

Environmental Assessment: Navajo and Enterprise-Brown Mines Underground Coal Fire Mitigation Project, McKinley County, New Mexico

eAMLIS PAD Numbers: NM935062 (Enterprise-Brown Mine)
and NM935063 (Navajo Mine)

Prepared for

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ENVIRONMENTAL ASSESSMENT

FOR:

Navajo and Enterprise-Brown Mines Underground Coal Fire Mitigation Project
McKinley County, New Mexico

Reviewed by: _____, Director

A handwritten signature in blue ink, appearing to read "J. A. ...", is written over a horizontal line.

Date: 7/19/2022

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1. INTRODUCTION

The New Mexico Energy, Minerals, and Natural Resources Department (EMNRD) Abandoned Mine Land (AML) Program, in partnership with the United State Department of Interior (USDI) Office of Surface Mining Reclamation and Enforcement (OSMRE), is proposing to mitigate ongoing underground coal fires at the Navajo Mine and Enterprise-Brown Mine sites near Gallup, McKinley County, New Mexico. The project is funded by the OSMRE, and the use of federal funds necessitates an environmental assessment (EA) for the project, in conformance with OSMRE guidance for compliance with the National Environmental Policy Act (NEPA): *Handbook on Procedures for Implementing the National Environmental Policy Act* (July 2019).

1.1 Summary of Proposed Action

The AML proposes to mitigate fire hazards at two separate on-going coal fires in the Gallup area. The two locations are identified as the Enterprise-Brown Mine and the Navajo Mine. At these locations, AML proposes to delineate the extent of each fire through exploratory drilling and geophysical investigation. Fires would be extinguished by excavating the burning coal seam and its overburden, quenching the burning material by mixing with inert material, and backfilling with the quenched material. Fire areas may also be extinguished by placing a layer of soil over the fire to limit airflow. In addition, specific adits and vents that are currently open would be closed as a safeguard measure for members of the public who may access the area.

1.2 Project Location

The two mines are located near the City of Gallup, New Mexico (see maps in Appendix A), approximately 1.25 miles (2.01 kilometers [km]) apart. The Navajo Mine site is near a commercial area of northwest Gallup; the Enterprise-Brown Mine site is approximately 1,000 feet (ft; 305 meters [m]) north of a residential subdivision on the east side of the city. Together, the two locations make up the project area and encompass 51.74 acres (20.94 hectares) of private land in Section 3, Township 16 North, Range 18 West; and Sections 4 and 10, Township 15 North, Range 18 West. Both locations are found on the *Gallup East* United States Geological Survey 7.5-minute quadrangle map.

1.3 Purpose and Need for Proposed Action

The purpose of the proposed action is to mitigate existing hazards to the health and safety of residents and protect critical infrastructure in the Gallup area due to ongoing underground coal fires and open adits and vents related to previous mining activities.

The project is needed because of on-going subsurface coal fires that are venting to the surface. Smoke has been observed rising from vent locations at the Navajo Mine location and temperatures have been documented at an average of 130°F (F) and up to 250°F. The Enterprise-Brown location has fracture vents that range in temperature from 78°F to 115°F. The potential hazards associated with these mine fires include possible wildfire ignition and injury or death to people visiting the area. The method of injury would most likely be unstable ground or ground openings such as adits and vents causing a fall near or onto the burning face of the fire or through exposure to toxic gases. The risk of

exposure to toxic gas is greatest at the Enterprise-Brown mine, which is located 0.3 miles (0.48 km) from a residential area of Gallup, whereas the Navajo Mile location is 0.75 miles (1.21 km) from the nearest paved road. Indigents are known to camp near other mine fires such as the Bell-Aztec mine and could potentially camp at the Enterprise-Brown or Navajo mine locations as well, increasing the possibility of bodily injury. In addition, the Enterprise-Brown fire is located approximately 130 ft (40 m) from the Navajo-Gallup Water Supply Project pipeline. If the fire were to increase and move along the seam outcrop, abatement would be required to protect the pipeline (Tetra Tech 2020a and 2020b).

1.4 Project History and Background

The following summary of the Enterprise-Brown history and background is taken from Tetra Tech (2020a:2):

The Enterprise-Brown and McVickers mine was started in 1907 by Hutchinson Brown and William McVickers. A slope was driven 1,300 ft to the northeast in the 4-6 ft thick Black Diamond coal seam. In 1910, the mine broke into the workings of the closed Sunshine mine, flooding the workings with “black damp”, a mixture of carbon monoxide and other toxic gases. The workings were sealed off at 700 ft from the mine portal. The remaining pillars from this seal back to the portal were pulled as the mine was abandoned (Sears, 1925). In 1979, it was reported that the mine slope entrance was found and that remnants of a pillar were on fire near the entrance (Nickelson, 1988).

Somewhat less information was reported for the Navajo Mine (Tetra Tech 2020b:2):

The Navajo underground coal mine fire is located 350 ft southwest along the coal outcrop from the Navajo mine entrance. It is important to note that it is believed that this Navajo mine was a relatively small mine in the No. 2 coal bed of the Gibson coal member and not believed to be connected to one of the larger Navajo No. 1, 2, or 5 mines located to the northwest. No mining maps were found for the area near the fire, so it is unclear if the seam in the area of the fire was mined or not.

While the information on the Navajo Mine is somewhat limited, the Tetra Tech report notes that the fire was reported during a previous field visit in 2011. Additionally, Tetra Tech performed unmanned aerial system (UAS) thermal and visual photogrammetry flights of the Navajo Mine area in November of 2019 and again in November of 2021. A comparison of the two flights indicates the fire has moved north and west into the hillside. The 2021 results indicated that new fractures formed 3 ft further to the northwest when compared to the 2019 results. Near the south end of the mine area, a new fracture developed 4 ft to the west of the western-most fracture from the 2019 investigation. Additionally, most previously identified fractures widened during this period and a juniper tree at the southern end of the fire expression died, apparently as a result of exposure to the underground fire. Fire surface temperatures from the 2021 investigation were consistent with those from 2019 (Tetra Tech 2021).

1.5 Project Decision

This EA was prepared on behalf of the AML Program and discloses the environmental consequences of implementing the proposed alternatives, including the No-Action Alternative. This EA will be reviewed by the lead agency, OSMRE, and made available to the public for review, comment, and consideration. If

appropriate, a Finding of No Significant Impact (FONSI) would then be prepared by the OSMRE describing the findings of the EA. The OSMRE Denver Field Branch Manager would be the “Deciding Official” for the action and the signatory of the FONSI if applicable.

1.6 Relevant Statutes and Regulations

The NEPA and its implementing regulations require federal agencies to consider potential environmental consequences of their proposed undertakings. The proposed action does not conflict with any known state or local planning or zoning ordinances. The following environmental laws and executive orders provide a broad regulatory and permitting context for NEPA compliance:

- American Indian Religious Freedom Act (AIRFA) of 1978 (42 USC 1996)
- Archaeological Resources Protection Act (ARPA) of 1979 (16 USC 470)
- Clean Air Act (CAA) of 1970, as amended (42 USC 7401 et seq.)
- Clean Water Act (CWA) of 1972, as amended (33 USC 1251 et seq.)
- Endangered Species Act (ESA) of 1973, as amended (16 USC 1531 et seq.)
- Floodplain Management (Executive Order [EO] 11988)
- Migratory Bird Treaty Act (MBTA) of 1918, as amended (16 USC 703-712)
- NEPA of 1969, as amended (42 USC 4321 et seq.)
- National Historic Preservation Act (NHPA) of 1966 as amended, (54 USC 300101 et seq.; formerly 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)
- Environmental Justice (EO 12898)
- Farmland Protection Act of 1981 (7 USC 4201 et seq.)
- Regulations for Implementing the Procedural Provisions of NEPA (40 CFR 1500 et seq.)

1.7 Public Involvement

The public was informed about the fire-mitigation efforts through a two-page flyer that was distributed throughout the Gallup area using the US Postal Service’s Every Door Direct delivery method. The flyer described the mission of AML; the purpose of the mitigation efforts; the proposed efforts at the Navajo Mine, Enterprise-Brown Mine, and three other mine locations around Gallup; and asked the public for comment (see Appendix B). The flyer was sent to over 3,200 mailboxes along postal routes that surrounded the project areas. Only one comment was received during the comment period from a person interested in discussing materials used to cap mine openings.

2. DESCRIPTION OF ALTERNATIVES

This section describes the alternatives developed to address the purpose and need for the project. Three alternatives are described below and considered throughout the EA. One of the alternatives, the

No-Action Alternative, does not satisfy the project purpose and need but is considered throughout the EA as it provides a baseline from which to consider potential environmental consequences of the other alternatives.

2.1 Alternative 1 (Preferred)

At both mine locations, AML proposes to delineate the extent of the fires through exploratory drilling and geophysical investigation. Fires would be extinguished by excavating the burning coal seam and its overburden, quenching the burning material by mixing with inert material, and backfilling with the quenched material. Fire areas may also be extinguished by placing a layer of soil over the fire to limit airflow. In addition, specific adits and vents that are currently open would be closed as a safeguard measure for members of the public who may access the area.

2.2 Alternative 2

Alternative 2 would allow the adits and vents to stay open and the coal fires to continue with the installation of fencing and warning signs around the perimeter of the fires. This would involve approximately 500 ft (152.4 m) of fencing at the Navajo Mine location and 400 ft (122 m) of fencing at the Enterprise-Brown Mine location. In addition to fencing and warning signs, biennial monitoring would be implemented to record fire temperatures and note the development of new surface features.

This alternative would only partially address the purpose and need for the project in that wildfires, personal injury or death, and damage to infrastructure could still be a possibility, if not an immediate concern. However, Alternative 2 would provide some benefit to the health, safety, and property of Gallup-area residents and is considered a viable alternative.

2.3 No-Action Alternative

Under the No-Action Alternative, no mitigation of the coal-fire hazards would take place. This alternative would not satisfy the purpose and need for the project and would involve continued and unreasonable risk to public safety. The No-Action Alternative is considered in this EA as a baseline existing condition.

3. AFFECTED ENVIRONMENT

This section describes the existing environmental conditions and resources within the project area.

3.1 General Project Setting

The project area falls within the Semiarid Tablelands sub-region of the Arizona/New Mexico Plateau (USGS 2011a, b). This area consists of mesas, plateaus, cliffs, and valleys with some ephemeral and intermittent streams. The elevation range for the Semiarid Tablelands is 5,200 ft to 8,748 ft (1,585m to 2,667 m) above mean sea level (amsl). The elevation of the project areas ranges from 6,670 ft to 6,940 ft (2,034 m to 2,116 m) amsl. The two locations are approximately 1.25 miles (2 km) apart separated by Gibson Canyon and surrounded by high hills that extend above the valley floor. These landforms feature multiple stepped terraces of varying geological stratigraphy, including thick layers of sandstone cap rock.

The primary land uses in the project area include recreational hiking, All Terrain Vehicle (ATV) use, and ranching/livestock grazing. Although both locations are private property, the Enterprise-Brown location in particular experiences recreational visitation, likely due to its proximity to nearby residential properties.

3.2 Socioeconomic Conditions and Environmental Justice

This information on socioeconomic conditions was derived from the EPA’s Environmental Justice Screen tool (<https://ejscreen.epa.gov/mapper/>, accessed June 8, 2022) and verified through the Justice40 Initiative screening tool (<https://screeningtool.geoplatform.gov/en/#11.96/35.5648/-108.72283>, beta version accessed June 9, 2022). The EJ screening tool uses American Community Survey (ACS) and US Census data to provide environmental and demographic characteristics of a designated area. The Justice40 Climate and Economic Justice Screening Tool (CEJST), implemented by the Biden-Harris Administration to “...deliver 40 percent of the overall benefits of federal investments in climate and clean energy, including sustainable transportation, to disadvantaged communities”, identifies census blocks that meet qualifications to be classified as disadvantaged. Both tools use the most recent available US Census Bureau data at the block-group level to identify demographic characteristics of a study area defined by the user. For this project area the most recent ACS data from the EJ screening tool and CEJST was from 2015-2019.

3.2.1 Employment and Income

Between 2015-2019, the population of the area that was 16 or older was estimated at 2,914 or approximately 64% percent of the total population. A total of 53 percent of this population was in the labor force and 8 percent were considered to be unemployed. The additional 47 percent of the population were not in the labor force. A total of 31 percent of households had an annual income of less than \$15,000, 39 percent had an income between \$15,000 and \$50,000, and 29 percent had an income over \$50,000.

3.2.2 Demographic Trends

A total of 47 percent of the population identify as American Indian, 25 percent are White, 11 percent are reported as two or more races, and 15 percent identify as “other race”. Additionally, 39 percent of the population identify as having a Hispanic ethnicity. There are 97 linguistically isolated households in the project area, approximately 6 percent of households in the area.

3.2.3 Environmental Justice and Disadvantaged Communities

Executive order 12898, federal Actions to Address Environmental Justice in Minority Populations and low-Income Populations, requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high or adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities.

Based on US Census data and ACS data from the EJ Screening tool presented above, low-income and American Indian populations are located within the project area. The low-income and American Indian populations are higher in the project area than average values for the state of New Mexico.

In addition to the EJ Screening Tool, the CEJST was used to identify potential disadvantaged communities in the project area. To be classified as a disadvantaged community, a census tract must be above the threshold for one or more environmental or climate indicators and it must be above the threshold for socioeconomic indicators.

The study area (1-mile buffer from project area) is located within four census tracts. Two of these tracts were identified as disadvantaged, as indicated below.:

1. 35031945500
2. 35031945400
3. 35031945300 (Disadvantaged)
4. 35031945200 (Disadvantaged)

Census tract 35031945300 is identified as disadvantaged in Health Burdens and in Workforce Development. Census tract 35031945200 is identified as disadvantaged in the Climate Change category.

3.3 Cultural Resources

In 2020, Parametrix archaeologists completed an archaeological survey of the entire project area. In all, four sites (LA 66500, LA 146726, LA 178670, and LA 199149) were recorded within the project area. LA 66500 is a large historic mining site that represents the remains of the Navajo Mine and Gibson townsite. The site is eligible for listing on the National Register of Historic Places (NRHP) under Criteria A and D for its association with historic mining in the Gallup area and its ability to contribute to future research. Similarly, LA 178670 is the remains of several historic mines in the Enterprise-Brown area and is also eligible to the NRHP under Criteria A and D. Both LA 146726 and LA 199149 are prehistoric Anasazi sites eligible for listing to the NRHP under Criterion D for their future research potential.

3.4 Water Resources

Water resources within the project area include ephemeral drainages and a floodplain as described below. No wetlands are located within the project area.

3.4.1 Waterways

Parametrix senior biologists surveyed the entire project area. There are no perennial or intermittent waterways identified in the Area of Potential Effect (APE). However, several ephemeral drainages exist in both mine locations. These drainages connect to the Rio Puerco and therefore fall under the jurisdiction of the CWA. Any fill placed within the drainages would need to comply with Section 404 of the CWA as regulated by the US Army Corps of Engineers.

3.4.2 Floodplains

The project area is located on Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Panel Number 35031C1540E (FEMA 2021). This panel indicates the project area is subject to minimal flooding hazards.

3.5 Vegetation

Four different plant communities were identified in the project area, as indicated below.

- Inter-Mountain Basins Greasewood Flat: 18.04 acres (7.30 hectares) including species such as black greasewood (*Sarcobatus vermiculatus*) and big sagebrush (*Artemisia tridentata*).
- Inter-Mountain Basins Big Sagebrush Shrubland: 3.74 acres (1.51 hectares) including big sagebrush (*Artemisia tridentata*), saltbush (*Atriplex spp.*), rubber rabbitbrush (*Ericameria nauseosa*), juniper (*Juniperus spp.*), blue grama grass (*Bouteloua gracilis*), and James' galleta grass (*Pleuraphis jamesii*).
- Colorado Plateau Pinyon-Juniper Woodland: 34.76 acres (14.07 hectares) including species such as pinyon pine (*Pinus edulis*), one-seed juniper (*Juniperus monosperma*), sagebrush species (*Artemisia spp.*), cliffrose (*Purshia tridentata*), James' galleta (*Pleuraphis jamesii*), western wheatgrass (*Pascopyrum smithii*), and muttongrass (*Poa fendleriana*)
- Developed, Low Intensity: 2.42 acres (0.98 hectares), this area includes a mixture of constructed materials, vegetation, and impervious surfaces that account for 20 to 49 percent of the total cover of this vegetation community.

One noxious weed was observed during field surveys: Siberian elm (*Ulmus pumila*) was present at scattered locations at both mine locations.

3.6 Wildlife

A limited amount of wildlife was observed during field surveys; however, habitat is sufficient for common species such as desert cottontail (*Sylvilagus audubonii*), jackrabbit (*Lepus californicus*), coyote (*Canis latrans*), mule deer (*Odocoileus hemionus*), and cougar (*Puma concolor*), as well as various migratory birds and bats.

3.7 Special-Status Species

Special-status species include plants and animals that are listed as threatened, endangered, candidate, experimental populations, Species of Greatest Conservation Need (SGCN) or Species of Economic and Recreational Importance (SERI) under state or federal regulations. Birds protected under the MBTA are also considered in this section. Below is a discussion of the state-listed plants and animals considered in the project area, federally listed plants and animals, as well as critical habitat and migratory birds. See Appendix C for the complete Biological Assessment and Biological Evaluation.

3.7.1 State-listed Plants

Two state-listed endangered species (Zuni fleabane and Parish’s alkali grass) [USFWS 2021a; NMEMNRD 2021] have the potential to occur in the project area. Based on field investigations, the state-listed threatened Gooding’s onion does not have the potential to occur in the project area due to the lack of habitat (steep slopes and spruce-fir habitat) in the project area. None of these three protected plant species were detected in field survey of the project area.

There are 17 plants listed as New Mexico rare plants for McKinley County. Two of these plants, Zuni fleabane, and Parish’s alkali grass, are also listed as state endangered and discussed above. However, none of these plants were identified during field surveys.

3.7.2 State-listed Animals

Of the 15 state-listed species, there is potential for two state-listed threatened/SGCN species (gray vireo, which was observed during field surveys, and spotted bat), three SGCN species (Gunnison’s prairie dog, juniper titmouse, and loggerhead shrike), and two SERI species (cougar and mule deer) to occur in the project area. These species are further evaluated below.

- The two gray vireos observed in May 2021 could be a breeding pair (the male exhibited territorial behavior) though no nest was found.
- Juniper titmice have been detected close to the project area (eBird 2021), though significant amounts of nesting habitat are not present.
- Loggerhead shrikes were not noted during field surveys but could travel into the proposed project area.
- No spotted bats were observed during field surveys (though the surveys were only conducted during the day). There is some potential habitat in the project area.
- No Gunnison’s prairie dogs, or their sign were seen during field surveys.
- If cougars travel into the project area, they would be able to avoid construction activity.
- If mule deer travel into the project area, they would be able to avoid construction activity.

3.7.3 Federally listed Plants

One federally listed threatened plant species (Zuni fleabane) has the potential to occur in the project area but was not observed during field surveys. The Zuni fleabane is also listed as a state-endangered species and was discussed in Section 3.6.1 above.

3.7.4 Federally listed Animals

Four federally listed animal species were considered during the biological assessment and evaluation conducted for the current project. They include:

- Mexican spotted owl (threatened)
- Southwestern willow flycatcher (endangered)
- Yellow-billed cuckoo (endangered)
- Zuni bluehead sucker (endangered)

The project area does not contain suitable habitat for these species, and they were not observed during field studies.

3.7.5 Critical Habitat

No critical habitat is located within the project or action area (USFWS 2021a; NMDGF 2021a). The nearest critical habitat occurs in the Rio Nutria for the Zuni bluehead sucker and in the Zuni Mountains for the Mexican spotted owl, both located approximately 18 miles (28.97 km) southeast of Gallup (USFWS 2021a; NMDGF 2021a).

3.7.6 Migratory Birds

Various species of migratory birds, including the gray vireo discussed above in Section 3.6.2, were observed during field survey of the northern portion of the Navajo Mine area. The remaining areas were surveyed outside of the nesting season. However, suitable habitat for various migratory bird species is present throughout the project area.

3.8 Geology/Soils

Geology consists of Quaternary colluvium with valley-fill alluvium, basalt flows colluvium, and discontinuous aeolian deposits; Cretaceous, Jurassic, and Triassic sedimentary rocks of sandstone, shale, and mudstone; and some areas of Tertiary and Quaternary volcanic fields (USGS 2011b).

Soils observed in the field consisted of sandy and silty loams that ranged from light brown to almost white in color. Coal deposits from the historic mining activity are also present as well. These deposits were either dark and concentrated in large piles or were found to be dispersed and mixed with natural sediment types. Soil types defined by the Natural Resource Conservation Service (NRCS) include Buckle fine sandy loam, 1 to 8 percent slopes; Buckle-Gapmesa-Barboncito complex, 1 to 5 percent slopes; and Eagleye-Atchee-Rock outcrop complex, 2 to 35 percent slopes (NRCS 2021).

The Farmland Protection Act, 7USC, Section 4201, defines existing farmland. For this project area, no prime farmland is present (NRCS 2021).

3.9 Mineral/Paleontological Resources

Both the Navajo and Enterprise-Brown mine areas are located in the Crevasses Canyon. The primary mineral consideration for both locations would be the coal that was originally mined area, although the mines were eventually abandoned due to limited commercial viability. The coal-bearing unit for the Enterprise-Brown Mine is the Dilco member and the coal-bearing unit for the Navajo Mine is the Gibson member (Tetra Tech 2021a and 2021b). Additionally, as the geologic deposits are from the Cretaceous period, paleontological resources are at least possible, although none were noted in the project area.

3.10 Visual Resources

The visual character of the area is a natural context with sandstone canyon walls and open vistas. The community of Gamerco, New Mexico is visible in the distance to the west from the Navajo Mine area and the Gallup urban area is visible to the south from the Enterprise-Brown Mine location. Overall,

views from the project area are of natural landforms with residential/semi-urban developments in the distance.

3.11 Air Quality

McKinley County has attainment status to National Ambient Air Quality Standards (NAAQS) for all criteria pollutants: carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter, and sulfur dioxide.

3.12 Human Health and Safety

On-going coal fires at the abandoned mines present serious threats to human health and safety. The potential hazards associated with these mine fires include possible wildfire ignition and injury or death to people visiting the area. The method of injury would most likely be unstable ground or ground openings such as adits and vents causing a fall near or onto the burning face of the fire or through exposure to toxic gases. See Section 1.3 above for additional detail.

4. ENVIRONMENTAL IMPACTS

This section evaluates the impacts of the proposed alternatives to the affected environment described above.

4.1 Socioeconomic Conditions and Environmental Justice

As described in Section 3.2 above, the project and surrounding area contain minority, low-income, and disadvantaged populations. Neither Alternative 1 (Preferred) or Alternative 2 would have an adverse effect or otherwise disproportionately affect these populations. Similarly, the No Action alternative would also have no effect to any minority, low-income, or otherwise disadvantaged populations.

4.2 Cultural Resources

As described earlier in Section 3.3, archaeological sites LA 66500, LA 146726, LA 178670, and LA 199149 are eligible for listing to the NRHP. Both Alternative 1 (Preferred) and Alternative 2 would have the same impacts to the cultural resources. Both alternatives would avoid the features of the sites that contribute to their eligibility. One feature at LA 199149 is within an access road. Proper avoidance measures such as fencing the feature for avoidance would be required to avoid adverse effects to the feature. If these avoidance measures are taken, neither alternative would have an adverse effect to any of the sites.

The No Action Alternative would have no effect to any cultural resources eligible for listing to the NRHP; however, this alternative would not satisfy the project purpose and need.

4.3 Water Resources

As described in Section 3.4 above, the project area contains ephemeral waterways; however, neither Alternative 1 (Preferred) or Alternative 2 would involve placing fill within any of the drainages and so

neither alternative would be regulated under Section 404 of the CWA. However, Alternative 1 (Preferred) would involve a substantial amount of ground disturbance and stormwater runoff would be a consideration per Section 402 of the CWA. Alternative 2 would involve less ground disturbance than Alternative 1 (Preferred) and stormwater runoff would likely not be a consideration for Alternative 2.

The No Action Alternative would have no effect to any jurisdictional waterways or wetlands; however, this alternative would not satisfy the project purpose and need.

4.4 Vegetation

The project area has a sparse vegetative cover consistent with sedimentary geologic substrates. Alternative 1 (Preferred) would have a minor impact on vegetation due to ground disturbance associated with construction; disturbed areas would need to be reseeded with a native seed mix.

Alternative 2 would involve less ground disturbance as it would involve installing protective fencing rather than extinguishing the fire and closing vents and adits. As such it would have less of an impact on vegetation.

Both alternatives would avoid the spread of noxious weeds through best management practices such as cleaning construction equipment upon arrival at the construction site and before leaving the site.

The No Action Alternative would have no effect to vegetation, although it would not satisfy the project purpose and need.

4.5 Wildlife

As described in Section 3.6 above, wildlife habitat the general area is suitable for common species such as desert cottontail, jackrabbits, coyote, cougars, mule deer, and various migratory bird and bat species. Neither Alternative 1 (Preferred) nor Alternative 2 would substantially decrease wildlife habitat.

Increased noise and construction activity associated with both alternatives may discourage wildlife from occupying or traveling through the project area during construction. However, these impacts are minor and temporary, and there is sufficient habitat outside the construction zone to accommodate wildlife.

The No Action Alternative would have no effect to wildlife, although it would not satisfy the project purpose and need.

4.6 Special-Status Species

Both Alternative 1 (Preferred) and Alternative 2 would have similar impacts on special-status species, including:

- Federally and state-listed plants: No federally or state-listed plant species would be affected by either alternative.
- State-listed animals: SERI-designated species such as the cougar and mule deer would experience only minor and temporary impacts similar to those described above for wildlife. The spotted bat (state threatened and SGCN) would not be affected because suitable habitat is only located in the rocky outcrops outside of the proposed construction zone. Effects to state-listed

birds such as the gray vireo (threatened), loggerhead shrike (SGCN), and juniper titmouse (SGCN) would be similar to those for migratory birds described below.

- Federally listed animals and critical habitat: neither alternative would affect federally listed animal species or critical habitat.
- Migratory birds: migratory birds, including the state-threatened gray vireo, were observed within the project area. If construction activity would require tree removal during the nesting season (March 15 through September 15), then potential impacts to migratory birds could occur.

The No Action Alternative would have no effect to special-status species, although it would not satisfy the project purpose and need.

4.7 Geology/Soils

For both alternatives, existing access routes would be utilized to the greatest extent possible and overland travel would be utilized only when absolutely necessary. Limited overland access by construction equipment would cause localized and minor impacts, such as soil compaction and increased potential for surface runoff and soil erosion. Alternative 1 (Preferred) would have additional geological and soil disturbance associated with excavating and extinguishing the coal fires and closing the adits and vents. Disturbances would be fairly minor for installation of protective fencing (Alternative 2).

The No Action Alternative would have no effect to geology and soils, although it would not satisfy the project purpose and need.

4.8 Mineral/Paleontological Resources

Paleontological resources have not been documented in the project area; however, it is possible undocumented fossils may be present. Although the footprint of the proposed fire-mitigation efforts is minimal, Alternative 1 (Preferred) would have a larger area of disturbance than Alternative 2 (protective fencing and warning signs only). Neither alternative would have impacts to mineral resources as there has been no active mineral exploration or extraction since the coal mines were closed and neither alternative would impact minerals.

The No Action Alternative would have no effect to minerals and paleontological resources, although it would not satisfy the project purpose and need.

4.9 Visual Resources

While in general, the project area does not contain unique visual attributes, a substantial change in the viewshed of the area should still be avoided. Neither alternative would create a substantial change in the viewshed as there would be no new visual elements beyond potential fencing and any excavation and/or grading to extinguish the fires and close adits would result in recontouring the landscape to its previous condition.

Under the No Action Alternative, the visual character of the project area would not change. However, the No Action Alternative would not address the project purpose and need.

4.10 Air Quality

Both Alternative 1 (Preferred) and Alternative 2 would have similar impacts to the air quality of the project area. Both alternatives would involve a temporary increase in vehicle access and use of construction equipment within the project area. Gasoline and diesel-powered vehicles and construction equipment would generate emissions and fumes, but these levels are anticipated to be low and in compliance with local and federal emission standards. Access to the area is primarily via dirt roads and fugitive dust may be generated by vehicle travel and during construction. However, construction would occur at a pace to allow resettling of particulate matter within the immediate vicinity of the project. Localized impacts to air quality are expected during construction, although these impacts would be temporary in nature and limited in scope.

The No Action Alternative would have no effect to air quality; however, the purpose and need of the project would remain unaddressed.

4.11 Human Health and Safety

Alternative 1 (Preferred) would best address human health and safety by mitigating known fire hazards. Alternative 2 would also improve human health and safety. However, without extinguishing the coal fire and closing vents and adits, the possibility exists for future human health and safety hazards.

The No Action Alternative would not address human health and safety related to existing and future potential subsidence hazards.

4.12 Summary of Environmental Impacts

As described above, the No Action Alternative would have the fewest environmental impacts of all the alternatives evaluated in this EA. However, the No Action Alternative fails to address the project purpose and need and is considered in the EA largely as a baseline from which to compare environmental impacts of the other alternatives.

Of the remaining options, Alternative 1 (Preferred) has slightly more environmental impacts than Alternative 2, particularly in the areas of vegetation, geology and soils, and mineral and paleontological resources. However, these impacts are not substantial and can be minimized through the mitigation actions described below in Section 6.

5. CUMULATIVE IMPACTS

Cumulative impacts are defined as the incremental effects of an action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7).

Past activities in the APE include coal mining, the expansion of the Gallup urban area over previous decades, ranching/livestock grazing in the general vicinity, and recreational uses such as hiking and ATV use. Also, the *City of Gallup Growth Management Master Plan Update* (2016) and the *McKinley County*

Comprehensive Plan Update (2012) both identify growth along the US 491 corridor approximately 1 mile (1.6 km) west of the project area.

Mitigating the fire hazards and closing existing vents and adits at the Navajo Mine and Enterprise-Brown Mine locations would not constitute a cumulative impact to the environment.

6. MITIGATION/AVOIDANCE

This section recommends measures to mitigate or avoid potential adverse impacts of Alternative 1 (Preferred) as described in Section 2.1. No mitigation measures are required for general wildlife, geology and soils, minerals and paleontological resources, visual resources, or human health and safety. The mitigation measures for additional resource considerations are presented below.

6.1 Cultural Resources

The elements of sites LA 178670 (historic mining complex) and LA 146726 (prehistoric artifact and feature scatter) that contribute to their NRHP eligibility are not within the work zone. There would be no adverse effect to these resources and no mitigation is required.

Site LA 66500 is the remains of the Navajo Mine and the Gibson town site. In the northern portion of the of the project area, the site contains intact mine openings. These features may require mechanical excavation and subsequent backfilling in order to quench the mine fire. If excavation and backfilling are required at intact mine openings in LA 66500, then a 2-3 ft depression would be left to demarcate the location of the historic mine opening. If these measures are taken, then no adverse effect would occur to LA 66500.

LA 199149 is a prehistoric artifact and feature scatter. One feature is located within an access road and would require appropriate avoidance measures. All other contributing elements of the site are outside of the construction zone and would not require mitigation or avoidance. If proper avoidance is undertaken, then there would be no adverse effect to LA 199149.

6.2 Water Resources

As the proposed action would involve disturbance over 1 acre in size, a NPDES permit under Section 402 of the CWA would be required. Implementing the erosion-control measures identified in the NPDES permit would avoid erosion and pollution from rain events that may occur during construction.

6.3 Vegetation

Following construction, site reclamation efforts would involve native seeding and mulching to reestablish the native vegetative community. All seed, mulch, matting, straw, and/or hay used would be certified weed-free of invasive and/or noxious weeds. Additionally, vehicles and construction equipment would be inspected and cleaned before and after use to limit potential for spread of noxious weeds.

6.4 Special-Status Species

If construction cannot be completed outside of the bird breeding season, defined as March 15 to September 15, a pre-construction nest survey would be conducted prior to construction activity in compliance with the MBTA. If active nests are located during the pre-construction survey, consultation with the USFWS would occur; to avoid disturbance, construction activities at the nest sites would be delayed until fledging occurs, or a nest removal permit is obtained from the USFWS.

6.5 Air Quality

To limit the amount of fugitive dust generated by increased vehicle access and construction activities within the project area, dust-control measures would be implemented. Dust-control measures may include but would not be limited to speed restrictions for vehicle access, binding particles by wetting access roads and exposed soils during construction, and stipulations to avoid access and construction during high-wind days.

7. AGENCY CONSULTATION

As indicated in the Section 4 above, there would be no effects to designated critical habitat or species that are protected under the ESA and, as such, no consultation with the USFWS was undertaken. Similarly, no water resources regulated by the USACE are located in the project areas and USACE consultation is not required. Consultation with SHPO under Section 106 of the NHPA and tribal consultation are summarized below, and copies of relevant consultation letters are attached (Appendix D).

7.1 State Historic Preservation Officer

The AML completed consultation with the SHPO per Section 106 of the NHPA. The AML and OSMRE determined that the proposed project would not adversely affect cultural resources and the SHPO concurred on August 28, 2021. See the attached consultation letter in Appendix C for additional details.

7.2 Tribal Consultation

Consistent with the 2021 county-by-county Native American consultation list from the New Mexico Historic Preservation Division, the following Native American tribes were consulted to determine if they had any traditional use or other concerns with the proposed project: Acoma Pueblo, Hopi Tribe, Isleta Pueblo, Laguna Pueblo, Navajo Nation, Tesuque Pueblo, and Zuni Pueblo. Copies of consultation letters are attached. To date, no concerns have been expressed.

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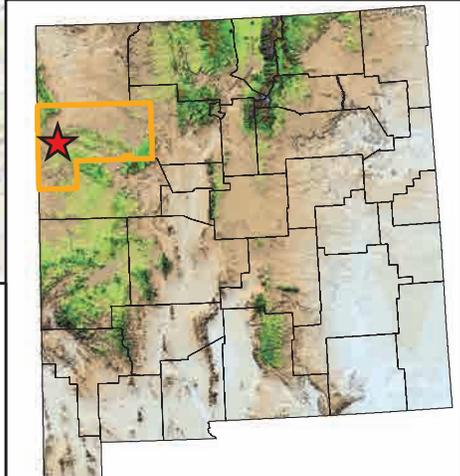
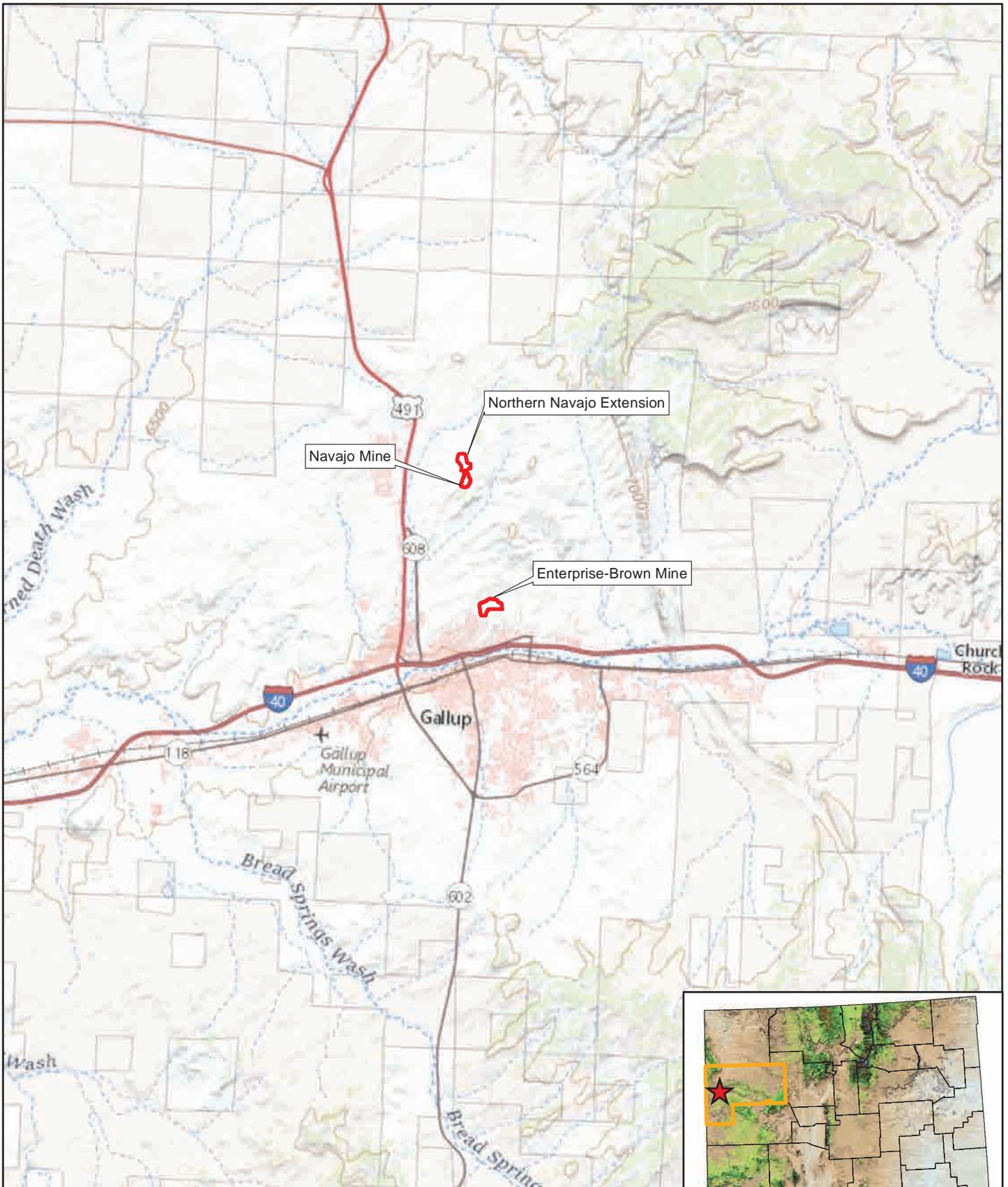
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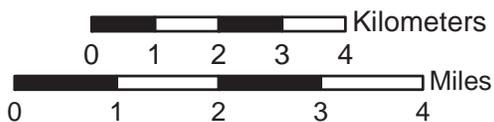
Appendix A

Project Area Maps

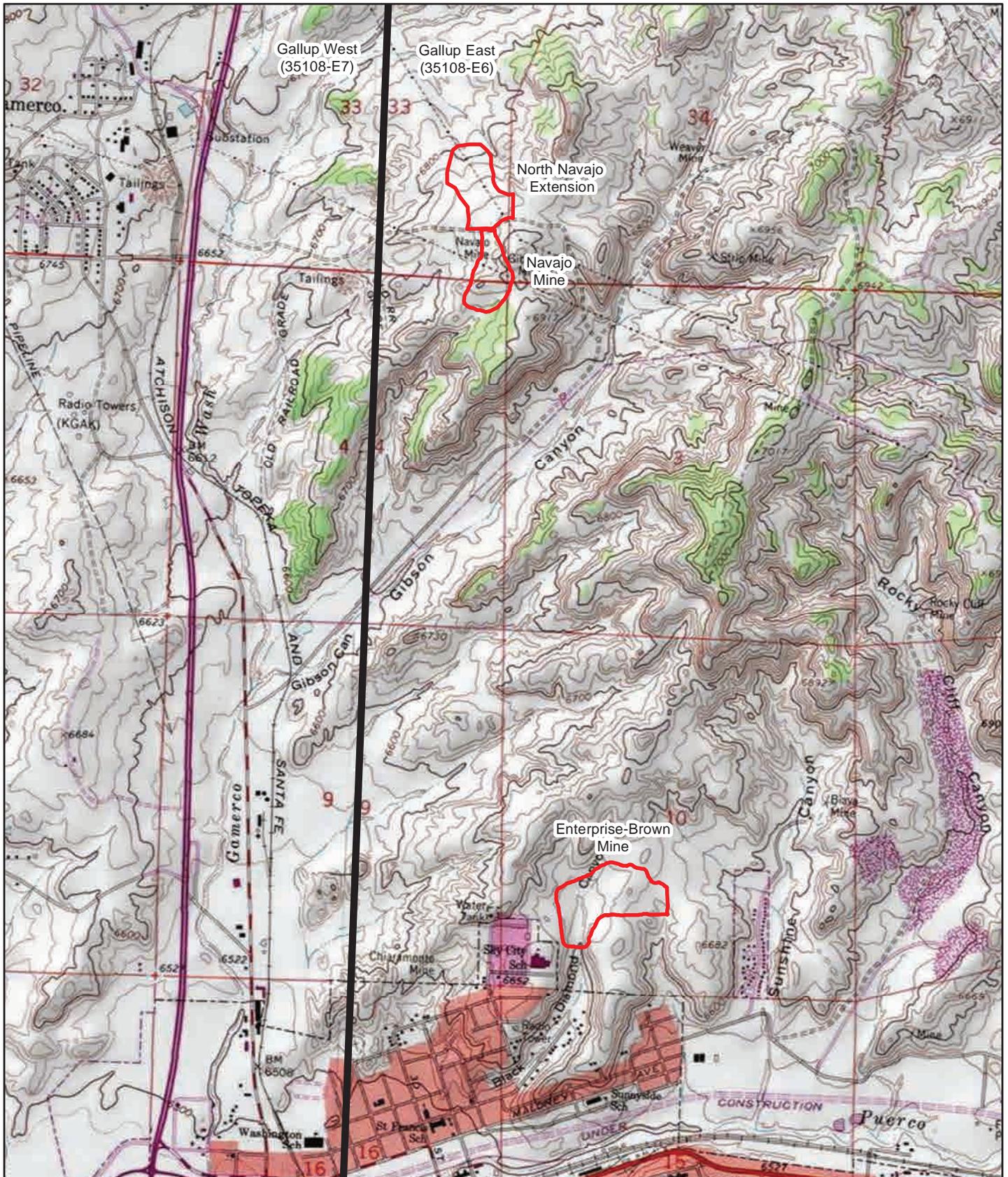


Parametrix

- Project Area
- McKinley County



Project Vicinity



-  Project Area
-  NM 24k Quad Grid

Parametrix

0 0.2 0.4 0.6 0.8 1 Kilometers

0 0.2 0.4 0.6 0.8 1 Miles



USGS 7.5 minute (1:24,000) quadrangle map depicting the project area



North Navajo Extension

Navajo Mine

Enterprise-Brown Mine

Gallup

491

40

Parametrix

 Project Area

 Kilometers

 Miles



Aerial map depicting the project area

Appendix B

Public Information Summary



Public Information Mailer

Gallup Area Mine Safeguarding and Mitigation
Projects, Gallup, NM



Public Outreach Summary

June 2021

In June 2021, the Abandoned Mine Lands (AML) program distributed a two-page flyer throughout the Gallup area using the US Postal Service's Every Door Direct delivery method. The flyer described the mission of AML; the purpose of the mitigation efforts; the proposed efforts at the Navajo Mine, Enterprise-Brown Mine, and three other mine locations around Gallup; and asked the public for comment (see Attachment 1). The flyer was sent to over 3,200 mailboxes along postal routes that surround the project areas. Recipients were encouraged to send written comments or questions to AML via email, telephone, or the US Postal Service. Based on the limited scope of the projects and the non-controversial nature of the proposed projects, the public information flyer was distributed in lieu of an in-person or virtual public meeting. Only one comment was received, via telephone, during the comment period from a person interested in discussing materials used to cap mine openings.



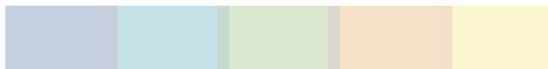
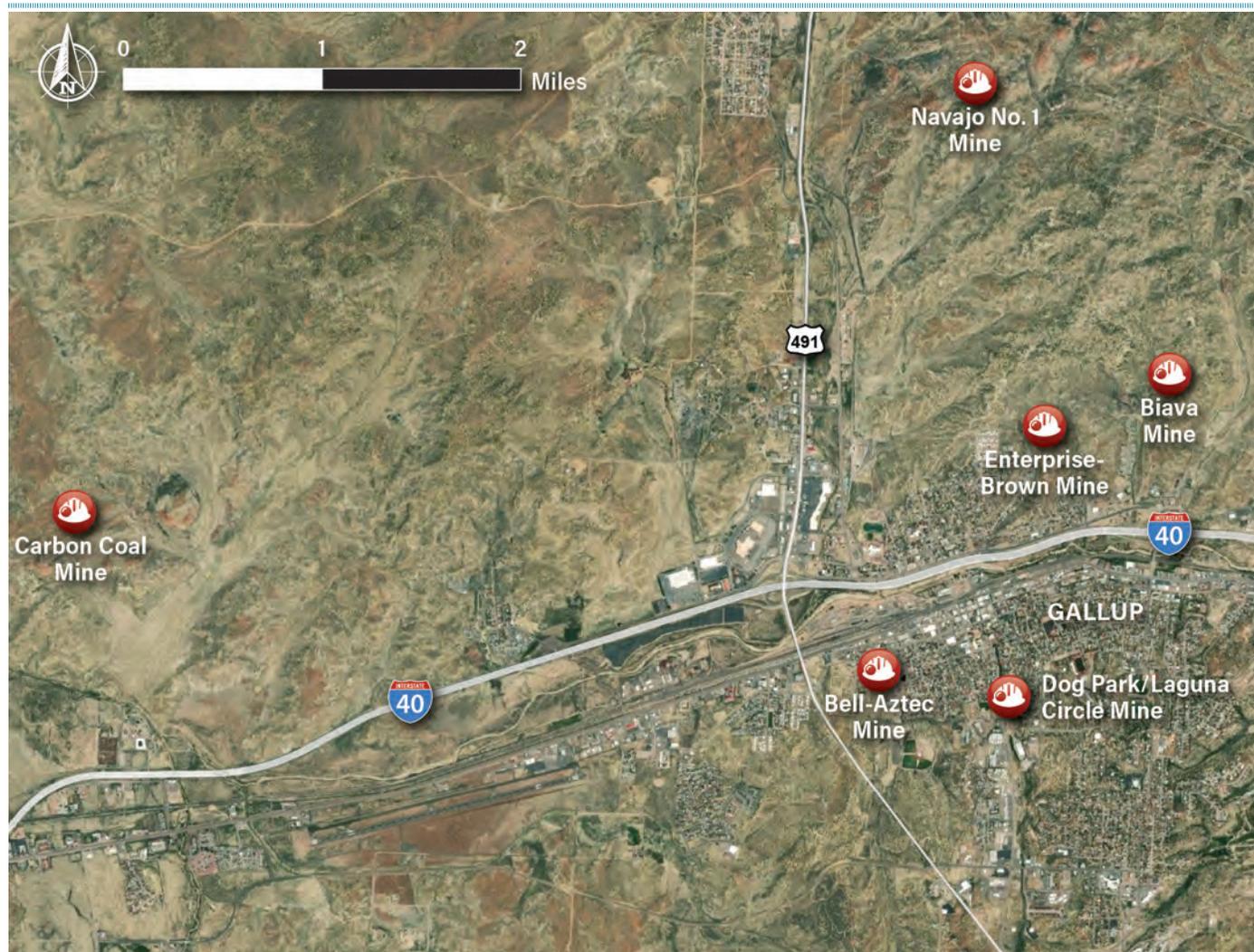
Gallup Area Mine Safeguarding and Mitigation Projects

The Abandoned Mine Land (AML) Program is proposing various mine safeguarding and mitigation efforts for six separate locations in and around Gallup, New Mexico. The Gallup area has a long history of coal mining dating back to the late 19th century and this mining legacy has occasionally left hazards such as on-going underground coal fires and unprotected vent and adit openings. The mission of the AML is to address public health and safety risks posed by abandoned mines throughout New Mexico, including the Gallup area.

We Would Like to Hear from You!

Please review the following information, ask questions, and provide comments to **Jeff Fredine, Parametrix, 9600 San Mateo Blvd. NE, Albuquerque, NM 87113; jfredine@parametrix.com; 505.821.4700** by **Wednesday, July 21, 2021**.

Location of Mines



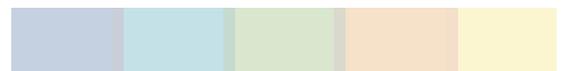


Gallup Area Mine Safeguarding and Mitigation Efforts

- **The Gallup Dog Park/Laguna Circle Site** is a 2.8-acre area located at the City of Gallup Dog Park between South 2nd Street and Laguna Circle. Between 1984 and 1985, AML stabilized the landform and backfilled one of the two adits at this location. AML seeks to safeguard the other mine adit and make minor drainage improvements. This involves excavating to investigate the northern adit, backfilling (if appropriate) with on-site materials, re-grading the site to facilitate appropriate drainage, and constructing erosion-control features to tie into the existing stormwater channel.
- **The Bell-Aztec Mine**, located south of West Aztec Ave. and east of 11th St., is a 1.1-acre area and the location of an underground fire burning along the coal seam and venting to the surface. AML seeks to safeguard the fire-venting location through installation of 200+/- feet of barbed-wire fence around the perimeter of the fire-vent location. Warning signs to inform people of the danger would also be installed.
- **The Biava No. 3 Coal Mine** is a 14.75-acre area located northeast of Gomez Dr., a residential street on the northeast end of Gallup. AML seeks to safeguard the fire-venting location through installation of 600+/- feet of barbed-wire fence around the perimeter of the fire-vent location. Warning signs to inform people of the danger would also be installed.
- **The Carbon Coal Mine**, a strip mine that operated from 1978 to 1984, is a 13.18-acre area north of the community of Mentmore. The mine is the location of a coal fire burning along the coal seam and venting at the surface. AML seeks to safeguard the fire-venting location through installation of 100+/- feet of barbed-wire fence around the perimeter of the fire-vent location. Warning signs to inform people of the danger would also be installed.
- **The Enterprise-Brown Mine** is a 22.46-acre area located at the north end of East Adams Ave. on the northeast side of Gallup. AML proposes to delineate the extent of the fire through exploratory drilling and geophysical investigation, followed by excavation and extinguishment of the fires. Fires would be extinguished by placing a layer of soil over the fire to limit airflow. Specific adits and vents that are currently open also will be closed as an additional safeguard measure.
- **The Navajo Mine** is a 29.28-acre area located north of the Gallup Flea Market and east of US 491. AML proposes to delineate the extent of the fire through exploratory drilling and geophysical investigation, followed by excavation and extinguishment of the fires. Fires would be extinguished by placing a layer of soil over the fire to limit airflow. Specific adits and vents that are currently open also will be closed as an additional safeguard measure.

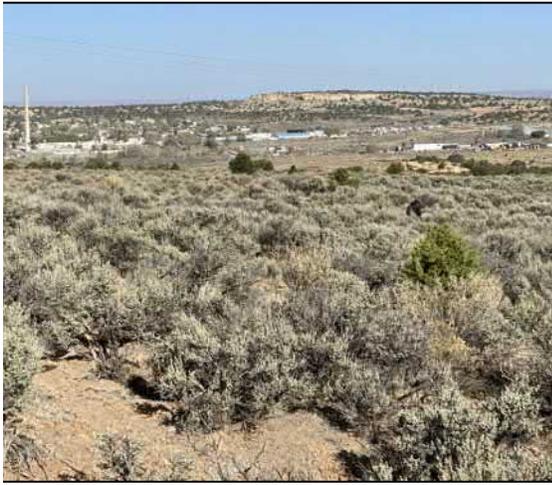
Schedule

Safeguard fencing will be completed for the Gallup Dog Park/Laguna Circle, Bell-Aztec, Biava No. 3, and Carbon Coal locations by late fall of 2021. Exploratory drilling and geophysical investigation may be initiated at the Enterprise-Brown and Navajo mines in the winter/spring of 2022, with additional mitigation measures planned for 2022-2023.



Appendix C

Biological Evaluation and Biological Assessment



Biological Assessment and Biological Evaluation for the Navajo and Enterprise-Brown Mines, McKinley County, New Mexico



Prepared for
Abandoned Mine Land Program—
Mining and Minerals Division—
Energy, Minerals, and Natural
Resources Department

June 2021



Prepared by
Steve Albert
with contributions from
Jeff Fredine and Jessica Alden

Parametrix

Biological Assessment and Biological Evaluation for the Navajo and Enterprise-Brown Mines, McKinley County, New Mexico

Prepared for

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Parametrix, 2021. Biological Assessment and Biological Evaluation for the Navajo and Enterprise-Brown Mines, McKinley County, New Mexico. Prepared by Parametrix, Albuquerque, New Mexico. June 2021.

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- A Pre-Field Species Lists and Other Consulted Resources
- B Observed Species List
- C NRCS Soil Report
- D FEMA Floodplain Maps

1. INTRODUCTION AND OVERVIEW OF PROPOSED PROJECT

1.1 Scope of the Biological Assessment/Biological Evaluation

The New Mexico Abandoned Mine Land Program (AML) contracted with Parametrix, Inc. (Parametrix) to prepare this Biological Assessment and Biological Evaluation (BABE) to address future, non-emergency mine remediation activities that will be conducted at the Navajo and Enterprise-Brown Mine sites in and around Gallup, McKinley County, New Mexico. Major construction activities considered to be federal actions that could significantly affect the quality of the human environment, as described in the National Environmental Policy Act (NEPA) of 1969 (42 US Code 4332(2)(C)), must be evaluated with a Biological Assessment (BA), a written analysis of the potential effects of a given action on the local biological resources, usually for listed species. This document therefore complies with Section 7(a)(2) of the Endangered Species Act (ESA), which requires that these actions be evaluated to determine whether they are likely to jeopardize the continued existence of federally-listed species including Threatened, Endangered, or Proposed federal species, or result in the destruction or adverse modification of any critical habitat (Title 50 Code of Federal Regulations (CFR) 402.01). This report also provides information on the area of potential effect (APE) and action area and evaluates potential effects of the proposed action on listed species and their habitats (50 CFR 402.02). As a combined BA and Biological Evaluation (BE), this document also presents the findings of a pedestrian biological survey of the APE and takes into consideration the action area; describes natural resources and species observed in the APE; provides analyses of impacts resulting from the proposed project; and recommends measures to avoid, minimize, and/or mitigate impacts to natural resources and species consistent with federal, state, and local laws.

1.2 Project Location

The original 12.5-acre Navajo Coal Fire and the 28.3 acre Enterprise-Brown Coal Fire sites are located near the city of Gallup, New Mexico (Figure 1 and Figure 2), approximately 1.25 miles apart. The Navajo Coal Fire site is near a commercial area of northwest Gallup; the Enterprise-Brown Coal Fire site is approximately 1,000 feet north of a residential subdivision on the east side of the city. In May 2021, an additional 16.9 acres immediately north of and adjacent to the Navajo Coal Fire site was added to the scope of work and that site is evaluated in this report as well. For ease of analysis and discussion, both the original Navajo site location and the additional 16.9-acre area are discussed as one site although the areas were visited at different times of year. Total area of all three APE's is 57.7 acres.

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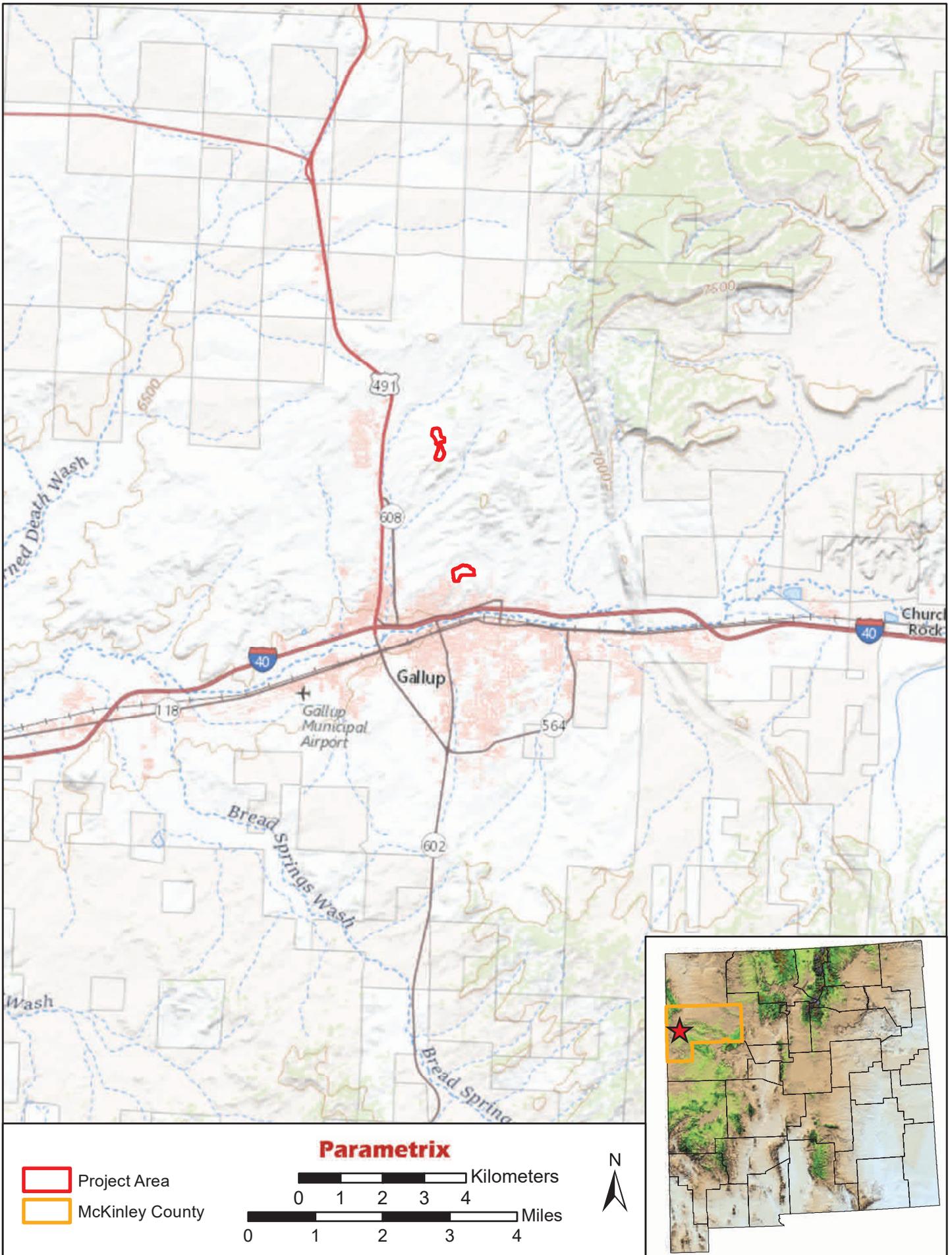
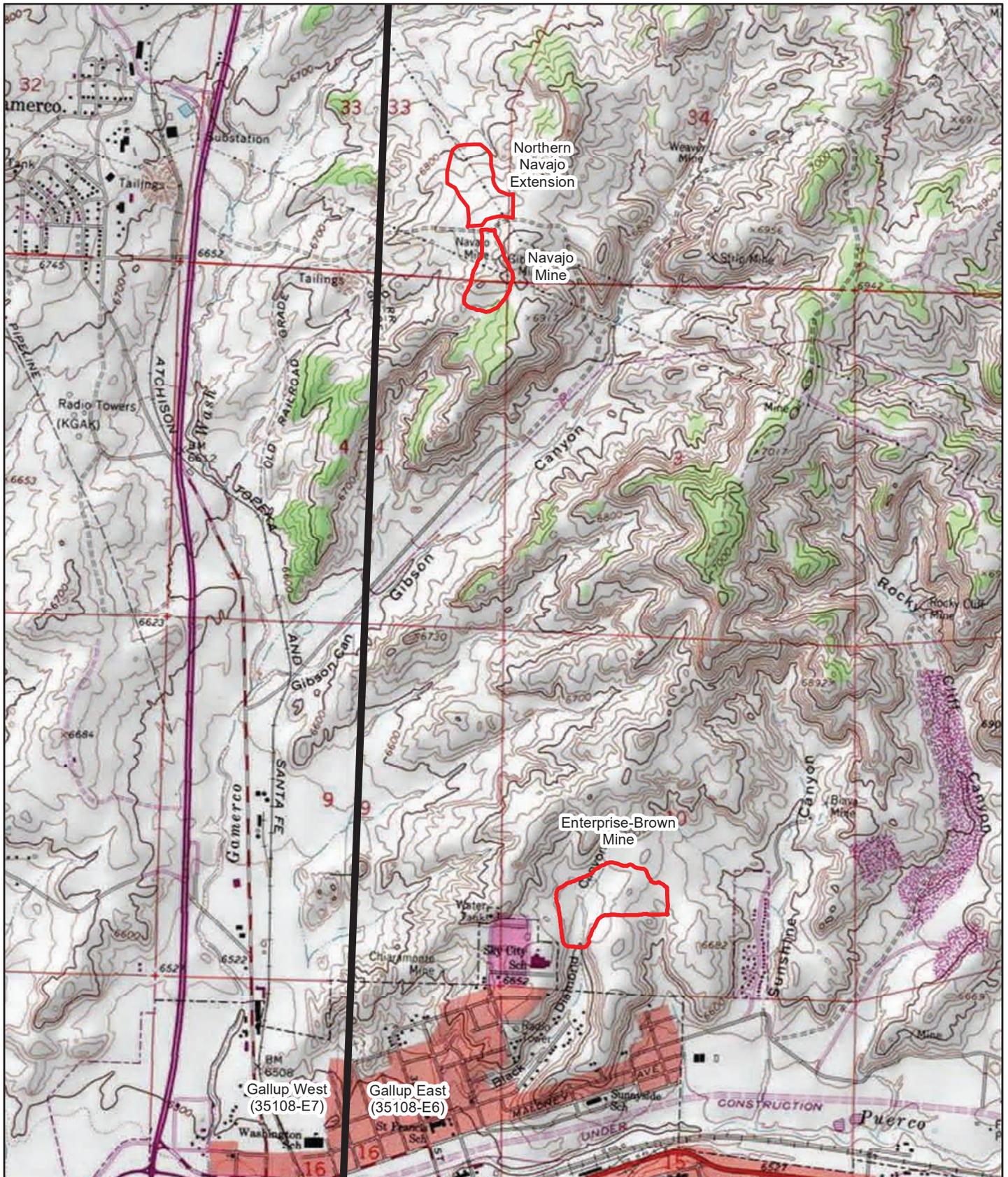


Figure 1: Project Vicinity

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- Project Area
- NM 24k Quad Grid

Parametrix

0 0.2 0.4 0.6 0.8 1 Kilometers

0 0.2 0.4 0.6 0.8 1 Miles



Figure 2: USGS 7.5 minute (1:24,000) quadrangle map depicting the APE

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2. PROPOSED ACTION

This BABE addresses a future phase of non-emergency mine remediation work planned for these abandoned coal mines. This proposed action is described further below, following the summary of previous (Phase I–III) emergency abatement actions at the sites.

2.1 Proposed Action

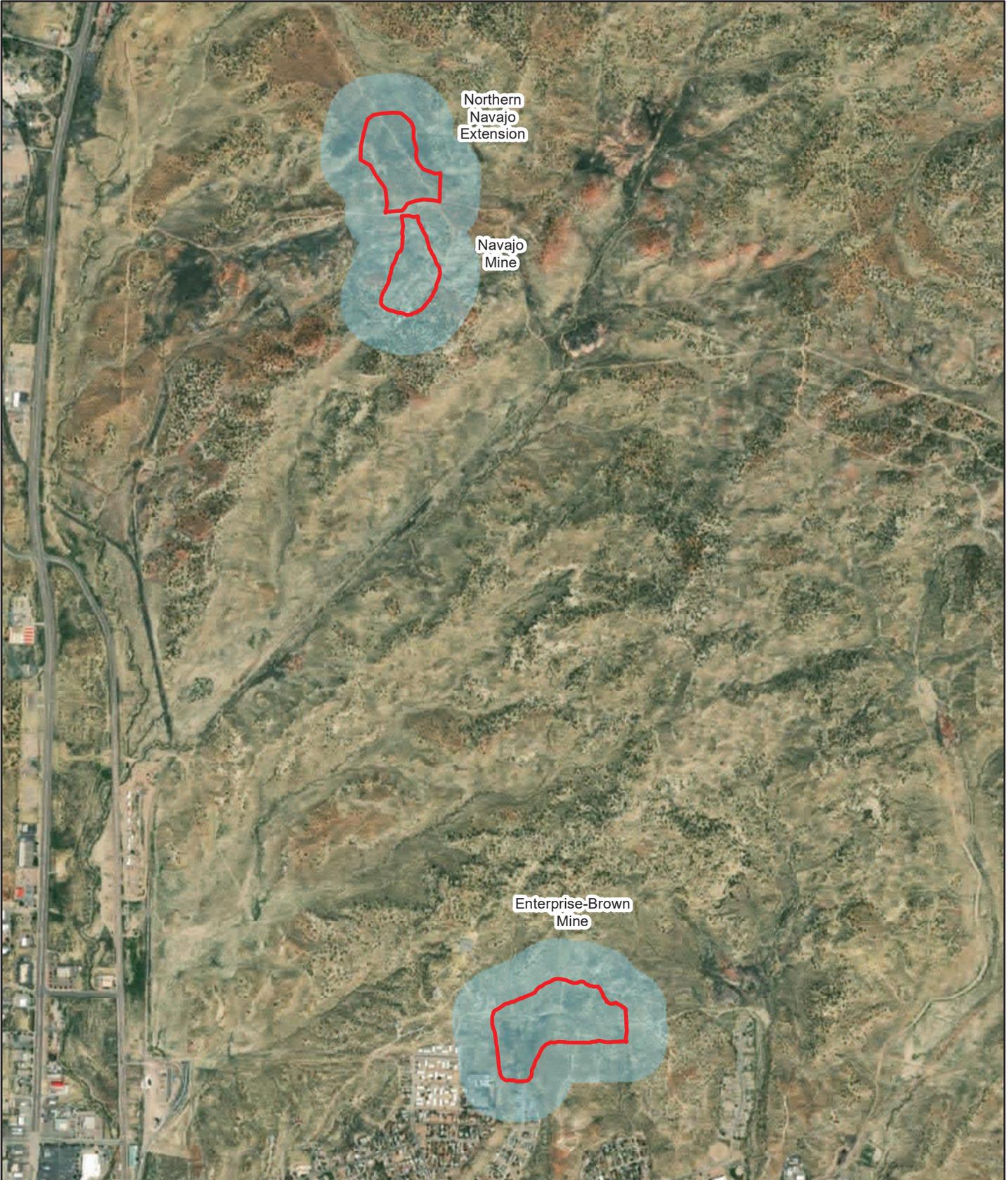
The New Mexico Energy, Minerals, and Natural Resources Department (EMNRD) - Mining and Minerals Division -Abandoned Mine Lands Program (henceforth referred to as AML) proposes the to mitigate fire hazards at two separate on-going coal fires in the Gallup area. The three locations are identified as the Enterprise-Brown Coal Mine, the Navajo Coal Mine, and North Navajo Extension. At these locations, AML proposes to delineate the extent of each fire through exploratory drilling and geophysical investigation followed by excavation and extinguishment of the fires. Fires would be extinguished by placing a layer of soil over the fire to limit airflow. In addition, specific adits and vents that are currently open would be closed as a safeguard measure for members of the public who may access the area. The project is located in three discrete locations around the City of Gallup:

- The Enterprise-Brown Mine location is a 22.46-acre survey area located northwest of Gomez Dr., a residential street on the northeast end of Gallup.
- The Navajo Coal Mine survey area is north of the Gallup Flea Market and east of US 491. This survey areas is 12. 46 acres in total.
- The North Navajo Extension is a 16.82-acre area located directly north of the Navajo Coal Mine survey area.

3. ACTION AREA

Parametrix evaluated possible impacts from the proposed project for all special-status species that could potentially utilize the Phase IV project action area. The U.S. Fish and Wildlife Service (USFWS) defines an action area as areas that could be directly or indirectly affected by a federal action (50 CFR 402.02). The action area for this project includes the 57.7-acre APE's defined by the AML and a 500-foot buffer surrounding the APE (Figure 3). This buffer area includes areas outside of the APE where temporary noise disturbance from construction activities and/or ground disturbance may impact listed species and areas that will be affected directly or indirectly by the undertaking such as areas that might experience downstream effects that may result from the proposed project, impacts associated with stormwater run-off linked to the project, and effect associated with habitat availability to support potentially displaced wildlife.

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Northern
Navajo
Extension

Navajo
Mine

Enterprise-Brown
Mine

 Project Area
 Action Area

Parametrix

 Kilometers
0 0.2 0.4 0.6 0.8 1

 Miles
0 0.2 0.4 0.6 0.8 1



Figure 3: APE with 500-ft Action Area

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4. ENVIRONMENT AND EXISTING CONDITIONS

This section of the report describes the existing environmental conditions of the APE, as determined through pre-field review of available records pertaining to the climate, physiography and geology, soils, vegetation, water resources, and wildlife of the area, including special status species.

4.1 Methods

4.1.1 Pre-field Methods

Prior to the field survey, federally-listed plant and animal species for this APE were reviewed through the USFWS's Information for Planning and Consultation (IPaC) resources list (USFWS 2021a), and state-listed plants were reviewed on the New Mexico Energy, Minerals and Natural Resources Department (NMEMNRD) website (NMEMNRD 2021) and the New Mexico Rare Plant Technical Council (NMRPTC) website (NMRPTC 1999a). The NMRPTC and NMEMNRD websites were also consulted for a list of rare plants in McKinley County. State-listed animals identified in McKinley County were compiled from the NMDGF's Biota Information System (BISON-M) (NMDGF 2021a) and the new Environmental Review Tool, the Conservation Information System (CIS) from NMDGF. See Section 4.1.10 for more about the CIS. Pre-field data reviewed also included the National Hydrology Dataset (NHD) (USGS 2020) and the National Wetland Inventory (NWI) (USFWS 2021b). Consulted species lists and other resources can be found in Appendix A.

4.1.2 Field Methods

A 100-percent, pedestrian survey was conducted to evaluate potential impacts to threatened or endangered species, migratory birds, rare plants or other vegetation, waterways and wetlands, and other natural resources within the APE defined by AML for the project. This field effort involved walking the area until 100-percent of the ground area had been examined. Field work was conducted in November 2020 and May 2021 (see detailed discussion of field work dates and activities further below in Section 6: *Results of the Field Survey*).

Survey field work was conducted by Steven Albert, Parametrix Senior Biologist. Mr. Albert has 30 years of professional experience conducting natural resources compliance investigations in the Southwest, including inventory surveys of wildlife, vegetation, and water resources. He has a Master of Science (MS, 1991) degree in Wildlife and Fisheries Sciences. Mr. Albert is certified to conduct wetland delineations/determinations. He examined all areas of the APE, documenting all species detected (Appendix B), and noting habitat associations. He also documented mammals, birds, and reptiles (if present) and their tracks and scat. Photographs were taken of representative habitats within and along the boundaries of the APE where wildlife species or their sign were detected. The time of year when some of the survey was conducted (November) limited the biological species encountered. No plants were in flower, migratory birds were absent, and reptiles and their sign were not visible.

A hand-held Global Positioning System (GPS) and an Apple iPad with Arc Collector software was used in the field to record locations of any pertinent field data. These data were collected using the North American Datum (NAD) 83 Universal Transverse Mercator coordinates. Results of the field work are presented below, following the summary of the APE's existing conditions.

4.1.3 Elevation and Climate

The APE includes a variety of landforms. General APE elevation range from 6,700 to 7,000 feet above mean sea level (amsl). Historical climate data from the Western Regional Climate Center (WRCC) show that the mean annual maximum temperature was 66.0 degrees Fahrenheit (F), and the mean annual minimum temperature was 33.6 degrees F, with the hottest months occurring in June, July, and August, and the coolest months occurring in December, January, and February. Average precipitation was 11.1 inches, with most rainfall occurring in July and August, and average snowfall was 30.6 inches (WRCC 2021).

4.1.4 Physiography and Geology

The APE is in the Navajo Section of the Colorado Plateau physiographic province. The Colorado Plateau physiographic province spreads across northwestern New Mexico as well as parts of Utah, Colorado, and Arizona. Elevations range from 6,670 to 6,940 feet above mean sea level within the APE. Pre-field review of ecoregions in the APE determined that the area falls within the Semiarid Tablelands sub-region of the Arizona/New Mexico Plateau (USGS 2011a, b). This area consists of mesas, plateaus, cliffs, and valleys with some ephemeral and intermittent streams. The elevation range for the Semiarid tablelands is 5,200 ft to 8,748 ft. Geology consists of Quaternary colluvium with valley-fill alluvium, basalt flows colluvium, and discontinuous aeolian deposits; Cretaceous, Jurassic, and Triassic sedimentary rocks of sandstone, shale, and mudstone; and some areas of Tertiary and Quaternary volcanic fields (USGS 2011b). The two APE sites are approximately 1.25 miles apart separated by Gibson Canyon and surrounded by high hills that extend above the valley floor. These landforms feature multiple stepped terraces of varying geological stratigraphy, including thick layers of sandstone cap rock.

4.1.5 Soils

Prior to the field survey, a soil survey report was compiled for the APE, utilizing the Natural Resources Conservation Service's (NRCS's) Web Soil Survey data (NRCS 2021). This soil survey report shows there are three soil types within this APE. These include Buckle fine sandy loam, 1 to 8 percent slope, Buckle-Gapmesa-Barboncito complex, 1 to 5 percent slopes, and Eagleye-Atchee-Rock outcrop complex, 2 to 35 percent slopes (Table 1, and Appendix C).

Table 1. Soils Present in the Navajo and Enterprise Mine sites

Soil Type	Acreage in APE	Typical Landform	Drainage Class	Depth to Restrictive Layer	Soil Profile
Buckle fine sandy loam, 1 to 8 percent slope	12.2	Drainages, fan remnants	Well drained	More than 80 inches	Fine sandy loam, sandy clay loam, loam, and clay loam
Buckle-Gapmesa-Barboncito complex, 1 to 5 percent slopes	16.2	Hills, cuesta dip slopes	Well drained	More than 80 inches	Loamy fine sand, clay loam, sandy clay loam, clay loam, loam, sine sandy loam, bedrock
Eagleye-Atchee-Rock outcrop complex, 2 to 35 percent slopes	30.3	Ridges, hills	Well drained	More than 80 inches	Gravelly clay loam, clay, bedrock, fine sandy loam, extremely channery sandy clay loam

Source: NRCS 2021

4.1.6 Waterways, Wetlands, and Floodplains

4.1.6.1 Waterways

A single ephemeral drainage was located at the Enterprise-Brown mine location (see Appendix A for NHD map). It is a large drainage in Black Diamond Canyon. Based on changes to the Navigable Waters Protection Rule in 2020, ephemeral drainages are no longer considered waters of the United States (WOUS) regulated by the Clean Water Act (CWA). However, as a stewardship practice, AML should adhere to the stipulations of the appropriate Nationwide Permit and the New Mexico Environment Department (NMED) 401 certification for ephemeral drainages.

4.1.6.2 Wetlands

Pre-field review of the NWI data (USFWS 2021b) determined that no wetlands were previously mapped within the APE.

4.1.6.3 Floodplains

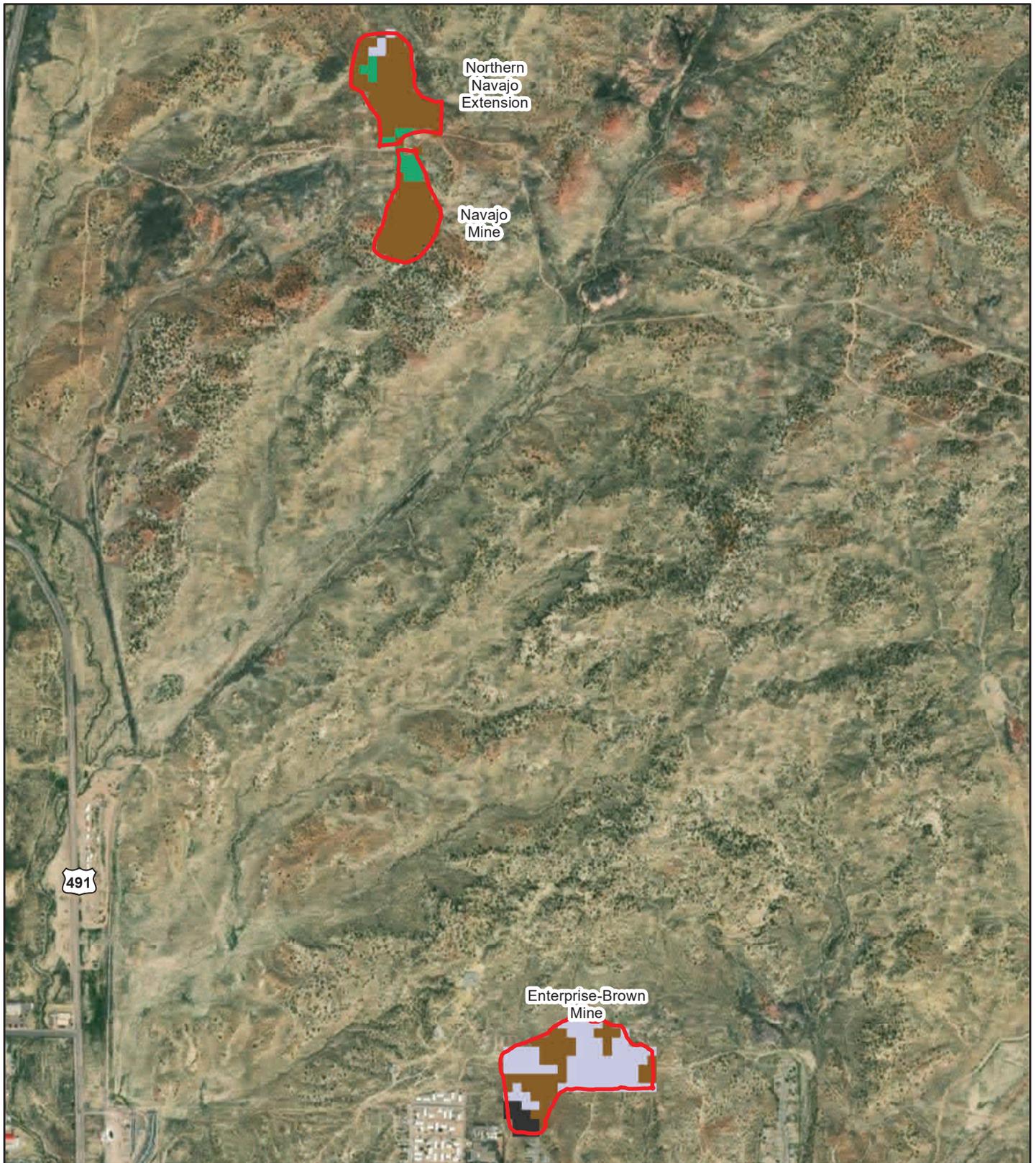
Pre-field review indicated that the APE lies within Zone X, an area of minimal flood hazard (Federal Emergency Management Agency (FEMA) 2021). Zone X for this area refers to a zone determined to be outside the 500-year flood and is typically protected by a levee from 100-year floods (FEMA 2021; Appendix D).

4.1.7 Vegetation

Prior to the field survey, the SWReGAP database (Lowry et al. 2005) was reviewed to determine the landcovers within the APE. Four ecological systems were identified in this APE (Figure 4). These included:

- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Big Sagebrush Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Developed, Low Intensity

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 Project Area

SWReGAP Description

-  Colorado Plateau Pinyon-Juniper Woodland
-  Developed, Open Space - Low Intensity
-  Inter-Mountain Basins Big Sagebrush Shrubland
-  Inter-Mountain Basins Greasewood Flat

Parametrix

 Meters
0 200 400 600

 Feet
0 1,000 2,000 3,000



Figure 4: Vegetation communities present in the APE according to the SWReGAP database

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4.1.8 Special Status Plant Species

4.1.8.1 Federally listed Plant Species

Based on the pre-field review, Zuni fleabane (*Erigeron rhizomatus*) is the only federally listed plant species for the APE (USFWS 2021a). This species is also state listed and a New Mexico rare plant.

4.1.8.2 State listed and New Mexico Rare Plants

Three state-listed species (NMEMNRD 2021) and 17 New Mexico rare plants (NMRPTC 1999a) are present in McKinley County. Each of the state-listed species is also listed as a New Mexico rare plant.

State-listed species for McKinley County:

- Gooding's onion (*Allium gooddingii*) (state-listed and New Mexico rare plant)
- Parish's alkali grass (*Puccinellia parishii*) (state-listed and New Mexico rare plant)
- Zuni fleabane (federal-listed, state-listed, and New Mexico rare plant)

New Mexico Rare Plants in McKinley County:

- Zuni fleabane (federal-listed, state-listed, and New Mexico rare plant)
- Gooding's onion (state-listed and New Mexico rare plant)
- Parish's alkali grass (state-listed and New Mexico rare plant)
- Acoma fleabane (*Erigeron acomanus*)
- Chaco milkvetch (*Astragalus micromerius*)
- Chuska milkvetch (*Astragalus chuskanus*)
- Clifford's groundsel (*Senecio cliffordii*)
- Clipped wild buckwheat (*Eriogonum lachnogynum* var. *colobum*)
- Clifford's milkvetch (*Astragalus cliffordii*)
- Heil's milkvetch (*Astragalus heilii*)
- Naturita milkvetch (*Astragalus naturitensis*)
- Navajo bladderpod (*Physaria navajoensis*)
- Navajo muhly (*Muhlenbergia arsenei*)
- Sarah's wild buckwheat (*Eriogonum lachnogynum* var. *sarahiae*)
- Sivinski's fleabane (*Erigeron sivinskii*)
- Threadleaf blazingstar (*Mentzelia filifolia*)
- Zuni milkvetch (*Astragalus missouriensis* var. *accumbens*)

4.1.9 Federal Special-Status Animal Species

In addition to reviewing the IPaC list for plant species that could potentially occur in the APE, the IPaC list was also reviewed prior to field surveys for federally listed and special status animal species that could occur in the APE (USFWS 2021a). Four additional federally listed species, including three bird and one fish species, are listed for the APE (USFWS 2021a):

- Mexican spotted owl (*Strix occidentalis lucida*) - Threatened
- Southwestern willow flycatcher (*Empidonax traillii extimus*) - Endangered
- Yellow-billed cuckoo (*Coccyzus americanus*) - Threatened
- Zuni bluehead sucker (*Catostomus discobolus yarrowi*) - Endangered

4.1.10 State-Listed Special Status Animal Species

Prior to the field survey in November 2020, state-listed species for this APE were reviewed using the NMDGF's BISON-M database (NMDGF 2021a). In August 2018, the NMDGF's Environmental Review Tool, the Conservation Information System (NMDGF 2021b) was introduced. The CIS contains an initial list of recommendations and potential impacts to special status species and habitats for a proposed APE and serves to assess impacts once project details are developed (NMDGF 2021b). This tool will be used in place of the former BISON-M list, as recommended by the NMDGF. The new CIS tool evaluates all state-listed species, those identified as Species of Greatest Conservation Need (SGCN), and species determined as those of Economic and Recreational Importance (SERI) that could potentially be impacted within 1-mile of the APE (NMDGF 2021b). For this APE, the CIS list recommends additional review of the following species (NMDGF 2021b):

Three state-listed threatened species:

- Gray vireo (*Vireo vicinior*)
- Peregrine falcon (*Falco peregrinus*)
- Spotted bat (*Euderma maculatum*)

Thirteen SGCN species (three of these species are also state-threatened species listed above):

- Clark's nutcracker (*Nucifraga columbiana*)
- Gray vireo
- Gunnison's prairie dog (*Cynomys gunnisoni*)
- Juniper titmouse (*Baeolophus ridgwayi*)
- Lewis's woodpecker (*Melanerpes lewis*)
- Olive-sided flycatcher (*Contopus cooperi*)
- Peregrine falcon
- Pinyon Jay (*Gymnorhinus cyanocephalus*)
- Pygmy nuthatch (*Sitta pygmaea*)
- Loggerhead shrike (*Lanis ludovicianus*)
- Spotted bat
- Western bluebird (*Sialia mexicana*)
- Williamson's Sapsucker (*Sphyrapicus thyroideus*)

Two SERI species:

- Cougar (*Puma concolor*)
- Mule deer (*Odocoileus hemionus*)

5. RESULTS OF THE FIELD SURVEY

Parametrix conducted a 100-percent pedestrian natural resources survey of the APE in November 2020 and May 2021. The purpose of these surveys was to provide baseline environmental data prior to the commencement of remediation work and document and assess potential effects to any natural resources that might be impacted by the proposed project. The natural resources survey was conducted by Steven Albert, Parametrix Senior Biologist, on November 15, 2020 and May 11, 2021.

5.1 Soils

Soils observed in the field consisted of sandy and silty loams that ranged from light brown to almost white in color. Coal deposits from the historic mining activity is present throughout the APE as well. These deposits were either dark and concentrated in large piles or were found to be dispersed and mixed with natural sediment types.

Although the sediment is stabilized by sagebrush and other vegetation, in most of the APE there are areas vulnerable to erosion. During the field survey, high winds occurred in the afternoon, resulting in large dust devils carrying and depositing sediment. Additionally, several deeply incised dry arroyos were noted in the Northern Navajo Extension and the Enterprise-Brown APE's. These drainages showed large, stratified sediment deposits.

5.2 Waterways and Wetlands

5.2.1 Waterways

There are no perennial or intermittent waterways identified in the APE. However, several ephemeral drainages exist in the Northern Navajo Extension and the Enterprise-Brown APE.

5.2.2 Wetlands

There were not wetlands identified in the APE.

5.3 Vegetation

5.3.1 Geological Conditions and Associated Plant Communities

Most of the APE is vegetated with common plant associations typical of sedimentary geologic substrates on the Colorado Plateau. Steep slopes at the abandoned mine and along the edges of the APE are outcrops of Menefee Formation shale and mudstone strata capped by harder sandstone. See Sections 5.3.1.1 through 5.3.1.4 below for detailed descriptions of these systems identified in the field.

5.3.1.1 Inter-Mountain Basins Greasewood Flat

Inter-Mountain Basins Greasewood Flats comprises approximately 18.04 acres of the APE. This system usually occurs in areas near drainages, on stream terraces, and flats, or may be found in areas where sparsely vegetated playas occur (USGS 2005). This ecological system was scattered throughout the APE

and includes species such as black greasewood (*Sarcobatus vermiculatus*) and big sagebrush (*Artemisia tridentata*).

5.3.1.2 Inter-Mountains Basins Big Sagebrush Shrubland

Inter-Mountain Basins Big Sagebrush Shrubland covers approximately 3.74 acres of the APE, and they usually occur between mountain ranges or on foothills. Typical vegetation includes big sagebrush (*Artemisia tridentata*), saltbush (*Atriplex spp.*), rubber rabbitbrush (*Ericameria nauseosa*), juniper (*Juniperus spp.*), blue grama grass (*Bouteloua gracilis*), and James' galleta grass (*Pleuraphis jamesii*).

5.3.1.3 Colorado Plateau Pinyon-Juniper Woodland

Colorado Plateau Pinyon-Juniper Woodland habitat comprises approximately 34.76 acres of the APE. This ecological system occurs along the eastern and western APE boundaries. These woodlands occur on dry mountains and foothills of the Colorado Plateau Region from the Western Slope Colorado to the Wasatch Range, south to the Mogollon Rim (USGS 2005). Pinyon-juniper woodlands are the predominant low-elevation woodlands of this region, and occur on dry sites on mountain slopes, mesas, plateaus, and ridges. Severe weather events, such as frost and drought can occur during the growing season and may limit the distribution of pinyon-juniper woodlands to relatively narrow altitudinal zones (USGS 2005). In the APE, pinyon pine and one-seed juniper are the most common trees. Shrubs were scattered and included sagebrush species and cliffrose. Grasses include blue grama, James' galleta, western wheatgrass, and muttongrass.

5.3.1.4 Developed, Low Intensity

Land classified as Developed, Medium Intensity comprises about 2.42 acres of the APE. This area includes a mixture of constructed materials, vegetation, and impervious surfaces that account for 20 to 49 percent of the total cover. These areas most commonly include single-family housing units (USGS 2005).

5.3.2 Special-Status Plants

Of the three special-status plants listed for McKinley County that have formal statutory protection, only one federally-listed threatened and state-listed endangered species, Zuni fleabane, and one state-listed endangered species, Parish's alkali grass (USFWS 2021a; NMEMNRD 2021), have the potential to occur in the APE. Based on our field investigations, the state-listed threatened Gooding's onion does not have the potential to occur in the APE due to the lack of habitat (steep slopes and spruce-fir habitat). None of these three protected plant species were detected in the APE.

The 17 plants listed as New Mexico rare plants for McKinley County are listed as species of concern by the State to acknowledge their rarity, and to encourage avoidance or mitigation of impacts whenever possible. Two of these 17 species, Zuni fleabane and Parish's alkali, have potential to occur in the APE, but were not detected during field surveys. Table 2 provides descriptions of each of the special-status plant species listed for McKinley County, as well as their habitat requirements and whether they were detected in the APE.

Table 2. Special Status Plant Species and their Occurrence in the APE

Common Name	Scientific Name	Status	Occurs in APE?	Habitat
Zuni fleabane	<i>Erigeron rhizomatus</i>	USFWS Threatened State Threatened NM Rare Plant	No	Found on nearly barren detrital clay hillslopes with soils derived from shales of the Chinle or Baca formations, most often on north or east-facing slopes in open pinyon-juniper woodlands from 7,300 to 8,000 ft. (NMRPTC 1999b). Only scattered pinyon and juniper are located in the APE's and this species was not detected. No impacts to this species are anticipated. No further analysis is required.
Gooding's onion	<i>Allium goodingii</i>	State Threatened NM Rare Plant	No	Found at the base of steep slopes and drainage bottoms in the shade of spruce-fir, mixed conifer, and aspen at 6,500-10,000 ft. in open meadows and avalanche chutes (NMRPTC 1999c). This species is not found in the APE due to the lack of habitat. No impacts to this species are anticipated. No further analysis is required.
Parish's alkali grass	<i>Puccinellia parishii</i>	State Endangered NM Rare Plant	No	Found in alkaline springs, seeps, and seasonally wet areas at the heads of drainages or on gentle slopes from 2,600-7,200 ft. Requires continuously damp soils during its growing period (late winter to spring; NMRPTC 1999d). Habitat is not present in the APE, and the species was not detected. No impacts to this species are anticipated. No further analysis is required.
Acoma fleabane	<i>Erigeron acomanus</i>	NM Rare Plant	No	Found on sandy slopes and benches beneath sandstone cliffs of Entrada Sandstone Formation in pinyon-juniper woodlands from 6,700-7,100 ft. (NMRPTC 1999e). Habitat for this species is not present in the APE's, and this species was not detected. No further analysis is required.
Chaco milkvetch	<i>Astragalus micromerius</i>	NM Rare Plant	No	Found in gypseous or limey sandstone in pinyon-juniper woodlands or in the Great Basin Desert Scrub habitat from 6,600-7,300 ft. (NMRPTC 1999f). Habitat for this species is not present in the APE's and no Chaco milkvetch were detected. No further analysis is required.
Chuska milkvetch	<i>Astragalus Chuskanus</i>	NM Rare Plant	No	Found in degraded Chuska sandstone in ponderosa pine and montane forest openings above 5,500 ft. (NMRPTC 1999g). Habitat for this species does not occur in the APE's and no Chuska milkvetch were detected. No further analysis is required.
Clifford's groundsel	<i>Senecio cliffordii</i>	NM Rare Plant	No	Found in sandy shale and mudstone areas (NMRPTC 1999h). Although sandy shale is present in the APE, this species was not detected. No further analysis is required.
Clifford's milkvetch	<i>Astragalus cliffordii</i>	NM Rare Plant	No	Found in rim rock ledges of the mesa Verde Group, in sagebrush and pinyon-juniper woodlands at 6,800 ft. (NMRPTC 1999i). Rim rock ledges of the Mesa Verde Group are not present in the APE. This species does not occur in the APE. No further analysis is required.

Common Name	Scientific Name	Status	Occurs in APE?	Habitat
Clipped wild buckwheat	<i>Eriogonum lachnogynum</i> var. <i>colobum</i>	NM Rare Plant	No	Found in open sandy or gypsum and limestone ridges and edges of mesas in pinyon-juniper woodlands from 6,820-7,450 ft. (NMRPTC 1999j). This species was not detected. No further analysis is required.
Heil's milkvetch	<i>Astragalus heilii</i>	NM Rare Plant	No	Found in rim rock ledges of the Mesa Verde Group in pinyon-juniper woodlands at about 7,200 ft. (NMRPTC 1999k). The Mesa Verde Group does not occur in the APE. This species was not detected. No further analysis required.
Naturita milkvetch	<i>Astragalus naturitensis</i>	NM Rare Plant	No	Found on sandstone ledges and rimrocks along canyons in pinyon-juniper woodlands (NMRPTC 1999l). Sandstone ledges and rimrock are present in spots, but this species was not detected in the APE's. No further analysis is required.
Navajo bladderpod	<i>Physaria navajoensis</i>	NM Rare Plant	No	Found on mesa rims of Todilto limestone in sparse pinyon-juniper woodlands from 7,200 to 7,600 ft. (NMRPTC 1999m). The Todilto limestone is not present in either APE. This species was not detected in the APE. No further analysis is required.
Navajo muhly	<i>Muhlenbergia arsenei</i>	NM Rare Plant	No	Found on limestone rock outcrops in pinyon-juniper woodlands from 4,600 to 6,500 ft. (NMRPTC 1999n). This species was not detected in the APE's.
Sarah's wild buckwheat	<i>Eriogonum lachnogynum</i> var. <i>sarahiae</i>	NM Rare Plant	No	Found on open sandy limestone ridges and edges of mesas in pinyon-juniper woodlands from 5,900 to 7,450 ft. (NMRPTC 1999o). This species was not detected in either APE. No further analysis is required.
Sivinski's fleabane	<i>Erigeron sivinskii</i>	NM Rare Plant	No	Found on Chinle shale in pinyon-juniper woodlands and in the Great Basin Desert Scrub habitat from 6,100 to 7,400 ft. (NMRPTC 1999p). This species was not detected in either APE. No further analysis is required.
Threadleaf blazingstar	<i>Mentzelia filifolia</i>	NM Rare Plant	No	Found on road cuts and shale slopes of the upper Chinle Formation in pinyon-juniper woodlands from 6,400 to 7,500 ft. (NMRPTC 1999q). The species was not detected during field surveys. No further analysis is required.
Zuni milkvetch	<i>Astragalus missouriensis</i> var. <i>accumbens</i>	NM Rare Plant	No	Found on gravelly clay banks and knolls, in dry, alkaline soils derived from sandstone in pinyon-juniper woodlands from 6,200 to 7,900 ft. (NMRPTC 1999r). Soils derived from sandstone are present; however, this species was not detected in the APE. No further analysis is required.

Sources: NMRPTC 1999a-r; NMEMNRD 2021; USFWS 2021a

5.3.2.1 Noxious weeds

The State of New Mexico, under the administration of the Department of Agriculture (NMDA), lists certain weed species as noxious (NMDA 2020). "Noxious" in this context is defined as plants not native to New Mexico that have a negative impact on the economy or environment and are targeted for management and control (NMDA 2020). Class A noxious weeds have limited distributions within the state. Preventing new infestations and eliminating existing infestations are the priorities for Class A noxious weeds (NMDA 2020). Class B noxious weeds are considered common, but not yet widespread within certain regions of the state (NMDA 2020). The objectives for control of Class B noxious weeds are to prevent new infestations, and in areas where they are already abundant, to contain these infestations and prevent further spread (NMDA 2020). Class C noxious weeds are common and widespread species

that are well established within the state. Management and suppression of Class C noxious weeds is left to the local land-manager’s discretion (NMDA 2020). The noxious weed list for New Mexico is in Appendix A.

One noxious weed was observed during field surveys: Siberian elm (*Ulmus pumila*) was present at scattered locations at all APE’s.

5.4 Federally Listed Species

Potential effects of the proposed project were considered for federally listed Threatened, Endangered, and proposed species. There are five federally listed species for the Navajo and Enterprise APE (USFWS 2021a; Table 3).

Table 3. Federally Listed Species for the APE

Species	Legal Status	Habitat Present	Habitat Requirements and Effects Determination
Mexican Spotted Owl (<i>Strix occidentalis caurina</i>)	Threatened	No	This species inhabits mixed-conifer forests dominated by Douglas-fir, juniper, pinyon pine, ponderosa pine, and Southwestern white pine. Nesting and roosting habitat consists of forested areas with high canopy cover with mature or old-growth stands, and rocky-canyon sites (USFWS 2012). Based on a lack of suitable habitat for this species in the APE there would be a “No Effect” determination for this species.
Southwestern Willow Flycatcher (<i>Empidonax traillii extimus</i>)	Endangered	No	This species uses areas dominated by willows, cottonwood, box elder, ash, alder, and other species, usually 10-50 feet tall, with a distinct overstory and dense understory. This species may also breed in dense, monotypic stands of exotic species such as Russian olive and saltcedar, or in areas of mixed native and exotic vegetation (Sogge et al. 2010). Based on a lack of suitable habitat in the APE there would be a “No Effect” determination for this species.
Yellow-billed Cuckoo (<i>Coccyzus americanus</i>)	Endangered	No	Yellow-billed cuckoos nest in dense, multi-storied riparian habitat containing willows, cottonwoods, and tamarisk, mesquite, or seep willow (McNeil et al. 2013). This species prefers contiguous riparian vegetation containing cottonwood and willow with an average overstory height of 15 feet. (Anderson and Ohmart 1984). Based on a lack of suitable habitat in the APE there would be a “No Effect” determination for this species.
Zuni Bluehead Sucker (<i>Catostomus discobolus yarrowi</i>)	Endangered	No	This species occupies streams with clear, perennial water flowing over a hard substrate, often in shaded pools and other areas where water runs less than 0.3 ft per second (USFWS 2014). Based on a lack of perennial water in the APE there would be a “No Effect” determination for this species.
Zuni Fleabane (<i>Erigeron rhizomatus</i>)	Endangered	No	This species occurs on nearly barren, detrital clay hillsides with soils derived from the Chinle or Baca formations. The species most often occurs on north- or east-facing slopes in open pinyon-juniper woodlands between 7,300-8,000 ft. (NMRPTC 1999b). Based on a lack of suitable habit in the APE there would be a “No Effect” determination for this species.

Sources: Anderson and Ohmart 1984; NMRPTC 1999b; Sogge et al. 2010; McNeil et al. 2013; USFWS 2012, 2014 2021a

5.4.1 Critical Habitat

No critical habitat is located within the APE or the action area (USFWS 2021a; NMDGF 2021a). The nearest critical habitat occurs in the Rio Nutria for the Zuni bluehead sucker and in the Zuni Mountains

for the Mexican spotted owl, both located approximately 40 miles (64 km) southeast of the APE (USFWS 2021a; NMDGF 2021a).

5.5 State-listed Special Status Animal Species

For this project, state-listed animal species were identified through BISON-M (NMDGF 2021a), and the CIS website (NMDGF 2021b), which was introduced in August 2018 by the NMDGF to address all species that are considered:

- State threatened, endangered, or proposed;
- SGCN species, or species that are monitored for their distribution and abundance, including low and declining populations that are indicative of the diversity and health of wildlife of the state (NMDGF 2021b);
- and SERI species designated, or those that are considered species with economic and recreational importance to the state (NMDGF 2021b).

The list generated by the CIS website for this project (NMDGF 2021b) includes three state listed threatened and SGCN designated species, 10 SGCN species, and two SERI species that could potentially be impacted within 1 mile (1.61 km) of the APE (Table 4).

Table 4. State-Listed Animal Species for McKinley County, and their Potential to Occur in the APE

Species	Legal Status	Habitat Present	Habitat Requirements and Effects Determination
BIRDS			
Gray Vireo (<i>Vireo vicinior</i>)	State Threatened SGCN	Yes	Gray vireos utilize juniper savannas associated with drainages (NMDGF 2017). This species was detected during field surveys in May 2021 in the Navajo North Extension Area and may be present in other portions of the APE (prior field work was conducted outside of the breeding season when the birds are present and most easily detected). If work is conducted outside of the early May to late-July breeding season, this will minimize impacts to this species.
Peregrine Falcon (<i>Falco peregrinus</i>)	State Threatened SGCN	No	Peregrine falcons hunt in canyons, mountains, rivers, or wetlands (Stahlecker 2010; NMDGF 2018a), ranging from 3,500 feet-9,000 feet, and nest on steep cliffs near water where prey is available (Stahlecker 2010). Steep cliffs and water are lacking in the APE. No impacts to this species are anticipated. No further analysis is required.
Clark's nutcracker (<i>Nucifraga columbiana</i>)	SGCN	No	This species utilizes riparian woodlands, pinyon-juniper woodlands, and Madrean evergreen woodlands (NMDGF 2018b). No Clark's nutcrackers were present during the field survey. This species has been documented near the Hemlock Canyon Trail in Gallup, beyond the buffer area. No impacts to this species are anticipated for this APE. No further analysis is required.
Juniper titmouse (<i>Baeolophus ridgwayi</i>)	SGCN	Yes	This species utilizes pinyon-juniper woodlands, riparian areas, and montane habitats (NMDGF 2018c), frequently using tree cavities nest sites (NMDGF 2018c). Although few snags were detected during field surveys, including those conducted during the May breeding season, no juniper titmouse were detected. Measures taken to avoid impacts to gray vireo will minimize impacts to this species as well.
Lewis's woodpecker	SGCN	No	This species is found in riparian areas, lowland and montane habitats (NMDGF 2018d), juniper savannah, pinyon-juniper woodlands, and ponderosa oak forests (NMDGF 2018d). Snags important to this species were not observed in

Species	Legal Status	Habitat Present	Habitat Requirements and Effects Determination
<i>(Melanerpes lewis)</i>			the APE and this species was not detected during field surveys. No impacts to this species are anticipated. No further analysis is required.
Loggerhead shrike (<i>Lanius ludovicianus</i>)	SGCN	Yes	This species is found in riparian areas, lowlands, and montane habitat (NMDGF 2018e) and can be a transient in desert scrub/rocky slopes and juniper savannahs (NMDGF 2018e). No loggerhead shrikes were detected during field surveys, no impacts to this species are anticipated, and no further analysis is required.
Olive-sided flycatcher (<i>Contopus cooperi</i>)	SGCN	No	This species utilizes riparian habitats and burned areas and may migrate through lowlands to forest habitat (NMDGF 2018f). Due to the lack of habitat and the fact that no individuals were detected during field surveys, no impacts to this species are anticipated. No further analysis is required.
Pinyon Jay (<i>Gymnorhinus cyanocephalus</i>)	SGCN	Yes	Pinyon jays utilize pinyon-juniper woodlands, sagebrush, scrub oak, chaparral, and ponderosa pine (NMDGF 2018g). Flocks may wander outside their normal home range in search of food (NMDGF 2018g). Several small stands of mature pinyon are present although no pinyon jays were observed during the field surveys. No impacts to this species are anticipated, and no further analysis is required.
Pygmy nuthatch (<i>Sitta pygmaea</i>)	SGCN	No	This species is found in ponderosa and mixed pine habitats (NMDGF, 2018h), none of which is present in the APE. No impacts to this species are anticipated and no further analysis is required.
Western bluebird (<i>Sialia mexicana</i>)	SGCN	No	This species utilizes pinyon-juniper woodlands, ponderosa-oak and mixed pine forests (NMDGF 2018i), using nest cavities excavated by woodpeckers. Trees large enough for cavity nesting birds as large as western bluebirds are lacking in the APE. No western bluebirds were present during field surveys and no impacts to this species are anticipated. No further analysis is required.
Williamson's sapsucker (<i>Sphyrapicus thyroideus</i>)	SGCN	No	Williamson's sapsuckers utilized mixed conifer forests, and breed in Douglas-fir, lodgepole pine, and ponderosa pine (NMDGF 2018j). This habitat does not occur in the APE and no Williamson's sapsuckers were seen during field surveys. No impacts to this species are anticipated. No further analysis is required.
Spotted bat (<i>Euderma maculatum</i>)	State Threatened SGCN	No	This species is normally found in open semi-desert shrublands, pinyon-juniper, ponderosa pine, and subalpine coniferous forests (NMDGF 2018k). Spotted bats are cliff dwellers who roost in cracks and crevices of canyons and cliffs. Due to the presence of sandstone rocks and rock outcrops in the APE, further analysis may be required. See Section 7.2.1.2.
MAMMALS			
Gunnison's prairie dog (<i>Cynomys gunnisoni</i>)	SGCN	No	Gunnison's prairie dogs inhabit grasslands from low valleys to montane meadows (NMDGF 2018l). No prairie dog sign was observed in the APE. No further analysis is required. See Section 7.2.1.2.
Cougar (<i>Puma concolor</i>)	SERI	Yes	This species utilizes many habitat associations such as pinyon-juniper woodlands, pine forests, and desert scrub (NMDGF 2018m) and may be present in the APE, though no sign was observed. No impacts to this species are anticipated. No further analysis is required.
Mule deer (<i>Odocoileus hemionus</i>)	SERI	Yes	Mule deer use a variety of habitats (NMDGF 2018n). Mule deer tracks and scat were identified during the field survey. There is abundant habitat outside the APE and no impacts to this species are anticipated. No further analysis is required.

Sources: NMDGF 2017, 2018a-n; Stahlecker 2010

6. ANALYSIS OF EFFECTS ON LISTED SPECIES

6.1 Federally Listed Species and Critical Habitat

Federally listed species are protected by the USFWS under the Endangered Species Act 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 668-668c). A Parametrix biologist analyzed the effects of the proposed action on the federally listed species in Table 6-2 above. No critical habitat occurs within the APE and none of federally listed species reviewed (USFWS 2021a) have the potential to occur in the APE, based on the lack of habitat and the fact that no detections occurred during field surveys. The effects determination provided below uses language specific to the USFWS's guidance pertaining to federally-listed species.

6.1.1 Determination

Due to the lack of habitat or occurrence of these species in the APE there would be a no effect determination for:

- Mexican spotted owl
- Southwestern willow flycatcher
- Yellow-billed cuckoo
- Zuni bluehead sucker
- Zuni fleabane

In addition, there is a no effect determination on critical habitat within this APE, because no critical habitat is present within the APE.

6.2 State Listed Species

A Parametrix biologist analyzed the effects of the project on New Mexico special-status animal species (NMDGF 2021a) within 1-mile of the Navajo and Enterprise mine site. These species included three state-listed Threatened/SGCN species, 10 SGCN species, and two SERI species.

6.2.1 State listed Species Evaluated Further

Of the 15 state listed species, there is potential for two state listed threatened/SGCN species (gray vireo, which was observed during field surveys, and spotted bat), two SGCN species (juniper titmouse, and loggerhead shrike), and two SERI species (cougar and mule deer) to occur in the APE and its associated action area as (see CIS list in Appendix A). These species are further evaluated below.

6.2.1.1 Birds

Gray vireo (*Vireo vicinior*) – New Mexico Threatened Species

Species Ecology, Habitat Use, and Threats

In New Mexico, the gray vireo has been observed from late April until mid-August on foothills and mesas in chaparral-juniper, pinyon-juniper woodlands, and pinyon-madrone associations (New Mexico Avian Conservation Partners (NMACP) (2007). Vegetation within gray vireo preferred habitat includes mountain mahogany, Utah serviceberry, and big sagebrush. Preferred breeding habitat is generally open woodlands/shrublands, containing juniper and oaks (NMACP 2007). This species does not appear to winter in New Mexico (NMACP 2007). Conservation concerns include loss or alteration of wintering habitat and suitable nest sites, brood parasitism by brown-headed cowbirds (NMACP 2007), and predation of eggs or nestlings by snakes, rats, chipmunks, coyotes, and other birds including jays, northern mockingbirds, Scott's orioles, and hooded orioles (NMACP 2007).

Habitat for Species in APE

Gray vireos had not been previously documented in the APE (eBird 2021) but were observed during field surveys in May 2021.

Potential Impacts

The two birds observed in May 2021 could be a breeding pair (the male exhibited territorial behavior) though no nest was found. While the gray vireo has been observed from late April until mid-August in some areas of the state, the nesting seasons within the APE is estimated to be approximately May 1-July 31 based on the elevation and other habitat characteristics specific to the APE. Construction noise and other disruptions during the nesting season could disrupt nesting activities and lead to nest failure. After nesting, the species migrates away from the area, so if work is conducted outside of nesting season, impacts would be minimized.

Recommendation

Like all migratory birds, gray vireo is protected from take, though the state designation of Threatened does not confer any additional protective status. It is recommended that ground distributing activities, especially activities that may remove pinyon or juniper trees, do not take place between May 1–July 31.

Juniper titmouse – New Mexico Species of Greatest Conservation Need

Species Ecology, Habitat Use, and Threats

Juniper titmouse habitat is typically pinyon-juniper woodland (NMDGF 2018c). This species is non-migratory and pairs will defend their territories year-round, although this species is known to move upslope into ponderosa pine forests in winter (NMDGF 2018c). They occupy foothills and canyons below 7,000 ft. and are frequent moves in juniper-savannah and pinyon-juniper woodlands, typically near waterways (NMDGF 2018c). This species eats pinyon seeds and terrestrial invertebrates gleaned from trees and shrubs or from the ground (NMDGF 2018c). This species is a cavity nesting bird and requires mature woodlands with trees large enough to support nest cavities (NMDGF 2018c). Threats include toxic and oily waste fluids in areas where natural gas and coalbed methane extraction of oil and minerals occurs (NMDGF 2018c). This species is sensitive to insecticide/pesticide use (NMDGF 2018c).

Habitat for Species in APE

No juniper titmouse were detected during field surveys, though the species has been detected within 5 miles of the APE in similar habitat (eBird 2021).

Potential Impacts

This species has been detected close to the APE (eBird 2021), though the APE does not appear to support significant amounts of nesting habitat. Only surveys of the Navajo North Extension Area were conducted during the breeding season. If juniper titmice travel into the proposed APE, they would be able to move away from direct and indirect construction-related disturbance, such as areas where noise related to construction activities.

Recommendation

Recommendations to avoid impacts to gray vireo will benefit this species as well.

Loggerhead shrike - New Mexico Species of Greatest Conservation Need

Species Ecology, Habitat Use, and Threats

Loggerhead shrike is widespread in lowland habitats of New Mexico including the Great Basin Desert Shrub, Plains-Mesa Sand Shrub, Chihuahuan Desert Scrub, and Plains-Mesa Grassland (NMACP 2007). This species has also been documented in the Chihuahuan Desert Grassland, pinyon-juniper woodlands, and agricultural areas. Loggerhead shrike is a year-round resident of the southern half of the United States from California to the Carolinas, south of the Pacific slope and into the interior highlands of Mexico (NMACP 2007). This species is associated with a variety of habitats, but general requirements include widely-spaced shrubs and low trees interspersed with grasses, forbs, and bare ground (NMACP 2007). In New Mexico, loggerhead shrike is usually associated with open country with short vegetation. Breeding territories are characterized by the presence of isolated trees and large shrubs, and dense, thorny shrubs are preferred for nesting. In desert areas, tall yucca stems are used as hunting perches. Presence of shrubs is critical to loggerhead shrike habitat where the species has access to thorns or barbed-wire on which to impale its prey (NMACP 2007). Threats include consuming fertilizer or pesticide-contaminated insects and small mammals (NMDGF 2018e).

Habitat for Species in APE

Lowland habitat is present in both APE's. Though no shrikes were detected during field surveys, most of the surveys were conducted outside of the nesting season when birds are most active and detectable. This species has been documented within 2 miles of the APE (eBird 2021).

Potential Impacts

No direct impacts to loggerhead shrike are expected to occur due to any project activities in the APE. Loggerhead shrike may be present in the APE, but the species would be able to travel away from construction-related disturbance.

Recommendation

Recommendations to avoid impacts to gray vireo will benefit this species as well.

6.2.1.2 Mammals

Spotted Bat – New Mexico Threatened Species

Species Ecology, Habitat Use, and Threats

The spotted bat is an insectivorous bat found in a variety of habitats, including pinyon-juniper woodlands, mixed-conifer forests, and ponderosa pine. Spotted bats roost diurnally in cracks and crevices in canyons and along cliffs. A critical component of this species' habitat is water (NMDGF 2018k). Limiting factors that potentially impact spotted bat populations include pesticides that are ingested through contaminated insects. Threats also may include loss of riparian areas where spotted bats are known to forage (NMDGF 2018k).

Habitat for Species in APE

No spotted bats were observed during field surveys (though the surveys were only conducted during the day). There is some potential habitat in the APE. Although water is limited in APE, puddles do form after rains, and the Rio Puerco is approximately one mile from the APE.

Potential Impacts

No direct impacts to this species are expected due to the proposed action. Any impacts related to the proposed action would be minor.

Recommendation

Recommendations to avoid impacts to gray vireo will benefit this species as well.

Gunnison's prairie dog - New Mexico Species of Greatest Conservation Need

Species Ecology, Habitat Use, and Threats

Gunnison's prairie dogs inhabit plains, desert grasslands, and Great Basin Desert-scrub habitat in New Mexico. They may also utilize agricultural fields and sometimes damage irrigation canal banks. Gunnison's prairie dogs eat mostly grasses, forbs, and sedges, but may also consume insects. Gunnison's prairie dogs may denude the vegetation around their colonies and will eventually abandon the site. Threats to this species include sylvatic plague, which can occasionally eliminate a group from an area, and control practices such as poisoning (NMDGF 2018I).

Habitat for Species in APE

No Gunnison's prairie dogs or their sign were seen during field surveys.

Potential Impacts

No direct or indirect impacts to Gunnison's prairie dogs are expected due to the proposed action.

Cougar – New Mexico Species of Economic and Recreational Importance

Species Ecology, Habitat Use, and Threats

Cougars inhabit many habitats including forested mountains, rock-rimmed canyons and cliffs, and foothills and rocky outcrops where deer are typically present. They may travel extended distances in search of food or mates. Although deer typically make up 50 to 75 percent of their diet, they may also

consume peccaries, pronghorn antelope, and small mammals such as rabbit, beaver, and skunk. In desert habitats, this species may consume reptiles. Threats to cougars may include trapping, hunting, and poisoning (NMDGF 2018m).

Habitat for Species in APE

Though no cougar or sign were observed during field survey, it's possible that they are present in the APE at certain times. Cougars may use the area as a travel corridor and may hunt in the foothills outside of the APE and action area boundaries.

Potential Impacts

No direct impacts to cougars are expected due to the proposed action. If cougars travel into the APE, they would be able to move away from direct or indirect disturbances such as noise related to construction. Impacts to this species are therefore expected to be minor, as relatively abundant habitat is present elsewhere near the APE.

Mule deer – New Mexico Species of Economic and Recreational Importance

Species Ecology, Habitat Use, and Threats

Mule deer are found throughout the state in a variety of habitats. They are browsers that consume various species such as bitterbush, oak, juniper, pinyon, Douglas-fir, and ponderosa pine. They may also consume grasses, sedges, mushrooms, acorns, and mistletoe depending on the time of year and availability of food sources (NMDGF 2018n). Threats include climatic conditions such as a lack of summer rains, declines in forage, and fire as many species including mule deer can be trapped and killed by fast-moving fires (NMDGF 2018n).

Habitat for Species in APE

Mule deer tracks and scat were found in the APE.

Potential Impacts

No direct impacts to mule deer are expected due to the proposed action. If mule deer travel into the APE, they would be able to move away from direct or indirect disturbances such as noise related to construction. Impacts to this species are therefore expected to be minor.

There would be no impacts to the following state listed plant species and state listed/SGCN-listed species (this is NOT a determination of effects as used in relation to federally listed species):

- Gooding's onion
- Parish's alkali grass
- Zuni fleabane

There would be no impacts to the following New Mexico special-status animal species (this is NOT a determination of effects as used in relation to federally listed species):

- Peregrine falcon
- Lewis's woodpecker
- Williamson's sapsucker
- Olive-sided flycatcher

- Pinyon jay
- Clark's nutcracker
- Pygmy nuthatch
- Western bluebird
- Gunnison's prairie dog

There may be impacts to the following species, and we recommend the associated actions to reduce potential impacts.

- Gray vireo (breeding pair(s) likely present on site. We recommend work be conducted outside of the May 1–July 31 breeding season).
- Loggerhead shrike was not observed but may be present on the site. Recommendations to avoid impacts to gray vireo will benefit this species as well.
- Juniper titmouse was not observed by may be present on the site. Recommendations to avoid impacts to gray vireo will benefit this species as well.
- Spotted bat was not observed but may be present on the site. Recommendations to avoid impacts to gray vireo will benefit this species as well.
- Cougar may be present on the site at certain times. However, this species is wary and wide-ranging, and will generally avoid human activity. No other mitigation measures are necessary.
- Mule deer are present on the site at certain times. However, this species is relatively abundant in the region, and generally wary and wide-ranging, and will avoid human activity and return when the activity ceases. No other mitigation measures are necessary.

7. SUMMARY AND RECOMMENDATIONS

Below is a list of findings and management recommendations from the natural resource surveys conducted in the APE in November 2020 and May 2021:

- The APE contains one Class C noxious weed, Siberian elm. Disturbed areas should be seeded and mulched with a native seed mix determined by the AML following any project construction activities (AML 2017).
- None of the five federally listed species that appear on the IPaC-generated species list (USFWS 2021a) have the potential to occur in the APE, due to the lack of habitat. No additional surveys are necessary prior to future construction activities.
- Fifteen state listed species appear on the CIS-generated project/action area list (NMDGF 2021b). Of these, six have the potential to occur in the APE: two state listed threatened/SGCN species (gray vireo, spotted bat), two SGCN species (loggerhead shrike, juniper titmouse) and two SERI species (cougar and mule deer). These six species were analyzed in detail in this report. Only gray vireo was documented in the APE, but field surveys except that in the Navajo North Extension area occurred at a time when migratory birds and bats would not have been present. The proposed action may have temporary effects on special-status species listed here. However, as long as nesting birds are not disturbed, these species would likely avoid the APE during construction. Once construction-related disturbances cease, these species would be expected to return to the APE.
- We recommend avoiding construction activities from May 1-July 31 to avoid potential impacts to gray vireo, juniper titmouse, loggerhead shrike, and spotted bat.

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Appendix A

Pre-Field Species Lists and Other Consulted Resources





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
<http://www.fws.gov/southwest/es/NewMexico/>
http://www.fws.gov/southwest/es/ES_Lists_Main2.html

In Reply Refer To:

March 18, 2021

Consultation Code: 02ENNM00-2021-SLI-0644

Event Code: 02ENNM00-2021-E-01442

Project Name: Navajo and Enterprise Mine Coal Fire Mitigation

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 (MBTA) as amended (16 USC 701-715), and the Bald and Golden Eagle Protection Act (BGEPA) as amended (16 USC 668-668c). 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.

FEDERALLY-LISTED SPECIES AND DESIGNATED CRITICAL HABITAT

Attached is a list of endangered, threatened, and proposed species that may occur in your project area. Your project area may not necessarily include all or any of these species. Under the ESA, it is the responsibility of the Federal action agency or its designated representative to determine if a proposed action "may affect" endangered, threatened, or proposed species, or designated critical habitat, and if so, to consult with the Service further. Similarly, it is the responsibility of the Federal action agency or project proponent, not the Service, to make "no effect" determinations. If you determine that your proposed action will have "no effect" on threatened or endangered species or their respective critical habitat, you do not need to seek concurrence with the Service. Nevertheless, it is a violation of Federal law to harm or harass any federally-listed threatened or endangered fish or wildlife species without the appropriate permit.

If you determine that your proposed action may affect federally-listed species, consultation with the Service will be necessary. Through the consultation process, we will analyze information contained in a biological assessment that you provide. If your proposed action is associated with

Federal funding or permitting, consultation will occur with the Federal agency under section 7(a)(2) of the ESA. Otherwise, an incidental take permit pursuant to section 10(a)(1)(B) of the ESA (also known as a habitat conservation plan) is necessary to harm or harass federally listed threatened or endangered fish or wildlife species. In either case, there is no mechanism for authorizing incidental take "after-the-fact." For more information regarding formal consultation and HCPs, please see the Service's Consultation Handbook and Habitat Conservation Plans at www.fws.gov/endangered/esa-library/index.html#consultations.

The scope of federally listed species compliance not only includes direct effects, but also any interrelated or interdependent project activities (e.g., equipment staging areas, offsite borrow material areas, or utility relocations) and any indirect or cumulative effects that may occur in the action area. The action area includes all areas to be affected, not merely the immediate area involved in the action. Large projects may have effects outside the immediate area to species not listed here that should be addressed. If your action area has suitable habitat for any of the attached species, we recommend that species-specific surveys be conducted during the flowering season for plants and at the appropriate time for wildlife to evaluate any possible project-related impacts.

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:
www.emnrd.state.nm.us/SFD/ForestMgt/Endangered.html

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

The MBTA prohibits the taking of migratory birds, nests, and eggs, except as permitted by the Service's Migratory Bird Office. To minimize the likelihood of adverse impacts to migratory birds, we recommend construction activities occur outside the general bird nesting season from March through August, or that areas proposed for construction during the nesting season be surveyed, and when occupied, avoided until the young have fledged.

We recommend review of Birds of Conservation Concern at website www.fws.gov/migratorybirds/CurrentBirdIssues/Management/BCC.html to fully evaluate the effects to the birds at your site. This list identifies birds that are potentially threatened by disturbance and construction.

BALD AND GOLDEN EAGLES

The bald eagle (*Haliaeetus leucocephalus*) was delisted under the ESA on August 9, 2007. Both the bald eagle and golden eagle (*Aquila chrysaetos*) are still protected under the MBTA and BGEPA. The BGEPA affords both eagles protection in addition to that provided by the MBTA, in particular, by making it unlawful to "disturb" eagles. Under the BGEPA, the Service may issue limited permits to incidentally "take" eagles (e.g., injury, interfering with normal breeding, feeding, or sheltering behavior nest abandonment). For information on bald and golden eagle management guidelines, we recommend you review information provided at www.fws.gov/midwest/eagle/guidelines/bgepa.html.

On our web site www.fws.gov/southwest/es/NewMexico/SBC_intro.cfm, we have included conservation measures that can minimize impacts to federally listed and other sensitive species. These include measures for communication towers, power line safety for raptors, road and highway improvements, spring developments and livestock watering facilities, wastewater facilities, and trenching operations.

We also 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 fish, wildlife, and plants.

Thank you for your concern for endangered and threatened species and New Mexico's wildlife habitats. We appreciate your efforts to identify and avoid impacts to listed and sensitive species in your project area. For further consultation on your proposed activity, please call 505-346-2525 or email nmesfo@fws.gov and reference your Service Consultation Tracking Number.

Attachment(s):

- Official Species List
- Migratory Birds

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

Consultation Code: 02ENNM00-2021-SLI-0644

Event Code: 02ENNM00-2021-E-01442

Project Name: Navajo and Enterprise Mine Coal Fire Mitigation

Project Type: FIRE

Project Description: Biological resource survey for Abandoned Mine Land Program to mitigated underground coal fires.

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@35.54079485,-108.73709500476643,14z>



Counties: McKinley County, New Mexico

Endangered Species Act Species

There is a total of 5 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 Fisheries¹, 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.

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.

Birds

NAME	STATUS
Mexican Spotted Owl <i>Strix occidentalis lucida</i> There is final critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/8196	Threatened
Southwestern Willow Flycatcher <i>Empidonax traillii extimus</i> There is final critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/6749	Endangered
Yellow-billed Cuckoo <i>Coccyzus americanus</i> Population: Western U.S. DPS There is proposed critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/3911	Threatened

Fishes

NAME	STATUS
Zuni Bluehead Sucker <i>Catostomus discobolus yarrowi</i> There is final critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/3536	Endangered

Flowering Plants

NAME	STATUS
Zuni Fleabane <i>Erigeron rhizomatus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/5700	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act¹ and the Bald and Golden Eagle Protection Act².

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described [below](#).

-
1. The [Migratory Birds Treaty Act](#) of 1918.
 2. The [Bald and Golden Eagle Protection Act](#) of 1940.
 3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern](#) (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ [below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found [below](#).

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Pinyon Jay <i>Gymnorhinus cyanocephalus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9420	Breeds Feb 15 to Jul 15

Probability Of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is $0.25/0.25 = 1$; at week 20 it is $0.05/0.25 = 0.2$.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

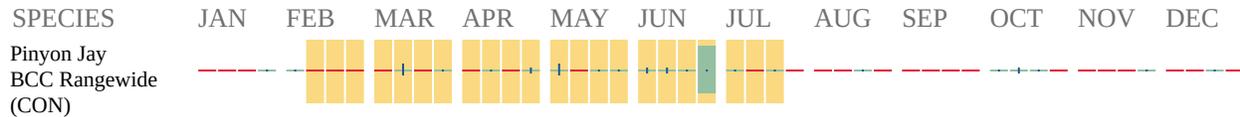
No Data (—)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

■ probability of presence ■ breeding season | survey effort — no data



Additional information can be found using the following links:

- Birds of Conservation Concern <http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php>
- Measures for avoiding and minimizing impacts to birds <http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php>
- Nationwide conservation measures for birds <http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf>

Migratory Birds FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. [Additional measures](#) or [permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [AKN Phenology Tool](#).

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: [The Cornell Lab of Ornithology All About Birds Bird Guide](#), or (if you are unsuccessful in locating the bird of interest there), the [Cornell Lab of Ornithology Neotropical Birds guide](#). If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#) and the [nanotag studies](#) or contact [Caleb Spiegel](#) or [Pam Loring](#).

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Federal or State Threatened/Endangered Species

McKinley

<u>Taxonomic Group</u>	<u># Species</u>	<u>Taxonomic Group</u>	<u># Species</u>
Birds	8	Fish	1
Lepidoptera; moths and butterflies	1	Mammals	1

TOTAL SPECIES: 11

<u>Common Name</u>	<u>Scientific Name</u>	<u>NMGE</u>	<u>USFWS</u>	<u>Critical Habitat</u>	<u>SGON</u>	<u>Photo</u>
Canada Lynx	Lynx canadensis		T			No Photo
Yellow-billed Cuckoo (western pop)	Coccyzus americanus occidentalis		T		Y	View
Costa's Hummingbird	Calypte costae	T			Y	View
Least Tern	Sternula antillarum	E			Y	View
Bald Eagle	Haliaeetus leucocephalus	T			Y	View
Mexican Spotted Owl	Strix occidentalis lucida		T	Y	Y	View
Peregrine Falcon	Falco peregrinus	T			Y	View
Southwestern Willow Flycatcher	Empidonax traillii extimus	E	E	Y	Y	View
Gray Vireo	Vireo vicinior	T			Y	View
Zuni Bluehead Sucker	Catostomus discobolus yarrowi	E	E	Y	Y	View
Monarch Butterfly	Danaus plexippus		C			View

New Mexico Rare Plant Technical Council Rare Plant List for McKinley County

Scientific Name	NMRPTC	State of				Navajo Nation	State Rank	Global Rank	Counties
		FWS	NM	USFS	BLM				
<i>Allium gooddingii</i>	R		E	SEN		GP 3	S2	G2	Catron, Lincoln, McKinley, San Juan
<i>Artemisia pygmaea</i>	D								McKinley, Rio Arriba, San Juan
<i>Astragalus accumbens</i>	R						S3	G3	Catron, Cibola, McKinley
<i>Astragalus chuskanus</i>	R						S3	G3	McKinley, San Juan
<i>Astragalus cliffordii</i>	R						S1	GNR	McKinley, San Juan, Sandoval
<i>Astragalus heilii</i>	R					GP 4	S1	G1?	McKinley
<i>Astragalus micromerius</i>	R			SEN				G3	McKinley, Rio Arriba, San Juan
<i>Astragalus naturitensis</i>	R					GP 3	S2	G3?	McKinley, San Juan
<i>Camissonia scapoidea</i>	D						S4	G5	McKinley, San Juan, Sandoval
<i>Erigeron acomanus</i>	R				SEN	GP 3	S1S2	G1G2	Cibola, McKinley
<i>Erigeron rhizomatus</i>	R	T	E			GP 2	S1	G2	Catron, McKinley, San Juan
<i>Erigeron sivinskii</i>	R			SEN		GP 4	S2	G2	McKinley
<i>Eriogonum lachnogynum</i> var. <i>colobum</i>	R				SEN		S2	G4?T 2	McKinley, Taos
<i>Eriogonum lachnogynum</i> var. <i>sarahiae</i>	R					GP 4	S1	G4?T 1	McKinley
<i>Mentzelia filifolia</i>	R						S1?	G3	McKinley
<i>Muhlenbergia arsenei</i>	D						S3	G5	Bernalillo, Los Alamos, McKinley, Sandoval, Santa Fe
<i>Physaria navajoensis</i>	R					GP 3	S1	G2	McKinley
<i>Puccinellia parishii</i>	R		E	SEN	SEN	GP 4	S1	G2G3	Catron, Cibola, Grant, Hidalgo, McKinley, San Juan, Sandoval
<i>Senecio cliffordii</i>	R						S2	GNR	McKinley, Rio Arriba



NEW MEXICO DEPARTMENT OF AGRICULTURE
Office of the Director/Secretary
MSC 3189
New Mexico State University
P.O. Box 30005
Las Cruces, NM 88003-8005
Phone: (575) 646-3007

July 2, 2020

MEMORANDUM

TO: General Public

FROM: Director/Secretary Jeff Witte 

SUBJECT: New Mexico Noxious Weed List Update

Petitions to add new plant species to the state noxious weed list were solicited and received by the New Mexico Department of Agriculture (NMDA) from Cooperative Weed Management Areas, individuals, agencies and organizations. The petitions were reviewed by the New Mexico Weed List Advisory Committee using ecological, distribution, impact, and legal status criteria within the State of New Mexico and adjoining states.

This list does not include every plant species with the potential to negatively impact the state's environment or economy. Landowners and land managers are encouraged to recognize plant species listed on the federal noxious weed list and other western states' noxious weed lists as potentially having negative impacts and to manage them accordingly.

As required by the Noxious Weed Management Act of 1998, the following plant species (*see attached New Mexico Noxious Weed List*) are designated as noxious weeds to be targeted for control or eradication. Thank you to the Cooperative Weed Management Areas, individuals, agencies and organizations who participated in this process.

attachment: New Mexico Noxious Weed List

IMG/jm/jw

New Mexico Noxious Weed List

Updated June 2020

Class A Species

Class A species are currently not present in New Mexico or have limited distribution. Preventing new infestations of these species and eradicating existing infestations is the highest priority.

<u>Common Name</u>	<u>Scientific Name</u>
Black henbane	<i>Hyoscyamus niger</i>
Camelthorn	<i>Alhagi psuedalhagi</i>
Canada thistle	<i>Cirsium arvense</i>
Dalmation toadflax	<i>Linaria dalmatica</i>
Diffuse knapweed	<i>Centaurea diffusa</i>
Dyer's woad	<i>Isatis tinctoria</i>
Giant salvinia	<i>Salvinia molesta</i>
Hoary cress	<i>Cardaria spp.</i>
Leafy spurge	<i>Euphorbia esula</i>
Oxeye daisy	<i>Leucanthemum vulgare</i>
Purple loosestrife	<i>Lythrum salicaria</i>
Purple starthistle	<i>Centaurea calcitrapa</i>
Ravenna grass	<i>Saccharum ravennae</i>
Scentless chamomile	<i>Matricaria perforata</i>
Scotch thistle	<i>Onopordum acanthium</i>
Spotted knapweed	<i>Centaurea biebersteinii</i>
Yellow starthistle	<i>Centaurea solstitialis</i>
Yellow toadflax	<i>Linaria vulgaris</i>

Class B Species

Class B species are limited to portions of the state. In areas with severe infestations, management should be designed to contain the infestation and stop any further spread.

<u>Common Name</u>	<u>Scientific Name</u>
African rue	<i>Peganum harmala</i>
Bull thistle	<i>Cirsium vulgare</i>
Chicory	<i>Cichorium intybus</i>
Halogeton	<i>Halogeton glomeratus</i>
Malta starthistle	<i>Centaurea melitensis</i>
Perennial pepperweed	<i>Lepidium latifolium</i>
Poison hemlock	<i>Conium maculatum</i>
Quackgrass	<i>Elytrigia repens</i>
Spiny cocklebur	<i>Xanthium spinosum</i>
Teasel	<i>Dipsacus fullonum</i>

Class C Species

Class C species are widespread in the state. Management decisions for these species should be determined at the local level, based on feasibility of control and level of infestation.

<u>Common Name</u>	<u>Scientific Name</u>
Cheatgrass	<i>Bromus tectorum</i>
Curlyleaf pondweed	<i>Potamogeton crispus</i>
Eurasian watermilfoil	<i>Myriophyllum spicatum</i>
Giant cane	<i>Arundo donax</i>
Hydrilla	<i>Hydrilla verticillata</i>
Jointed goatgrass	<i>Aegilops cylindrica</i>
Musk thistle	<i>Carduus nutans</i>
Parrotfeather	<i>Myriophyllum aquaticum</i>
Russian knapweed	<i>Acroptilon repans</i>
Russian olive	<i>Elaeagnus angustifolia</i>
Saltcedar	<i>Tamarix spp.</i>
Siberian elm	<i>Ulmus pumila</i>
Tree of heaven	<i>Ailanthus altissima</i>

Watch List Species

Watch List species are species of concern in the state. These species have the potential to become problematic. More data is needed to determine if these species should be listed. When these species are encountered, please document their location and contact appropriate authorities.

<u>Common Name</u>	<u>Scientific Name</u>
Buffelgrass	<i>Pennisetum ciliaris</i>
Crimson fountaingrass	<i>Pennisetum setaceum</i>
Meadow knapweed	<i>Centaurea pratensis</i>
Myrtle spurge	<i>Euphorbia myrsinites</i>
Pampas grass	<i>Cortaderia sellonana</i>
Yellow bluestem	<i>Bothriochloa ischaemum</i>

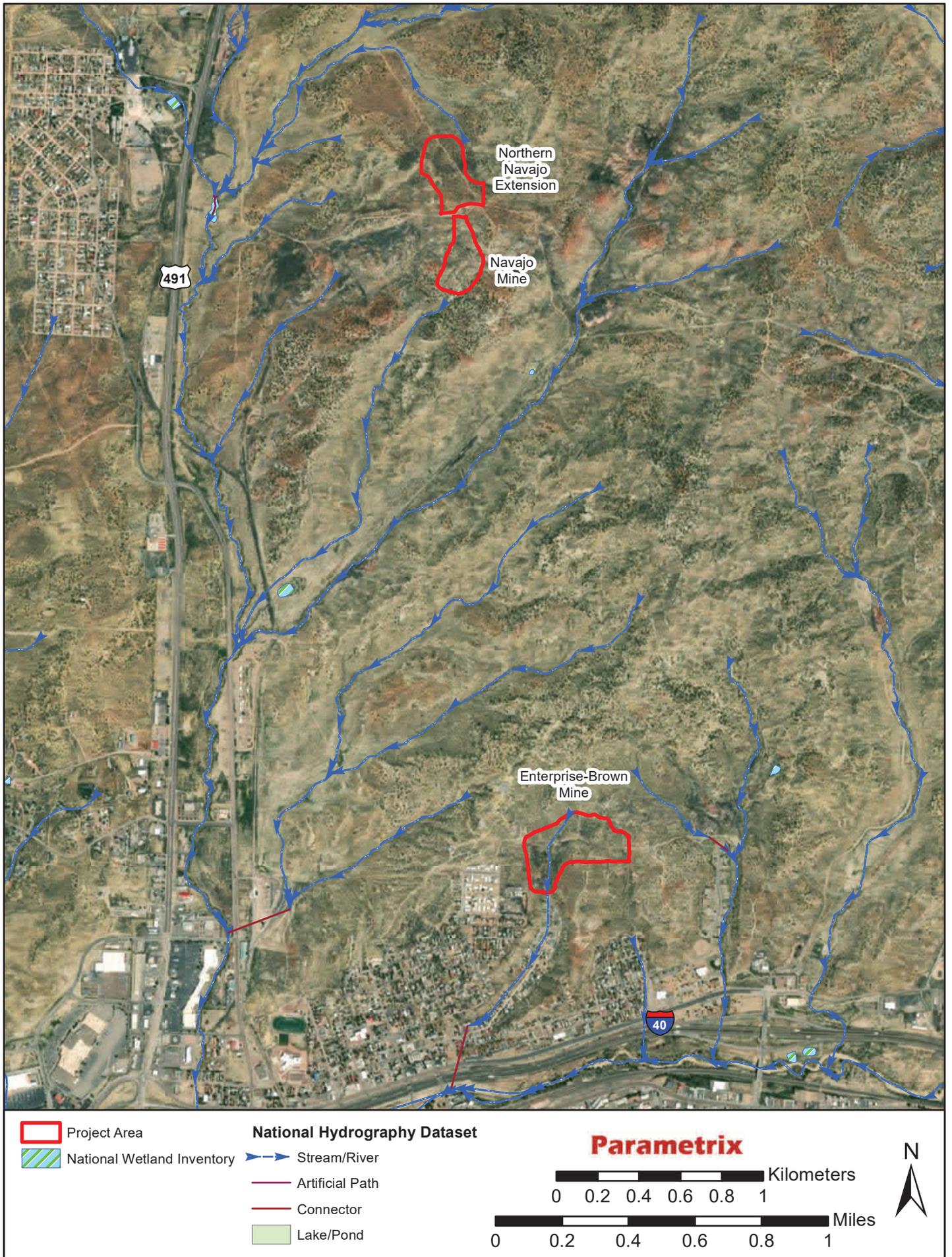
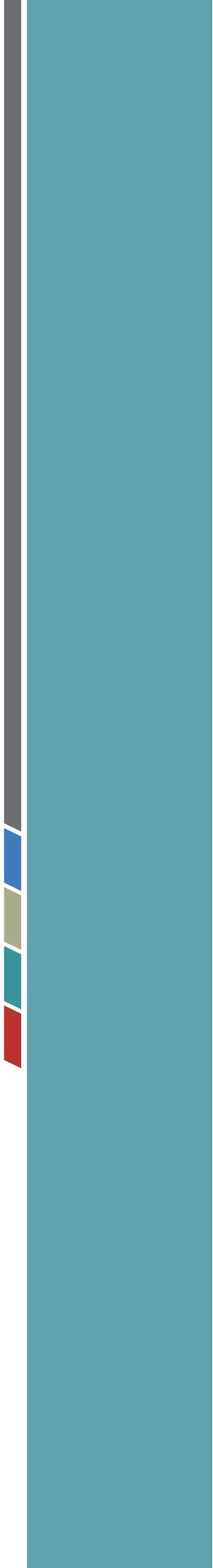


Figure A1: Water resources within the APE according to the National Hydrography Dataset and National Wetland Inventory

Appendix B

Observed Species List



Observed Species

Plants

Common Name	Scientific Name
Siberian Elm	<i>Ulmus pumila</i>
One-seed Juniper	<i>Juniperus monosperma</i>
Four-wing Saltbush	<i>Atriplex canescens</i>
Rubber Rabbitbrush	<i>Ericameria nauseosa</i>
Desert Prickly Pear Cactus	<i>Opuntia phaeacantha</i>
Pencil Cholla	<i>Cylindropuntia leptocaulis</i>
Broom Snakeweed	<i>Gutierrezia sarothrae</i>
Big Sagebrush	<i>Artemisia tridentata</i>
Blue Grama	<i>Bouteloua gracilis</i>
Alkali Sacaton	<i>Sporobolus airoides</i>
Giant Sacaton	<i>Sporobolus wrightii</i>
Indian Ricegrass	<i>Oryzopsis hymenoides</i>
Currant	<i>Ribes</i> spp.
Pinyon Pine	<i>Pinus edulis</i>
Pale Wolfberry	<i>Lycium pallidum</i>

Mammals

Common Name	Scientific Name
Desert Cottontail	<i>Sylvilagus auduboni</i>
Black-tailed Jackrabbit	<i>Lepus californicus</i>
Rocky Mountain Mule Deer (sign)	<i>Odocoileus hemionus</i>
Sign of various small mammals	Various Species

Reptiles

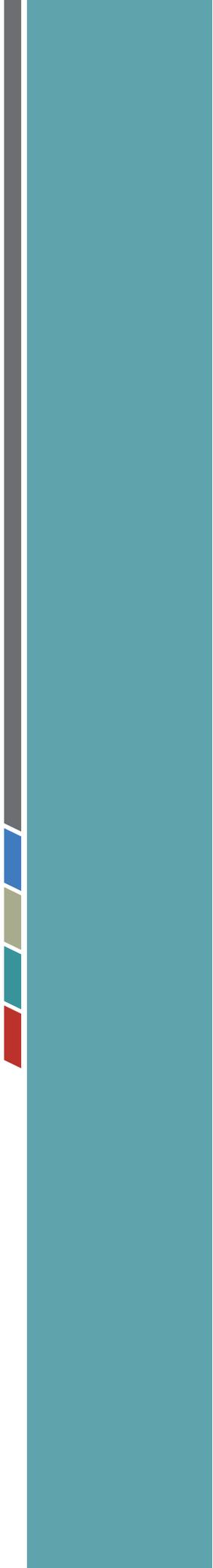
Common Species	Scientific Name
Short Horned Lizard	<i>Phrynosoma hernandesi</i>
Unidentified small lizard	Unidentified

Birds

Common Name	Scientific Name
Gray Vireo	<i>Vireo vicinior</i>
Eurasian Collared Dove	<i>Streptopelia decaocto</i>
Turkey Vulture	<i>Cathartes aura</i>
Red-tailed Hawk	<i>Buteo jamaicensis</i>
Ash-throated Flycatcher	<i>Myiarchus cinerascens</i>
Common Raven	<i>Corvus corax</i>
Western Kingbird	<i>Tyrannus verticalis</i>
Woodhouse's Scrub Jay	<i>Aphelocoma woodhouseii</i>
Mountain Chickadee	<i>Poecile gambeli</i>
American Robin	<i>Turdus migratorius</i>
Western Bluebird	<i>Sialia mexicana</i>
Chipping Sparrow	<i>Spizella passerina</i>
House Finch	<i>Haemorhous mexicanus</i>
Spotted Towhee	<i>Pipilo maculatus</i>
Brewer's Sparrow	<i>Spizella breweri</i>
Dark-eyed Junco	<i>Junco hyemalis</i>
Blue-gray Gnatcatcher	<i>Polioptila caerulea</i>
Canyon Towhee	<i>Melospiza fusca</i>
Lark Sparrow	<i>Chondestes grammacus</i>
Northern Flicker	<i>Colaptes auratus</i>

Appendix C

NRCS Soil Report





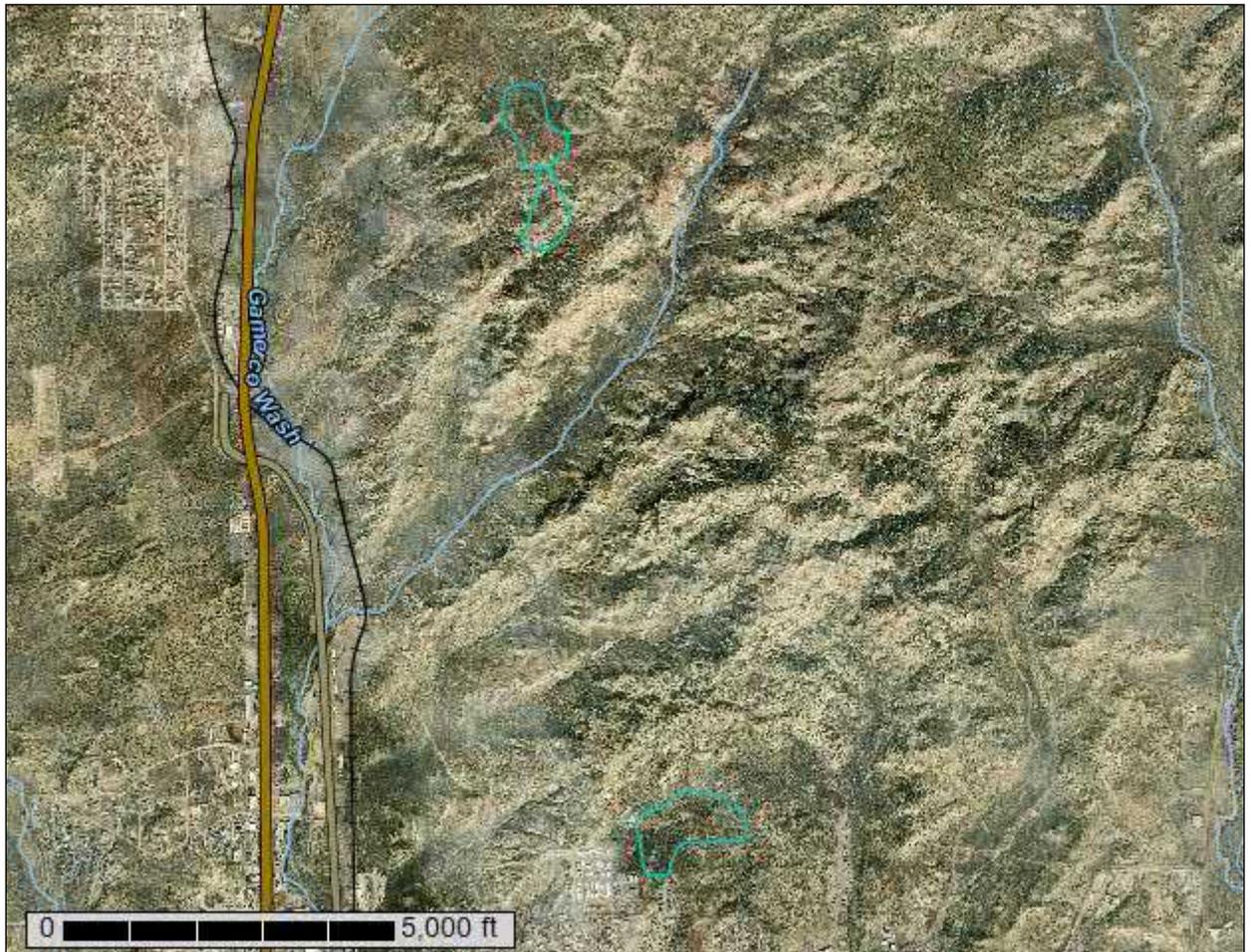
United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for McKinley County Area, New Mexico, McKinley County and Parts of Cibola and San Juan Counties



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

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scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

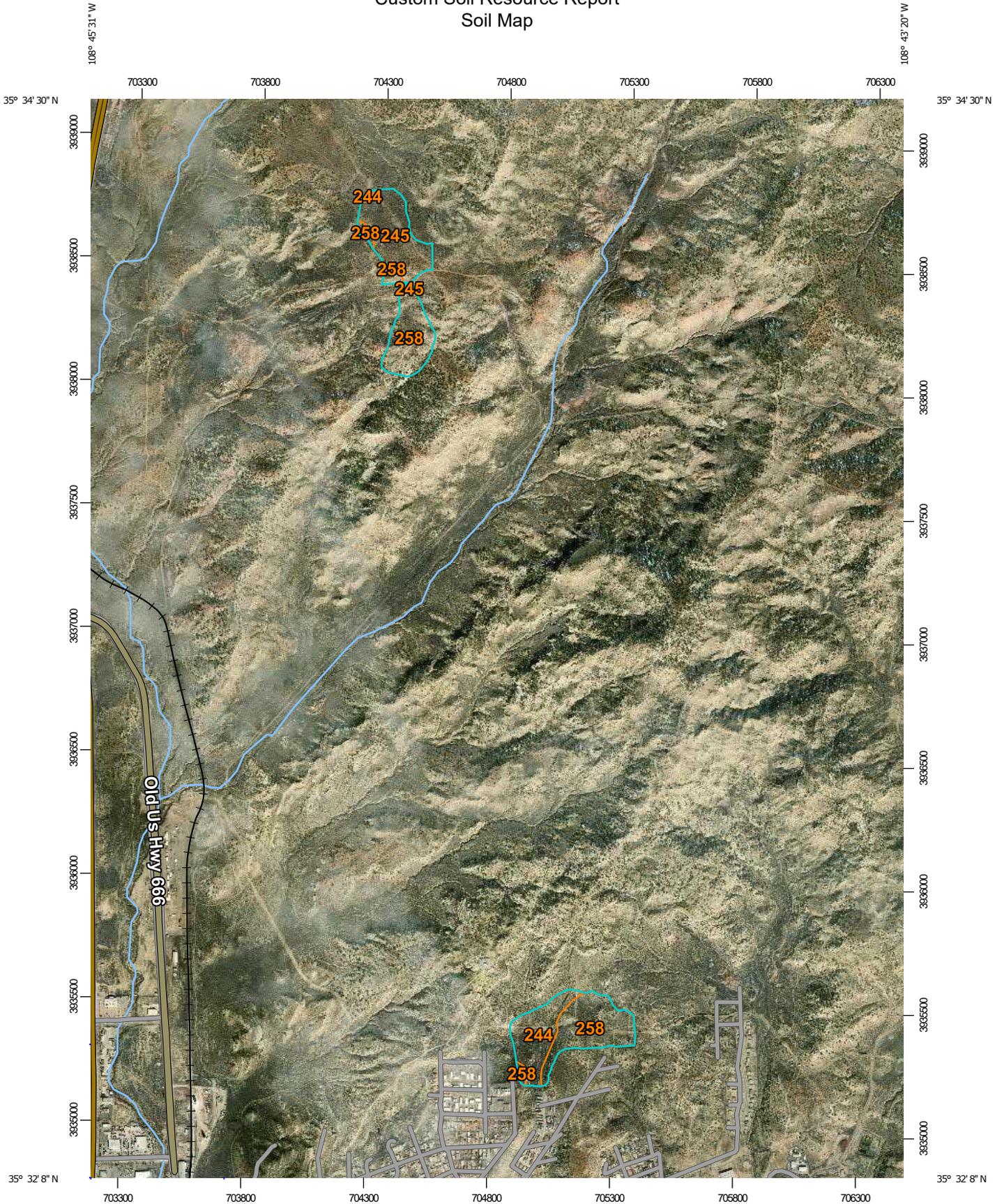
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identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report Soil Map



Map Scale: 1:21,300 if printed on A portrait (8.5" x 11") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 12N WGS84

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features

-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot

-  Spoil Area
-  Stony Spot
-  Very Stony Spot
-  Wet Spot
-  Other
-  Special Line Features

Water Features

 Streams and Canals

Transportation

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: McKinley County Area, New Mexico, McKinley County and Parts of Cibola and San Juan Counties
 Survey Area Data: Version 15, Jun 8, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 1, 2015—Nov 2, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
244	Buckle fine sandy loam, 1 to 8 percent slopes	12.2	20.8%
245	Buckle-Gapmesa-Barboncito complex, 1 to 6 percent slopes	16.2	27.5%
258	Eagleye-Atchee-Rock outcrop complex, 2 to 35 percent slopes	30.3	51.6%
Totals for Area of Interest		58.7	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate

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pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

McKinley County Area, New Mexico, McKinley County and Parts of Cibola and San Juan Counties

244—Buckle fine sandy loam, 1 to 8 percent slopes

Map Unit Setting

National map unit symbol: 1xn3
Elevation: 6,400 to 6,800 feet
Mean annual precipitation: 10 to 13 inches
Mean annual air temperature: 45 to 49 degrees F
Frost-free period: 100 to 135 days
Farmland classification: Not prime farmland

Map Unit Composition

Buckle and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Buckle

Setting

Landform: Drainageways, fan remnants on valley sides
Landform position (three-dimensional): Side slope, tread, dip
Down-slope shape: Linear, convex, concave
Across-slope shape: Convex, concave
Parent material: Eolian deposits over fan and slope alluvium derived from sandstone and shale

Typical profile

A - 0 to 4 inches: fine sandy loam
Bt1 - 4 to 14 inches: sandy clay loam
Bt2 - 14 to 22 inches: sandy clay loam
Btk1 - 22 to 34 inches: loam
Btk2 - 34 to 48 inches: clay loam
Btk3 - 48 to 62 inches: clay loam
Btk4 - 62 to 75 inches: clay loam

Properties and qualities

Slope: 1 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Gypsum, maximum content: 1 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water capacity: High (about 10.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6c

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Hydrologic Soil Group: C
Ecological site: R036XB006NM - Loamy
Hydric soil rating: No

Minor Components

Gapmesa

Percent of map unit: 10 percent
Ecological site: R035XA112NM - Loamy
Other vegetative classification: Loamy (null_13)
Hydric soil rating: No

Zia

Percent of map unit: 5 percent
Ecological site: R035XA113NM - Sandy
Other vegetative classification: Sandy (null_29)
Hydric soil rating: No

245—Buckle-Gapmesa-Barboncito complex, 1 to 6 percent slopes

Map Unit Setting

National map unit symbol: 1xn4
Elevation: 6,400 to 6,800 feet
Mean annual precipitation: 10 to 13 inches
Mean annual air temperature: 45 to 49 degrees F
Frost-free period: 100 to 135 days
Farmland classification: Not prime farmland

Map Unit Composition

Buckle and similar soils: 35 percent
Gapmesa and similar soils: 30 percent
Barboncito and similar soils: 25 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Buckle

Setting

Landform: Ridges, hills, dip slopes on cuestas
Landform position (two-dimensional): Backslope, footslope, shoulder, toeslope
Landform position (three-dimensional): Side slope, crest, nose slope, head slope
Down-slope shape: Convex
Across-slope shape: Convex, concave
Parent material: Eolian deposits over fan and slope alluvium derived from sandstone and shale

Typical profile

A - 0 to 1 inches: loamy fine sand
Bt1 - 1 to 7 inches: clay loam
Bt2 - 7 to 25 inches: sandy clay loam
Btk - 25 to 35 inches: clay loam

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Bk - 35 to 80 inches: fine sandy loam

Properties and qualities

Slope: 1 to 6 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 10 percent

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water capacity: High (about 9.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6c

Hydrologic Soil Group: C

Ecological site: R036XB006NM - Loamy

Hydric soil rating: No

Description of Gapmesa

Setting

Landform: Ridges, hills, dip slopes on cuestas

Landform position (two-dimensional): Backslope, footslope, shoulder, toeslope

Landform position (three-dimensional): Side slope, crest, nose slope, head slope

Down-slope shape: Convex

Across-slope shape: Convex, concave

Parent material: Eolian deposits over alluvium derived from sandstone and shale

Typical profile

A - 0 to 1 inches: fine sandy loam

Bt - 1 to 9 inches: loam

Btk1 - 9 to 20 inches: loam

Btk2 - 20 to 31 inches: clay loam

R - 31 to 40 inches: bedrock

Properties and qualities

Slope: 1 to 3 percent

Depth to restrictive feature: 20 to 40 inches to lithic bedrock

Drainage class: Well drained

Runoff class: High

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 5 percent

Gypsum, maximum content: 1 percent

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water capacity: Low (about 5.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Custom Soil Resource Report

Land capability classification (nonirrigated): 6c
Hydrologic Soil Group: C
Ecological site: R036XB006NM - Loamy
Hydric soil rating: No

Description of Barboncito

Setting

Landform: Ridges, hills, dip slopes on cuestas
Landform position (two-dimensional): Backslope, footslope, shoulder, toeslope
Landform position (three-dimensional): Side slope, crest, nose slope, head slope
Down-slope shape: Convex
Across-slope shape: Convex, concave
Parent material: Eolian deposits over slope alluvium derived from sandstone and shale

Typical profile

A - 0 to 2 inches: loamy fine sand
Bt - 2 to 6 inches: sandy clay loam
Btk - 6 to 11 inches: clay loam
R - 11 to 20 inches: bedrock

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water capacity: Very low (about 1.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: R036XB006NM - Loamy
Hydric soil rating: No

Minor Components

Betonnite

Percent of map unit: 5 percent
Ecological site: R035XA113NM - Sandy
Other vegetative classification: Sandy (null_29)
Hydric soil rating: No

Rock outcrop

Percent of map unit: 5 percent
Hydric soil rating: No

258—Eagley-Atchee-Rock outcrop complex, 2 to 35 percent slopes

Map Unit Setting

National map unit symbol: 1xnd
Elevation: 6,500 to 7,000 feet
Mean annual precipitation: 10 to 13 inches
Mean annual air temperature: 46 to 49 degrees F
Frost-free period: 100 to 135 days
Farmland classification: Not prime farmland

Map Unit Composition

Eagley and similar soils: 40 percent
Atchee and similar soils: 35 percent
Rock outcrop: 20 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Eagleye

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Backslope, footslope, shoulder, toeslope
Landform position (three-dimensional): Side slope, crest, nose slope, head slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Slope alluvium over residuum weathered from shale

Typical profile

A - 0 to 2 inches: gravelly clay loam
Cy - 2 to 10 inches: clay
Cr - 10 to 20 inches: bedrock

Properties and qualities

Slope: 5 to 35 percent
Depth to restrictive feature: 5 to 20 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Gypsum, maximum content: 2 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water capacity: Very low (about 1.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: R036XB002NM - Clayey
Hydric soil rating: No

Description of Atchee

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Backslope, footslope, shoulder, toeslope
Landform position (three-dimensional): Side slope, crest, nose slope, head slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Slope alluvium over residuum weathered from sandstone and shale

Typical profile

A - 0 to 2 inches: fine sandy loam
C1 - 2 to 12 inches: extremely channery sandy clay loam
C2 - 12 to 14 inches: extremely channery sandy clay loam
R - 14 to 20 inches: bedrock

Properties and qualities

Slope: 2 to 10 percent
Depth to restrictive feature: 5 to 20 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water capacity: Very low (about 1.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: R036XB002NM - Clayey
Hydric soil rating: No

Description of Rock Outcrop

Typical profile

R - 0 to 60 inches: bedrock

Properties and qualities

Depth to restrictive feature: 0 inches to lithic bedrock
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)

Custom Soil Resource Report

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8s

Hydric soil rating: No

Minor Components

Lockerby

Percent of map unit: 3 percent

Ecological site: R035XA128NM - Clayey

Other vegetative classification: Clayey (null_7)

Hydric soil rating: No

Barboncito

Percent of map unit: 2 percent

Ecological site: R035XA112NM - Loamy

Other vegetative classification: Loamy (null_13)

Hydric soil rating: No

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Custom Soil Resource Report

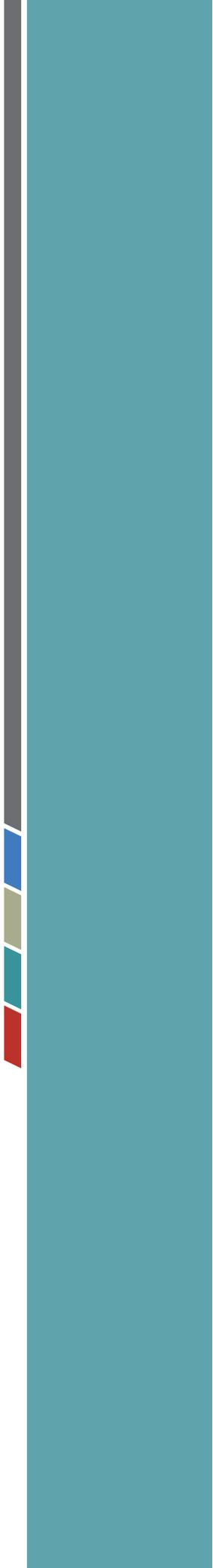
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Appendix D

FEMA Floodplain Maps



Appendix D

Tribal and Agency Consultation

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

Jerry Schoeppner, Director
Mining and Minerals Division



9 August 2021

Mr. Jeff Pappas Ph. D., State Historic Preservation Officer and Director
Historic Preservation Division
Department of Cultural Affairs
407 Galisteo Street, Suite 236
Bataan Memorial Bldg.
Santa Fe, NM 87501

Dear Dr. Pappas;

The New Mexico Abandoned Mine Land Program (AML), in partnership with the U.S. Department of the Interior, Office of Surface Mining Reclamation and Enforcement, is planning to address long-term threats to life and properties due to coal fires north of Gallup, McKinley County, New Mexico. 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 proposed project is in the Gallup area of McKinley County, New Mexico and consists of the Enterprise-Brown, and the Navajo coal Mine fire, northeast of Gallup (Figure 1). The area of potential effects, as defined under 36 CFR 800.16(d), encompasses staging areas and work areas and potential areas of surface disturbance.

Background

The Gallup Coal Field had been identified prior to 1870 and was commercially developed in the early 1880s at the railroad arrived as a means to bring the coal to markets and also served as a important user of the coal. Specific coal mines to be addressed in this Task Order include”

1. Enterprise-Brown Coal Mine Fire Mitigation Project (Figures 1 & 2)
2. Navajo coal mine fire Mitigation Project (Figures 1 & 3)

The **Enterprise-Brown Mine fire** is described in Nickelson’s 1988 treatment of the coal mining in the San Juan Basin. Mining activities began in 1907 with mining Black Diamond coal bed. By 1913 mining was extended into the old Sunshine and Black Diamond mines, which filled the mine with damp, and they began to close the mine by robbing its pillars. By 1979, the remaining coal room pillars were burning.

The area of potential effects (APE) for this project covers 22.46 acres and is situated in the SE ½ of the SW ¼ and the W ½ of the SW ¼ of Section 10, Township 5N, Range 18W (Figures 1 & 3).

Treatment activities may include geotechnical drilling to identify active fire areas and to extinguish the fire areas, AML may excavate and quench the fire, then cover the disturbed areas.

The **Navajo Coal Mine** consists of several mines (Navajo, Navajo No. 1-3 and Navajo No. 5) opened between 1909 and 1921. The APE covers 29.28 acres of land in the SE $\frac{1}{4}$ of the SE $\frac{1}{4}$ and the NW $\frac{1}{4}$ of the NW $\frac{1}{4}$ of Section 3, Township 15N Range 18W. (Figure 1 & 3)

As part of the historic property identification efforts for this undertaking, the AML contracted Parametrix to subject the entire APE to an intensive level cultural resources management (CRM) inventory. A copy of the cultural resources inventory report and supporting documents are attached.

A total of three Isolated Occurrences (IO) and four archaeological sites were documented during this investigation. The IOs are unlikely to contain additional important information beyond what has been documented in the report.

Three previously recorded archaeological sites were revisited and updated. One of those previously documented sites (LA 178670) was originally documented as five separate sites (LA 178670, LA 178681, LA 178682, LA 178683, and LA 178692) in 2013 by PaleoWest. However, Parametrix found that the sites had a continuous artifact scatter between them and combined them under a single site number, LA 178670. This US Territorial to Statehood-WWII (AD 1880–1920) site is the remains of a historic mining complex that included the Black Diamond, Bubany, Enterprise-Brown, McVickers, and Kauzlarich mines. This mining complex manifests a strong association with the historic mining activity in the Gallup area and includes habitation features that could lend information to the lifeways and settlement patterns of the miners. Therefore, LA 178670 is recommended eligible under Criteria A and D. Within the project work zone, there are no intact mining features. This could be due to previous disturbance or mitigation. Therefore, no adverse effects are anticipated to LA 178670 because of this project.

LA 66500 is another large historic mining site that was updated during this investigation. This site is the remains of the Navajo Mine and the Gibson town site. Like LA 178670, this site dates to the US Territorial to Statehood-WWII period (AD 1880–1940) and contains multiple mine openings and habitation features. Again, this type of site shows how intensive mining activity was in the Gallup area and could contribute additional information to existing historic records on these mines. LA 66500 is recommended eligible under Criteria A and D. Within the southern portion of the Navajo mine survey area, there are no intact mining features, which is likely due to previous disturbance or mitigation. However, there are intact mine openings within the northern extent of the Navajo Survey area and the Northern Navajo Extension. These features may be backfilled with their waste piles or sediment of the same color. Treatment activities may include geotechnical drilling to identify active fire areas and to extinguish the fire areas, AML may excavate and quench the fire, then cover the disturbed areas. A 2 to 3-foot depression should be left to demarcate the location of the mine opening. If these measures are taken no adverse effect is anticipated to LA 66500.

Two prehistoric sites were also recorded, one of which was previously recorded (LA 146726) and the other newly identified (LA 199149). LA 146726 is an Anasazi, Pueblo II-III (AD 925–1175) site with five features, including a habitation feature and a midden.

August 9, 2021

Page 3

LA 199149 is an Anasazi, late Pueblo I-III (AD 850–1150) site with two features of undetermined origin. Both sites have features with data potential and are recommended eligible under Criterion D. The project would not impact the prehistoric site locations, but one feature at LA 199149 is within an access road. If proper avoidance measures are taken, no adverse effect is anticipated at either of prehistoric sites.

Consultation with appropriate Indian Tribes (the Pueblos of Acoma, Hopi, Isleta, Laguna, Tesuque and Zuni and the Navajo Nation) were conducted. No responses of Tribal concerns were received.

With the cautionary measures stated above taken, the safeguard projects should produce no adverse effects to historic properties. We seek your concurrence with our findings and recommendations regarding resource eligibility to the NRHP and potential project effects.

Should you have any questions, please contact Rick Wessel at (505)-819-8856 or richard.wessel@state.nm.us.

Sincerely,



Richard L. Wessel,
AML Cultural Resources Manager

Concur:

Andrew Zink

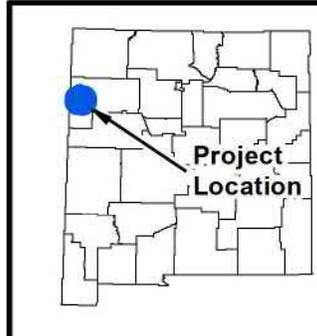
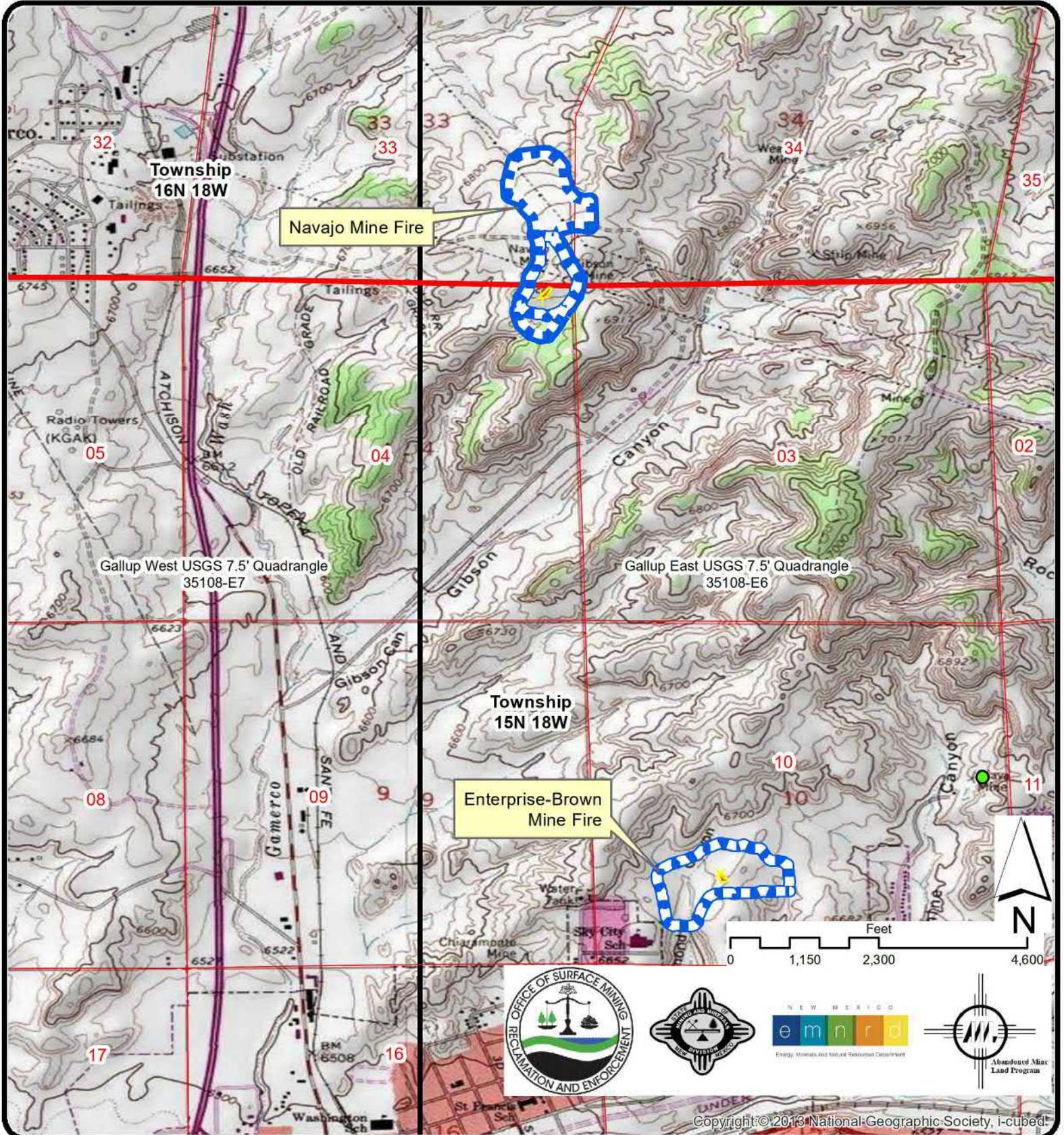
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Date: 2021.08.23 13:29:21 -06'00'

8/23/2021

for: State Historic Preservation Officer

Date

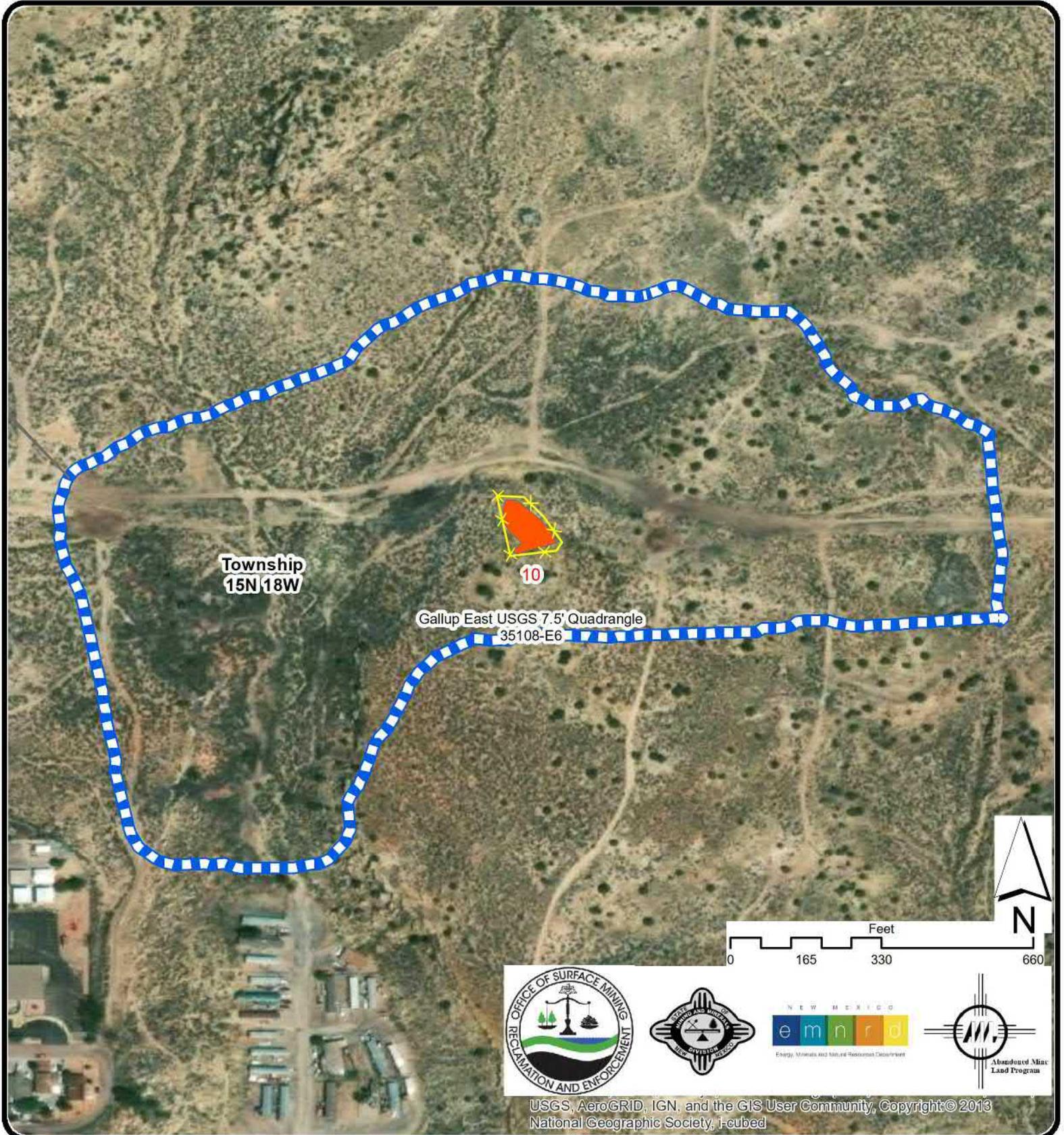
Comments:



- ### Legend
-  APE
 -  Surveyed Space
 -  Fence
 -  Fire Area

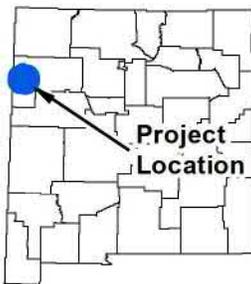
Title:
Figure 1: Gallup Coal Mine Fires

Location:
Gallup, McKinley County, New Mexico



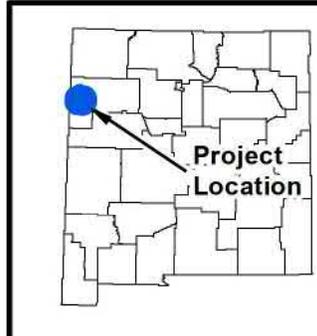
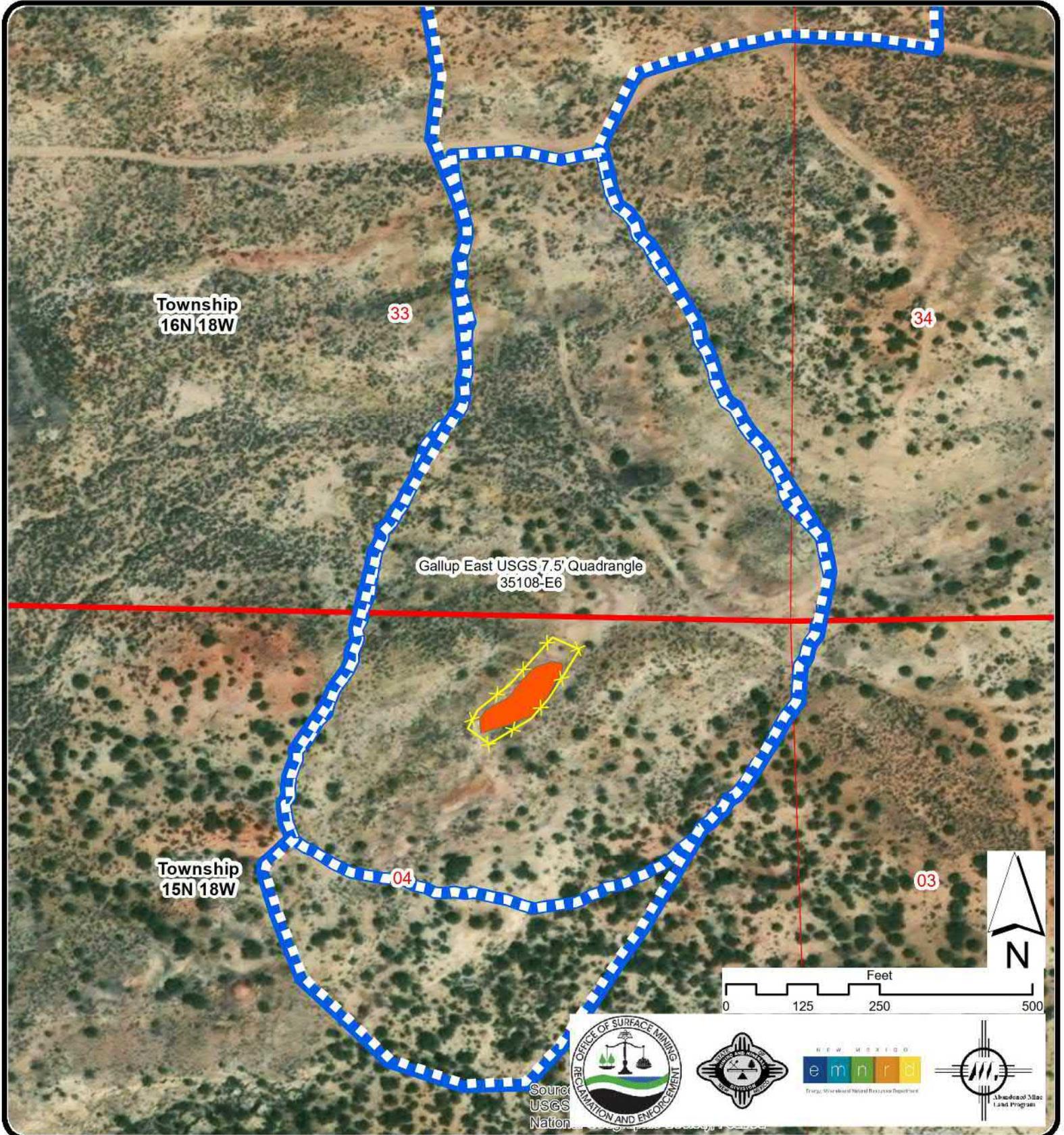
Legend

-  APE
-  Surveyed Space
-  Fence
-  Fire Area

 Project Location

Title:
Figure 2: Enterprise-Brown Coal Mine Fire

Location:
Gallup, McKinley County, New Mexico



- Legend**
-  APE
 -  Surveyed Space
 -  Fence
 -  Fire Area

Title:
Figure 3: Navajo Coal Mine Fire

Location:
Gallup, McKinley County, 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

Jerry Schoeppner, Director
Mining and Minerals Division



2 November 2020

Honorable Brian Vallo, Governor
P.O. Box 309
Acoma, NM 87034

Dear Honorable Governor Vallo,

The New Mexico Abandoned Mine Land Program (AML), in partnership with the U.S. Department of the Interior, Office of Surface Mining Reclamation and Enforcement, is planning to address longterm threats to life and properties due to coal fires and one open mine adits in and around Gallup, McKinley County, New Mexico. 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 proposed project is in the Gallup area of McKinley County, New Mexico and consists of one open adit (Gallup Dog Park) and a coal fire (Bell-Aztec Coal Mine) within the town of Gallup and three coal mine fires (Enterprise Brown, Navajo, and Biava coal mines) north of Gallup and one coal mine fire (Carbon Coal Mine) west of Gallup (Figure 1).

The area of potential effects, as defined under 36 CFR 800.16(d), encompasses staging areas and work areas and potential areas of surfac disturbance. (Figures 2a-f)

Background

The Gallup Coal Field had been identified prior to 1870 and was commercially developed in the early 1880s at the railroad arrived as a means to bring the coal to markets and also served as a important user of the coal. Specific coal mines to be addressed in this Task Order include”

1. Gallup Dog Park/Laguna Circle Adit Safeguard & Drainage Project (Figures 1 & 2a)
2. Bell-Aztec Coal Fire Safeguard Project (Figures 1 & 2b)
3. Biava Coal Mine Fire Safeguard Project (Figures 1 & 2c)
4. Carbon Coal Mine Fire Safeguard Project (Figures 1 & 2d)
5. Enterprise-Brown Coal Mine Fire Mitigation Project (Figures 1 & 2e)
6. Navajo coal mine fire Mitigation Project (Figures 1 & 3f)

The **Gallup Dog Park/Laguna Circle Mine Adit** is not mentioned in Nickelson’s 1988 treatment of the coam mining in the San Juan Basin. Mining activities were conducted to extract the fire clay and coal. Mining operations were conducted through two adits whose portals are located near the bottom of the west facing

slope, west and southwest of the Laguna Circle cul de sac. At present, it is not known who conducted the mining or when they occurred.

In 1984-5 the AML conducted exploratory drilling to determine the extent of the underground mine workings, grouting to stabilize the landform, and backfilling the southern adit.

AML is planning to close an adit and improve its drainage at the Gallup City Dog Park, fence four coal mine fire surface.

The area of potential effects (APE) for this project covers 2.8 acres and is situated in the NW $\frac{1}{4}$ of the NW $\frac{1}{4}$ of Section 22, TWP. 5N, RNG 18W (Figures 1 & 2a.).

The **Bell-Aztec Coal Mine** was initially opened around 1885 by Judge Joseph Bell, among others who formed the Bell and Company, which operated until 1888 when it was sold and was renamed the Aztec mine. A fire has been burning along the coal seam and is venting through to the surface.

The APE, which covers 1.1 acres of land owned by the City of Gallup in the SE $\frac{1}{4}$ of the NE $\frac{1}{4}$ of S10 T 15N R18W of S10 and the SW $\frac{1}{4}$ of the NW $\frac{1}{4}$ of S11 of the same township (Figures 1 & 2b).

The **Biava No. 3 Coal Mine** was opened in 1949 and operated through 1957 when the Leyba Coal Co. took over the operation and it continued until 1961, when the mine closed.

The Biava No. 3 mine is located in the SE $\frac{1}{4}$ of the NE $\frac{1}{4}$ and the NW $\frac{1}{4}$ of the SW $\frac{1}{4}$ of Section 10, T15N R18W and the SW $\frac{1}{4}$ of the NW $\frac{1}{4}$ and the NW $\frac{1}{4}$ of the SW $\frac{1}{4}$ of Section 11 of the same township.

The Biava project APE covers 14.75 acres of privately owned land (Figures 1 & 2c).

The **Carbon Coal Mine** was operated by the Carbon Coal Company, which began strip mining operations on land just west of Gallup, approximately 2 miles northeast of the village of Mentmore in late 1978. It was placed on inactive status in December 1984. A fire has been burning along the coal seam and is venting to the surface.

The APE for this area covers 13.18 acres of privately-owned land and is situated in the SE $\frac{1}{4}$ of the NW $\frac{1}{4}$ of the NW $\frac{1}{4}$ of Section 14, T15N R19W, N.M.P.M. (Figures 1 & 2d)

The **Enterprise-Brown Mine fire** is described in Nickelson's 1988 treatment of the coam mining in the San Juan Basin. Mining activities began in 1907 with mining Black Diamond coal bed. By 1913 mining was extended into the old Sunshine and Black Diamond mines, which filled the mine with damp and they began to close the mine by robbing its pillars. By 1979, the remaining coal room pillars were burning.

The area of potential effects (APE) for this project covers 22.46 acres and is situated in the SE $\frac{1}{2}$ of the SW $\frac{1}{4}$ and the W $\frac{1}{2}$ of the SW $\frac{1}{4}$ of Section 10, Township 5N, Range 18W (Figures 1 & 2e).

The **Navajo Coal Mine** consists of several mines (Navajo, Navajo No. 1-3 and Navajo No. 5) opened between 1909 and 1921. The APE covers 12.46 acres of land in the SE $\frac{1}{4}$ of the SE $\frac{1}{4}$ and the NW $\frac{1}{4}$ of the NW $\frac{1}{4}$ of Section 3, Township 15N Range 18W (Figures 1 & 2f).

As part of the historic property identification efforts for this undertaking, the AML will have the entire APE subjected to an intensive level cultural resources management (CRM) inventory. At your request, a PDF copy of CRM inventory results will be forwarded to your office part of this project specific consultation. Importantly, we welcome any concerns or comments you may have pertaining to the proposed project and the scope of the historic property inventory at this time.

Please indicate within 30 days upon receipt of this letter if you wish to be a consulting party in accordance with the revised regulations of Section 106 of the NHPA (36 CFR Part 800). Also, if you have any questions or need additional information feel free to contact me at (505) 476-3426 or at richard.wessel@state.nm.us. We look forward to working with you and any tribal historic preservation representative on this project.

Sincerely,



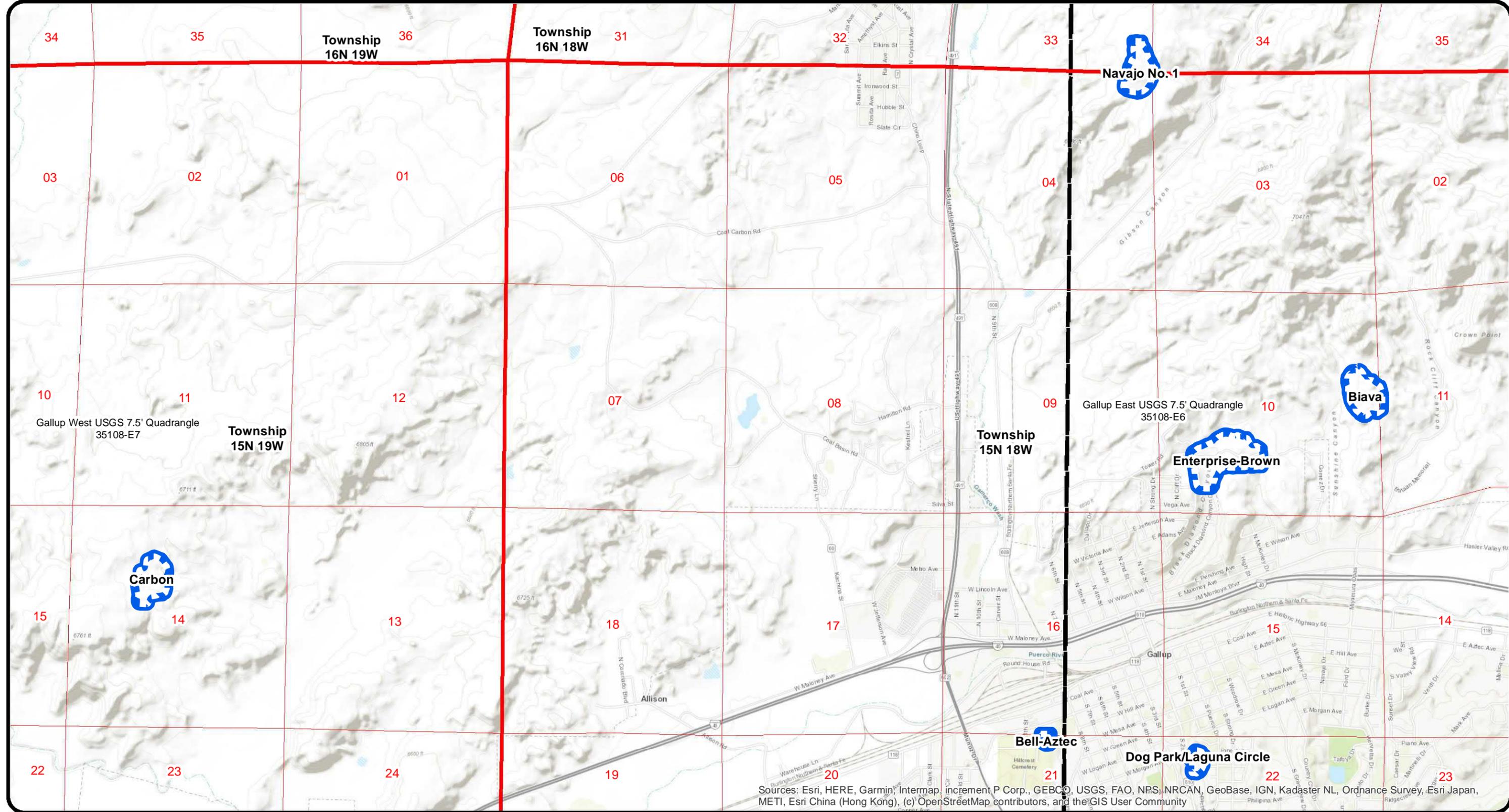
Richard L. Wessel
Cultural Resources Manager

CC: Mr. Todd Scissions, Acoma Pueblo Tribal Historic Preservation Officer

- Yes, the Pueblo of Acoma wishes to be a consulting party to the Coal Mine Land Safeguard Project and would like to review and comment in the cultural resources inventory report
- The Pueblo of Acoma does not have concerns with the proposed project and does not wish to be a consulting party unless conditions specified below are met.

Tribal Representative: _____ Date: _____

Comments/Conditions:



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Office of Surface Mining Reclamation and Enforcement
 New Mexico
 Abandoned Mine Land Program

Project Location

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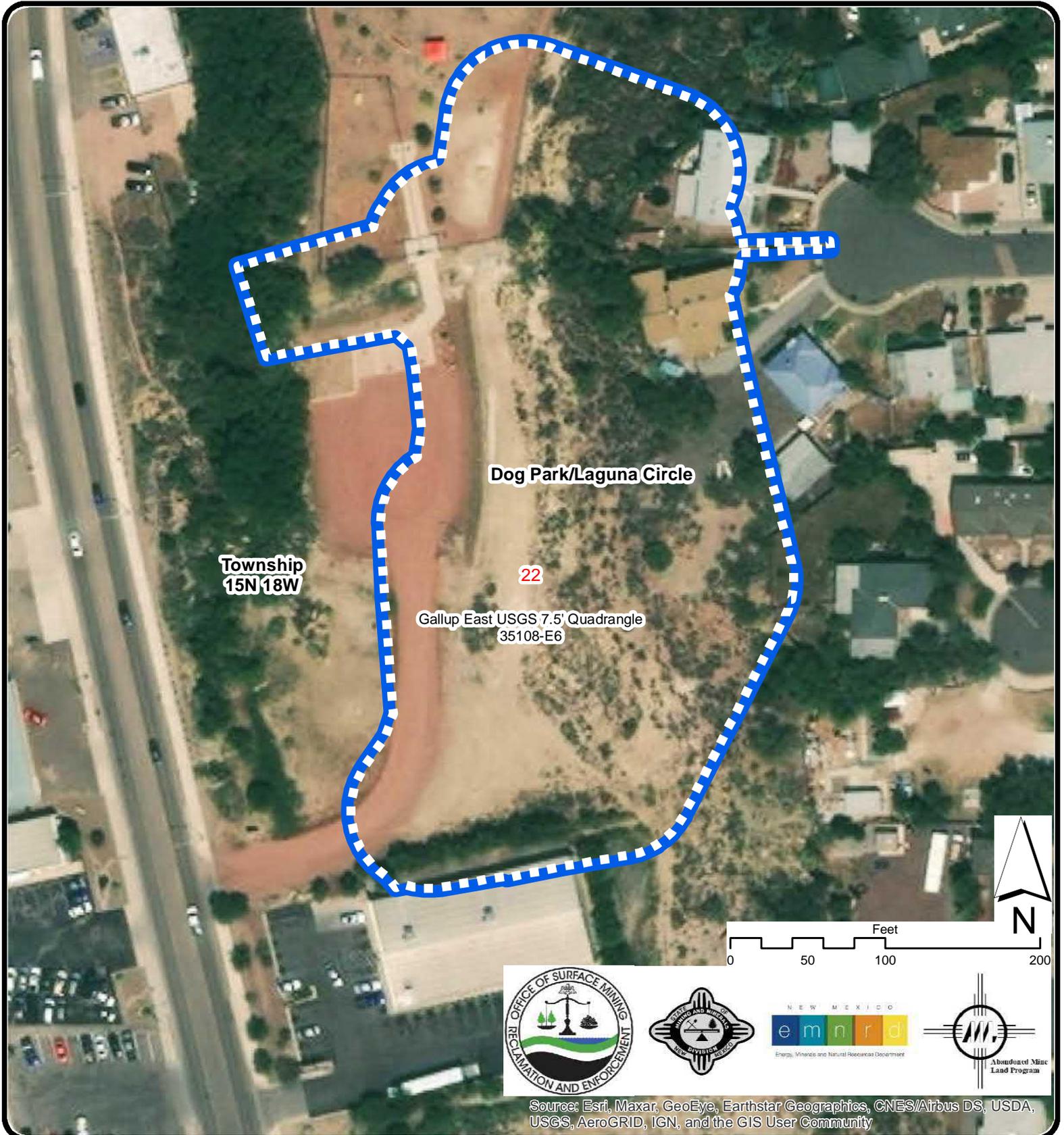
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Project Locations

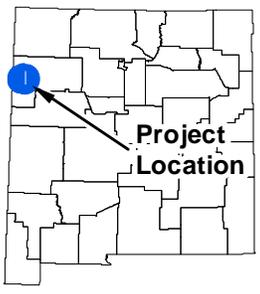
Mine

Title: **Figure 1: Project Locations**

Location: **Gallup, McKinley County, New Mexico**

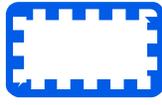


Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Legend

Project Locations

 Mine

Title:

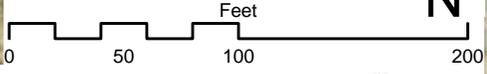
Figure 2a: Gallup Dog Park Adit APE

Location:

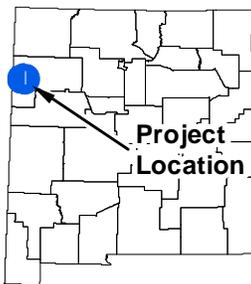
**Gallup, McKinley County,
New Mexico**



Bell-Aztec

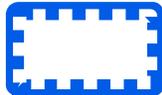


Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



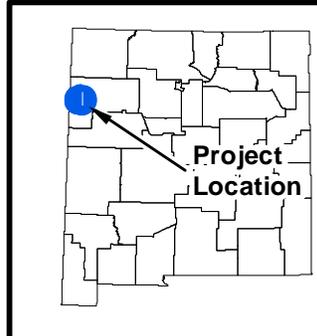
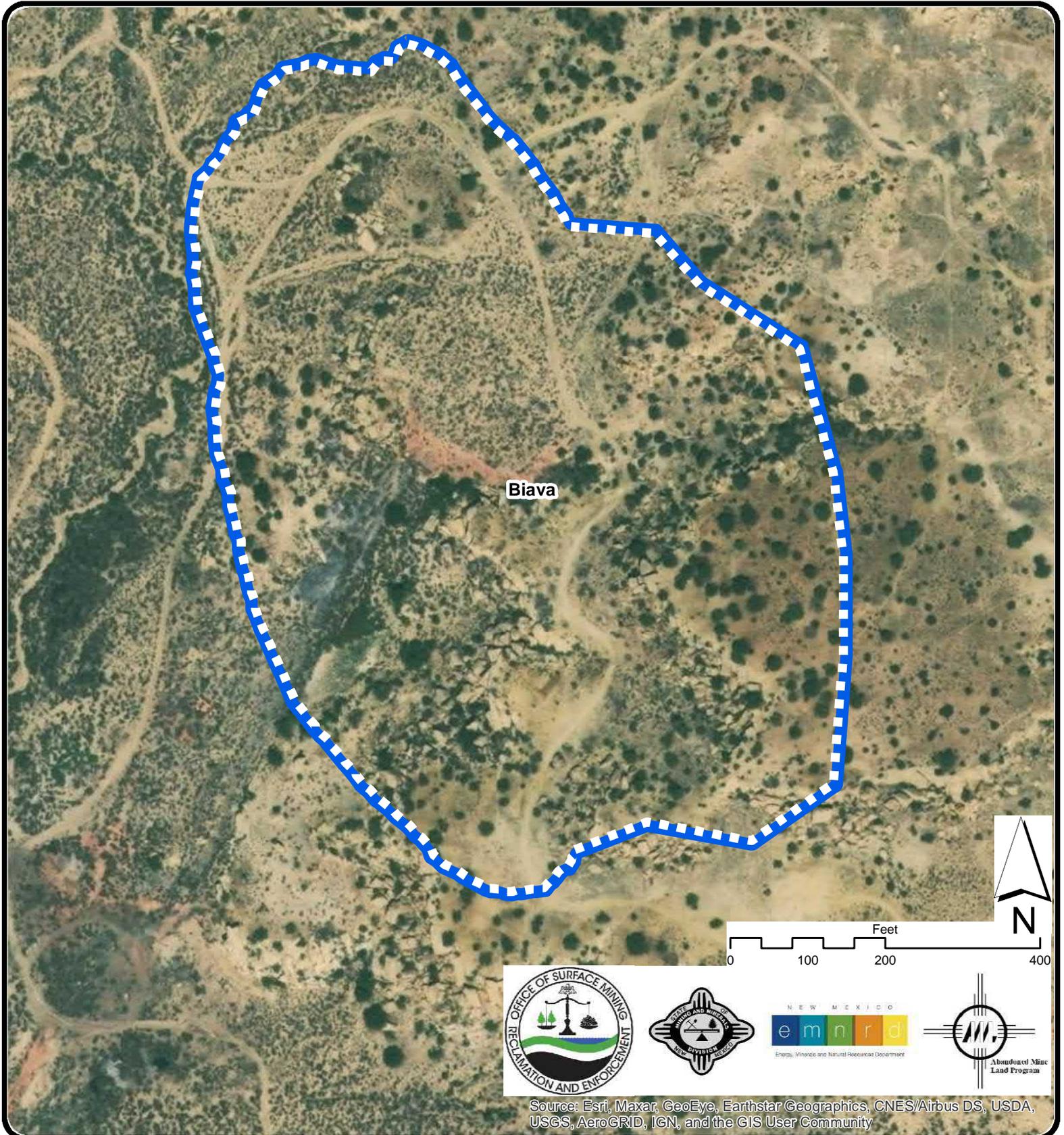
Legend

Project Locations

 Mine

Title:
Figure 2b: Bell Aztec Mine Fire APE

Location:
**Gallup, McKinley County,
 New Mexico**



Legend

Project Locations

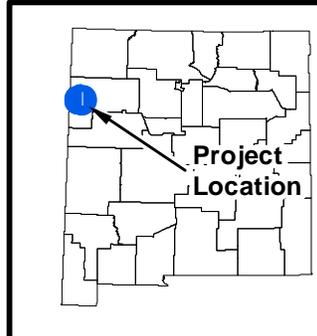
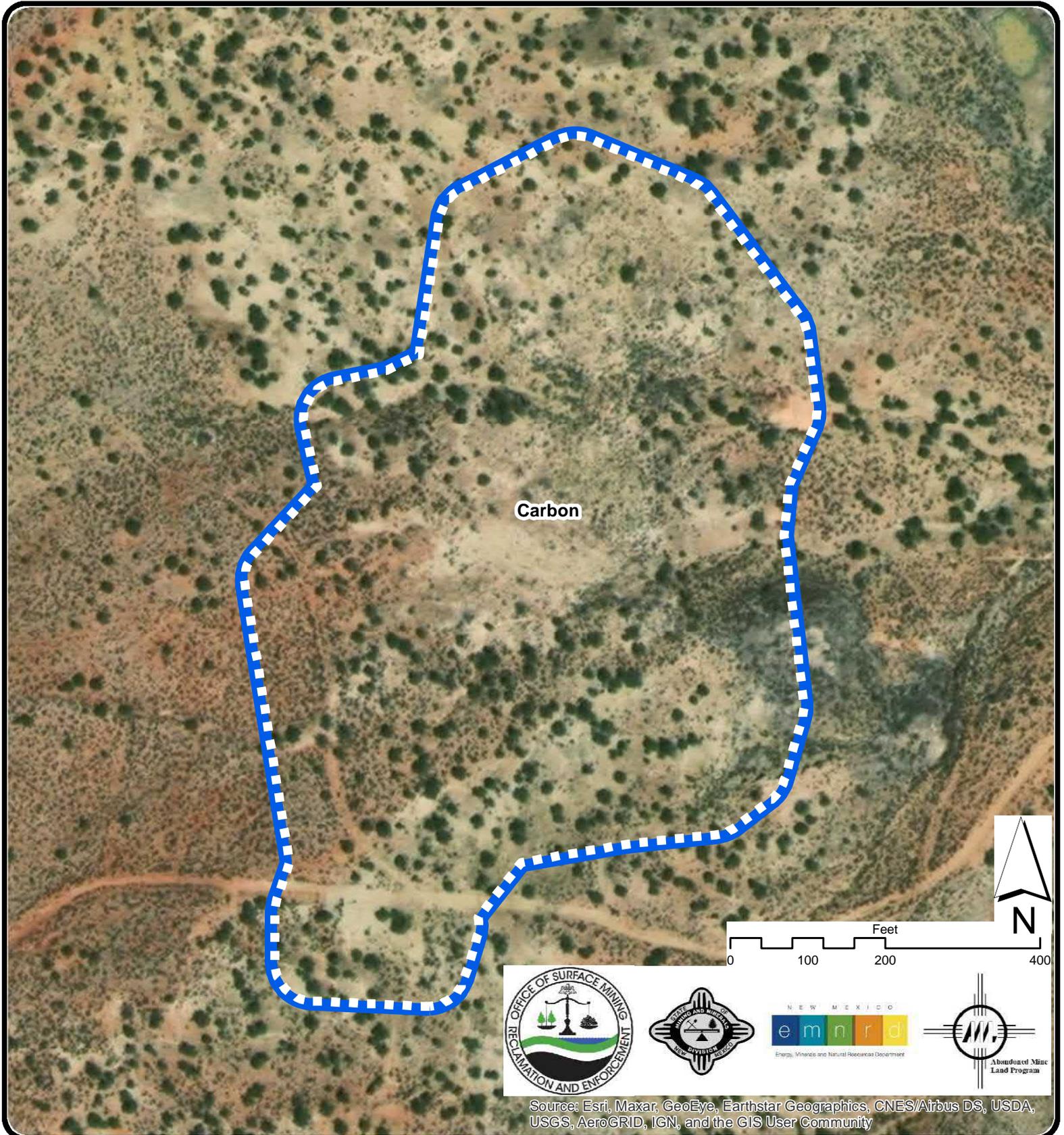
APE

Title:

Figure 2c: Biava Mine Fire APE

Location:

Gallup, McKinley County,
New Mexico



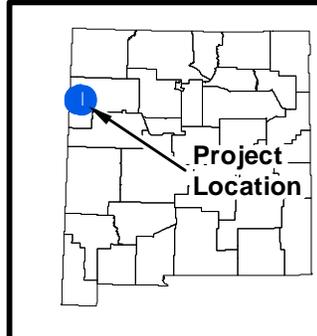
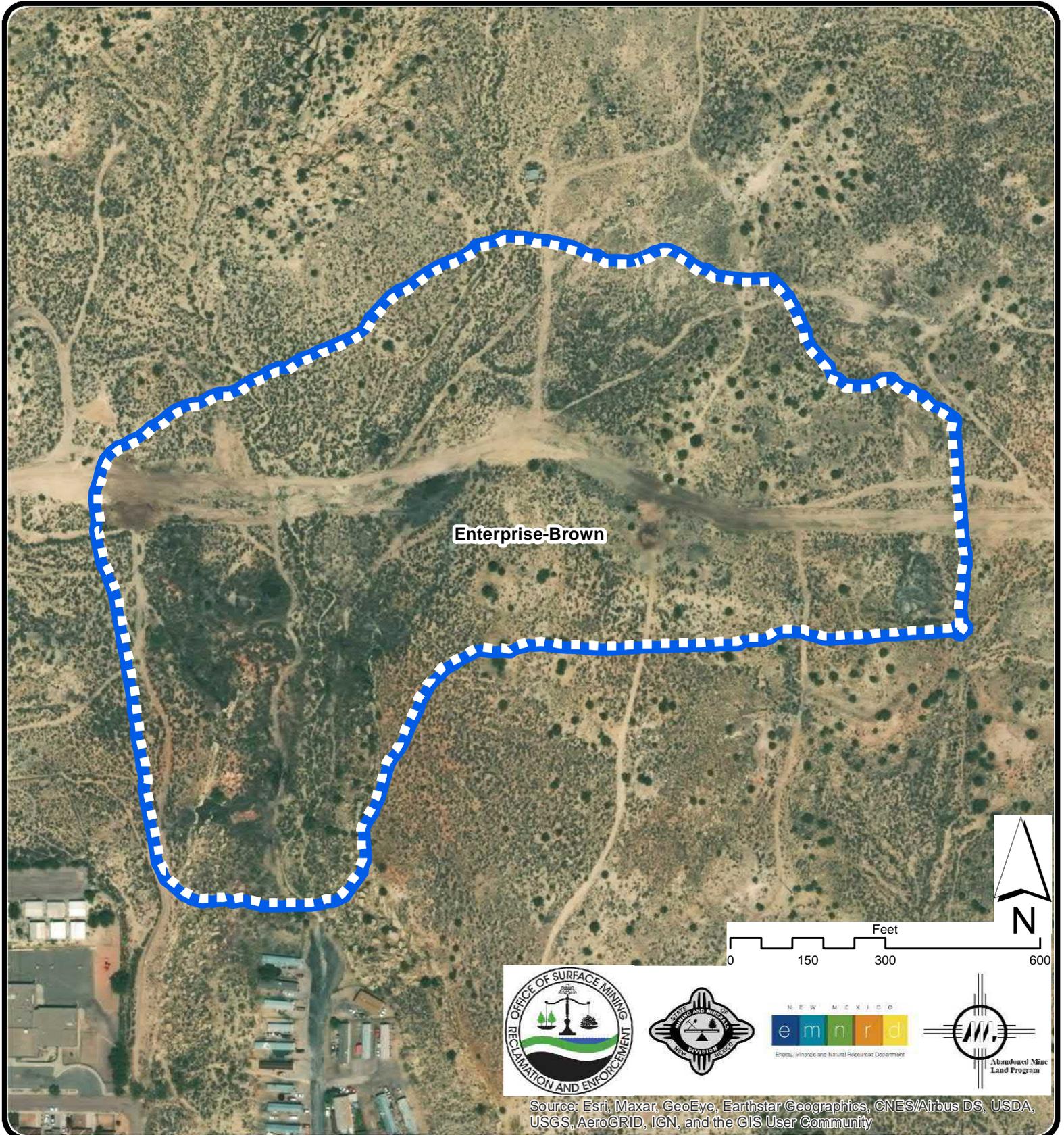
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Project Locations

APE

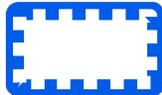
Title:
Figure 2d: Carbon Mine Fire APE

Location:
**Gallup, McKinley County,
New Mexico**



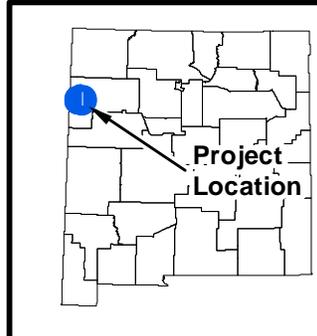
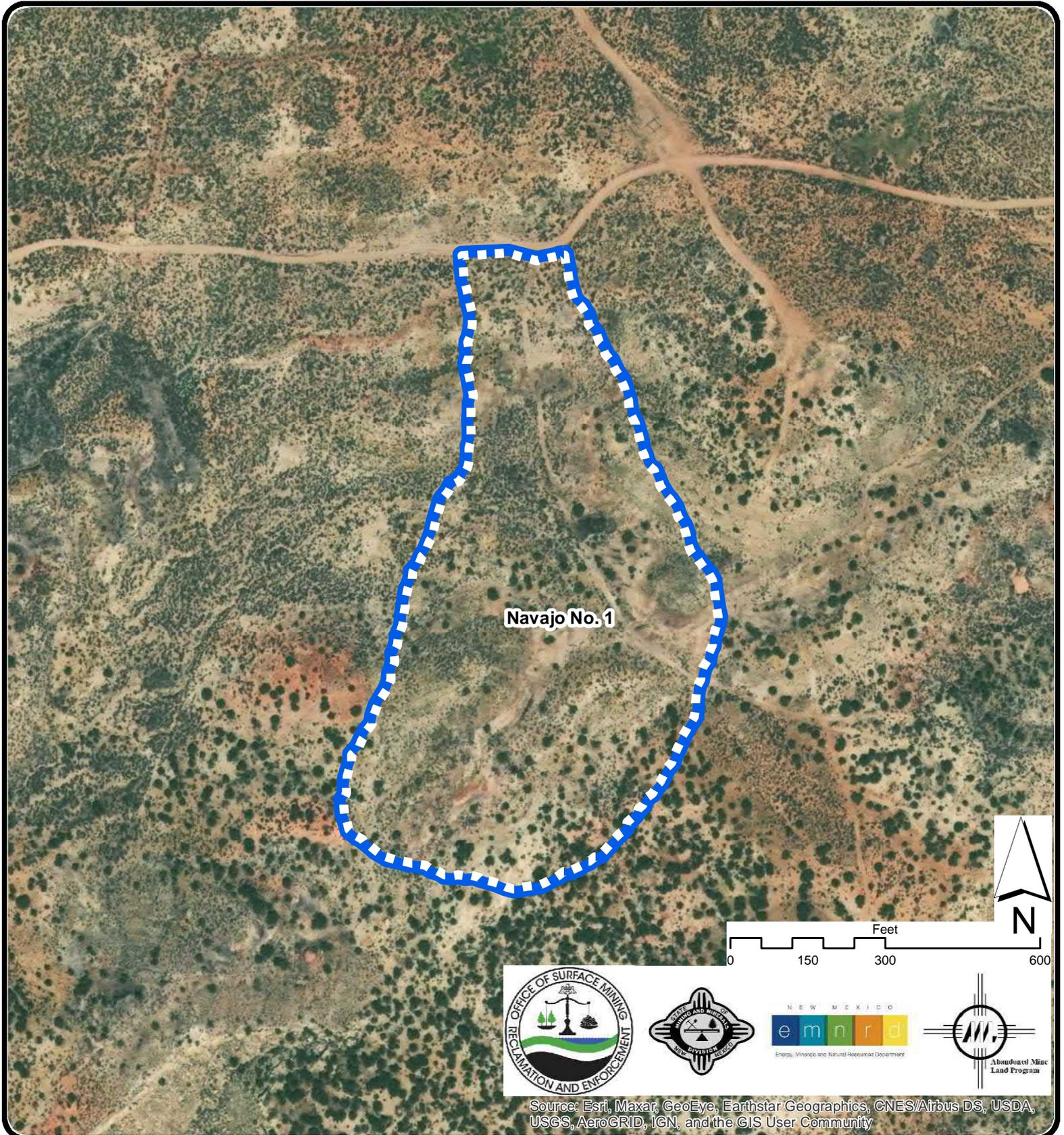
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Project Locations

 APE

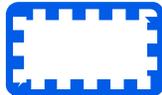
Title:
Figure 2e: Enterprise-Brown Mine Fire APE

Location:
Gallup, McKinley County, New Mexico



Legend

Project Locations

 APE

Title:

Figure 2 f: Navajo Mine Fire APE

Location:

**Gallup, McKinley County,
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

Jerry Schoeppner, Director
Mining and Minerals Division



2 November 2020

Honorable Chairman Timothy L. Nuvangyaoma
P.O. Box 123
Kykotsmovi, AZ 86039

Dear Honorable Chairman Nuvangyaoma,

The New Mexico Abandoned Mine Land Program (AML), in partnership with the U.S. Department of the Interior, Office of Surface Mining Reclamation and Enforcement, is planning to address longterm threats to life and properties due to coal fires and one open mine adits in and around Gallup, McKinley County, New Mexico. 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 proposed project is in the Gallup area of McKinley County, New Mexico and consists of one open adit (Gallup Dog Park) and a coal fire (Bell-Aztec Coal Mine) within the town of Gallup and three coal mine fires (Enterprise Brown, Navajo, and Biava coal mines) north of Gallup and one coal mine fire (Carbon Coal Mine) west of Gallup (Figure 1).

The area of potential effects, as defined under 36 CFR 800.16(d), encompasses staging areas and work areas and potential areas of surfac disturbance. (Figures 2a-f)

Background

The Gallup Coal Field had been identified prior to 1870 and was commercially developed in the early 1880s at the railroad arrived as a means to bring the coal to markets and also served as a important user of the coal. Specific coal mines to be addressed in this Task Order include”

1. Gallup Dog Park/Laguna Circle Adit Safeguard & Drainage Project (Figures 1 & 2a)
2. Bell-Aztec Coal Fire Safeguard Project (Figures 1 & 2b)
3. Biava Coal Mine Fire Safeguard Project (Figures 1 & 2c)
4. Carbon Coal Mine Fire Safeguard Project (Figures 1 & 2d)
5. Enterprise-Brown Coal Mine Fire Mitigation Project (Figures 1 & 2e)
6. Navajo coal mine fire Mitigation Project (Figures 1 & 3f)

The **Gallup Dog Park/Laguna Circle Mine Adit** is not mentioned in Nickelson’s 1988 treatment of the coam mining in the San Juan Basin. Mining activities were conducted to extract the fire clay and coal. Mining operations were conducted through two adits whose portals are located near the bottom of the west facing

slope, west and southwest of the Laguna Circle cul de sac. At present, it is not known who conducted the mining or when they occurred.

In 1984-5 the AML conducted exploratory drilling to determine the extent of the underground mine workings, grouting to stabilize the landform, and backfilling the southern adit.

AML is planning to close an adit and improve its drainage at the Gallup City Dog Park, fence four coal mine fire surface.

The area of potential effects (APE) for this project covers 2.8 acres and is situated in the NW $\frac{1}{4}$ of the NW $\frac{1}{4}$ of Section 22, TWP. 5N, RNG 18W (Figures 1 & 2a.).

The **Bell-Aztec Coal Mine** was initially opened around 1885 by Judge Joseph Bell, among others who formed the Bell and Company, which operated until 1888 when it was sold and was renamed the Aztec mine. A fire has been burning along the coal seam and is venting through to the surface.

The APE, which covers 1.1 acres of land owned by the City of Gallup in the SE $\frac{1}{4}$ of the NE $\frac{1}{4}$ of S10 T 15N R18W of S10 and the SW $\frac{1}{4}$ of the NW $\frac{1}{4}$ of S11 of the same township (Figures 1 & 2b).

The **Biava No. 3 Coal Mine** was opened in 1949 and operated through 1957 when the Leyba Coal Co. took over the operation and it continued until 1961, when the mine closed.

The Biava No. 3 mine is located in the SE $\frac{1}{4}$ of the NE $\frac{1}{4}$ and the NW $\frac{1}{4}$ of the SW $\frac{1}{4}$ of Section 10, T15N R18W and the SW $\frac{1}{4}$ of the NW $\frac{1}{4}$ and the NW $\frac{1}{4}$ of the SW $\frac{1}{4}$ of Section 11 of the same township.

The Biava project APE covers 14.75 acres of privately owned land (Figures 1 & 2c).

The **Carbon Coal Mine** was operated by the Carbon Coal Company, which began strip mining operations on land just west of Gallup, approximately 2 miles northeast of the village of Mentmore in late 1978. It was placed on inactive status in December 1984. A fire has been burning along the coal seam and is venting to the surface.

The APE for this area covers 13.18 acres of privately-owned land and is situated in the SE $\frac{1}{4}$ of the NW $\frac{1}{4}$ of the NW $\frac{1}{4}$ of Section 14, T15N R19W, N.M.P.M. (Figures 1 & 2d)

The **Enterprise-Brown Mine fire** is described in Nickelson's 1988 treatment of the coam mining in the San Juan Basin. Mining activities began in 1907 with mining Black Diamond coal bed. By 1913 mining was extended into the old Sunshine and Black Diamond mines, which filled the mine with damp and they began to close the mine by robbing its pillars. By 1979, the remaining coal room pillars were burning.

The area of potential effects (APE) for this project covers 22.46 acres and is situated in the SE $\frac{1}{2}$ of the SW $\frac{1}{4}$ and the W $\frac{1}{2}$ of the SW $\frac{1}{4}$ of Section 10, Township 5N, Range 18W (Figures 1 & 2e).

The **Navajo Coal Mine** consists of several mines (Navajo, Navajo No. 1-3 and Navajo No. 5) opened between 1909 and 1921. The APE covers 12.46 acres of land in the SE $\frac{1}{4}$ of the SE $\frac{1}{4}$ and the NW $\frac{1}{4}$ of the NW $\frac{1}{4}$ of Section 3, Township 15N Range 18W (Figures 1 & 2f).

November 2, 2020

Page 3

As part of the historic property identification efforts for this undertaking, the AML will have the entire APE subjected to an intensive level cultural resources management (CRM) inventory. At your request, a PDF copy of CRM inventory results will be forwarded to your office part of this project specific consultation. Importantly, we welcome any concerns or comments you may have pertaining to the proposed project and the scope of the historic property inventory at this time.

Please indicate within 30 days upon receipt of this letter if you wish to be a consulting party in accordance with the revised regulations of Section 106 of the NHPA (36 CFR Part 800). Also, if you have any questions or need additional information feel free to contact me at (505) 476-3426 or at richard.wessel@state.nm.us. We look forward to working with you and any tribal historic preservation representative on this project.

Sincerely,



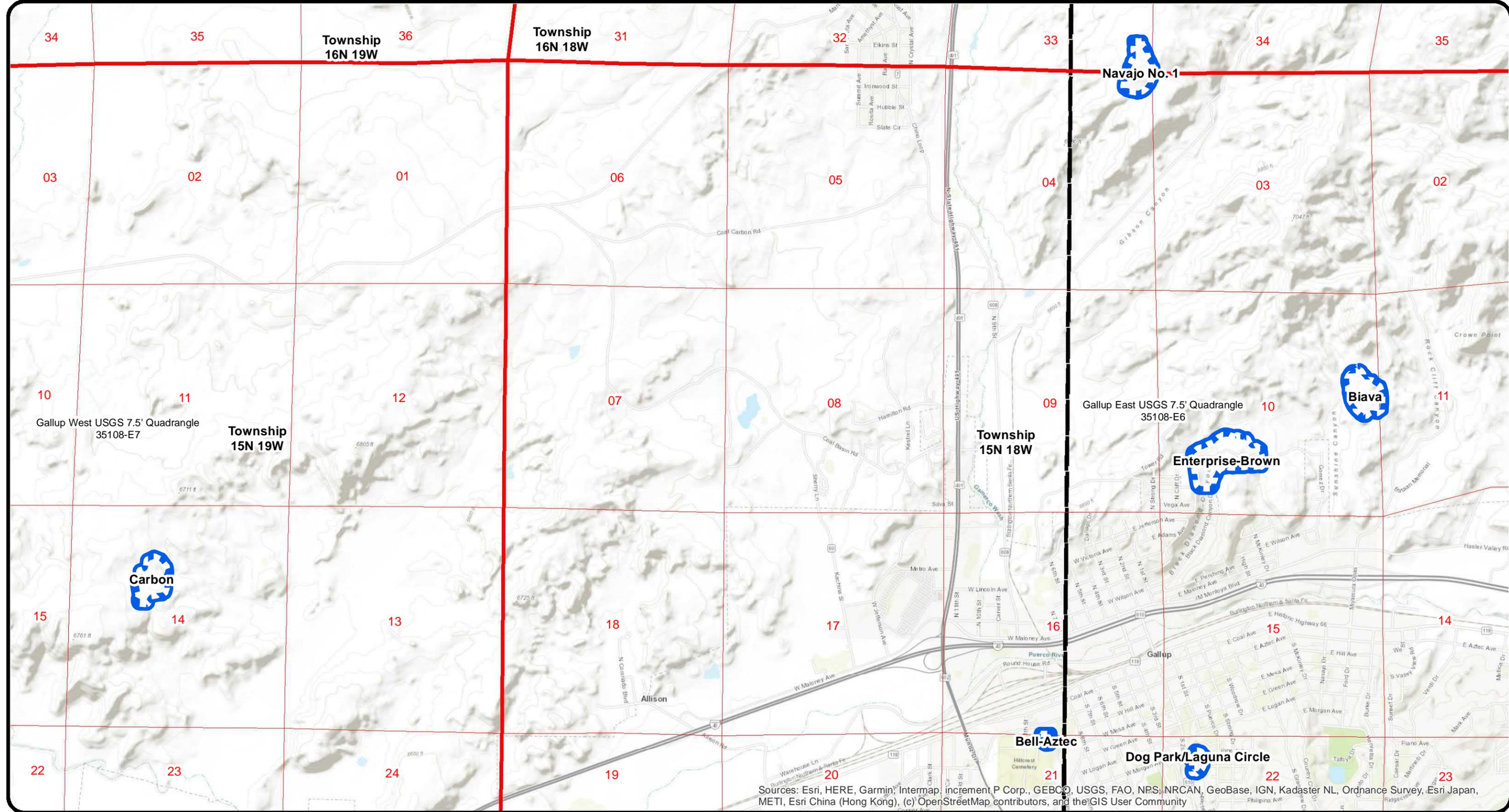
Richard L. Wessel
Cultural Resources Manager

CC: Director Stewart Koyiyumptewa, Cultural Preservation Office

- Yes, the Hopi Tribe wishes to be a consulting party to the Coal Mine Land Safeguard Project and would like to review and comment in the cultural resources inventory report
- The Hopi Tribe does not have concerns with the proposed project and does not wish to be a consulting party unless conditions specified below are met.

Tribal Representative: _____ Date: _____

Comments/Conditions:



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

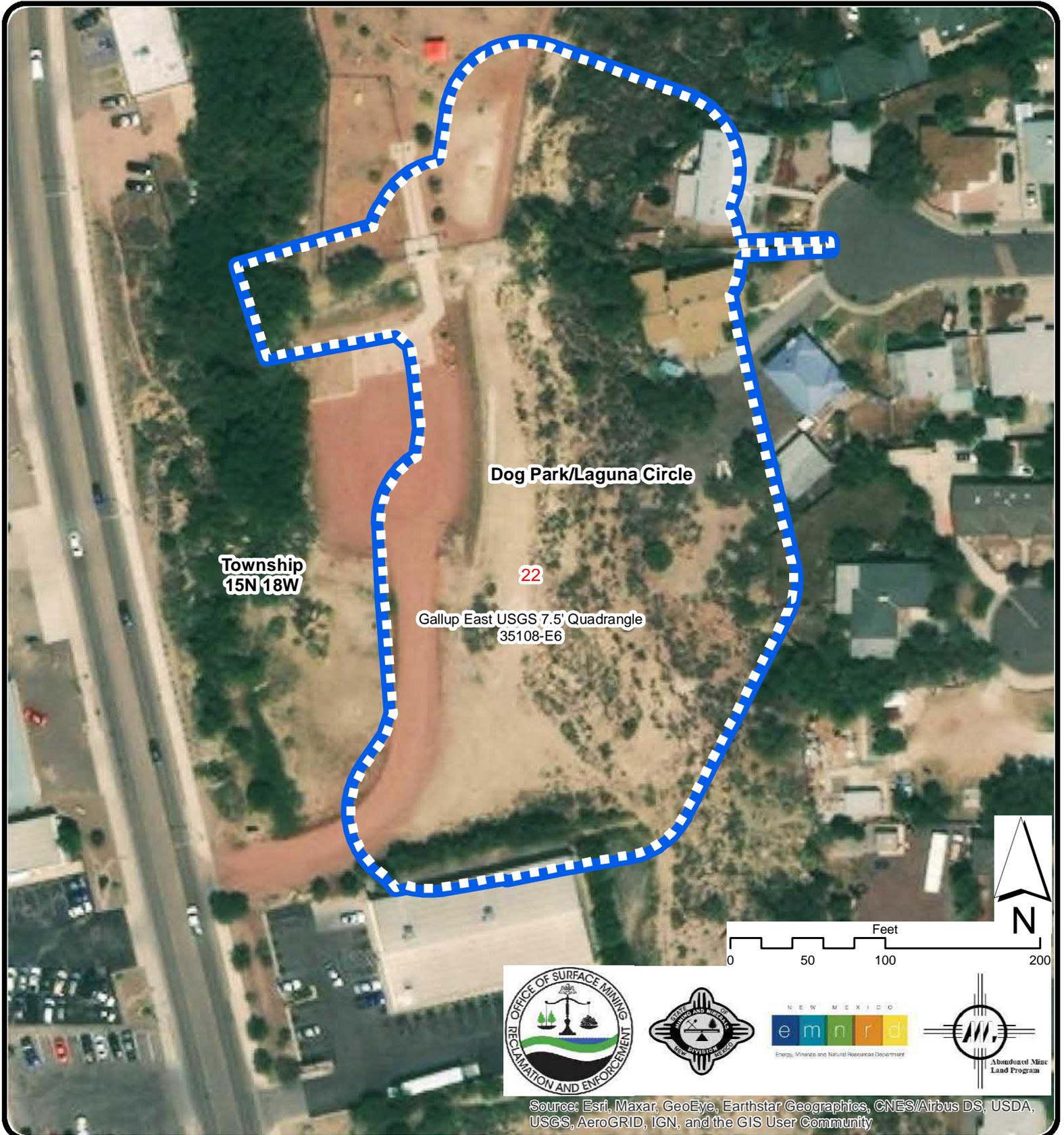
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Project Locations

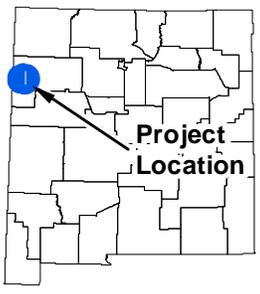
Mine

Title: **Figure 1: Project Locations**

Location: **Gallup, McKinley County, New Mexico**

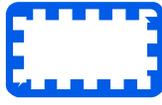


Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Legend

Project Locations

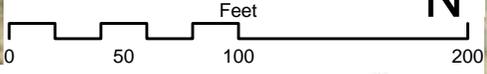
 Mine

Title:
Figure 2a: Gallup Dog Park Adit APE

Location:
**Gallup, McKinley County,
 New Mexico**



Bell-Aztec

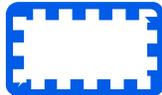


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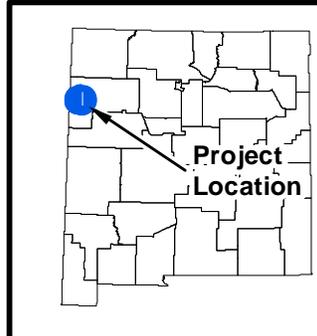
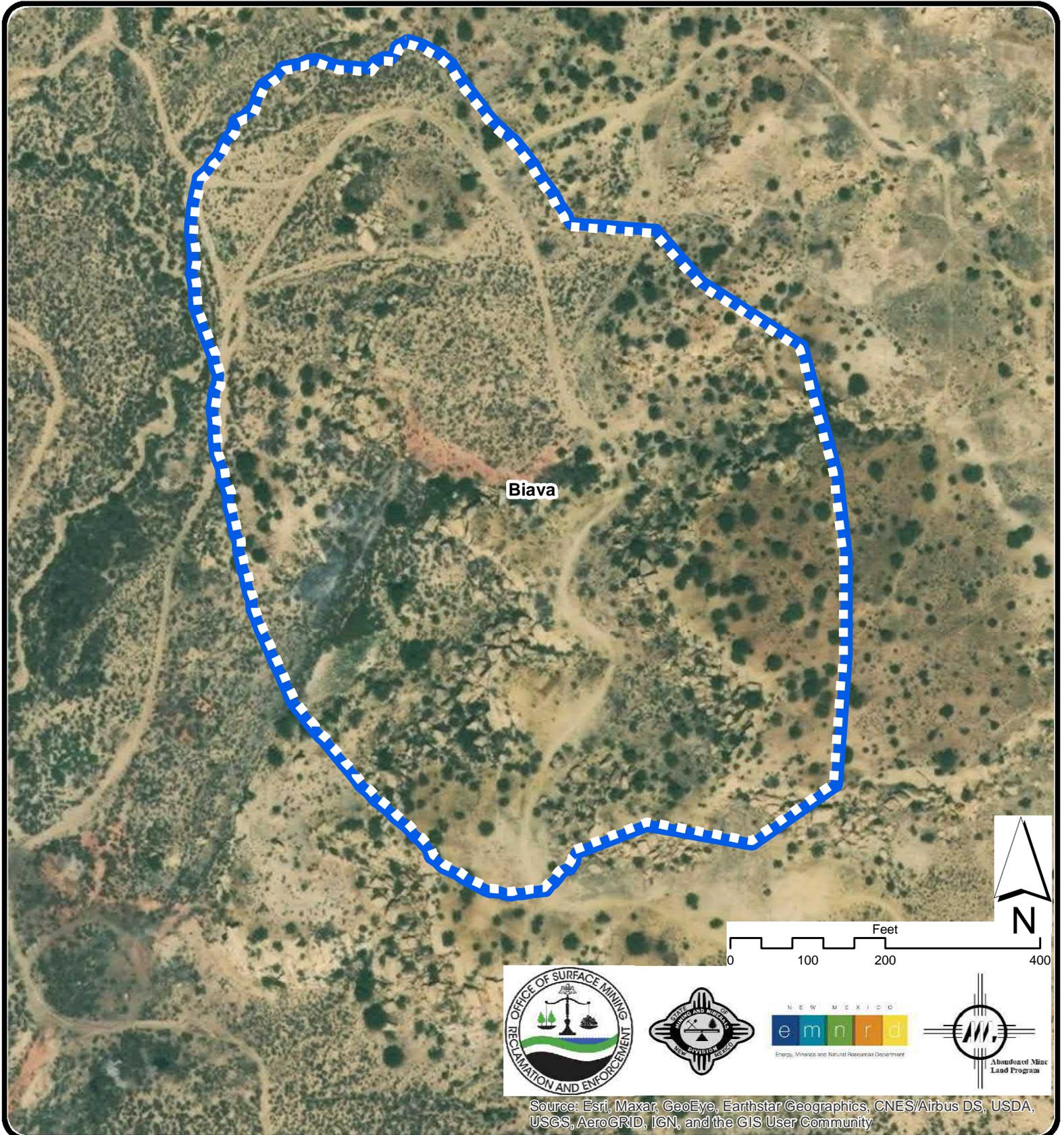
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Project Locations

 Mine

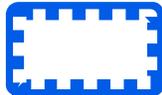
Title:
Figure 2b: Bell Aztec Mine Fire APE

Location:
**Gallup, McKinley County,
New Mexico**



Legend

Project Locations

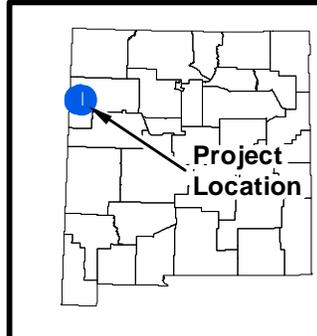
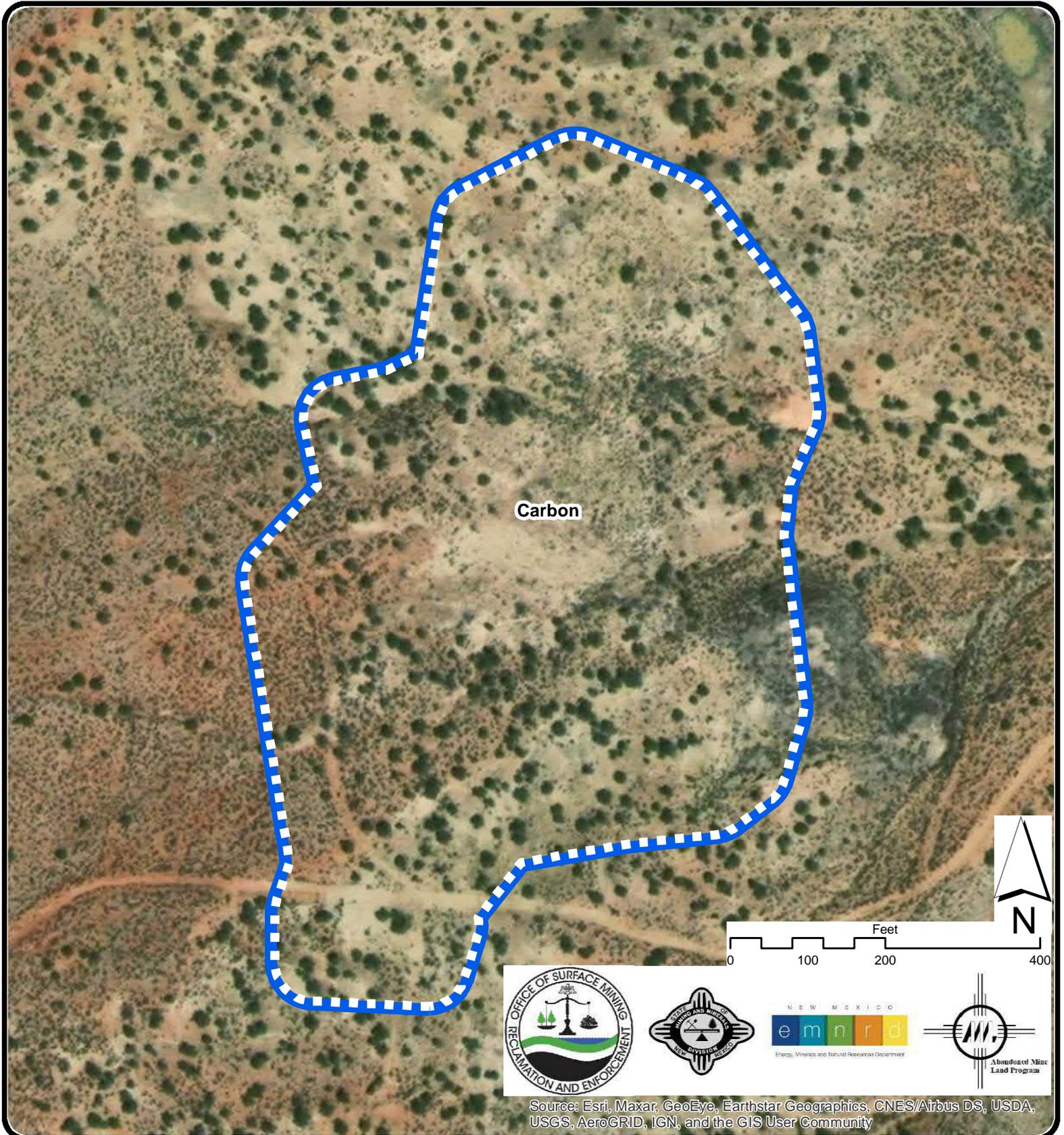
 APE

Title:

Figure 2c: Biava Mine Fire APE

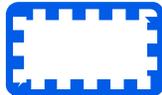
Location:

**Gallup, McKinley County,
New Mexico**



Legend

Project Locations

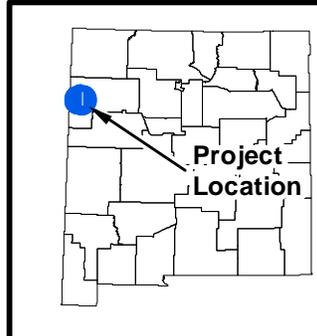
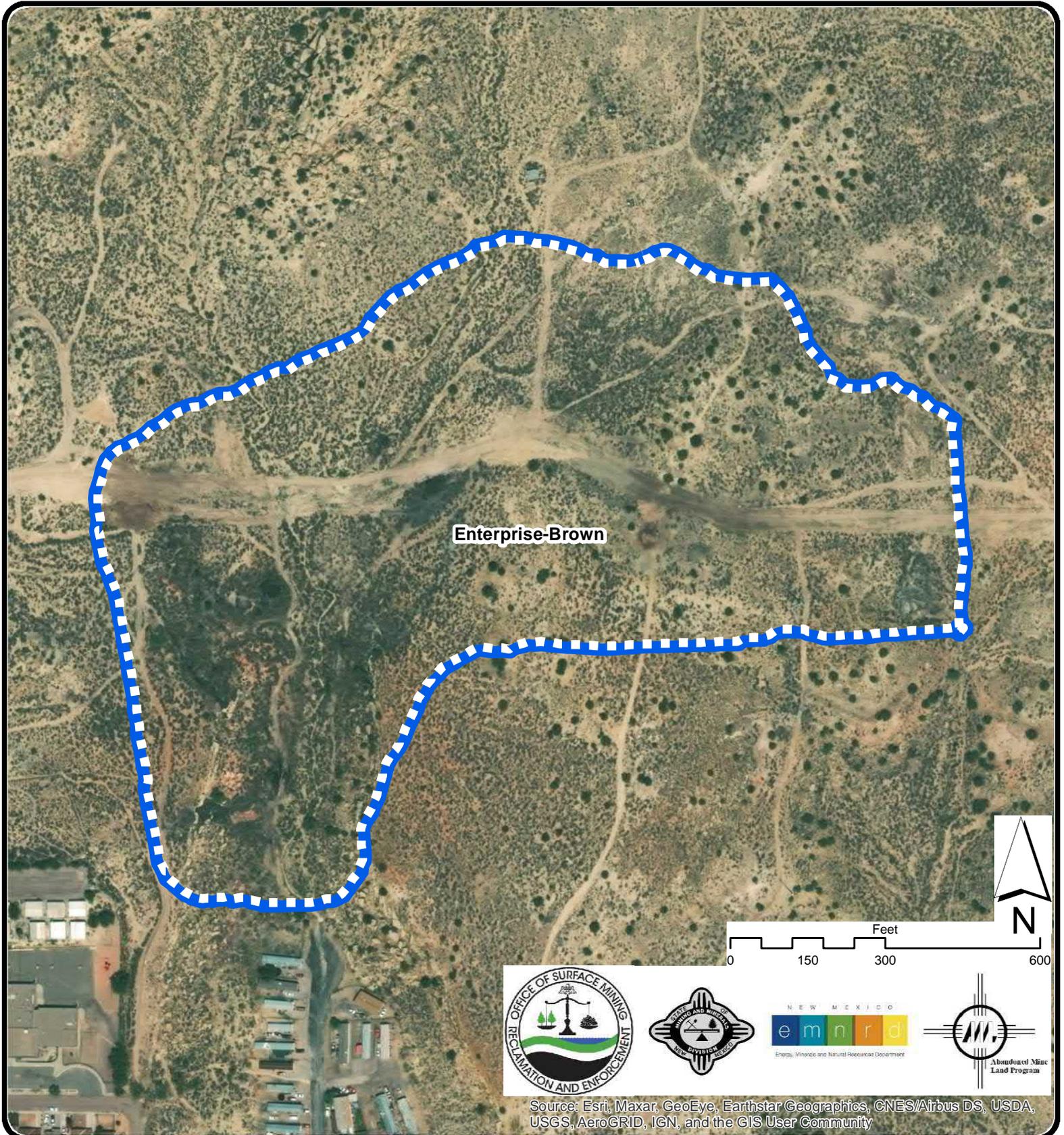
 APE

Title:

Figure 2d: Carbon Mine Fire APE

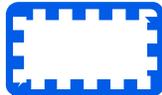
Location:

**Gallup, McKinley County,
New Mexico**



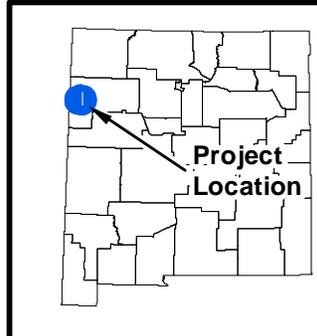
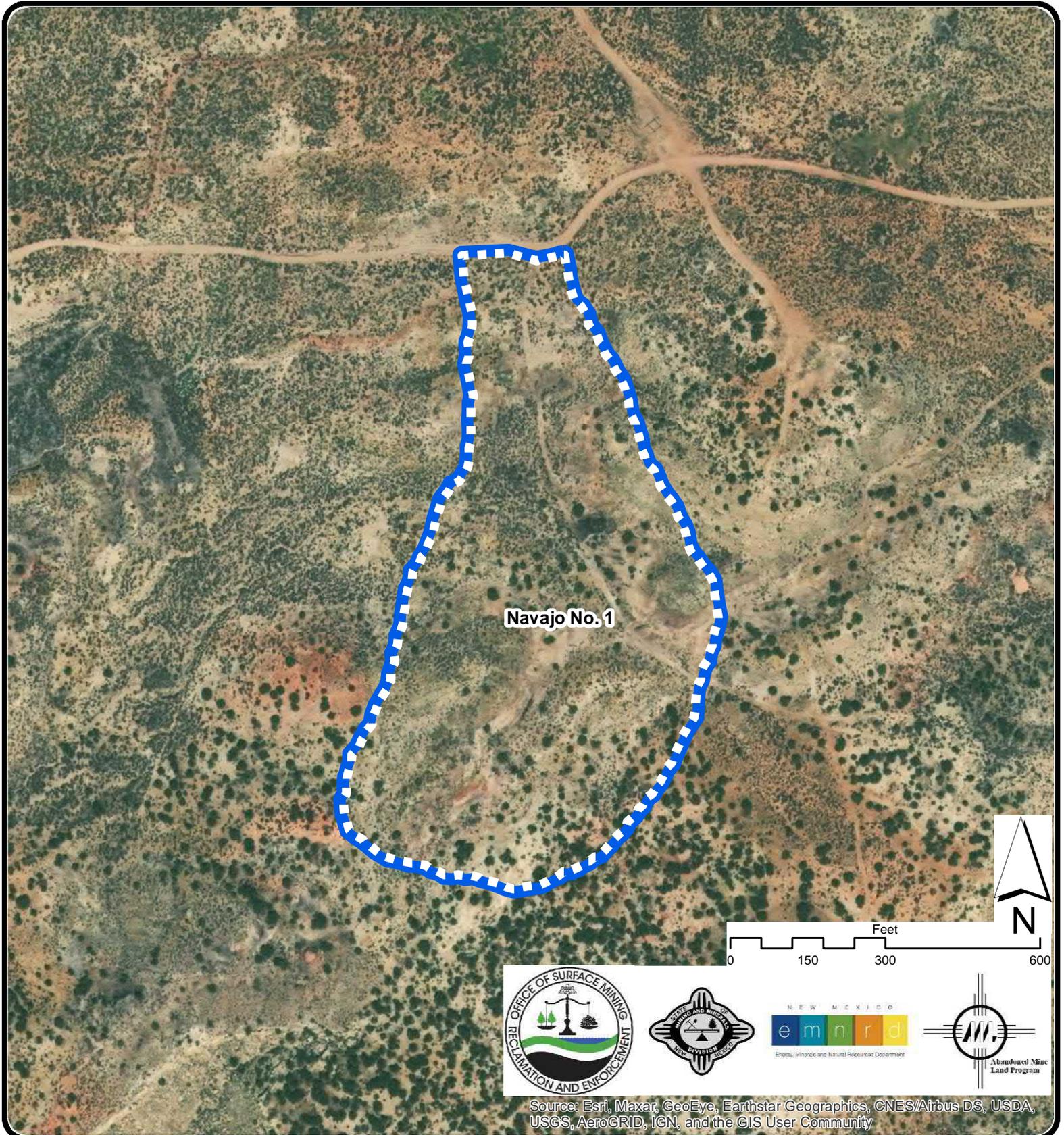
Legend

Project Locations

 APE

Title:
**Figure 2e: Enterprise-Brown
Mine Fire APE**

Location:
**Gallup, McKinley County,
New Mexico**



Legend

Project Locations

APE

Title:

Figure 2 f: Navajo Mine Fire APE

Location:

**Gallup, McKinley County,
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

Jerry Schoeppner, Director
Mining and Minerals Division



2 November 2020

Governor Max A. Zuni
P.O. Box 1270
Isleta Pueblo, NM 87022

Dear Honorable Governor Zuni,

The New Mexico Abandoned Mine Land Program (AML), in partnership with the U.S. Department of the Interior, Office of Surface Mining Reclamation and Enforcement, is planning to address longterm threats to life and properties due to coal fires and one open mine adits in and around Gallup, McKinley County, New Mexico. 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 proposed project is in the Gallup area of McKinley County, New Mexico and consists of one open adit (Gallup Dog Park) and a coal fire (Bell-Aztec Coal Mine) within the town of Gallup and three coal mine fires (Enterprise Brown, Navajo, and Biava coal mines) north of Gallup and one coal mine fire (Carbon Coal Mine) west of Gallup (Figure 1).

The area of potential effects, as defined under 36 CFR 800.16(d), encompasses staging areas and work areas and potential areas of surfac disturbance. (Figures 2a-f)

Background

The Gallup Coal Field had been identified prior to 1870 and was commercially developed in the early 1880s at the railroad arrived as a means to bring the coal to markets and also served as a important user of the coal. Specific coal mines to be addressed in this Task Order include”

1. Gallup Dog Park/Laguna Circle Adit Safeguard & Drainage Project (Figures 1 & 2a)
2. Bell-Aztec Coal Fire Safeguard Project (Figures 1 & 2b)
3. Biava Coal Mine Fire Safeguard Project (Figures 1 & 2c)
4. Carbon Coal Mine Fire Safeguard Project (Figures 1 & 2d)
5. Enterprise-Brown Coal Mine Fire Mitigation Project (Figures 1 & 2e)
6. Navajo coal mine fire Mitigation Project (Figures 1 & 3f)

The **Gallup Dog Park/Laguna Circle Mine Adit** is not mentioned in Nickelson’s 1988 treatment of the coam mining in the San Juan Basin. Mining activities were conducted to extract the fire clay and coal. Mining operations were conducted through two adits whose portals are located near the bottom of the west facing

slope, west and southwest of the Laguna Circle cul de sac. At present, it is not known who conducted the mining or when they occurred.

AML is planning to close an adit and improve its drainage at the Gallup City Dog Park, fence four coal mine fire surface.

In 1984-5 the AML conducted exploratory drilling to determine the extent of the underground mine workings, grouting to stabilize the landform, and backfilling the southern adit

The area of potential effects (APE) for this project covers 2.8 acres and is situated in the NW $\frac{1}{4}$ of the NW $\frac{1}{4}$ of Section 22, TWP. 5N, RNG 18W (Figures 1 & 2a.).

The **Bell-Aztec Coal Mine** was initially opened around 1885 by Judge Joseph Bell, among others who formed the Bell and Company, which operated until 1888 when it was sold and was renamed the Aztec mine. A fire has been burning along the coal seam and is venting through to the surface.

The APE, which covers 1.1 acres of land owned by the City of Gallup in the SE $\frac{1}{4}$ of the NE $\frac{1}{4}$ of S10 T 15N R18W of S10 and the SW $\frac{1}{4}$ of the NW $\frac{1}{4}$ of S11 of the same township (Figures 1 & 2b).

The **Biava No. 3 Coal Mine** was opened in 1949 and operated through 1957 when the Leyba Coal Co. took over the operation and it continued until 1961, when the mine closed.

The Biava No. 3 mine is located in the SE $\frac{1}{4}$ of the NE $\frac{1}{4}$ and the NW $\frac{1}{4}$ of the SW $\frac{1}{4}$ of Section 10, T15N R18W and the SW $\frac{1}{4}$ of the NW $\frac{1}{4}$ and the NW $\frac{1}{4}$ of the SW $\frac{1}{4}$ of Section 11 of the same township.

The Biava project APE covers 14.75 acres of privately owned land (Figures 1 & 2c).

The **Carbon Coal Mine** was operated by the Carbon Coal Company, which began strip mining operations on land just west of Gallup, approximately 2 miles northeast of the village of Mentmore in late 1978. It was placed on inactive status in December 1984. A fire has been burning along the coal seam and is venting to the surface.

The APE for this area covers 13.18 acres of privately-owned land and is situated in the SE $\frac{1}{4}$ of the NW $\frac{1}{4}$ of the NW $\frac{1}{4}$ of Section 14, T15N R19W, N.M.P.M. (Figures 1 & 2d)

The **Enterprise-Brown Mine fire** is described in Nickelson's 1988 treatment of the coam mining in the San Juan Basin. Mining activities began in 1907 with mining Black Diamond coal bed. By 1913 mining was extended into the old Sunshine and Black Diamond mines, which filled the mine with damp and they began to close the mine by robbing its pillars. By 1979, the remaining coal room pillars were burning.

The area of potential effects (APE) for this project covers 22.46 acres and is situated in the SE $\frac{1}{2}$ of the SW $\frac{1}{4}$ and the W $\frac{1}{2}$ of the SW $\frac{1}{4}$ of Section 10, Township 5N, Range 18W (Figures 1 & 2e).

The **Navajo Coal Mine** consists of several mines (Navajo, Navajo No. 1-3 and Navajo No. 5) opened between 1909 and 1921. The APE covers 12.46 acres of land in the SE $\frac{1}{4}$ of the SE $\frac{1}{4}$ and the NW $\frac{1}{4}$ of the NW $\frac{1}{4}$ of Section 3, Township 15N Range 18W (Figures 1 & 2f).

November 2, 2020

Page 3

As part of the historic property identification efforts for this undertaking, the AML will have the entire APE subjected to an intensive level cultural resources management (CRM) inventory. At your request, a PDF copy of CRM inventory results will be forwarded to your office part of this project specific consultation. Importantly, we welcome any concerns or comments you may have pertaining to the proposed project and the scope of the historic property inventory at this time.

Please indicate within 30 days upon receipt of this letter if you wish to be a consulting party in accordance with the revised regulations of Section 106 of the NHPA (36 CFR Part 800). Also, if you have any questions or need additional information feel free to contact me at (505) 476-3426 or at richard.wessel@state.nm.us. We look forward to working with you and any tribal historic preservation representative on this project.

Sincerely,



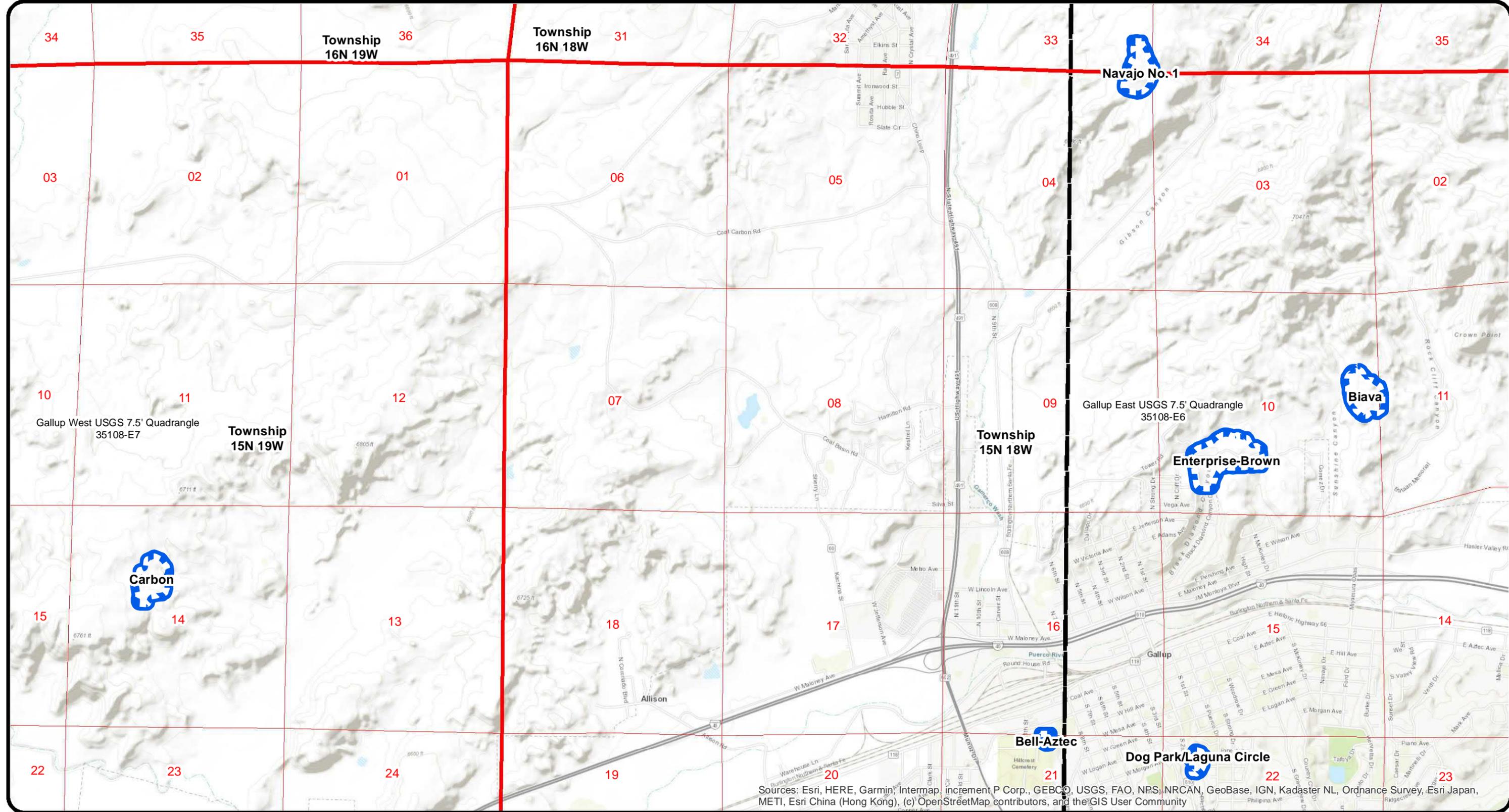
Richard L. Wessel
Cultural Resources Manager

CC: Director Stewart Koyiyumptewa, Cultural Preservation Office

- Yes, the Pueblo of Isleta wishes to be a consulting party to the Coal Mine Land Safeguard Project and would like to review and comment in the cultural resources inventory report
- The Pueblo of Isleta does not have concerns with the proposed project and does not wish to be a consulting party unless conditions specified below are met.

Tribal Representative: _____ Date: _____

Comments/Conditions:

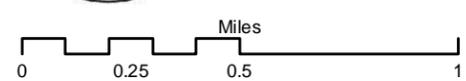


Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NRS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community



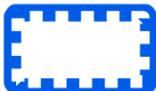






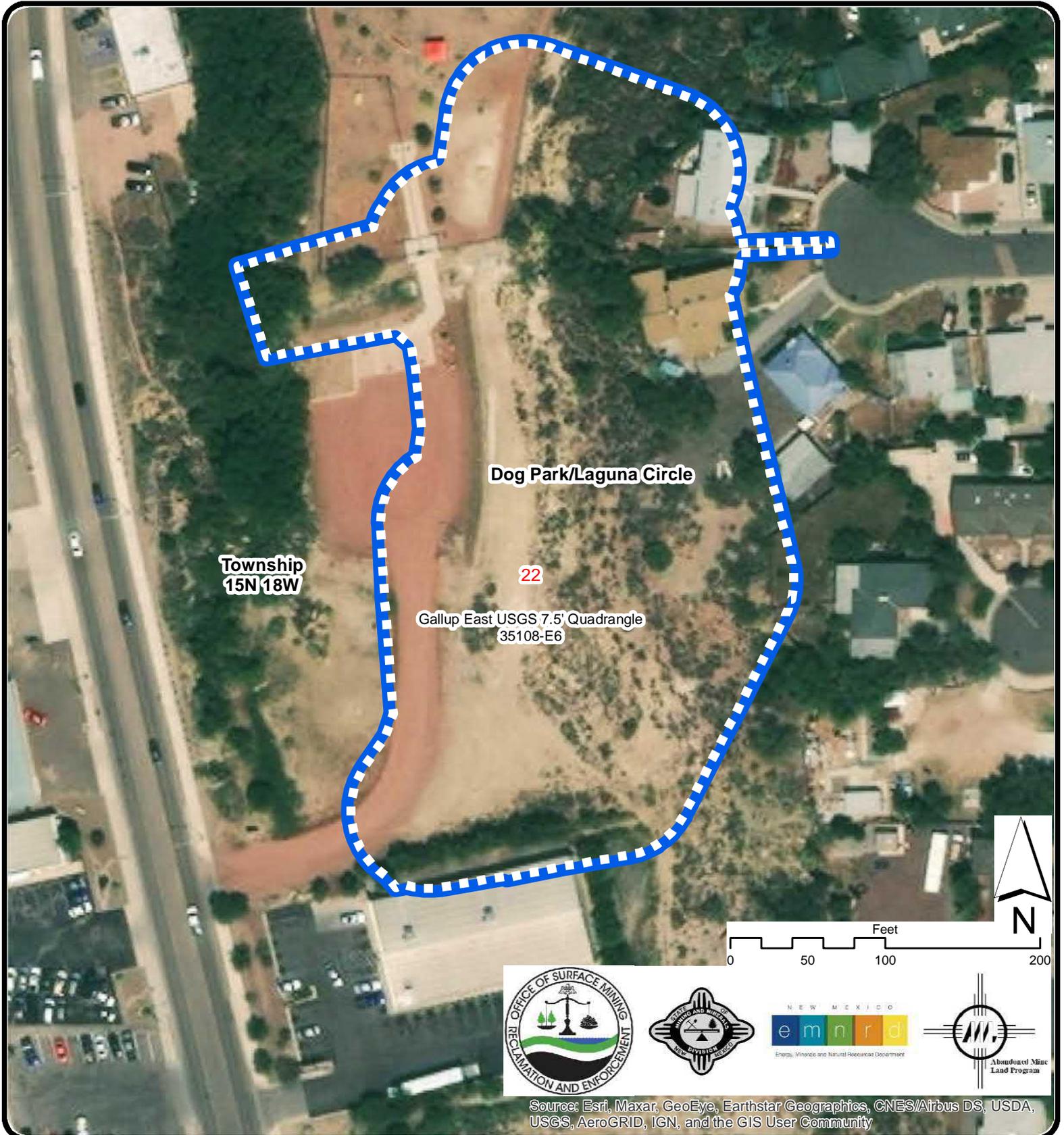
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Project Locations

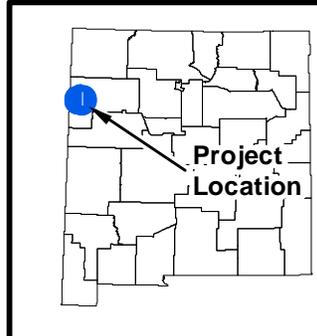
 Mine

Title: **Figure 1: Project Locations**

Location: **Gallup, McKinley County, New Mexico**

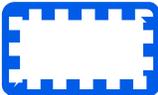


Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Legend

Project Locations

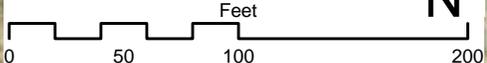
 Mine

Title:
Figure 2a: Gallup Dog Park Adit APE

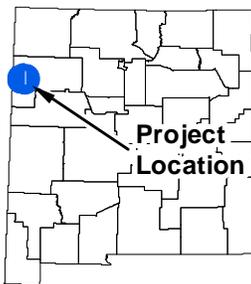
Location:
**Gallup, McKinley County,
 New Mexico**



Bell-Aztec

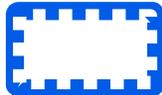


Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



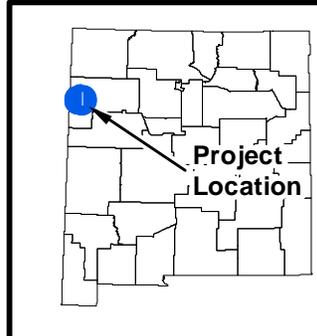
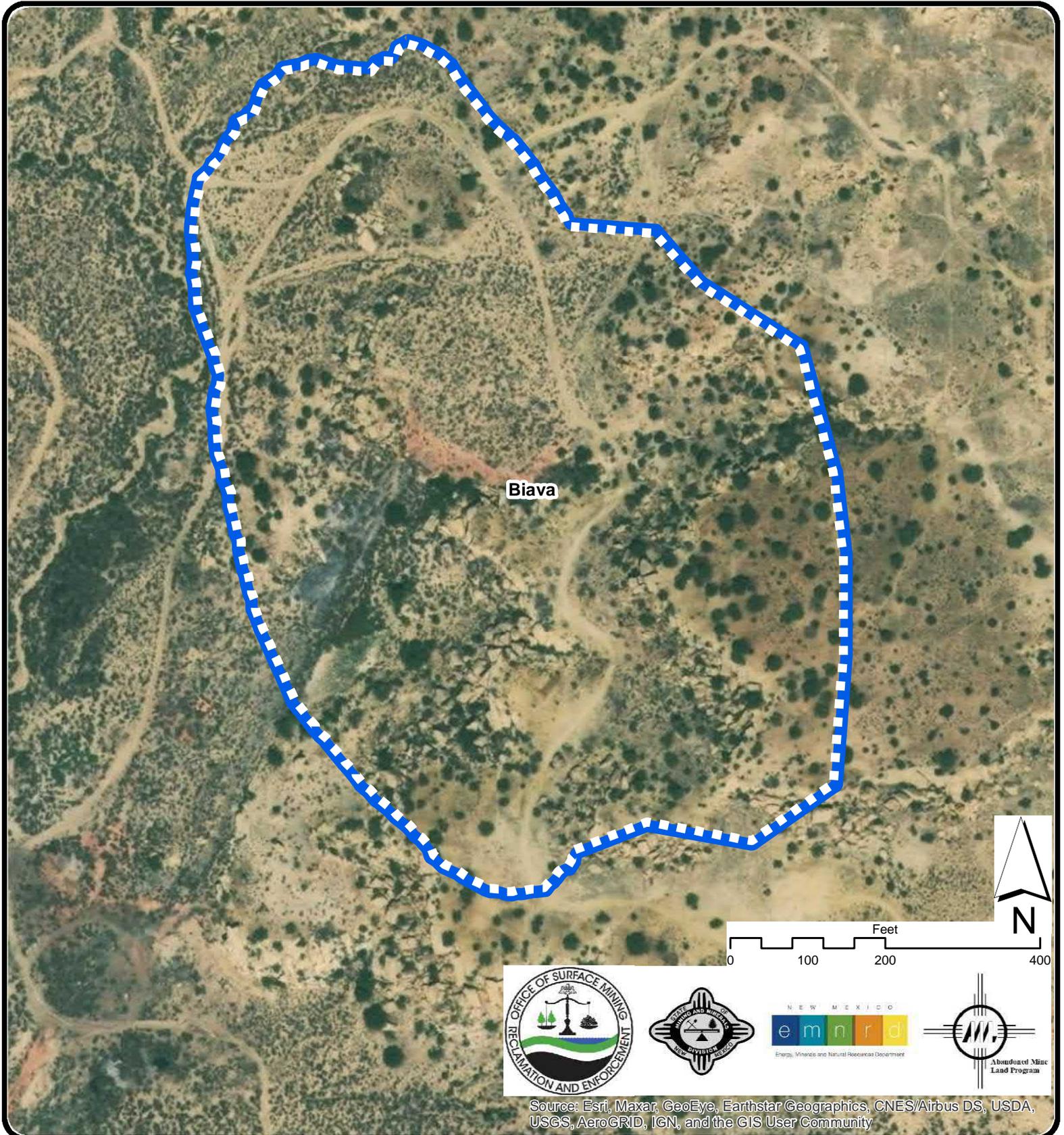
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Project Locations

 Mine

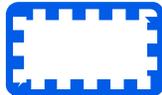
Title:
Figure 2b: Bell Aztec Mine Fire APE

Location:
**Gallup, McKinley County,
 New Mexico**



Legend

Project Locations

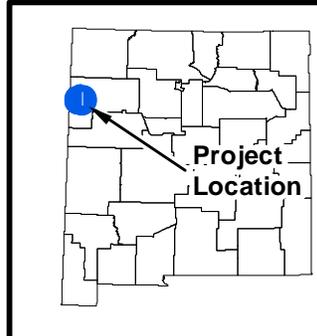
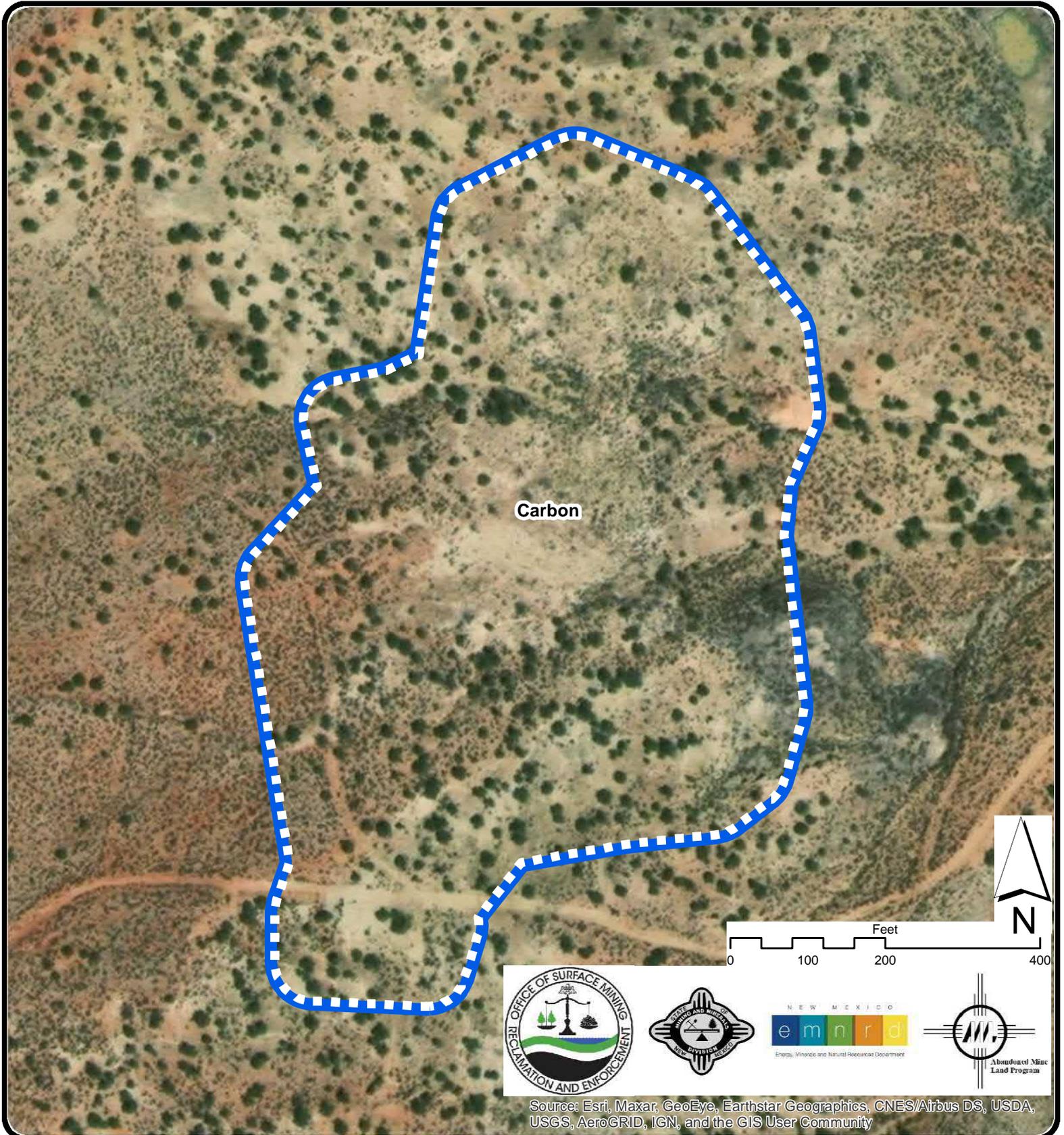
 APE

Title:

Figure 2c: Biava Mine Fire APE

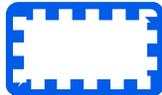
Location:

Gallup, McKinley County,
New Mexico



Legend

Project Locations

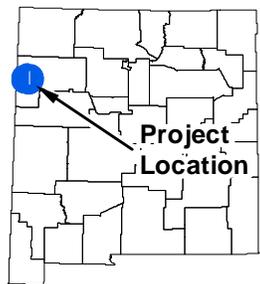
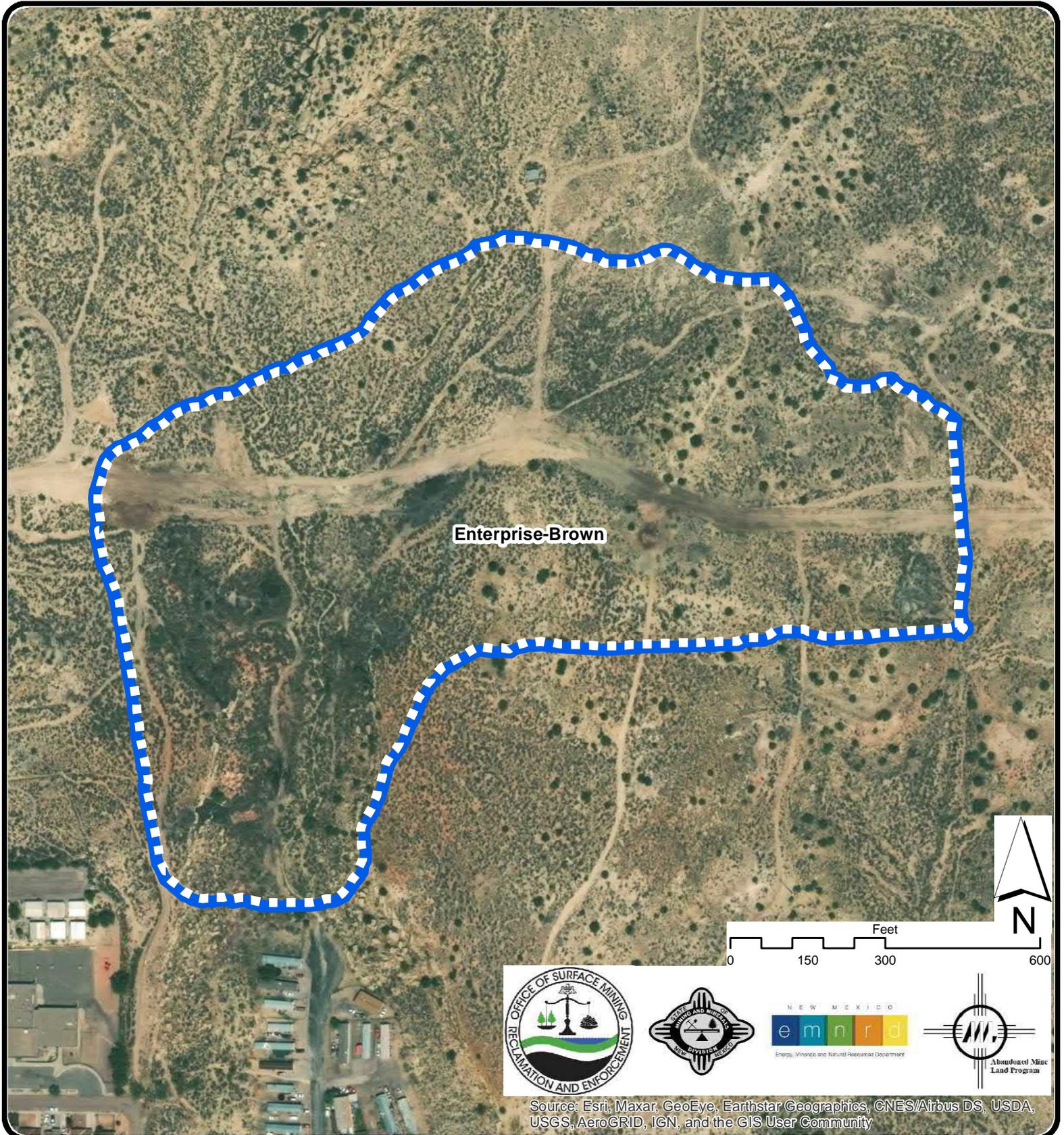
 APE

Title:

Figure 2d: Carbon Mine Fire APE

Location:

**Gallup, McKinley County,
New Mexico**



Legend

Project Locations

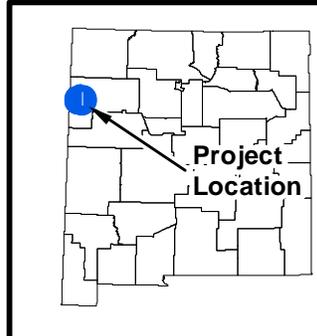
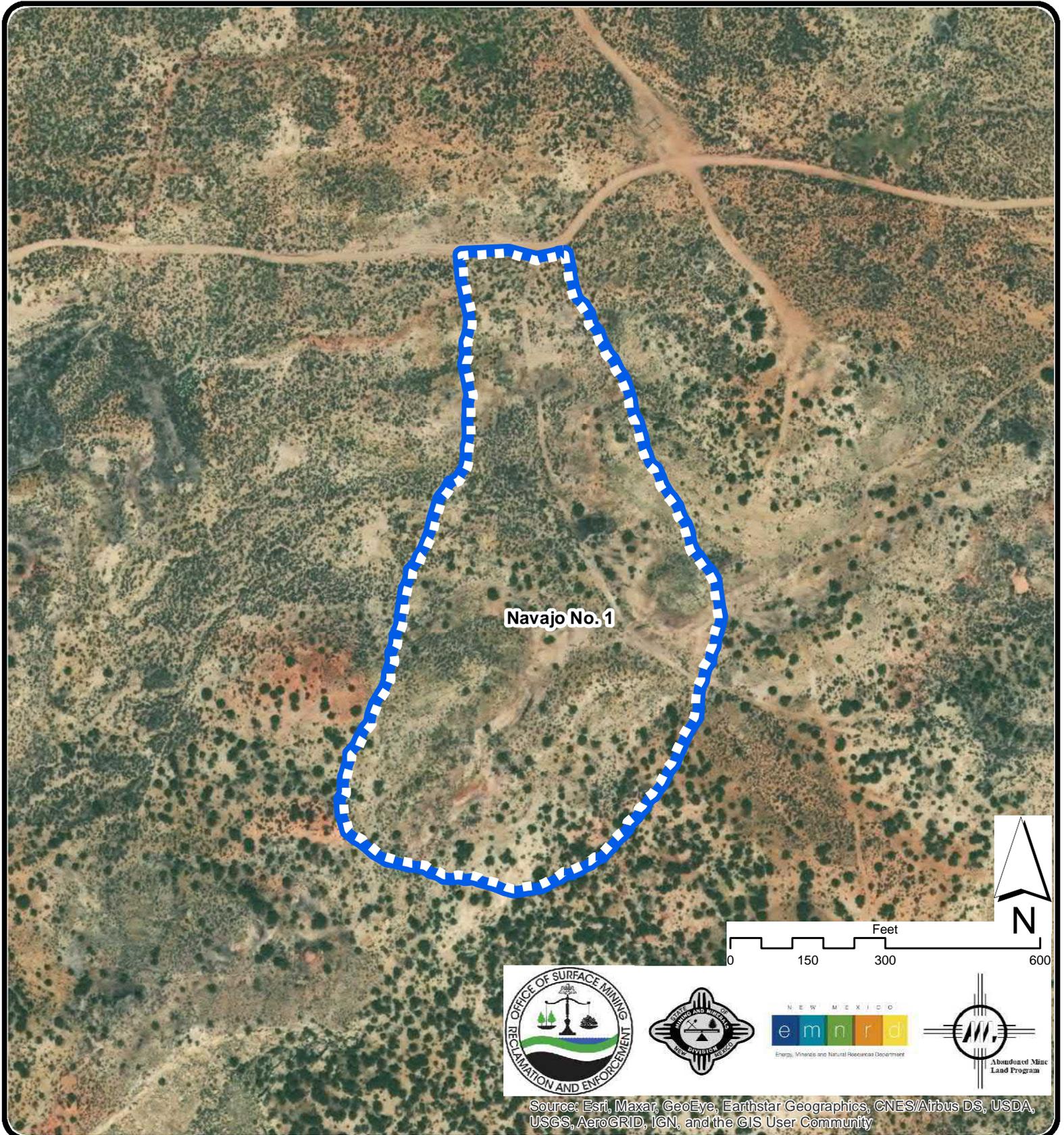


Title:

**Figure 2e: Enterprise-Brown
Mine Fire APE**

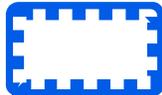
Location:

**Gallup, McKinley County,
New Mexico**



Legend

Project Locations

 APE

Title:

Figure 2 f: Navajo Mine Fire APE

Location:

**Gallup, McKinley County,
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

Jerry Schoeppner, Director
Mining and Minerals Division



2 November 2020

Governor Wilfred Herrera, Jr.
P.O. Box 194
Laguna Pueblo, NM 87026

Dear Honorable Governor Herrera,

The New Mexico Abandoned Mine Land Program (AML), in partnership with the U.S. Department of the Interior, Office of Surface Mining Reclamation and Enforcement, is planning to address longterm threats to life and properties due to coal fires and one open mine adits in and around Gallup, McKinley County, New Mexico. 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 proposed project is in the Gallup area of McKinley County, New Mexico and consists of one open adit (Gallup Dog Park) and a coal fire (Bell-Aztec Coal Mine) within the town of Gallup and three coal mine fires (Enterprise Brown, Navajo, and Biava coal mines) north of Gallup and one coal mine fire (Carbon Coal Mine) west of Gallup (Figure 1).

The area of potential effects, as defined under 36 CFR 800.16(d), encompasses staging areas and work areas and potential areas of surfac disturbance. (Figures 2a-f)

Background

The Gallup Coal Field had been identified prior to 1870 and was commercially developed in the early 1880s at the railroad arrived as a means to bring the coal to markets and also served as a important user of the coal. Specific coal mines to be addressed in this Task Order include”

1. Gallup Dog Park/Laguna Circle Adit Safeguard & Drainage Project (Figures 1 & 2a)
2. Bell-Aztec Coal Fire Safeguard Project (Figures 1 & 2b)
3. Biava Coal Mine Fire Safeguard Project (Figures 1 & 2c)
4. Carbon Coal Mine Fire Safeguard Project (Figures 1 & 2d)
5. Enterprise-Brown Coal Mine Fire Mitigation Project (Figures 1 & 2e)
6. Navajo coal mine fire Mitigation Project (Figures 1 & 3f)

The **Gallup Dog Park/Laguna Circle Mine Adit** is not mentioned in Nickelson’s 1988 treatment of the coam mining in the San Juan Basin. Mining activities were conducted to extract the fire clay and coal. Mining operations were conducted through two adits whose portals are located near the bottom of the west facing

slope, west and southwest of the Laguna Circle cul de sac. At present, it is not known who conducted the mining or when they occurred.

In 1984-5 the AML conducted exploratory drilling to determine the extent of the underground mine workings, grouting to stabilize the landform, and backfilling the southern adit.

AML is planning to close an adit and improve its drainage at the Gallup City Dog Park, fence four coal mine fire surface. The area of potential effects (APE) for this project covers 2.8 acres and is situated in the NW $\frac{1}{4}$ of the NW $\frac{1}{4}$ of Section 22, TWP. 5N, RNG 18W (Figures 1 & 2a.).

The **Bell-Aztec Coal Mine** was initially opened around 1885 by Judge Joseph Bell, among others who formed the Bell and Company, which operated until 1888 when it was sold and was renamed the Aztec mine. A fire has been burning along the coal seam and is venting through to the surface.

The APE, which covers 1.1 acres of land owned by the City of Gallup in the SE $\frac{1}{4}$ of the NE $\frac{1}{4}$ of S10 T 15N R18W of S10 and the SW $\frac{1}{4}$ of the NW $\frac{1}{4}$ of S11 of the same township (Figures 1 & 2b).

The **Biava No. 3 Coal Mine** was opened in 1949 and operated through 1957 when the Leyba Coal Co. took over the operation and it continued until 1961, when the mine closed.

The Biava No. 3 mine is located in the SE $\frac{1}{4}$ of the NE $\frac{1}{4}$ and the NW $\frac{1}{4}$ of the SW $\frac{1}{4}$ of Section 10, T15N R18W and the SW $\frac{1}{4}$ of the NW $\frac{1}{4}$ and the NW $\frac{1}{4}$ of the SW $\frac{1}{4}$ of Section 11 of the same township.

The Biava project APE covers 14.75 acres of privately owned land (Figures 1 & 2c).

The **Carbon Coal Mine** was operated by the Carbon Coal Company, which began strip mining operations on land just west of Gallup, approximately 2 miles northeast of the village of Mentmore in late 1978. It was placed on inactive status in December 1984. A fire has been burning along the coal seam and is venting to the surface.

The APE for this area covers 13.18 acres of privately-owned land and is situated in the SE $\frac{1}{4}$ of the NW $\frac{1}{4}$ of the NW $\frac{1}{4}$ of Section 14, T15N R19W, N.M.P.M. (Figures 1 & 2d)

The **Enterprise-Brown Mine fire** is described in Nickelson's 1988 treatment of the coam mining in the San Juan Basin. Mining activities began in 1907 with mining Black Diamond coal bed. By 1913 mining was extended into the old Sunshine and Black Diamond mines, which filled the mine with damp and they began to close the mine by robbing its pillars. By 1979, the remaining coal room pillars were burning.

The area of potential effects (APE) for this project covers 22.46 acres and is situated in the SE $\frac{1}{2}$ of the SW $\frac{1}{4}$ and the W $\frac{1}{2}$ of the SW $\frac{1}{4}$ of Section 10, Township 5N, Range 18W (Figures 1 & 2e).

The **Navajo Coal Mine** consists of several mines (Navajo, Navajo No. 1-3 and Navajo No. 5) opened between 1909 and 1921. The APE covers 12.46 acres of land in the SE $\frac{1}{4}$ of the SE $\frac{1}{4}$ and the NW $\frac{1}{4}$ of the NW $\frac{1}{4}$ of Section 3, Township 15N Range 18W (Figures 1 & 2f).

As part of the historic property identification efforts for this undertaking, the AML will have the entire APE subjected to an intensive level cultural resources management (CRM) inventory. At your request, a PDF copy of CRM inventory results will be forwarded to your office part of this project specific consultation. Importantly, we welcome any concerns or comments you may have pertaining to the proposed project and the scope of the historic property inventory at this time.

Please indicate within 30 days upon receipt of this letter if you wish to be a consulting party in accordance with the revised regulations of Section 106 of the NHPA (36 CFR Part 800). Also, if you have any questions or need additional information feel free to contact me at (505) 476-3426 or at richard.wessel@state.nm.us. We look forward to working with you and any tribal historic preservation representative on this project.

Sincerely,



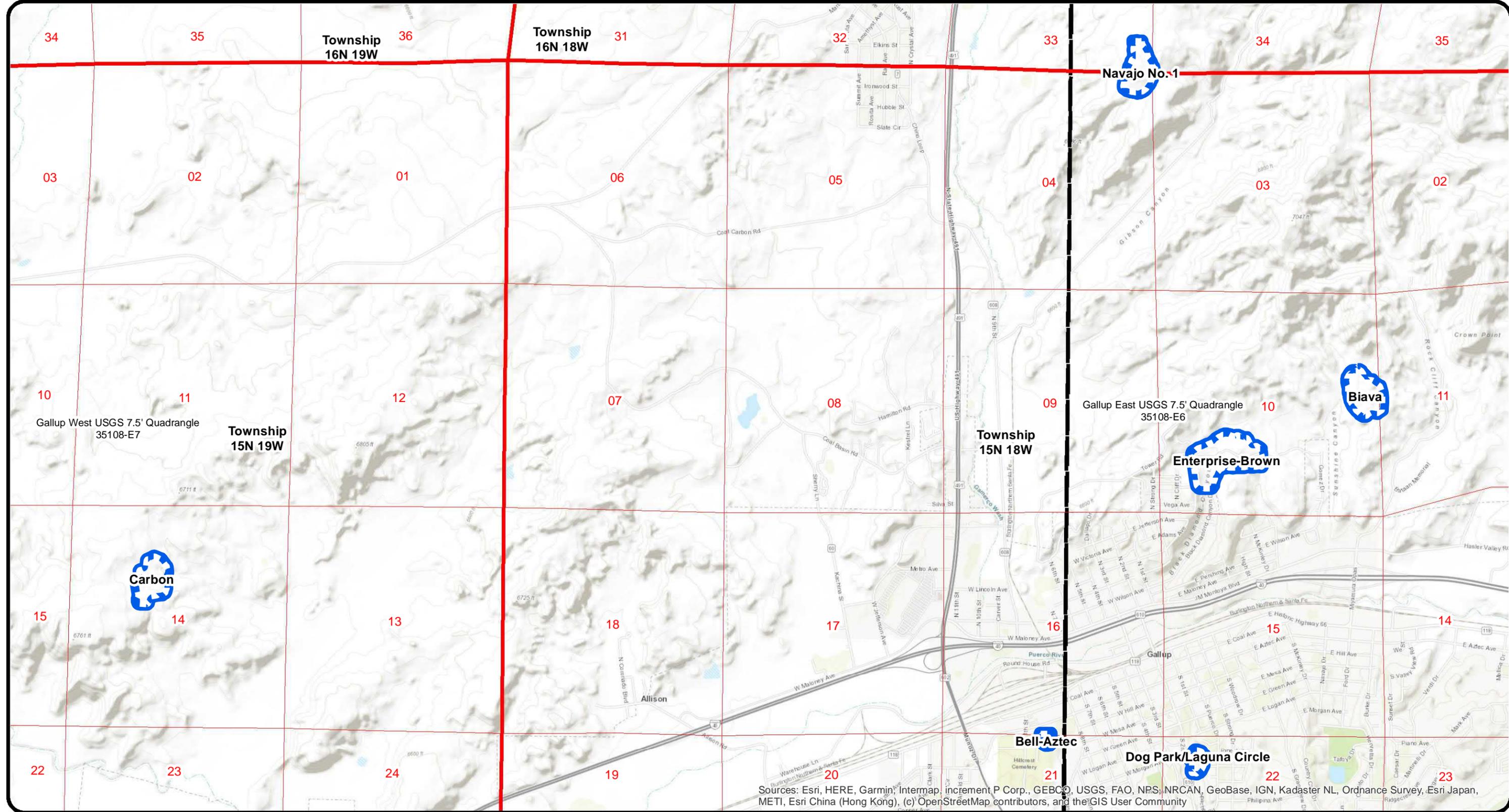
Richard L. Wessel
Cultural Resources Manager

CC: Mr. Richard Smith, Sr., Tribal Historic Preservation Officer

- Yes, the Pueblo of Laguna wishes to be a consulting party to the Coal Mine Land Safeguard Project and would like to review and comment in the cultural resources inventory report
- The Pueblo of Laguna does not have concerns with the proposed project and does not wish to be a consulting party unless conditions specified below are met.

Tribal Representative: _____ Date: _____

Comments/Conditions:



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

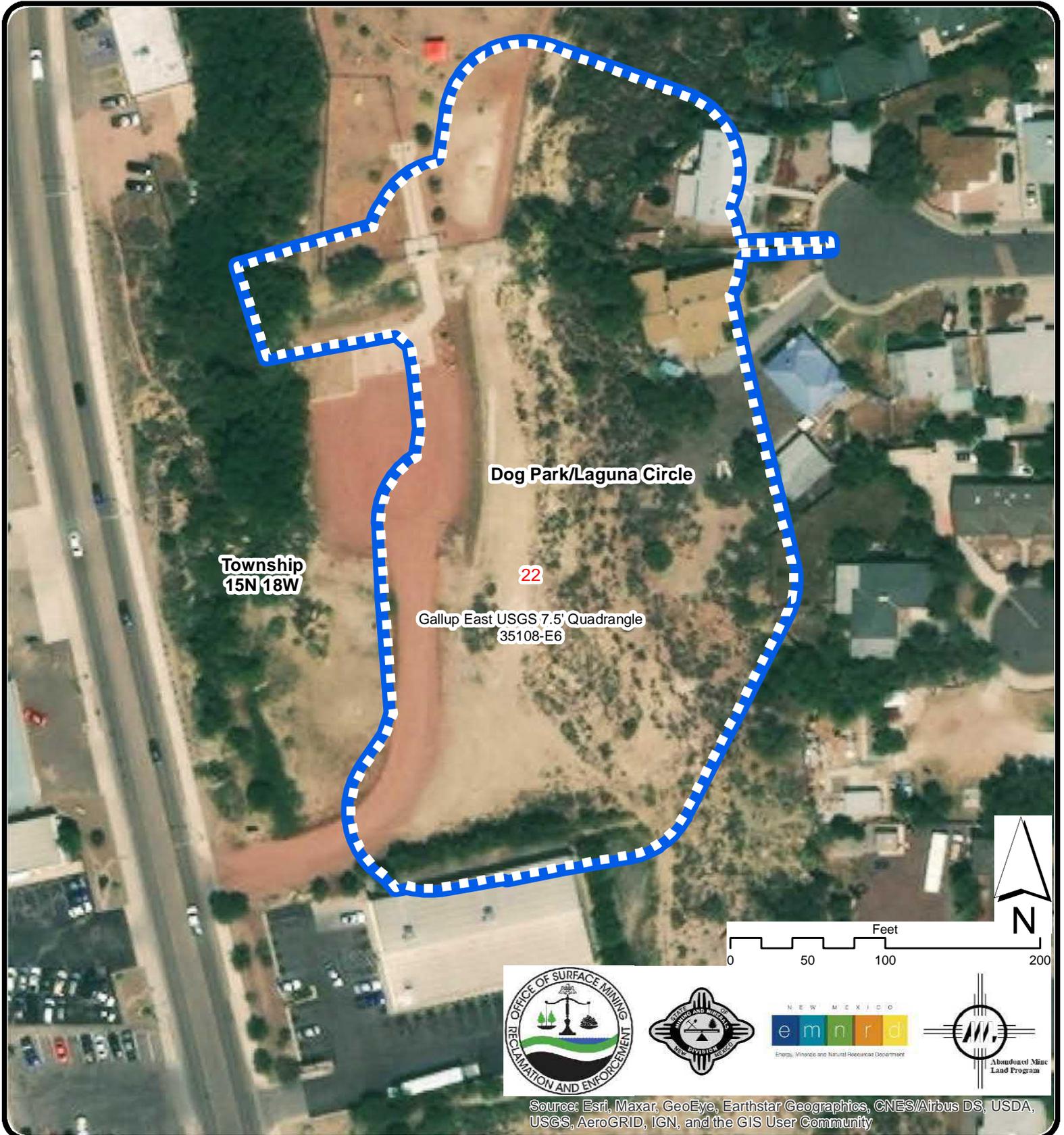
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Project Locations

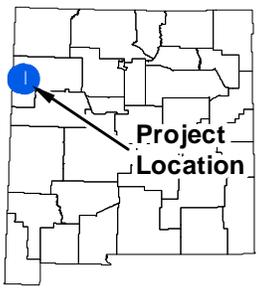
Mine

Title: **Figure 1: Project Locations**

Location: **Gallup, McKinley County, New Mexico**

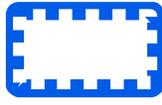


Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Legend

Project Locations

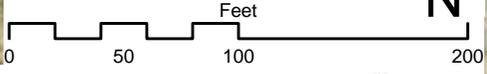
 Mine

Title:
Figure 2a: Gallup Dog Park Adit APE

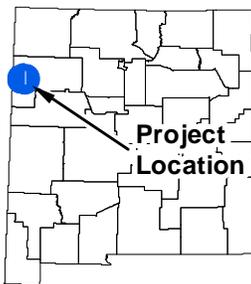
Location:
**Gallup, McKinley County,
 New Mexico**



Bell-Aztec

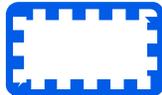


Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



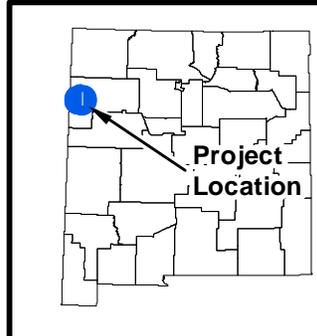
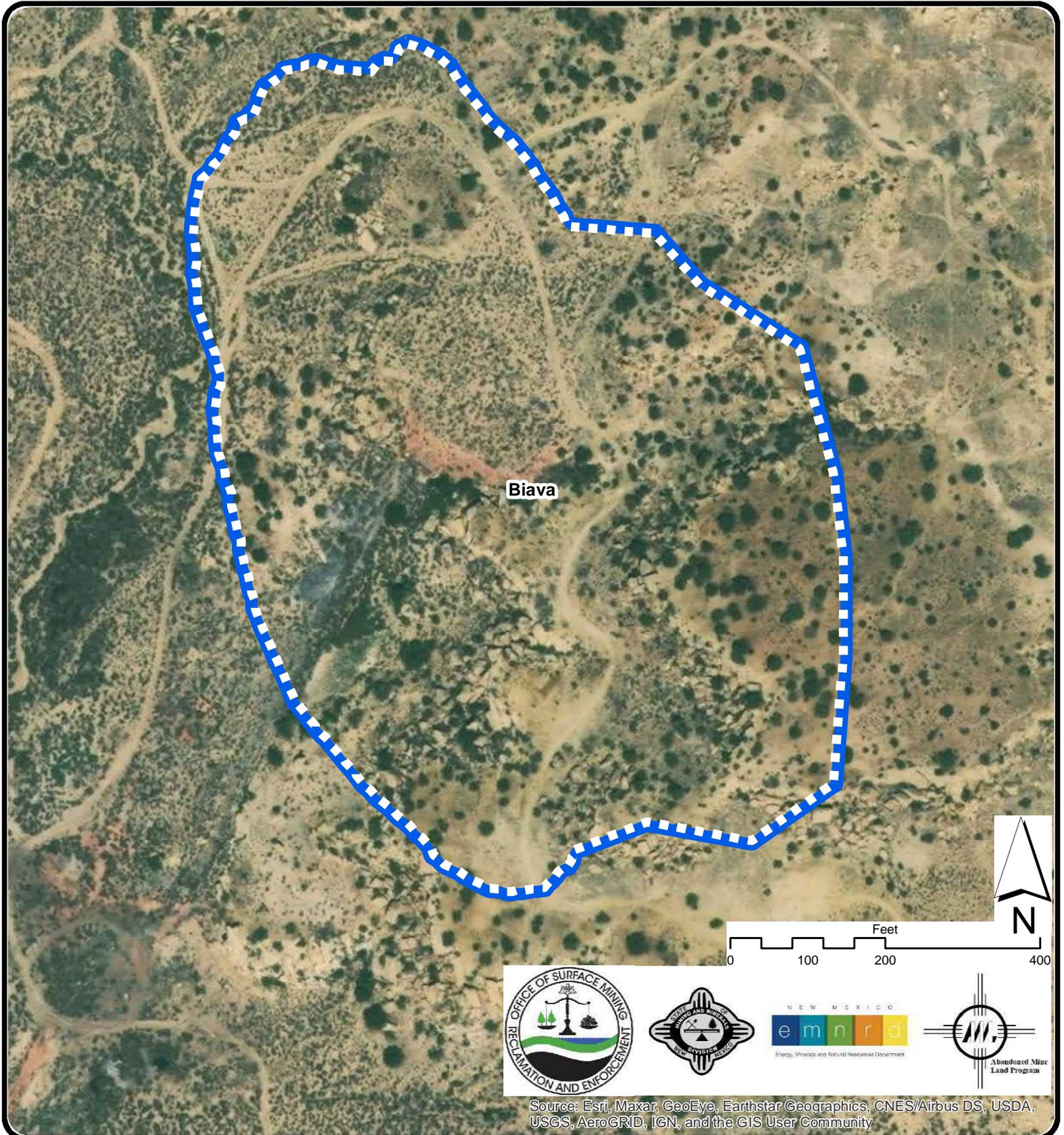
Legend

Project Locations

 Mine

Title:
Figure 2b: Bell Aztec Mine Fire APE

Location:
**Gallup, McKinley County,
 New Mexico**



Legend

Project Locations

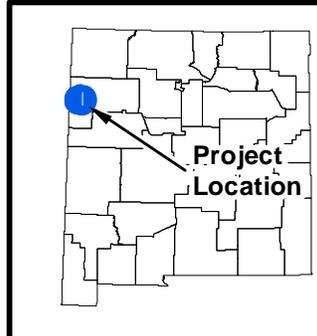
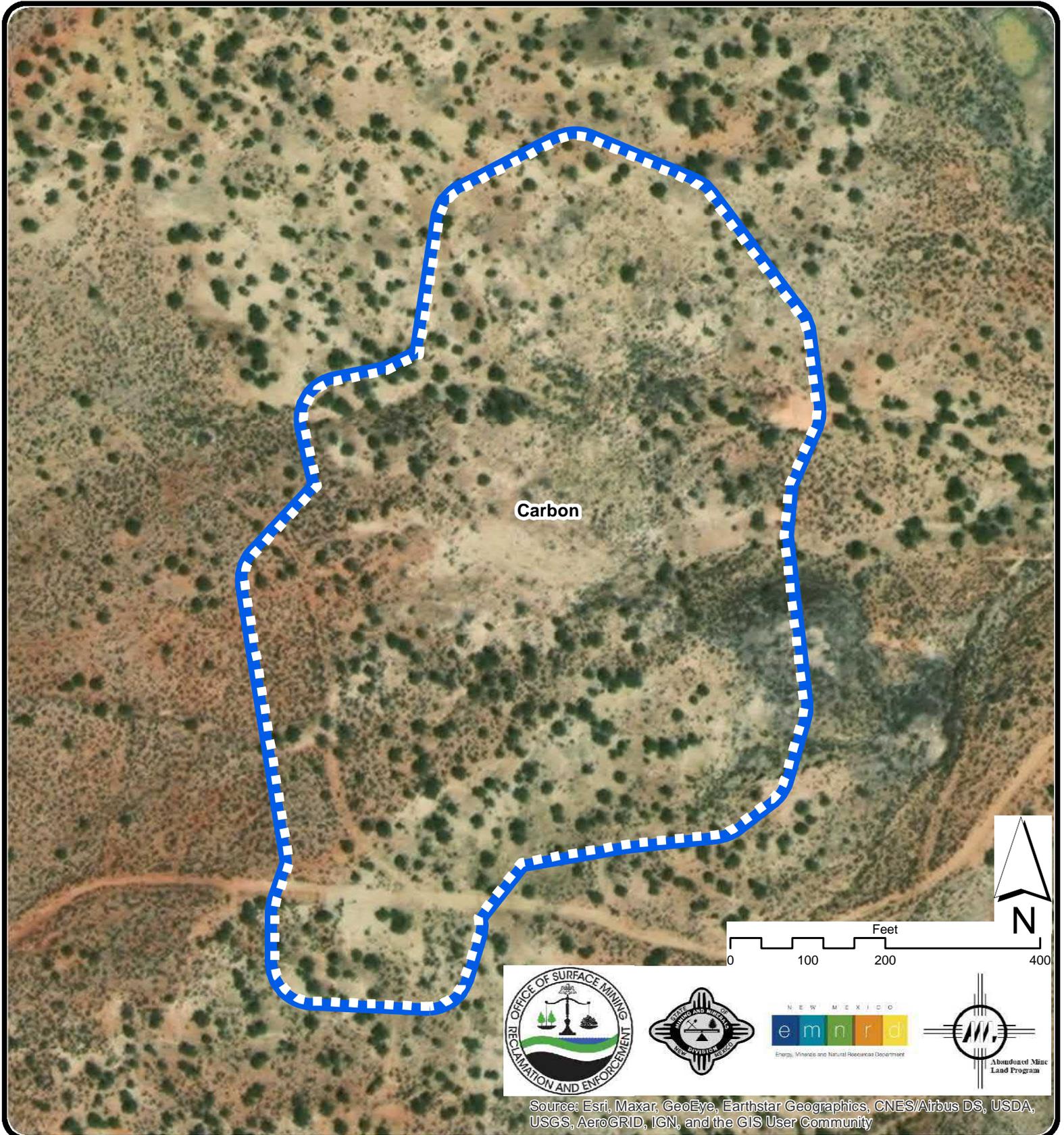
APE

Title:

Figure 2c: Biava Mine Fire APE

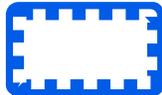
Location:

Gallup, McKinley County,
New Mexico



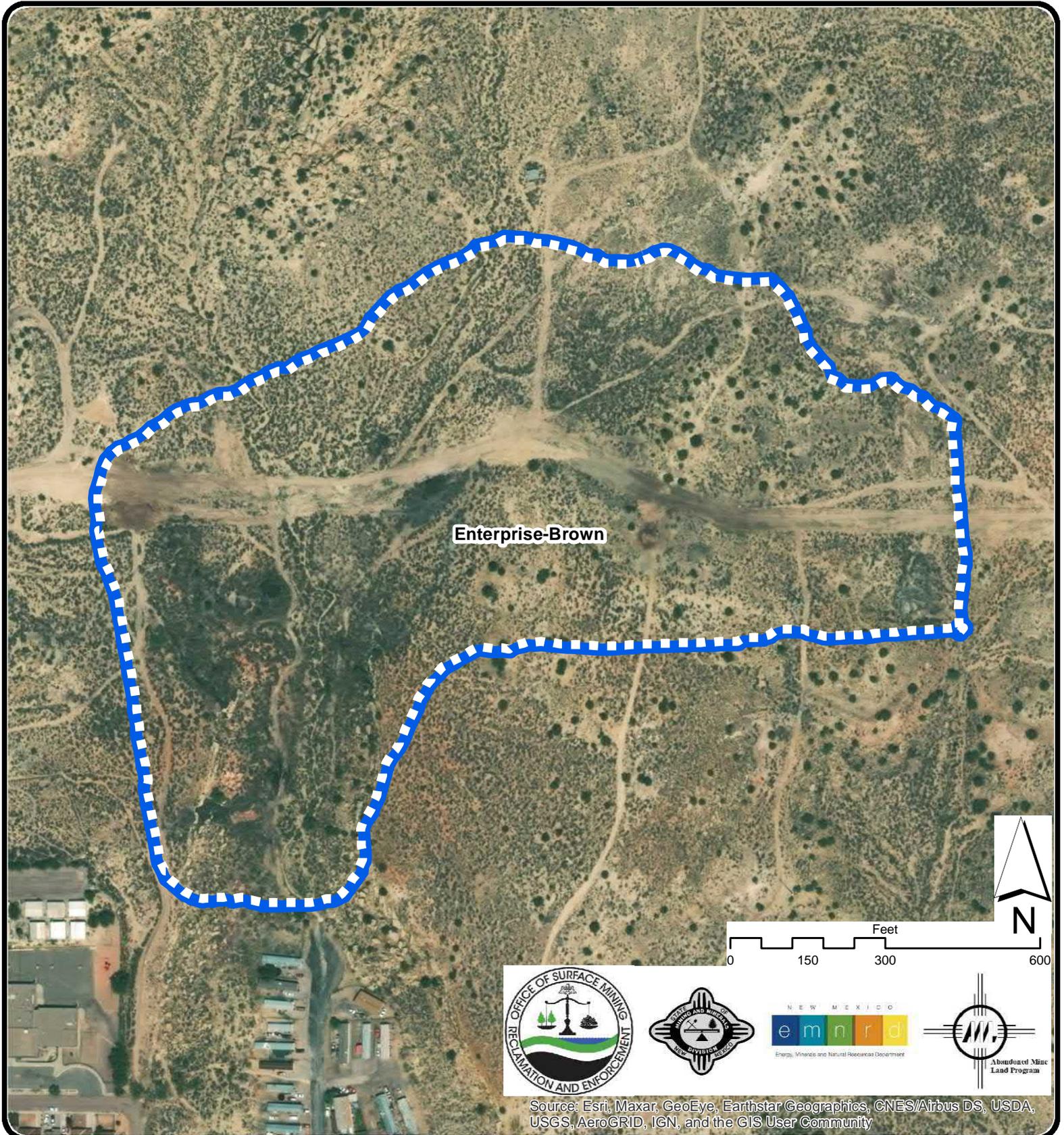
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Project Locations

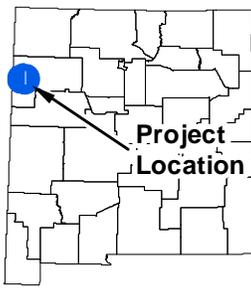
 APE

Title:
Figure 2d: Carbon Mine Fire APE

Location:
**Gallup, McKinley County,
New Mexico**



Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



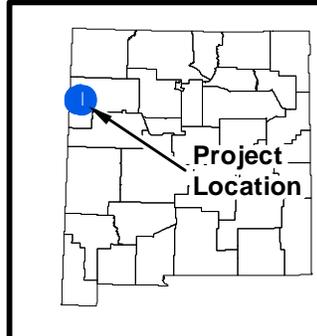
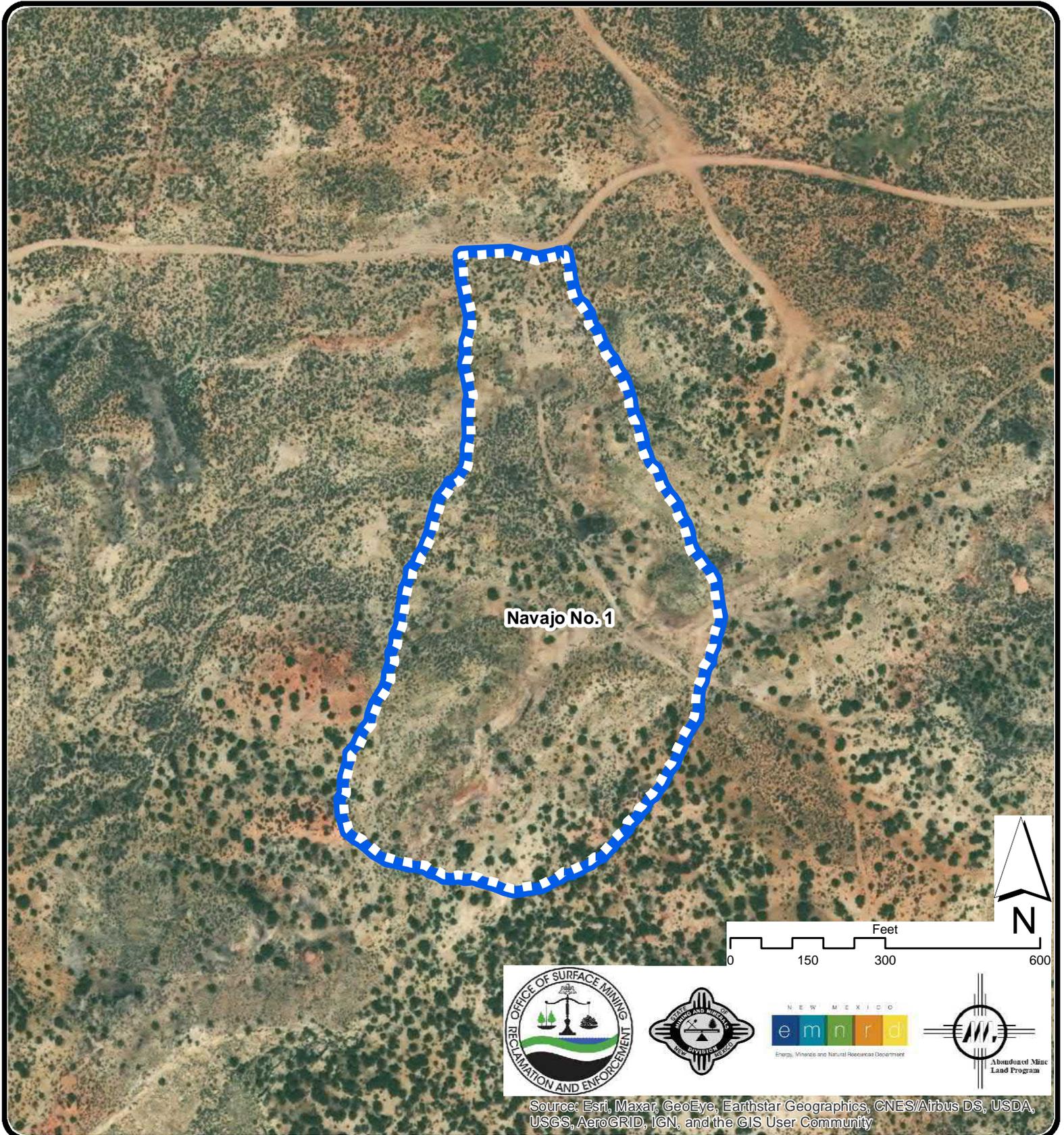
Legend

Project Locations



Title:
Figure 2e: Enterprise-Brown Mine Fire APE

Location:
Gallup, McKinley County, New Mexico



Legend

Project Locations

APE

Title:
Figure 2 f: Navajo Mine Fire APE

Location:
**Gallup, McKinley County,
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

Jerry Schoeppner, Director
Mining and Minerals Division



2 November 2020

Honorable Jonathan Nez, President.
P.O. Box 7440
Window Rock, AZ 86515

Dear Honorable President Nez,

The New Mexico Abandoned Mine Land Program (AML), in partnership with the U.S. Department of the Interior, Office of Surface Mining Reclamation and Enforcement, is planning to address longterm threats to life and properties due to coal fires and one open mine adits in and around Gallup, McKinley County, New Mexico. 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).

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AML is planning to close an adit and improve its drainage at the Gallup City Dog Park, fence four coal mine fire surface.

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conducted to extract the fire clay and coal. Mining operations were conducted through two adits whose portals are located near the bottom of the west facing slope, west and southwest of the Laguna Circle cul de sac. At present, it is not known who conducted the mining or when they occurred.

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The Biava project APE covers 14.75 acres of privately owned land (Figures 1 & 2c).

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The area of potential effects (APE) for this project covers 22.46 acres and is situated in the SE $\frac{1}{2}$ of the SW $\frac{1}{4}$ and the W $\frac{1}{2}$ of the SW $\frac{1}{4}$ of Section 10, Township 5N, Range 18W (Figures 1 & 2e).

The **Navajo Coal Mine** consists of several mines (Navajo, Navajo No. 1-3 and Navajo No. 5) opened between 1909 and 1921. The APE covers 12.46 acres of land in the SE $\frac{1}{4}$ of the SE $\frac{1}{4}$ and the NW $\frac{1}{4}$ of the NW $\frac{1}{4}$ of Section 3, Township 15N Range 18W (Figures 1 & 2f).

As part of the historic property identification efforts for this undertaking, the AML will have the entire APE subjected to an intensive level cultural resources management (CRM) inventory. At your request, a PDF copy of CRM inventory results will be forwarded to your office part of this project specific consultation. Importantly, we welcome any concerns or comments you may have pertaining to the proposed project and the scope of the historic property inventory at this time.

Please indicate within 30 days upon receipt of this letter if you wish to be a consulting party in accordance with the revised regulations of Section 106 of the NHPA (36 CFR Part 800). Also, if you have any questions or need additional information feel free to contact me at (505) 476-3426 or at richard.wessel@state.nm.us. We look forward to working with you and any tribal historic preservation representative on this project.

Sincerely,



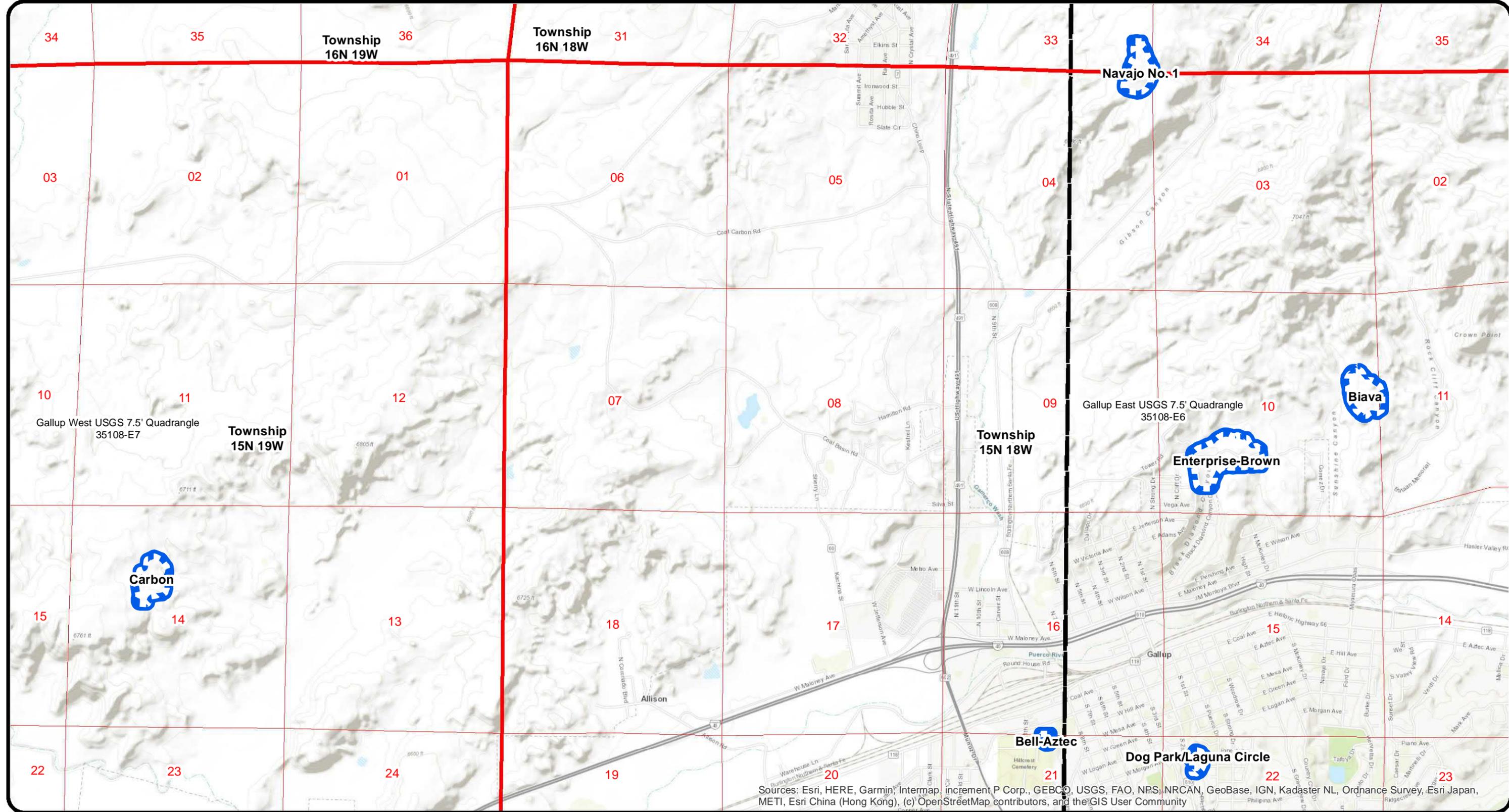
Richard L. Wessel
Cultural Resources Manager

CC: Mr. Richard M. Begay, Navajo Nation Historic Preservation Officer

- Yes, the Navajo Nation wishes to be a consulting party to the Coal Mine Land Safeguard Project and would like to review and comment in the cultural resources inventory report
- The Pueblo of Navajo Nation does not have concerns with the proposed project and does not wish to be a consulting party unless conditions specified below are met.

Tribal Representative: _____ Date: _____

Comments/Conditions:

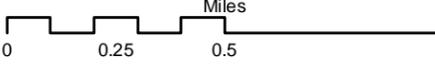


Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community









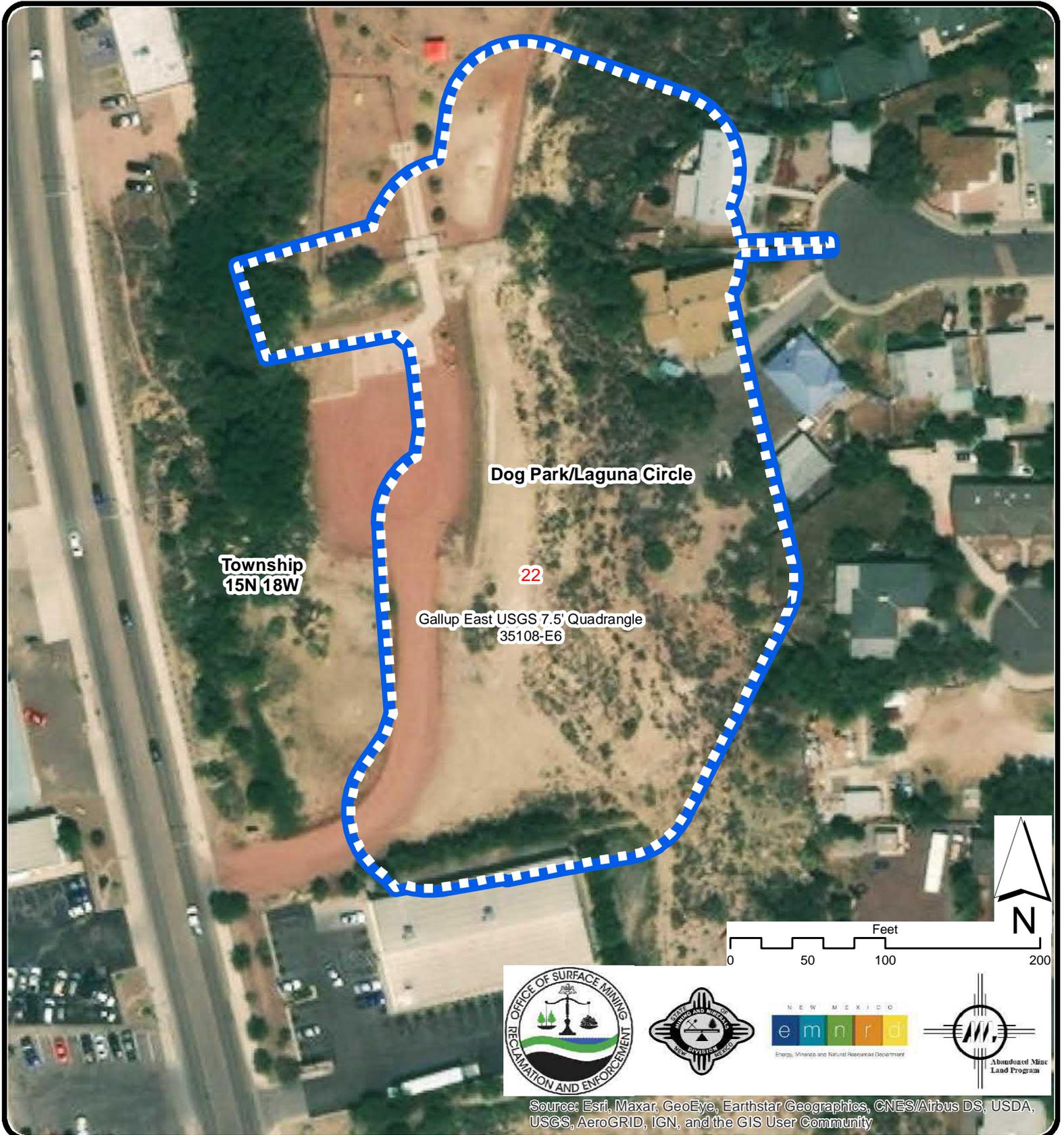
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Project Locations

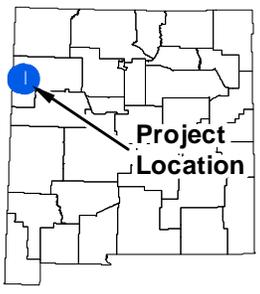
 Mine

Title: **Figure 1: Project Locations**

Location: **Gallup, McKinley County, New Mexico**

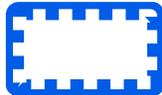


Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Legend

Project Locations

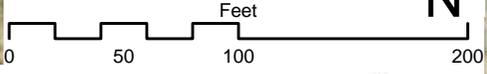
 Mine

Title:
Figure 2a: Gallup Dog Park Adit APE

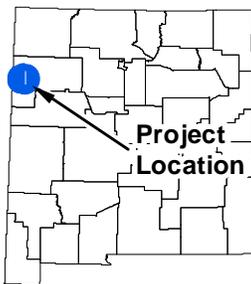
Location:
**Gallup, McKinley County,
 New Mexico**



Bell-Aztec

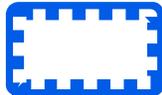


Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



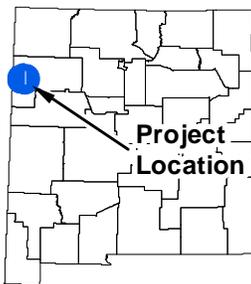
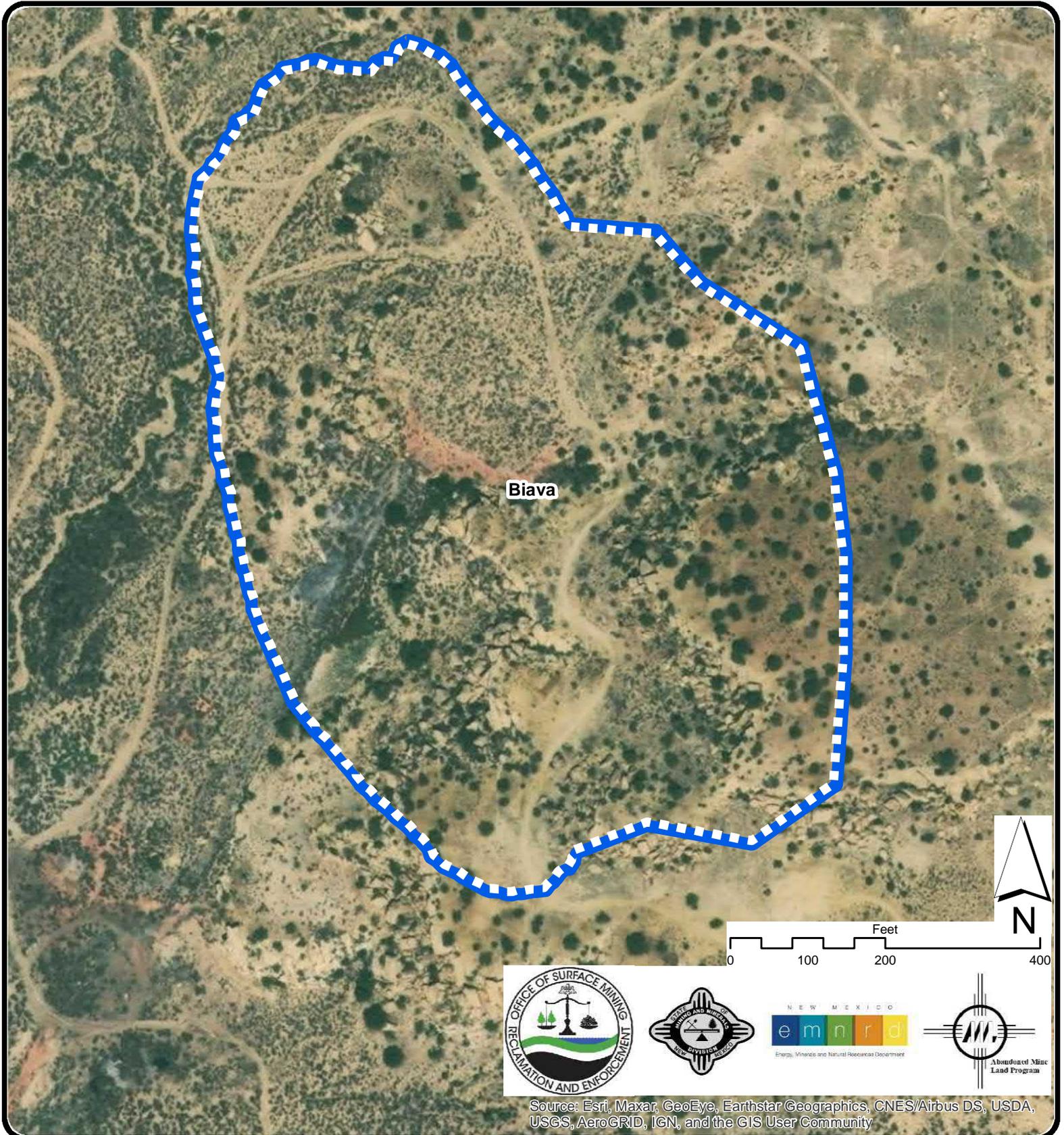
Legend

Project Locations

 Mine

Title:
Figure 2b: Bell Aztec Mine Fire APE

Location:
**Gallup, McKinley County,
New Mexico**



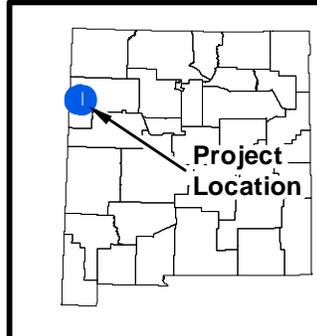
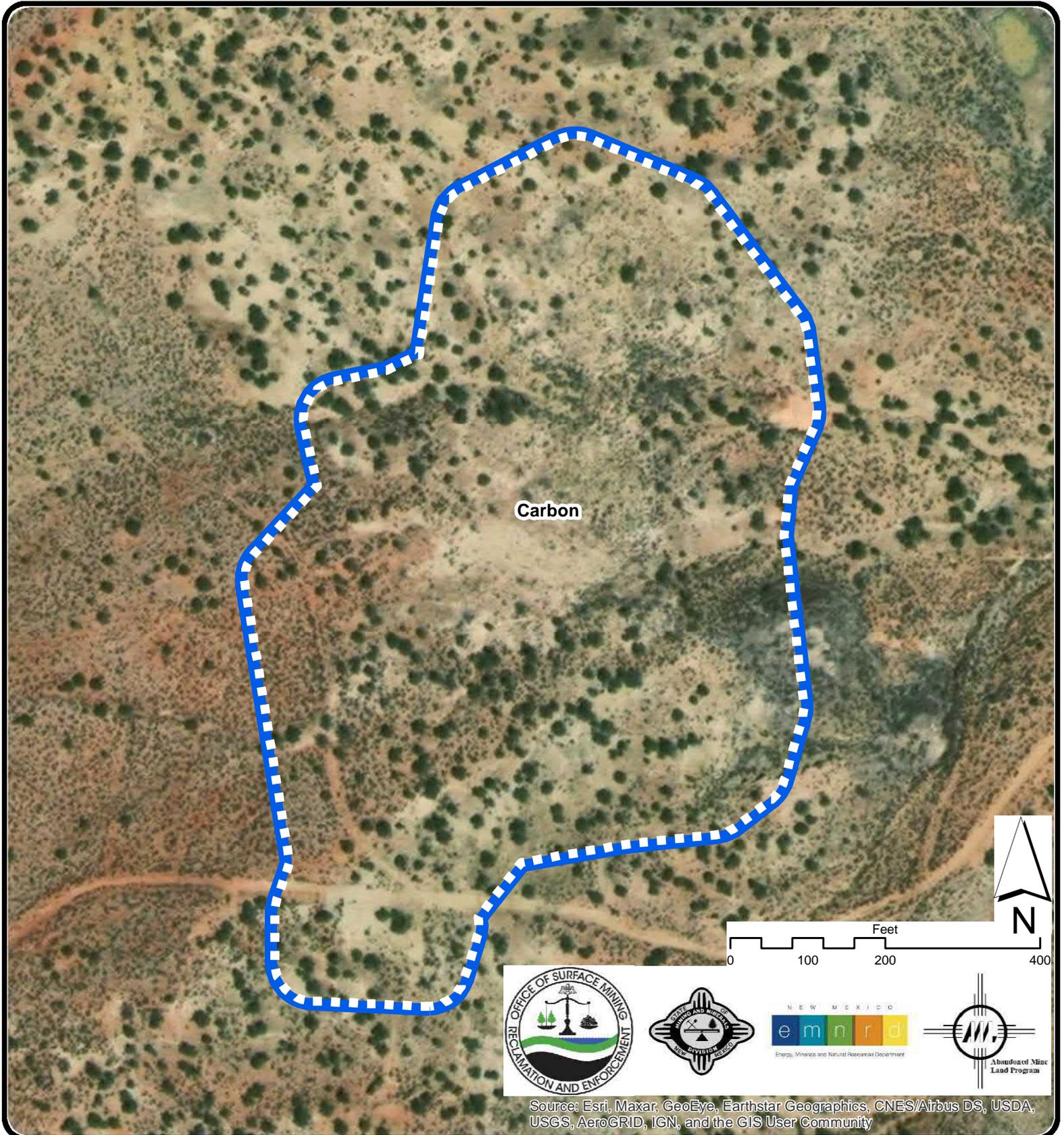
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Project Locations



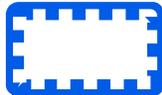
Title:
Figure 2c: Biava Mine Fire APE

Location:
**Gallup, McKinley County,
New Mexico**



Legend

Project Locations

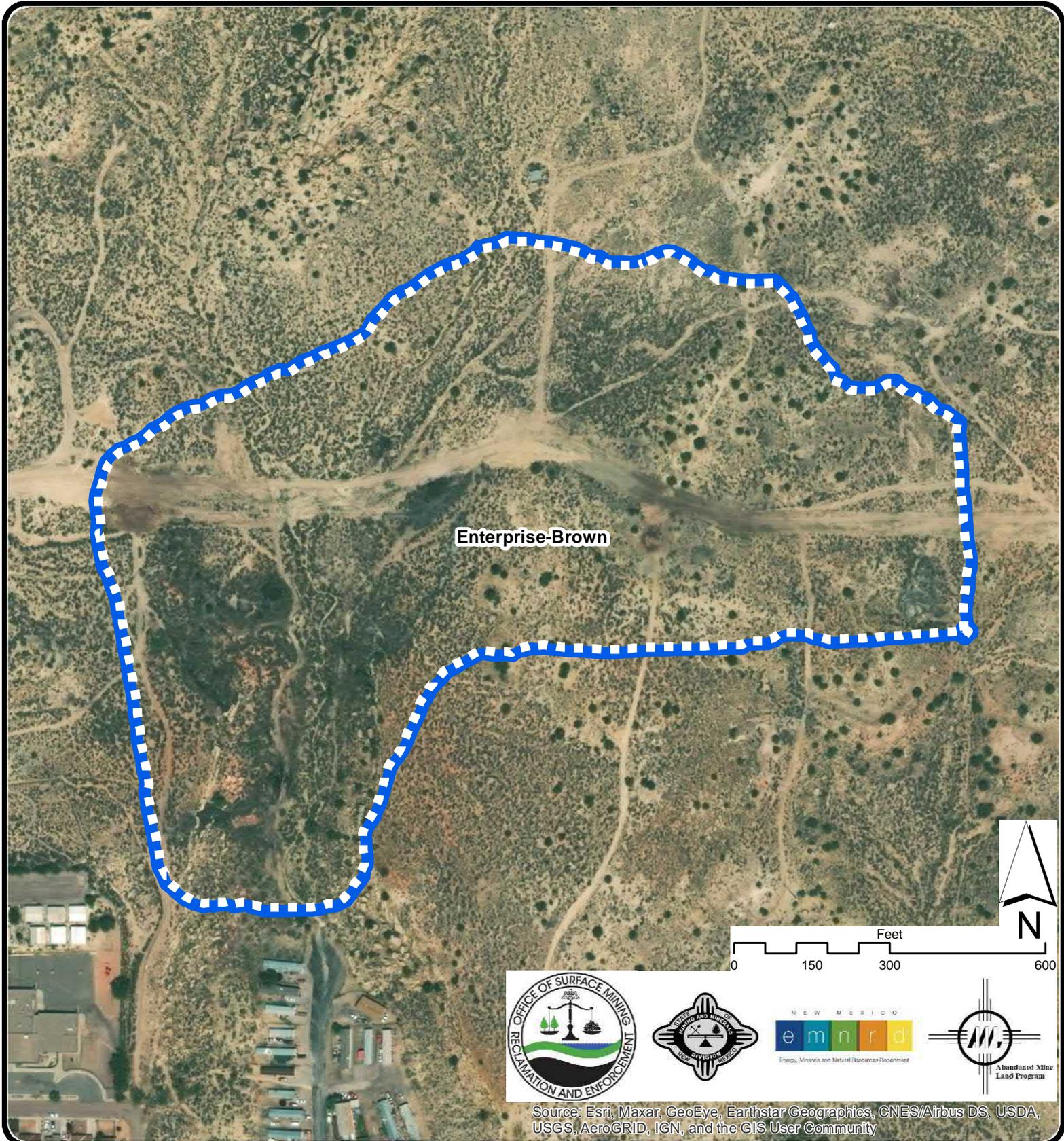
 APE

Title:

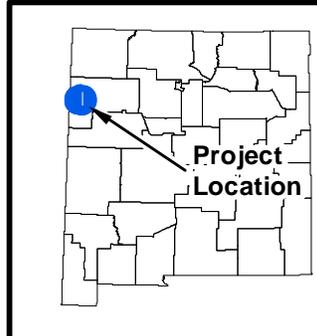
Figure 2d: Carbon Mine Fire APE

Location:

**Gallup, McKinley County,
New Mexico**

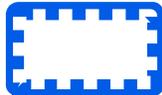


Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



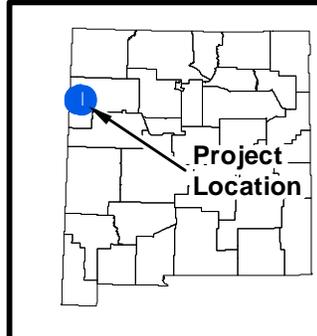
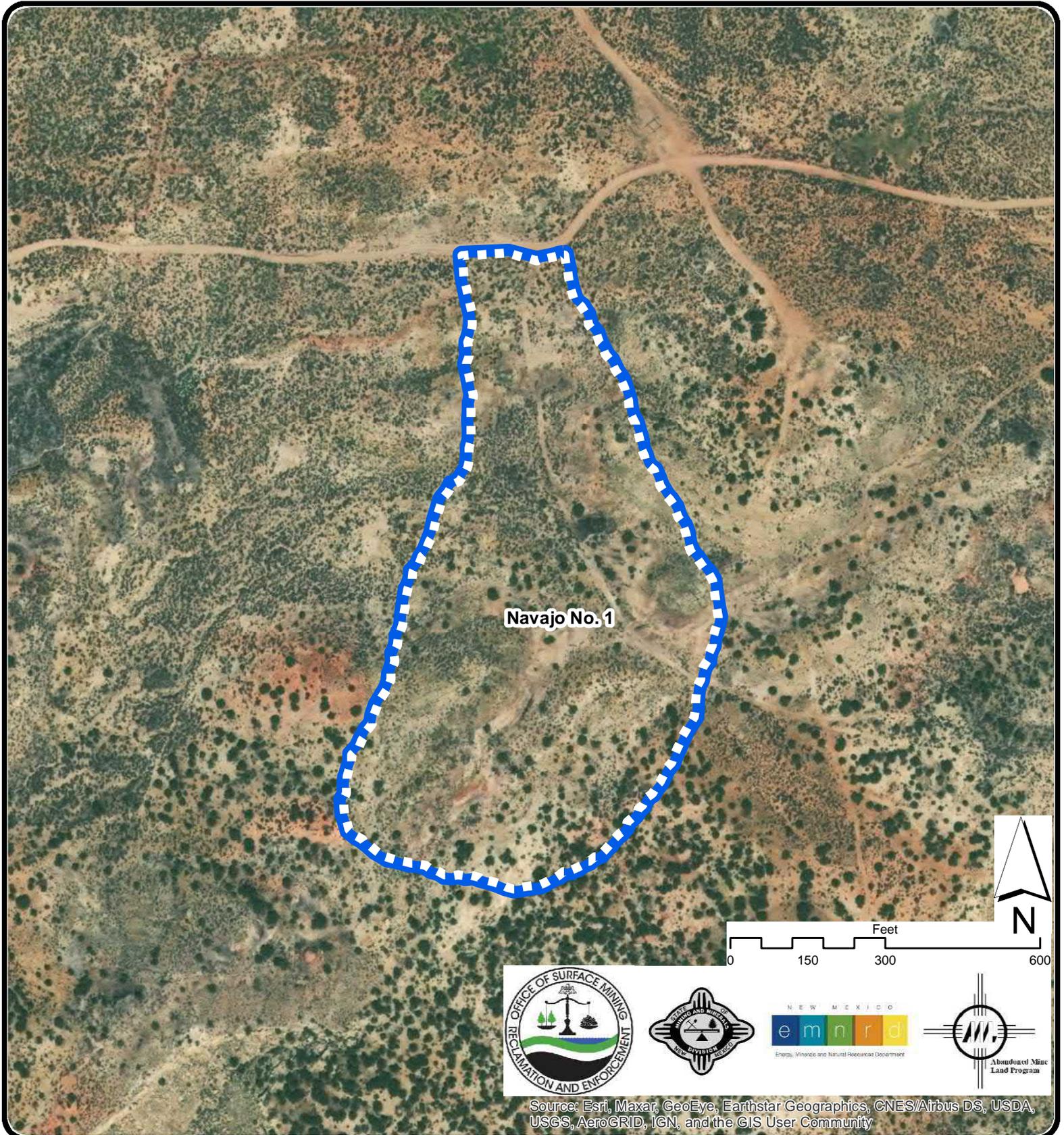
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Project Locations

 APE

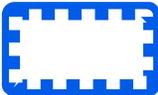
Title:
Figure 2e: Enterprise-Brown Mine Fire APE

Location:
Gallup, McKinley County, New Mexico



Legend

Project Locations

 APE

Title:

Figure 2 f: Navajo Mine Fire APE

Location:

**Gallup, McKinley County,
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

Jerry Schoeppner, Director
Mining and Minerals Division



2 November 2020

Honorable Robert Mora Sr., Governor
Route 42, Box 360-T
Santa Fe, NM 87506

Dear Honorable Governor Mora,

The New Mexico Abandoned Mine Land Program (AML), in partnership with the U.S. Department of the Interior, Office of Surface Mining Reclamation and Enforcement, is planning to address longterm threats to life and properties due to coal fires and one open mine adits in and around Gallup, McKinley County, New Mexico. 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 proposed project is in the Gallup area of McKinley County, New Mexico and consists of one open adit (Gallup Dog Park) and a coal fire (Bell-Aztec Coal Mine) within the town of Gallup and three coal mine fires (Enterprise Brown, Navajo, and Biava coal mines) north of Gallup and one coal mine fire (Carbon Coal Mine) west of Gallup (Figure 1).

The area of potential effects, as defined under 36 CFR 800.16(d), encompasses staging areas and work areas and potential areas of surfac disturbance. (Figures 2a-f)

AML is planning to close an adit and improve its drainage at the Gallup City Dog Park, fence four coal mine fire surface.

Background

The Gallup Coal Field had been identified prior to 1870 and was commercially developed in the early 1880s at the railroad arrived as a means to bring the coal to markets and also served as a important user of the coal. Specific coal mines to be addressed in this Task Order include”

1. Gallup Dog Park/Laguna Circle Adit Safeguard & Drainage Project (Figures 1 & 2a)
2. Bell-Aztec Coal Fire Safeguard Project (Figures 1 & 2b)
3. Biava Coal Mine Fire Safeguard Project (Figures 1 & 2c)
4. Carbon Coal Mine Fire Safeguard Project (Figures 1 & 2d)
5. Enterprise-Brown Coal Mine Fire Mitigation Project (Figures 1 & 2e)
6. Navajo coal mine fire Mitigation Project (Figures 1 & 3f)

The **Gallup Dog Park/Laguna Circle Mine Adit** is not mentioned in Nickelson’s 1988 treatment of the coam mining in the San Juan Basin. Mining activities were conducted to extract the fire clay and coal. Mining operations were conducted

through two adits whose portals are located near the bottom of the west facing slope, west and southwest of the Laguna Circle cul de sac. At present, it is not known who conducted the mining or when they occurred.

In 1984-5 the AML conducted exploratory drilling to determine the extent of the underground mine workings, grouting to stabilize the landform, and backfilling the southern adit

The area of potential effects (APE) for this project covers 2.8 acres and is situated in the NW $\frac{1}{4}$ of the NW $\frac{1}{4}$ of Section 22, TWP. 5N, RNG 18W (Figures 1 & 2a.).

The **Bell-Aztec Coal Mine** was initially opened around 1885 by Judge Joseph Bell, among others who formed the Bell and Company, which operated until 1888 when it was sold and was renamed the Aztec mine. A fire has been burning along the coal seam and is venting through to the surface.

The APE, which covers 1.1 acres of land owned by the City of Gallup in the SE $\frac{1}{4}$ of the NE $\frac{1}{4}$ of S10 T 15N R18W of S10 and the SW $\frac{1}{4}$ of the NW $\frac{1}{4}$ of S11 of the same township (Figures 1 & 2b).

The **Biava No. 3 Coal Mine** was opened in 1949 and operated through 1957 when the Leyba Coal Co. took over the operation and it continued until 1961, when the mine closed.

The Biava No. 3 mine is located in the SE $\frac{1}{4}$ of the NE $\frac{1}{4}$ and the NW $\frac{1}{4}$ of the SW $\frac{1}{4}$ of Section 10, T15N R18W and the SW $\frac{1}{4}$ of the NW $\frac{1}{4}$ and the NW $\frac{1}{4}$ of the SW $\frac{1}{4}$ of Section 11 of the same township.

The Biava project APE covers 14.75 acres of privately owned land (Figures 1 & 2c).

The **Carbon Coal Mine** was operated by the Carbon Coal Company, which began strip mining operations on land just west of Gallup, approximately 2 miles northeast of the village of Mentmore in late 1978. It was placed on inactive status in December 1984. A fire has been burning along the coal seam and is venting to the surface.

The APE for this area covers 13.18 acres of privately-owned land and is situated in the SE $\frac{1}{4}$ of the NW $\frac{1}{4}$ of the NW $\frac{1}{4}$ of Section 14, T15N R19W, N.M.P.M. (Figures 1 & 2d)

The **Enterprise-Brown Mine fire** is described in Nickelson's 1988 treatment of the coam mining in the San Juan Basin. Mining activities began in 1907 with mining Black Diamond coal bed. By 1913 mining was extended into the old Sunshine and Black Diamond mines, which filled the mine with damp and they began to close the mine by robbing its pillars. By 1979, the remaining coal room pillars were burning.

The area of potential effects (APE) for this project covers 22.46 acres and is situated in the SE $\frac{1}{2}$ of the SW $\frac{1}{4}$ and the W $\frac{1}{2}$ of the SW $\frac{1}{4}$ of Section 10, Township 5N, Range 18W (Figures 1 & 2e).

The **Navajo Coal Mine** consists of several mines (Navajo, Navajo No. 1-3 and Navajo No. 5) opened between 1909 and 1921. The APE covers 12.46 acres of land in the SE $\frac{1}{4}$ of the SE $\frac{1}{4}$ and the NW $\frac{1}{4}$ of the NW $\frac{1}{4}$ of Section 3, Township 15N Range 18W (Figures 1 & 2f).

As part of the historic property identification efforts for this undertaking, the AML will have the entire APE subjected to an intensive level cultural resources management

(CRM) inventory. At your request, a PDF copy of CRM inventory results will be forwarded to your office part of this project specific consultation. Importantly, we welcome any concerns or comments you may have pertaining to the proposed project and the scope of the historic property inventory at this time.

Please indicate within 30 days upon receipt of this letter if you wish to be a consulting party in accordance with the revised regulations of Section 106 of the NHPA (36 CFR Part 800). Also, if you have any questions or need additional information feel free to contact me at (505) 476-3426 or at richard.wessel@state.nm.us. We look forward to working with you and any tribal historic preservation representative on this project.

Sincerely,



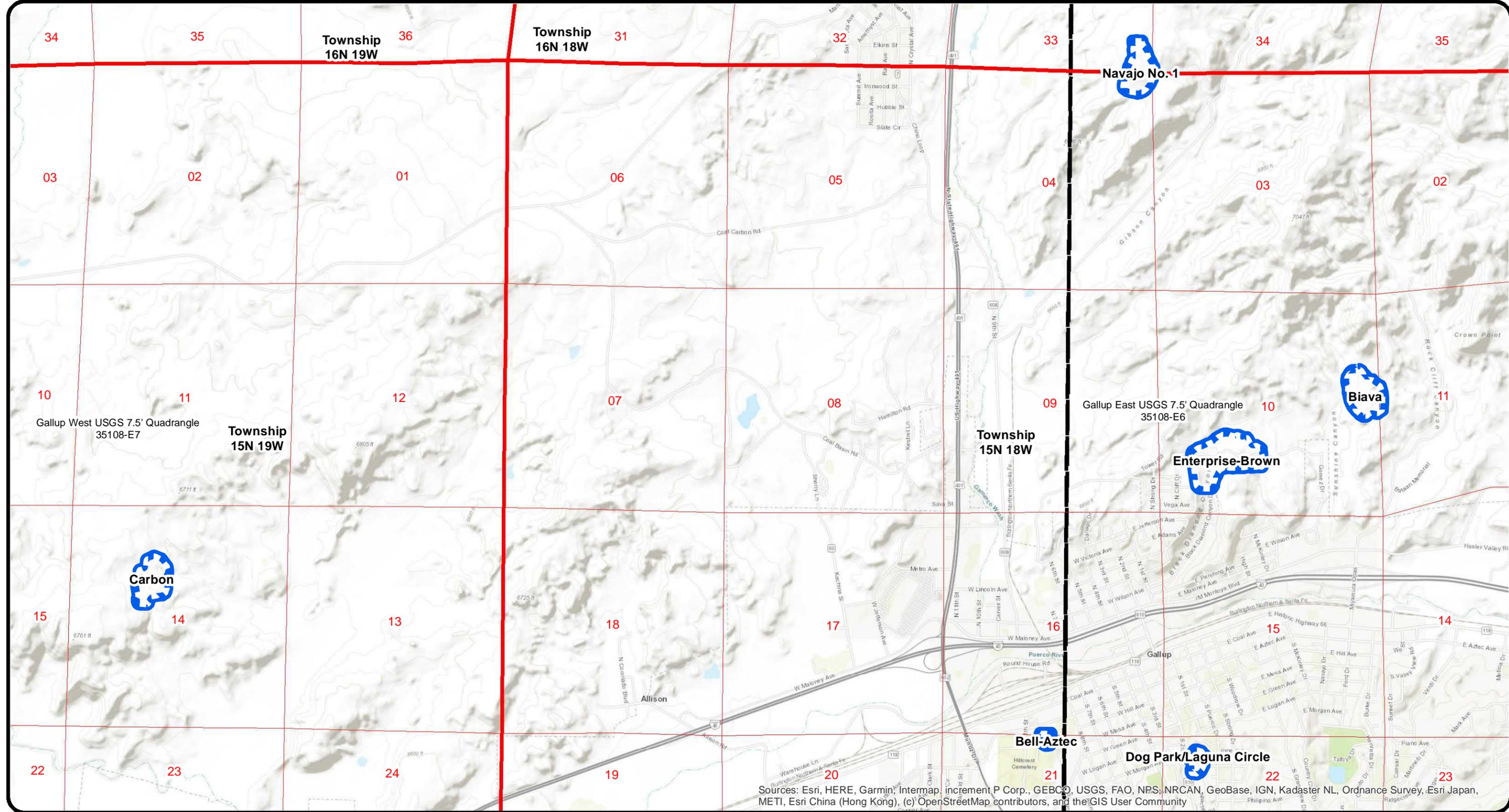
Richard L. Wessel
Cultural Resources Manager

CC: Mr. Mr. Mark Mitchell , Tesuque Pueblo Historic Preservation Officer

- Yes, the Pueblo of Tesuque wishes to be a consulting party to the Coal Mine Land Safeguard Project and would like to review and comment in the cultural resources inventory report
- The Pueblo of Pueblo of Tesuque does not have concerns with the proposed project and does not wish to be a consulting party unless conditions specified below are met.

Tribal Representative: _____ Date: _____

Comments/Conditions:



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

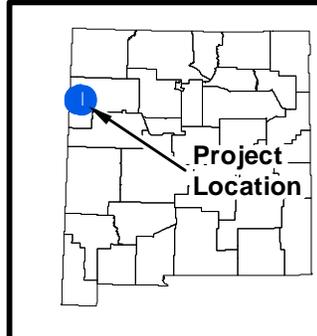
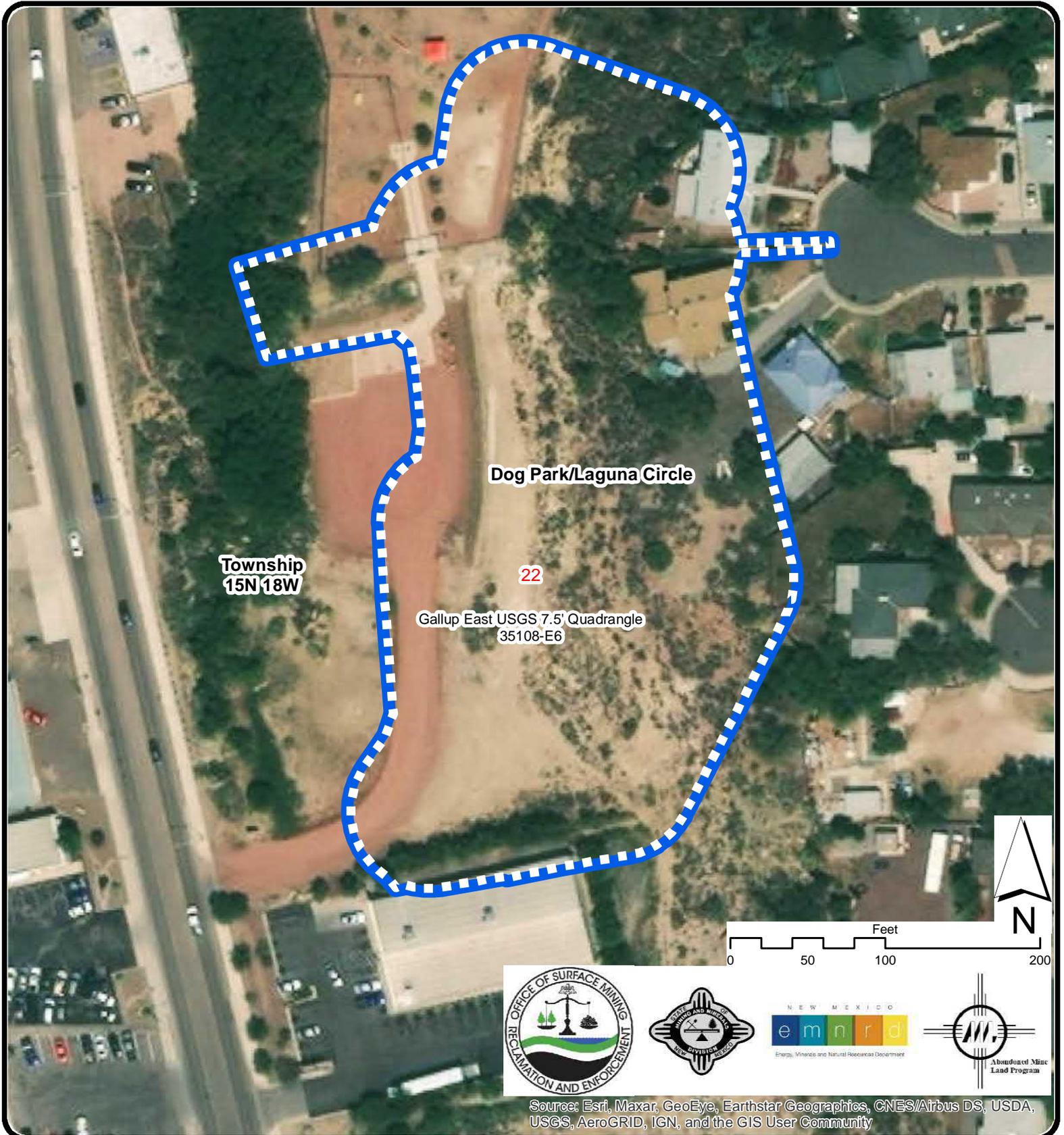
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Project Locations

Mine

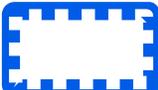
Title: **Figure 1: Project Locations**

Location: **Gallup, McKinley County, New Mexico**



Legend

Project Locations

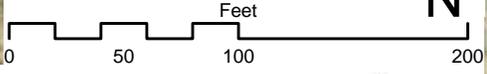
 Mine

Title:
Figure 2a: Gallup Dog Park Adit APE

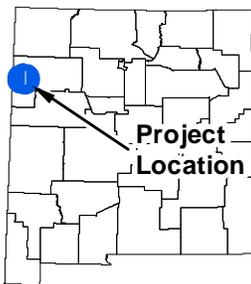
Location:
**Gallup, McKinley County,
 New Mexico**



Bell-Aztec



Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



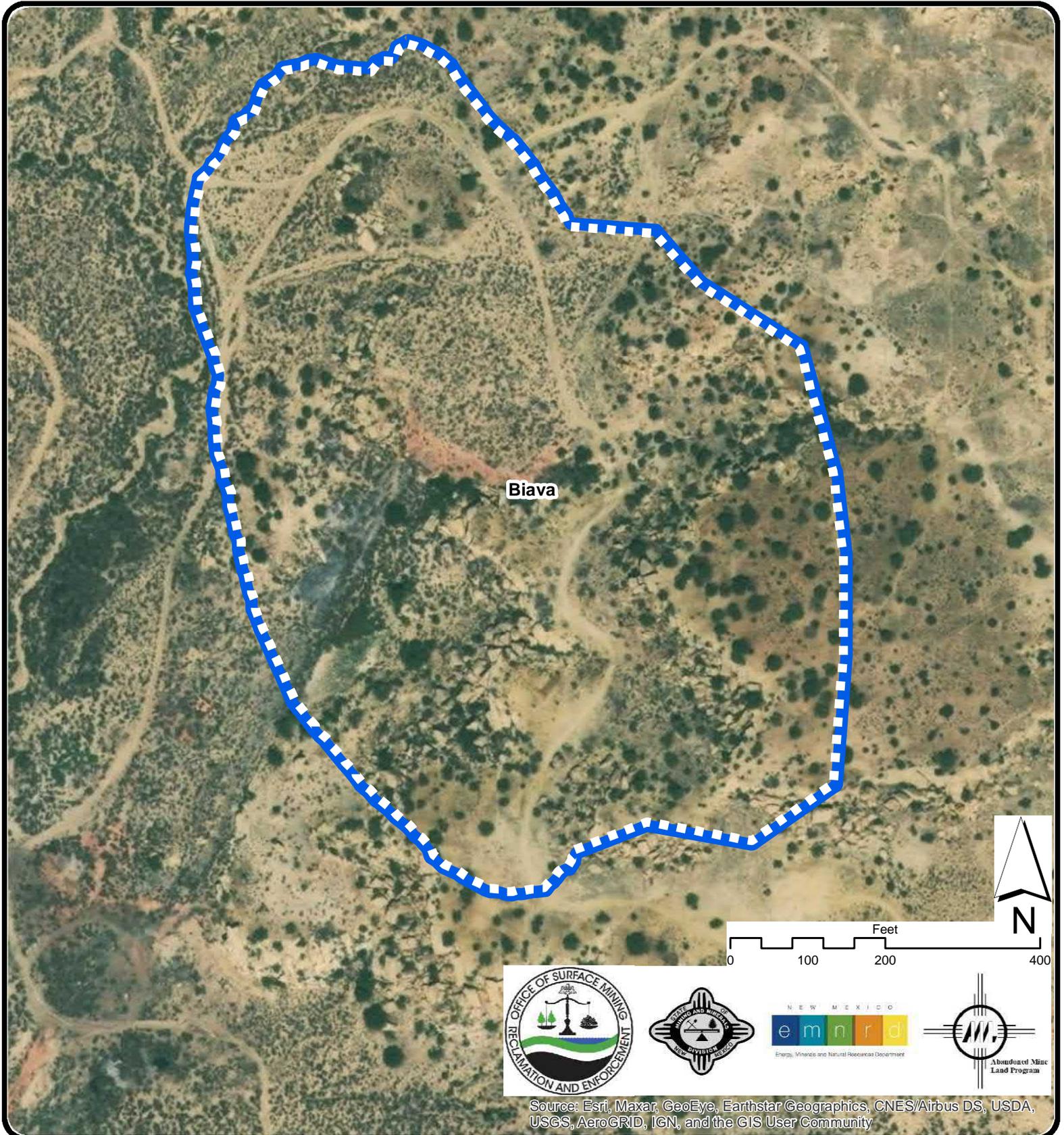
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Project Locations

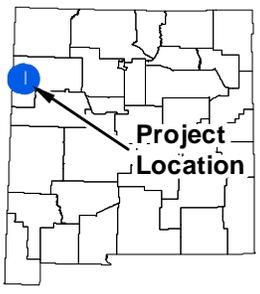


Title:
Figure 2b: Bell Aztec Mine Fire APE

Location:
**Gallup, McKinley County,
 New Mexico**



Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



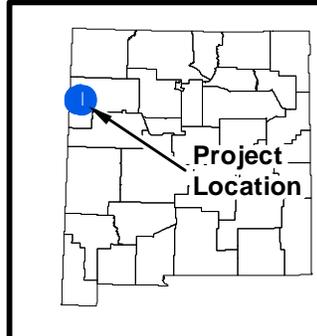
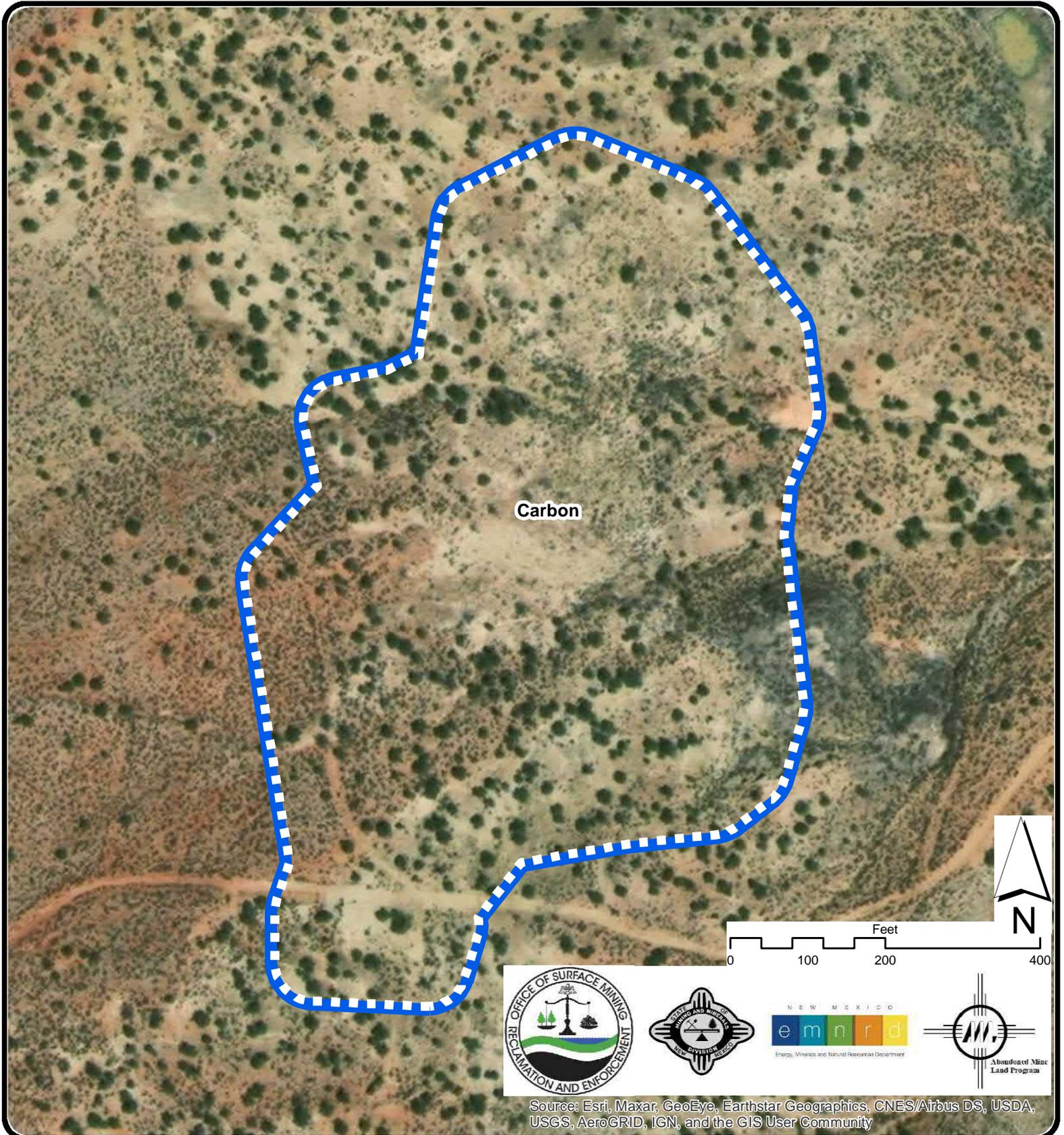
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Project Locations



Title:
Figure 2c: Biava Mine Fire APE

Location:
**Gallup, McKinley County,
 New Mexico**



Legend

Project Locations

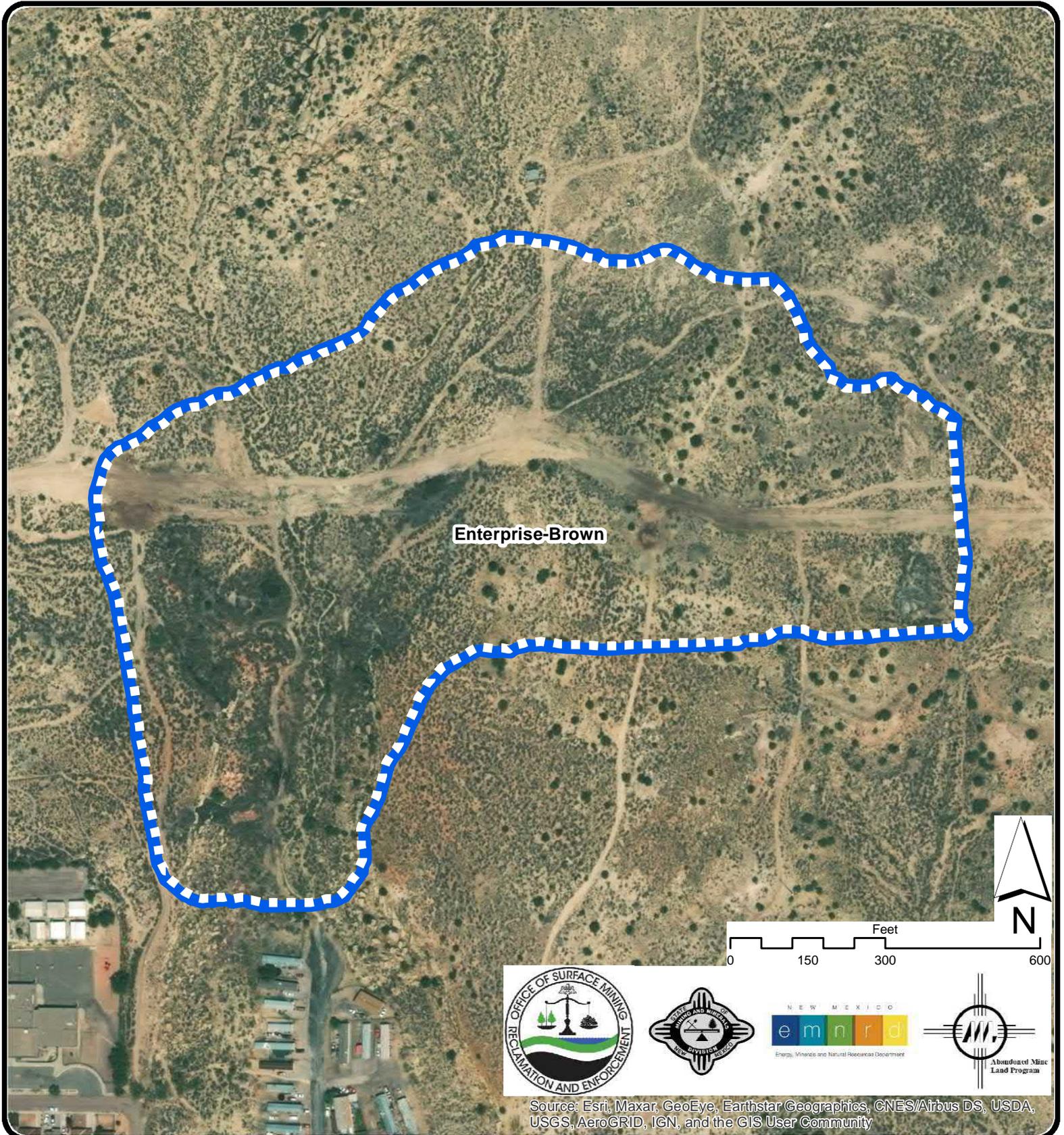
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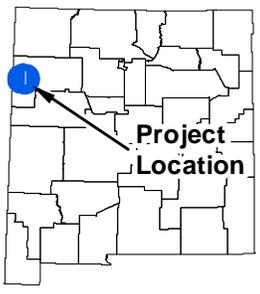
Figure 2d: Carbon Mine Fire APE

Location:

**Gallup, McKinley County,
New Mexico**

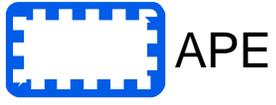


Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



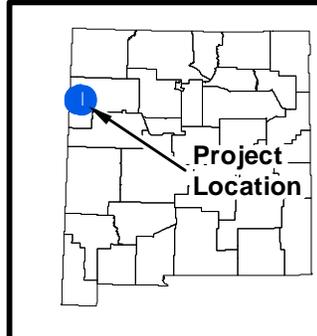
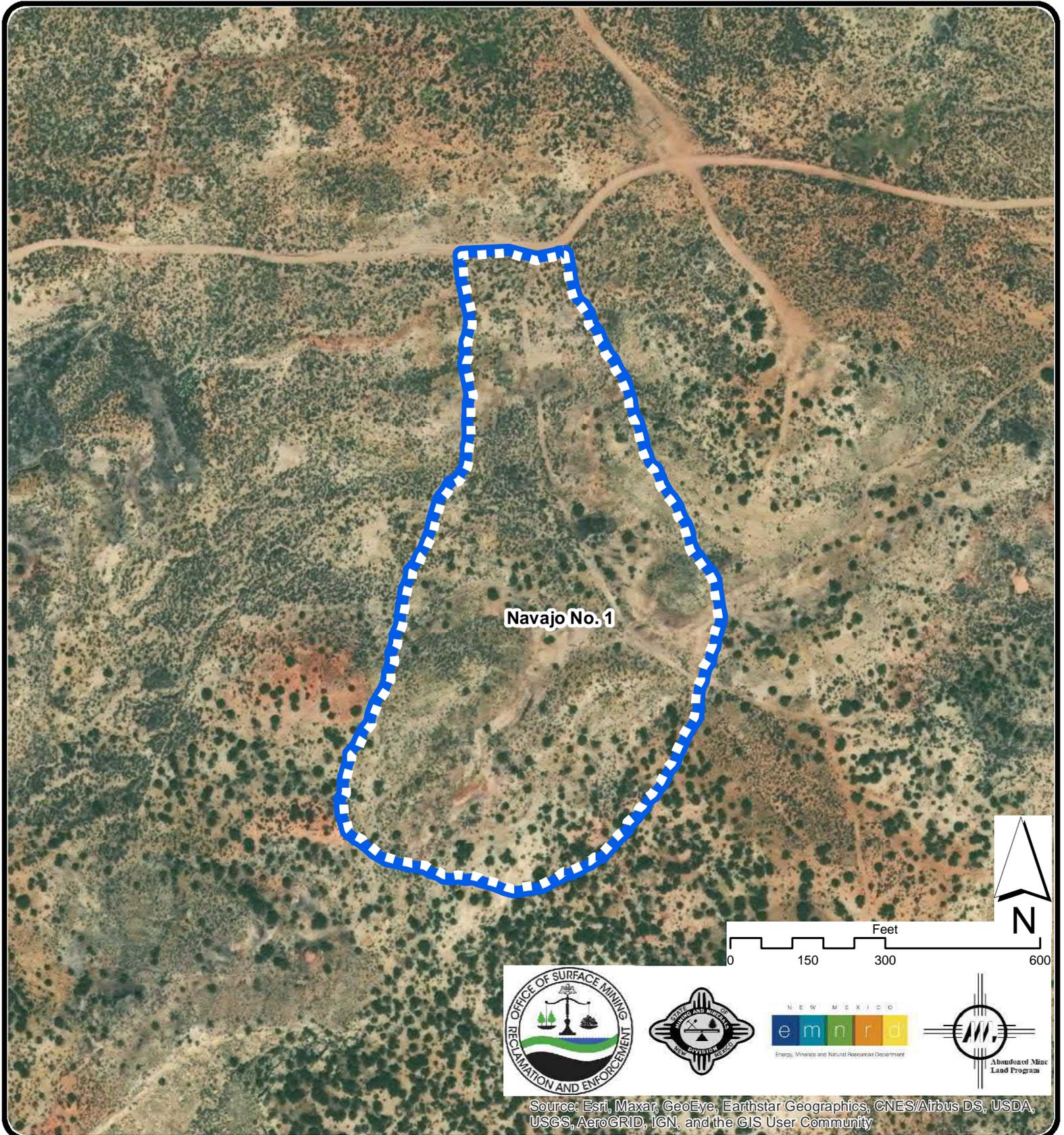
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Project Locations



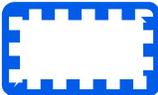
Title:
**Figure 2e: Enterprise-Brown
Mine Fire APE**

Location:
**Gallup, McKinley County,
New Mexico**



Legend

Project Locations

 APE

Title:

Figure 2 f: Navajo Mine Fire APE

Location:

**Gallup, McKinley County,
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

Jerry Schoeppner, Director
Mining and Minerals Division



2 November 2020

Honorable Val R. Panteah, Sr., Governor
P.O. Box 339
Zuni, NM 87327

Dear Honorable Governor Panteah,

The New Mexico Abandoned Mine Land Program (AML), in partnership with the U.S. Department of the Interior, Office of Surface Mining Reclamation and Enforcement, is planning to address longterm threats to life and properties due to coal fires and one open mine adits in and around Gallup, McKinley County, New Mexico. 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 proposed project is in the Gallup area of McKinley County, New Mexico and consists of one open adit (Gallup Dog Park) and a coal fire (Bell-Aztec Coal Mine) within the town of Gallup and three coal mine fires (Enterprise Brown, Navajo, and Biava coal mines) north of Gallup and one coal mine fire (Carbon Coal Mine) west of Gallup (Figure 1).

The area of potential effects, as defined under 36 CFR 800.16(d), encompasses staging areas and work areas and potential areas of surface disturbance. (Figures 2a-f)

Background

The Gallup Coal Field had been identified prior to 1870 and was commercially developed in the early 1880s at the railroad arrived as a means to bring the coal to markets and also served as a important user of the coal. Specific coal mines to be addressed in this Task Order include”

1. Gallup Dog Park/Laguna Circle Adit Safeguard & Drainage Project (Figures 1 & 2a)
2. Bell-Aztec Coal Fire Safeguard Project (Figures 1 & 2b)
3. Biava Coal Mine Fire Safeguard Project (Figures 1 & 2c)
4. Carbon Coal Mine Fire Safeguard Project (Figures 1 & 2d)
5. Enterprise-Brown Coal Mine Fire Mitigation Project (Figures 1 & 2e)
6. Navajo coal mine fire Mitigation Project (Figures 1 & 3f)

The **Gallup Dog Park/Laguna Circle Mine Adit** is not mentioned in Nickelson’s 1988 treatment of the coam mining in the San Juan Basin. Mining activities were conducted to extract the fire clay and coal. Mining operations were conducted through two adits whose portals are located near the bottom of the west facing

slope, west and southwest of the Laguna Circle cul de sac. At present, it is not known who conducted the mining or when they occurred.

In 1984-5 the AML conducted exploratory drilling to determine the extent of the underground mine workings, grouting to stabilize the landform, and backfilling the southern adit.

AML is planning to close an adit and improve its drainage at the Gallup City Dog Park, fence four coal mine fire surface.

The area of potential effects (APE) for this project covers 2.8 acres and is situated in the NW $\frac{1}{4}$ of the NW $\frac{1}{4}$ of Section 22, TWP. 5N, RNG 18W (Figures 1 & 2a.).

The **Bell-Aztec Coal Mine** was initially opened around 1885 by Judge Joseph Bell, among others who formed the Bell and Company, which operated until 1888 when it was sold and was renamed the Aztec mine. A fire has been burning along the coal seam and is venting through to the surface.

The APE, which covers 1.1 acres of land owned by the City of Gallup in the SE $\frac{1}{4}$ of the NE $\frac{1}{4}$ of S10 T 15N R18W of S10 and the SW $\frac{1}{4}$ of the NW $\frac{1}{4}$ of S11 of the same township (Figures 1 & 2b).

The **Biava No. 3 Coal Mine** was opened in 1949 and operated through 1957 when the Leyba Coal Co. took over the operation and it continued until 1961, when the mine closed.

The Biava No. 3 mine is located in the SE $\frac{1}{4}$ of the NE $\frac{1}{4}$ and the NW $\frac{1}{4}$ of the SW $\frac{1}{4}$ of Section 10, T15N R18W and the SW $\frac{1}{4}$ of the NW $\frac{1}{4}$ and the NW $\frac{1}{4}$ of the SW $\frac{1}{4}$ of Section 11 of the same township.

The Biava project APE covers 14.75 acres of privately owned land (Figures 1 & 2c).

The **Carbon Coal Mine** was operated by the Carbon Coal Company, which began strip mining operations on land just west of Gallup, approximately 2 miles northeast of the village of Mentmore in late 1978. It was placed on inactive status in December 1984. A fire has been burning along the coal seam and is venting to the surface.

The APE for this area covers 13.18 acres of privately-owned land and is situated in the SE $\frac{1}{4}$ of the NW $\frac{1}{4}$ of the NW $\frac{1}{4}$ of Section 14, T15N R19W, N.M.P.M. (Figures 1 & 2d)

The **Enterprise-Brown Mine fire** is described in Nickelson's 1988 treatment of the coam mining in the San Juan Basin. Mining activities began in 1907 with mining Black Diamond coal bed. By 1913 mining was extended into the old Sunshine and Black Diamond mines, which filled the mine with damp and they began to close the mine by robbing its pillars. By 1979, the remaining coal room pillars were burning.

The area of potential effects (APE) for this project covers 22.46 acres and is situated in the SE $\frac{1}{2}$ of the SW $\frac{1}{4}$ and the W $\frac{1}{2}$ of the SW $\frac{1}{4}$ of Section 10, Township 5N, Range 18W (Figures 1 & 2e).

The **Navajo Coal Mine** consists of several mines (Navajo, Navajo No. 1-3 and Navajo No. 5) opened between 1909 and 1921. The APE covers 12.46 acres of land in the SE $\frac{1}{4}$ of the SE $\frac{1}{4}$ and the NW $\frac{1}{4}$ of the NW $\frac{1}{4}$ of Section 3, Township 15N Range 18W (Figures 1 & 2f).

November 2, 2020

Page 3

As part of the historic property identification efforts for this undertaking, the AML will have the entire APE subjected to an intensive level cultural resources management (CRM) inventory. At your request, a PDF copy of CRM inventory results will be forwarded to your office part of this project specific consultation. Importantly, we welcome any concerns or comments you may have pertaining to the proposed project and the scope of the historic property inventory at this time.

Please indicate within 30 days upon receipt of this letter if you wish to be a consulting party in accordance with the revised regulations of Section 106 of the NHPA (36 CFR Part 800). Also, if you have any questions or need additional information feel free to contact me at (505) 476-3426 or at richard.wessel@state.nm.us. We look forward to working with you and any tribal historic preservation representative on this project.

Sincerely,



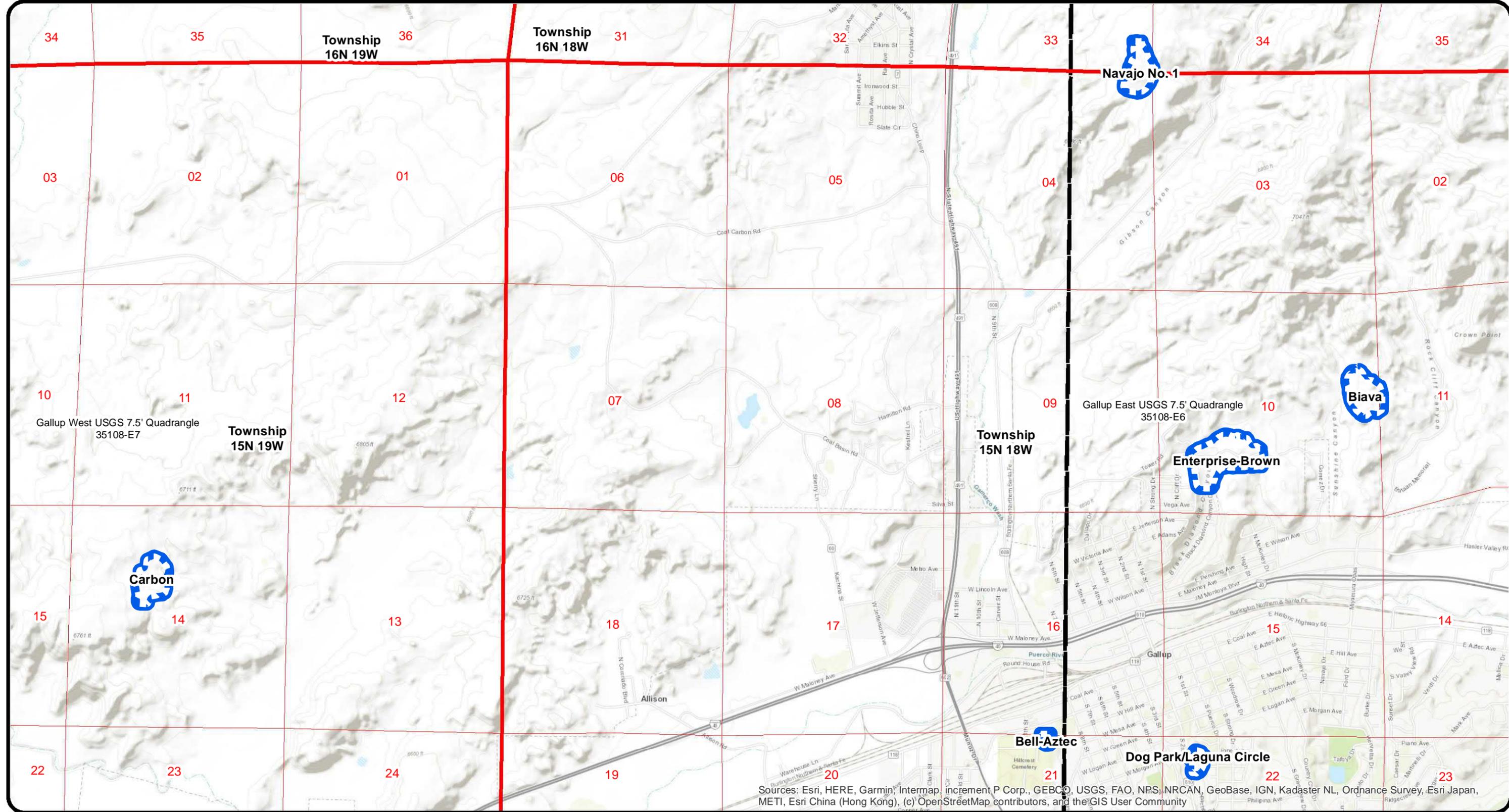
Richard L. Wessel
Cultural Resources Manager

CC: Mr. Mr. Mr. Kurt Dongoske, Zuni Pueblo Historic Preservation Officer

- Yes, the Pueblo of Zuni wishes to be a consulting party to the Coal Mine Land Safeguard Project and would like to review and comment in the cultural resources inventory report
- The Pueblo of Pueblo of Zuni does not have concerns with the proposed project and does not wish to be a consulting party unless conditions specified below are met.

Tribal Representative: _____ Date: _____

Comments/Conditions:



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

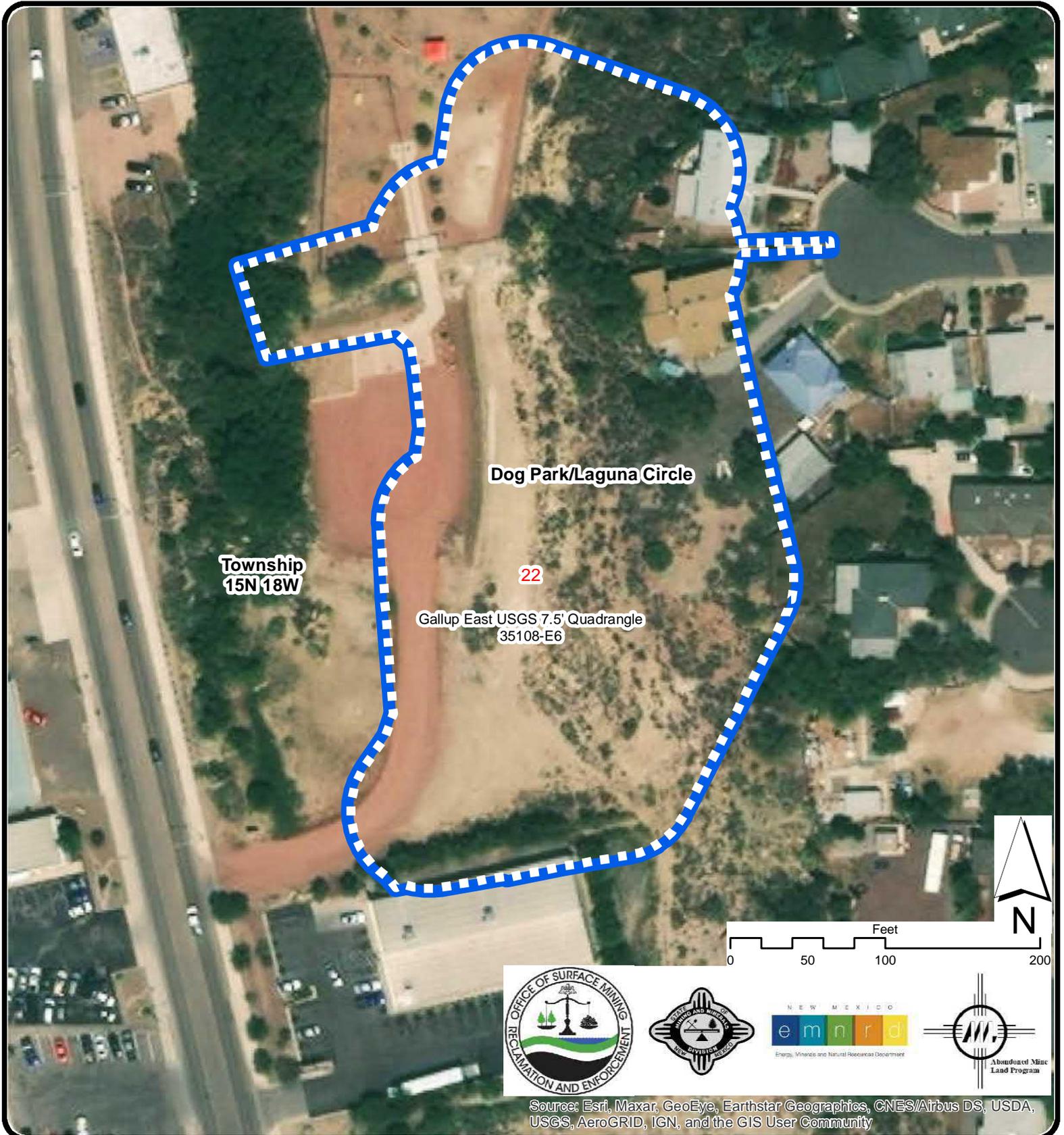
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Project Locations

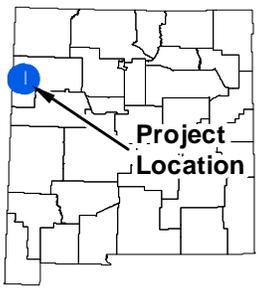
Mine

Title: **Figure 1: Project Locations**

Location: **Gallup, McKinley County, New Mexico**

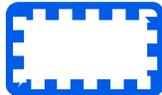


Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Legend

Project Locations

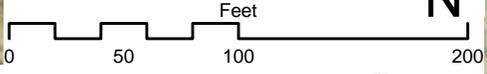
 Mine

Title:
Figure 2a: Gallup Dog Park Adit APE

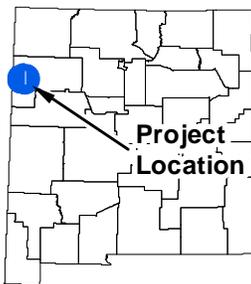
Location:
**Gallup, McKinley County,
 New Mexico**



Bell-Aztec

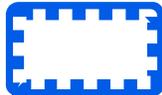


Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



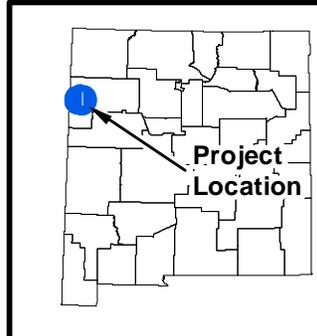
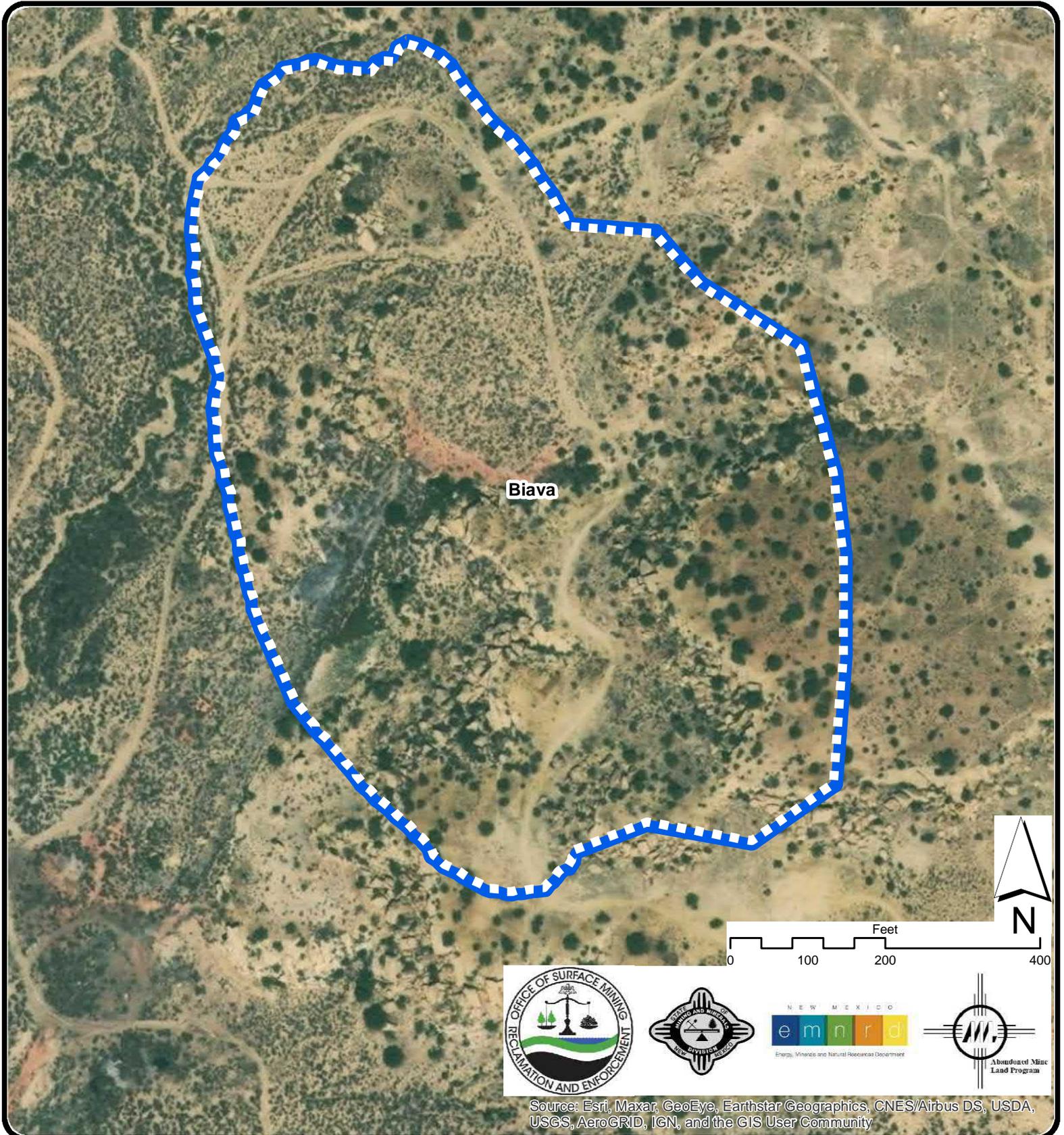
Legend

Project Locations

 Mine

Title:
Figure 2b: Bell Aztec Mine Fire APE

Location:
**Gallup, McKinley County,
New Mexico**



Legend

Project Locations

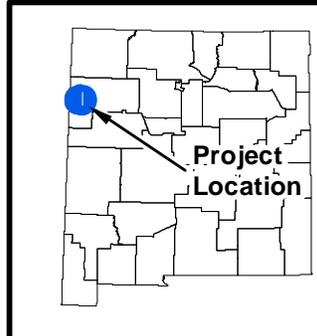
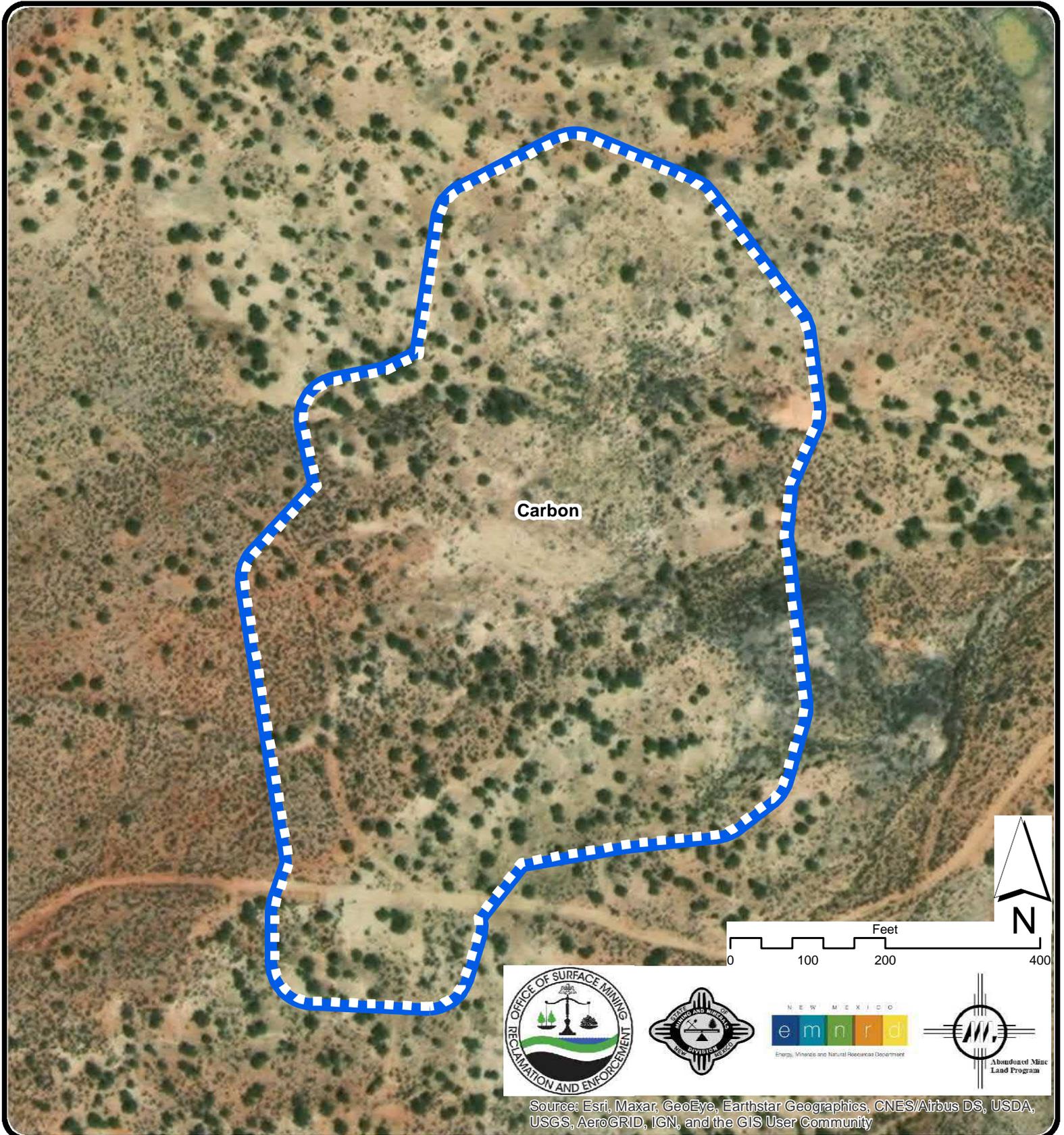
APE

Title:

Figure 2c: Biava Mine Fire APE

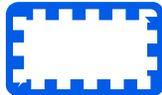
Location:

Gallup, McKinley County,
New Mexico



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Project Locations

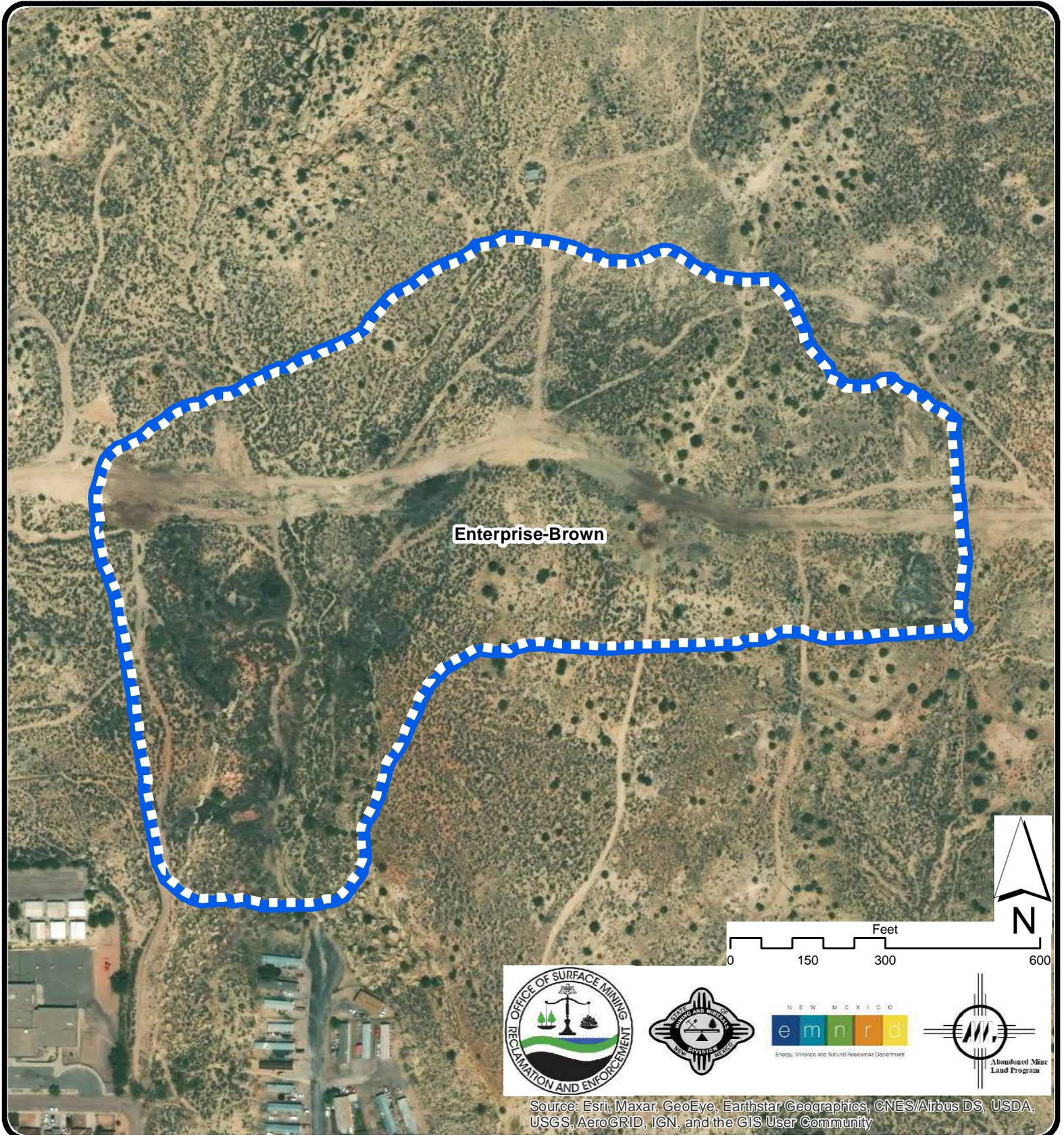
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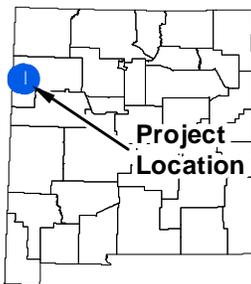
Figure 2d: Carbon Mine Fire APE

Location:

**Gallup, McKinley County,
New Mexico**



Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Legend

Project Locations



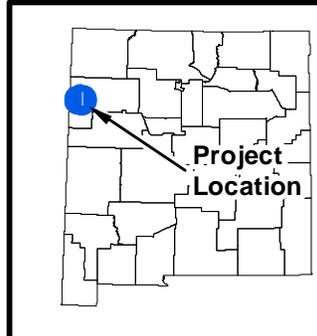
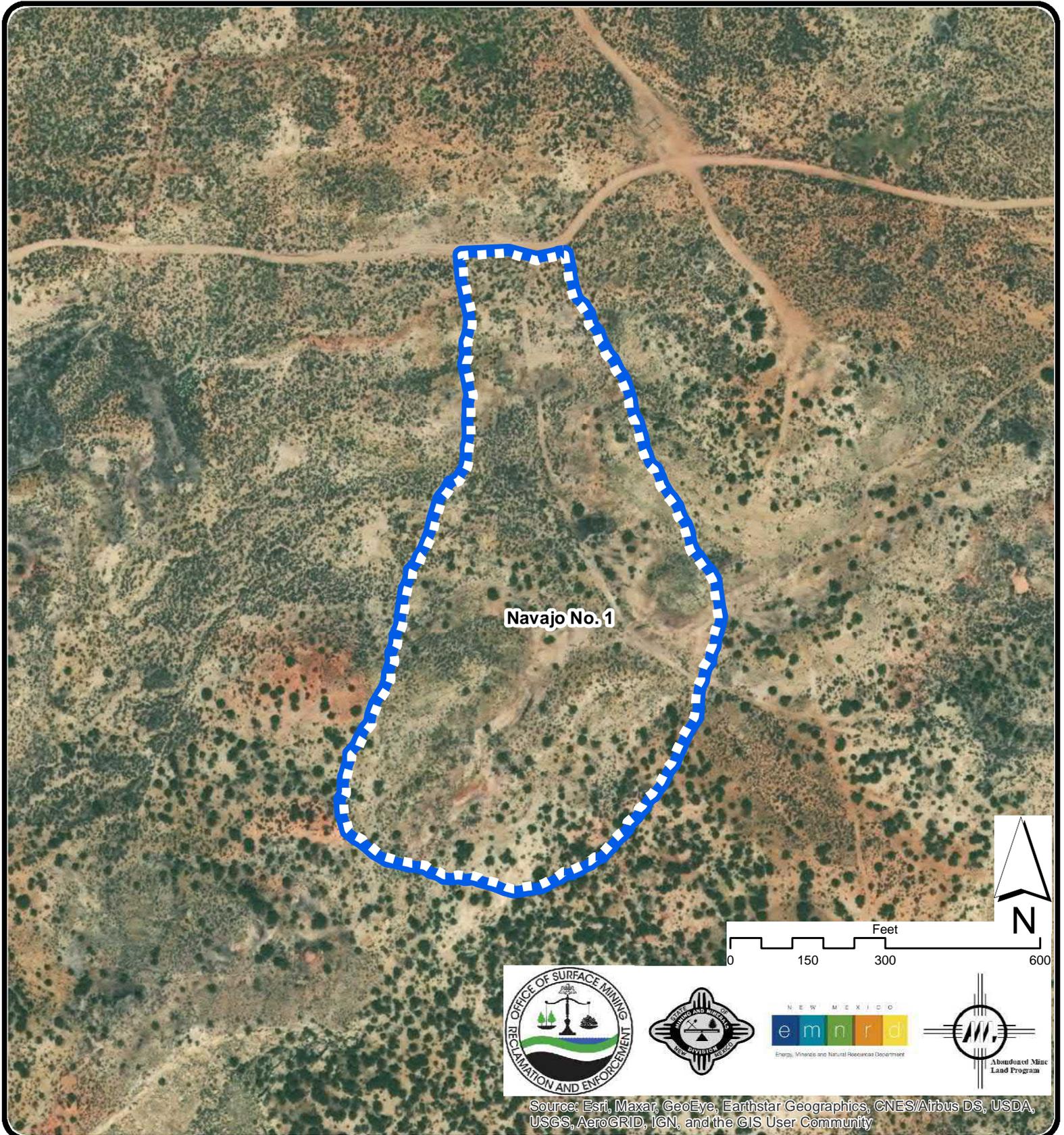
APE

Title:

Figure 2e: Enterprise-Brown Mine Fire APE

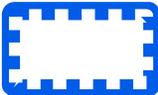
Location:

Gallup, McKinley County, New Mexico



Legend

Project Locations

 APE

Title:

Figure 2 f: Navajo Mine Fire APE

Location:

**Gallup, McKinley County,
New Mexico**