend some conservation measures that can be included in your project design.

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the ESA of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the ESA, the accuracy of this species list should be verified after 90 days. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

The purpose of the ESA is to provide a means whereby threatened and endangered species and

the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the ESA and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (NEPA; 42 USC 4332(2) (c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.pdf.

Candidate Species and Other Sensitive Species

A list of candidate and other sensitive species in your area is also attached. Candidate species and other sensitive species are species that have no legal protection under the ESA, although we recommend that candidate and other sensitive species be included in your surveys and considered for planning purposes. The Service monitors the status of these species. If significant declines occur, these species could potentially be listed. Therefore, actions that may contribute to their decline should be avoided.

Lists of sensitive species including State-listed endangered and threatened species are compiled by New Mexico State agencies. These lists, along with species information, can be found at the following websites.

Biota Information System of New Mexico (BISON-M): www.bison-m.org

New Mexico State Forestry. The New Mexico Endangered Plant Program: https://www.emnrd.nm.gov/sfd/rare-plants/

New Mexico Rare Plant Technical Council, New Mexico Rare Plants: nmrareplants.unm.edu

Natural Heritage New Mexico, online species database: nhnm.unm.edu

WETLANDS AND FLOODPLAINS

Under Executive Orders 11988 and 11990, Federal agencies are required to minimize the destruction, loss, or degradation of wetlands and floodplains, and preserve and enhance their natural and beneficial values. These habitats should be conserved through avoidance, or mitigated to ensure that there would be no net loss of wetlands function and value.

We encourage you to use the National Wetland Inventory (NWI) maps in conjunction with ground-truthing to identify wetlands occurring in your project area. The Service's NWI program website, www.fws.gov/wetlands/Data/Mapper.html, integrates digital map data with other resource information. We also recommend you contact the U.S. Army Corps of Engineers for permitting requirements under section 404 of the Clean Water Act if your proposed action could impact floodplains or wetlands.

MIGRATORY BIRDS

In addition to responsibilities to protect threatened and endangered species under the ESA, there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the Service (50 CFR 10.12 and 16 USC 668(a)). For more information regarding these Acts, see https://www.fws.gov/program/migratory-bird-permit/what-we-do.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a Federal nexus) or a Bird/Eagle Conservation Plan (when there is no Federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures, see https://www.fws.gov/library/collections/threats-birds. We also recommend review of the Birds of Conservation Concern list (https://www.fws.gov/media/birds-conservation-concern-2021) to fully evaluate the effects to the birds at your site. This list identifies migratory and non-migratory bird species (beyond those already designated as federally threatened or endangered) that represent top conservation priorities for the Service, and are potentially threatened by disturbance, habitat impacts, or other project development activities.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 thereby provides additional protection for both migratory birds and migratory bird habitat. Please visit https://www.fws.gov/partner/council-conservation-migratory-birds for information regarding the implementation of Executive Order 13186.

We suggest you contact the New Mexico Department of Game and Fish, and the New Mexico Energy, Minerals, and Natural Resources Department, Forestry Division for information regarding State protected and at-risk species fish, wildlife, and plants.

For further consultation with the Service we recommend submitting inquiries or assessments electronically to our incoming email box at nmesfo@fws.gov, where it will be more promptly routed to the appropriate biologist for review.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New Mexico Ecological Services Field Office
2105 Osuna Road Ne
Albuquerque, NM 87113-1001
(505) 346-2525

PROJECT SUMMARY

Project Code: 2024-0011999
Project Name: Yankee Canyon Mine Sageguarding project
Project Type: Subsurface Reclamation - Coal
Project Description: Abandoned mine safeguarding project
Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@36.954760300000004,-104.3455549221806,14z

Counties: Colfax County, New Mexico

ENDANGERED SPECIES ACT SPECIES

There is a total of 6 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
New Mexico Meadow Jumping Mouse *Zapus hudsonius luteus*	Endangered

There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/7965

BIRDS

NAME	STATUS
Mexican Spotted Owl *Strix occidentalis lucida*	Threatened

There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/8196

Piping Plover *Charadrius melodus* — Threatened

Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered.
There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/6039

Southwestern Willow Flycatcher *Empidonax traillii extimus* — Endangered

There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/6749

FISHES

NAME	STATUS
Rio Grande Cutthroat Trout *Oncorhynchus clarkii virginalis*	Candidate

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/920

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus*	Candidate

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/9743

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

IPAC USER CONTACT INFORMATION

Agency: Private Entity
Name: Jean-Luc Cartron
Address: 6020 Academy Road NE Suite 100
City: Albuquerque
State: NM
Zip: 87109
Email jcartron@geo-logic.com
Phone: 5059777716

LEAD AGENCY CONTACT INFORMATION

Lead Agency: Office of Surface Mining Reclamation and Enforcement

Appendix C

State Threatened/ Endangered Species Colfax County

DBS&A
a Geo-Logic Company

Federal or State Threatened/Endangered Species

Colfax

Taxonomic Group	# Species	Taxonomic Group	# Species
Birds	12	Fish	2
Lepidoptera; moths and butterflies	1	Mammals	5
Molluscs	2		

TOTAL SPECIES: 22

Common Name	Scientific Name	NMGF	US FWS	Critical Habitat	SGCN	Photo
Least Shrew	Cryptotis parvus	T			Y	View
Canada Lynx	Lynx canadensis		T			No Photo
Pacific Marten	Martes caurina	T			Y	View
Black-footed Ferret	Mustela nigripes		E		Y	View
Meadow Jumping Mouse	Zapus luteus luteus	E	E	Y	Y	View
White-tailed Ptarmigan	Lagopus leucura	E			Y	View
Piping Plover	Charadrius melodus	T	T			No Photo
Least Tern	Sternula antillarum	E			Y	View
Neotropic Cormorant	Phalacrocorax brasilianus	T			Y	View
Brown Pelican	Pelecanus occidentalis	E				View
Bald Eagle	Haliaeetus leucocephalus	T			Y	View
Common Black Hawk	Buteogallus anthracinus	T			Y	View
Mexican Spotted Owl	Strix occidentalis lucida		T	Y	Y	View
Boreal Owl	Aegolius funereus	T			Y	View
Peregrine Falcon	Falco peregrinus	T			Y	View
Southwestern Willow Flycatcher	Empidonax traillii extimus	E	E	Y	Y	View
Baird's Sparrow	Centronyx bairdii	T			Y	View
Southern Redbelly Dace	Chrosomus erythrogaster	E			Y	View
Suckermouth Minnow	Phenacobius mirabilis	T			Y	View
Star Gyro	Gyraulus crista	T			Y	No Photo
Monarch Butterfly	Danaus plexippus		C			View
Lake Fingernailclam	Musculium lacustre	T			Y	View

Appendix D

BCI Report on Yankee Canyon Abandoned Mine Bat Surveys

DBS&A
a Geo-Logic Company

BAT CONSERVATION INTERNATIONAL

TO:

Lloyd Moiola
Environmental Manager
New Mexico EMNRD
Santa Fe, New Mexico

Laurence D'Alessandro
Project Manager
New Mexico EMNRD
Albuquerque, New Mexico

FROM:

Subterranean Team, Bat Conservation International

Dillon Metcalfe
Subterranean Specialist
Flagstaff, Arizona

Shawn Thomas
Subterranean Team Manager
Olympia, Washington

SUBJECT: Report on Yankee Canyon Abandoned Mine Bat Surveys

SURVEY DATES: November 17-18, 2021

OVERVIEW:

This biological survey project assessed abandoned mines in Yankee Canyon, located on the flanks of Horse Mesa, east of Raton, New Mexico. All sites were surveyed by Bat Conservation International (BCI) staff following standardized protocols and safety procedures for providing subterranean mapping, biological data, and closure recommendations. Mapping efforts focused on accessible workings to determine proximity to road A-25 and a known subsidence in the middle of the roadway. The field project resulted in bat surveys being conducted on two distinct features, comprising two openings to the surface (Figure 1, Table 1). Bat habitat assessments and closure recommendations are provided for all features. A survey summary, full survey results, and a discussion of road A-25 can be referenced on the following pages.

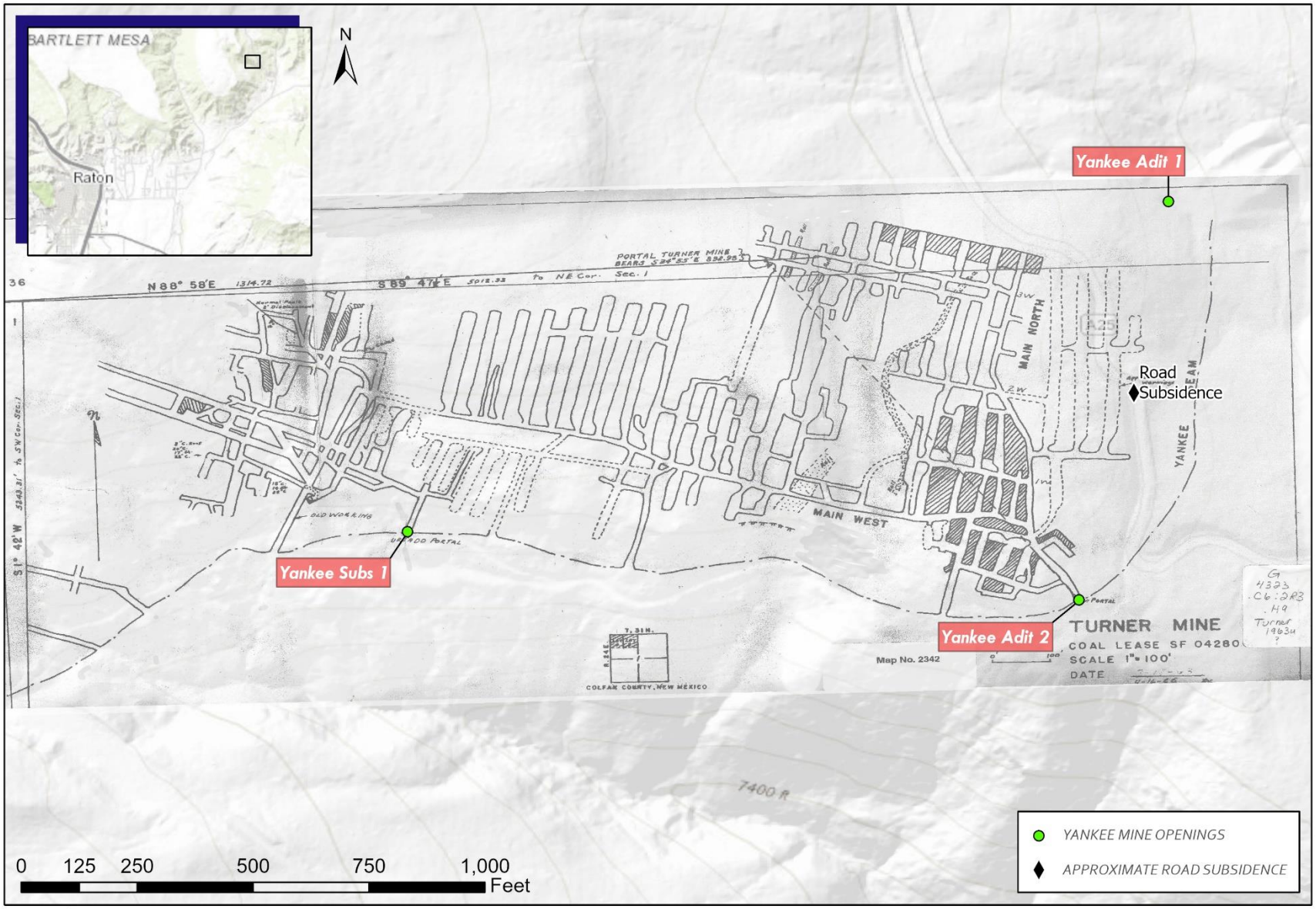
ACKNOWLEDGEMENTS:

BCI wishes to thank Lloyd Moiola for initiating the project and for providing the scope of work and site inventory descriptions. Special thanks to Laurence D'Alessandro for providing on-site navigation, assistance locating features, and serving in the surface safety role during field work. Additional thanks to Yeny Maestas, ENMRD, for joining the crew in the field.

All surveys conducted by BCI Subterranean Team staff: Dillon Metcalfe and Bill Burger. This report was authored by Dillon Metcalfe.

Report and photos submitted February 18, 2021.

BCI FIELD SURVEYS: YANKEE MINE GEOREFERENCE



BAT CONSERVATION INTERNATIONAL

Bureau of Land Management, Esri, HERE, Garmin, USGS, NGA, EPA, USDA, NPS, Airbus,USGS,NGA,NASA,CGIAR,NCEAS,NLS,OS,NMA,Geodatastyrelsen,GSA,GSI and the GIS User Community, Bureau of Land Management, Esri, HERE, Garmin, GeoTechnologies, Inc., USGS, EPA, USDA

Figure 1: Overview Map of Project Area and Features Surveyed

Table 1. Summary of bat survey results and closure recommendations.

Feature[1]	**Closure Recommendation**[2]	**Live Bats**[3]	**Bat Sign**	**Roost Function**	**Bat Habitat**
Yankee Adit VanLaten01	BCWS	3 COTO	none	hibernaculum	Good
Yankee Adit VanLaten02	DCWS	none	none	none	Moderate

[1]Feature: A distinct feature may consist of a single opening, multiple openings interconnected via underground workings, or closely related surface workings. In the "Feature" column, distinct features are separated by solid lines, and associated openings of a feature are separated by dashed lines. A feature contains shared biological and habitat characteristics and is therefore described by a single survey, whereas closure recommendations are unique to each opening.

[2]Closure recommendations:

<u>Bat-compatible Closures</u>
BCAT – bat-compatible closure, any time
BCCS – bat-compatible closure, cold season
BCWS – bat-compatible closure, warm season
CM – closure modification

<u>No Action</u>
LAI – leave as is

<u>Destructive Closures</u>
DCAT – destructive closure, any time
DCWS – destructive closure, warm season

<u>Other Closure Type</u>
AC – airflow closure

[3]Bat species codes: COTO – Townsend's big-eared bat (*Corynorhinus townsendii*)

SECTION 1: SURVEY SUMMARY

BIOLOGICAL SURVEY SUMMARY:

Biological surveys are focused on subterranean habitat, with a primary emphasis on bat use. Surveys attempt to identify bat species present, document other bat sign (e.g., guano, insect parts, roost staining), and determine roost function of the site. Additionally, surveys document other wildlife use of features, evident by live animals, scat, nests, etc. All bat and other wildlife observations inform habitat assessments and closure recommendations.

Bat Use:

Two distinct features[1] received comprehensive biological surveys. Both of these features offered some level of subterranean habitat with potential for bat use. One feature contained three hibernating bats. No other bat sign was observed.

Other Wildlife Use:

Other wildlife sign consisted of a small amount of packrat scat in VanLaten 2.

BAT HABITAT ASSESSMENT SUMMARY:

Bat habitat assessments are determined based on observed bats and bat sign, along with physical characteristics of the site such as complexity and extensiveness of workings, portal size and obstructions, ceiling textures that bats select for, hydrological activity (such as seasonal flooding) that may preclude bat use, and any additional observations that may influence bat use of the site. A bat habitat assessment is applied to each distinct AML feature, which may include multiple openings. See Appendix 2 for additional details on assessment classifications. Bat habitat assessments for this project are summarized in Table 2.

Table 2. Bat habitat assessments for distinct AML features surveyed.

Bat Habitat Assessment	# Features
None	0
Poor	0
Marginal	0
Moderate	1
Good	1
Excellent	0
Unknown	0

[1] A distinct feature may consist of a single opening, multiple openings interconnected via underground workings, or closely related surface workings. Each distinct feature, including associated openings, contains shared biological and habitat characteristics and is therefore described by a single survey.

CLOSURE RECOMMENDATION SUMMARY:
Closure recommendations generally fall into bat-friendly or destructive closure categories and include a seasonal component that recommends the closure to occur either during the warm season, cold season, or at any time. A closure recommendation is provided for each individual opening of an AML feature. See Appendix 3 for additional details on recommendation classifications and Appendix 4 for guidance on conducting exclusion prior to closure. Closure recommendations for this project are summarized in Table 3.

Table 3. Closure recommendations for AML openings surveyed.

Closure Recommendation	**Code**	**# Openings**
Bat-compatible Closure, Any Time	BCAT	0
Bat-compatible Closure, Cold Season	BCCS	0
Bat-compatible Closure, Warm Season	BCWS	1
Other Wildlife-compatible Closure	OWC	0
Destructive Closure, Any Time	DCAT	0
Destructive Closure, Warm Season	DCWS	1
Leave As Is	LAI	0
Closure Modification	CM	0
Airflow Closure	AC	0

APPENDICES:
Appendix 1 contains selected photos from this survey project. Appendix 2 describes bat habitat assessment classifications. Appendix 3 describes closure recommendation classifications. Appendix 4 provides guidance on bat exclusion methods when recommended for destructive closures.

SECTION 2: FULL SURVEY RESULTS

Unless otherwise noted, all features are driven in moderate- to good-quality rock (qualitative safety assessment), contain good air*, and exhibit minimal signs of post-mining human disturbance. All feature locations are listed as latitude and longitude (decimal degrees) in the WGS84 datum.

* Good air is defined as no alarm sounding on the Altair 4x Multi-gas Detector carried during all surveys. The detector measures four gases (oxygen, carbon monoxide, hydrogen sulfide, methane) and alarms for gas levels that fall outside of safe thresholds.

Feature: Yankee Adit VanLaten01
Location: 36.95887065, -104.34187169
Date: November 17, 2021
Observations: This feature is a straight adit with a short crosscut that leads to another crosscut parallel to the main adit. Total workings are 457' and together form a capitol "H" shape in plan view. The main adit is straight and wide and is 274' long to where it ends in collapse. It is very likely that this feature connected to the known historical workings of the Yankee Mine prior to this collapse. There are plentiful timber stulls fixed with intermittent porcelain knobs for electrical wire. 73' from the portal, a crosscut is driven 32' to the right, where it intersects another crosscut that is driven 89' in one direction and 63' in another. Three hibernating Townsend's big-eared bats were observed in various parts of the mine. No other wildlife sign was observed.
Bat Habitat: Good
Closure Recommendation: Bat-compatible Closure, Warm Season (BCWS)

Feature: Yankee Adit VanLaten02
Location: 36.95651851, -104.34240019
Date: November 17, 2021
Observations: This feature is a backfilled adit that has subsided. It can be identified by a piece of railroad rail that is stuck in the backfill material. The open subsidence is 2' wide and 1.5' high. 112' of workings were surveyed. The adit is driven straight for 55', where an unstable, collapsing area prevented further passage. A very large block of sandstone is precariously balanced on a single old stull, and passage would not be possible without pressing against the block in order to slide past. 29' from the face, a drift is driven to the left for 33' before ending in collapse.
Bat Habitat: Moderate
Closure Recommendation: Destructive Closure, Warm Season with exclusion.

Discussion of county road A-25: Attempts were made to find a connection between the subsidence and either of the accessible portals. Neither Yankee Adit 01 or Yankee Adit 02 connected to the subsidence via accessible subterranean workings. Both features ended in collapse before the large, historically documented workings could be reached. It is likely that the road overlays some historical excavation and that further subsidence is possible. Given the known extent of the historical mine, the road will likely need to be rerouted to the east and north. No major topographical obstacles appear to prevent this reroute, but extensive archeological resources in the vicinity of the portal should be considered before construction. The georeferenced map provided in Figure 1 of this report suggests that rerouting the road anywhere to the west would risk overlaying the historical workings that honeycomb the mesa.

APPENDIX 1

Selected photos from the field project. The full set of photos from all features was provided in digital form with this report.

Yankee Adit 01: Dillon examines the back for bats.
BCI Photo by Bill Burger

Yankee Adit 01: A Townsend's big-eared bat roosts on the ribs.
BCI Photo by Bill Burger

Yankee Adit 01: The coal seam is visible along the ribs.
BCI Photo by Bill Burger

Yankee Adit 02: The dangerous section that prohibited passage. Note the large, rectangular white block balanced on a single old timber stull.
BCI Photo by Bill Burger

Yankee Adit 02: Another view of the dangerous blockage.
BCI Photo by Bill Burger

Yankee Adit 01: Much of the feature required crawling squeezes to negotiate.
BCI Photo by Bill Burger

Yankee Adit 01: Dillon quietly crawls under a hibernating bat.
BCI Photo by Bill Burger

APPENDIX 2

Bat Habitat Assessment Classifications

Bat habitat is assessed for each feature surveyed and describes the value of that feature for bat use. Determining bat habitat is the primary objective of surveys conducted by the BCI Subterranean Program. Survey of a feature results in seven possible bat habitat classifications: excellent, good, moderate, marginal, poor, no habitat, or unknown. Each of these classifications are described below.

Excellent Bat Habitat

Description

Excellent bat habitat is very rare amongst features surveyed. For a feature to be assessed as having excellent habitat, significant bat use, usually by colonies, must be documented. Typically, this occurs when a large single species roost (>20 bats) is identified using the feature for warm season aggregation, usually in conjunction with substantial guano piles. Bats present in lower numbers but representing multi-species use of three or more species also warrants an assessment of excellent habitat. Bats need not be present to identify excellent habitat, as obvious bat sign such as large guano piles, heavily scattered guano along flyways, and roost staining on ceilings are indicators of significant bat use. Major winter use by bats cannot be confirmed during warm season surveys, though features that exhibit cold temperatures, airflow, and a high diversity of microclimates and roosting habitat can be identified as sites with good potential for serving as hibernacula. Features offering excellent bat habitat usually exhibit striking internal complexity, with extensive workings and possibly multiple levels. Due to the extensiveness of underground workings, these features nearly always offer high quality rock habitat. Exceptions, however, include small features used as maternity sites. Feature stability should be good, with little concern for future collapse that could result in loss of the roost.

Closure Recommendation

Features with excellent bat habitat should nearly always be recommended for protection (exceptions include imminent collapse or other major safety hazards). To minimize disturbance while bats are using the feature for a critical life cycle phase, bat-friendly closures should occur during the opposite season of primary use. For example, closure of a feature that hosts a maternity colony should occur during the cold season, and closure of a feature that serves as a hibernaculum should occur during the warm season. For features with multiple entrances, closures should protect all openings that are either used for bat access or necessary to preserve airflow patterns.

Good Bat Habitat

Description
Good bat habitat is represented by features that contain clear signs of persistent bat use but do not exhibit the striking evidence of significant use by bat colonies. These features often support use by one or two species of bats that use the site as a day roost or night roost. Bat sign such as guano, either scattered or in small piles, and insect parts are common in these features. The internal workings usually exhibit moderate complexity, with rock habitat quality that meets the specific needs of day or night roosting bats, such as domes, drill holes, and/or a heavily featured back. Feature stability should be good, with little concern for future collapse that could result in loss of the roost.

Closure Recommendation
Features with good bat habitat should nearly always be recommended for protection (exceptions include imminent collapse or other major safety hazards). Bat-friendly closures can usually occur at any time of the year, as bat use of these sites is persistent but dispersed and does not represent significant use for warm season maternity colony aggregation or cold season hibernation. For features with multiple entrances, closures should protect all openings that are either used for bat access or necessary to preserve airflow patterns.

Moderate Bat Habitat

Description
Moderate bat habitat generally refers to features that exhibit some signs of minor bat use or have potential for bat use due to the level of complexity and/or stable microclimate offered within. Moderate habitat features are often occupied by one or two bats, possibly on a seasonal nature, but will not display any signs of significant bat use. Guano, if present, will be lightly scattered, or in no more than a few very small piles representative of solitary bats of a single species. Insect parts may also be present, indicating night roosting. Bat sign may also be completely absent from these features at the time of survey, either due to extremely limited bat use, suspected winter use that cannot be detected during a warm season survey, or feature conditions such as flooding that may cover or destroy evidence of bat use. Complexity of the feature will range from simple, if combined with other signs of bat use, to moderately complex. Feature stability should be relatively stable, and rock habitat quality should offer some level of suitable roosting surface.

Closure Recommendation
Features with moderate bat habitat fall into the "grey area" where bat use is not necessarily prominent enough to immediately warrant a protective closure, yet the possibility for increased future bat use exists. Generally, a bat-friendly closure should be recommended for features with moderate habitat in order to maintain a conservative approach to habitat protection. Furthermore, the context of the feature relative to the surrounding landscape may elevate its importance if few other suitable habitat options are available. Scenarios that may call for destructive closure recommendations on features that meet the criteria for moderate habitat include unstable internal conditions that suggest future collapse/destruction of the feature or areas in which the feature is eclipsed by numerous other features with superior habitat. If a destructive closure is recommended, it must be accompanied by bat exclusion prior to closure.

Marginal Bat Habitat

Description
Features designated marginal bat habitat generally lack bats and bat sign. Less commonly, these features may exhibit signs of very minor, infrequent use. A single bat may be present, but there may be no accompanying signs that would allow detection if the bat was absent. Guano and insect parts, if present, will be very sparsely scattered and require diligence for detection. Complexity of the feature will always be simple, with no substantial workings; however, these features are usually extensive enough to include a dark zone, and the entire feature is not visible from the portal or collar. Marginal features are often short, simple adits or blind and bald shafts. Feature stability can be stable, but often poor rock conditions contribute to marginal habitat. Rock habitat quality will generally be poor to fair, with less than ideal roosting surfaces.

Closure Recommendation
Features with marginal bat habitat are almost invariably recommended for destructive closure due to these features lacking bat sign and/or containing unstable conditions that threaten collapse. Given the possibility for bats to be present in these features, exclusion is required prior to closures occurring in the warm season when bats are active. In rare circumstances, a protective closure may be warranted to allow for the possibility of future bat use, especially if the feature represents one of the only subterranean habitat options in the area.

Poor Bat Habitat

Description
Features classified as poor bat habitat tend to be very small prospects that exhibit no signs of bat use. While these features offer some level of subterranean habitat, the workings are so limited as to offer no true dark zone and no area of stable subterranean microclimate. Usually, the entire feature will be visible from the portal or collar. These features are so small that structural stability is often quite good, but they may also be in a state of collapse. Rock habitat quality can range the entire spectrum, but this assessment is largely irrelevant in such small features that offer little physical area from which bats can select roosting spots that have a stable microclimate.

Closure Recommendation
Features with poor bat habitat are recommended for destructive closure. Due to the lack of bat sign or potential for future bat use, a "DCAT" recommendation is usually warranted on these features.

No Bat Habitat

Description
Assessing a feature as containing no bat habitat means no subterranean habitat is available. No underground workings are present at all, and the feature would present no option for bats to roost in subterranean environments. This scenario occurs for features that are totally collapsed, prospect scrapes, entirely and permanently flooded, or some other similar circumstance. This assessment is also appropriate for portals that are almost entirely sloughed closed and/or overgrown with vegetation such that bats would be unable to access the workings.

Closure Recommendation
With no subterranean component and thus no bat habitat, a "DCAT" recommendation is always warranted. For some features, though, especially those that contain no inherent hazard, a "Leave As Is" recommendation may be most appropriate. This recommendation is most applicable to prospect scrapes and pits that contain no headwall and may be largely overgrown.

Unknown Bat Habitat

Description
If an internal survey cannot be conducted, and underground workings are likely to exist based on observations from the surface, then bat habitat cannot be assessed. This usually occurs when the feature is not accessible due to safety concerns (e.g., wildlife hazards, rock or timber hazards) at the portal or collar. Often, looking into the feature from outside confirms that underground workings are present, though inaccessible. An unknown bat habitat assessment may also be appropriate for some partial internal surveys, when a survey is terminated underground due to safety concerns. In these instances, though, if extensive workings and/or bats and bat sign are observed prior to terminating the survey, then a higher bat habitat classification and feature protection are warranted.

Closure Recommendation
Closures of features with unknown bat habitat should follow conservative recommendations to minimize the possibility of destroying potentially important bat roosts. When possible, bat-friendly closures should be recommended for these features. In cases where destructive closures are more appropriate (e.g., collapse of feature is imminent), exclusion is required prior to closures occurring in the warm season when bats are active.

APPENDIX 3

Closure Recommendation Classifications

Closure recommendations are assigned to each opening of a distinct feature surveyed and prescribe the appropriate remediation strategy for the site. Bat use, other wildlife use, feature stability, and overall nature of the workings are considered when determining the closure recommendations. Survey of a feature usually results in recommendation of a bat-compatible closure or destructive closure for each opening, with a seasonal component to advise suitable timing of the closure. In some cases, openings may warrant other wildlife-friendly closures or recommendation of no action (leave as is). Each of these classifications are described below.

Bat-compatible Closures

Bat-compatible closures are recommended for openings to features that contain bats / bat sign and/or exhibit characteristics that indicate high potential for bat use. These features warrant protective closures to maintain the bat habitat within and allow for continued bat use. Bat-compatible closures include a variety of methods that fall on a spectrum of high to low compatibility. No closure method is perfect for all bat species, but generally, gates designed to comply with bat-compatible specifications are preferred to 1) minimize the potential of disrupting current use patterns and 2) promote long-term access for bats and other wildlife. For openings that are unstable or present access challenges, construction of a standard bat gate may not be possible. In these instances, use of alternative methods such as culverts or cable nets may be the most feasible method; while these closure types are not ideal for bats and other wildlife, they may still facilitate moderate levels of access and habitat use and therefore present a suitable alternative to total habitat loss.

Three seasonal designations are used to recommend appropriate timing of bat-friendly closures:

- BCAT (Bat-compatible Closure, Any Time): "Any time" bat closures are recommended for openings to features in which overall bat use is relatively minor or not confined to any single season.

- BCCS (Bat-compatible Closure, Cold Season): Cold season bat closures are recommended for openings to features that display significant warm season use, typically by a maternity colony of bats. Closure is recommended to occur during the cold season to avoid disturbance of bat colonies, which could potentially lead to abandonment of the site.

- BCWS (Bat-compatible Closure, Warm Season): Warm season bat closures are recommended for openings to features that are documented as hibernacula or exhibit characteristics that indicate high potential for significant cold season use by hibernating bats. Closure is recommended to occur during the warm season to avoid disturbance of hibernating bats, which could potentially lead to bats arousing and burning critical energy reserves.

Airflow Closures

Airflow closures may be recommended for secondary openings to features with multiple openings that access habitat warranting protection. Independent, secondary openings often contribute to the microclimate and habitat suitability of the underground workings via air exchange but may not serve as important access points for wildlife. In these cases, it is appropriate to close these secondary openings in a way to maintain air exchange without preserving access to wildlife.

Other Wildlife-compatible Closures

Protection may also be recommended for openings to features that display significant use by wildlife other than, or in addition to, bats. These closure recommendations are relatively rare, and closure methods are dependent on type of wildlife use. Protection of features may be warranted for use by wildlife including, but not limited to, birds (e.g., owls, vultures), mammals (e.g., cats, foxes, porcupines, ringtails), and reptiles/amphibians (e.g., salamanders).

Closure Modifications

Closure modifications are recommended for existing closures such as bat gates or backfills that do not adequately protect or maintain habitat provided by the feature. In these cases, a modification to the existing closure is recommended to improve wildlife access to habitat assessed at the time of survey. Closure modifications are recommended to provide access to previously inaccessible habitat or to facilitate increased use of existing habitat. Seasonality is also considered in closure modification recommendations to advise suitable timing of the modification.

Destructive Closures

Destructive closures are recommended for openings to features that either offer no bat habitat, contain no evidence of bat use, or exhibit only minor, insignificant bat use. In some cases, destructive closures may also be recommended for secondary openings to features that are protected through bat-compatible closure of primary openings used for wildlife access. Two destructive closure designations are used to recommend appropriate measures based on possible bat use:

- DCAT (Destructive Closure, Any Time): These openings access features that exhibit no signs of bat use or potential for bats to be present and can be destructively closed without conducting exclusion, during any season. This recommendation may also be applied to secondary openings to features protected for wildlife habitat, provided that these openings do not serve any critical function in maintaining wildlife access or suitable habitat conditions.

- DCWS (Destructive Closure, Warm Season): These openings access features that either exhibit signs of minor, insignificant bat use or have the potential for bats to be present

during destructive closure. In some cases, other wildlife such as birds may be present, and these animals should also be excluded; alternatively, closure with bat exclusion may be timed for after the nesting season when birds are no longer using the feature. Using appropriate exclusion techniques on the features prior to closure is critical. Exclusion needs to be done during the warm season when bats are active and will be able to escape. See Appendix 5 and refer to “Managing Abandoned Mines for Bats,” published by Bat Conservation International, for guidance on exclusion techniques.

No Action

"Leave as is" treatments are recommended for features that present no inherent safety concerns. A feature with this recommendation is generally either a prospect scrape/trench with no subterranean component, or the portal has completely collapsed, making the feature inaccessible.

APPENDIX 4

Exclusion Guidance as Excerpted from BCI's "Managing Abandoned Mines for Bats"

Timing of Exclusions

The exact timing of exclusions and site closures is best determined locally, given the variability in types of use by different species. As a general rule, bats must be active for exclusions to be effective, so all exclusions should be conducted outside of hibernation season. In general:

- The best time to implement exclusions and portal closures is during late summer or early fall, after cessation of maternity activities and before the onset of hibernation.

- Early-fall closures will best ensure a window for bats to find alternate hibernacula and will give females a full spring season to locate alternate maternity sites.

Exclusions for Destructive Closures

Regardless of the reason for a destructive closure of known or potential bat roosts, steps must be taken to ensure significant bat colonies are not destroyed as a direct result of closure activities. Managers should include adequate exclusions as a routine part of mine reclamation programs to minimize the risk of entombing bats in closed workings. Further, closures should be conducted immediately following exclusion to limit the chance of bats becoming reestablished in the mine. In general, these two guidelines can help determine whether exclusions should be conducted and how intense the exclusion effort should be.

Exclusions Not Required: Exclusions are generally not required if a mine does not offer potential bat habitat, as mutually agreed upon by all partners involved in the mine closure project.

Standard Exclusions: In general, exclusions are recommended at all mines that represent habitat for bats. Given the ephemeral and episodic use of some roosts, it is prudent to err on the side of caution and conduct standard exclusions efforts, especially if significant time has elapsed since biological assessments were conducted.

The use of one-inch mesh material (e.g., chicken wire, polypropylene or similar material) is most often used to exclude bats from a mine. Lighter-weight material may be used for remote mines that require physically transporting the material over long distances or rough terrain. Although this material is very effective for excluding bats, it may also entangle bats and other wildlife. Managers may need to develop a plan to periodically check exclusion materials at sites with large bat colonies or high use by other wildlife to prevent loss of entangled bats, amphibians, reptiles or birds.

Exclusion materials should be maintained for at least three nights prior to portal closure at mines that provide habitat and where little or no bat use has been detected. Simultaneously

covering all external openings with exclusion materials and leaving it in place for at least one week is an effective method for excluding most bat species from roosts. Difficulties in navigating through exclusion materials should cause bats to seek alternate roosts rather than continuing to access the mine through the wire.

For most species, simply spreading exclusion materials across portals will be sufficient to allow bats to exit a mine while effectively discouraging their return. However, not all bats in all roosts across all landscapes will respond in an identical manner. As a general rule, smaller colonies in areas where roosts are abundant tend to quickly abandon roosts after exclusion materials are installed. For example, exclusion materials left in place for three to five nights will usually cause small colonies of Townsend's big-eared bat roosting in small mines in Nevada to abandon the roosts.

END OF SURVEY REPORT

Appendix D

EJ Report

DBS&A
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EJScreen Report (Version 2.11)

8 miles Ring Centered at 36.943830,-104.333600, NEW MEXICO, EPA Region 6

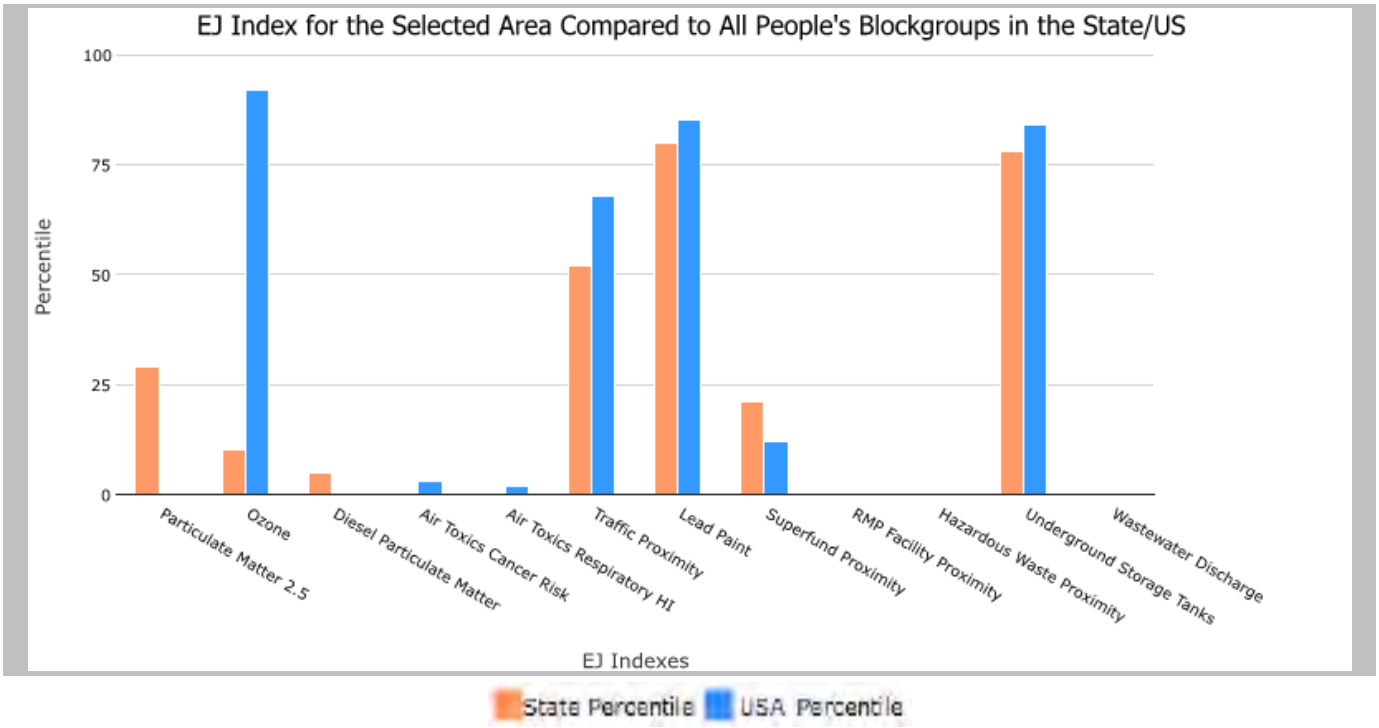
Approximate Population: 6,229

Input Area (sq. miles): 200.96

Yankee

Selected Variables	State Percentile	USA Percentile
Environmental Justice Indexes		
Particulate Matter 2.5 EJ index	29	0
Ozone EJ index	10	92
Diesel Particulate Matter EJ index*	5	0
Air Toxics Cancer Risk EJ index*	0	3
Air Toxics Respiratory HI EJ index*	0	2
Traffic Proximity EJ index	52	68
Lead Paint EJ index	80	85
Superfund Proximity EJ index	21	12
RMP Facility Proximity EJ index	0	0
Hazardous Waste Proximity EJ index	0	0
Underground Storage Tanks EJ index	78	84
Wastewater Discharge EJ index	0	0

EJ Indexes - The EJ indexes help users screen for potential EJ concerns. To do this, the EJ index combines data on low income and people of color populations with a single environmental indicator.



*Diesel particular matter, air toxics cancer risk, and air toxics respiratory hazard index are from the EPA's Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. Cancer risks and hazard indices from the Air Toxics Data Update are reported to one significant figure and any additional significant figures here are due to rounding. More information on the Air Toxics Data Update can be found at: https://www.epa.gov/haps/air-toxics-data-update.

EJScreen Report (Version 2.11)

8 miles Ring Centered at 36.943830,-104.333600, NEW MEXICO, EPA Region 6

Approximate Population: 6,229

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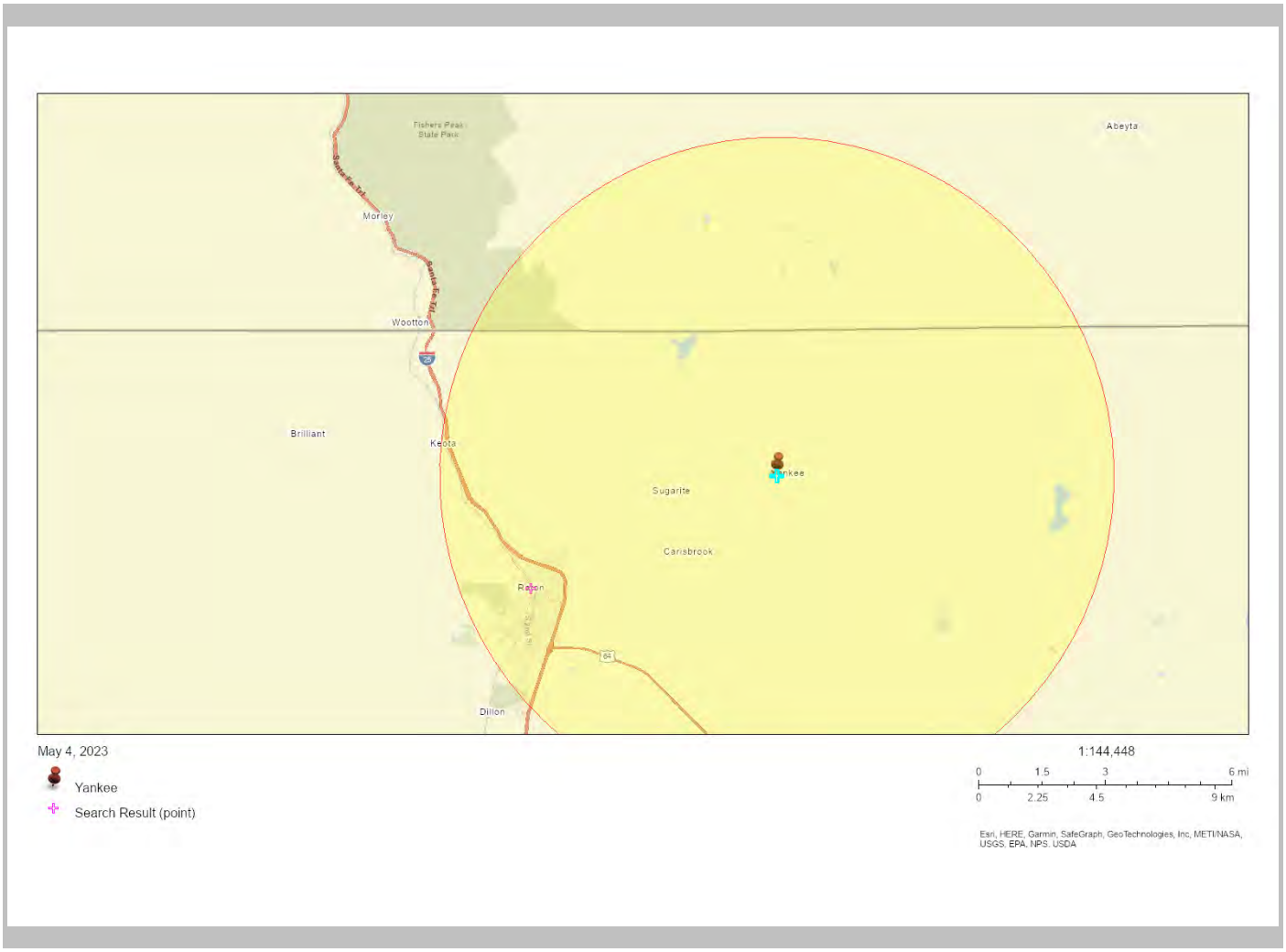
Yankee



Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	0

EJScreen Report (Version 2.11)

8 miles Ring Centered at 36.943830,-104.333600, NEW MEXICO, EPA Region 6

Approximate Population: 6,229

Input Area (sq. miles): 200.96

Yankee

Selected Variables	Value	State Avg.	%ile in State	USA Avg.	%ile in USA
Pollution and Sources					
Particulate Matter 2.5 (µg/m^3)	4.76	5.54	23	8.67	0
Ozone (ppb)	52.9	56	7	42.5	90
Diesel Particulate Matter* (µg/m^3)	0.0161	0.198	4	0.294	<50th
Air Toxics Cancer Risk* (lifetime risk per million)	10	20	0	28	<50th
Air Toxics Respiratory HI*	0.1	0.23	0	0.36	<50th
Traffic Proximity (daily traffic count/distance to road)	190	510	41	760	45
Lead Paint (% Pre-1960 Housing)	0.51	0.18	88	0.27	74
Superfund Proximity (site count/km distance)	0.01	0.14	16	0.13	4
RMP Facility Proximity (facility count/km distance)	0.0083	0.24	0	0.77	0
Hazardous Waste Proximity (facility count/km distance)	0.007	0.81	0	2.2	0
Underground Storage Tanks (count/km^2)	11	3.3	92	3.9	90
Wastewater Discharge (toxicity-weighted concentration/m distance)	1.1E-06	3.5	13	12	9
Socioeconomic Indicators					
Demographic Index	52%	51%	53	35%	76
Supplemental Demographic Index	18%	17%	58	15%	71
People of Color	55%	63%	40	40%	70
Low Income	50%	39%	66	30%	80
Unemployment Rate	2%	7%	36	5%	36
Limited English Speaking Households	2%	5%	49	5%	63
Less Than High School Education	14%	14%	58	12%	67
Under Age 5	5%	6%	58	6%	55
Over Age 64	30%	17%	84	16%	88
Low Life Expectancy	20%	19%	62	20%	61

EJScreen Report (Version 2.11)

8 miles Ring Centered at 36.943830,-104.333600, NEW MEXICO, EPA Region 6

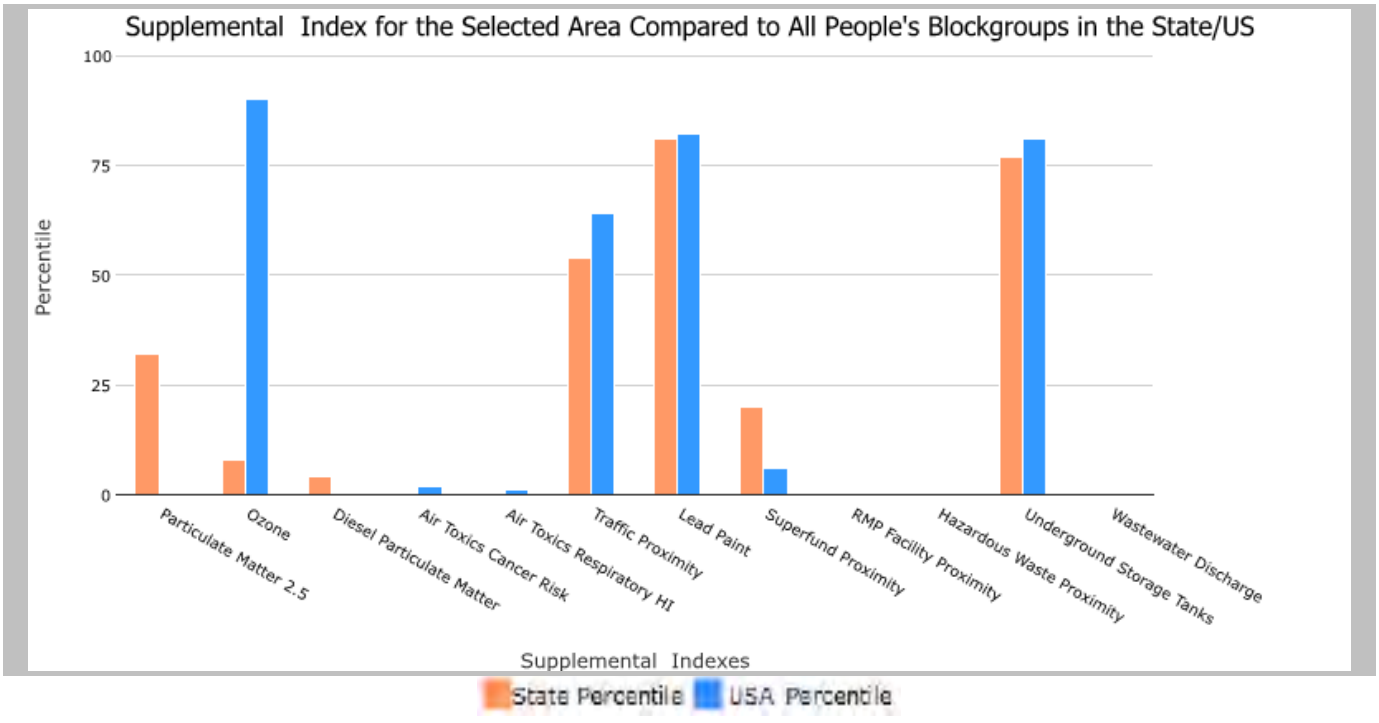
Approximate Population: 6,229

Input Area (sq. miles): 200.96

Yankee

Selected Variables	State Percentile	USA Percentile
Supplemental Indexes		
Particulate Matter 2.5 Supplemental Index	32	0
Ozone Supplemental Index	8	90
Diesel Particulate Matter Supplemental Index*	4	0
Air Toxics Cancer Risk Supplemental Index*	0	2
Air Toxics Respiratory HI Supplemental Index*	0	1
Traffic Proximity Supplemental Index	54	64
Lead Paint Supplemental Index	81	82
Superfund Proximity Supplemental Index	20	6
RMP Facility Proximity Supplemental Index	0	0
Hazardous Waste Proximity Supplemental Index	0	0
Underground Storage Tanks Supplemental Index	77	81
Wastewater Discharge Supplemental Index	0	0

Supplemental Indexes - The supplemental indexes offer a different perspective on community-level vulnerability. They combine data on low-income, limited English speaking, less than high school education, unemployed, and low life expectancy populations with a single environmental indicator.



This report shows the values for environmental and demographic indicators, EJScreen indexes, and supplemental indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJScreen documentation for discussion of these issues before using reports. For additional information, see: www.epa.gov/environmentaljustice.

Appendix E

Agency Responses

DBS&A
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State of New Mexico
Energy, Minerals and Natural Resources Department

Michelle Lujan Grisham
Governor

Sarah Cottrell Propst
Cabinet Secretary

Todd Leahy, JD, PhD
Deputy Secretary

Albert Chang, Director
Mining and Minerals Division

May 15, 2023

Greetings,

The Abandoned Mine Land (AML) Program is proposing to safeguard hazardous mine features at the former Yankee Mine and is in the process of evaluating measures that would best meet the purpose and need for the project. The project area is located approximately 8 miles northeast of the City of Raton, Colfax County, New Mexico, all on private and State Land Office lands (See attached map). County Road A-25 crosses the project area and is included in the safeguarding measures being proposed.

Daniel B. Stephens & Associates, Inc. has prepared the Draft Environmental Assessment (EA) for the proposed project on behalf of the AML Program. As part of the release of the Draft EA, we are inviting review of the EA from interested parties regarding potential environmental impacts resulting from implementation of the project.

To assist you in evaluating this project, please find the following attachments:

- Project Summary
- Location Map

A public meeting is scheduled for June 8, 2023 from 5:30 to 7:00 pm, to provide information regarding the project, and present findings of the Draft EA. Please find a meeting flyer attached for more information regarding the meeting. Please feel free to share the information with others who would also like to attend or who may be interested in learning more about the project.

The Draft EA and additional information regarding the project will be available at the following link:
https://www.emnrd.nm.gov/mmd/public-notices/

Please simply reply to this email (jkutz@geo-logic.com) or by mail to Ms. Julie Kutz, Daniel B. Stephens & Associates, 6020 Academy NE, Albuquerque NM 87109-3315 with your comments or questions; or call 505-822-9400 to discuss. You may also contact James Hollen at: james.hollen@emnrd.nm.gov or (505) 231-8332 with questions, comments, or for more information.

We appreciate your input and thank you for your interest in the project.

Project Summary

Background

The New Mexico Energy, Minerals, and Natural Resources Department (NMEMNRD), Abandoned Mine Land (AML) Program, in partnership with the U.S. Department of Interior, Office of Surface Mining Reclamation and Enforcement (OSMRE), is proposing to safeguard hazardous abandoned mine features throughout the Yankee Canyon area (Project Area) located eight miles northeast of the City of Raton, Colfax County, New Mexico (Figure 1).

Mining was first conducted around Yankee Canyon, as well as the nearby Sugarite Canyon, in the early 1890s. Mining operations continued for over 40 years until the early 1940s, when mining was shut down in the area.

The Project Area consists of private land and state trust land administered by the New Mexico State Land Office. The area contains numerous historical mining features, many of which are hazardous and in need of safeguarding.

Project Description

The Yankee Canyon Safeguard Project (herein referred to as the Proposed Project) involves the implementation of safeguarding measures in the most dangerous locations of the Project Area with a focus on repair of a section of County Road (CR) A-25 where it passes through the Project Area. Safeguarding measures would include investigation and repair of subsidence on CR A-25, stabilization of steep slopes on coal gob piles, and the construction of structural barriers designed to restrict human access. Gates, cupolas, or other wildlife-compatible closures would be installed site-wide where the dangerous features are located.

Existing roads would be used wherever possible to access the mining features proposed for closure. Construction staging areas would be located near existing roads in areas that are already disturbed. The Proposed Project ground disturbance footprint would be focused on the identified hazardous mine features throughout the Project Area. Colfax County Roads A-25 and A-26 would serve as the main access roads, along with former two-track, unpaved mine roads that would serve as access to other areas situated away from the county roads. Existing disturbed and flat areas adjacent to the road may also be used for geotechnical drilling activities and staging of drilling, construction equipment and materials.

Implementation of the Proposed Project is anticipated to begin in the early fall 2023. The Proposed Project would be completed in phases, with the most critical work taking place first. The below table shows the phases and estimated timing of completion.

Phase	CR A-25	Structural Closures	Coal Waste (Gob) Piles	Approximate Timing of Completion	Public Accessibility During Construction
I	X	X (near CR A-25)	-	Up to 1 month	Access will be limited during work along CR A-25. All efforts will be made to accommodate local residential traffic, however there may be times when the road must be shut down.
II	-	X	X (on at least state trust lands)	Up to 1 year	No limitations

Phase I

Phase I would investigate and repair areas on or adjacent to CR A-25 where subsidence features (tension cracks) have been identified along a section of the road. In addition, Phase I includes the safeguarding of several adits close to the road. Safeguarding hazardous mine openings and other features will be designed to allow for open access to, and continued use of, the mine features by smaller wildlife species, including bats.

Phase II

Phase II would consist of safeguarding the remaining adits and other hazardous features identified throughout the Project Area. Phase II would also include gob pile reclamation on state trust land and potentially on private land.

Phase I and II Project Details

The following describes the safeguarding measures in detail for the Proposed Project:

County Road A-25

Geotechnical exploration would be conducted by drilling to further characterize subsurface conditions and determine if the subsidence is related to underground mine workings. Backfilling through drilling and injection of a water, sand and cement grout mixture would then be completed to mitigate the areas of subsidence impacting the road. The grout mixture would be injected into the voids beneath and adjacent to the A-25 alignment. The grouting work may take place concurrently with the drilling investigation. The goal of drilling and grouting the CR

A-25 subsidence features is to map the voids under and near the road alignment and to fill those voids with grout to stop additional subsidence in the area and stabilize the road. The drill holes would be spaced every 30 feet along the A-25 alignment, with an increased drilling density of every 20 feet around the existing subsidence features.

Adits and Other Hazardous Mine Features

Gates: Gates would be installed over mine shafts and in mine adits or portals, as well as in other mine entryways where gates are determined to be the best method for blocking access to mine features. The gates would be designed in accordance with the latest industry standards and would be modified as necessary to fit the specific entryway, occasionally using steel culverts to support the gate. The basic gate design generally used consists of a vertical to horizontally placed flat grid of welded steel cross bars anchored in place over the mine entryway. The cross bars would be oriented horizontally and welded onto vertical supports spaced widely. Spacing of the horizontal cross bars would be 6 inches, designed to allow passage of bats in flight, as well as access for other small mammals and for birds, but not spaced widely enough to allow human entry. Gates are typically constructed of 2-inch by 4-inch and 2-inch-square tubular weathering steel that is anchored into the surrounding rock using 1-inch steel rods. Gates are designed to not inhibit air flow into or out of the mine feature and constructed of angled steel oriented with the apex up to maximize the airflow through the gate.

The gates would be installed at all features identified for closure that have been surveyed by Bat Conservation International (BCI) and documented for historical purposes (Okun 2023). Closure and construction timing will be in accordance with the recommendations of BCI. Any recommendations, such as pre-construction wildlife surveys, resulting from the BA/BE conducted in the Project Area (DBSA 2022) will be followed.

Rock/concrete bulkhead with culvert gate: At some locations, gates would consist of a bulkhead constructed of a 2- to 4-foot-thick section of rocks cemented together with concrete. A 3- to 4-foot steel culvert with a steel gate would be constructed inside.

Cupolas: Cupolas are a type of gate designed to fit over a vertical mine shaft. Bat-friendly cupolas may be installed over mine shafts if determined to be an appropriate measure for safeguarding a feature in the Project Area. Locations and construction timing will be in accordance with the recommendations of BCI and based on pre-construction surveys of wildlife usage of features.

Backfill: Some mine openings may be backfilled with adjacent coal gob or waste rock piles.

Other structural closures: Polyurethane foam (PUF) plugs, gated culverts, and other structures may be used to safeguard mine openings.

Coal Waste (Gob) Pile Reclamation

Stabilization of steep slopes on coal gob piles would be conducted in place to prevent mine waste from entering adjacent ephemeral channels. Proposed work would include in situ burial of coal gob or the establishment of vegetation and installation of various erosion control structures on the gob piles as necessary to facilitate effective stormwater management.

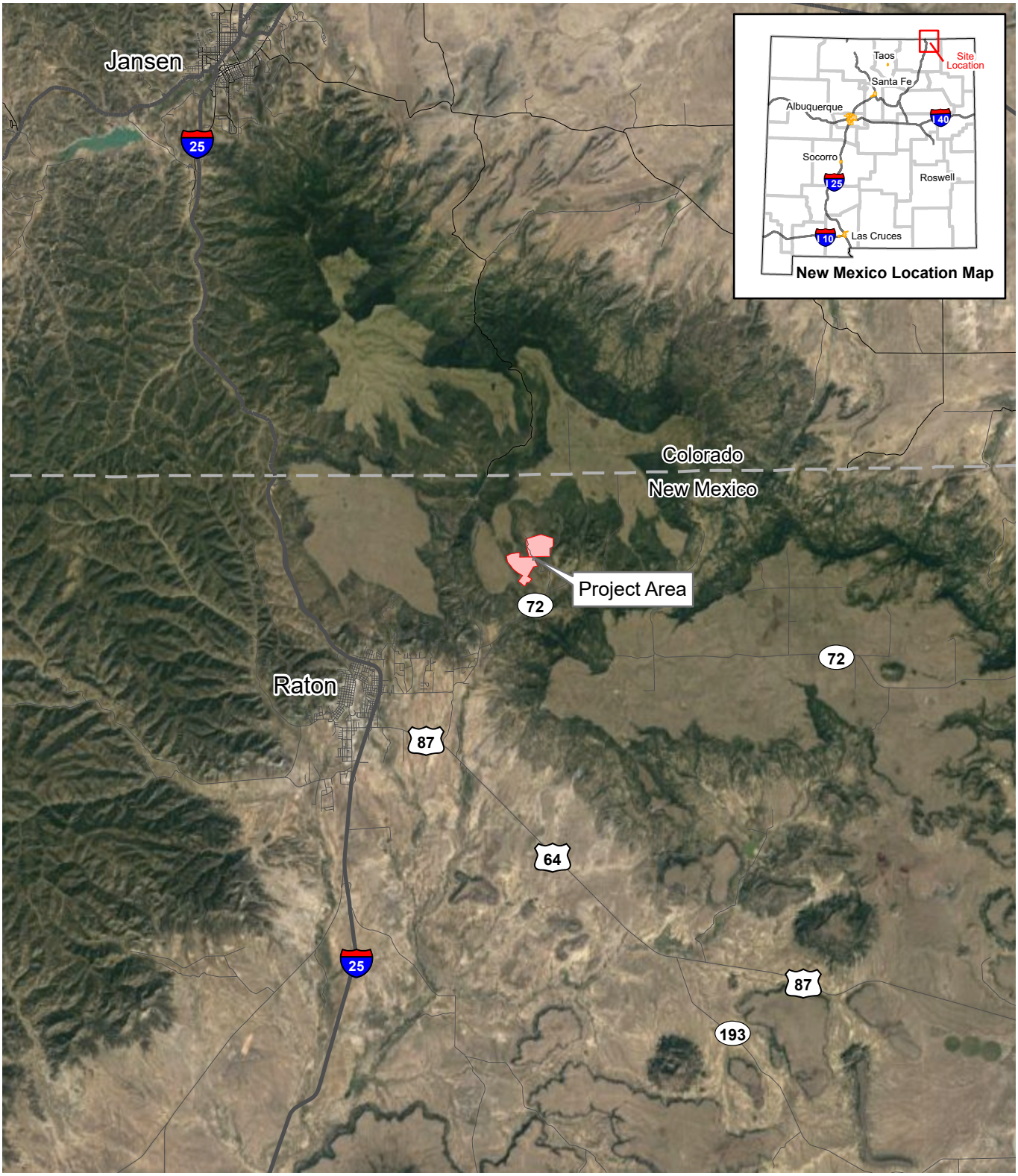

Image source: Google Earth Pro, 5/1/2014

N

0 2 4 Miles

DBS&A
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2/15/2023 DB21.1363

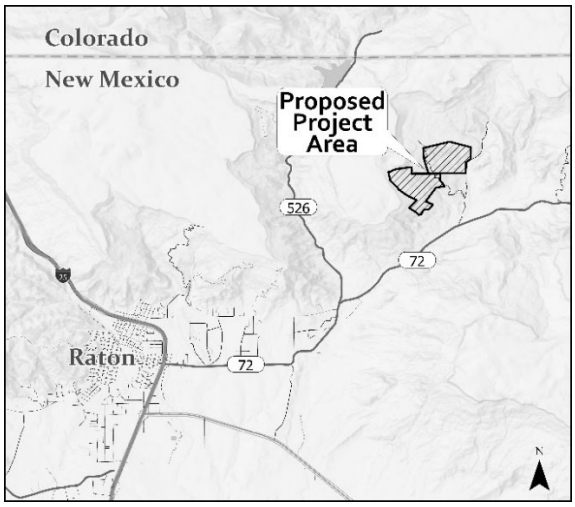
YANKEE CANYON EA
Area Map

Figure 1

\\SS6ABQ\DATAS\PROJECTS\DB21.1363 ENMRD AML ENVIRONMENTAL SERVICES\PHASE 7 YANKEE CANYON EA\GIS\ARCGIS PRO\YANKEE CANYON EA\YANKEE CANYON EA.APRX

PUBLIC MEETING NOTICE
Yankee Mine Safeguarding Project
Raton, NM

Thursday, June 8, 2023, 5:30 – 7:00pm
City of Raton Library, 244 Cook Ave., Raton, NM
Draft Environmental Assessment Presentation



The Abandoned Mine Land (AML) Program invites you to a public meeting for the proposed safeguarding of the former Yankee Mine, including County Road A-25, located 8 miles northeast of Raton, NM.

Project Scope: The New Mexico Energy, Minerals, and Natural Resources Department, AML Program, in partnership with the U.S. Department of Interior, Office of Surface Mining Reclamation and Enforcement is proposing to safeguard numerous hazardous abandoned mine openings/features throughout the former Yankee Mine area with a focus on destabilized areas of CR A-25, which traverses through the former mine site.

Public Meeting Purpose: Coinciding with the release of the Draft Environmental Assessment (EA), the meeting is to give the public, area neighbors, and stakeholders the opportunity to learn more about the project. The findings of the EA will be discussed during the meeting.

ADA: To request Americans with Disabilities Act (ADA)-related accommodations for this meeting, contact Jean-Luc Cartron at (505) 822-9400 or jcartron@geo-logic.com at least two days before the public meeting.

Comments: Comments/questions will be accepted and recorded at the meeting, or they can be submitted to james.hollen@state.nm.us or by phone (505-231-8332). Please submit comments by July 8, 2023.

From: Zeller, Brook J
To: Kutz, Julie
Cc: Hollen, James, EMNRD; Cartron, Jean-Luc
Subject: Re: [EXTERNAL] Draft EA for Yankee Canyon Safeguarding Project
Date: Thursday, May 18, 2023 2:16:24 PM

Received, thank you Julie!

Brook Zeller
Environmental Protection Specialist
OSMRE – Denver Field Branch
Office: (303)-236-3980
Cell: (303)-874-8806
Email: bzeller@osmre.gov

From: Kutz, Julie <jkutz@geo-logic.com>
Sent: Wednesday, May 17, 2023 11:01 AM
Cc: Hollen, James, EMNRD <james.hollen@emnrd.nm.gov>; Cartron, Jean-Luc <jcartron@geo-logic.com>
Subject: [EXTERNAL] Draft EA for Yankee Canyon Safeguarding Project

Good morning,
Please see the attached documents for an announcement of the release of the draft Environmental Assessment for a safeguarding project northeast of Raton, New Mexico. The project is being proposed by the New Mexico Abandoned Mine Land Program.
Thank you for your time and please let me know if you need more information.
Julie

Julie Kutz
Biologist

Daniel B. Stephens & Associates, Inc.
a Geo-Logic Company

6020 Academy NE, Suite 100
Albuquerque, New Mexico 87109-3315
Office: (505) 822-9400 ¦ Direct: (505) 353-9103 ¦ Mobile: (505) 715-9140
jkutz@dbstephens.com and jkutz@geo-logic.com

www.dbstephens.com ¦ www.geo-logic.com

State of New Mexico
Energy, Minerals and Natural Resources Department

Michelle Lujan Grisham
Governor

Sarah Cottrell Propst
Cabinet Secretary

Todd Leahy, JD, PhD
Deputy Secretary

Albert Chang, Director
Mining and Minerals Division

HPD Log 120733
Received 9-25-2023

September 25, 2023

Mr. Jeff Pappas Ph. D.,
State Historic Preservation Officer and Director
Historic Preservation Division
407 Galisteo Street, Suite 236
Bataan Memorial Bldg.
Santa Fe, NM 87501
Jeff.pappas@dca.nm.gov

RE: The Yankee Canyon Historic Mining District: Cultural Resource Survey for an EMNRD Abandoned Mine Land Program Coal Mine Safeguarding Project, Colfax County, New Mexico (NMCRIS 151925)

Dear Dr. Pappas,

The New Mexico Abandoned Mine Land Program (AML), in partnership with the U.S. Department of the Interior (USDI), Office of Surface Mining Reclamation and Enforcement (OSMRE), is conducting preliminary environmental studies within the Yankee Canyon Mining District near Yankee, New Mexico in Colfax County, New Mexico, prior to planned mine closures (Attachment 1). The proposed closure project is designed to protect the public from dangers associated with historical coal mining features such as unstable coal gob waste piles, adits, shafts, subsidence features, and other mine openings. As a federally funded program this proposed AML undertaking is subject to Section 106 (54 U.S.C. 306108) of the National Historic Preservation Act (NHPA) (54 U.S.C. 300101 et seq.) and its implementing regulations (36 CFR Part 800: Protection of Historic Properties, as revised August 2004).

The project area includes the Yankee Canyon Mining District where the earliest recorded coal mining activities date to 1905 and continued into the 1960s. Early on, coal mining in Yankee Canyon was a corporate venture but this was a short-lived trend as mining at this scale only lasted for the first eight years of mining operations. From 1913 to the area's abandonment in the 1960s, the mining activities can best be described as small-scale family operations. The APE for these activities is encompassed within a ~582-acre block (Attachment 1) that consists of private land (~300-acres) and State Trust Land managed by the SLO (~282-acres).

The AML is requesting SHPO review AML's identification and treatment of historic properties as documented in the above referenced report and associated LA Forms. Table 1 (Attachment 2)

provides a summary of AML's National Register of Historic Places (NRHP) eligibility determinations based on our review of the accompanying cultural resources report and site forms. AML has assessed that the proposed undertaking will result in ***no adverse effect to historic properties*** or the mining landscape. The AML is seeking concurrence from the SHPO on our NRHP site eligibility determinations and effect assessment.

The portion of the Yankee Canyon Mitigation and Safeguarding activity involving STL (T:32N, R:24E, S:36) has been authorized by the New Mexico Commissioner of Public Lands (Commissioner) under a Natural Resource Authorization (NRA) agreement (#FOD-NR-329) between the State of New Mexico Energy, Minerals, and Natural Resources Department, Mining and Minerals Division and the Commissioner. Because the Area of Potential Effect (APE) involves STL, this AML undertaking is subject to review by the Commissioner under Rule 19.2.24 NMAC; *Cultural Properties Protection*, in accordance with the New Mexico Cultural Properties Protection Act Sections 18-6A-6 NMSA 1978. To encourage coordination, the AML requested input from the New Mexico State Land Office (SLO) regarding any concerns they might have had with the project regarding the identification and treatment of historic properties on STL as documented in the above referenced report and associated LA Forms. The Commissioner concurred with the AMLP's NRHP site eligibility determinations and effect assessment (Attachment 3).

The Comanche Nation of Oklahoma, Kiowa Tribe, Jicarilla Apache Nation, Mescalero Apache Tribe, and the Pueblo of Taos were all consulted on the proposed undertaking and the potential cultural resource survey in November of 2022. The AML program did not receive any interest from the tribes.

As part of their preliminary studies, the EMNRD retained Okun Consulting Solutions (OCS) to perform a cultural resources inventory of the proposed project APE, and a full-coverage pedestrian survey was performed between October 11, 2022, and November 8, 2022, under the supervision of OCS archaeologists Adam Okun and Timothy Schoonover.

During the current investigation, OCS documented seven newly recorded sites (LA202927–LA202933) and four previously recorded sites (LA57200, LA119817, LA119818, and LA120611). In total, 11 archaeological sites were documented, all historic coal mining sites that were in use between 1905 to 1963. A total of nine Isolated Occurrences (IOs) were encountered in the project area and are not considered eligible for listing in the NRHP.

Of the 11 sites, OCS recommended four sites *eligible* and the remaining seven sites *not eligible* for listing in the National Register of Historic Places (NRHP). Given certain integrity standards can be met, archaeological sites' eligibility evaluations are primarily evaluated for their information potential under NRHP eligibility Criterion D, but can also be eligible for listing under Criteria A, B, and C. OCS states in their report, *"[To] qualify for listing on the NRHP, resources must possess historic significance in American history, architecture, archaeology, engineering, or culture, and they must exhibit historic integrity—the ability to convey their significance through the survival of their physical characteristics".* The primary factors influencing the OCS NRHP eligibility recommendation were, *"(1) whether a site contained habitation loci with potential for intact subsurface archaeological deposits and (2) whether a site contained intact or unique mine engineering features with the ability to visually convey an association with the period of historic mining in Yankee Canyon."*

Four sites were determined *eligible* for listing in the NRHP. LA 57200 (DENTON-COLANGELO_STRASIA_RODMAN MINE) is a historic period coal mining site assigned a NM Statehood to Recent Historic (A.D. 1930 – 1960) affiliation and is determined *eligible* under Criteria A and D. LA 119817 (TURNER_URTADO MINE A) is a historic period coal mining site assigned a NM Statehood to Recent Historic (A.D. 1921 – 1949) affiliation and is determined *eligible* under Criteria D. LA 120611 (YANKEE NO. 3 MINE) is a historic period coal mining site assigned a NM Statehood to Recent Historic (A.D. 1905 – 1913) affiliation and is determined *eligible* under Criteria D. LA 202929 is a historic period coal mining site assigned a NM Statehood to Recent Historic (A.D. 1930 – 1963) affiliation and is determined *eligible* under Criteria D. Because there is a potential for individual historic mining sites to contribute to what is currently an undefined historic mining district and/or landscape, and because OCS did not address this potential directly in their NRHP eligibility evaluations, the AML Program left the remaining seven historic mining sites (LA119818, LA202927, LA202928, LA202930, LA202931, LA202932, and LA202933) recommended *not eligible* by OCS, as *unevaluated*.

In general, AML safeguards mine features that are eight (8) feet or more in depth or length, which intrude into the ground surface. AML safeguarding activities include a variety proposed methods such as mechanically or manually filling mine openings with surrounding waste material or polyurethane foam (PUF) and building structural barriers that restrict human access such as fences, locking gates, cupolas, or other wildlife compatible closures. Other than dangerous openings, AML also address threats associated with the erosion of large coal gob waste piles through seeding and recontouring. These safeguarding measures minimize exposure and dangers associated with of hazardous abandoned mine openings and gob waste piles to the public, while also working to preserve the visual and informational integrity of cultural manifestations, and wildlife habitat, if present.

Mining features filled with existing waste rock or PUF will remain visible as shallow depressions and residual waste rock material will be recontoured in place. In addition, mine openings with highly visible waste piles, particularly on steep slopes, will be closed by an alternate method (PUF or other structural closure), thereby leaving the viewshed of the mining landscape intact. Structural closures are typically built on site to BLM Visual Resource Management specifications (https://www.blm.gov/programs/recreation/recreation-programs/visual-resource-management). It's also a priority to maintain the historic viewshed when considering the methods used to mediate the hazards of large coal gob waste piles, including those associated with steep slopes, as these features are often defining features of the mining landscape. Consequently, seeding and recontouring activities will maintain the visual integrity of the mining district's setting by stabilizing the slope, thus minimizing the natural erosional processes affecting these slope features. Whenever possible, AML will use existing roads to access the features scheduled for closure.

During the construction phase AML will treat all archaeological sites with an *unevaluated* NRHP determination as *eligible* for listing in the NRHP and like with the NRHP *eligible* sites, institute safeguarding methods that protects the visual and informational integrity of the site. AML proposes to avoid any remaining mine related features (structural foundations) outside the treatment areas with all equipment, vehicles, foot traffic, and any other ground surface disturbing activities during construction. Designated avoidance areas that extend up to 50 feet (15 meters) from cultural resources will be established prior to construction. When working near designated avoidance areas and where construction access routes pass next to these locations, high visibility barrier/indicators will be installed around the avoidance perimeter. The Contractor, AML Cultural Resource Manager/Archaeologist, and AML Project Manager shall cooperate fully with avoidance practices to

preserve archaeological and historic artifacts found within the project area. Moving, removal, or collecting of archaeological or historic materials from the project area or vicinity is prohibited.

Lastly, if previously unidentified archaeological sites, deposits, or in situ artifacts are encountered, all operation in that immediate area shall be terminated (100-ft. radius, 30 meters) until the proper preservation agencies and Native American groups have been notified and offered the opportunity to assess the discovery site.

Table 1 (Attachment 2) provides a summary of AML's NRHP eligibility determinations based on our review of the accompanying cultural resources report and site forms provided by OCS. Further, following the above protocol, AML has assessed that the proposed undertaking will result in ***no adverse effect to historic properties*** or the mining landscape. The AML is seeking concurrence from the SHPO on site eligibility determinations and the AML's effect assessment. Accordingly, please review the OCS report and LA Forms, and provide AML with any comments, recommendations, or corrections. The report and cultural resource documentation can be accessed through the AML's file share site linked in the accompanying email and/or the NMCRIS database.

Alternatively, if the SHPO has no objections, please return a signed copy of this correspondence to concur with the AML determinations as presented.

If you would like additional information or have any questions, please feel free to contact me by email at andrew.zink@emnrd.nm.gov or by phone at 505-490-7379

Thank you for your coordination in this project.

Sincerely,

Andrew Zink
AMLP Cultural Resources Manager
EMNRD-MMD

Enclosed: Attachment 1.) APE Map
Attachment 2.) Table 1.) Site Eligibility and management Recommendations
Attachment 3.) Signed NM State Land Office Consultation Letter

Concurrence: _____ Date: 10/3/2023

For: New Mexico State Historic Preservation Officer

Comments: ____

United States Department of the Interior

FISH AND WILDLIFE SERVICE

New Mexico Ecological Services Field Office
2105 Osuna Road NE
Albuquerque, New Mexico 87113
Telephone 505-346-2525 Fax 505-346-2542
www.fws.gov/southwest/es/newmexico/

January 29, 2024

Cons# 2023-0125615

James Hollen
NEPA Coordinator
New Mexico Abandoned Mine Land Program
Mining and Minerals Division
Energy, Minerals, and Natural Resources Department
1220 South St. Francis Drive
Santa Fe, NM 87505

Dear James Hollen:

Thank you for your letter dated July 21, 2023, providing an initial draft biological assessment (BA) and requesting informal conferencing with the U.S. Fish and Wildlife Service (Service) pursuant to section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.) (Act), as amended. The New Mexico New Mexico Energy, Minerals, and Natural Resources Department (EMNRD) Abandoned Mine Lands Program (AML), in partnership with the U.S. Department of Interior, Office of Surface Mining Reclamation and Enforcement (OSMRE), is requesting informal conferencing for the permitting of activities to safeguard and repair mine features and County Road A-25 within Yankee Canyon, Colfax County, New Mexico. We recommended that the BA include an analysis for tricolored bat (*Perimyotis subflavus*), which was proposed for listing as endangered on September 14, 2022, and is pending a final listing determination. We reviewed the current BA, dated November 20, 2023, and received by the Service's New Mexico Ecological Services Field Office on January 4, 2024. This letter transmits the Service's concurrence pursuant to section 7 of the Act.

In the BA, the AML made an effects determination for the proposed action of "*may affect, not likely to jeopardize*" for tricolored bat, and "no effect" determinations for southwestern willow flycatcher (*Empidonax traillii extimus*) and its critical habitat, Mexican spotted owl (*Strix occidentalis lucida*) and its critical habitat, piping plover (*Charadrius melodus*), New Mexico meadow jumping mouse (*Zapus hudsonius luteus*) and its critical habitat, Rio Grande cutthroat trout (*Oncorhynchus clarkii virginalis*), and monarch butterfly (*Danaus plexippus*). Although the

Act does not require agencies to consult if the action agency determines their actions will have "no effect" on threatened or endangered species or designated critical habitats (50 CFR 402.12), we appreciate your consideration for the conservation of these species and notification of your "no effect" determinations.

Proposed Project

The AML Program, in partnership with the OSMRE, is proposing to safeguard hazardous abandoned mine features throughout the Yankee Canyon area (Project Area) located near the City of Raton, Colfax County, New Mexico. The Project Area consists of private land and land administered by the New Mexico State Land Office (SLO).

The proposed action will investigate and mitigate hazardous mine features in the Project Area, including a section of County Road A-25 where subsidence features (tension cracks) have been identified. The scope of work also includes safeguarding of other related hazardous mine openings and features identified throughout the Project Area, while allowing for open access and continued use of underground habitat by smaller wildlife species, including bats. The AML program will evaluate and implement the following safeguarding measures in priority areas.

- *County Road A-25:* Conduct geotechnical exploration and backfilling through drilling and injection of a water, sand, and cement grout mixture to mitigate subsidence impacting County Road A-25. Drill holes will be spaced every 30 feet along the County Road A-25 alignment, with an increased drilling density of every 20 feet around the existing subsidence features.
- *Gates*: Gates will be installed over mine shafts and in mine adits or portals, as well as in other mine entryways where they are determined to be the best method for blocking access to mine features. Gate design will incorporate the latest industry standards with modification as necessary to fit the specific entryway, including use of steel culverts for support as needed. The general gate design consists of a vertical to horizontally placed flat grid of welded steel cross bars anchored in place over the mine entryway. The cross bars are oriented horizontally and welded onto vertical supports spaced widely. Spacing of the horizontal cross bars will be 6 inches, designed to allow passage of bats in flight, as well as access for other small mammals and for birds, but not spaced widely enough to allow human entry. Gates are typically constructed of 2-inch by 4-inch and 2-inch-square tubular weathering steel that is anchored into the surrounding rock using 1-inch steel rods. Gates are designed to not inhibit air flow into or out of the mine feature and are constructed of angled steel oriented with the apex up to maximize the airflow through the gate.

  At some locations, gates will consist of a bulkhead constructed of a 2- to 4-foot-thick section of rocks cemented together with concrete; and a 3- to 4-foot steel culvert with a steel gate inside.

  Gates will be installed at all features identified for closure that have been previously surveyed by Bat Conservation International (BCI). Closure and construction timing will be in accordance with the recommendations from the project's bat report by BCI.

- *Cupolas:* Cupolas are a type of gate designed to fit over a vertical mine shaft where determined to be an appropriate measure for safeguarding a feature in the Project Area. Locations of cupolas and construction timing will be in accordance with the recommendations from the BCI pre-construction surveys of wildlife usage of mine features.
- *Backfill:* Mine openings may be backfilled with adjacent coal gob or waste rock piles.
- *Other structural closures*: Polyurethane foam (PUF) plugs and other structures may be used to safeguard mine openings.
- *Coal gob pile reclamation:* Stabilization of steep slopes on coal gob piles may be needed to prevent mine waste from entering adjacent ephemeral stream channels. Work may include in situ burial of coal gob, establishment of vegetation, and installation of various erosion control structures on the gob piles as necessary to facilitate effective stormwater management.

The proposed project would be implemented in two phases. During the first phase, the road would be repaired and the adits located nearest the road would be closed. During Phase 2, all other mine openings would be closed, and gob piles would be reclaimed on SLO, and possibly private, lands. Gob piles on private lands would only be reclaimed where agreement is reached with property owners.

Concurrence

Tricolored bat roosting and hibernating habitat is present within the project area, including tree foliage, abandoned mines, rock crevices, and other man-made structures. Surveys of the project area have not detected presence of tricolored bats within the abandoned mine openings, although the possibility exists that tricolored bats may utilize these in the future. Potential tree maternity roosts within the project area would not be impacted by the proposed action, due to the avoidance of work during the summer maternity season (May 15 – July 31), as stated in the BA. Vegetation disturbance would be minimal and no trees would be removed, minimizing impacts to all potential tree roosts.

The proposed action will install bat-friendly gates as safeguarding mine features on appropriate bat habitat mine openings to allow for the continued use as roosts and hibernacula. The BCI survey report recommended one mine opening (Yankee Adit VanLaten02) for a destructive closure. As stated in the BA, the proposed action will follow all recommendations in the project's BCI survey report, including the timing of constructing destructive closures during the early fall period to allow for bats to find alternate hibernacula, and to allow female bats a full spring season to locate alternate maternity sites. Avoiding the hibernation period ensures that bats that may be present within mine features will not be trapped or result in mortality or harm to bats. Exclusion materials will be maintained for at least three nights prior to portal closure at mines that are planned for destructive closure and where little or no bat use has been detected, as documented at the Yankee Adit VanLaten02. Covering all external openings with exclusion materials for a minimum of one week will likely be effective in excluding bats from roosts. Additional pre-construction wildlife surveys will be performed as necessary prior to any destructive closures or the installation of safeguarding measures to confirm a lack of wildlife usage of features prior to closure.

The Service concurs with your determination of "*may affect, not likely to jeopardize*" for the tricolored bat, based on the conservation measures stated above. In addition to the information above, the Service also notes that the following information presented in the BA will likely avoid, reduce, or have beneficial impacts to tricolored bats including the following.

- Existing roads will be utilized.
- Construction staging areas would be located near existing roads in areas that are already disturbed.
- The project will reduce human access to mine features. Humans can spread the fungus that causes White-Nose Syndrome from one hibernaculum to another by accidentally carrying the fungus on shoes, clothing, or gear. Reduced human access to any of the mine features that harbor or could harbor bats in the future is an anticipated benefit of the Proposed Action.

Conclusion

This concludes informal section 7 conferencing with the Service for the permitting of safeguarding and repairing dangerous mine features and County Road A-25 within Yankee Canyon, Colfax County, New Mexico. Please contact our office if: 1) new information reveals changes to the action that may affect listed species or critical habitat in a manner or to an extent not previously considered, 2) the action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not previously considered, or 3) a new species is listed, or critical habitat designated that may be affected by the action.

Thank you for your concern for threatened and endangered species and New Mexico's wildlife resources. If you have questions, please contact Nicole (Nik) MacPhee at the letterhead address or by electronic mail at nicole_macphee@fws.gov.

Sincerely,

SHAWN SARTORIUS

Digitally signed by SHAWN SARTORIUS
Date: 2024.01.29 13:01:56 -07'00'

Shawn Sartorius
Field Supervisor

cc (electronic):
Abandoned Mine Lands Environmental Manager, EMNRD, Santa Fe, New Mexico
Abandoned Mine Lands Project Manager, EMNRD, Santa Fe, New Mexico

State of New Mexico
Energy, Minerals and Natural Resources Department

Michelle Lujan Grisham
Governor

Sarah Cottrell Propst
Cabinet Secretary

Todd Leahy, JD, PhD
Deputy Secretary

Albert Chang, Director
Mining and Minerals Division

September 11, 2023

Stephanie Garcia Richard
Commissioner of Public Lands
New Mexico State Land Office
310 Old Santa Fe Trail
Santa Fe, NM 87501
505-827-5760

RE: The Yankee Canyon Historic Mining District: Cultural Resource Survey for an EMNRD Abandoned Mine Land Program Coal Mine Safeguarding Project, Colfax County, New Mexico (NMCRIS 151925)

Dear Ms. Richard,

The New Mexico Abandoned Mine Land Program (AML), in partnership with the U.S. Department of the Interior (USDI), Office of Surface Mining Reclamation and Enforcement (OSMRE), is conducting preliminary environmental studies involving New Mexico State Trust Lands (STL) near Yankee, in the Yankee Canyon Mining District, Colfax County, New Mexico, prior to planned mine closures (Attachment 1). The proposed closure project is designed to protect the public from dangers associated with historical coal mining features such as adits, shafts, subsidence features, and other mine openings. The portion of the Yankee Canyon Mitigation and Safeguarding activity involving STL (T:32N, R:24E, S:36) has been authorized by the New Mexico Commissioner of Public Lands (Commissioner) under a Natural Resource Authorization (NRA) agreement (#FOD-NR-329) between the State of New Mexico Energy, Minerals, and Natural Resources Department, Mining and Minerals Division and the Commissioner.

Because the Area of Potential Effect (APE) involves STL, this AML undertaking is subject to review by the Commissioner under Rule 19.2.24 NMAC; *Cultural Properties Protection*, in accordance with the New Mexico Cultural Properties Protection Act Sections 18-6A-6 NMSA 1978. To encourage coordination, the AML is requesting input from the New Mexico State Land Office (SLO) regarding any concerns you might have with the project regarding the identification and treatment of historic properties on STL as documented in the above referenced report, and associated LA Forms proposed in this letter.

As a federally funded program this proposed AML undertaking is subject to Section 106 (54 U.S.C. 306108) of the National Historic Preservation Act (NHPA) (54 U.S.C. 300101 et seq.) and its

implementing regulations (36 CFR Part 800: Protection of Historic Properties, as revised August 2004). The APE for these activities is encompassed within a ~582-acre block (Attachment 1) that consists of private land (~300-acres) and State Trust Land managed by the SLO (~282-acres). The Comanche Nation of Oklahoma, Kiowa Tribe, Jicarilla Apache Nation, Mescalero Apache Tribe, and the Pueblo of Taos were all consulted on the proposed undertaking and the potential cultural resource survey in November of 2022. The AML program did not receive any interest from the tribes.

The project area includes the Yankee Canyon Mining District where the earliest recorded coal mining activities date to 1905 and continued into the 1960s. Early on, coal mining in Yankee Canyon was a corporate venture but this was a short-lived trend as mining at this scale only lasted for the first eight years of mining operations. From 1913 to the area's abandonment in the 1960s, the mining activities can best be described as small-scale family operations.

As part of their preliminary studies, the EMNRD retained Okun Consulting Solutions (OCS) to perform a cultural resources inventory of the proposed project APE, and a full-coverage pedestrian survey was performed between October 11, 2022, and November 8, 2022, under the supervision of OCS archaeologists Adam Okun and Timothy Schoonover.

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Of the 11 sites, OCS recommended four sites *eligible* and the remaining seven sites *not eligible* for listing in the National Register of Historic Places (NRHP). Given certain integrity standards can be met, archaeological sites' eligibility evaluations are primarily evaluated for their information potential under NRHP eligibility Criterion D, but can also be eligible for listing under Criteria A, B, and C. OCS states in their report, *"[To] qualify for listing on the NRHP, resources must possess historic significance in American history, architecture, archaeology, engineering, or culture, and they must exhibit historic integrity—the ability to convey their significance through the survival of their physical characteristics".* The primary factors influencing the OCS NRHP eligibility recommendation were, *"(1) whether a site contained habitation loci with potential for intact subsurface archaeological deposits and (2) whether a site contained intact or unique mine engineering features with the ability to visually convey an association with the period of historic mining in Yankee Canyon."*

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NRHP eligibility evaluations, the AML Program left all seven historic mining sites (LA119818, LA202927, LA202928, LA202930, LA202931, LA202932, and LA202933) recommended *not eligible* by OCS, as *unevaluated*.

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Lastly, if previously unidentified archaeological sites, deposits, or in situ artifacts are encountered, all operation in that immediate area shall be terminated (100-ft. radius, 30 meters) until the proper preservation agencies and Native American groups have been notified and offered the opportunity to assess the discovery site.

Table 1 provides a summary of AML's NRHP eligibility determinations based on our review of the accompanying cultural resources report and site forms provided by OCS. Further, following the above protocol, AML has assessed that the proposed undertaking will result in ***no adverse effect to historic properties*** or the mining landscape. The AML is seeking concurrence from the Commissioner on site eligibility determinations for sites located on State Trust Land and the AML Program's effect assessment. Accordingly, please review the OCS report and LA Forms, and provide AML with any comments, recommendations, or corrections for sites administered by the SLO and the Commissioner (See Table 1. for Land Status). The report and cultural resource documentation have been uploaded to the NMCRIS database and can be downloaded for you to view.

Alternatively, if the Commissioner has no objections, please return a signed copy of this correspondence to concur with the AML determinations as presented. Along with the Commissioner's response, the AML will forward copies of the final report and site forms to the SHPO for final review and concurrence. Lastly, the AML will forward any project related correspondence it receives from the SHPO to the Commissioner for the State Land Office project file.

If you would like additional information or have any questions, please feel free to contact me by email at andrew.zink@emnrd.nm.gov or by phone at 505-490-7379

Thank you for your coordination in this project.

Sincerely,

Andrew Zink
AMLP Cultural Resources Manager
EMNRD-MMD

CC: Ethan Ortega (New Mexico State Land Office, Director of Cultural Resources)

Concurrence: DocuSigned by: Stephanie Garcia Richard 80A84ED7FDCE465... _____ Date: 9/15/2023

For: New Mexico Commissioner of Public Lands

Comments: The NMSLO's Cultural Resources Office concurs with the AMLP's eligibility and management recommendations for the cultural properties on STL within this project area. NMSLO's eligibility ratings have been entered in NMCRIS.

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Envelope Summary Events	Status	Timestamps
Envelope Sent	Hashed/Encrypted	9/15/2023 8:44:38 AM
Certified Delivered	Security Checked	9/15/2023 4:19:57 PM
Signing Complete	Security Checked	9/15/2023 4:21:07 PM
Completed	Security Checked	9/15/2023 4:21:07 PM

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If you elect to receive required notices and disclosures only in paper format, it will slow the speed at which we can complete certain steps in transactions with you and delivering services to you because we will need first to send the required notices or disclosures to you in paper format, and then wait until we receive back from you your acknowledgment of your receipt of such paper notices or disclosures. Further, you will no longer be able to use the DocuSign system to receive required notices and consents electronically from us or to sign electronically documents from us.

All notices and disclosures will be sent to you electronically

Unless you tell us otherwise in accordance with the procedures described herein, we will provide electronically to you through the DocuSign system all required notices, disclosures, authorizations, acknowledgements, and other documents that are required to be provided or made available to you during the course of our relationship with you. To reduce the chance of you inadvertently not receiving any notice or disclosure, we prefer to provide all of the required notices and disclosures to you by the same method and to the same address that you have given us. Thus, you can receive all the disclosures and notices electronically or in paper format through the paper mail delivery system. If you do not agree with this process, please let us know as described below. Please also see the paragraph immediately above that describes the consequences of your electing not to receive delivery of the notices and disclosures electronically from us.

How to contact Carahsoft OBO New Mexico State Land Office:

You may contact us to let us know of your changes as to how we may contact you electronically, to request paper copies of certain information from us, and to withdraw your prior consent to receive notices and disclosures electronically as follows:
To contact us by email send messages to: thoffman@slo.state.nm.us

To advise Carahsoft OBO New Mexico State Land Office of your new email address

To let us know of a change in your email address where we should send notices and disclosures electronically to you, you must send an email message to us at thoffman@slo.state.nm.us and in the body of such request you must state: your previous email address, your new email address. We do not require any other information from you to change your email address.

If you created a DocuSign account, you may update it with your new email address through your account preferences.

To request paper copies from Carahsoft OBO New Mexico State Land Office

To request delivery from us of paper copies of the notices and disclosures previously provided by us to you electronically, you must send us an email to thoffman@slo.state.nm.us and in the body of such request you must state your email address, full name, mailing address, and telephone number. We will bill you for any fees at that time, if any.

To withdraw your consent with Carahsoft OBO New Mexico State Land Office

To inform us that you no longer wish to receive future notices and disclosures in electronic format you may:

i. decline to sign a document from within your signing session, and on the subsequent page, select the check-box indicating you wish to withdraw your consent, or you may;

ii. send us an email to thoffman@slo.state.nm.us and in the body of such request you must state your email, full name, mailing address, and telephone number. We do not need any other information from you to withdraw consent.. The consequences of your withdrawing consent for online documents will be that transactions may take a longer time to process..

Required hardware and software

The minimum system requirements for using the DocuSign system may change over time. The current system requirements are found here: https://support.docusign.com/guides/signer-guide-signing-system-requirements.

Acknowledging your access and consent to receive and sign documents electronically

To confirm to us that you can access this information electronically, which will be similar to other electronic notices and disclosures that we will provide to you, please confirm that you have read this ERSD, and (i) that you are able to print on paper or electronically save this ERSD for your future reference and access; or (ii) that you are able to email this ERSD to an email address where you will be able to print on paper or save it for your future reference and access. Further, if you consent to receiving notices and disclosures exclusively in electronic format as described herein, then select the check-box next to 'I agree to use electronic records and signatures' before clicking 'CONTINUE' within the DocuSign system.

By selecting the check-box next to 'I agree to use electronic records and signatures', you confirm that:

- You can access and read this Electronic Record and Signature Disclosure; and
- You can print on paper this Electronic Record and Signature Disclosure, or save or send this Electronic Record and Disclosure to a location where you can print it, for future reference and access; and
- Until or unless you notify Carahsoft OBO New Mexico State Land Office as described above, you consent to receive exclusively through electronic means all notices, disclosures, authorizations, acknowledgements, and other documents that are required to be provided or made available to you by Carahsoft OBO New Mexico State Land Office during the course of your relationship with Carahsoft OBO New Mexico State Land Office.

From: kadamczyk@slo.state.nm.us
To: Hollen, James, EMNRD
Subject: [EXTERNAL] RE: Requests Review and Comment - Draft EA Yankee Mine Safeguarding Project
Date: Thursday, August 1, 2024 8:22:54 AM
Attachments: image001.jpg
image003.png
image005.jpg
image002.jpg
image004.png
image006.jpg

Hi James,

I'm very sorry I didn't get to this prior to the deadline of July 12th, I have been swamped. I did review the BA/BE and have no major comments (especially considering the passed deadline). If you have any action items for me, please let me know. Thank you!

Katrina Adamczyk, CWB®
Wildife Biologist
Surface Resources
O: 505.827.5096
C: 505.690.0545
New Mexico State Land Office
310 Old Santa Fe Trail
P.O. Box 1148
Santa Fe, NM 87504-1148
kadamczyk@slo.state.nm.us
nmstatelands.org

.....

From: Hollen, James, EMNRD <james.hollen@emnrd.nm.gov>
Sent: Friday, June 7, 2024 11:30 AM
To: Adamczyk, Katrina D. <kadamczyk@slo.state.nm.us>
Cc: Moiola, Lloyd, EMNRD <lloyd.moiola@emnrd.nm.gov>; Zink, Andrew, EMNRD <Andrew.Zink@emnrd.nm.gov>; D'Alessandro, Laurence, EMNRD <Laurence.DAlessandro@emnrd.nm.gov>
Subject: [EXTERNAL] Requests Review and Comment - Draft EA Yankee Mine Safeguarding Project

June 7, 2024

Via email: khucks@slo.state.nm.us

Katrina Adamczyk, Biologist/Conservationist
Surface Resources
New Mexico State Land Office
310 Old Santa Fe Trail
P.O. Box 1148
Santa Fe, NM 87504-1148

Dear Ms. Adamczyk,

The New Mexico Energy, Minerals and Natural Resources Department, Mining and Minerals Division, Abandoned Mine Land Program (AML), in cooperation with the US Department of Interior, Office of Surface Mining Reclamation and Enforcement (OSMRE), is planning to mitigate impacts from historical coal mining within the boundaries of the Yankee Canyon Project Area. The proposed area of potential effect (APE) consists of approximately 580 total acres, including approximately 300 acres of private land and approximately 280 acres of land administered by the New Mexico State Land Office (SLO). AML is authorized by SLO to conduct mine mitigation and safeguarding work through March 31, 2025, including entry and use of specific tracts of land administered by the SLO pursuant to a Natural Resource Authorization (#FOD-NR-329). The Proposed Action involves measures to repair the area around Colfax County Road A-25 where a section of the road is collapsing due to subsidence of mine features underlying the road. Additional mitigation measures may include stabilization of steep slopes on coal gob waste piles and safeguarding of other hazardous abandoned mine features, such as adits and other mine entryways to limit long-term threats to life and property while also limiting disturbance to other resources on adjacent county, state, federal and private lands.

Since the 1980's, the OSMRE and AML have addressed public safety and environmental concerns associated with dangerous abandoned mine adits and shafts throughout New Mexico. As a federally funded program this proposed AML project constitutes an undertaking subject to review under NEPA. Under the Proposed Action, the OSMRE would approve a Federal Grant for use by the state of New Mexico in implementing the Proposed Action. Based on our draft Environmental Assessment (EA) and the proposed construction, the AML Program finds that remediation activities proposed for the Yankee Canyon Mine Safeguarding Project will not have significant effects on the quality of the human or natural environment, and proposed construction for the Yankee Project is estimated to start this Fall/early-Winter, 2024.

A draft EA has been completed, including a Biological Analysis and Evaluation in addition to a report from Bat Conservation International documenting bat use and habitat of the abandoned mine features within the project area. AML also completed consultation with the U.S. Fish and Wildlife Service (FWS) pursuant to Section 7 of the Endangered Species Act regarding the potential for the tricolored bat (*Perimyotis subflavus*) to occur within the project area. AML received concurrence with the proposed project from FWS in January 2024. An archaeological survey report documenting an inventory of cultural resources found throughout the project area and providing AML resource

eligibility recommendations and a project effects assessment was provided to the SLO in a request for concurrence dated September 11, 2023; concurrence was provided by SLO on September 15, 2023. The draft EA and supporting documents are available for your review via the following link:

https://fs.emnrd.nm.gov/portal/s/129214168084499368

AML requests that you review the draft EA and provide any comments you may have by July 12, 2024.

Please contact me at (505) 231-8332 or via email at: james.hollen@emnrd.nm.gov with any problems accessing the documents, questions or comments you may have regarding the project or this request.

Sincerely,

James Hollen <> NEPA Coordinator
New Mexico Abandoned Mine Land Program
Energy, Minerals & Natural Resources Department <> Mining & Minerals Division
1220 South St. Francis Drive <> Santa Fe, NM 87505
Cell: 505-231-8332 <> Email: james.hollen@emnrd.nm.gov
Web: www.emnrd.nm.gov

Cc via email:
Lloyd Moiola, AML Environmental Manager, lloyd.moiola@emnrd.nm.gov
Laurence D'Alessandro, AML Project Manager, laurence.dalessandro@emnrd.nm.gov
Andrew Zink, AML Cultural Resources Manager, andrew.zink@emnrd.nm.gov

Appendix F

Public Scoping Meeting Summaries

DBS&A
a Geo-Logic Company

Meeting #1

DBS&A
a Geo-Logic Company

Memorandum

To: Lloyd Moiola and James Hollen, Abandoned Mine Land Program

Date: March 30, 2023

From: Julie Kutz and Jean-Luc Cartron

Subject: Public Scoping Summary, Yankee Canyon Mine Safeguarding Project March 9, 2023 Public Meeting 1

The New Mexico Energy Minerals and Natural Resources Department (EMNRD), Mining and Minerals Division (MMD), Abandoned Mine Land Program (AML) is in the process of preparing a draft environmental assessment (EA) for the Yankee Canyon Mine Safeguarding Project located east of the Town of Raton, New Mexico. A public meeting to provide information on the project, answer questions and receive input was conducted on March 9, 2023 at the City of Raton public library (Arthur Johnson Memorial Library), located at 244 Cook Avenue. This was the first meeting for the proposed project.

Public Meeting Outreach

Notification of the meeting was completed by the following methods (Attachment 1):

- Agencies and stakeholders were e-mailed and/or sent by regular mail an invitation flyer, project description, and project location map for the meeting on March 9, 2023.
- Newspaper announcements were run one time in English and Spanish in one newspaper: *The World Journal* (February 23, 2023). The advertisement was also set for publication on February 23, 2023 in *The Chronical News*; however, an error by the newspaper caused the announcements to not be published. Attachment 1 provides documentation from each publication.
- Radio public service announcements (PSAs) were provided to KRTN 93.9 FM for reading on their Community Meetings segment.
- Flyers (in Spanish and English) were posted at the Raton public library (Arthur Johnson Memorial Library).
- A meeting announcement, as well as reports related to the project, were posted on the AML website on or around February 20, 2023.

- The PowerPoint presentation was posted on the AML website following the March 9, 2023 meeting.

Public Meeting

The meeting was conducted at the Raton public library, second floor, on March 9, 2023 from 5:30 to 7:00 p.m. A PowerPoint presentation was given to describe the proposed project and its purpose and need, the National Environmental Policy Act (NEPA) process, and the upcoming draft EA, with an overview of the affected environment and resource topics, anticipated impacts, and mitigation measures (Attachment 2). Following the presentation, the meeting was opened up for questions and comments.

There were 12 attendees, including 6 private citizens, present at the meeting. One person attended the meeting virtually, through the Zoom© virtual meeting service. Questions or comments during the meeting were as follows:

1. Can you please explain what a gob pile is?
2. Most of us live/work near by the project area. Overall it is a great project; however, we worry about accessibility during construction on CR A-25.
3. Can you provide the schedule of construction?
4. How are gob piles reclaimed?
5. What is the contracting process?
6. What is the construction cost?
7. How long is the road segment?
8. How deep are the voids?
9. Is there before and after water quality sample data from Sugarite to review and see if gob pile reclamation has been effective?
10. Can water sampling be conducted at a spring on my property, located downstream of this project area?
11. Why was reclamation of Yankee Canyon not conducted at the same time as Sugarite Canyon?

Responses to these comments/questions are provided in Attachment 3.

Comments

The comment period was set to be from March 9, 2023 until April 9, 2023. There were a total of four comments received from private citizens. Responses are summarized in the table provided as Attachment 3. Comments received are provided in Attachment 4.

Attachment 1

Outreach Documentation

DBS&A
a Geo-Logic Company

DBS&A
a Geo-Logic Company

February 16, 2023

City of Raton Library
244 Cook Avenue
Raton, NM 87740

Re: Public Meeting for Abandoned Mine Lands Program

Dear Sir or Madam:

We will be holding our public meeting at your library on the 9th of March and we would appreciate it if you can post the enclosed meeting notice in your library. I've included a few extra copies that you can hand out or post elsewhere. There are 2 versions, English and Spanish, if you don't mind please post one of each. I can also send more copies if needed.

Also, we will be arriving in Raton mid-afternoon and will check in at the library to make sure we are ready for the meeting. Can you refer me to who I will need to talk to for checking in? I've included my phone/email contact info below. We will have a PowerPoint presentation, what equipment will we need to bring? We can bring a laptop, projector and screen if necessary.

Thank you so much and thank you for letting us use your facility, we're looking forward to the meeting!

Sincerely,

DANIEL B. STEPHENS & ASSOCIATES, INC.

Julie Kutz
Biologist

Office Phone: 505-353-9103; Cell phone: 505-715-9140
Email: jkutz@geo-logic.com

File
Attachment: Meeting flyers

From:	Kutz, Julie
To:	krtn@bacavalley.com
Cc:	Cartron, Jean-Luc
Subject:	Meeting announcements
Date:	Monday, February 20, 2023 9:35:00 AM
Attachments:	Radio announcements.docx

Good morning,
I'm attaching a meeting notice that I am hoping you can read on air as part of your public service announcements. If you could read it starting toward the end of this week and maybe a few times up until March 9, I would greatly appreciate it. I've included 2 versions, a shorter and longer, I wasn't sure if you have time constraints so which ever works better for you is fine. Please let me know if you need anything else from me.
Thank you so much!
Julie

Julie Kutz
Biologist

Daniel B. Stephens & Associates, Inc.
a Geo-Logic Company

6020 Academy NE, Suite 100
Albuquerque, New Mexico 87109-3315
Office: (505) 822-9400 ¦ Direct: (505) 353-9103 ¦ Mobile: (505) 715-9140
jkutz@dbstephens.com and jkutz@geo-logic.com

www.dbstephens.com ¦ www.geo-logic.com

Send to: krtn@bacavalley.com

Radio Announcement for KRTN Radio

(shorter version - about 23 seconds)

Learn about the Proposed Yankee Mine Safeguarding Project located 8 miles northeast of Raton. There will be a public meeting about the project on Thursday, March 9th from 5:30 to 7:00 PM at the City of Raton Library. For more information call (505) 353-9103.

(longer version – about 29 seconds)

The New Mexico Abandoned Mine Land Program is proposing a mine safeguarding project at the former Yankee Mine located 8 miles northeast of Raton. There will be a public meeting to discuss the project on Thursday, March 9th from 5:30 to 7:00 PM at the City of Raton Library, 244 Cook Avenue. For more information call (505) 353-9103.

From: Lloyd Gum
To: Kutz, Julie
Subject: Re: Newspaper ad for public meeting
Date: Wednesday, March 8, 2023 12:11:42 PM
Attachments: image011.png
image012.png
image013.png
image014.png
image015.png
image016.png
image018.png
image019.png
image020.png
image021.png
Outlook-40tyotcu.png
Outlook-dqkyhsdh.png
Outlook-ak3u3wzg.png
Outlook-h5atb4kt.png
Outlook-21idlck3.png
Outlook-0w4qquot.png
media_99fe7e05-79a7-4508-aded-9a8f39bb3875.png
linkedin_7f3abc2e-1b0f-4e82-8338-0b0ca32179a9.png
facebook_44c4c80a-f481-419d-8f82-cc1987719370.png
Twitter32_99725968-8d22-4aa5-88a8-9f7f499c951a.png

This is a response to the reason why the announcement about the Meeting on March 9th was sent in plenty of time to make the paper, Julie had received a proof and approved the ad , somehow the ad did not get placed in the paper, it was not a break down on Julie, she did everything to approve the ad for the paper, I am checking with our production department to find out why this ad did not run on the 23 and why it was not checked against our manifest of ads to run. I want to apologize for this misstate on our part, sincerely Lloyd Gum

Lloyd Gum | **Multimedia Sales Executive**
Kansas -Dodge Globe, Pratt Tribune, St. John News
Kiowa Co. Signal, Del Suroeste (Spanish)
Southwest Shopper
Colorado-Ag Journal (E .Colo, W. Kan, N.NM),
Bent Co Democrat, La Junta Tribune-Democrat
Fowler Tribune, The Trinidad Chronicle-New.com
Cell 620-682-5558
LGum@cherryroad.com

Secure, Cloud-Based, Solutions Enabling Government Continuity

Lloyd Gum | **Multimedia Sales Executive**
Dodge City Daily Globe
LGum@cherryroad.com

We Deliver Information and Technology

From: Kutz, Julie <jkutz@geo-logic.com>
Sent: Tuesday, March 7, 2023 10:51 AM
To: Lloyd Gum <LGum@cherryroad.com>
Subject: RE: Newspaper ad for public meeting

Good morning Lloyd,
I'm just checking in to see if I can get the invoice for the ad publication and either the affidavit of publication or a copy of the page showing the ad (an e-tear?).
Thank you,
Julie

Julie Kutz
Biologist

Daniel B. Stephens & Associates, Inc.
a Geo-Logic Company

6020 Academy NE, Suite 100
Albuquerque, New Mexico 87109-3315
Office: (505) 822-9400 ¦ Direct: (505) 353-9103 ¦ Mobile: (505) 715-9140
jkutz@dbstephens.com and jkutz@geo-logic.com

www.dbstephens.com ¦ www.geo-logic.com

From: Lloyd Gum <LGum@cherryroad.com>
Sent: Monday, February 20, 2023 7:37 AM
To: Kutz, Julie <jkutz@geo-logic.com>
Subject: Re: Newspaper ad for public meeting

You will receive a statement at the end of the month, thanks

Lloyd Gum | **Multimedia Sales Executive**
Kansas -Dodge Globe, Pratt Tribune, St. John News
Kiowa Co. Signal, Del Suroeste (Spanish)
Southwest Shopper
Colorado-Ag Journal (E .Colo, W. Kan, N.NM),
Bent Co Democrat, La Junta Tribune-Democrat

Fowler Tribune, The Trinidad Chronicle-New.com
Cell 620-682-5558
LGum@cherryroad.com

Secure, Cloud-Based, Solutions Enabling Government Continuity

Lloyd Gum | **Multimedia Sales Executive**
Dodge City Daily Globe
LGum@cherryroad.com

We Deliver Information and Technology

From: Kutz, Julie <jkutz@geo-logic.com>
Sent: Friday, February 17, 2023 3:49 PM
To: Lloyd Gum <LGum@cherryroad.com>
Subject: RE: Newspaper ad for public meeting

Hi Lloyd,
That looks great, thank you for running it by me.
Please let me know who I need to talk to for billing.
Happy Friday!
Julie

Julie Kutz
Biologist

Daniel B. Stephens & Associates, Inc.
a Geo-Logic Company

6020 Academy NE, Suite 100
Albuquerque, New Mexico 87109-3315
Office: (505) 822-9400 ¦ Direct: (505) 353-9103 ¦ Mobile: (505) 715-9140
jkutz@dbstephens.com and jkutz@geo-logic.com

www.dbstephens.com ¦ www.geo-logic.com

mail and any attached documentation. Thank you.

From: Lloyd Gum <LGum@cherryroad.com>
Sent: Friday, February 17, 2023 2:32 PM
To: Kutz, Julie <jkutz@geo-logic.com>
Subject: Re: Newspaper ad for public meeting

Proof

Lloyd Gum | **Multimedia Sales Executive**
Kansas -Dodge Globe, Pratt Tribune, St. John News
Kiowa Co. Signal, Del Suroeste (Spanish)
Southwest Shopper
Colorado-Ag Journal (E .Colo, W. Kan, N.NM),
Bent Co Democrat, La Junta Tribune-Democrat
Fowler Tribune, The Trinidad Chronicle-New.com
Cell 620-682-5558
LGum@cherryroad.com

Secure, Cloud-Based, Solutions Enabling Government Continuity

Lloyd Gum | **Multimedia Sales Executive**
Dodge City Daily Globe
LGum@cherryroad.com

We Deliver Information and Technology

From: Kutz, Julie <jkutz@geo-logic.com>
Sent: Tuesday, February 14, 2023 10:49 AM
To: Lloyd Gum <LGum@cherryroad.com>
Cc: Cartron, Jean-Luc <jcartron@geo-logic.com>
Subject: Newspaper ad for public meeting

Good morning Lloyd,
Attached are 2 ads, one in English and one in Spanish, that we would like published on or near the 23rd of February (that puts our notice out 2 weeks before the meeting).
I set the margins, I think, so that the ad is about 3.5"x5", one of the sizes we discussed. If I remember correctly that would be $90 for each ad for a total of $180? I will call you to discuss payment and any questions.
Also, I'm including the pngs/jpg for the logos and the map in case you need them.
Thank you so much for your help.
Julie

Julie Kutz
Biologist

Daniel B. Stephens & Associates, Inc.
a Geo-Logic Company

6020 Academy NE, Suite 100
Albuquerque, New Mexico 87109-3315
Office: (505) 822-9400 ¦ Direct: (505) 353-9103 ¦ Mobile: (505) 715-9140
jkutz@dbstephens.com and jkutz@geo-logic.com

www.dbstephens.com ¦ www.geo-logic.com

MCMC's high tech conference room

by Sharon Niederman

RATON — The Feb. 17 meeting of Miners Colfax Medical Center Board of Trustees marked the board's inauguration of the hospital's new technically-enabled acute care conference room. Intended for meetings, conferences, and special events, the state-of-the-art venue allows both audio and visual presentations to be experienced with clear, professional, high quality dynamics.

Gina Duran received the monthly Cares Act recognition for outstanding service as secretarial coordinator responsible for scheduling and interfacing with medical personnel, earning the respect of MDs for her reliable and hardworking efforts.

HR Director Barbara Duran reported on recruitment efforts designed to lower agency personnel dependence, setting a realistic goal of recruiting five personnel. Her department is working on creating clear job descriptions of the hospital's 260 employees' positions, is advertising daily on KRTN, and looking toward expanding advertising. To encourage staff's "involvement and communication" with each other, she is "trying to celebrate everything we can," such as monthly birthdays, national spaghetti day, national meatball day, Superbowl, and other fun events. Despite the departures of at least nine medical staff, many full and part-time positions have been filled, with the additions of ER physicians, a surgeon, a hospitalist, and more."We're in a good spot right now," Duran said.

CFO Lonny Medina reported MCMC has $3.26 million in cash on hand, which translates at 30.7 days of operation in the bank, up 5.5% from this time last year. The cost of operating the hospital is $110,000-$115,000 per day. A legislative request of $44.65 million is being made.

CEO Bo Beames said in his administrative report there has been a downturn of COVID cases, especially among employees. He announced the Federal public health emergency order will expire May 11, 2023. The hospital will be paying close attention and making a suitable response.

Dr. Singleton of Long-Term Care visited the potash miners in Carlsbad, NM with good response.

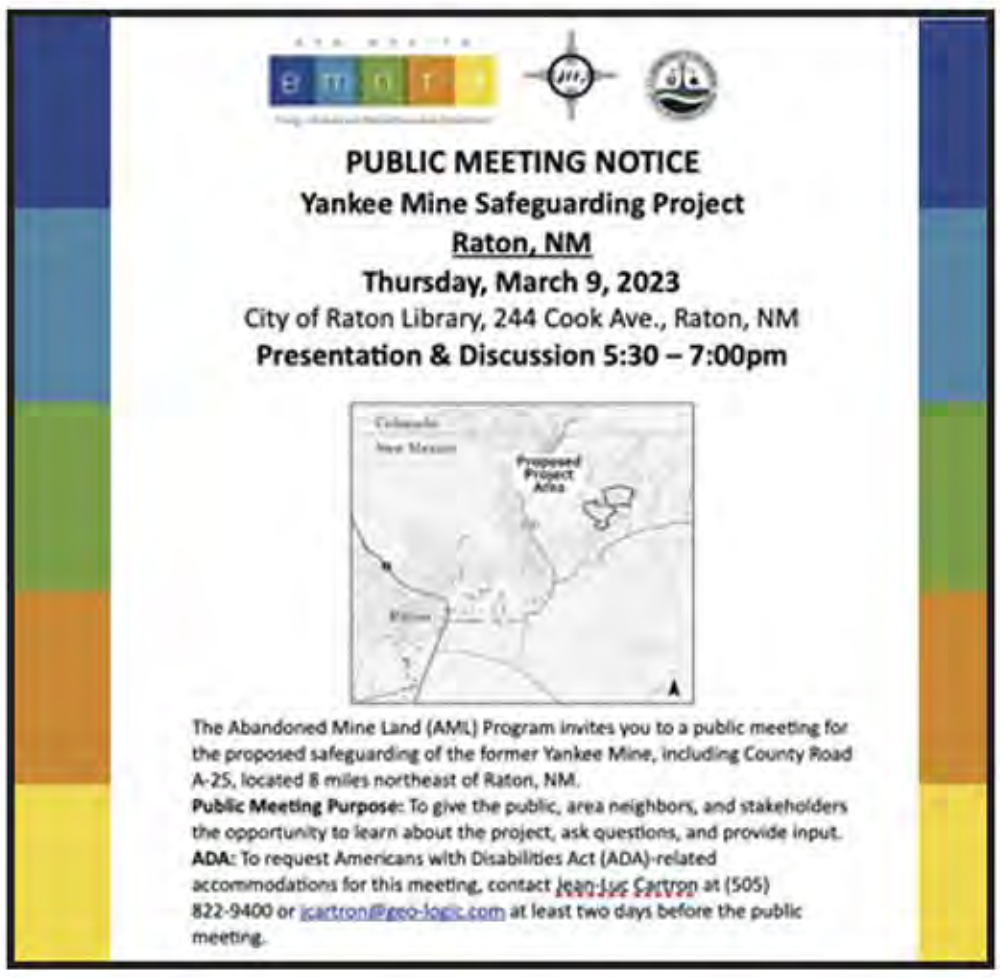
Beames also reported the Outreach team is "doing great" and reaching 32 miners in Questa and 35 in Kirtland, NM. The team is headed to Socorro and Utah.

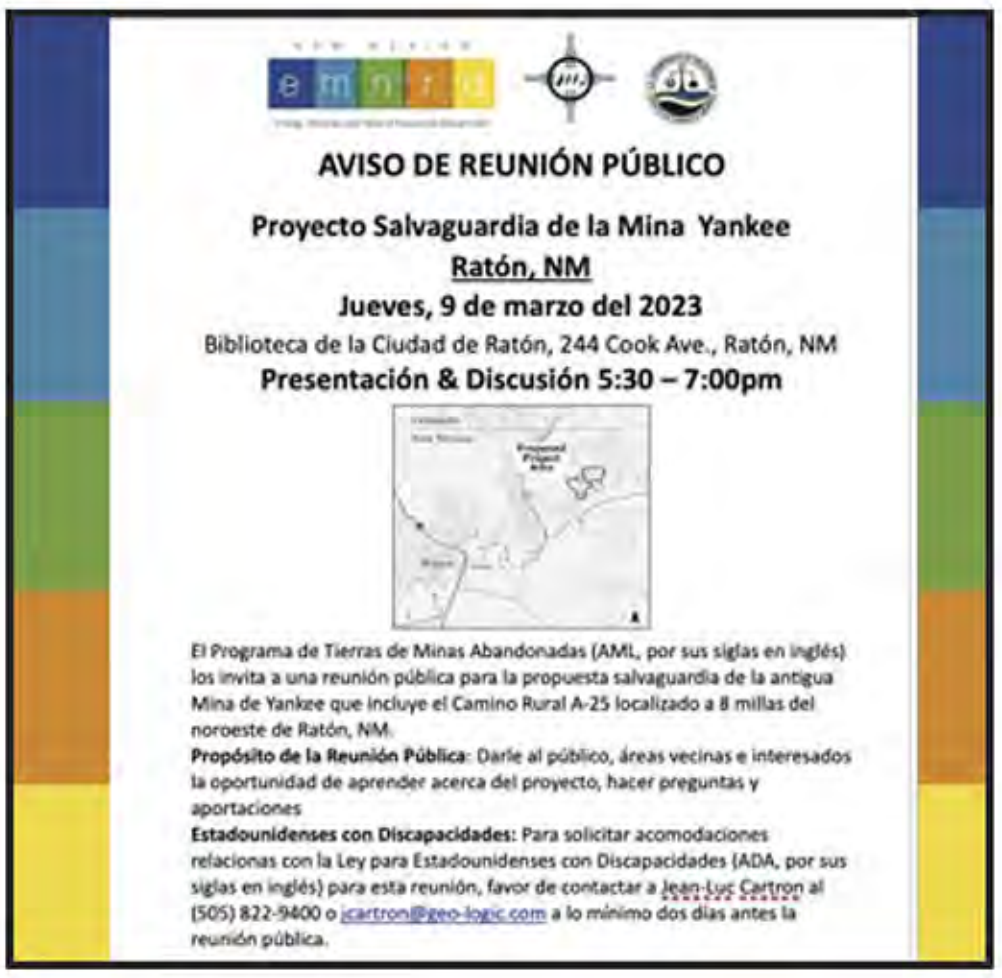
Colfax County welcomes new deputies

by Lillian Eva Lieske

RATON — On Feb. 16 Sheriff Leonard Baca of the Colfax County Sheriffs Office swore in the department's two newest deputies. Deputy Jonathan Hernandez and Deputy Steven Roble. Hernandez and Roble took their oath and signed their paperwork. Both Deputy Hernandez and Deputy Roble have experience in law enforcement. Both deputies used to be police officers in the small community of Springer, New Mexico. With a generous sign-on bonus of $10,000 for new deputies in Colfax County, the small areas, villages, and towns are seeing their law enforcement go to the county. Relocation and bonuses are drawing in more and more deputies to the Colfax County Sheriff's Office.

Colfax County Sheriff Baca swears in the county's newest Deputies, Deputy Jonathan Hernandez and Deputy Steven Roble on Feb. 16.
Photo courtesy of CCSO





Yankee Canyon Mine Safeguarding Project Stakeholders

NM State Land Office
Kyle Rose, PhD
Assistant Director of Stewardship
Surface Resources Division
NM State Land Office
505-490-5704 (cell)
505-827-3827 (office)
krose@slo.state.nm.us

Colfax County Road Department
Colfax County Road Superintendent
207 Copper Ave, Raton, NM 87740
(575) 445-8292

NM Dept of Cultural Affairs - SHPO
Historic Preservation Division
NM Department of Cultural Affairs
Bataan Memorial Building
407 Galisteo St., Suite 207
Santa Fe, NM 87501

OSMRE
Brook Zeller
Environmental Protection Specialist
OSMRE – Denver Field Branch
Office: (303)-236-3980
Cell: (303)-874-8806
Email: bzeller@osmre.gov

NM State Representative – House District 67
Representative Jack Chatfield
Jack.Chatfield@nmlegis.gov
505-986-4467

NM State Senator – Senate District 8
Senator Pete Campos
Pete.campos@nmlegis.gov
505-986-4311

Newspaper Legal Notice/Flyer and Local Radio Announcements
Trinidad Chronicle-News https://www.thechronicle-news.com/contact-us/
World Journal - Advertising:
debi.worldjournal@gmail.com , office.worldjournal@gmail.com
KRTN Radio (Enchanted Air Radio 575-445-3652 krtnradio.com; 93.9 FM & 1490 AM)

Yankee Canyon Area - adjacent landowners

Van L. Leighton
48 S ROGERS WAY GOLDEN CO 80401
vleighton@live.com

Steven Vukonich
155 Francis Ave.
Raton, NM 87740

Rhet French
4 OAKBRIDGE DR PUEBLO CO 81001

Diane K. Berry
765 HIGHWAY 72 RATON NM 87740

MCAULIFFE RANCH CO
PO BOX 1122 RATON NM 87740

Mike Begio & TESTAMENTARY TRUST
660 HIGHWAY 72 RATON NM 87740

Robert & Shirley Walton
1404 GARDNER RD RATON NM 87740

James S. Bennett
PO BOX 1072 RATON NM 87740

Robert Louis Caldarelli
573 HIGHWAY 72 RATON NM 87740

Dr. Donald F. Belknap
P.O. Box 1454
Raton, NM 87740

Non-Profit Organizations

New Mexico Wildlife Federation
Headquarters: 3620 Wyoming Blvd NE, Suite 222
Albuquerque, NM 87111
Email: nmwildlife@nmwildlife.org
Phone: 505-299-5404

MAILING RECORD:

Hard copy mailed Thursday, February 16, 2023
Five+ hard copies of fliers mailed to Raton Library on February 16, 2023
Emailed to 5 emails on Monday, February 20, 2023
Hard copy mailed to Dr. Donald Belknap on February 27, 2023
Did not email Van Leighton because we received his email address on March 1, 2023 and he had received his hard copy package.

State of New Mexico
Energy, Minerals and Natural Resources Department

Michelle Lujan Grisham
Governor

Sarah Cottrell Propst
Cabinet Secretary

Todd Leahy, JD, PhD
Deputy Secretary

Mike Tompson, Interim Director
Mining and Minerals Division

February 16, 2023

Greetings,

The Abandoned Mine Land (AML) Program is proposing to safeguard hazardous mine features at the former Yankee Mine and is in the process of evaluating measures that would best meet the purpose and need for the project. The project area is located approximately 8 miles northeast of the City of Raton, Colfax County, New Mexico, all on private or State Land Office lands (See attached map). County Road A-25 crosses the project area and is included in the safeguarding measures being proposed.

Daniel B. Stephens & Associates, Inc. is currently preparing the Environmental Assessment (EA) for the proposed project on behalf of the AML Program. As part of the preparation of the EA, we are requesting input from interested parties regarding potential environmental impacts resulting from implementation of the project.

To assist you in evaluating this project, please find the following attachments:

- Project Summary
- Location Map

A public meeting is scheduled for March 9, 2023 from 5:30 to 7:00 pm, to provide information regarding the project, answer questions and gather input. Please find a meeting flyer attached for more information regarding the meeting. Please feel free to share the information with others who would also like to attend or who may be interested in learning more about the project.

Additional information regarding the project is available at the following link:
https://www.emnrd.nm.gov/mmd/public-notices/

Please simply reply to this email (jkutz@geo-logic.com) or by mail to Ms. Julie Kutz, Daniel B. Stephens & Associates, 6020 Academy NE, Albuquerque NM 87109-3315 with your comments or questions; or call 505-822-9400 to discuss. You may also contact James Hollen at: james.hollen@emnrd.nm.gov or (505) 231-8332 with questions, comments, or for more information.

We appreciate your input and thank you for your interest in the project.

Project Summary

Background

Enacted on May 2, 1977 (amended in 2006), the Surface Mining Control and Reclamation Act (SMCRA) created the nationwide Abandoned Mine Land (AML) Reclamation Program. It places fees on active coal mines to fund the reclamation of coal mines abandoned before 1977. The Office of Surface Mining Reclamation and Enforcement (OSMRE) distributes funds to the state and tribal abandoned mine land programs, which rank abandoned mine land problems on a priority scale of 1 to 3 as defined by federal law. High priority reflects the degree of need for the protection of public health, safety, and property from the adverse effects of coal mining practices prior to 1977, including restoration of land, water, and the environment. The funds are also allowed for safety closures of mine sites other than coal mines if they have been determined to be a public safety hazard.

Mining was first conducted around Yankee Canyon, as well as the nearby Sugarite Canyon, in the early 1890s. Mining operations continued for over 40 years until the early 1940s, when mining was shut down in the area.

County Road A-25 traverses the slopes from the bottom of Yankee Canyon to the top of Horse Mesa, through the Project Area. The unpaved road appears to be experiencing a loss of bearing capacity due to historical mining activity in the area. Based on evidence of observed subsidence, the Colfax County Road Department has temporarily closed the road due to dangerous, unstable conditions for vehicle passage in this area.

No previous mine reclamation or safeguarding measures have been completed in the Project Area.

Project Description

The Proposed Action is designed to investigate and repair areas adjacent to County Road A-25 where subsidence features (tension cracks) have been identified along a section of the road. Geotechnical drilling will be performed to characterize subsurface conditions to determine if the subsidence is related to underground mine workings. The scope of work also includes safeguarding of other related hazardous mine openings and features identified throughout the Project Area, while allowing for open access and continued use of the mine features by smaller wildlife species, including bats. The following safeguarding measures are being evaluated for implementation in priority areas:

County Road A-25: Geotechnical exploration and backfilling through drilling and injection of a water, sand and cement grout mixture are proposed to mitigate subsidence impacting the road. Grout would be injected into the voids beneath and adjacent to the A-25 alignment. The grouting work may take place concurrently with the drilling investigation. The goal of drilling and grouting the County Road A-25 subsidence features is to map the voids under and near the road alignment and to fill those voids with grout to stop additional subsidence in the area and stabilize the road. The drill holes would be spaced every 30 feet along the A-25 alignment, with an increased drilling density of every 20 feet around the existing subsidence features.

Gates: Gates would be installed over mine shafts and in mine adits or portals, as well as in other mine entryways where gates are determined to be the best method for blocking access to mine features. The gates would be designed in accordance with the latest industry standards and would be modified as necessary to fit the specific entryway, occasionally using steel culverts to support the gate. The basic gate design generally used consists of a vertical to horizontally placed flat grid of welded steel cross bars anchored in place over the mine entryway. The cross bars would be oriented horizontally and welded onto vertical supports spaced widely. Spacing of the horizontal cross bars would be 6 inches, designed to allow passage of bats in flight, as well as access for other small mammals and for birds, but not spaced widely enough to allow human entry. Gates are typically constructed of 2-inch by 4-inch and 2-inch-square tubular weathering steel that is anchored into the surrounding rock using 1-inch steel rods. Gates are designed to not inhibit air flow into or out of the mine feature and constructed of angled steel oriented with the apex up to maximize the airflow through the gate.

The gates would be installed at all features identified for closure and surveyed by Bat Conservation International (BCI) and following recommendations provided in BCI's 2021 report conducted for the Project Area. Additional features may also be identified for safeguarding based on the results of an extensive cultural resources survey completed for the Project Area. Construction timing would be in accordance with the recommendations of the BCI report and any recommendations resulting from surveys of the Project Area performed for this BA/BE. Pre-construction wildlife surveys will also be performed as necessary prior to any destructive closures or the installation of safeguarding measures to inspect for wildlife usage of features prior to closure. In addition, on some adit and shaft openings within the open stopes of the Project Area, gates constructed and anchored as described above would be installed.

Rock/concrete bulkhead with culvert gate: At some locations, gates would consist of a bulkhead constructed of a 2- to 4-foot-thick section of rocks cemented together with concrete. A 3- to 4-foot steel culvert with a steel gate would be constructed inside.

Cupolas: Cupolas are a type of gate designed to fit over a vertical mine shaft. Bat-friendly cupolas may be installed over mine shafts if determined to be an appropriate measure for safeguarding a feature in the Project Area. Locations and construction timing would be in accordance with the recommendations of the bat report by BCI (2021) and based on pre-construction surveys of wildlife usage of features.

Backfill: Mine openings may be backfilled with adjacent coal gob or waste rock piles.

Other structural closures: Polyurethane foam (PUF) plugs, gated culverts, and other structures may be used to safeguard mine openings.

Coal Gob Pile Reclamation: Stabilization of steep slopes on coal gob piles may be needed to prevent mine waste from entering adjacent ephemeral channels. Proposed work may include in situ burial of coal gob or the establishment of vegetation and installation of various erosion control structures on the gob piles as necessary to facilitate effective stormwater management.

The Proposed Project ground disturbance footprint would be focused on the identified hazardous mine features throughout the Project Area. Colfax County Roads A-25 and A-26 would serve as the main access roads, along with former two-track, unpaved mine roads that would serve as access for geotechnical drilling activities and to access other areas situated away from the county roads. Existing disturbed and flat areas adjacent to the road may also be used for geotechnical drilling activities and staging of drilling, construction equipment and materials.

Implementation of the Proposed Action is anticipated to begin at the earliest in fall 2023.

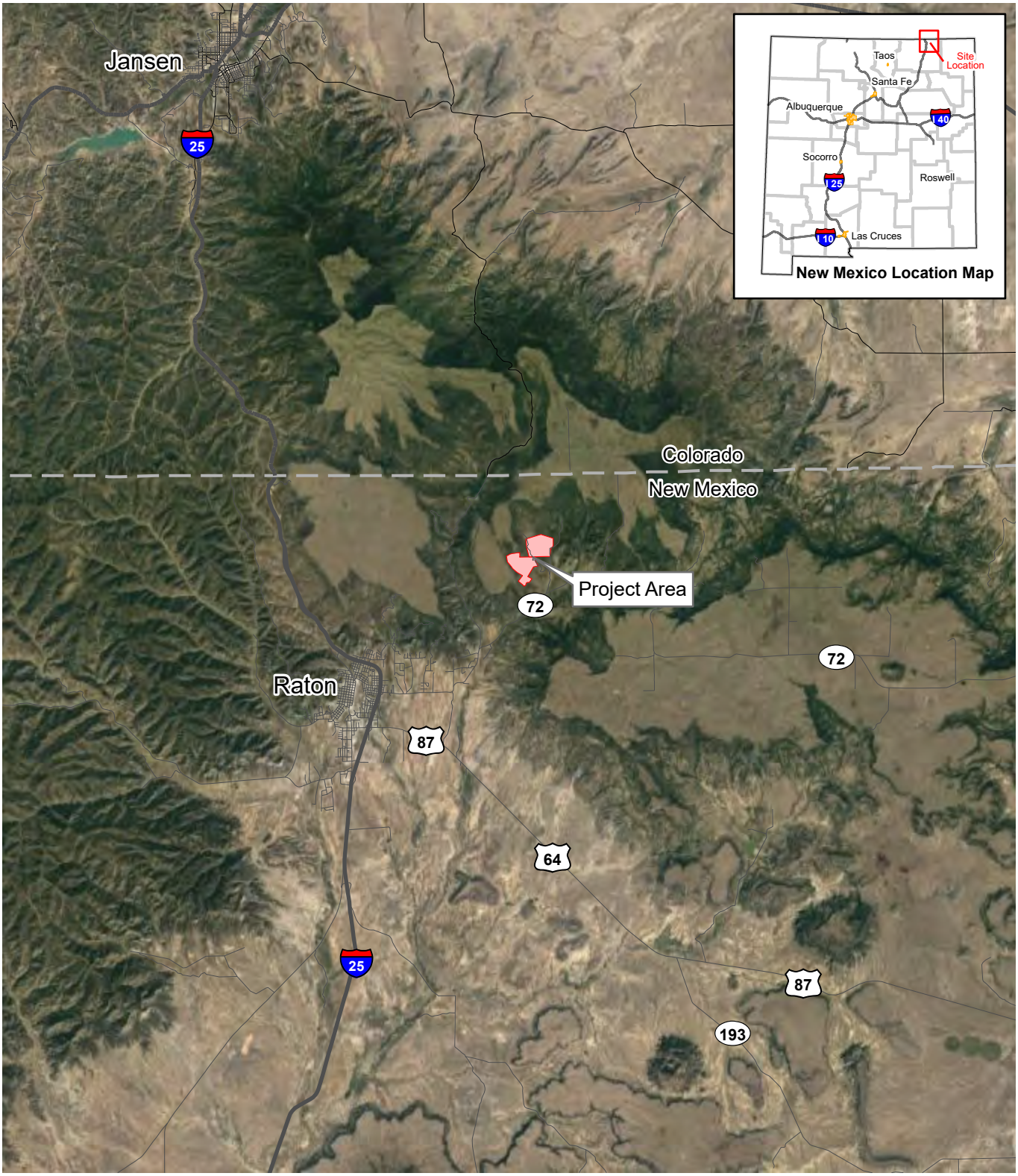


Image source: Google Earth Pro, 5/1/2014

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DBS&A
a Geo-Logic Company

2/15/2023 DB21.1363

YANKEE CANYON EA
Area Map

Figure 1

\\SS6ABQ\DATAS\PROJECTS\DB21.1363 ENMRD AML ENVIRONMENTAL SERVICES\PHASE 7 YANKEE CANYON EA\GIS\ARCGIS PRO\YANKEE CANYON EA\YANKEE CANYON EA.APRX

Attachment 2

Public Meeting

DBS&A
a Geo-Logic Company

Sign-in Sheet

Public Information Meeting

Yankee Canyon Mine Safeguarding Project

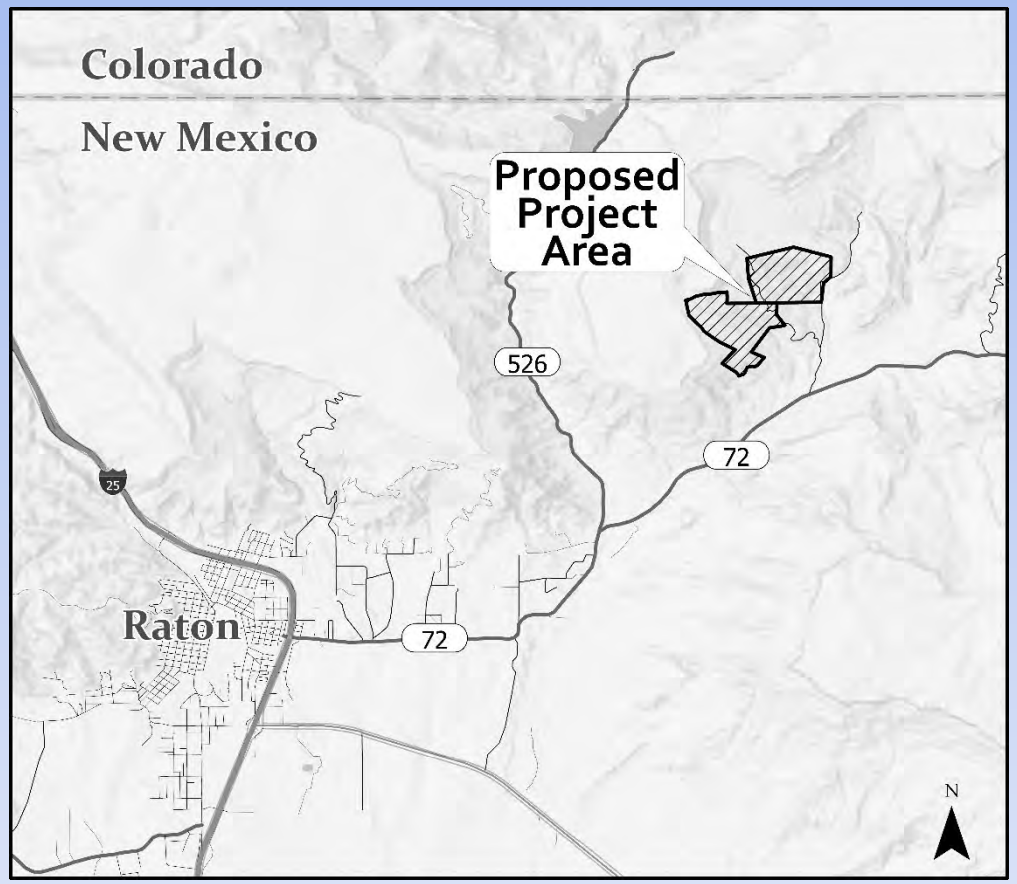
City of Raton Library, 244 Cook Ave., Raton, NM

Thursday, March 9, 2023, from 5:30 pm to 7:00 pm

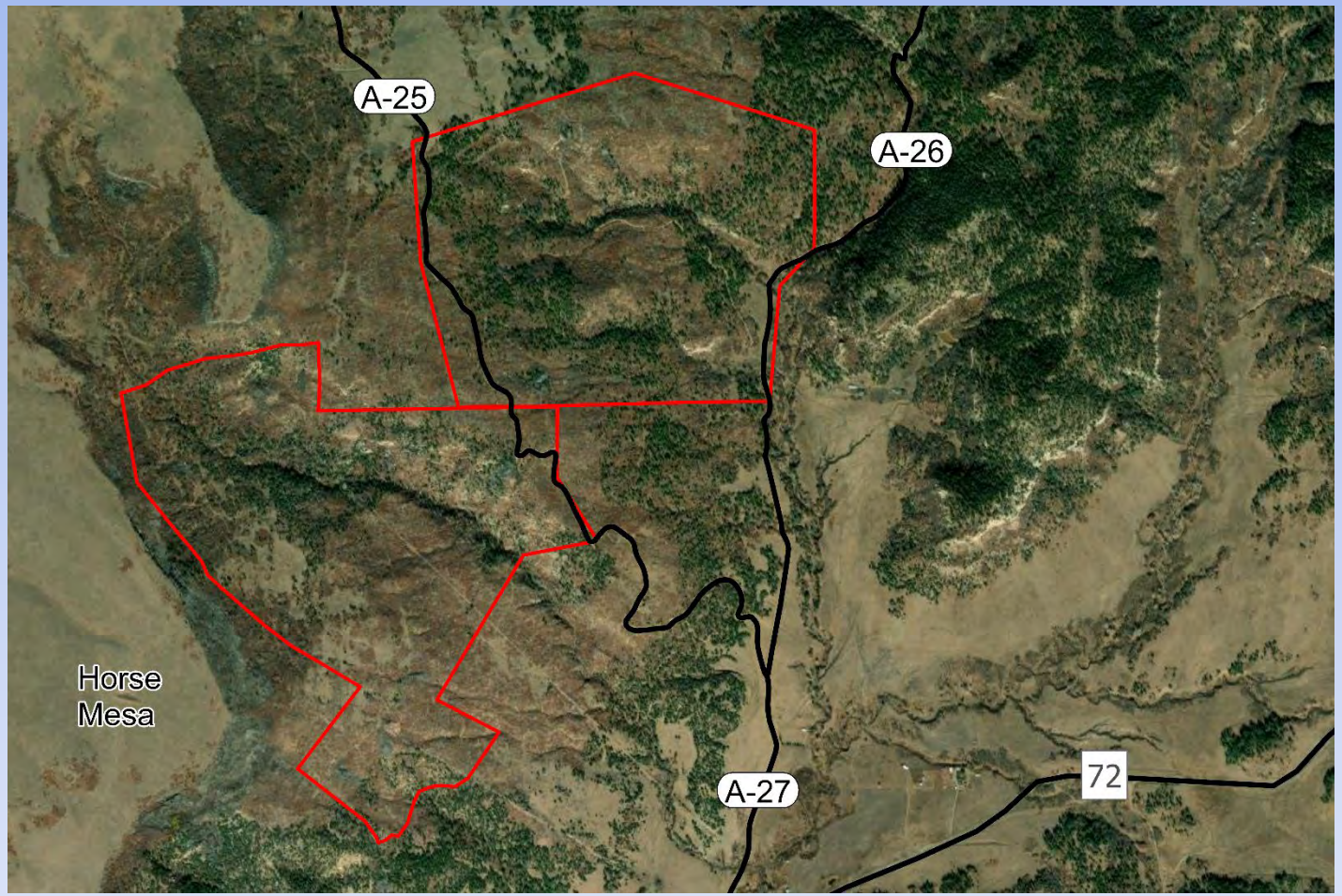
Name	Organization (if applicable)	Address	Email Address	Phone No.
Yeny Maestas	AML	Santa Fe	Yeny.maestas@emnrd.nm.gov	505 469 6678
JKUEKITZ	DBS&A		jkuntz@geo-logic.com	505-358-9103
James Hollen	AML	SAF	james.hollen@emnrd.nm.gov	505 231 8332
Jontsje & Don Bolknap		350 Horse Mesa Road	DforbesBD@gmail.com	575 613 6670.
Pam Harkness	McAuliffe Ranch	PO Box 1122 - Raton	harknesspam@hotmail.com	575-447-8811
KATHRYN WEBB		422 S 7th	—	575 383 0161
Lloyd Moiola	Emnrd-AML	Albuquerque nm	Lloyd.Moiola@emnrd.nm.gov	505-629-3757
Laurence D'Alessandro	EMNRD-AML	ABQ, NM	Laurence.Dalessandro@EMNRD.NM.gov	505 469-0511
Patrick R Berry		PO Box 721		575-445-2944
Chuck Dentino	EMNRD		charles.dentino@emnrd.nm.gov	505-795-3339
Van Leighton		RATON		

Yankee Canyon Mine Safeguarding Project
Public Meeting
03/09/2023

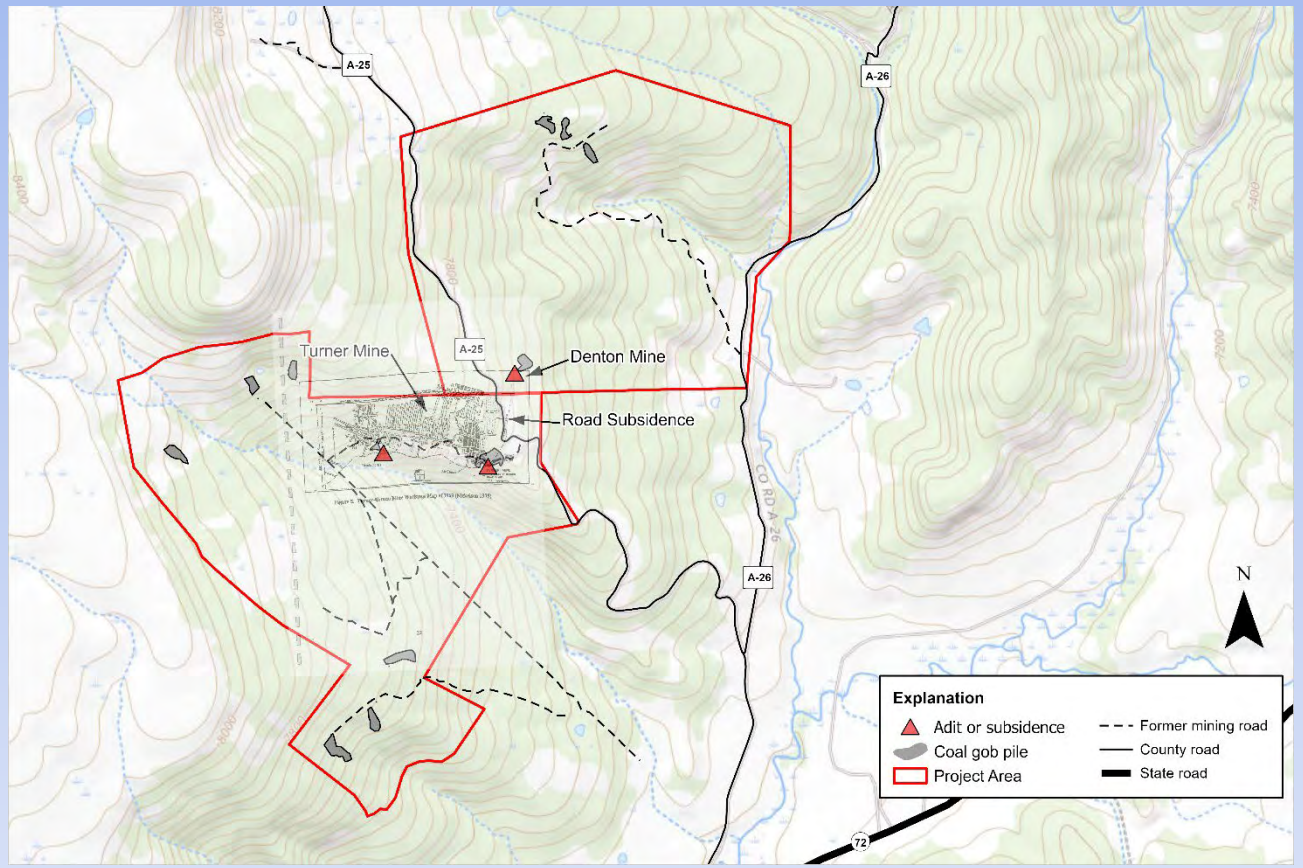
Project Location



Project Area



Mine Features of Project Area



Project Purpose and Need

- Many of Yankee Mine's mine features are accessible to the public, yet many of them represent safety hazards.
- County Road A-25 shows evidence of subsidence likely caused by underground mining. For safety reasons, the road has been closed. There is a need to stabilize it before it can be reopened.
- Exposed gob piles can threaten water quality.
- The purpose of the project is to mitigate risks to public safety and environmental issues in the project area.

B ADIT A-2
SCALE: NONE

A COUNTY ROAD A-25 SUBSIDENCE FEATURE
SCALE: NONE

Photos from Trihydro, 2023

Project Team

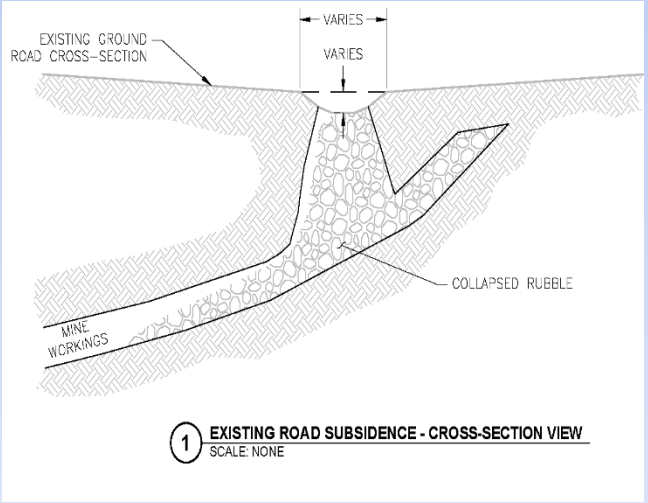
- Abandoned Mine Land Program: Mike Tompson, AML Program Manager, Yeny Maestas, Project Manager, Lloyd Moiola, Environmental Manager; James Hollen, NEPA Coordinator.
- Daniel B. Stephens & Associates: Jean-Luc Cartron, Project Manager/NEPA and Natural Resources Lead.
- Okun Consulting Solutions: Adam Okun, Cultural Resources Expert.

Supporting Studies

- Trihydro. 2023. *County Road A-25 Subsidence, Colfax County, New Mexico, Site Characterization and Mitigation Recommendations Report.*
- Okun Consulting Solutions. 2023. *Cultural Resources Report, Yankee Canyon.*
- Daniel B. Stephens & Associates. 2022. *Biological Assessment/Biological Evaluation, Yankee Canyon Coal Mine.*
- Bat Conservation International. 2021. *Report on Yankee Canyon Abandoned Mine Bat Surveys*

County Road A-25

- Trihydro Corporation conducted site characterization of CR A-25 for the AMLP (Trihydro 2023).
- By utilizing historical records and conducting visual inspections, Trihydro located 3 distinct subsidence features likely related to historic mining.
- Through a ground penetrating radar (GPR) and electromagnetic induction (EMI) geophysical investigation voids were mapped along a 600 ft section of the A-25 roadway.
- Following the subsurface investigation Trihydro determined that there may be other subsidence locations along A-25 and recommended further investigation and monthly monitoring until the road can be stabilized.
- Reclamation recommendations were made leading to the proposed project.

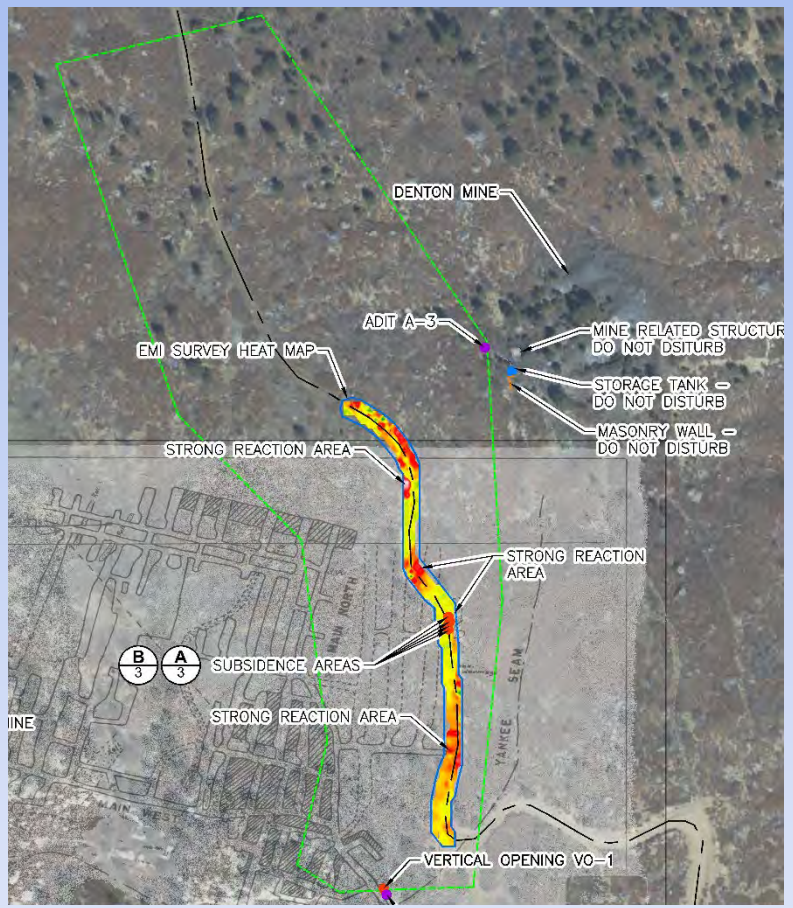


Safeguarding Project

- **County Road A-25.** The project would further investigate then repair areas on road where subsidence features are identified.

  Investigation by Geotechnical Drilling Performed to characterize subsurface conditions. Drill holes placed every 20 to 30 feet.

  Repair through Backfilling conducted through drilling and injection of a water, sand and cement grout mixture. Grout would be injected into voids beneath and adjacent to the road.



CR A-25 Subsidence (Trihydro, 2023)

Safeguarding Project, Cont.

- **Gates.** Gates may be installed in mine entryways safeguarding mine openings. The gates would be designed according to the latest industry standards, and wildlife compatible, following recommendations by Bat Conservation International.
- **Cupolas.** Bat cupolas may be an option to cover vertical shafts.
- **Backfill**. Mine openings may be backfilled with adjacent waste rock piles.

Safeguarding Project, Cont.

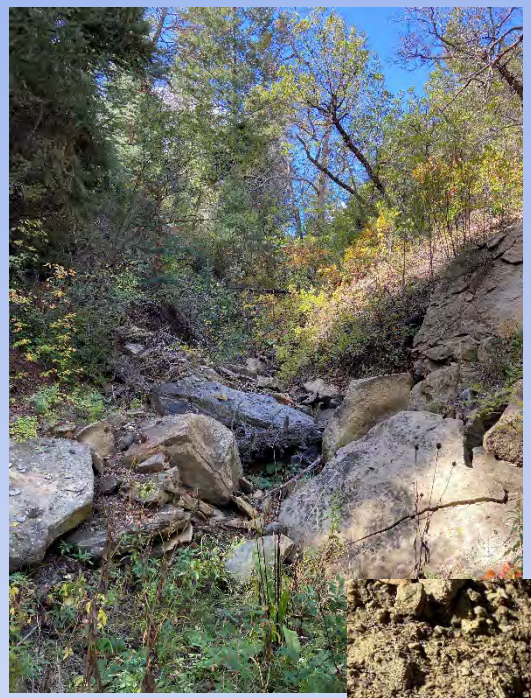
- **Other Structural Closures**. Polyurethane Foam (PUF) plugs, gated culverts, and other structures may be used to safeguard mine openings.

- **Coal Gob Pile Reclamation.** Stabilization of steep slopes on coal gob piles needed to prevent mine waste from entering adjacent ephemeral channels.

National Environmental Policy Act

- Federal agencies and their representatives are required to provide meaningful opportunities for public participation. A primary goal of public involvement is to ensure that all interested and affected parties are aware of the proposed action.
- An analysis of all the potential impacts is being conducted.

Biological Surveys



- Plants and wildlife species were documented during a biological survey conducted in 2022 by Daniel B. Stephens & Assoc.
- During the survey, an evaluation of potential impacts to special-status species and their habitat was conducted.
- A separate survey of bats and bat habitat was conducted by Bat Conservation International.

Bats and Bat Habitat

- Bat Conservation International (BCI) evaluated bat occupancy and potential habitat associated with the mine features in 2021.
- BCI's 2021 survey of two distinct mine features found suitable habitat for Townsend's big-eared bat.
- BCI provided closure recommendations (BCI 2021).

History of Yankee Canyon Coal Mining

Town of Yankee in 1907

- Coal was discovered in the region by the 1840s
- First major mining area was west of Raton
- From 1910 to 1920, Colfax County produced 75 percent of coal in New Mexico

- Yankee formed as a boomtown after the construction of the SFR&E Railroad from Raton to Yankee Mines on Johnson Mesa
- Town went into decline around 1910; Yankee Mines were closed in 1921
- Railroad line was abandoned in 1930s
- Small-scale family mining began around 1901 and continued all the way to the 1960s

Cultural Resource Survey

- Cultural resources survey was conducted in Oct-Nov 2022 to document historic mining features and help the project comply with the National Historic Preservation Act and other historic preservation laws.

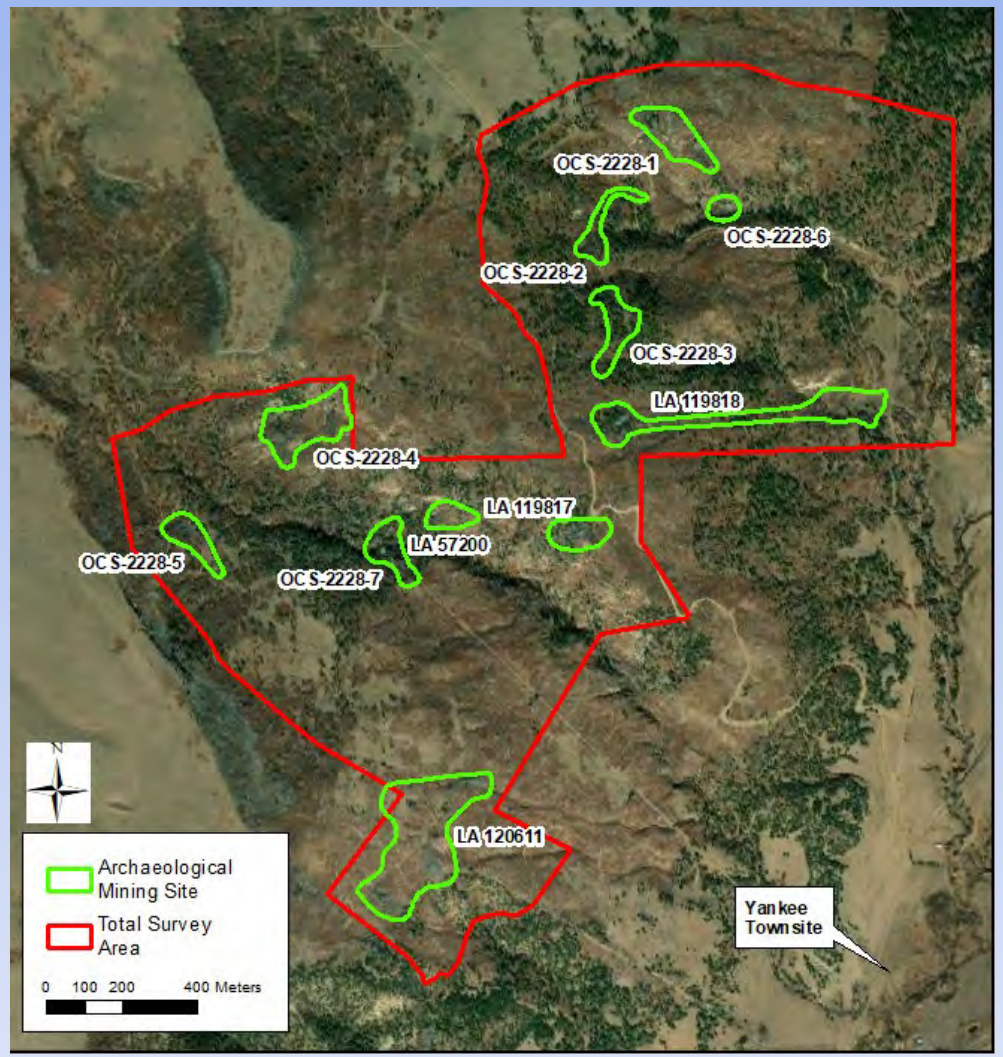
- 582 acres were surveyed
- 138 separate mining features and hundreds of historic artifacts were documented
- Coal waste (gob) pile is the most common feature type, but many other types are present
- Features are related to assaying, extraction, processing, transport, and supporting activities

FEATURE TYPE	COUNT	FEATURE TYPE	COUNT
Coal Gob Pile	35	Ore Cart	2
Structure Foundation	19	Road-Related Feature	2
Adit	10	RR Grade	2
Open Cut/Pit	8	Structure (Extant)	2
Fence	7	Tramway Feature	2
Car Body	4	Prospect Pit	2
Waste Rock Platform	4	Machine Platform	2
Landform Modification	4	Privy/Depression	2
Wall	4	Ramp	2
Midden	3	Bridge	1
Tramway Segment	3	Corral	1
Entrance (Shaft/Vent)	3	Graffiti Panel	1
Reservoir/Tank	3	Well	1
Concrete Bin	2	Tipple Foundation	1
Developed Spring	2	Utility Pole	1
Trail/Road	2	Wood Concentration	1
TOTAL			**138**

Documented Mining Feature By Type

Survey Results

- 11 different clusters defined as archaeological sites
- Yankee Mines and small family operations are represented
- Sites date from 1905 to 1960s
- Four of the mines had been documented in the past



Historic Mining Features

- Below are examples of historic mining features
- AML will work to preserve significant features where feasible

Coal Gob Piles on Steep Slope

Car Body

Tipple Structure Remains

Mine Opening

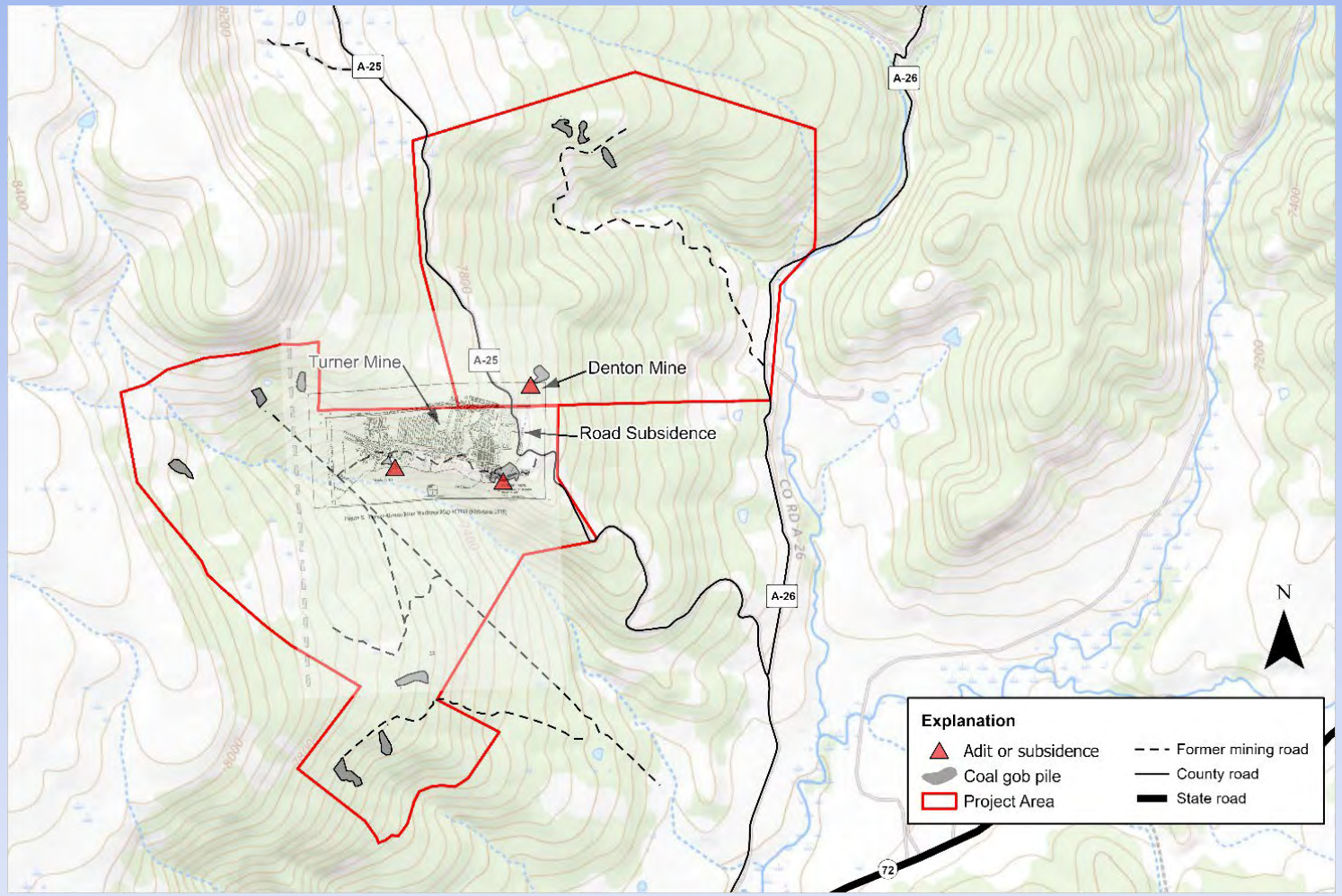
Land Use

- The area is rich in natural resources, with abundant wildlife including game species such as elk and deer. County Road A-25 is utilized by hunters and provides access to private ranches and hunting lodges in the region.
- Lands are also utilized for livestock grazing.

Land Use, cont.

- Safeguarding measures would be on county-maintained roads, private property and state land. Access agreements would be in place prior to construction.
- The project would change land use by allowing for CR A-25 to reopen following road stabilization. No other land use would change as a result of the project.

Mine Features of Project Area



Typical AML Reclamation/Closures

Revegetated gob pile (Dillon Canyon).

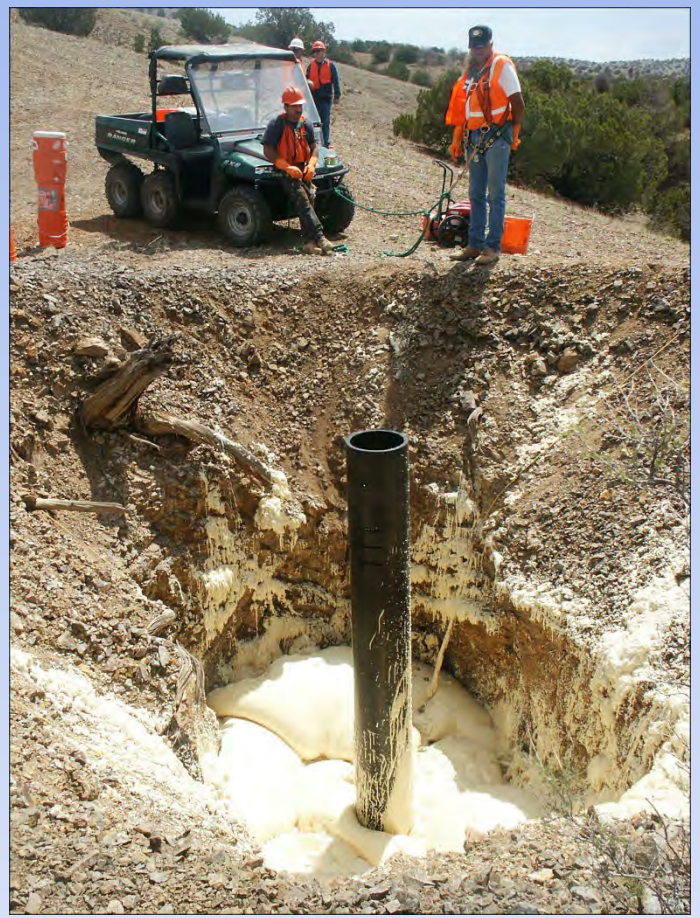
Rock bulk-headed culvert with bat-friendly gate. Cemented rocks assist with blending into landscape

Typical AML Closures

Bat and wildlife friendly gate enclosure

Culvert with bat and wildlife-friendly gate

Typical AML Closures



Polyurethane foam plug with a drain pipe (Cerrillos Hills State Park)

A complete polyurethane foam closure with beehive grate and concrete collar

Any Questions?

- For questions or additional information, please contact:
  - Lloyd Moiola, <lloyd.moiola@state.nm.us>, 505-629-3757
  - James Hollen,<James.Hollen@state.nm.us>, 505-231-8332 OR
  - Mike Tompson P.E., <Mike.Tompson@state.nm.us>, 505-690-8063

- To submit comments, please email:
  jcartron@geo-logic.com, call 505-353-9190, or mail to:
  DBS&A, c/o Jean-Luc Cartron
  6020 Academy NE, Suite 100
  Albuquerque, NM 87109

<u>Please provide comments by April 9, 2023</u>

Thank you!

Attachment 3

Comments Summary and Responses

DBS&A
a Geo-Logic Company

Yankee Canyon Environmental Assessment
Meeting Comments and Questions, March 9, 2023

Comment No.	Comment category	Comment	Date	Response Given during the Meeting	Follow-up Comment by the AML Program
1	Mining reclamation process	Can you please explain what a gob pile is?	3/9/2023	A gob pile is the coal waste from the mining operation. It consists of actual coal, but it is determined to be of lesser value and therefore discarded.	
2	Schedule/accessibility	Most of us live/work near by the project area. Overall it is a great project, however we worry about accessibility during construction on CR A-25.		We are hoping for Phase I construction to take no more than a week* to complete and at least most of the time will not require complete road closure. Drilling to look for subsidence will primarily be located on the edge of the roadway. We are planning to complete the road work and installation of adit closures first as the Phase I part of the overall construction. We are planning to complete work before winter, by late September/early October. The EA will need to be completed and approved by the end of summer, then the contractor bidding process can commence. The plan is to select the contractor, do the Phase I project at least and complete construction by October. The Spec Book (Construction & Materials Specifications) is ready, and so is the design packet.	*The time estimated at the March 9, 2022, meeting was one week. This time frame has been subsequently revised to reflect the potential for complications during construction. Stakeholders will be informed of the revised time estimate.
3	Schedule/accessibility	Can you provide the schedule of construction			
4	Mining reclamation process	How are gob piles reclaimed?		They will most likely be reclaimed in place. The pile is amended, typically it is not necessary to bring in soil as long as there is ammendments on the pile. A native mix of seedlings and plants is then worked in with the amendment. Mixes included an emphasis on planting New Mexico locust trees, along with a ground cover mix of grasses and forbs.	
5	Cost/funding/hiring of contractor	What is the contracting process		Through the State's purchasing division. The AMLP advertises for construction contractors, with an emphasis on hiring local contractors.	
6	Cost/funding/hiring of contractor	What is the construction cost?		For construction alone, the estimate is around $300,000	
7	Details about road subsidence	How long is the road segment?		The estimated subsidence segment is 600 feet.	
8	Details about road subsidence	How deep are the voids?		Based on surface investigations done by Trihydro in December 2021, the largest of 4 subsidence features in CR A-25 measured approximately 28 in. by 11 in. with a measured depth of 15 ft. (Trihydro 2023). The other three measured were considerably smaller. Trihydro believes that mine workings are about 5.5 ft thick and may be fairly shallow near the A-25 subsidence due to the location of the Turner Mine adit and the 2-degree coal seam dip (Trihydro 2023)	

Yankee Canyon Environmental Assessment
Meeting Comments and Questions, March 9, 2023

Comment No.	Comment category	Comment	Date	Response Given during the Meeting	Follow-up Comment by the AML Program
9	Water quality	Is there before and after water quality sample data from Sugarite to review and see if gob pile reclamation has been effective?		There is at the Environment Department, and the AML will pull the data. The Sugarite gob pile reclamation has also been very effective for preventing sediment from entering waterways. Compared to hard rock mining, gob piles represent more of an erosion issue	
10	Water quality	Can water sampling be conducted at a spring on my property, located downstream of this project area?		Yes, it would be a good location to sample. The NMED also has water quality data for that area in Yankee Canyon.	
11	Other	Why was reclamation of Yankee Canyon not conducted at the same time as Sugarite Canyon?		Mostly because of funding. The most noticeable issues get attention first.	

Attachment 4

Comments Received

DBS&A
a Geo-Logic Company

This attachment will be provided once all public comments are received.

Meeting #2

DBS&A
a Geo-Logic Company

Memorandum

To: Lloyd Moiola and James Hollen,
Abandoned Mine Land Program

Date: June 19, 2023

From: Julie Kutz and Jean-Luc Cartron

Subject: Public Meeting for Release of Draft Environmental Assessment Summary, Yankee Canyon Mine Safeguarding Project
June 8, 2023, Public Meeting 2

The New Mexico Energy Minerals and Natural Resources Department (EMNRD), Mining and Minerals Division (MMD), Abandoned Mine Land Program (AML) prepared a draft environmental assessment (EA) for the Yankee Canyon Mine Safeguarding Project located east of the Town of Raton, New Mexico. A public meeting to present the findings of the draft EA, answer questions and receive comments was conducted on June 8, 2023 at the City of Raton public library (Arthur Johnson Memorial Library), located at 244 Cook Avenue. This was the second meeting for the proposed project.

Public Meeting Outreach

Notification of the meeting was completed by the following methods (Attachment 1):

- Agencies and stakeholders were e-mailed and/or sent by regular mail an invitation flyer for the June 8 meeting starting on May 15, 2023. Included in the mailing was a project location map and an updated project description that included an estimated timeline for Phase I and Phase II for construction.
- Newspaper announcements were published one time in English and Spanish on May 25, 2023 in two newspapers: *The World Journal* and *The Chronical News*. Attachment 1 provides documentation from each publication.
- Radio public service announcements (PSAs) were provided to KRTN 93.9 FM for reading on their Community Meetings segment.
- Flyers (in Spanish and English) were posted at the Raton public library (Arthur Johnson Memorial Library).

- A meeting announcement, as well as reports related to the project, were posted on the AML website on or around May 25, 2023.
- The PowerPoint presentation was posted on the AML website following the June 8, 2023 meeting.
- The draft EA was published on the AML website the week of the June 8, 2023, public meeting. A screenshot of the website showing all associated documents is provided in Attachment 1.

Public Meeting

The meeting was conducted at the Raton public library, second floor, on June 8, 2023 from 5:30 to 7:00 p.m. A PowerPoint presentation was given to present the findings of the draft EA, including describing the proposed project and its purpose and need, overview of the affected environment and resource topics, draft findings of impacts, and mitigation measures (Attachment 2). Following the presentation, the meeting was opened up for questions and comments.

There were three attendees, including two who work for the Colfax County Road Department, present at the meeting. Questions or comments during the meeting were as follows:

1. Is the County Road A-25 going to be closed permanently?
2. Where is the funding coming from? It seems like a lot of money to be spent on an area where nobody goes.
3. Not sure about the project, it is going to turn everything black to green.
4. When will the CR A-25 reopen and how will it be fixed?

Responses to these comments/questions are provided in Attachment 3. The full meeting notes are also provided in Attachment 3.

Comments

The comment period was set to be from June 8, 2023 until July 8, 2023. There were a total of four comments received during the meeting. One comment was received prior to the meeting (see Meeting #1 summary). Responses are summarized in the table provided as Attachment 3.

Attachment 1

Outreach Documentation

DBS&A
a Geo-Logic Company

MMD Online: Web Applications
Mining Data and Statistics
Public Notices
Coal Mine Reclamation Program
Mining Act Reclamation Program
Abandoned Mine Land Program
Mine Registration and Reporting Program
Excellence in Reclamation Award
Commissions
Oil & Gas
Geothermal Resource Permits

Abandoned Mine Land Program

Engineering Services for the AML Program
Public Notice
Request for Proposals: Released April 27, 2023
Mandatory Pre-proposal Meeting: May 15, 2023
Presentation (PDF) shown at May 15, 2023 Pre-proposal meeting
Recorded Presentation from May 15, 2023 (link corrected)
Attendance List of May 15, 2023 Pre-proposal meeting
Amendment No. 1
Amendment No. 2
Amendment No. 3
Proposals Due: June 15, 2023

BOSTON HILL MINE SAFEGUARD PROJECT – PHASE I, GRANT COUNTY
Bids were opened April 14, 2023

YANKEE MINE SAFEGUARDING PROJECT, RATON
County Road A-25 Specifications Report
County Road A-25 Plan Set
Biological Analysis and Evaluation Report
Bat Survey Report
March 9, 2023, Public Meeting Presentation

Yankee Canyon Project Summary
Draft Yankee Canyon Environmental Assessment_5-26-2023

AML Project Introduction
Yankee Canyon Project Area Map
June 8, 2023 Public Meeting Flyer
Yankee Canyon Project Public Meeting Flyer (Spanish)
June 8, 2023 Yankee Project Public Meeting Presentation

ALLISON MINE SUBSIDENCE MITIGATION PROJECT, McKINLEY COUNTY
Environmental Assessment

NAVAJO AND ENTERPRISE-BROWN MINES UNDERGROUND COAL FIRE MITIGATION PROJECT
McKinley County, New Mexico
Environmental Assessment (Final)

DBS&A
a Geo-Logic Company

May 15, 2023

City of Raton Library
244 Cook Avenue
Raton, NM 87740

Re: Public Meeting for Abandoned Mine Lands Program

Dear Sir or Madam:

We will be holding our public meeting at your library on the 8th of June and we would appreciate it if you can post the enclosed meeting notice in your library. I've included a few extra copies that you can hand out or post elsewhere. There are 2 versions, English and Spanish, if you don't mind please post one of each. I can also send more copies if needed.

Also, we will be arriving in Raton mid-afternoon and will check in at the library to make sure we are ready for the meeting. We will have a newer laptop to hopefully easily connect to your smart TV screen, and will bring a projector and screen just in case.

Thank you so much and thank you for letting us use your facility, we're looking forward to the meeting!

Sincerely,

DANIEL B. STEPHENS & ASSOCIATES, INC.

Julie

Julie Kutz
Biologist

Office Phone: 505-353-9103; Cell phone: 505-715-9140
Email: jkutz@geo-logic.com

File
Attachment: Meeting flyers

Send to: krtn@bacavalley.com

Radio Announcement for KRTN Radio

(shorter version - about 22 seconds)

A public meeting for the Yankee Mine Safeguarding Project, Draft Environmental Assessment will be held on Thursday, June 8th from 5:30 to 7:00 PM at the City of Raton Library, 244 Cook Avenue. For more information call (505) 353-9103.

(longer version – about 35 seconds)

The New Mexico Abandoned Mine Land Program is proposing a mine safeguarding project at the former Yankee Mine located 8 miles northeast of Raton. There will be a public meeting to discuss the project and the findings of the draft Environmental Assessment on Thursday, June 8th from 5:30 to 7:00 PM at the City of Raton Library, 244 Cook Avenue. For more information call (505) 353-9103.

From:	Kutz, Julie
To:	krtn@bacavalley.com
Subject:	Public Meeting notice
Date:	Tuesday, May 30, 2023 12:01:00 PM
Attachments:	Radio announcements_for June8.pdf

Good morning,
I'm attaching a meeting notice that I am hoping you can read on air as part of your public service announcements. If you could read a few times up until June 8, I would greatly appreciate it. I've included 2 versions, a shorter and longer, I wasn't sure if you have time constraints so which ever works better for you is fine. Please let me know if you need anything else from me.
Thank you so much!
Julie

Julie Kutz
Biologist

Daniel B. Stephens & Associates, Inc.
a Geo-Logic Company

6020 Academy NE, Suite 100
Albuquerque, New Mexico 87109-3315
Office: (505) 822-9400 ¦ Direct: (505) 353-9103 ¦ Mobile: (505) 715-9140
jkutz@dbstephens.com and jkutz@geo-logic.com

www.dbstephens.com ¦ www.geo-logic.com

Opinion

Old bones can be a small town's movie stars

Adam Larson
Writers on the Range

Writers on the Range

Adam Larson

The prehistoric past can perk up the present. When woolly mammoth bones were found in my hometown in Wisconsin years ago, they became the centerpiece of one of our local museums. Today, they continue to attract visitors and serve as one of the city's informal symbols.

Unfortunately, the story across much of the fossil-rich West is more abandonment than local fame. During the late 19th century, paleontologists made huge finds in the region, excavating specimens of famed dinosaurs like Triceratops, Stegosaurus, Diplodocus and Allosaurus.

But like many would-be movie stars, the bones ended up leaving their rural sites to find fame in the big cities. Left behind were holes—literally, in the case of the dinos.

It took time for the West to stake its claim to keeping some fossil finds at home. Countless fossils, for example, have been exhumed in Wyoming since the late 19th century, but the University of Wyoming Geological Museum in Laramie didn't have a single mount of a Wyoming dinosaur until 1961.

One reason was money. Even today, a town might be located right next to spectacular fossil sites, but limited municipal budgets can make it hard to keep the lights on in a museum. Funding for the collection, curation and study of fossils doesn't always match up with areas containing many fossils.

Yet everyone benefits when at least some fossil finds stay put. In many cases, they are discovered not by paleontologists but by ordinary citizens. In 2006, oil workers in Wyoming happened upon giant white bones, recognized their importance, and called in experts. The bones were part of an enormous, 11,600-year-old Columbian mammoth.

Thankfully, that mammoth is now on public display at the Tate Geological Museum in Casper, Wyoming. The landowners whose property contained the mammoth bones thoughtfully chose to donate them.

Once in local museums, fossil displays give people in the area examples of the bones they might come across, and a place for them to contact if they find something unusual. When locally found fossils stay local, they also connect people to their prehistoric heritage and encourage them to donate discoveries to local museums.

But there's more: fossils help the local economy by attracting visitors. Once local museums start drawing a crowd, they can help pay for themselves while also indirectly contributing to schools and roads. According to the national group Americans for the Arts, tourism from museums and other cultural nonprofits generates five dollars in tax revenue for each dollar they receive in government funding.

Thankfully, a lot has changed since the first fossil hunters descended upon the West in search of prehistoric dinosaurs, mammals and more. Fossil fans in the West no longer have to travel hundreds or thousands of miles to see incredible discoveries made in their home states.

For example, in Ekalaka, Montana, population 399, the Carter County Museum hosts an annual "Dino Shindig," which attracts paleontologists from across the country and hundreds of other visitors.

As Carter County Museum director Sabre Moore told the documentary series Prehistoric Road Trip, the Shindig shares groundbreaking science and includes the landowners who made the discoveries possible.

At the Wyoming Dinosaur Center in Thermopolis, population 2,725, visitors can see fossils of dinosaurs large and small, tour active dig sites and even take part in the digs themselves.

"I like that we're a destination for folks coming to Thermopolis," said Levi Shinkle, collections manager at the Wyoming Dinosaur Center and a Thermopolis native. "We're a small museum," he added, "but we're often in the same conversations as the large museums in urban centers."

In North Dakota, the North Dakota State Fossil Collection is on a quest, in the words of founder John Hoganson, to put "a fossil exhibit in every town." The program has helped put up more than two dozen paleontology and geology exhibits across the state, from Pembina, population 512, to Lidgerwood, population 600, to Bowman, population 1,470.

Sharing a home where the dinosaurs once roamed definitely adds to local pride. When the Museum of the Rockies in Bozeman, Montana, obtained a second large Tyrannosaurus rex, they put the second one up on display in the museum as "Montana's T. rex," and they loaned the other to the Smithsonian in Washington, DC, where it's now known as the "Nation's T. rex."

Sharing the riches of the West's past—right here in the West— enriches everyone.

Adam Larson is a contributor to Writers on the Range, writersontherange.org, an independent nonprofit dedicated to spurring lively conversation about the West. He is a former editor of the Wyoming Dinosaur Center's newsletter.

National Park Service

An Allosaurus fossil on display.

$9 billion Colorado education budget signed, but still doesn't meet obligations for full funding

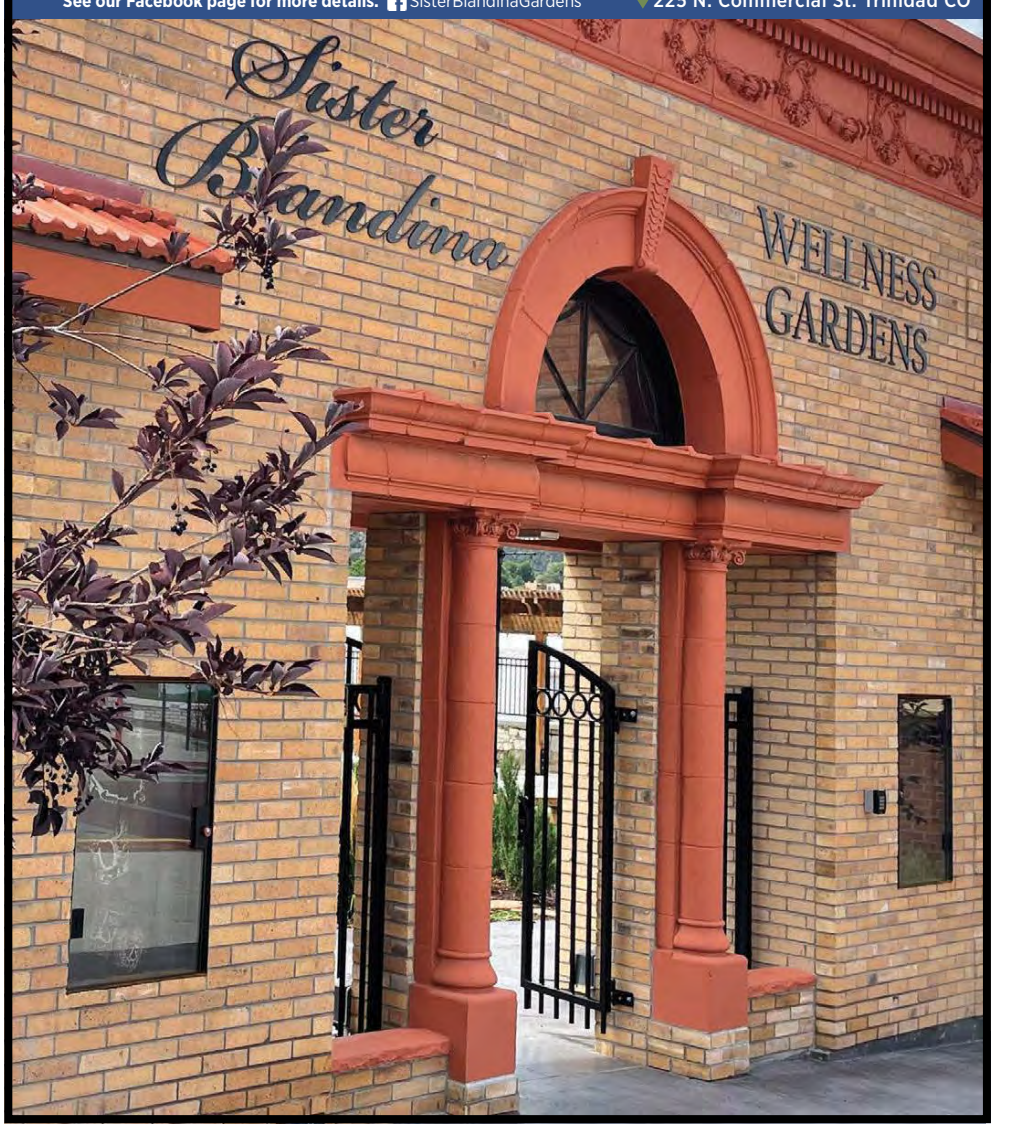
...Continued from Page 3

Polis also signed a bill that will invest more in teaching math after state and national tests showed students lost ground in that subject during the pandemic. The state will spend $25 million via three-year grants for after-school math tutoring programs that will be run by school districts, charter schools, and community groups.

The bill also will provide optional training for teachers and parents, offer evidence-based resources for math programs, and require teacher preparation programs to train prospective educators in math instruction.

Zenzinger said now that the state is on track to fully fund schools within the next budget cycle, she wants lawmakers to rethink what it costs to fully educate a student.

"It's going to be really, really important that once we have established full funding, whether that is then adequate," Zenzinger said.



49 RHS Seniors make the walk

Photo by Marty Mayfield

by Marty Mayfield
KRTN Multi-Media

RATON — Raton High School held graduation ceremonies Friday evening May 19, 2023, at Tiger Gym where 49 seniors walked across the stage and received their diplomas to the delight of a packed house.

This year, the Valedictorian was Cayden Walton and Salutatorian was Anderson Weese.

Emilia Rose gave the welcoming address, thanking parents and faculty for the many things they did for the class. She noted this was the last class to go through all of the Raton Public School's buildings and the last class to attend Kearney School.

Walton in his speech spoke of failure, noting that "failing is a necessity if you want to succeed. Failure gives us the opportunity to bounce back from our mistakes and helps us appreciate the successes in our life." He went on to say that many live by the old adage that failure is not an option. Walton disagrees saying "Failure IS an option. In fact, it's often a requirement. I prefer to follow the more truthful saying, 'Failure is not the opposite of success, it is part of success.'"

Walton told his fellow classmates that failure was what made a four-time state championship cheer team. That the losses allowed other Raton teams to beat some of the best teams in the state. He finished off his speech by reminding his fellow classmates to remember to be thankful. "We must be thankful for this time in our lives, because there's going to be no tother like it." "I will remember you all with fondness and pride, for I will forever be part of the Raton High School Class of 2023."

The keynote speaker Brian Colon told the class that "Sometimes you will never know the value of a moment until it becomes a memory." He went to explain how he grew up from a youngster watching his parents slowly pass and that he had a New Mexico community to help raise him. He explained that he lived his father's dream of going to college and how he then went on to be a lawyer and eventually on to New Mexico State Auditor. The point is his failure lead to success.

After the seniors with accolades were recognized and diplomas handed out, Weese spoke of the last goodbye and the history this class made. Weese said, "Graduates! We are the last class to have gone through both Kearny and Columbian schools and we are the second 7th grade class to attend the high school." This class also dealt with a "crazy covid year" "Through all the good times, and all the bad times our class has made Raton High our home, and it's bittersweet to be finally leaving it."

Weese went on to say "No matter what your choice is, this next chapter of our lives is a scary one. After all, 'Life is a master of choices and every choice you make, makes you.'"

RATON
continued from page 5

cover some of the costs for advertising, merchandising and other expenses.

Commissioners received RFPs from InBank and New Mexico Bank and Trust for banking services. After reviewing the proposals and grading each one the committee unanimously recommended InBank for a five-year contract for banking services.

Commissioners heard about the capital appropriation agreement with the Department of Finance and Administration for the Kearney School. The agreement was approved by the state legislature in 2022 and the city still does not have the agreement, so a decision on the agreement was postponed till the June 13 meeting.

The FY24 Interim Budget was presented to the commissioners. Berry noted that the revenues are about 20% above the budget for this fiscal year. The FY24 budget will use some of the surplus monies for projects that the community needs by upgrading some of the buildings owned by the city and economic development projects. The new budget will include work on the ball fields to include restrooms, concession stand and parking. The total general fund budget will be $7,432,937. Commissioners will see a pay increase to $1000 a month which will be effective to newly elected commissioner's current commissioners will remain at $300 a month.

Berry noted that the GRT increase has come from online sales that the city is now receiving. Construction projects have also helped and there will be other construction projects in the upcoming year that will also help the bottom line. City Treasurer Michael Anne Antonucci noted the interim budget will go to DFA by June 1. Mayor Neil Segotta noted this is the first budget since he has been on the commission that the city can do something not just keep their head above water.

Commissioners received word on the April 2023 financial report which includes some loan payments from RPS and noted a 22% increase in GRT receipts. With May and June Lodger's Tax income Antonucci felt that the city would break the $500,000 mark.

Commissioners then approved the FY23 Budget Adjustment #16 which includes a transfer of $60,000 for the chip seal project from the general fund.

The city will receive bids for the demo of the building just south of InBank later this month. Construction projects are continuing with the airport hangar project coming to a close. Sugarite Ave construction is coming along well. The pavement project is progressing with the first phase being completed. Phase 2, which is funded by the cooperative funds will begin this week. The streets will have a smaller course of gravel then a seal coat will be the final stage.

The solar project has received the land from Colfax County and was approved by the state. Construction on the project has begun with fence building and the array will begin soon. The library renovations have been completed. The ADA compliant ramp at 3rd and Park has been completed. Jason Phillips will be presenting project applications one for repairs to Second Street and three bridge projects and other street improvements.

Billy Donati accepts the Proclamation Saluting Billy D from Mayor Neil Segotta at the May 23 meeting of the Raton City Commission meeting. ***Photo by Marty Mayfield***

TSD1 board recognizes teachers, approves tentative agreement

by Ruth Stodghill

TRINIDAD — It was a short and sweet special meeting of the Trinidad School District #1 board on May 16, with a handful of action and staffing items on the agenda.

The meeting opened with the recognition of a select group of the most inspiring educators within the district who have been profiled in the "Mighty Miner Teacher Feature" over the course of the school year.

In action items, the board voted to approve the approval of a tentative compensation agreement between the school district and the Trinidad Educators Association and Trinidad Federation of Teachers unions.

The board also approved the renewal of the district's group medical plan with Cigna.

In personnel items, the board voted to approve the hiring of Allen Hank as a social studies teacher, as well as Jessica McCullough as a multi-media art teacher at Trinidad High School.

PUBLIC MEETING NOTICE
Yankee Mine Safeguarding Project
Raton, NM
Thursday, June 8, 2023, 5:30 – 7:00pm
City of Raton Library, 244 Cook Ave., Raton, NM
Presentation on Draft Environmental Assessment

The Abandoned Mine Land (AML) Program invites you to a public meeting for the proposed safeguarding of the former Yankee Mine, including County Road A-25, located 8 miles northeast of Raton, NM.
Public Meeting Purpose: To give the public, area neighbors, and stakeholders the opportunity to learn about the findings of the draft EA and ask questions.
ADA: To request Americans with Disabilities Act (ADA)-related accommodations for this meeting, contact Jean-Luc Cartron at (505) 822-9400 or jcartron@geo-logic.com at least two days before the public meeting.

AVISO DE REUNIÓN PÚBLICO
Proyecto Salvaguardia de la Mina Yankee
Ratón, NM
Ocho, 8 de Junio del 2023, 5:30 – 7:00pm
Biblioteca de la Ciudad de Ratón, 244 Cook Ave., Ratón, NM
Presentación borrador Ambiental Evaluación

El Programa de Tierras de Minas Abandonadas (AML, por sus siglas en inglés) los invita a una reunión pública para la propuesta salvaguardia de la antigua Mina de Yankee que incluye el Camino Rural A-25 localizado a 8 millas del noroeste de Ratón, NM.
Propósito de la Reunión Pública: Darle al público, áreas vecinas e interesados la oportunidad de aprender acerca del proyecto, hacer preguntas y aportaciones
Estadounidenses con Discapacidades: Para solicitar acomodaciones relacionas con la Ley para Estadounidenses con Discapacidades (ADA, por sus siglas en inglés) para esta reunión, favor de contactar a Jean-Luc Cartron al (505) 822-9400 o jcartron@geo-logic.com a lo mínimo dos días antes la reunión pública.

Yankee Canyon Mine Safeguarding Project Stakeholders

NM State Land Office
Kyle Rose, PhD
Assistant Director of Stewardship
Surface Resources Division
NM State Land Office
505-490-5704 (cell)
505-827-3827 (office)
krose@slo.state.nm.us

Colfax County Road Department
Colfax County Road Superintendent
207 Copper Ave, Raton, NM 87740
(575) 445-8292

NM Dept of Cultural Affairs - SHPO
Historic Preservation Division
NM Department of Cultural Affairs
Bataan Memorial Building
407 Galisteo St., Suite 207
Santa Fe, NM 87501

OSMRE
Brook Zeller
Environmental Protection Specialist
OSMRE – Denver Field Branch
Office: (303)-236-3980
Cell: (303)-874-8806
Email: bzeller@osmre.gov

NM State Representative – House District 67
Representative Jack Chatfield
Jack.Chatfield@nmlegis.gov
505-986-4467

NM State Senator – Senate District 8
Senator Pete Campos
Pete.campos@nmlegis.gov
505-986-4311

Yankee Canyon Area - adjacent landowners

Van L. Leighton
48 S ROGERS WAY GOLDEN CO 80401
vleighton@live.com

Steven Vukonich
155 Francis Ave.
Raton, NM 87740

Rhet French
4 OAKBRIDGE DR PUEBLO CO 81001

Diane K. Berry
765 HIGHWAY 72 RATON NM 87740

MCAULIFFE RANCH CO
PO BOX 1122 RATON NM 87740

Mike Begio & TESTAMENTARY TRUST
660 HIGHWAY 72 RATON NM 87740

Robert & Shirley Walton
1404 GARDNER RD RATON NM 87740

Warren Walton
LTAMERS@icloud.com

James S. Bennett
PO BOX 1072 RATON NM 87740

Robert Louis Caldarelli
573 HIGHWAY 72 RATON NM 87740

Dr. Donald F. Belknap
P.O. Box 1454
Raton, NM 87740

Non-Profit Organizations

New Mexico Wildlife Federation
Headquarters: 3620 Wyoming Blvd NE, Suite 222
Albuquerque, NM 87111
Email: nmwildlife@nmwildlife.org
Phone: 505-299-5404

Raton Public Library (package will include cover letter and 6 flyers (English and Spanish)
Arthur Johnson Memorial Library
244 Cook Ave.
Raton, NM 87740

MAILING RECORD:
March 9 meeting:

Hard copy mailed Thursday, February 16, 2023
Five+ hard copies of fliers mailed to Raton Library on February 16, 2023
Emailed to 5 emails on Monday, February 20, 2023
Hard copy mailed to Dr. Donald Belknap on February 27, 2023
Did not email Van Leighton because we received his email address on March 1, 2023 and he had received his hard copy package.

June 8 meeting:

Sent ads for publication on May 15, 2023
Hard copy mailed to 12 recipients Monday, May 15, 2023
Five+ hard copies of fliers mailed to Raton Library on May 15, 2023
Emailed stakeholders that have email addresses on May 17, 2023
Sent meeting announcements to be read on air to KRTN on May 24, 2023

Newspaper Legal Notice/Flyer and Local Radio Announcements
Trinidad Chronicle-News https://www.thechronicle-news.com/contact-us/
World Journal - Advertising:
debi.worldjournal@gmail.com , office.worldjournal@gmail.com
KRTN Radio (Enchanted Air Radio 575-445-3652 krtnradio.com; 93.9 FM & 1490 AM)

From:	Kutz, Julie
Cc:	Hollen, James, EMNRD; Cartron, Jean-Luc
Bcc:	krose@slo.state.nm.us; bzeller@osmre.gov; Jack.Chatfield@nmlegis.gov; Pete.campos@nmlegis.gov; vleighton@live.com; LTAMERS@icloud.com; nmwildlife@nmwildlife.org
Subject:	Draft EA for Yankee Canyon Safeguarding Project
Date:	Wednesday, May 17, 2023 11:01:00 AM
Attachments:	AMLP_IntroLetter05152023.pdf F01_Area_Map.pdf Project Summary.pdf PublicMeetingFlyer.pdf SPAN Flyer_8.5x11.pdf

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Good morning,
Please see the attached documents for an announcement of the release of the draft Environmental Assessment for a safeguarding project northeast of Raton, New Mexico. The project is being proposed by the New Mexico Abandoned Mine Land Program.
Thank you for your time and please let me know if you need more information.
Julie

Julie Kutz
Biologist

Daniel B. Stephens & Associates, Inc.
a Geo-Logic Company

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Albuquerque, New Mexico 87109-3315
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www.dbstephens.com ¦ www.geo-logic.com

State of New Mexico
Energy, Minerals and Natural Resources Department

Michelle Lujan Grisham
Governor

Sarah Cottrell Propst
Cabinet Secretary

Todd Leahy, JD, PhD
Deputy Secretary

Albert Chang, Director
Mining and Minerals Division

May 15, 2023

Greetings,

The Abandoned Mine Land (AML) Program is proposing to safeguard hazardous mine features at the former Yankee Mine and is in the process of evaluating measures that would best meet the purpose and need for the project. The project area is located approximately 8 miles northeast of the City of Raton, Colfax County, New Mexico, all on private and State Land Office lands (See attached map). County Road A-25 crosses the project area and is included in the safeguarding measures being proposed.

Daniel B. Stephens & Associates, Inc. has prepared the Draft Environmental Assessment (EA) for the proposed project on behalf of the AML Program. As part of the release of the Draft EA, we are inviting review of the EA from interested parties regarding potential environmental impacts resulting from implementation of the project.

To assist you in evaluating this project, please find the following attachments:

- Project Summary
- Location Map

A public meeting is scheduled for June 8, 2023 from 5:30 to 7:00 pm, to provide information regarding the project, and present findings of the Draft EA. Please find a meeting flyer attached for more information regarding the meeting. Please feel free to share the information with others who would also like to attend or who may be interested in learning more about the project.

The Draft EA and additional information regarding the project will be available at the following link:
https://www.emnrd.nm.gov/mmd/public-notices/

Please simply reply to this email (jkutz@geo-logic.com) or by mail to Ms. Julie Kutz, Daniel B. Stephens & Associates, 6020 Academy NE, Albuquerque NM 87109-3315 with your comments or questions; or call 505-822-9400 to discuss. You may also contact James Hollen at: james.hollen@emnrd.nm.gov or (505) 231-8332 with questions, comments, or for more information.

We appreciate your input and thank you for your interest in the project.

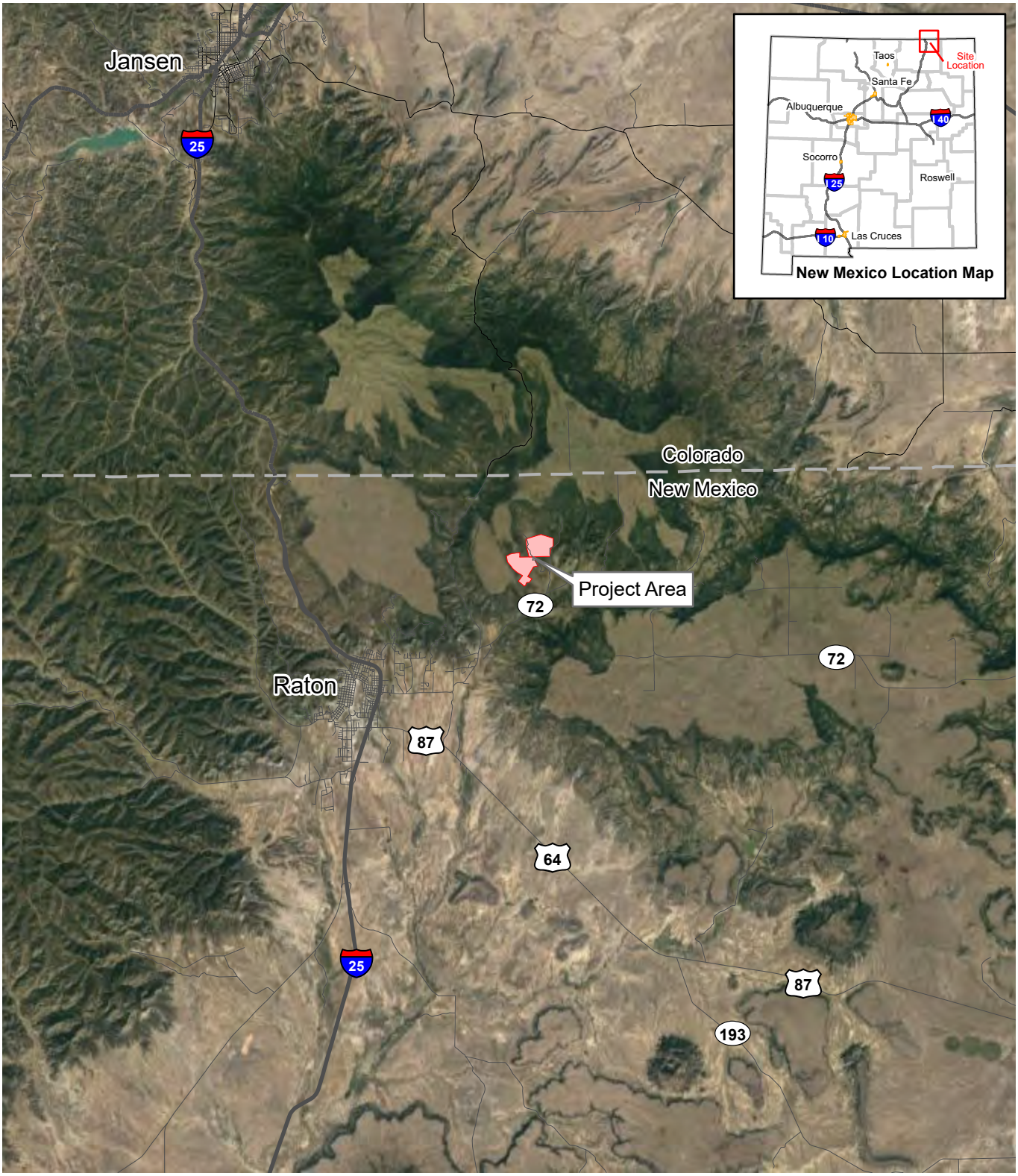

Image source: Google Earth Pro, 5/1/2014

N

0 2 4 Miles

DBS&A
a Geo-Logic Company

2/15/2023 DB21.1363

YANKEE CANYON EA
Area Map

Figure 1

\\SS6ABQ\DATAS\PROJECTS\DB21.1363 ENMRD AML ENVIRONMENTAL SERVICES\PHASE 7 YANKEE CANYON EA\GIS\ARCGIS PRO\YANKEE CANYON EA\YANKEE CANYON EA.APRX

Project Summary

Background

The New Mexico Energy, Minerals, and Natural Resources Department (NMEMNRD), Abandoned Mine Land (AML) Program, in partnership with the U.S. Department of Interior, Office of Surface Mining Reclamation and Enforcement (OSMRE), is proposing to safeguard hazardous abandoned mine features throughout the Yankee Canyon area (Project Area) located eight miles northeast of the City of Raton, Colfax County, New Mexico (Figure 1).

Mining was first conducted around Yankee Canyon, as well as the nearby Sugarite Canyon, in the early 1890s. Mining operations continued for over 40 years until the early 1940s, when mining was shut down in the area.

The Project Area consists of private land and state trust land administered by the New Mexico State Land Office. The area contains numerous historical mining features, many of which are hazardous and in need of safeguarding.

Project Description

The Yankee Canyon Safeguard Project (herein referred to as the Proposed Project) involves the implementation of safeguarding measures in the most dangerous locations of the Project Area with a focus on repair of a section of County Road (CR) A-25 where it passes through the Project Area. Safeguarding measures would include investigation and repair of subsidence on CR A-25, stabilization of steep slopes on coal gob piles, and the construction of structural barriers designed to restrict human access. Gates, cupolas, or other wildlife-compatible closures would be installed site-wide where the dangerous features are located.

Existing roads would be used wherever possible to access the mining features proposed for closure. Construction staging areas would be located near existing roads in areas that are already disturbed. The Proposed Project ground disturbance footprint would be focused on the identified hazardous mine features throughout the Project Area. Colfax County Roads A-25 and A-26 would serve as the main access roads, along with former two-track, unpaved mine roads that would serve as access to other areas situated away from the county roads. Existing disturbed and flat areas adjacent to the road may also be used for geotechnical drilling activities and staging of drilling, construction equipment and materials.

Implementation of the Proposed Project is anticipated to begin in the early fall 2023. The Proposed Project would be completed in phases, with the most critical work taking place first. The below table shows the phases and estimated timing of completion.

Phase	CR A-25	Structural Closures	Coal Waste (Gob) Piles	Approximate Timing of Completion	Public Accessibility During Construction
I	X	X (near CR A-25)	-	Up to 1 month	Access will be limited during work along CR A-25. All efforts will be made to accommodate local residential traffic, however there may be times when the road must be shut down.
II	-	X	X (on at least state trust lands)	Up to 1 year	No limitations

Phase I

Phase I would investigate and repair areas on or adjacent to CR A-25 where subsidence features (tension cracks) have been identified along a section of the road. In addition, Phase I includes the safeguarding of several adits close to the road. Safeguarding hazardous mine openings and other features will be designed to allow for open access to, and continued use of, the mine features by smaller wildlife species, including bats.

Phase II

Phase II would consist of safeguarding the remaining adits and other hazardous features identified throughout the Project Area. Phase II would also include gob pile reclamation on state trust land and potentially on private land.

Phase I and II Project Details

The following describes the safeguarding measures in detail for the Proposed Project:

County Road A-25

Geotechnical exploration would be conducted by drilling to further characterize subsurface conditions and determine if the subsidence is related to underground mine workings. Backfilling through drilling and injection of a water, sand and cement grout mixture would then be completed to mitigate the areas of subsidence impacting the road. The grout mixture would be injected into the voids beneath and adjacent to the A-25 alignment. The grouting work may take place concurrently with the drilling investigation. The goal of drilling and grouting the CR

A-25 subsidence features is to map the voids under and near the road alignment and to fill those voids with grout to stop additional subsidence in the area and stabilize the road. The drill holes would be spaced every 30 feet along the A-25 alignment, with an increased drilling density of every 20 feet around the existing subsidence features.

Adits and Other Hazardous Mine Features

Gates: Gates would be installed over mine shafts and in mine adits or portals, as well as in other mine entryways where gates are determined to be the best method for blocking access to mine features. The gates would be designed in accordance with the latest industry standards and would be modified as necessary to fit the specific entryway, occasionally using steel culverts to support the gate. The basic gate design generally used consists of a vertical to horizontally placed flat grid of welded steel cross bars anchored in place over the mine entryway. The cross bars would be oriented horizontally and welded onto vertical supports spaced widely. Spacing of the horizontal cross bars would be 6 inches, designed to allow passage of bats in flight, as well as access for other small mammals and for birds, but not spaced widely enough to allow human entry. Gates are typically constructed of 2-inch by 4-inch and 2-inch-square tubular weathering steel that is anchored into the surrounding rock using 1-inch steel rods. Gates are designed to not inhibit air flow into or out of the mine feature and constructed of angled steel oriented with the apex up to maximize the airflow through the gate.

The gates would be installed at all features identified for closure that have been surveyed by Bat Conservation International (BCI) and documented for historical purposes (Okun 2023). Closure and construction timing will be in accordance with the recommendations of BCI. Any recommendations, such as pre-construction wildlife surveys, resulting from the BA/BE conducted in the Project Area (DBSA 2022) will be followed.

Rock/concrete bulkhead with culvert gate: At some locations, gates would consist of a bulkhead constructed of a 2- to 4-foot-thick section of rocks cemented together with concrete. A 3- to 4-foot steel culvert with a steel gate would be constructed inside.

Cupolas: Cupolas are a type of gate designed to fit over a vertical mine shaft. Bat-friendly cupolas may be installed over mine shafts if determined to be an appropriate measure for safeguarding a feature in the Project Area. Locations and construction timing will be in accordance with the recommendations of BCI and based on pre-construction surveys of wildlife usage of features.

Backfill: Some mine openings may be backfilled with adjacent coal gob or waste rock piles.

Other structural closures: Polyurethane foam (PUF) plugs, gated culverts, and other structures may be used to safeguard mine openings.

Coal Waste (Gob) Pile Reclamation

Stabilization of steep slopes on coal gob piles would be conducted in place to prevent mine waste from entering adjacent ephemeral channels. Proposed work would include in situ burial of coal gob or the establishment of vegetation and installation of various erosion control structures on the gob piles as necessary to facilitate effective stormwater management.

PUBLIC MEETING NOTICE
Yankee Mine Safeguarding Project
Raton, NM

Thursday, June 8, 2023, 5:30 – 7:00pm
City of Raton Library, 244 Cook Ave., Raton, NM
Draft Environmental Assessment Presentation

The Abandoned Mine Land (AML) Program invites you to a public meeting for the proposed safeguarding of the former Yankee Mine, including County Road A-25, located 8 miles northeast of Raton, NM.

Project Scope: The New Mexico Energy, Minerals, and Natural Resources Department, AML Program, in partnership with the U.S. Department of Interior, Office of Surface Mining Reclamation and Enforcement is proposing to safeguard numerous hazardous abandoned mine openings/features throughout the former Yankee Mine area with a focus on destabilized areas of CR A-25, which traverses through the former mine site.

Public Meeting Purpose: Coinciding with the release of the Draft Environmental Assessment (EA), the meeting is to give the public, area neighbors, and stakeholders the opportunity to learn more about the project. The findings of the EA will be discussed during the meeting.

ADA: To request Americans with Disabilities Act (ADA)-related accommodations for this meeting, contact Jean-Luc Cartron at (505) 822-9400 or jcartron@geo-logic.com at least two days before the public meeting.

Comments: Comments/questions will be accepted and recorded at the meeting, or they can be submitted to james.hollen@state.nm.us or by phone (505-231-8332). Please submit comments by July 8, 2023.

Attachment 2

Public Meeting

DBS&A
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Sign-in Sheet

Public Information Meeting

Yankee Canyon Mine Safeguarding Project

City of Raton Library, 244 Cook Ave., Raton, NM

Thursday, June 8, 2023, from 5:30 pm to 7:00 pm

Name	Organization (if applicable)	Address	Email Address	Phone No.
Gary Decker	UM WA Member	635 Rio Grande	—	—
James Hollen	NM AML PROGRAM	SANTA FE	james.hollen@emnrd.nm.gov	505 231 8332
Yeny Maestas	NM AML Program	Santa Fe	yeny.maestas@emnrd.nm.gov	505.469.6678
JULIE KUTZ	DBS&A	GODD ACADEMY NE, ABQ, NM	JKutz@geo-Logic.com	505.353.9123
Jean-Luc Cactra	DBS&A	Gold Academy NE, ABQ, NM	jcactra@geo-logic.com	505-822-9400
/Ken Brinster	DBS&A	4929 Calle de Tierra NE	kbrinster@geo-logic.com	505-239-5141
DANNY VUKOMICH		47 BLACK MESA RD		575-447-8083
Glen Stevens	Colfax County Road Dept	207 Copper	gstevens@co.colfax.nm.us.	575-445-8292

Yankee Canyon Mine Safeguarding Project Public Meeting June 8, 2023

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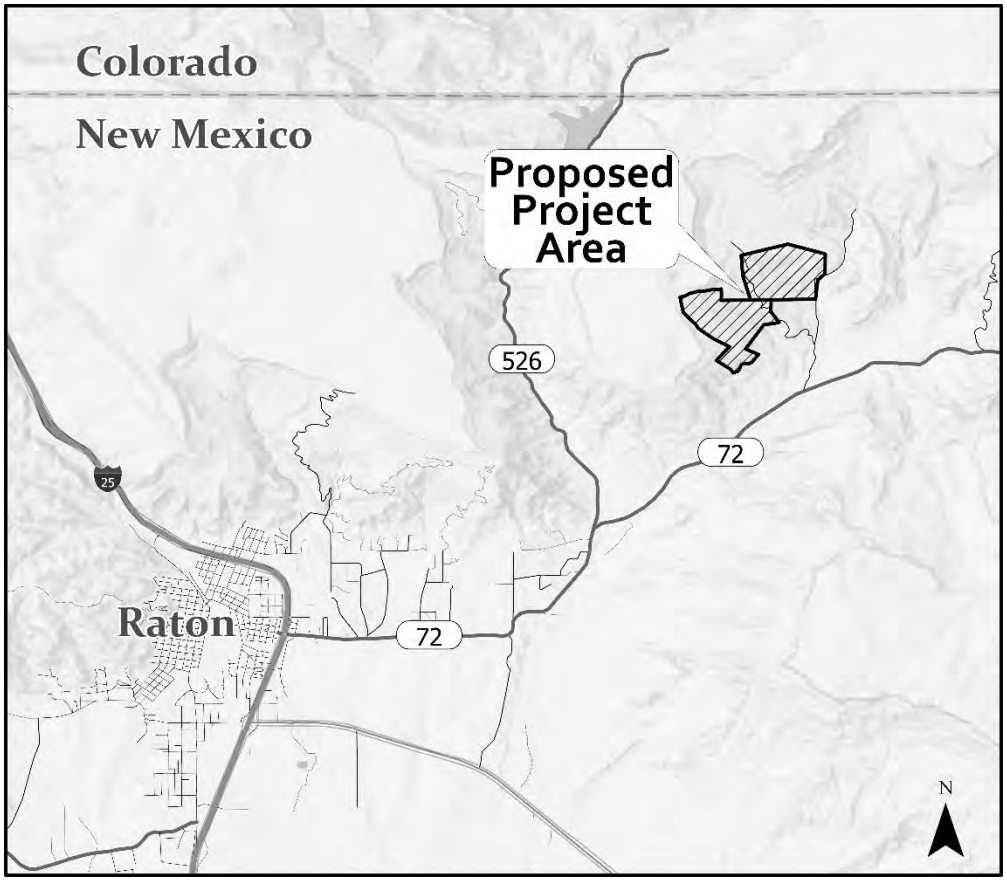
Project Location



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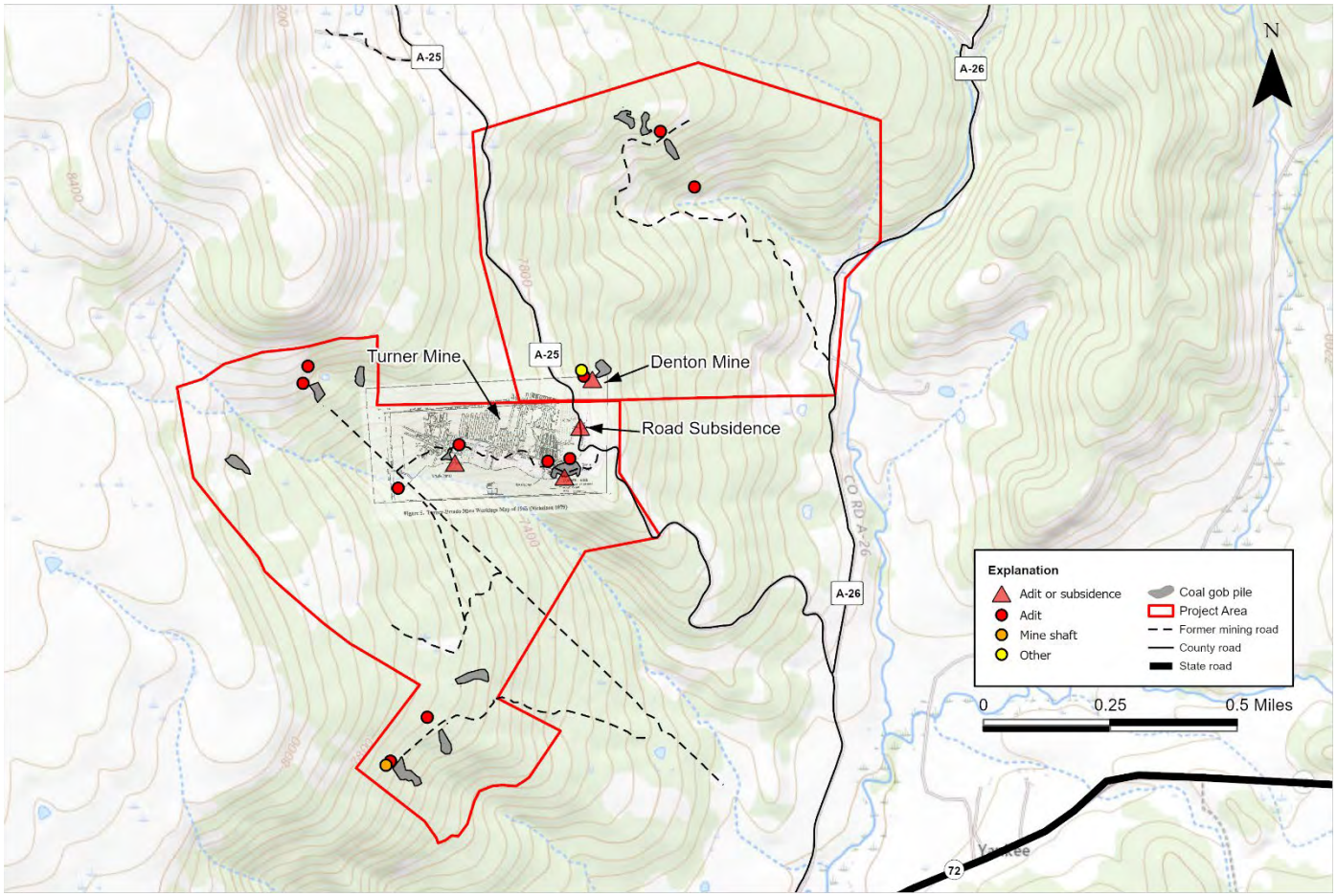
NEW MEXICO emnrd Energy, Minerals and Natural Resources Department

U.S. DEPARTMENT OF THE INTERIOR OFFICE OF SURFACE MINING

Project Area



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NEW MEXICO emnrd Energy, Minerals and Natural Resources Department

U.S. DEPARTMENT OF THE INTERIOR OFFICE OF SURFACE MINING

Project Team

- Abandoned Mine Land Program: Mike Tompson, AML Program Manager, Yeny Maestas, Project Manager, Laurence D'Alessandro, Project Manager, Lloyd Moiola, Environmental Manager; James Hollen, NEPA Coordinator
- Daniel B. Stephens & Associates: Jean-Luc Cartron, Project Manager/NEPA and Natural Resources Lead, Julie Kutz, Biologist/NEPA Specialist, Ken Brinster, NEPA Specialist
- Okun Consulting Solutions: Adam Okun, Cultural Resources Expert

National Environmental Policy Act

- Under the National Environmental Policy Act, federal agencies and their representatives are required to assess the environmental effects of their proposed actions prior to making decisions
- A draft Environmental Assessment has been prepared with an analysis of potential impacts on the natural and human environment of Yankee Canyon and its surrounding area
- Public review and participation are an important component of NEPA

Project Purpose and Need

- The purpose of the project is to safeguard against historical mining feature hazards throughout the Project Area
- County Road A-25 has been closed due to subsidence likely caused by historic mining. There is a need to stabilize it before it can be reopened.
- Unprotected mine features need to be safeguarded to protect against hazards
- Exposed gob piles need to be reclaimed because they can threaten water quality and may combust spontaneously, leading to an elevated risk of fire.

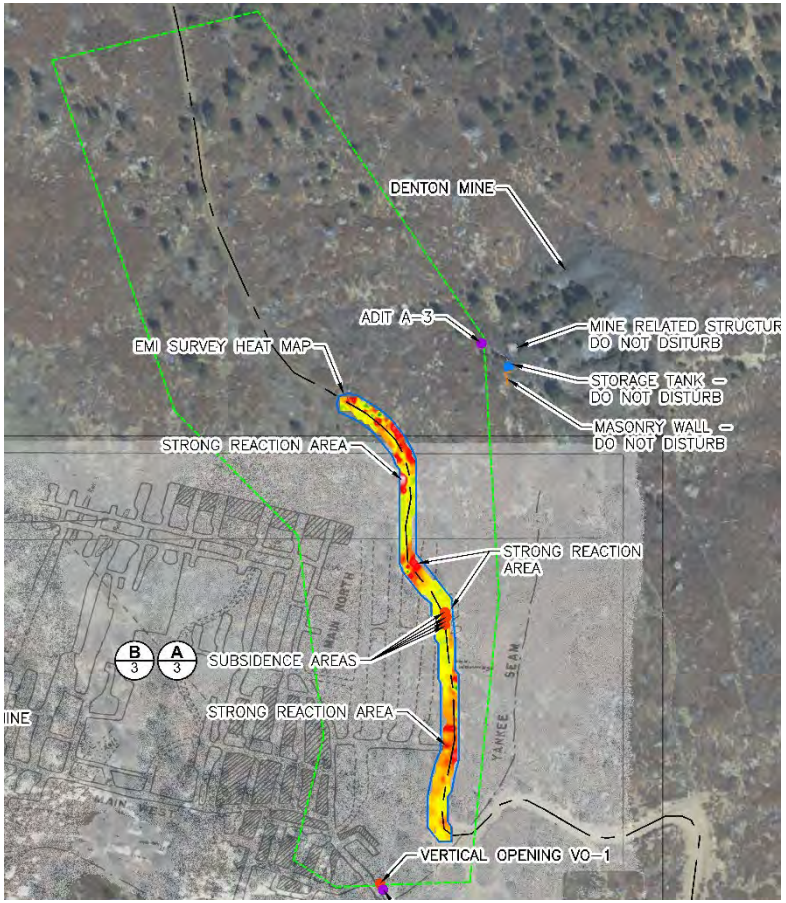
B ADIT A-2
SCALE: NONE

A COUNTY ROAD A-25 SUBSIDENCE FEATURE
SCALE: NONE

Photos from Trihydro, 2023

Safeguarding Project (Phase 1)

- County Road A-25. The project would further investigate then repair areas on road where subsidence features are identified.
  - Investigation by geotechnical drilling performed to characterize subsurface conditions. Drill holes placed every 20 to 30 feet.
  - Repair by backfilling conducted through drilling and injection of a water, sand and cement grout mixture. Grout would be injected into voids beneath and adjacent to the road.
- Closure of three adits near CR A-25



CR A-25 Subsidence (Trihydro, 2023)

Safeguarding Project (Phase 2)

- Closure of all other mine openings (gates, cupolas, backfill, polyurethane foam (PUF) plugs, gated culverts)
- Stabilization of gob piles on state lands and on private land with owners' consent

Stabilization of steep slopes on coal gob piles is needed to prevent mine waste from entering adjacent ephemeral channels.

Typical AML Reclamation/Closures

Revegetated gob pile (Dillon Canyon)

Rock bulk-headed culvert with bat-friendly gate. Cemented rocks assist with blending into landscape

Typical AML Closures

Bat and wildlife friendly gate enclosure

Culvert with bat and wildlife-friendly gate

Affected Environment

- Topics Evaluated in the Environmental Assessment:
  - Cultural Resources
  - Water Resources
  - Vegetation
  - Wildlife
  - Special Status Species
  - Topography/Geology/Soils
  - Land Use
  - Human Health and Safety
  - Socioeconomic/Environmental Justice

Impacts of the Proposed Project

- All elements of the affected environment are evaluated and included in full in draft EA
- Supporting studies are included or referenced in the EA

Analysis of Impacts: Cultural Resources

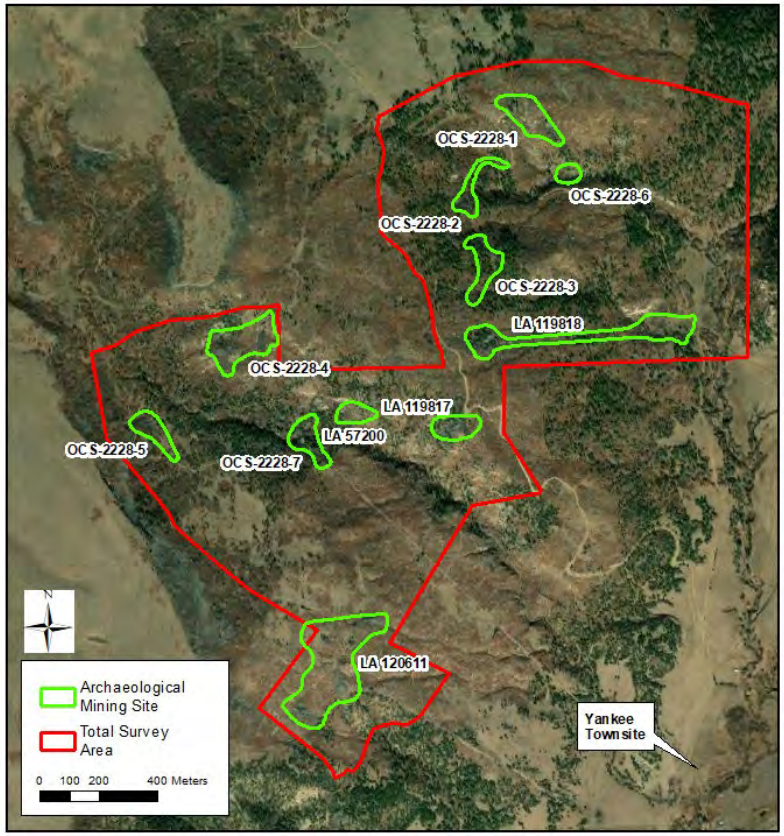
- An archaeological survey was conducted in Oct-Nov 2022 to document historic mining features and help the project comply with the National Historic Preservation Act and other historic preservation laws.
  - 582 acres were surveyed
  - 138 separate mining features and hundreds of historic artifacts were documented
  - Coal waste (gob) pile is the most common feature type, but many other types are present
  - Features are related to assaying, extraction, processing, transport, and supporting activities

FEATURE TYPE	COUNT	FEATURE TYPE	COUNT
Coal Gob Pile	35	Ore Cart	2
Structure Foundation	19	Road-Related Feature	2
Adit	10	RR Grade	2
Open Cut/Pit	8	Structure (Extant)	2
Fence	7	Tramway Feature	2
Car Body	4	Prospect Pit	2
Waste Rock Platform	4	Machine Platform	2
Landform Modification	4	Privy/Depression	2
Wall	4	Ramp	2
Midden	3	Bridge	1
Tramway Segment	3	Corral	1
Entrance (Shaft/Vent)	3	Graffiti Panel	1
Reservoir/Tank	3	Well	1
Concrete Bin	2	Tipple Foundation	1
Developed Spring	2	Utility Pole	1
Trail/Road	2	Wood Concentration	1
TOTAL			**138**

Documented Mining Feature By Type

Survey Results

- 11 different clusters defined as archaeological sites
- Yankee Mines and small family operations are represented
- Sites date from 1905 to 1960s
- Four of the mines had been documented in the past



Historic Mining Features

- Below are examples of historic mining features
- AML will work to preserve significant features where feasible

Coal Gob Piles on Steep Slope

Car Body

Tipple Structure Remains

Mine Opening

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Cultural Resources: Avoidances

- Four sites are recommended as eligible for listing on the National Register of Historic Places
- On eligible sites, specific features will be avoided with suitable buffers during mine remediation, and all project activities at these sites should be monitored by a permitted archaeologist.
- One other site with intact mining infrastructure requires similar avoidances and monitoring

Analysis of Impacts: Land Use

- The area is rich in natural resources, with abundant wildlife including game species such as elk and deer. County Road A-25 is used by hunters and provides access to private ranches and hunting lodges in the region.
- Lands are also used for livestock grazing.

Analysis of Impacts: Land Use

- Repair of CR A-25 would have a negative, short-term impact on land use because of limited road access during construction
- It would have a positive long-term impact by allowing the road to be reopened under safe conditions.
- The non-implementation of the project would have negative impacts in the long term.
- Safeguarding measures would be on county-maintained roads, private property and state land. Access agreements would be in place prior to construction.
- No other land use would be impacted by the Proposed Project

Analysis of Impacts: Biological Resources

- Bat compatible closure and timing would mitigate impacts to bats
- No threatened or endangered species have the potential to occur in the project area, therefore no impact
- Mitigation measures for migratory birds such as construction timing will be implemented
- Surveys for wildlife usage of mine features will be conducted prior to closure of mine features
- Potential positive, long-term impact on vegetation with revegetation of gob piles using native species
- Minimum short-term impacts on soils and vegetation with mitigation measures in place
- No long-term impacts to biological resources with implementation of mitigation measures

Analysis of Impacts: Other Resources

- Potential positive, long-term impact on downstream water quality
- Positive impact on human health and safety
- Short-term positive impact on socioeconomics
- Positive impact on environmental justice through improved access on CR A-25 and improved water quality
- No impact to topography, geology or soils

Impacts Conclusion

- Proposed Project (Proposed Action Alternative)
  - With mitigation measures in place, No Significant Impact was found
- No Action Alternative
  - Ranges from no impact to negative impact

Any Questions?

- For questions or additional information, please contact:
  - Lloyd Moiola, <Lloyd.Moiola@emnrd.nm.gov>, 505-629-3757
  - James Hollen,<James.Hollen@emnrd.nm.gov>, 505-231-8332 OR
  - Mike Tompson P.E., <Mike.Tompson@emnrd.nm.gov>, 505-690-8063
- Draft Environmental Assessment and Supporting Studies are posted on the AML website at: https://www.emnrd.nm.gov/mmd/public-notices/
- To submit comments, please email jcartron@geo-logic.com, call 505-353-9190, or mail to DBS&A, c/o Jean-Luc Cartron
  6020 Academy NE, Suite 100
  Albuquerque, NM 87109
- Please provide comments by July 8, 2023 - Thank you!

Attachment 3

Comments Summary and Responses

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Yankee Canyon Environmental Assessment
Meeting Comments and Questions, June 8, 2023

Comment No.	Comment category	Comment	Date	AML Program Response	Response Given during the Meeting
1	Proposed project details	Is the County Road A-25 going to be closed permanently?	6/8/2023	No, the road will be reopened following the proposed repair.	Yes
2	Proposed project details	Not sure about the project, it is going to turn everything black to green.	6/8/2023	The project will include gob reclamation on State Trust Lands, they have been in discussion with the State Land Office and they want reclamation to be done. Gob reclamation otherwise would be done only with the private property owner's permission.	Yes
3	Proposed project details	When will the CR A-25 reopen and how will it be fixed?	6/8/2023	Perhaps by October, although there are unknowns that could affect the schedule. The project would further investigate then repair areas on road where subsidence features are identified. Investigation would be done by geotechnical drilling with drill holes placed every 20 to 30 feet. Repair would be done by drilling and injecting a water, sand and cement grout mixture injected into voids beneath and adjacent to the road. The grout will be brought in by trucks that are suitable to travel on CR A-25, perhaps by transferring from a large truck to a smaller truck that is able to navigate the road.	Yes

Yankee Canyon Environmental Assessment
Meeting Comments and Questions, June 8, 2023

Comment No.	Comment category	Comment	Date	AML Program Response	Response Given during the Meeting
4	Proposed project details	Is it possible to plant ponderosas on north-facing slopes as part of the stabilization process. Although the Locusts are apparently well-suited to the dry conditions in the Raton area, I'm not a fan.	5/28/2023	Ponderosa pine is difficult to start in reclamation piles, whereas native NM locust has performed very well. However, the AMLP will work with the landowner on the seed mix if it is determined that gob reclamation needs to be done on the property. See full response from the AMLP, Appendix F	No, email response given
5	Cost/funding/hiring of contractor	Where is the funding coming from? It seems like a lot of money to be spent on an area where nobody goes.	6/8/2023	The AMLP is paying for it through a tax on every ton of coal taken from the mines in the area and the infrastructure bill (“Bill Fund”) were the revenue sources.	Yes