Work Plan for the Schmitt Decline Mine Site Assessment McKinley County, New Mexico

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Prepared for

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Office of the Secretary
Office of Strategic Initiatives
Uranium Mine Reclamation Program
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ACRONYMS AND ABBREVIATIONS

#	number
^{214}Bi	Bismuth 214
^{220}Rn	Radon-220
^{222}Rn	Radon-222
^{226}Ra	Radium-226
^{228}Ra	Radium-228
ALARA	as low as reasonably achievable
APE	area of potential effect
CAS	Chemical Abstract Service
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFR	Code of Federal Regulations
cm	centimeter(s)
DOE	U.S. Department of Energy
EA	EA Engineering, Science, and Technology Inc., PBC
EML	Environmental Measurements Laboratory
ESFS	EnergySolutions Federal Services
EPA	United States Environmental Protection Agency
ft-bgs	feet below ground surface
FSS	Final Status Survey
GIS	Geographic Information Systems
GPS	Global Positioning System
GWS	gamma walkover survey
HASL	Health and Safety Laboratory
HMC	Homestake Mining Company
ICPMS	inductively coupled plasma mass spectrometry
ID	identification
IL	investigation level
LiDAR	light detection and ranging
MARSSIM	Multi-Agency Radiation Site Survey Investigation Manual
mg/L	milligram(s) per liter
m^2/s	square meters per second

NaI	sodium iodide
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NMEMNRD	New Mexico Energy, Minerals, and Natural Resources Department
NMOSE	New Mexico Office of the State Engineer
NMSLO	New Mexico State Land Office
NPL	National Priorities List
NRC	U.S. Nuclear Regulatory Commission
pCi/g	picocuries per gram
Pinyon	Pinyon Environmental, Inc.
PPE	personal protective equipment
RBA	reference background area
RCA	Radiological Controlled Area
RPP	Radiation Protection Plan
RSO	Radiation Safety Officer
SAP	Sampling and Analysis Plan
SHPO	State Historic Preservation Officer
SMC	San Mateo Creek
SU	Survey Unit
TDS	Total Dissolved Solids
TEDE	Total Effective Dose Equivalent
UMSA	Uranium Mine Site Assessment
USGS	U.S. Geological Survey

1. INTRODUCTION

EA Engineering, Science, and Technology, Inc., PBC (EA) has prepared this work plan in response to the New Mexico Environment Department's (NMED) Technical Proposal Request for Abandoned Uranium Mine Cleanup in the Grants Mining District. This Work Plan describes the activities required to conduct the Stage 2 Uranium Mine Site Assessment (UMSA) at the Schmitt Decline Uranium Mine (NM0261, Site) located in McKinley County, New Mexico (Figure 1-1), including field investigation, sampling, and analysis.

This Work Plan was prepared, and the requested scope of work will be completed under NMED Contract #26-667-2030-00004. The site assessment will be conducted to provide data for reclamation alternatives and will be presented in a Closure Plan. The Closure Plan will include details describing the proposed surface reclamation plan.

The activities described in this Work Plan will be conducted in accordance with the following documents prepared during the Stage 1 UMSA:

- The Health and Safety Plan/Activity Hazard Analysis (EA, 2025a) include the health and safety requirements for field personnel and the Activity Hazard Analysis documents describing the procedures to be performed along with potential risks and mitigations.
- The Sampling and Analysis Plan (SAP) (Energy Solutions Federal Services [ESFS], 2025) provides analytical methods to be used for the project and quality assurance/quality control methods and documentation. This document includes a description of the instrumentation to be used for field screening during the walking radiological survey, including calibration and instrument sensitivity information.
- The Community Relations Plan (EA, 2025b) was developed to encourage community involvement in the project and facilitate communication between the community members throughout the project. The Public Involvement Plan (EA, 2025c) was developed to provide public participation opportunities and information that may be needed for the community to participate in the uranium mine reclamation process for this Site.

1.1 OVERSIGHT RESPONSIBILITY

The Schmitt Decline Mine is a former uranium mine site located on state trust land managed by the New Mexico State Land Office (NMSLO). The NMED Office of Strategic Initiatives is the regulatory body overseeing cleanup activities at the Schmitt Decline Mine.

1.2 REGULATORY REQUIREMENTS

Surface reclamation of mine sites falls under the jurisdiction of the New Mexico Mining Act for surface conditions and is administered by the New Mexico Energy, Minerals, and Natural Resources Department (NMEMNRD). The New Mexico Mining Act is administered under the New Mexico Mining Commission regulations (19.10 New Mexico Administrative Code [NMAC]). Surface and subsurface mine reclamation of mine sites also falls under the jurisdiction of the New Mexico Water Quality Act, which is implemented through the New Mexico Water

Quality Control Commission (20.6 NMAC). Work will be performed to extent possible in accordance with Joint Guidance for the Cleanup and Reclamation of Existing Uranium Mining Operations in New Mexico (NMENMRD/NMED 2016).

1.2.1 Laws and Regulations Applicable to Cleanup

The responsibility of addressing the remediation and reclamation of former uranium mining sites falls under both NMED and NMEMNRD, and joint guidance was authored by both parties to minimize future impact on these sites (NMEMNRD/NMED, 2016). This guidance reviewed standards and documents from the United States Environmental Protection Agency (EPA), the United States Nuclear Regulatory Commission (NRC), the United States Department of Energy (DOE), and other state and federal agencies for establishing criteria for cleanup and reclamation of existing uranium mine sites. Based on the results of the characterization, the following regulations may be applied to subsequent reclamation activities:

The EPA regulations refer to 40 CFR 192, which are associated with specific concentrations of uranium and thorium mill tailings. The Schmitt Decline Mine site may not have processed uranium ores or generated mill tailings, however the concentrations limits for Radium-226 (226Ra) will be used as a conservative basis for establishing measurement/data quality objectives during site characterization activities and laboratory analyses, as follows:

- 5 pCi/g averaged over the first 15 cm of soil below the surface
- 15 pCi/g averaged over 15 cm-thick layers of soil more than 15 cm below the surface

The NRC also includes the following radium concentration limits (above background and over 100 square meter areas) for operating uranium mines referred to as the “5/15 standard” and is referenced within 10 CFR 40 Appendix A, Criterion 6, Paragraph 6:

- 5 pCi/g in the first 15cm of the surface
- 15 pCi/g below 15 cm from the surface10 CFR 40 Appendix A, Criterion 6, Paragraph 6

10 CFR 40 Appendix A, Criterion 6, Paragraph 6 also addresses radon flux limitations after reclamation establishing a criterion of 20 $pCi/m^2/sec$ averaged over stockpiles and impoundments.

The byproduct material containing concentrations of radionuclides other than radium must not result in a TEDE that exceeds the dose from cleanup of radium-contaminated soils described in the “5/15 standard” above. A dose assessment will be performed and included within our Site Characterization Final Report.

Finally, the NRC establishes a Total Effective Dose Equivalent (TEDE) limit of 25 millirem per year (mrem/yr) in 10 CFR 20.1402 (see also equivalent State of NM requirements in Subchapter B of 20.3.4.426 NMAC).

1.2.2 Cleanup Standards for Contaminants of Concern

The cleanup criteria for the radiological contaminants of concern are listed in Table 1-1. Elevated radiological readings encountered during characterization survey activities or review of laboratory analysis will be communicated to the Project Health Physicist and will be subsequently addressed in future reclamation activities for this Site.

1.2.3 Radiological License Requirements

As a uranium mine site with no history of ore processing, the naturally occurring radioactive materials on-site are exempt from licensing based on state regulation (see Subsection B of 20.3.3.301 NMAC [NRC]).

2. SITE BACKGROUND

2.1 SITE LOCATION

The Schmitt Decline Mine is located in the San Mateo Creek (SMC) Basin along the southern margin of the underlying San Juan Basin. The Schmitt Decline Mine (NM0261, Site) is approximately 13 miles northeast of Milan, New Mexico in the northern portion of the Central Study Area of the SMC Basin (Figure 1-1). The Schmitt Decline Mine is located approximately 1.32 miles northwest of the intersection between New Mexico State Highways 509 and 605 within New Mexico Land Office managed land. A title search for the property is included as Appendix A.

2.2 PREVIOUS INVESTIGATIONS

There have been multiple investigations performed in the area of the Schmitt Decline Mine. The four documents that are most applicable to the Schmitt Decline Mine are discussed below.

The EPA conducted an assessment that is documented in the Preliminary Phase 1 Site investigation Report, San Mateo Creek Legacy Mines, Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) Identification (ID) NMN00060684, McKinley and Cibola Counties, New Mexico dated March 2010 (EPA, 2010). During this investigation, a water sample was collected from livestock well SMC-18. At that time, the groundwater level was measured at 82.3 feet below ground surface (ft-bgs), and the depth of the well was measured at 102 ft-bgs. The laboratory data is discussed in Section 2.5 and provided in Table 2-1.

The EPA conducted an additional assessment documented in the Expanded Site Inspection, Phase 1 Groundwater Investigation Report for San Mateo Creek Basin Uranium Legacy Site, Cibola and McKinley Counties, New Mexico dated August 30, 2016 (EPA, 2016). This assessment focused on the investigation of alluvial groundwater within the SMC Basin to assess potential impacts from legacy uranium mining. Based on the investigation findings, alluvial sediments in the northern and western upland areas of the SMC Basin are mostly dry.

The EPA conducted another assessment documented in the Phase 2 Groundwater Investigation for the San Mateo Creek Basin Legacy Uranium Mines Site, Cibola and McKinley Counties, New Mexico Report dated October 1, 2018 (EPA, 2018). The report presents the second phase of an Expanded Site Inspection groundwater investigation conducted at the SMC Basin Legacy Uranium Mines Site. The investigation was performed to assess potential impacts by legacy uranium mining and milling activities on water resources. This Phase 2 groundwater investigation began in 2015 as an expansion of the Phase 1 study to fill in data gaps and to assess potential impacts to bedrock groundwater, with a focus on the Dakota Sandstone aquifer in the Ambrosia Lake Valley.

The results of the report indicated that groundwater flow is generally in the direction of the regional tilt of the bedrock, to the north and northeast. The Dakota Sandstone aquifer is a confined system. Water quality data collected during the Phase 2 groundwater investigation for the Dakota Sandstone shows elevated concentrations of sulfate and total dissolved solids (TDS). Sulfate concentrations ranged from 2,000 milligrams per liter (mg/L) to 2,500 mg/L. TDS concentrations

ranged from 3,300 mg/L to 3,800 mg/L. Uranium concentrations ranged from 0.011 to 0.028 mg/L, selenium concentrations ranged from 0.014 mg/L to 0.033 mg/L, and chloride concentrations ranged from 33 mg/L to 57 mg/L.

Initial Site scoping was performed on July 10, 2025, during an initial site walk with NMED, EA, ESFS and other stakeholders. During this visit, an ESFS technician used a Ludlum Model 19 gamma survey meter to assess potential exposure rates in the areas of interest. No readings were collected in the mine itself, however, radiation exposure rates of 0.9 milliroentgen per hour (mR/hr) were recorded on a large stockpile northwest of the mine entrance, referred to as a "sandstone waste stockpile". General area dose rates around the same stockpile ranged from 0.25 mR/hr to 0.43 mR/hr and additional readings at the mine entrance and around the remainder of the Site ranged from 0.015 mR/hr to 0.035 mR/hr.

2.3 SITE CONDITIONS

2.3.1 Surface Conditions

The Site is located on a mesa, approximately 1.3 miles west of the intersection of New Mexico State Highways 605 and 509. The Dakota sandstone outcrops at or near the surface. The former mine consists of an open unfenced decline entrance, remnant mining equipment, miscellaneous debris, and an access road. The decline dips steeply at approximately 30 to 45 degrees. Waste rock from mine development extends a maximum of approximately 150 feet to the north of the mine portal. There are two mine waste rock piles, one to the northeast and the other to the northwest of the decline entrance (Figures 2-1 and 2-2). A third waste rock pile that indicated elevated radiological concentrations is located approximately 130 feet east of the mine portal. Drainage appears to be to the northeast.

Wind data from the Western Regional Climate Center website was reviewed for data collected at the Grants-Milan, New Mexico airport (Appendix B). The average annual wind speed for the years between 1997 and 2011 ranged between 8.3 and 8.7 miles per hour. The annual average prevailing wind direction was from the west-northwest.

2.4 LOCAL GEOLOGY

The major tectonic and structural geologic feature in the SMC Basin is the centrally located San Mateo Fault Zone (EPA, 2018). The San Mateo Fault Zone is a northeast-southwest trending fault zone within the San Juan Basin that extends from the Zuni Uplift through the Homestake Mining Company (HMC) National Priorities List (NPL) site and parallel to New Mexico State Highway 605 until it ends near the edge of San Mateo Mesa. The fault zone underlies the central portion of the SMC Basin, and it likely influenced early drainage features and channel development within the basin. The maximum vertical displacement of the San Mateo fault (with the east side of the fault being downthrown) is estimated to be about 450 feet in the vicinity of the New Mexico State Highways 605 and 509 (EPA, 2018).

Based on Cross-section E-E' from the Phase 2 Ground-Water Investigation Report (EPA, 2018), the Schmitt Decline Mine is situated within the Dakota Sandstone that is approximately 60 feet

thick in this area. The Brushy Basin Member of the Morrison Formation underlies the Dakota Sandstone and is approximately 100 feet thick. The Brushy Basin Shale Member is composed of montmorillonitic mudstones interbedded with discontinuous, intercalated, lenticular, fluvial-channel sandstones (EPA, 2018).

2.5 HYDROGEOLOGY

The important water bearing formations within the SMC Basin include (from south to north across the study area) the Jurassic Morrison Formation (Westwater Canyon Member) and Quaternary alluvium. Other aquifer units may include the Triassic Chinle Formation, the Jurassic and Cretaceous Dakota Sandstone, Mancos Shale, and Mesa Verde Group (EPA, 2018).

Alluvial groundwater flow within the SMC Basin generally mirrors the local topographic surface and flows down slope, mostly in a southerly direction. Quaternary alluvium consists primarily of unconsolidated sands, silts, and some clays and gravels with an average thickness of 10 to 80 feet (EPA, 2018). Groundwater found in the quaternary alluvium is typically discontinuous with variable quality within the SMC Basin. Most of the upper SMC Basin alluvium is unsaturated except for some thin zones located near recharge areas in the deeper reaches of the San Mateo Creek and Arroyo del Puerto paleo channels. The greatest thicknesses of saturated alluvial material are found in the vicinity of the HMC NPL site in the southern part of the SMC Basin. A few miles north of the HMC NPL site the occurrence of saturated alluvium decreases significantly. The occurrences of saturated alluvium in the central and northern SMC Basin have steadily declined due to the absence of artificial recharge from uranium mine discharges in the mid-1980's (EPA, 2018).

EA performed an assessment of groundwater wells and identified several in the vicinity of the Site. There are four livestock/private wells completed in the Dakota Sandstone. Well SMC-18 is located approximately 0.1 mile to the south of the Site. Wells SMC-23, B01636 (listed as an alternate well ID for well SMC-23), and SMC-24 are located approximately one mile to the southeast of the Schmitt Decline Mine (Figure 2-3). As reported in the Preliminary Phase 1 Site investigation Report (EPA, 2010) the depth to water in livestock well SMC-18 was 82.3 ft-bgs and is completed in the Dakota Sandstone. The depths to water reported in wells SMC-23 and SMC-24 were 190 and 86 ft-bgs, respectively. The groundwater elevation in feet reported in wells SMC-23 and SMC-24 were 6,698 feet and 6,723 feet, respectively. The depths of these wells were reported as 260 and 170 ft-bgs, respectively. These wells are also completed in the Dakota Sandstone. Note that the coordinates provided in Table A1-4 (EPA, 2018) were used to plot SMC-18, SMC-23, and SMC-24 and the well location for B01636 was obtained from the New Mexico State Engineer Office Well Record (Figure 2-3).

No well logs were found for SMC-18 and SMC-24. The New Mexico Office of the State Engineer (NMOSE) Well Record for SMC-23 documents sand and shale from ground surface to 55 ft-bgs, shale from 55 to 60 ft-bgs, sandstone and shale from 60 to 100 ft-bgs, gravel from 100 to 122 ft-bgs, sandstone from 122 to 135 ft-bgs, blue shale (possibly the Mancos) from 135 to 190 ft-bgs, and sandstone (possibly Dakota) from 190 to total depth of 220 ft-bgs.

A NMOSE Well Record identified as B01636 that is listed as an alternate well ID for well SMC-23 was also found in Table A1-4 in the Phase 2 Ground-Water Investigation report (EPA, 2018). This well is located approximately 1.3 miles east, southeast of the Schmitt Decline Mine near the intersection between New Mexico State Highways 605 and 509 (Figure 2-3). According to the well log the depth of this well is 260 ft-bgs and the depth to water at the time of well completion was 80 ft-bgs. The well record included a boring log for this well. The subsurface was described as brown clay from ground surface to five ft-bgs, blow sand from five feet to 90 ft-bgs, dry sand and gravel from 90 to 120 ft-bgs, black shale from 120 to 220 ft-bgs, and white sandstone from 220 to 260 ft-bgs.

Groundwater samples were collected from SMC-18 and SMC-23 on April 1, 2009, and March 30, 2009 (respectively), and submitted for laboratory analysis. Analytical results for these samples are presented in Table 2-1. The groundwater sample collected from SMC-18 contained a TDS concentration of 732 mg/L, a uranium concentration of 0.002 mg/L, and a total radium concentration of 2.18 picocuries per liter (pCi/L). The groundwater sample collected from SMC-23 contained a TDS concentration of 440 mg/L, a uranium concentration of 0.0101 mg/L, and a total radium concentration of 1.39 pCi/L (EPA, 2010).

Additional groundwater samples were collected from SMC-23 and SMC-24 on July 21, 2015, and December 9, 2015. The groundwater samples collected on July 21, 2015, contained TDS concentrations of 3,500 and 3,300 mg/L, respectively, uranium concentrations of 0.011 and 0.025 mg/L, respectively, total radium concentrations of 0.82 and 0.73 pCi/L. The groundwater samples collected from SMC23 and SMC-24 on December 9, 2015, contained TDS concentrations of 3,800 and 3,700 mg/L, respectively, uranium concentrations of 0.013 and 0.029 mg/L, respectively, and total radium concentrations of 1.27 and 1.15 pCi/L (EPA, 2018).

All TDS concentrations in wells SMC-18, SMC-23, and SMC-24, are less than the New Mexico Administrative Code Section 20.6.2.3103 New Mexico Water Quality Control Commission standard of 10,000 mg/L. The groundwater standards of Section 20.6.2.3103 apply to all groundwater within the State of New Mexico which has an existing concentration of 10,000 mg/L or less TDS. All of the uranium concentrations are less than the EPA National Primary Drinking Water maximum contaminant level of 0.030 mg/L.

3. SCOPE OF WORK

This Work Plan describes the activities required for the Stage 2 Investigation outlined in the July 25, 2025, Proposed Project Approach (EA, 2025d). To meet the schedule, the following surveys will be conducted concurrently:

- Section 4.1: Radiological Surveys
- Section 4.2: Aerial Drone Photography
- Section 4.3: Endangered Species Site Survey
- Section 4.4: Historic and Archeological Survey
- Section 4.5: Waste Rock Pile Sampling and Analysis
- Section 4.6: Well Sampling of SMC-18
- Section 4.7: Surface and Underground Light Detection and Ranging (LiDAR) Survey

An SAP (ESFS, 2025) has been prepared for this project. Upon completion of site assessment activities, a Stage 2 UMSA Site Investigation Report will be prepared to include the results of each of the surveys and laboratory analyses.

Investigation-derived waste at this Site is expected to be disposable personal protective equipment (PPE) and decontamination materials. Soil cuttings and groundwater will remain on-site and will not require transportation and disposal.

4. FIELD ACTIVITIES

4.1 RADIOLOGICAL SURVEYS

Radiological field activities will be performed in two phases. Phase 1 will include characterization surveys, consisting of gamma walkover surveys (GWS) and systematic, random and biased soil sampling to characterize site soils and identify areas requiring remedial action. Phase 2 will include remediation/reclamation activities of radiologically impacted soils and Final Status Survey (FSS) activities to confirm that residual radioactivity in each survey area meets the site clean-up criteria. FSS activities will include additional soil sampling and GWS in areas where remedial action was taken.

Characterization surveys and FSS activities will be performed in accordance with the Multi-Agency Radiation Site Survey Investigation Manual (MARSSIM). The impacted areas of the Site have been divided into Class 1, 2, or 3 Survey Units (SUs) based on contamination potential (as referenced in Section 2.2 of MARSSIM) and are shown in Figure 4-1. The acreage of SU1A and SU1B are 0.07 and 0.008 acres, respectively. The acreage of SU2 is 0.85 acres and the acreage of SU3 is 5.74 acres. The acreage of SU1A, SU1B, SU2, and SU3 combined totals 6.67 acres. If additional Class 1 SUs are identified during the assessment, they will be noted for future reclamation/disposal.

Class 1 SUs refers to areas that have potential for contamination and include the waste pile with elevated radioactivity and the mine entrance, identified as SU1A and SU1B, respectively. The Class 2 Survey Unit (SU) refers to areas that are not likely to have concentrations that exceed project action limits. This SU includes the areas surrounding the waste pile with elevated radiological readings and mine entrance, which encompasses additional waste piles on the Site, as well as the sloping topography that leads downhill to the channel referred to as the “Dry Wash”. Additional areas surrounding the Class 2 SU and encompassing the remaining portions of the Site limits are classified as SU 3. Class 3 areas have a low probability of containing residual radioactivity.

Details regarding planned field activities during Phase 1 and Phase 2 are described below. Additional technical guidance as well as the descriptions, proposed survey unit areas and survey coverage of the different Class SU’s are provided in the SAP (ESFS, 2025).

4.1.1 Pre Field Radiological Activities

Mobilization consists of moving project specific personnel and equipment to the Site and conducting project-specific training for onsite workers. It has been previously determined that no on-site utilities exist, and utility clearance surveys are not anticipated.

Initial instrument setup and establishment of quality control baselines will also take place during site preparation activities.

4.1.2 On-Site Safety Briefings

All site personnel shall receive a general site briefing, including potential site hazards, elements of the SSHP/RPP, and associated protective measures that will be communicated by the Site Lead or designee prior to the start of work on-site. ESFS Radiation Safety personnel will be available onsite. to provide consultation on site-specific radiological hazards, measurement results, and measures to maintain radiation exposures as-low-as-reasonably-achievable (ALARA).

4.1.3 Reference Background Area

A reference background area (RBA) will be established in a non-impacted area of the Site that exhibits similar geological and surficial characteristics and is representative of ambient background radiation levels within the impacted area of the Site. Radiation measurements will be collected within the RBA for each instrument utilized during GWS to determine detector response to ambient background radiation. RBA measurement data will be used to determine investigation levels (IL) for use during GWS within the impacted area. The IL is an instrument-specific response level that indicates the potential presence of elevated radioactivity, which should be further investigated by additional survey measurements and/or biased sampling. In addition to the field measurements, three soil samples will be sent for laboratory analyses in accordance with the SAP (ESFS, 2025).

A GWS data set will be collected for each instrument used to perform GWS measurements as part of an FSS. The GWS reference area data sets will be combined to form GWS ILs for surface soils. The GWS IL will be calculated as the average of the total GWS reference area data set plus three standard deviations.

4.1.4 Gamma Walkover Survey

GWS will be performed to measure surface and near surface gamma radioactivity at the Site during characterization surveys and following remediation/reclamation activities for the purpose of FSS. The radiological technician will utilize a Ludlum 2221 rate meter paired with a Ludlum 44-10 two-inch by two-inch sodium iodide (NaI) detector (or equivalent instruments) to perform the survey. The radiological instrument will be connected to a global navigation satellite system device capable of corelating and logging a spatial position with the instruments count rate measurement at one second intervals. The technician will walk parallel transects across the survey area at a speed of approximately 0.5 meters per second, while suspending the detector approximately 4-inches above the ground surface and moving the detector in a serpentine motion while progressing through the survey area.

GWS will be performed within the RBA, as well as throughout each SU in accordance with the data quality objectives and coverage goals presented in the SAP (ESFS, 2025). The RBA GWS will be performed to determine the detector response to ambient background levels and develop ILs for surface and subsurface soils for use during surveys within the impacted area. GWS data from the impacted area will be analyzed by converting each count rate measurement to a Z-Score. The resulting Z-score can be interpreted as the number of standard deviations a measurement lies above or below the mean. Interpretation of the results will focus on areas that exceed the IL to

identify potential areas of elevated radioactivity that should be evaluated further to confirm if residual radioactivity is present.

Following completion of the GWS, the measurement data will be downloaded from the datalogger instrumentation and sent offsite to a geographic information systems (GIS) Specialist for geospatial and statistical analysis. The data will be analyzed and plotted using GIS mapping software and presented to the project Health Physicist for evaluation. GWS data and map presentations will be evaluated for visual trends and comparison of count rates to specific project ILs.

4.1.5 Soil Sample Collection

Volumetric surface and subsurface soil samples will be collected from site survey units within the impacted area to evaluate soils for radiological contaminants of concern. Surface and subsurface samples will be collected from each SU at frequencies specified in the SAP (ESFS, 2025). Systematically located samples based on a random starting point, will be collected from MARSSIM Class 1 and 2 SUs and randomly collected samples will be collected from Class 3 SUs. Biased samples will be collected from selected areas of elevated radioactivity identified during GWS or from judgmental locations (i.e. to investigate waste piles, dry wash areas, etc.). Field staff have the option to re-locate random systematic soil sample locations as necessary, in areas where soils are inaccessible and away from surface bedrock ground cover.

Soil samples will be collected using a hand auger or stainless-steel trowel and homogenized in a stainless-steel bowl prior to containerization. Soil samples will be classified in accordance with the Unified Soil Classification System. The ESFS Site lead will regularly coordinate with the Project HP during field observations and characterization survey results to ensure that representative soil types are collected and analyzed, including particle size (sampling fines vs. rocks). In addition to fines, rock will be included in soil sample collection activities. Rocks may be pulverized mechanically by field personnel to comply with the analytical laboratory's sampling requirements. Field duplicate samples will be collected at a frequency of 10% for quality control purposes. Soil samples will be sent to an offsite laboratory for the required radiological analyses.

Soil sample analytical results will be evaluated to determine if areas of radioactivity exceed screening criteria for the site and potential remedial or disposal options that are recommended for future site reclamation activities. Analytical results data, results data assessments and summary conclusions and recommendations will be provided in a Site Characterization Final Report at the conclusion of the characterization effort, which will support future site decision-making.

4.1.6 Radiation Protection and Monitoring Activities

Radiation protection and monitoring activities will be performed in accordance with the Site RPP and associated operating procedures, as well as other applicable health and safety plans, to protect site workers from potential exposure to radiological hazards, control the spread of contamination throughout the Site and protect the public and the environment. Radiation detection instrumentation appropriate for the detection of site radiological contaminants of concern will be utilized and maintained onsite throughout the project. The Site RSO will ensure that contamination control activities performed onsite are effective, occupational doses are maintained as low as

reasonably achievable (ALARA), and that activities performed onsite adhere to the RPP and ESFS's operating procedures.

4.1.6.1 External Exposure Hazards

During initial site scoping, radiation surveys using a Ludlum Model 19 were conducted to assess exposure rates in the areas of interest with maximum contact readings of 0.9 milliroentgen per hour (0.9 mR/hr) observed on a large stockpile; general area dose rates on the same stockpile ranged from 0.25 mR/hr to 0.43 mR/hr. No readings were collected inside of the mine. However, radiation exposure rates at the mine entrance and around the remainder of the Site ranged from 0.015 mR/hr to 0.035 mR/hr. Additional readings will be collected during this characterization effort. Based on these reported levels and the planned work scope, personnel dosimetry is not required but, personnel will limit their time on and in the immediate proximity of the large stockpile exhibiting elevated exposure rates.

4.1.6.2 Internal Exposure Hazards

An ESFS certified health physicist and an ESFS certified safety professional reviewed the planned non-surface destructive field activities and determined that intake potential from inhaled particulate airborne uranium is negligible. Therefore, air monitoring of particulates is not planned.

Further assessment of radon in the workplace is recommended prior to performing any reclamation/remediation activities or entering the mine adit. Radon monitoring and radon flux monitoring will be performed during radiological characterization field efforts to evaluate airborne concentrations representative of potential worker exposure for future reclamation activities. ESFS would place a continuous radon monitor on a tripod in the mine adit, and using the operating manual, collect data in up to 48-hour increments from the monitor. Data results would be reviewed by the Project Health Physicist and included within the final summary report.

In addition, radon flux monitoring may also be performed to characterize the radon emission rates from various locations on the site. These potential sampling locations include but are not limited to, the elevated sandstone stockpile (SU-1A), the opening of the mine entrance, designated reference background locations, and other biased locations based on field survey data. This will serve to quantify radon emissions from known impacted surface materials as compared to baseline conditions (background). All collected samples and instrument data would be sent offsite for laboratory analysis. The results would be evaluated and presented in the final characterization report, including a determination if additional controls are needed to address radon exposures to cleanup personnel or future site occupants.

4.1.7 Radon Monitoring

To assess potential radon hazards, ESFS will conduct continuous radon monitoring within the entranceway of the mine entrance to evaluate airborne concentrations representative of potential worker exposure. In addition, radon flux monitoring will be performed at the location of the elevated waste rock pile on the Site (SU-1A), as well as at a designated background location. This will serve to quantify radon emissions from known impacted surface materials as compared to

baseline conditions (background). All collected soil samples and instrument data will be sent offsite for laboratory analysis. The results will be evaluated against established project action limits and presented in the final characterization report, including a determination of whether remedial actions are warranted during the next reclamation phase.

4.1.8 Site Restoration

No backfill remediation activities are expected during this phase of work, so site restoration activities associated with this site characterization phase will refer to general housekeeping only. The Site will be restored to existing conditions by the contractor at the duration of this field event.

4.1.9 Decontamination and Release of Equipment and Tools

Prior to being released from the site, personnel, materials, tools, and equipment used to support the investigation will be surveyed for radioactivity, and decontaminated as necessary, per the RPP (EA, 2025). Radiation Safety personnel will direct survey activities along with any required decontamination efforts.

4.1.10 Waste Management

Disposable PPE such as gloves or boot covers will be surveyed for residual radioactivity and are expected to be treated as general waste.

4.2 AERIAL DRONE PHOTOGRAPHY

Aerial drone photography will be conducted by Unmanned Aerial Service Inc. from Butte, Montana to document the condition of the Site before reclamation work begins and after reclamation has been completed. Prior to drone flights, Unmanned Aerial Services Inc. MSHA Part 48-certified and FAA Part 107-licensed field technicians will obtain required Federal Aviation Administration (FAA) flight permissions. High-resolution aerial imagery will be collected from the land surface outside of the Schmitt Decline Mine to cover the extent of the reclaimed areas of the Site (Figure 2-1). Drone flights will be conducted by an experienced pilot and spotter. Data will be processed following the flights and documentation will include control point documentation and aerial imagery.

4.3 ENDANGERED SPECIES SITE SURVEY

An endangered species site survey will be performed to document if any endangered species are present at the Site and provide mitigations as necessary. This survey will be conducted in the area of potential effect (APE) determined by the NMSLO and will include at a minimum the proposed parking and lay-down area and the proposed site access route (Figure 4-2).

Pinyon Environmental, Inc. (Pinyon) has been subcontracted to complete the endangered species site survey. The survey will be conducted as follows:

- An initial desktop review will be conducted to identify species of concern potentially present using the following data sources:
    - The U.S. Fish and Wildlife Service Information for Planning and Consultation database
    - New Mexico Department of Game and Fish Biota Information System of New Mexico
    - Natural Heritage New Mexico's Conservation Information System
    - Aerial Imagery
    - U.S. Geological Survey (USGS) Topographic maps
- Following desktop review, the biologist will walk through the APE to note area of sensitive species habitat. The biologist will also visually scan for raptor nests within a 0.5-mile buffer of the APE, to the extent visible from accessible locations.
- The biologist will use tablet-based ArcGIS *FieldMaps* paired with sub-meter accurate global navigation satellite systems receiver to record locations for sensitive wildlife areas if encountered. The biologist will also use photographs and annotated hardcopy maps to document general habitat conditions as well as sensitive habitat areas and species of concern habitat.
- Following the site visit, Pinyon will provide a Biological Resources Technical Memorandum to discuss the species of concern and habitat conditions of the Site. Areas mapped in the field will be submitted as raw GIS files and figures showing data mapped during the site visit.

4.4 HISTORIC AND ARCHEOLOGICAL SURVEY

An archaeological survey will be conducted to document if archeological sites are present within the APE, which includes the proposed parking and lay-down area and the proposed site access route (Figure 4-2).

Pinyon will be subcontracted to complete the archeological site survey. The field crew will be supervised by an NMSLO-permitted Field Director who will be a qualified archaeologist that meet Secretary of Interior (SOI) Standards, listed in the New Mexico SHPO Directory, and possess the proper BLM and State archaeological investigation permits. The survey will be conducted as follows:

- Prior to conducting field work, the team will conduct a files and literature search to identify any previously documented resources within the APE and a surrounding one-mile buffer. The goal of the search will be to identify the type, location, and distribution of previously documented cultural resources; gather information on past surveys and other investigations

in the area; identify current research issues pertinent to the project; and identify factors such as geomorphological conditions that may affect site integrity, depth potential, and visibility. This search will include:

  - A formal file search request made through the New Mexico State Historic Preservation Office (SHPO), New Mexico Historic Preservation Division's (HPD) national and state register files
  - Literature search through the New Mexico Cultural Resource Information System (NMCRIS) managed by the Archaeological Records Management Section (ARMS) of HPD
  - General Land Office survey records and maps
  - Aerial photographs obtained from the USGS Earth Explorer webpage
  - Additional relevant information

- The field crew will conduct a pedestrian survey when lighting and weather conditions permit adequate ground surface visibility. The pedestrian survey will cover the APE using systematic parallel transects spaced no more than 15 meters apart, depending on terrain conditions. Transect lines will be maintained using ESRI's *FieldMaps* application preloaded onto tablets and by following an easting and northing provided by Global Positioning System (GPS).
- As needed, the field archaeologist may deviate from their established transects to perform intuitive inventory by examining exposed rock surfaces and faces, as well as exposed subsurface profiles for evidence of buried or otherwise obscured cultural resources.
- Cultural resources identified within the APE will be fully recorded. Cultural resources might include, but are not limited to prehistoric and historic sites, historic structures, linear sites, well pads, and isolated finds. Sites will be defined following guidance provided by New Mexico SHPO, professional judgement, and consultation with the New Mexico SHPO prior to any a-typical site recording methodologies.
- The field crew will make every effort to observe previously recorded cultural resources within the APE; these will be examined, reevaluated against the most recent recording, and updated as necessary.
- Field archaeologists will provide recommendations for National Register of Historic Places eligibility for each recorded resource, both previously known and newly recorded.
- When the field crew encounters a site, surface artifacts and features will be flagged, allowing for a visual representation of site boundaries and artifact distributions, providing precise recording with a sub-meter accurate GPS unit. Sites will be fully recorded as they are encountered, and flagging will be removed following site documentation.

- Site documentation will include, at a minimum, a written description of the site and observed features and artifacts (including a formal tally), photographic documentation, and mapping. The site's description will include the site size, setting and topographic location, sediment description as related to depositional conditions (specifically the potential for the resource to contain intact, buried cultural deposits), site impacts, vegetation, feature and artifact descriptions and distribution.
- The field archaeologist will collect sufficient data on features and artifacts to attempt an analysis and description of site function and chronology, providing information about the class of feature/artifact, make, type or series, and other attributes that relate to the interpretation of chronology, form, and function. In-field analysis will be performed on all or a sample of all classes of visible surface artifacts.
- High-quality photographs will be taken using 16-megapixel cameras to fully document the nature of the project in general, each site, features, individual diagnostic (or otherwise unique) artifacts, and other visual information relevant to project goals. Overview photos will be taken to show site topography, geology, terrain, and overall vegetative conditions. Features and important/diagnostic artifacts will be photographed with a professional scale and north arrow as appropriate.
- GPS data will be collected to sub-meter accuracy to create detailed site sketch maps.
- Field archaeologists will adhere to strict non-collection policy. However, if unique or vulnerable artifacts are encountered, the New Mexico SHPO and NMSLO archaeologist will be notified immediately and consulted about potential collection and curation. If human remains, funerary objects, sacred objects, or objects of cultural patrimony are encountered, all activities surrounding the discovery will be stopped and the field archaeologist will immediately notify the NMSLO archaeologist and New Mexico SHPO by phone and email. Additionally, if human remains are encountered the County Coroner will also be contacted.
- Following the field survey, the field archaeologists will provide NRHP eligibility recommendations for each site, presented in a Class III Cultural Resources Inventory. An NRHP-eligibility recommendation will be provided for all sites, and no sites will be left as "needs data" or unevaluated. A current assessment of site conditions will be made for each site in terms of impacts to site integrity from natural processes, human processes, recreational motorized vehicles, trash dumping, historical vegetation treatments, or livestock.

4.5 WASTE ROCK PILE SAMPLING AND ANALYSIS

The impacted areas of the Site as shown in Figure 4-1 will be sampled to assess for elevated radiological concentrations. Waste rock samples will be field screened and samples with elevated radiological concentrations will be submitted for laboratory analysis. ESFS technician(s) will

verify the collection of radiologically elevated materials using additional field screening with the 2x2 NaI during sampling and prior to sending the samples off-site for analyses.

Waste rock samples will be collected using a hand auger, hand trowel, shovel or similar tool within the first 15-cm and every 15-cm thereafter at each boring location until native soil or bedrock is reached. If soil samples cannot be collected with a hand tool, i.e. if the waste rock pile is highly consolidated, mechanical equipment may be required. During sample collection, rocks may be pulverized mechanically by field personnel to comply with the analytical laboratory's sampling requirements. EA will coordinate with NMED to assess scheduling and requirements to utilize this equipment and complete all sampling activities.

The SAP (ESFS, 2025) describes sampling procedures, analytical methods, and laboratory analysis in detail. A proposed survey unit layout and sample locations are shown in Figure 4-1. See Section 5.1, below for laboratory analyses.

4.6 WELL SAMPLING OF SMC-18

If accessible, well SMC-18 will be sampled to assess elevated radiological concentrations in comparison to the groundwater sample collected on April 1, 2009, by NMED (Table 2-1). Accessibility will be based on whether an operational pump is present, or a small sampling pump can be lowered to the water table without having to remove down-hole equipment.

Prior to groundwater sample collection the field equipment will be decontaminated, and the well will be gauged with an electronic water level meter. The well will be checked to determine if there is an existing workable pump in place. If there is no current pump in place, then a portable pump will be utilized to purge and sample the well using low-flow sampling methods. Field parameters (turbidity, temperature, dissolved oxygen, specific conductivity, pH, and oxidation-reduction potential) will be measured and recorded every 5 minutes and documented on the well purge log form. Any purge water obtained will be discharged to the ground or placed in the stock tank. The groundwater sample will be collected in clean laboratory-supplied containers. The groundwater sample will be placed on ice and delivered to the laboratory under chain-of-custody procedures. See Section 5.2, below for laboratory analyses.

4.7 SURFACE AND UNDERGROUND LIGHT DETECTION AND RANGING SURVEY

A LiDAR survey will be conducted by Unmanned Aerial Service Inc. from Butte, Montana to estimate the volume of underground workings available to receive and inter waste rock. The survey will be conducted using a drone-based LiDAR system. In the interest of safety, personnel will not enter the mine unless a significant event such as damage to the drone has occurred. LiDAR scanning will be performed inside the mine as far as the drone is accessible or as the battery permits. Results of the LiDAR survey will be used to provide a volume report of the mined voids in the vicinity of the decline.

A surface LiDAR survey will also be conducted using a drone-based LiDAR system to assess the volume of surface waste rock. LiDAR and drone capture deliverables will include

- Point cloud delivered as an ESRI LAS files. Point cloud colorized with the photographs taken by UAS.
- Derivatives from point clouds - Digital Elevation Models (DEM) and contours as an ESRI shapefile or feature class based on the DEM.
- One-foot minor elevation contours and 5-foot major elevation contours
- Ortho-imagery from the flights at 1 to 2-inch resolution where possible. Original orthomosaic tiffs and compressed orthomosaic (e.g., sid files) images.
- Full density points clouds include intensity, range and elevation; surface contours, surface and underground wireframe mesh ortho-mosaic images, underground drone footage, and volume and dimension reporting.

5. LABORATORY ANALYSIS

Laboratory analytical methods and quality assurance/quality control are provided in the SAP (ESFS, 2025).

5.1 SOIL AND ROCK SAMPLES

All soil/rock samples (systematic and bias) will be analyzed for the following analyses:

- ^{226}Ra by Gamma Spectroscopy (DOE Environmental Measurements Laboratory [EML] Health and Safety Laboratory [HASL]-300 4.5.2.3/Ga-01-R)
- Total Thorium & Uranium by inductively coupled plasma mass spectrometry (ICPMS) (SW846 6020)

In addition, select systematic and bias soil samples will be collected and analyzed for the additional analyses for quality control and data comparison purposes:

- Uranium by Alpha Spectroscopy (233/234, 235/236, 238 DOE EML HASL-300 U-02-RC Mod)
- Thorium by Alpha Spectroscopy (228, 230, 232 DOE EML HASL-300 Th-01-RC Mod)

This Work Plan includes up to eighty-five soil samples that will be collected and analyzed, including both surface and subsurface samples taken in Class I, II and III areas. This task includes the analysis of background samples, quality control samples, and biased samples that will be collected based on the analysis of field survey data. Some select biased samples (determined by the SRSL and project HP) will include both Gamma and Alpha Spectroscopy analysis to provide cross-verification and stronger confidence in the analysis of data results.

5.2 GROUNDWATER SAMPLING

Groundwater samples collected from well SMC-18 will be analyzed for the following analyses:

- Gross Alpha/Beta by EPA 900.0
- ^{226}Ra by EPA 903.1
- Total Thorium & Uranium by ICPMS (SW846 6020)
- Nitrates by Ion Chromatography (SW846 9056)
- TDS by SM 2540 C

At least one groundwater sample will be collected and analyzed to be sent for offsite analysis.

5.3 RADON FLUX SAMPLING

Radon flux samples will be analyzed for the following analyses:

- Radon-222 by Gamma Spectroscopy (EPA Method 901.1 modified)

5.4 QUALITY CONTROL SAMPLING

Laboratory quality control samples, including field duplicates, will be collected and analyzed in accordance with the SAP (ESFS, 2025).

6. SCHEDULE AND REPORTING

6.1 REPORTING

Upon completion of field activities and receipt of analytical data, a Stage 2 UMSA Site Investigation Report will be provided to the NMED Office of Strategic Initiatives including the results of each of the surveys and laboratory analyses. These findings will be used to inform the Cleanup Analysis and Proposals for Alternative Methods of Disposal.

6.2 SCHEDULE

Field activities are anticipated to commence on September 15, 2025, pending approval of this Work Plan. Surveys will be conducted concurrently. It is estimated that field work will take approximately two to three weeks to complete. Analytical results will take approximately one month to receive. The Stage 2 UMSA Site Investigation Report, Cleanup Analysis, and Proposals for Alternative Methods of Disposal are anticipated to be provided to the NMED Office of Strategic Initiatives by November 14, 2025.

7. REFERENCES

EA Engineering, Science, and Technology, Inc., PBC (EA). 2025a. *Site Specific Health and Safety Plan, Schmitt Deline Mine, Grants Mining District, New Mexico.* (2025)

EA. 2025b. *Community Relations Plan, Abandoned Uranium Mine Reclamation, Schmitt Decline Mine, Grants Mining District, New Mexico.* (2025)

EA. 2025c. *Public Involvement Plan for Schmitt Decline Mine (NM0261).* (2025)

EA. 2025d. *Re: Proposed Project Approach for Schmitt Decline Uranium Mine Site Assessment, Milan, New Mexico.* (2025)

Energy, Minerals, & Natural Resources Department (EMNRD) and New Mexico Environment Department (NMED). 2016. *Joint Guidance for the Cleanup and Reclamation of Existing Uranium Mining Operations in New Mexico.* (2016)

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EPA. 2012. *U.S. Environmental Protection Agency Region 6 Superfund Site Strategy Recommendation, Schmitt Decline Mine.* (2012)

EPA. 2016. *Expanded Site Inspection, Phase 1 Groundwater Investigation Report for San Mateo Creek Basin Uranium Legacy Site, Cibola and McKinley Counties, New Mexico.* (2016)

EPA. 2018. *Phase-2-Ground-Water Investigation for the San Mateo Creek Basin Legacy Uranium Mines Site, Cibola and McKinley Counties, New Mexico.* (2018)

Figures

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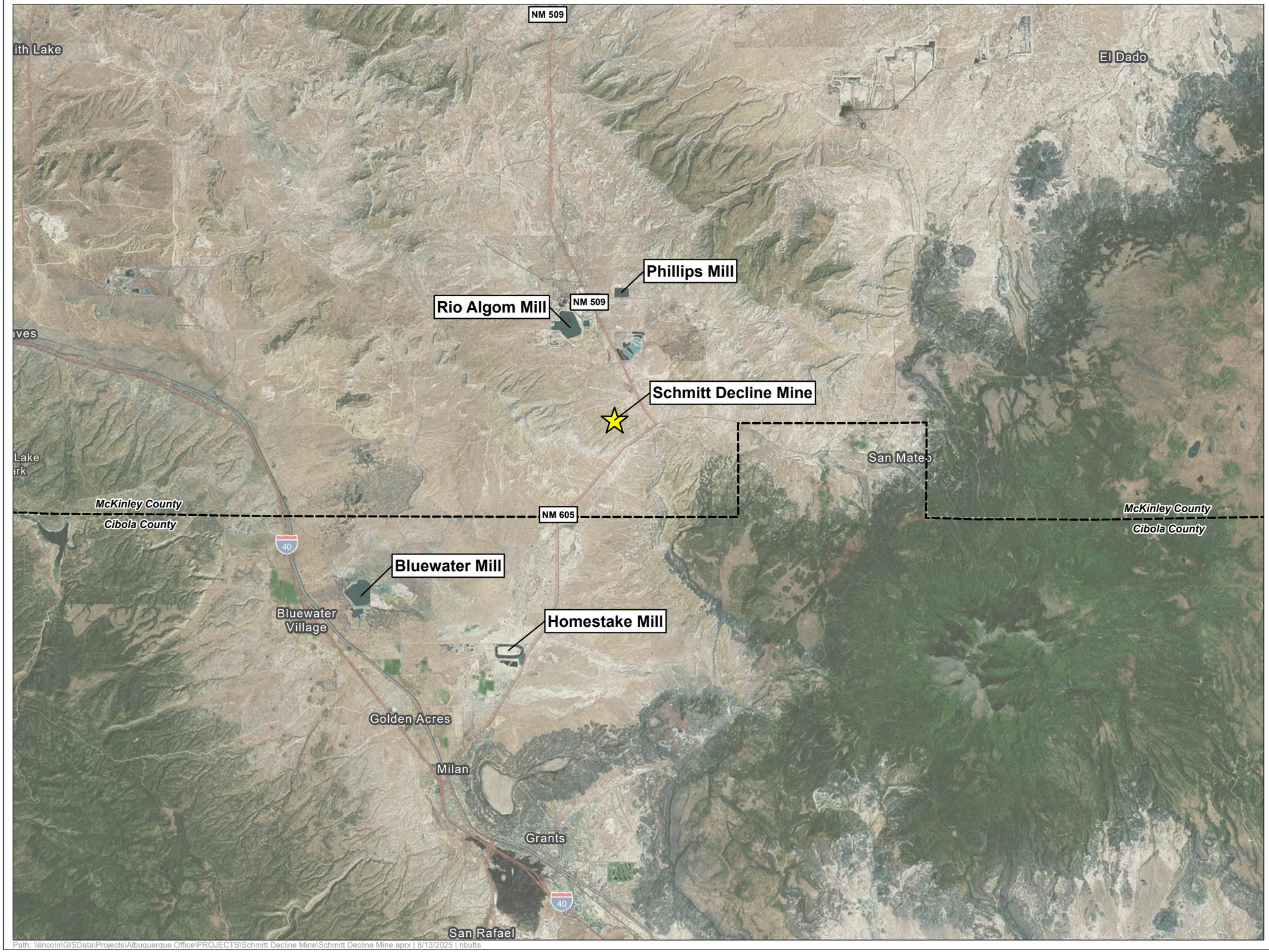

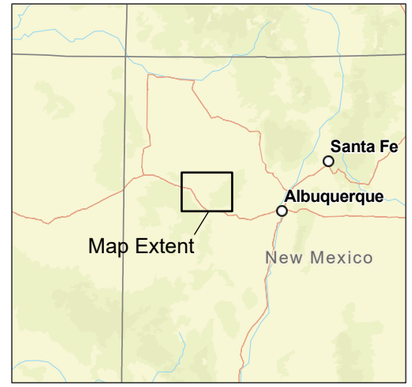

Legend

- Schmitt Decline Mine
- County Boundary

Date Saved: 8/13/2025
Projection: NAD 1983 StatePlane New Mexico West FIPS 3003 Feet
Scale: 1:192,000

0 8,000 16,000
US Feet

Data Sources: ESRI

Schmitt Decline Mine
McKinley County, New Mexico

Site Location Map

Figure 1-1

Path: \\lincoln\GISData\Projects\Albuquerque Office\PROJECTS\Schmitt Decline Mine\Schmitt Decline Mine.aprx | 8/13/2025 | nbutts

Legend

- Schmidt Decline Mine
- Area of Concern

Note:
ft. = feet

Date Saved: 8/15/2025
Projection: NAD 1983 StatePlane New Mexico West FIPS 3003 Feet
Scale: 1:720

0 30 60
US Feet

Data Sources: ESRI

Schmitt Decline Mine
McKinley County, New Mexico

Site Layout

Figure 2-1

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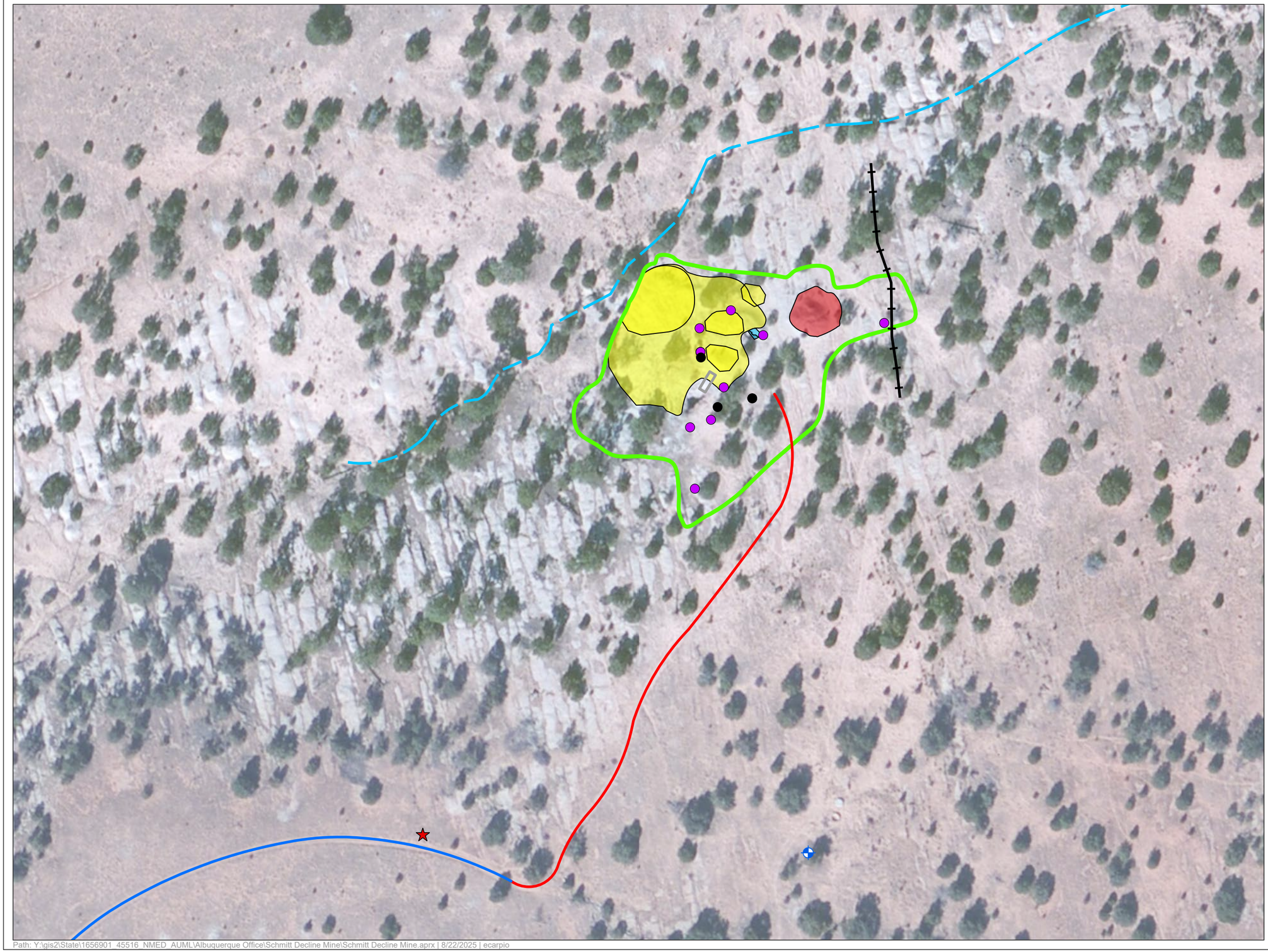


Legend

- Parking Spot
- Debris
- Remnant Mining Equipment
- Livestock Well SMC-18 (approximate location)
- High Reading Waste Rock Pile
- Overburden
- Settling Cells
- Schmitt Decline
- Outside Boundary of Impacted Area (Includes Piles, Surface Cover, and Overburden)
- Dry Wash
- Fence Line
- Access to Site (needs to be cleared by Archaeologist and flagged)
- Existing Road to Site (assume no Archaeological Survey required)

Date Saved: 8/22/2025
Projection: NAD 1983 StatePlane New Mexico West FIPS 3003 Feet
Scale: 1:1,200

0 50 100
US Feet

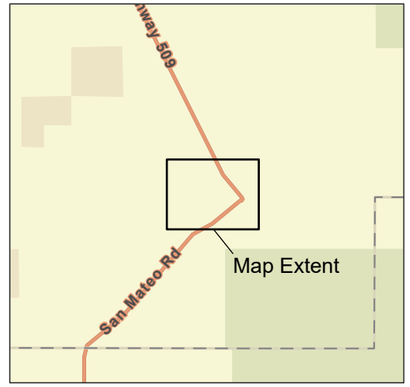
Data Sources: ESRI

Schmitt Decline Mine
McKinley County, New Mexico

Site Features Map

Figure 2-2

Path: Y:\gis2\State\1656901_45516_NMED_AUML\Albuquerque Office\Schmitt Decline Mine\Schmitt Decline Mine.aprx | 8/22/2025 | ecarpio



Legend

- Private Well
- SMC Well
- Schmitt Decline Mine

Date Saved: 8/14/2025
Projection: NAD 1983 StatePlane New Mexico West FIPS 3003 Feet
Scale: 1:8,400

0 350 700
Feet

Data Sources: ESRI

Schmitt Decline Mine
McKinley County, New Mexico

Wells Completed in the Dakota Sandstone

Figure 2-3

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SU 3 (Class 3)
- (18) Random Surface Samples

Dry Wash Area

SU 1A (Class 1)
(Radioactive Waste Pile)
- (14) Systematic Samples
- (7) Surface Sample
- (7) Subsurface Sample

SU 2 (Class 2)
- (18) Systematic Surface Samples
- (4) Bias Samples (Waste Piles)
  - (2) Surface Sample
  - (2) Subsurface Sample
- (2) Bias Surface Samples (Dry Wash)

SU 1B (Class 1)
(Schmitt Decline)
- (4) Surface Samples

Legend

- Systematic Sample Location (SU 1)
- Systematic Sample Location (SU 2)
- Random Sample Location (SU 3)
- Bias Sample Location
- Dry Wash

MARSSIM Class (SU)

- Class 1 (SU 1A/1B)
- Class 2 (SU 2)
- Class 3 (SU 3)
- Schmitt Decline
- Site Survey Boundary
- Waste Pile

Note(s):
- SU 1A = 0.07 acres
- SU 1B = 0.008 acres
- SU 2 = 0.85 acres
- SU 3 = 5.74 acres
-Total of SU 1A, 1B, 2, and 3 = 6.67 acres

Date Saved: 9/3/2025
Projection: NAD 1983 StatePlane New Mexico West FIPS 3003 Feet
Scale: 1:720

0 30 60
US Feet

Data Sources: ESRI

Schmitt Decline Mine
McKinley County, New Mexico

Survey Unit Layout and Sample Locations

Figure 4-1

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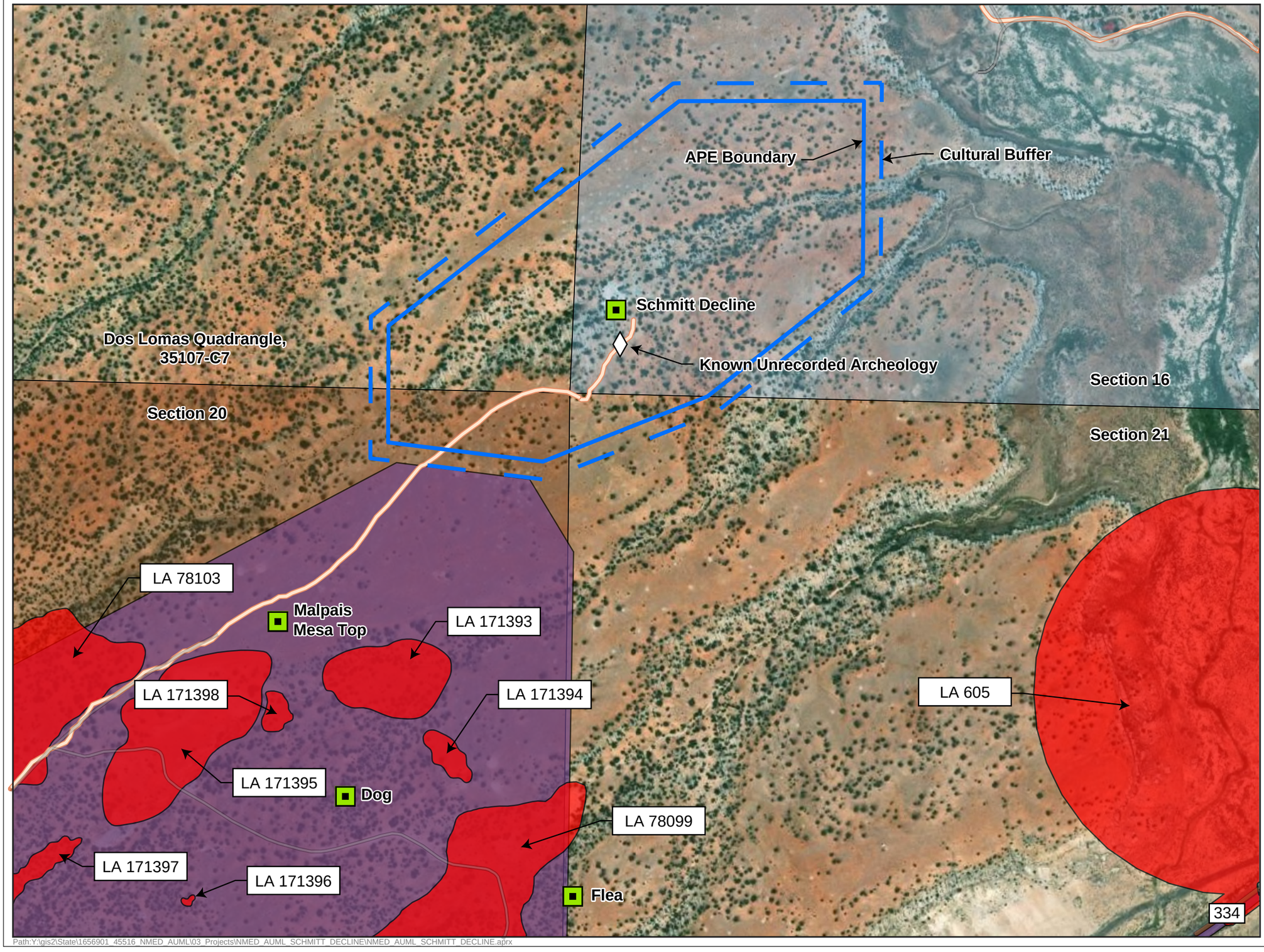

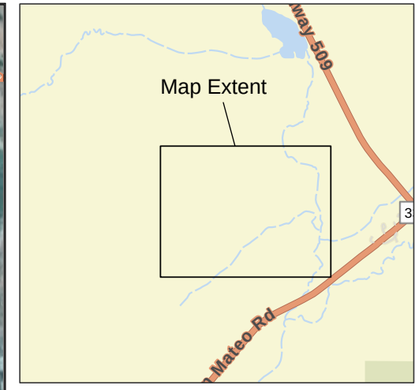

Legend

- Known Uranium Mine Locations AUM
- Known Unrecorded Archaeology
- Road Access
- Schmitt Decline APE
- Schmitt Decline CR Buffer
  13 August 2025
- Cultural Resources
- Cultural Resource Survey

AUM = Abandoned Uranium Mines
APE = Area of Potential Effect
CR = Cultural Resources

Date Saved: 8/22/2025
Projection: NAD 1983 StatePlane New Mexico West FIPS 3003 Feet
Scale: 1:1320

0 0.125 0.25
US Mile

Data Sources: New Mexico Environmental Department, Energy, Minerals & Natural Resources Department, Mining & Minerals Division, Abandoned Mine Land Program

Schmitt Decline Mine
McKinley County, New Mexico

Area of Potential Effect

Figure 4-2

Path:Y:\gis2\State\1656901_45516_NMED_AUML\03_Projects\NMED_AUML_SCHMITT_DECLINE\NMED_AUML_SCHMITT_DECLINE.aprx

Tables

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Table 1-1 - Radiological Contaminants of Concern

Analyte	CAS Number	Project Action Limit(1)
^{226}Ra(2)	13982-63-3	≤5 pCi/g above background for surface soil (0-15-cm depth)
		≤15 pCi/g above background for the subsurface soil (below 15-cm)
^{220}Rn (3)	10043-92-2	≤20 pCi/m^2/s
^{222}Rn (3)	14859-67-7	≤20 pCi/m^2/s

Note(s):

(1) The project action limits (Derived Concentration Guideline Level [DCGLW]) for soil collected during FSS were obtained from Schmitt Decline Site Assessment Procedure.

(2) ^{226}Ra will be determined via gamma spec with ingrowth and the ^{214}Bi result will be reported as ^{226}Ra assuming secular equilibrium.

(3) Radon will be determined by laboratory analysis for radon concentration monitoring within the mine entrance and/or radon flux monitoring of various proposed onsite sampling locations.

^{226}Ra = Radium-226
^{220}Rn = Radon-220
^{222}Rn = Radon-222
^{214}Bi = Bismuth 214
≤ = less than or equal to
CAS = Chemical Abstract Service
cm = centimeters
FSS = Final Status Survey
m^2/s = square meters per second
pCi/g = picocuries per gram
µg/kg = micrograms per kilogram

Table 2-1 Geochemical and Isotopic Data for Wells Completed in the Dakota Sandstone

Analyte:			Potassium	Magnesium	Sodium	Calcium	Nitrate + Nitrite As N	Nitrate As N	Nitrite As N	Nitrate +Nitrite As N	Chloride	Bicarbonate	Sulfate	TDS	pH
Total (T) or Dissolved (D):			D	D	D	D	T	T	T	T	T	T	T	T	T
Units:			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	pH Units
Well ID	Sample ID	Sample Date	--	--	--	--	--	--	--	--	--	--	--	--	--
SMC-18	SMC-18-20090401	4/1/2009	8.12	14.8 K	136	89.9	0.04 U	n/a	n/a	0.04 U	10	167	370	732	7.7
SMC-23	SMC-23-20090330	3/30/2009	1 U	1.44	143	7.07	4.43	n/a	n/a	4.43	33	192	49	440	8.4
SMC-23	SMC23-20150721-21	7/21/2015	5.4 JK	130 JK	220 JK	490 JK	n/a	15 D	0.5 U	15.5	55 D	180 D	2100 D	3500 D	7.49 JK
SMC-23	SMC-23-20151209-21	12/9/2015	6.6 JH	150	270 JH	610 JH	n/a	14	1 U	15	59	190 JK	2500	3800	7.63 JK
SMC-24	SMC24-20150721-21	7/21/2015	7.2 JK	130 JK	210 JK	480 JK	n/a	17 D	0.5 U	17.5	54 D	180 D	2000 D	3300 D	7.58 JK
SMC-24	SMC-24-20151209-21	12/9/2015	7.6 JH	150	240 JH	570 JH	n/a	17	1 U	18	59	180 JK	2400	3700	7.36 JK

Table 2-1 Geochemical and Isotopic Data for Wells Completed in the Dakota Sandstone

		Analyte:	Arsenic	Molybdenum	Selenium	Uranium	UAR	δ 34S SO42-	δ18O H2O	Total Radium Ux1
		Total (T) or Dissolved (D):	D	D	D	D	T	T	T	T
		Units:	mg/L	mg/L	mg/L	mg/L	Ratio	‰	‰	pCi/L
Well ID	**Sample ID**	**Sample Date**	--	--	--	--	--	--	--	--
SMC-18	SMC-18-20090401	4/1/2009	0.002 U	n/a	0.0036	0.002 U	7.17	1.53	-9.99	2.18 calc
SMC-23	SMC-23-20090330	3/30/2009	0.0031	n/a	0.0271	0.0101	1.61	-12.07	-9.51	1.39 calc
SMC-23	SMC23-20150721-21	7/21/2015	0.00036 UJ	0.0013 J	0.032 JK	0.011 JK	1.803	-11.6	-9.12	0.82 calc
SMC-23	SMC-23-20151209-21	12/9/2015	0.00036 U	0.0018 J	0.038 JH	0.013	1.877	-11.6	-9.1	1.27 calc
SMC-24	SMC24-20150721-21	7/21/2015	0.00047 JLQ	0.001 J	0.017	0.025 JK	1.516	-11.3	-9.09	0.73 calc
SMC-24	SMC-24-20151209-21	12/9/2015	0.00036 U	0.001 J	0.017 JH	0.029	1.386	-11.1	-9.05	1.15 calc

Table 2-1 Geochemical and Isotopic Data for Wells Completed in the Dakota Sandstone

Note(s)

calc. - Calculated value
mg/L - Milligrams per liter.
n/a - not available or not analyzed
pCi/L - picocuries per liter.
TDS - Total Dissolved Solids.
UAR - Ratio of U-234/U-238.
Ux1 - Total created using the full value of the detection limit.
δ 34S SO42 - Ratio of two stable isotopes of Sulfur ^{34}S:^{32}S.
δ18O H2O - Ratio of stable isotopes oxygen-18 (^{18}O) and oxygen-16 (^{16}O)

Results Qualifiers

B - The analyte detected in sample may be attributable to blank contamination
J - The identification of the analyte is acceptable; the reported value is an estimate
H - High bias
K - Unknown bias
L - Low bias
Q - Detected below the quantitation limit
U - Analyte not detected

Table derived from Table A5-1 from the Phase 2 Ground-Water Investigation Report for the San Mateo Basin Legacy Uranium Mine Site, Cibola and McKinley Counties, New Mexico (USEAP, 2018)

Appendix A

Title Search

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Title Search Findings: Schmitt Decline		
Aliases/Other Spellings: Schmidtt, Schmidt, Schmitt Ranch decline, Section 16		
Ownership Details	Current:	Surface: State Land (MLRS, *see attached Patent*)
		Mineral: Private, Lease ID WM06940000 (NMSLO Land Status)
	Historic:	Unknown
Encumbrances, liens, ROWs, or restrictions:		None identified; however, site is part of Agricultural Lease (Roxanne T. Elkins, Lease ID R21760000)
PRP status, if applicable:		No PRP identified
Under federal, state, tribal, or voluntary clean-up program?:		Not under any dedicated site-specific program. Located within San Mateo Creek Basin legacy uranium sites study area.
Coordinates (Lat, Long):		35.31267662151536, -107.81250608012999
Mine Summary & Description:		Operational history is unknown (NMED SOS, 2009). Mine is an open decline surrounded by waste material piles and operational equipment.
Additional Information:		Potential association with Dog Flea, and/or Doris mines.

Notes:
ROW= Right-of-way
PRP= Potentially Responsible Party
Lat= Latitude
Long= Longitude

Attachment:

- **Patent Number 1187782**, land granted by the United States (Bureau of Land Management) to the State of New Mexico on October 29, 1958

References:

BLM Mineral & Land Records System (MLRS). https://www.blm.gov/services/land-records/mlrs

NMSLO Land Status. https://mapservice.nmstatelands.org/LandStatus/

NMED Formerly Operating Uranium Mine and Mill Sites Dashboard. https://nmenv.maps.arcgis.com/apps/dashboards/690621694d4e4906b2ae2886f528eec1

NMED SOS. 2009. *Pre-CERCLIS Screening Assessment of Schmitt Decline Mine, McKinley County, New Mexico: Further action under CERCLA recommended.* September 10. https://cloud.env.nm.gov/resources/_translator.php/OTk0NGJhYjU1YTRiNDRjMGEwNGFhMDBmMF8xNTYzMTM~.pdf

New Mexico 07719-A

4—1043

The United States of America,

To all to whom these presents shall come, Greeting:

WHEREAS, There are now deposited in the Bureau of Land Management of the United States an application by the State of New Mexico and a decision of the Land Office at Santa Fe, New Mexico, directing that a patent issue to the State of New Mexico under the provisions of the Act of Congress approved June 21, 1934 (48 Stat. 1185), entitled "An Act Authorizing the Secretary of the Interior to issue patents to the numbered school sections in place, granted to the States by the Act approved February 22, 1889, by the Act approved January 25, 1927 (44 Stat. 1026), and by any other Act of Congress," for the following numbered school section lands in place, granted for the support of common schools and the title to which vested in the State of New Mexico under the Act of June 21, 1898, upon the date of the Act, which grant was confirmed under the enabling Act of June 20, 1910 (36 Stat. 557):

New Mexico Principal Meridian, New Mexico.

T. 9 N., R. 16 W.,
Sec. 16, All;
Sec. 36, All;

T. 10 N., R. 16 W.,
Sec. 16, All;
Sec. 36, All;

T. 10 N., R. 20 W.,
Sec. 16, All;

T. 10 N., R. 21 W.,
Sec. 36, Lots 1, 2, 3, and 4, $N\frac{1}{2}$, $N\frac{1}{2}SW\frac{1}{4}$, $NW\frac{1}{4}SE\frac{1}{4}$, $SW\frac{1}{4}SW\frac{1}{4}$;

T. 11 N., R. 16 W.,
Sec. 36, All;

T. 11 N., R. 19 W.,
Sec. 16, All;
Sec. 36, All;

T. 11 N., R. 20 W.,
Sec. 16, All;
Sec. 36, All;

T. 11 N., R. 21 W.,
Sec. 36, All;

nt Number

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New Mexico Principal Meridian, New Mexico.

T. 12 N., R. 18 W.,
Sec. 16, All;

T. 12 N., R. 20 W.,
Sec. 16, All;
Sec. 36, All;

T. 13 N., R. 8 W.,
Sec. 16, All;

T. 13 N., R. 9 W.,
Sec. 16, All;

T. 13 N., R. 10 W.,
Sec. 16, All;
Sec. 36, All;

T. 13 N., R. 11 W.,
Sec. 16, All;
Sec. 36, All;

T. 13 N., R. 12 W.,
Sec. 16, All;
Sec. 36, All;

T. 13 N., R. 13 W.,
Sec. 16, All;
Sec. 36, All;

T. 13 N., R. 14 W.,
Sec. 16, All;

T. 13 N., R. 15 W.,
Sec. 36, All;

T. 13 N., R. 18 W.,
Sec. 16, All;
Sec. 36, All;

T. 13 N., R. 20 W.,
Sec. 36, All.

The areas described aggregate 19,132.42 acres, according to the Official Plats of the Surveys of the said Land, on file in the Bureau of Land Management:

NOW, THEREFORE, KNOW YE, That the UNITED STATES OF AMERICA, in consideration of the premises, and in conformity with the said Act of Congress of June 21, 1934, and as evidence of the title which was granted to and vested in the State

of New Mexico to the above described lands on June 21, 1898, for the support of common schools, as aforesaid, and in confirmation of such title for such purpose, HAS GIVEN AND GRANTED, and by these presents DOES GIVE AND GRANT, unto the said State of New Mexico, and to its assigns the lands above described; TO HAVE AND TO HOLD the same, together with all the rights, privileges, immunities, and appurtenances, of whatsoever nature, thereunto belonging, unto the said State of New Mexico, and to its assigns forever; subject to any vested and accrued water rights for mining, agricultural, manufacturing, or other purposes, and rights to ditches and reservoirs used in connection with such water rights, as may be recognized and acknowledged by the local customs, laws, and decisions of courts; and there is reserved from the lands hereby granted, a right-of-way thereon for ditches or canals constructed by the authority of the United States.

IN TESTIMONY WHEREOF, the undersigned officer of the Bureau of Land Management, in accordance with section 1 of the act of June 17, 1948 (62 Stat., 476, 43 U. S. C. sec. 15), has, in the name of the United States, caused these letters to be made Patent, and the Seal of the Bureau to be hereunto affixed.

(SEAL)

GIVEN under my hand, in the District of Columbia, the TWENTY-NINTH day of OCTOBER in the year of our Lord one thousand nine hundred and FIFTY-EIGHT and of the Independence of the United States the one hundred and EIGHTY-THIRD.

For the Director, Bureau of Land Management.

By Rose M. Brall

Chief, Patents Section.

RECORD OF PATENTS: Patent Number 1307282

U. S. GOVERNMENT PRINTING OFFICE 16—28096-2

Legend

Abandoned Uranium Mines

0 2.5 5

Miles

N

Source: Aerial - ArcGIS Online, dated 2018

Schmitt Decline Location

Exported: 8/18/2025 4:08 PM

S:\ABQ\EMNRD.M002.AUM\Graphics\MapDocs\AUM Site Assessment Locations\AUM Site Assessment Locations.aprx

User: towen

Map: Map1

Layout: Schmitt_decline

INTERA

Legend

- Abandoned Uranium Mines
- PLSSTownship
- PLSSFirstDivision

Surface Ownership

- BLM
- Forest Service
- Private Land
- State Land

0 0.5 1 Miles

N

Source: Aerial - ArcGIS Online, dated 2018

Schmitt Decline
Land Ownership

Exported: 8/18/2025 4:01 PM

S:\ABQ\EMNRD.M002.AUM\Graphics\MapDocs\AUM Site Assessment Locations\AUM Site Assessment Locations.aprx

User: towen

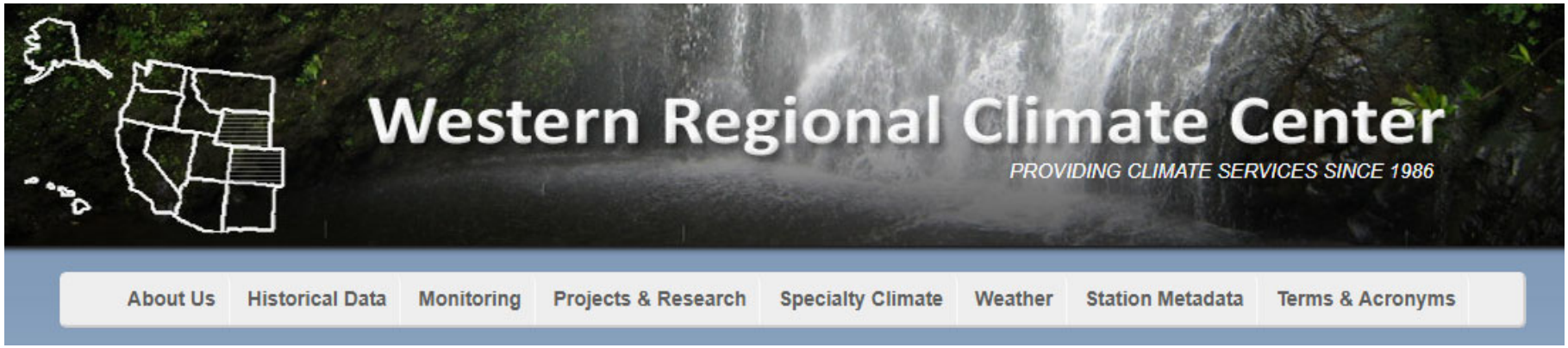
Map: Map1

Layout: Schmitt_Surf_Ownership

INTERA

Appendix B

Western Regional Climate Center Website Data



NEW MEXICO - Prevailing Wind Direction - Direction														
Prevailing wind direction is based on the hourly data from 1992-2002 and is defined as the direction with the highest percent of frequency. Many of these locations have very close secondary maximum which can lead to noticeable differences month to month. All directions are where the wind blows FROM.														
STATION	**YEARS**	**JAN**	**FED**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**	**ANNUAL**
GRANTS AIRPORT, NM (KGNT)	1992-2002	NW	NW	NW	W	W	W	SE	SE	NW	NW	NW	NW	NW

NEW MEXICO - Average Monthly Wind Speed - MPH														
Based on daily average wind speed from reporting ASOS locations. Data is preliminary and may contain errors.														
STATION	**YEARS**	**JAN**	**FED**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**	**ANNUAL**
GRANTS AIRPORT, NM (KGNT)	2001 - 2011	7.6	8.3	9.2	10.6	9.6	9.0	7.7	6.9	7.4	7.7	7.9	7.5	8.3

NEW MEXICO - Average Wind Speeds - MPH														
Average wind speeds are based on the hourly data from 1996-2006 from automated stations at reporting airports (ASOS) unless otherwise noted.														
STATION	**YEARS**	**JAN**	**FED**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**	**ANNUAL**
GRANTS AIRPORT, NM (KGNT)	1997 - 2006	7.8	8.8	9.6	10.9	10.0	9.8	8.1	7.2	7.9	8.4	8.0	7.6	8.7

Note(s):

Data pulled from https://wrcc.dri.edu/Climate/comp_tables.php on August 22, 2025.

MPH = Miles per Hour