Everett Ecological

Mr. David J. (DJ) Ennis, P.G., Permit Lead
New Mexico Mining and Minerals Division
Mining Act Reclamation Program
1220 South Saint Francis Drive
Santa Fe, NM 87505

April 20, 2023

RE: Summa Silver Corporation Part 3 Minimal Impact Exploration Permit Modification and Renewal, Mogollon Project, Permit No. CA027EM

Dear Mr. Ennis,

On behalf of Summa Silver Corporation (Summa), Everett Ecological is submitting this memorandum to request a (I.) modification to and (II.) renewal of Summa's Part 3 Minimal Impact Permit No. CA027EM (Permit) for Mogollon Project in Catron County, New Mexico. This request encompasses the documentation associated with the original nineteen exploration work sites addressed in both the original Permit Application Package (PAP, Component A - Attachment 1) approved by MMD in March 2021 and the Permit Renewal Application (PRA) subsequently approved in August 2022. Furthermore, this request introduces the addition of thirteen new exploration work sites. We have provided this renewal package electronically via email to expedite the review process, and the $500 application fee has been mailed to your office.

This package is comprised of four components:

A. An explanatory permit modification outline addressing proposed modifications to the Permit relative to the 2021 PAP and the 2022 PRA, including direct updates to relevant PAP sections to focus the restructured scope of work.
B. Westland Resources, Inc. has prepared an updated cultural resources report addressing the new exploration work sites for this request. As this report may contain sensitive data, we understand that the MMD will grant electronic access to the New Mexico State Historic Preservation Office (SHPO).
C. Everett Ecological has prepared an updated and expanded environmental evaluation to provide a comprehensive baseline assessment of various natural resource values associated with Summa's patented properties and surrounding lands.
D. An updated map set delineating Summa's new exploration work sites.

Please contact me at your convenience if you have any questions, concerns, or require further information regarding this Permit modification and renewal application. Thank you for your attention to this matter, and we look forward to your response.

Respectfully,

James Waddell
Ecologist - Wildlife Biologist
Everett Ecological
1810 E. Sahara Ave Ste 212 #1947
Las Vegas, NV 89104
james.waddell@eveco.tech
(520) 289-9247

Everett Ecological

Summa Silver Corporation Part 3 Minimal Impact Exploration Permit Modification and Renewal, Mogollon Project, Permit No. CA027EM

Component A
Permit Modification Outline

Component A frameworks the proposed modifications to the Permit in relation to the 2021 PAP (Component A - Attachment 1) and the 2022 PRA. This proposal presents the restructured scope of work by integrating direct updates to relevant PAP sections to enable clear communication of the requested permit modifications.

The 2021 PAP included a Part 3 Minimal Impact Exploration Operation Permit Application (Application). The Application is twenty-five pages in length and composed of a checklist with nine sections:

- Check List To Determine Minimal Impact Exploration Operation Eligibility (Pages 1-2)
- Section 1 – Operator Information (Page 3)
- Section 2 – Right To Enter Information (Pages 4-6)
- Section 3 – Maps And Project Location (Pages 7-8)
- Section 4 – Exploration Description (Pages 9-14)
- Section 5 – Chemical Use (Pages 15-16)
- Section 6 – Groundwater/Surface Water Information (Pages 17-19)
- Section 7 – Reclamation & Operation Plan (Pages 20-23)
- Section 8 – Permit Fees And Financial Assurance (Page 24)
- Section 9 – Certification Requirement (Page 25)

The remainder of this component will address each of the Application sections and what modifications, if any, are proposed.

Check List To Determine Minimal Impact Exploration Operation Eligibility

- No modifications to the 2021 Application are requested.

Section 1 – Operator Information

- No modifications to the 2021 Application are requested.

Section 2 – Right To Enter Information

- Modifications to this section include updated Surface Estate Owner and Mineral Estate Owner contact information and supplemental right to enter documentation (Subsections A & B).
- Subsection C: Cultural Resource Survey. The Cultural Resources Report is presented in Component B of this memorandum.
- Subsection D: Wildlife Survey or Vegetation Survey citations. The Environmental Evaluation is presented in Component C of this memorandum.

Section 3 – Maps And Project Location

- Modifications to this section include coordinates detailing the locations of thirteen new exploration work sites in addition to the original nineteen sites evaluated in the 2021 PAP and the 2022 PRA (Subsection A).
- An updated map set delineating the new exploration work sites is presented in Component D of this memorandum.
- No modifications to the remaining subsections of Section 3 are requested.

Section 4 – Exploration Description

- Subsection A: Anticipated dates of exploration are updated to September 1, 2023 - September 1, 2024.
- Subsection C: Proposed method(s) of exploration is updated to reflect the modified number of holes and number of drill pads. The "Total Acreage To Be Disturbed Due To Drill Pads" value has been updated to reflect the new drill pad additions.
- Subsection F: Roads and Overland Travel updated to reflect the addition of new access roads associated with the new drill pad additions.
- Subsection H: "Total Acreage To Be Disturbed By Project" has been updated to reflect the new drill pad and associated access road additions (1.44 acres [2021 PAP] + 2.46 acres [2023 Modification] = *3.9 Total Acreage To Be Disturbed By Project*).
- No modifications to the remaining subsections of Section 4 are requested.

Section 5 – Chemical Use

- Subsection A: Updated Drilling Mud list and estimated diesel fuel quantity.
- No modifications to the remaining subsections of Section 5 are requested.

Section 6 – Groundwater/Surface Water Information

- Subsection A: An updated estimate of depth to groundwater based on the average of 23 sample sites recorded in Section(s) 28, 33 Township: 10S Range: 19W by the New Mexico Office of the State Engineer.
- No modifications to the remaining subsections of Section 6 are requested.

Section 7 – Reclamation & Operation Plan

- Subsection B: Updated to include the use of silt fencing and certified weed-free straw bales.
- No modifications to the remaining subsections of Section 7 are requested.

Section 8 – Permit Fees And Financial Assurance

- Subsection B: Updated to include check number and financial institution information.

Section 9 – Certification Requirement

- No modifications to Section 9 are requested.

PART 3
MINIMAL IMPACT EXPLORATION OPERATION

PERMIT APPLICATION

Accompanying instructions for this permit application are available from MMD, and on MMD webpage:

http://www.emnrd.state.nm.us/MMD/MARP/MARPApplicationandReportingForms.htm

Send 6 copies of the completed application to:

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
Director
Mining and Minerals Division
1220 South Saint Francis Drive
Santa Fe, New Mexico 87505
Telephone: (505) 476-3400

Webpage: www.emnrd.state.nm.us/MMD/index.htm

CHECK OFF LIST TO DETERMINE YOUR PROJECT'S STATUS AS A MINIMAL IMPACT EXPLORATION OPERATION:

☐ Yes ☑ No My project **will exceed 1000 cubic yards of excavation**, per permit.

☐ Yes ☑ No Surface disturbances for constructed roads, drill pads and mud pits **will exceed 5 acres** total for my project.

☐ Yes ☑ No My project is located in or is expected to have a direct surface impact on wetlands, springs, perennial or intermittent streams, lakes, rivers reservoirs or riparian areas.

☐ Yes ☑ No My project is located in designated critical habitat areas as determined in accordance with the federal Endangered Species Act of 1973 or in areas determined by the Department of Game and Fish likely to result in an adverse impact on an endangered species designated in accordance with the Wildlife Conservation Act, Sections 17-2-37 through 17-2-46 NMSA 1978 or by the State Forestry Division for the Endangered Plants Act, section 75-6-1 NMSA 1978.

☐ Yes ☑ No My project is located in an area designated as Federal Wilderness Area,

Wilderness Study Area, Area of Critical Environmental Concern, or an area within the National Wild and Scenic River System.

☐ Yes ☑ No My project is located in a known cemetery or other burial ground.

☐ Yes ☑ No My project is located in an area with cultural resources listed on either the National Register of Historic Places or the State Register of Cultural Properties.

☐ Yes ☑ No My project will or is expected to have a direct impact on ground water that has a total dissolved solids concentration of less than 10,000 mg/L, except exploratory drilling intersecting ground water may be performed as a minimal impact operation.

☐ Yes ☑ No My project is expected to use or using cyanide, mercury amalgam, heap leaching or dump leaching in its operations.

☐ Yes ☑ No My project is expected to result in point or non-point source surface or subsurface releases of acid or other toxic substances from the permit area.

☐ Yes ☑ No My project requires a variance from any part of the Mining Act Rules as part of the permit application.

If you answer yes to any of the above questions, your project does not qualify as a minimal impact exploration operation.

Confidential Information

☐ Yes ☑ No Is any of the information submitted in this application considered by the applicant to be confidential in nature? If yes, please provide this information separately and marked as “confidential.”

Timeline

- Exploration applications must be provided no less than 45 days prior to the anticipated date of operations desired by the applicant.
- Renewal applications shall be filed at least 30 days preceding expiration of the current permit. Permits are valid for one year.
- Approved permit is valid for one year from the date of approval.

SECTION 1 – OPERATOR INFORMATION (§304.D.1)

Project Name: Mogollon Project - Phase 2

Nearest Town To Project: Mogollon, New Mexico

Applicant Name and Contact Information (entity obligated under the Mining Act):

Name: Galen McNamara

Address: 918-1030 West Georgia Street Vancouver, BC, V6E 2Y3

Office Phone: 604-288-8004 Cell Phone: 604-788-3677

Fax Number: N/A Email: galen@summasilver.com

Name of On-Site Contact, Representative, or Consultant:

Name: Chris York

Address: 2552 Hamilton Creek Trail, Elko, Nevada, 89801

Office Phone: 618-263-8664 Cell Phone: 618-263-8664

Fax Number: N/A Email: cyork@summasilver.com

SECTION 2 – RIGHT TO ENTER INFORMATION (§302.D.1)

A. Describe or attach copies of documents that give the applicant the right to enter the property to conduct the exploration and reclamation, include: lease agreements, access agreements, right of way agreements, surface owner agreements, and claim numbers, if applicable.

Exploration activities will be conducted on:
- Patented claims owned or leased by Summa Silver Corp. (Attachment #: Patented Mine Claims and Patented Mine Claim Lease Agreements).
- Unpatented claims owned by Summa Silver Corp. (Attachment #: Unpatented Mine Claims and Patented Mine Claim Lease Agreements)

Attachment Documents are inserted at the end of this section.

B. List the names and addresses of surface and mineral ownership within the proposed permit area. If the mineral is federal mineral, indicate as federal mineral, but provide the name of the claim holder or lease holder.

Surface Estate Owner(s):

Name	Address	Phone #
☐ U.S. BLM		
☐ U.S. Forest Service		
☐ State of NM		
☒ Private/Corporate		

Lehigh Mining Claims Name: Mack, John Jr. and Hott, Ann and Parker, Mary K.
Address: 9A Cherokee Sq, Wilkes Barre, PA, 18702

Columbus Mining Claims Name: Allegiant Gold (U.S.) LTD.
Address: 1090 Hamilton Street, Vancouver, BC, V6B 2R9

Last Chance Mining Claims Name: Mogollon Enterprises Inc. c/o Elton Clark
Address: 2180 East Circulo Solaz, Tucson, AZ, 85918

☐ Other		
Name:		

Lease Holder(s) of Surface Estate (if applicable):

Name	Address	Phone #
Summa Silver Corp.	918-1030 West Georgia Street, Vancouver BC, V6E 2Y3	(604) 778-3677

Mineral Estate Owner(s):

Name	Address	Phone #
☐ Bureau of Land Management		
☐ US Forest Service		
☐ State of NM		

■ Claim/Lease Holders

Lehigh Mining Claims Name: Mack, John Jr. and Hott, Ann and Parker, Mary K.
Address: 9A Cherokee Sq, Wilkes Barre, PA, 18702

Columbus Mining Claims Name: Allegiant Gold (U.S.) LTD.
Address: 1090 Hamilton Street, Vancouver, BC, V6B 2R9

Last Chance Mining Claims Name: Mogollon Enterprises Inc. c/o Elton Clark
Address: 2180 East Circulo Solaz, Tucson, AZ, 85918

Claim Numbers: _____

☐ Claim/Lease Holder _____ _____

Name: _____ _____

Claim Numbers: _____

☐ Other _____ _____

Name: _____ _____

C. Has a Cultural Resource Survey been performed on the site? ☒ Yes ☐ No

If yes, please provide the author, title, date and report number, and include a copy of the survey with this application, if possible:

Lan Craig and John M.D. Hooper/WestLand Resources, Inc. “A Cultural Resources Inventory of 29.17 Acres of Private Lands near Mogollon, Catron County, New Mexico for a Proposed Mineral Exploration Drilling Project”. April 7, 2023, Cultural Resources Report No. 2023-018, NMCRIS Activity No. 152144

Attachment This report has been provided directly to the New Mexico State Historic Preservation Officer and is not included with this submittal for confidentiality reasons.

D. Has a wildlife survey or vegetation survey been performed for the permit area?

☒ Yes ☐ No If yes, please provide the author, title, date and report number, and include a copy of the survey with this application, if possible:

James Waddell/Everett Ecological, LLC. “Mogollon Project Baseline Habitat Assessment and Wildlife Evaluation”. April 10, 2023.

Attachment See Component C: Environmental Evaluation

March 20th, 2023

Mr. John Mack
9A Cherokee Sq.
Wilkes-Barre, PA, 18702

RE. Lehigh Mining Claims

Dear Mr. Mack,

This letter confirms your approval for Summa Silver Corp. by way of an option agreement with Allegiant Gold Corp dated August 24th, 2020 (www.SEDAR.com) to use those patented mining claims (the Lehigh Patents; Socorro No. 1 etc.) subject to the Amended and Restated Mining Lease Agreement dated September 21, 2021 between yourself and partners, Allegiant Gold (U.S.) Ltd., and Summa Silver (U.S.) Ltd. to provide access for its exploration and development programs on your claims in the Mogollon district. Such approval covers, among other things, construction of permitted roads and drill pads. All such activities will follow Federal, state or county laws or regulations, including reclamation.

Your signature below will constitute approval as outlined above.

Sincerely,

Galen McNamara
CEO Summa Silver Corp.

Approved this 21st day of MARCH 2023.

John Mack

Click to Print

Owner Information

Owner # 2283 **District** 1

MACK, JOHN JR. & HOTT, ANN &

PARKER, MARY K.

9A CHEROKEE SQ

WILKES BARRE PA 18702

Estimated Taxes for Owner

Estimated Tax	Estimated Year used
$3353.98	2022

Calculate Estimated Tax

Recap Value Information

Central Full Value	0	**Full Value**	551931
Land Full Value	547881	**Taxable Value**	183977
Improvements Full value	4050	**Exempt Value**	0
Personal Property Full Value	0	**Net Value**	183977
Manufactured Home Full Value	0		
Livestock Full Value	0		

Property Information

Property Code 3112058184475

Book 17 **Page** 330 **Reception#** 0

Physical Address

Bldg Apt

Section 21 **Township** 10 S **Range** 19 W

LEAP YEAR #1070

Property Value Information

112 Non-Residential	Land	796.800	0.00	542622
101 Residential	Land	1.000	0.00	5259
223 Non-Residential	Improvements	1	0.00	234
221 Residential	Improvements	1	0.00	3816

Property Information

Property Code 3112060220000

Book 17 **Page** 330 **Reception#** 0

Physical Address

Bldg Apt

Section 28 **Township** 10 S **Range** 19 W

LITTLE FANNY #840

CHAMPION #1392

LITTLE CHARLIE #1689

MAUDE S. #912-A

SILVER FOUNTAIN #304

ANDREW JACKSON &CONSOLIDATED #1392

LEXINGTON GUNBOAT #1392

VIRGINIA #1656

SANDY #1689

HOMESTAKE #1689

JOHNSON #20 #1653

JOHNSON #21 #1653

JOHNSON #25 #1625

JOHNSON #26 #1625

LAST ATTEMPT #967

Property Information

Property Code 3112060220000 28

Book 17 **Page** 330 **Reception#** 0

Physical Address

Bldg Apt

Section 28 **Township** 10 S **Range** 19 W

OLD STRIK #524 27 &28

SILVER BAR #305 21 & 28

SOCORRO #1 #1392 27 & 28

SOCORRO #2 #1392 28 & 33

LENA #1689 28 & 29

LITTLE GIANT #1689 28 & 29

SELMA #1689 28 & 33

JOHNSON #11 #1625 28 & 29

JOHNSON #13 #1625 28 & 29

FIRST ATTEMPT #1653 28 & 29

FREE MILLING #561-A20 & 29

LEXINGTON CONSTENTION #1392 28 & 33

1216 SQ. FT. HOUSE HERE

Property Information

Property Code 3113059264198

Book 17 **Page** 330 **Reception#** 0

Physical Address

Bldg Apt

Section 29 **Township** 10 S **Range** 19 W

JOHNSON #1365

JOHNSON #2 #1625

JOHNSON #3 #1625

JOHNSON #4 #1625

JOHNSON #5 #1625

JOHNSON #6 #1625

JOHNSON #10 #1625

JOHNSON #12 #1625

JOHNSON #14 #1625

JOHNSON #15 #1625

JOHNSON #16 #1625

JOHNSON #18 #1625

SLAY BACK #56-A

Next

March 17th, 2023

Allegiant Gold Ltd.
1090 Hamilton Street
Vancouver, BC
V6B 2R9

RE. Columbus Mining Claims

Dear Mr. Gianulis,

This letter confirms your approval for Summa Silver Corp. by way of an option agreement with Allegiant Gold Corp dated August 24th, 2020 (www.SEDAR.com) to use those patented mining claims (the Crescent etc.) to provide access for its exploration and development programs on Allegiant's (previously Columbus Silver Corp.) claims in the Mogollon district. Such approval covers, among other things, construction of permitted roads and drill pads. All such activities will follow Federal, state or county laws or regulations, including reclamation.

Your signature below will constitute approval as outlined above.

Sincerely,

Galen McNamara
CEO Summa Silver Corp.

Approved this __20_ day of _March_ 2023.

_____
Peter Gianulis
Allegiant Gold Ltd.

Click to Print

Owner Information

Owner # 2269 **District** 1

ALLEGIANT GOLD (U.S.) LTD.

1090 HAMILTON STREET

VANCOVER, BC

Estimated Taxes for Owner

Estimated Tax	Estimated Year used
$776.20	2022

Calculate Estimated Tax

Recap Value Information

Central Full Value	0	**Full Value**	127665
Land Full Value	127665	**Taxable Value**	42555
Improvements Full value	0	**Exempt Value**	0
Personal Property Full Value	0	**Net Value**	42555
Manufactured Home Full Value	0		
Livestock Full Value	0		

Property Information

Property Code 3112059167422

Book 133 **Page** 1446 **Reception#** 201800299

Physical Address

Bldg Apt

Section 28 **Township** 10 S **Range** 19 W

IDA MAY SURVEY 1372

Property Value Information

112 Non-Residential Land 187.465 0.00 127665

Property Information

Property Code 3112059280310

Book 133 **Page** 1446 **Reception#** 201800299

Physical Address

Bldg Apt

Section 28 **Township** 10 S **Range** 19 W

INDEPENDENCE SUR #1558 21/28

ANACONDA SUR #1558 21/28

COMET SUR #1558 21/28

UNION SUR 1558 21/28

DON'T CARE SUR 1558 21/28

NEW CHUM SUR 1558 21/28

CRESCENT SUR 1558 21/28

THURSDAY SUR 1558 21/28

WOLFTON SUR 1558 21/28

UNPATENTED SUR 1558 21/28

WLFTON MILLSITE

UNPATENTED SUR 1558 21/28

ISABELLA SUR 1558 21/28

GOOD HOPE #2 SUR 1558 21/28

TOTAL ACRES 187.465

March 17th, 2023

Mogollon Enterprises Inc.
c/o. Elton Clark
2180 East Circulo Solaz
Tucson, AZ, 85918

RE. Last Chance Mining Claims

Dear Mr. Clark,

This letter confirms your approval for Summa Silver Corp. by way of an option agreement with Allegiant Gold Corp dated August 24th, 2020 (www.SEDAR.com) to use those patented mining claims (the Frieda #2, Anna E., Last Chance, Settle etc.) subject to the Amended and Restated Mining Lease Agreement dated September 21, 2021 between yourself and partners, Allegiant Gold (U.S.) Ltd., and Summa Silver (U.S.) Ltd. to provide access for its exploration and development programs on your claims in the Mogollon district. Such approval covers, among other things, construction of permitted roads and drill pads. All such activities will follow Federal, state or county laws or regulations, including reclamation.

Your signature below will constitute approval as outlined above.

Sincerely,

Galen McNamara
CEO Summa Silver Corp.

Approved this 20 day of March 2023.

Elton Clark
Mogollon Enterprises Inc.

Click to Print

Owner Information

Owner # 2308 **District** 1

MOGOLLON ENTERPRISES

FOY, THOMAS P. C/O PRESIDENT

P.O. BOX 2331

SILVER CITY NM 88062

Estimated Taxes for Owner

Estimated Tax	Estimated Year used
$1260.14	2022

Calculate Estimated Tax

Recap Value Information

Central Full Value	0	**Full Value**	207261
Land Full Value	207261	**Taxable Value**	69087
Improvements Full value	0	**Exempt Value**	0
Personal Property Full Value	0	**Net Value**	69087
Manufactured Home Full Value	0		
Livestock Full Value	0		

Property Information

Property Code 3113060185132

Book K **Page** 476 **Reception#** 0

Physical Address

Bldg Apt

Section 32 **Township** 10 S **Range** 19 W

WHITEWATER GROUP

CONFIDENCE SURVEY #873-A

BLACKBIRD SURVEY #877-A

SOUTH ALPINE SURVEY #876-A

BLUE BIRD SURVEY #882

NORTH ALPINE SURVEY #883SEC29&32

RED BIRD SURVEY #881

S.ALPINE MILLSITE SUR #876-B

Property Value Information

112 Non-Residential Land 304.348 0.00 195390

Property Information

Property Code 3112060330356

Book K **Page** 476 **Reception#** 0

Physical Address

Bldg Apt

Section 33 **Township** 10 S **Range** 19 W

LAST CHANCE GROUP

FRIEDA #2 MILLSITE SURVEY #1551-A

LAST CHANCE SURVEY #980-A

SETTLE SURVEY #1980-C

FRIEDA #2 SURVEY #1551-A

ANNA E. SURVEY #1551-B

HUB #1 SURVEY #1551-C

JACK POT SURVEY PART LOC HERE #1552

BOISE CITY MILLSITE SURVEY #979-B

HUMMING BIRD SURVEY #1550

FIRST NATIONAL LODE SURVEY #1899

DUTCH BOY SURVEY #1045

Property Information

Property Code 3112060250449

Book K **Page** 476 **Reception#** 0

Physical Address

Bldg **Apt**

Section 34 **Township** 10 S **Range** 19 W

TOP SURVEY #939-A

BOISE CITY SURVEY #980-B

CROSS SURVEY #979-A

TOP MILLSITE SURVEY #939-B

Property Information

Property Code 3112061185033

Book K **Page** 476 **Reception#** 0

Physical Address

Bldg **Apt**

Section 3 **Township** 11 S **Range** 19 W

LIME KILN SURVEY #1553

20.661 AC. M/L

ALSO PART OF JACK POT SURVEY #1552

LOCATED HERE

Next

SECTION 3 – MAPS AND PROJECT LOCATION (§302.D.2)

A. Project Location:

Township 10 S Range 19 W Section 28

Township 10 S Range 19 W Section 33

List the drill hole/exploration name and the GPS coordinates for each site.

I.D. Number	Northing / Latitude	Easting / Longitude
DP4	33.395096°	-108.804855°
DP6	33.410213°	-108.807739°
DP7	33.410591°	-108.810181°
DP8A	33.406699°	-108.804938°
DP8B	33.406979°	-108.804884°
DP8C	33.409590°	-108.805036°
DP9A	33.404588°	-108.801302°
DP10	33.402443°	-108.806175°
DP12	33.400219°	-108.797218°
DP13	33.401810°	-108.796521°

I.D. Number	Northing / Latitude	Easting / Longitude

Coordinate system used to collect GPS data points:

- ☐ NAD83 Geographic
- ☐ NAD83 UTM Zone 13 (or 12)
- ■ WGS 1984
- ☐ NAD27 Geographic
- ☐ NAD27 UTM Zone 13 (or 12)
- ☐ Other: _____

Attachment N/A (for listing additional boreholes)

B. Maps (see application form instructions for examples of maps to be included): Are topographic maps included with the application that show the following items:

■ Yes – The boundary of the proposed exploration project Permit Area

■ Yes – The proposed exploration locations (i.e., borehole locations)

■ Yes – Existing roads, new roads, and overland travel routes

■ Yes ☐ N/A – Areas of proposed road improvement

Attachments See Component D: Map Set

Are maps or figures included with the application showing the approximate dimensions and locations of drill pads and other disturbances:

■ Yes – Drill pad dimensions and constructed drill pad locations

Attachments See Component D: Map Set

C. Provide detailed driving directions to access the site:

The proposed exploration areas are located just west and north of the town of Mogollon, NM and approximately seven (7) miles east of the town of Alma, NM. To reach the site, travel east on NM State Road 159 for approximately seven (7) miles from the junction with US HWY 180. Drill sites will be accessed from spur roads originating from SR 159 just west of Mogollon, including Fanny Road (See Map D).

SECTION 4 – EXPLORATION DESCRIPTION (§302.D.3 & 4)

A. Anticipated exploration: Start Date: September 1, 2023 End Date: September 1, 2024

B. List the mineral(s)/element(s) to be explored for: Silver, Gold

C. Proposed method(s) of exploration:

☐ **Air drilling (air rotary, coring, etc.):**

_____# of holes _____Depth (ft.) _____Diameter (in.)

_____# of drill pads _____Length (ft.)_____Width (ft.)

Will drill pads be graded/bladed or overland: ☐ Graded/bladed ☐ Overland

Will drill pads need some mechanical leveling (grading/blading): ☐ Yes ☐ No

Approx. Weight of Drill Rig (lbs.)_____ Number of Axles: _____

Total length of drill stem that can be carried on the rig:_____

Is a support pipe truck anticipated? ☐ Yes ☐ No _____Weight (lbs.)

Weight of support compressor (lbs.):_____Trailer mounted?_____

Anticipated Drilling Contractor:_____ License No._____

■ **Mud/fluid drilling:**

75 # of holes ~600-2000 / hole Depth (ft.) 4-5" Diameter (in.)

29 # of drill pads 50 Length (ft.) 50 Width (ft.)

Will drill pads be graded/bladed or overland: ■ Graded/bladed ☐ Overland

Will drill pads need some mechanical leveling (grading/blading): ■ Yes ☐ No

Will a closed loop system be used or will mud/fluid pits be used? The project does not involve constructing ponds or impoundments. Drilling mud/fluid will be contained within aboveground mobile storage tanks at each drill site.

If mud/fluid pits are proposed:

_____# of pits _____Length (ft.) _____Width (ft.) _____Depth (ft.)

Anticipated excavating equipment:

- ATV
- Tire/Track Mounted Drilling Rig
- Water Tender
- Light Weight Four (4) Wheel Drive Pick Ups
- Fuel and Lube Truck
- Wheel Loader
- Bulldozer
- Hydraulic Excavator
- Backhoe

How will excavating equipment be transported to the site (i.e., driven, low-boy, etc.):

Driven via roads.

Will mud pits be lined?: ☐ Yes ☐ No

If yes, proposed material to line the mud pits: N/A

Approx. Weight of Drill Rig (lbs.) ~ 18,000 lbs. Number of Axles: 3 or track mounted.

Anticipated Drilling Contractor: Contract not awarded yet License No. _____

☐ **Test pits / exploratory trenches:**

_____# of pits _____Length (ft.) _____Width (ft.) _____Depth (ft.)

Anticipated excavating equipment: _____

How will excavating equipment be transported to the site (i.e., driven, low-boy, etc.):

■ **Other methods of exploration** (i.e., cuts, shafts, tunnels, adits, declines, blasting, etc.). Indicate method and details: Mineral exploration, diamond core drilling. A small footprint wheel or track-mounted diamond drill rig will be used to drill a series of exploration holes averaging 1,100 feet from 29 pads. Multiple HQ diameter, angled exploration holes will be completed from each pad.

TOTAL ACREAGE TO BE DISTURBED DUE TO DRILL PADS = 0 . 5 7 3 acres
(to convert to acres, multiply total square footage of drill pads by 0.0000229)

D. Disposal of drill cuttings

If this exploration project is for uranium or other radioactive elements/minerals, applicant agrees to perform a gamma radiation survey at each drill site prior to, and after, exploration activities. Applicant/Owner/Operator agrees to restore gamma radiation levels at each drill site to pre-exploration levels. ☐ Yes ☐ No ■ N/A

Will excess drill cuttings be buried at each drill site location or within a single disposal pit?
■ At each drill pad location ☐ Within a single disposal pit

If a single disposal pit is proposed, please provide the following:

Description or GPS coordinates of the proposed cuttings disposal pit location:

Dimensions of the single proposed cuttings disposal pit (length, width, and depth):

_____Length (ft.) _____Width (ft.) _____Depth (ft.)

TOTAL ACREAGE TO BE DISTURBED DUE TO DISPOSAL PIT = N / A acres
(to convert to acres, multiply total square footage of disposal pit by 0.0000229)

E. Other Supporting Equipment (check all that apply):

■	4x4 Trucks/Vehicles	Quantity:	Three (3)
■	Water Truck	Weight (lbs.):	~ 35,000 lbs.
☐	Geophysical Truck	Weight (lbs.):	
■	Pipe Truck (rig support)	Weight (lbs.):	~ 35,000 lbs.
■	Bulldozer	Type:	CAT® bulldozer (size = D6 or D7, weight ~80,000 lbs)
■	Backhoe	Type:	Cat 420
☐	Trackhoe	Type:	
☐	Scaper/Grader	Type:	
■	Trailers	Quantity/Type:	Trailers (lowboys) to mobilize equipment
■	Portable Toilet	Quantity:	One (1)
■	Other	List:	Fuel and lube truck, wheel loader, mud system tank

F. Roads and Overland Travel:

Access to the project is provided via the existing road in Graveyard Gulch, an ephemeral drainage. Use of this existing road for access should not impact this ephemeral drainage feature. There are no other natural surface water features in the project area and the project will have no direct surface impact on wetlands, springs, perennial or intermittent streams, lakes, rivers, reservoirs, or riparian areas.

List of new roads to be constructed for this exploration project:

Description of *NEW* Roads	Length (ft.)	Width (ft.)	Total Acres (length x width x 0.0000229)
USFS 4056N to DP8B	90.644	14.000	0.029
TOTAL ACRES DISTURBED BY NEW ROAD CONSTRUCTION :			**0.029**

Describe how new roads will be constructed:

New road construction will be completed using heavy equipment such as a bulldozer, wheel loader, backhoe, and track excavator. Equipment and operations will be maintained with light service vehicles (pick-ups), water tender, and lube/fuel truck. Construction will be located to minimize disturbance to land and wildlife and enhance stability. Road stability will be maintained by following the land contour to the extent possible and using good road building practices such as constructing water turn-outs and water bars at suitable intervals. Road construction and widening locations have been selected to make use of natural features such as shelves and to avoid drainages, excessively steep slopes, and loose soil material. To ensure good engineering methods are employed, the BLM/USFS Gold Book for road construction will be consulted. If it is necessary for road construction or widening to be conducted in loose soil or tailings, adequate steps will be taken to ensure road stability. Steps may include the import of rip-rap and filter fabric to stabilize soil and avoid head-cuts, and the frequent installation of water bars.

List for extension or widening of existing roads:

Description of Modification to *EXISTING* Roads	Length (ft.)	Width (ft.)	Total Acres (length x width x 0.0000229)
DP4 Access	1,404.304	10.00	0.322
DP6/DP7 Access	985.938	10.00	0.226
DP10 Access	4,128.365	10.00	0.945
DP12 Access	1,269.687	10.00	0.291
DP13 Access	310.386	10.00	0.071
TOTAL ACRES DISTURBED BY ROAD IMPROVEMENTS :			**1.855**

Describe how existing roads will be extended or widened:

Existing road construction and widening will be completed using heavy equipment such as a bulldozer, wheel loader, backhoe, and track excavator. Equipment and operations will be maintained with light service vehicles (pick-ups), water tender, and lube/fuel truck. Construction will be located to minimize disturbance to land and wildlife and enhance stability. Road stability will be maintained by following the land contour to the extent possible and using good road building practices such as constructing water turn-outs and water bars at suitable intervals. Road construction and widening locations have been selected to make use of natural features such as shelves and to avoid drainages, excessively steep slopes, and loose soil material. To ensure good engineering methods are employed, the BLM/USFS Gold Book for road construction will be consulted. If it is necessary for road construction or widening to be conducted in loose soil or tailings, adequate steps will be taken to ensure road stability. Steps may include the import of rip-rap and filter fabric to stabilize soil and avoid head-cuts, and the frequent installation of water bars.

List for routes of overland travel:

Description of *OVERLAND TRAVEL* Routes	Length (ft.)	Width (ft.)	Total Acres (length x width x 0.0000229)
No routes of overland travel			
TOTAL ACRES DISTURBED BY OVERLAND TRAVEL :			**0**

G. Support Facilities

Describe (location and size) any support facility disturbances (equipment staging, equipment and material storage and/or lay down areas, vehicle parking, temporary housing and/or trailers) to be created or situated on the site during exploration operations.

The drill program will be staged from an off-site location. Vehicles and equipment will be parked on existing roads or on permitted drill pads while on-site.

H. **TOTAL ACREAGE TO BE DISTURBED BY PROJECT = 2.456 acres**
(include all disturbed acreage from drill pads, cuttings disposal pit, new roads, improved roads and overland travel routes)

SECTION 5 – CHEMICAL USE (§302.D.4)

A. Check any and all chemicals that will be used for this project.

☒	Drilling Mud (i.e., EZ Mud)	Type/Quantity:	Hydrous silica of alumina/Wyoming sodium bentonite/sodium montmorillonite/ Performaltrol 930 40-lb buckets.
☒	Diesel Fuel	Quantity:	150 gallons/day/drill
☒	Down-hole Lubricants	Type/Quantity:	Rod grease – 17kg pails
☒	Lost Circulation Materials	Type/Quantity:	Kwik-Plug
☒	Oils/Grease	Quantity:	5 gallons
☒	Gasoline	Quantity:	5 to 10 gallons/day
☒	Hydraulic Fluid	Quantity:	10 gallons
☐	Ethylene Glycol	Quantity:	
☒	Cement	Type/Quantity:	Portland II – 65 50-lb bags
☒	Water	Source:	Water tender
☒	Bentonite	Quantity:	Quick Gel – 65 50-lb bags
☐	Fertilizer	Type/Quantity:	
☐	Other	Type/Quantity:	

B. Describe, in detail, a plan for the containment, use and disposal of all chemicals listed above: The proposed drilling program will not use cyanide, solvents, laboratory agents or mill processing. Drill samples will be taken off-site for analysis. The drilling fluid/mud is not considered hazardous and will be contained in an appropriately labeled aboveground mobile storage tank. Any lubricants or hydraulic fluids needed for operations will be stored in small quantities within vehicles in clearly labeled containers. It is not anticipated that significant quantities of hazardous or toxic substances will be used during the proposed exploration project.

C. Describe where equipment fueling/refueling will occur: Fuel for heavy equipment and the drill rig will be brought on-site in clearly labeled fuel tanks, mounted in the bed of a 4x4 pickup. Smaller more mobile equipment will be fueled off-site. Any lubricants or hydraulic fluids needed for operations will be stored in small quantities within vehicles in clearly labeled containers.

D. Describe how hazardous material spills/leaks will be handled: Spill kits will be maintained on-site within designated vehicles and on the drilling rig in case of a petroleum product release. A Stormwater Pollution Prevention Plan (SWPPP) will be prepared and initiated prior to the commencement of drilling operations. Personnel on-site will receive training on best management practices (BMPs) outlined in the SWPPP prior to commencing operations. A copy of the SWPPP will be provided to the New Mexico Mining and Minerals Division upon request.

De minimis spills will be cleaned up with absorbent materials and the materials will be disposed of properly. Petroleum contaminated soils will be removed and taken to a certified disposal location. Reportable spills will be reported to the Environmental Protection Agency Spill Reporting Center and the New Mexico Environment Department.

E. Identify spill cleanup materials that will be kept on-site (check all that apply):

- ☒ Bentonite clay or cat litter
- ☒ Adsorbent pads, rolls, mats, socks, pillows, dikes, etc.
- ☒ Drum or barrel for containing contaminated soil/adsorbent materials
- ☐ Other/list: _____
- ☐ Other/list: _____
- ☐ Other/list: _____

F. Applicant/owner/representative agrees to immediately notify the State of New Mexico immediately of any spills of hazardous materials (see page 1 of this application for phone numbers to notify): ☒ Yes ☐ No

SECTION 6 – GROUNDWATER/SURFACE WATER INFORMATION (§302.D.5)

A. Provide an estimate of depth to ground water and the total dissolved solids (TDS) concentration.

Depth to groundwater (ft.): 211 ft. TDS concentration (mg/L): Within Catron County TDS concentrations range from 120 mg/L to 1,440 mg/L.

Describe the source of this information:

New Mexico State Engineer's W.A.T.E.R.S website PLSS Search: Section(s) 28, 33 Township: 10S Range: 19W
http://nmwrrs.ose.state.nm.us/meterReport.html).

Historic Mining References
-1920. Scott, D. B., Ore deposits of the Mogollon district: Am. Inst. Min. Eng. Trans., vol. 63, pp. 289-310, 1920.

-1927. Ferguson, Geology and Ore Deposits: U.S.G.S. Bulletin 787
https://geoinfo.nmt.edu/resources/water/projects/home.cfml?id=105

Land, Lewis, 2016, Overview of Fresh and Brackish Water Quality in New Mexico - San Agustin Basin, Project Summary Sheet.

Land, Lewis, 2016, Overview of Fresh and Brackish Water Quality in New Mexico, New Mexico Bureau of Geology Mineral Resources, Open-file Report, v. 0583, pp. 55.

B. Will dewatering activities be conducted: ☐ Yes ■ No

If yes, please describe: N/A

C. Is groundwater anticipated to be encountered during exploration: ■ Yes ☐ No

If YES:

Have you completed Form WR-07 (Application for permit to drill a well with no consumptive use of water) and mailed it to the District Office of the State Engineer? ☐ Yes

Have you completed Form WD-08 (Well plugging plan of operations) and mailed it to the District Office of the State Engineer? ☐ Yes

Attachment: Attachments will be provided when the driller is selected (copies of the completed WR-07 and WD-08 forms)

D. Exploration Borehole Abandonment

Dry Boreholes

☐ Dry hole abandonment (option 1): 100% bentonite pellets/chips (i.e. HOLEPLUG® manufactured by Baroid Industrial Products), dropped from surface then hydrated in place according to the manufacturer's recommendations, emplaced from total depth to within 12 feet of the original ground surface, followed by 10 feet of neat cement, followed by 2 feet of topsoil/topdressing.

☐ Dry hole abandonment (option 2): Neat cement slurry, mixed according to the manufacturer's recommendations, emplaced with a tremie pipe from total depth to within 2 feet of the original ground surface, followed by 2 feet of topsoil/topdressing.

☐ Dry hole abandonment (option 3): Cement + 6% bentonite slurry, mixed according to the manufacturer's recommendations, emplaced with a tremie pipe from total depth to within 2 feet of the original ground surface, followed by 2 feet of topsoil/topdressing.

☐ Dry hole abandonment (option 4): High-density bentonite clay (≥ 20% active solids; i.e. QUIK-GROUT® manufactured by Baroid Industrial Products), mixed according to the manufacturer's recommendations, emplaced with a tremie pipe from total depth to within 12 feet of the original ground surface, followed by 10 feet of neat cement, followed by 2 feet of topsoil/topdressing.

☐ Dry hole abandonment (option 5): Other materials / describe and justify use:

Wet Boreholes

■ Wet hole abandonment (option 1): Neat cement slurry, mixed according to the manufacturer's recommendations, emplaced with a tremie pipe from total depth to within 2 feet of the original ground surface, followed by 2 feet of topsoil/topdressing.

■ Wet hole abandonment (option 2): High-density bentonite clay (≥ 20% active solids; i.e. QUIK-GROUT® manufactured by Baroid Industrial Products), mixed according to the manufacturer's recommendations, emplaced with a tremie pipe from total depth to within 12 feet of the original ground surface, followed by 10 feet of neat cement, followed by 2 feet of topsoil/topdressing.

☐ Wet hole abandonment (option 3): Other sealing material approved by the Office of the State Engineer. Describe and include well plugging plan approval by the State Engineer:

D. Applicant agrees to contain any water produced from the exploration borehole at the drill site and acknowledges that discharge of this water to a watercourse may be a violation of the Federal Clean Water Act: ☒ Yes ☐ No

E. Is any drilling proposed to occur within the channel of any perennial, intermittent, or ephemeral streams? ☐ Yes ☒ No

F. Is any drilling anticipated to occur within 100 feet of any perennial, intermittent, or ephemeral streams? ☐ Yes ☒ No

SECTION 7 – RECLAMATION & OPERATION PLAN (§302.D.6 AND 302.I.K)

A. Salvage/Preservation of Topsoil

Before any grading/blading or similar activities occur in relation to this project, operator agrees to salvage and preserve all topsoil and topdressing for use in future reclamation of this project ☒ Yes ☐ No

Describe how topsoil will be salvaged prior to initiation of exploration activities (check all that apply):

☐ N/A – no construction work will occur, therefore no soil salvage is needed.
☒ Excavated from drill pads and stored at each drill pad
☒ Excavated from road improvements/construction and stored adjacent to road
☐ Excavated from mud/fluid pits and storage at each pit
☐ Other, describe:

B. Erosion Control

Describe the best management practices that will be implemented to control erosion:

☒ Silt fencing Location: Perimeter of drill pads

☐ Straw waddles Location:

☒ Straw bales Location: Perimeter of drill pads. Certified weed-free.

☐ Ditches/swales Location:

☒ Berms/dikes/dams Location: Perimeter of drill pads

☐ Sediment basins Location:

☒ Other or N/A Type/Location: Drill pads will be constructed with no more than a 2% grade to minimize run off. Reconstructed slopes will have a minimal length and gradient. Reclamation of drill pads will include revegetation with native species. Re-vegetation seed rows will be established perpendicular to the slope to minimize erosion.

C. Wildlife Protection / Noxious Weed Prevention

Will the perimeter of drill pits be fenced to prevent wildlife entrapment? ☐ Yes ☒ No

Proposed pit perimeter fence material: No mud pits, but temporary fences will be installed around shallow cutting sumps. Chain link or high-visibility orange safety fencing will be used.

Describe how the pit perimeter fencing will be installed and secured (i.e., T-posts, wooden stakes, etc.): Temporary sump fences will be secured with either T-posts or wooden stakes depending on fencing material.

Will at least one side of the interior of the drill pits be sloped at 3:1 as a ramp for wildlife escape? ☒ Yes ☐ No

If No, will another type of constructed escape ramp be installed? Describe: Yes, a ramp will be constructed for the shallow cutting sumps.

Applicant/Owner/Operator commits to pressure-washing or steam-clean all equipment prior to entering the permit area: ☒ Yes ☐ No

D. Reclamation Details

Describe in general how re-contouring or re-establishment of the surface topography will be restored: Disturbed areas will be returned to their original contour during reclamation as much as practicable. Stockpiled topsoil will be re-applied to the area from which it was removed upon completion of re-contouring disturbed areas. Soil application will be performed with a frontend loader or excavator. The topsoil will be smoothed and scarified to provide a good seed bed. Small seed rows will be created perpendicular to the slope of the land to slow storm water run-off, promote infiltration, and create micro-habitats conducive to seed germination.

Describe how the reclamation of portals, adits, drilling fluid/mud and/or waste pits, shafts, ponds, roads and other disturbances will be performed: Reclamation of drill pads will be conducted upon completion of drilling activities.

Reclamation activities will proceed as described in Section 7.0 Part B. All disturbed areas will be re-contoured, covered with topsoil, prepped, and seeded with a mixture approved by the New Mexico Mining and Minerals Division. Seed mixtures will be certified "Free of Noxious Weeds." Seeding and scarifying will be conducted with the contour, to minimize erosion. Revegetation efforts will be monitored. Areas which fail to establish perennial vegetation will be re-seeded.

Summa Silver Corp. does not anticipate the installation of culverts or construction of bridges as part of the scope of work for the proposed exploration drilling project. If culverts are required, Summa Silver Corp. will provide drawings of the culvert crossing to the New Mexico Mining and Minerals Division. Culverts will not be installed without approval by the Division. If any culverts are installed, they will be removed upon completion of the project or road segment, and the area will be re-contoured and revegetated.

Mine tailing, sludges, and waste rock will not be generated by the exploration drilling project. Care will be taken to avoid disturbing pre-existing structures, adits, shafts, and tailings piles.

Is seeding of the reclaimed areas proposed: ☒ Yes ☐ No

If no, provide a justification as to why no revegetation is needed:

Plant mix to be used in the re-establishment of vegetation:

☐ US Forest Service specified mix applied through broadcast at their recommended rate
☐ BLM specified mix applied through broadcast at their recommended rate
☒ Other: New Mexico Mining and Minerals Division. Seed mixtures will be certified "Free of Noxious Weeds".

Plant Name	Seeding Rate (lbs./acre)
Blue grama	4.0
Sideoats grama	3.0
Bottlebrush squirrel tail	3.0
Mountain bromegrass	2.0
Slender wheatgrass	2.0
Mountain mahogany	2.0

Broadcast applied or drill-seeded: ☒ Broadcast ☐ Drill-seeded

Scarification Methods (check all that apply):

☐ Primary tillage to greater than 6-inches depth of all constructed drill pads and roads
☐ Secondary tillage of all constructed drill pads and roads, and/or overland travel routes
☒ Chain drag or tire drag over seeds in areas used for overland travel
☒ Light raking of soil over seeds in areas used for overland travel
☐ None
☐ Other/describe:

Mulch Use:

☐ Certified weed-free straw mulch will be placed over areas that have been tilled/disced or ripped at a rate of 2 tons per acre, and will be crimped in place
☒ No mulch is proposed

E. Reclamation Timeline

Applicant/Owner/Operator commits to reclamation of the disturbed area as soon as possible following the completion or abandonment of the exploration operation, unless the disturbed area is included within a complete permit application for a new mining permit:

☒ Yes ☐ No

Anticipated Start of Reclamation:

☐ 0-30 days after completion of drilling
☐ 31-60 days after completion of drilling
☒ Other/specify: Within 90 days of final assay results.

SECTION 8 – PERMIT FEES AND FINANCIAL ASSURANCE (§302.I.2 AND 5)

A. Financial assurance must be posted with Mining and Minerals Division prior to approval of this application. The acceptable forms of financial assurance are surety bonds, letters of credit, and certificates of deposit. Provide an estimate of, and an instrument for, the proposed financial assurance required by Subpart 3.

☐ Surety Bond
☐ Letter of Credit
☐ Cash Account / Certificate of Deposit

☐ Estimated amount of financial assurance: _____

Or

☒ Applicant will provide the amount of financial assurance calculated by MMD.

B. Attach the permit fees as determined pursuant to Subpart 2. The application fee for a minimal impact exploration permit is $500.00.

☐ Money Order/Cashier's Check
☒ Check

Check Number: 5065

Financial Institution: Wells Fargo Bank

SECTION 9 – CERTIFICATION REQUIREMENT (§302.I.3 & 4)

I certify that I have personally examined and am familiar with the information submitted herein, and based on my inquiry of those individuals responsible for obtaining the information; I believe the submitted information is true, accurate, and complete. I agree to comply with the reclamation requirements set forth in this permit application and related correspondence, the New Mexico Mining Act and the Rules. Further, I certify that I am not in violation of any other obligation under the New Mexico Mining Act or the Rules adopted pursuant to that Act and I allow the Director to enter the permit area, without delay, for the purposes of conducting inspections during exploration and reclamation.

Signature of Permittee or Authorized Agent: _____

Name (type or print): Galen McNamara

Title/Position: CEO

Date: _____

Everett Ecological

Component A - Attachment 1

2021 Part 3 Minimal Impact Exploration Operation Permit Application

PART 3
MINIMAL IMPACT EXPLORATION OPERATION

PERMIT APPLICATION

Accompanying instructions for this permit application are available from MMD, and on MMD webpage:
http://www.emnrd.state.nm.us/MMD/MARP/MARPApplicationandReportingForms.htm

Send 6 copies of the completed application to:

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
Director
Mining and Minerals Division
1220 South Saint Francis Drive
Santa Fe, New Mexico 87505
Telephone: (505) 476-3400
Webpage: www.emnrd.state.nm.us/MMD/index.htm

CHECK OFF LIST TO DETERMINE YOUR PROJECT'S STATUS AS A MINIMAL IMPACT EXPLORATION OPERATION:

☐ Yes ☒ No My project **will exceed 1000 cubic yards of excavation**, per permit (drill pads, mud pits, and roads will not be counted in excavated materials).

☐ Yes ☒ No Surface disturbances for constructed roads, drill pads and mud pits **will exceed 5 acres** total for my project.

☐ Yes ☒ No My project is located in or is expected to have a direct surface impact on wetlands, springs, perennial or intermittent streams, lakes, rivers reservoirs or riparian areas.

☐ Yes ☒ No My project is located in designated critical habitat areas as determined in accordance with the federal Endangered Species Act of 1973 or in areas determined by the Department of Game and Fish likely to result in an adverse impact on an endangered species designated in accordance with the Wildlife Conservation Act, Sections 17-2-37 through 17-2-46 NMSA 1978 or by the State Forestry Division for the Endangered Plants Act, section 75-6-1 NMSA 1978.

☐ Yes ☒ No My project is located in an area designated as Federal Wilderness Area, Wilderness Study Area, Area of Critical Environmental Concern, or an area within the National Wild and Scenic River System.

☐ Yes ☒ No My project is located in a known cemetery or other burial ground.

☐ Yes ☒ No My project is located in an area with cultural resources listed on either the National Register of Historic Places or the State Register of Cultural Properties.

☐ Yes ☒ No My project will or is expected to have a direct impact on ground water that has a total dissolved solids concentration of less than 10,000 mg/L, except exploratory drilling intersecting ground water may be performed as a minimal impact operation.

☐ Yes ☒ No My project is expected to use or using cyanide, mercury amalgam, heap leaching or dump leaching in its operations.

☐ Yes ☒ No My project is expected to result in point or non-point source surface or subsurface releases of acid or other toxic substances from the permit area.

☐ Yes ☒ No My project requires a variance from any part of the Mining Act Rules as part of the permit application.

If you answer yes to any of the above questions, your project does not qualify as a minimal impact exploration operation.

Confidential Information

☐ Yes ☒ No Is any of the information submitted in this application considered by the applicant to be confidential in nature? If yes, please provide this information separately and marked as “confidential.”

Timeline

- Exploration applications must be provided no less than 45 days prior to the anticipated date of operations desired by the applicant.
- Renewal applications shall be filed at least 30 days preceding expiration of the current permit. Permits are valid for one year.
- Approved permit is valid for one year from the date of approval.

SECTION 1 – OPERATOR INFORMATION (§304.D.1)

Project Name: Mogollon Project

Nearest Town To Project: Mogollon, New Mexico

Applicant Name and Contact Information (entity obligated under the Mining Act):

Name: Galen McNamara

Address: 918-1030 West Georgia Street Vancouver, BC, V6E 2Y3

Office Phone: 604-288-8004 Cell Phone: 604-788-3677

Fax Number: N/A Email: galen@summasilver.com

Name of On-Site Contact, Representative, or Consultant:

Name: Chris York

Address: 2552 Hamilton Creek Trail, Elko, Nevada, 89801

Office Phone: 618-263-8664 Cell Phone: 618-263-8664

Fax Number: N/A Email: cyork@summasilvier.com

SECTION 2 – RIGHT TO ENTER INFORMATION (§302.D.1)

A. Describe or attach copies of documents that give the applicant the right to enter the property to conduct the exploration and reclamation, include: lease agreements, access agreements, right of way agreements, surface owner agreements, and claim numbers, if applicable.

Exploration activities will be conducted on patented claims owned or leased by: Summa Silver Corp.

Attachment A: Patented Mine Claims and Patented Mine Claim Lease Agreements.

B. List the names and addresses of surface and mineral ownership within the proposed permit area. If the mineral is federal mineral, indicate as federal mineral, but provide the name of the claim holder or lease holder.

Surface Estate Owner(s):

Name	Address	Phone #
☐ U.S. BLM	_____	_____
	_____	
☐ U.S. Forest Service	_____	_____
	_____	
☐ State of NM	_____	_____
	_____	

☒ Private/Corporate

Name: Mack, John Jr. and Hott, Ann and Parker, Mary K.
Address: 9A Cherokee Sq, Wilkes Barre, PA, 18702

☐ Other_____ _____

Name: _____ _____

Lease Holder(s) of Surface Estate (if applicable):

Name	Address	Phone #
Summa Silver Corp.	918-1030 West Georgia Street, Vancouver BC, V6E 2Y3	(604) 778-3677

Mineral Estate Owner(s):

Name	Address	Phone #
☐ Bureau of Land Management		
☐ US Forest Service		
☐ State of NM		
☒ Claim/Lease Holder		

Name: Mack, John Jr. and Hott, Ann and Parker, Mary K.
Address: 9A Cherokee Sq, Wilkes Barre, PA, 18702

Claim Numbers: See Attachment: A_SSVR_Patent_Information_Catron_County_20210302

☐ Claim/Lease Holder

Name: _____ _____

Claim Numbers: _____

☐ Other _____ _____

Name: _____ _____

C. Has a Cultural Resource Survey been performed on the site?

☒ Yes ☐ No If yes, please provide the author, title, date and report number, and include a copy of the survey with this application, if possible:

John M.D. Hooper/WestLand Resources, Inc. “A Class III Cultural Resources Survey of 21 Acres of Private Land Near Mogollon, Catron County, New Mexico, For a Proposed Mineral Exploration Drilling Project, Summa Silver Corporation” February 4, 2021, Cultural Resources Report 2021-16: NMCRIS Activity No. 147264

Attachment B-Cultural Resources Report – This report has been provided directly to the New Mexico State Historic Preservation Officer and is not included with this submittal for confidentiality reasons.

D. Has a wildlife survey or vegetation survey been performed for the permit area?

☒ Yes ☐ No If yes, please provide the author, title, date and report number, and include a copy of the survey with this application, if possible:

Ahvi Potticary/WestLand Resources, Inc., “Desktop Screening And Habitat Assessment For Area Of Proposed Exploration Near Mogollon, New Mexico” December 8, 2020. Project 2172.01

Attachment C – Biological Evaluation Report

SECTION 3 – MAPS AND PROJECT LOCATION (§302.D.2)

A. Project Location:

Township 10S Range 19 W Section 27
Township 10S Range 19 W Section 28

List the drill hole/exploration name and the GPS coordinates for each site.

I.D. Number	Northing / Latitude	Easting / Longitude		I.D. Number	Northing / Latitude	Easting / Longitude
10	3698381.98	704904.34		28	3698772.02	704921.60
11	3698417.44	704961.31		29	3698679.83	704972.92
12	3698467.07	704951.85				
13	3698527.96	704975.41				
14	3698322.71	704956.97				
15	3698351.33	704920.98				
17	3698476.06	705028.91				
18	3698573.93	705042.15				
19	3698640.11	705022.77				
20	3698633.97	705057.75				
21	3698683.13	705069.80				
22	3698734.66	705071.22				
23	3698798.75	705018.05				
24	3698827.65	704979.03				
25	3698858.52	704935.30				
26	3698714.34	705009.76				
27	3698754.05	704968.64				

Coordinate system used to collect GPS data points:

☐ NAD83 Geographic
☒ NAD83 UTM Zone 12
☐ WGS 1984
☐ NAD27 Geographic
☐ NAD27 UTM Zone 13 (or 12)
☐ Other:

Attachment N/A (for listing additional boreholes)

B. Maps (see application form instructions for examples of maps to be included):

Are topographic maps included with the application that show the following items:

☒ Yes – The boundary of the proposed exploration project Permit Area

☒ Yes – The proposed exploration locations (i.e., borehole locations)

☒ Yes – Existing roads, new roads and overland travel routes

☒ Yes ☐ N/A – Areas of proposed road improvement

Attachments D

Are maps or figures included with the application showing the approximate dimensions and locations of drill pads and other disturbances:

☒ Yes – Drill pad dimensions and constructed drill pad locations

Attachments E

C. Provide detailed driving directions to access the site:

The proposed exploration areas are located just west and north of the town of Mogollon, NM and approximately seven (7) miles east of the town of Alma, NM. To reach the site, travel east on NM State Road 159 for approximately seven (7) miles from the junction with US HWY 180. Drill sites will be accessed from spur roads originating from SR 159 just west of Mogollon, including Fanny Road (See Map D).

SECTION 4 – EXPLORATION DESCRIPTION (§302.D.3 & 4)

A. Anticipated exploration: Start Date: June 21, 2021 End Date: June 20, 2022

B. List the mineral(s)/element(s) to be explored for: Gold, Silver

C. Proposed method(s) of exploration:

☐ **Air drilling (air rotary, coring, etc.):**

_____# of holes _____Depth (ft.) _____Diameter (in.)

_____# of drill pads _____Length (ft.)_____Width (ft.)

Will drill pads be graded/bladed or overland: ☐ Graded/bladed ☐ Overland

Will drill pads need some mechanical leveling (grading/blading): ☐ Yes ☐ No

Approx. Weight of Drill Rig (lbs.)_____ Number of Axles: _____

Total length of drill stem that can be carried on the rig:_____

Is a support pipe truck anticipated? ☐ Yes ☐ No _____Weight (lbs.)

Weight of support compressor (lbs.):_____Trailer mounted?_____

Anticipated Drilling Contractor:_____ License No._____

☒ **Mud/fluid drilling:**

50 # of holes ~600-2000 / hole Depth (ft.) 4-5" Diameter (in.)

19 # of drill pads 50 Length (ft.) 50 Width (ft.)

Will drill pads be graded/bladed or overland: ☒ Graded/bladed ☐ Overland

Will drill pads need some mechanical leveling (grading/blading): ☒ Yes ☐ No

Will a closed loop system be used, or will mud/fluid pits be used? The project does not involve constructing ponds or impoundments. Drilling mud/fluid will be contained within above-ground mobile storage tanks at each drill site.

If mud/fluid pits are proposed: N/A

_____# of pits _____Length (ft.) _____Width (ft.) _____Depth (ft.)

Anticipated excavating equipment:

- ATV
- Tire/Track Mounted Drilling Rig
- Water Tender
- Light Weight Four (4) Wheel Drive Pick Ups
- Fuel and Lube Truck
- Wheel Loader
- Bulldozer
- Hydraulic Excavator
- Backhoe

How will excavating equipment be transported to the site (i.e., driven, low-boy, etc.):
Driven via roads.

Will mud pits be lined? ☐ Yes ☐ No

If yes, proposed material to line the mud pits: N/A

Approx. Weight of Drill Rig (lbs) ~ 18,000 lbs Number of Axles: 3 or track mounted.

Anticipated Drilling Contractor: contract not awarded yet License No._____

☐ **Test pits / exploratory trenches:**

_____# of pits _____Length (ft.) _____Width (ft.) _____Depth (ft.)

Anticipated excavating equipment:_____

How will excavating equipment be transported to the site (i.e., driven, low-boy, etc.): _____

_____

_____

☒ **Other methods of exploration** (i.e., cuts, shafts, tunnels, adits, declines, blasting, etc.). Indicate method and details: mineral exploration, diamond core drilling. A small footprint wheel or track mounted diamond drill rig will be used to drill a series of exploration holes averaging 1100 feet from 19 pads on patented claims. One to four HQ diameter, angled exploration holes will be completed from each pad. _____

TOTAL ACREAGE TO BE DISTURBED DUE TO DRILL PADS = 1.1 acres
(to convert to acres, multiply total square footage of drill pads by 0.0000229)

D. Disposal of drill cuttings

If this exploration project is for uranium or other radioactive elements/minerals, applicant agrees to perform a gamma radiation survey at each drill site prior to, and after, exploration activities. Applicant/Owner/Operator agrees to restore gamma radiation levels at each drill site to pre-exploration levels. ☐ Yes ☐ No ☒ N/A

Will excess drill cuttings be buried at each drill site location or within a single disposal pit?
☒ At each drill pad location ☐ Within a single disposal pit

If a single disposal pit is proposed, please provide the following:

Description or GPS coordinates of the proposed cuttings disposal pit location:

_____

Dimensions of the single proposed cuttings disposal pit (length, width, and depth):

_____Length (ft.) _____Width (ft.) _____Depth (ft.)

TOTAL ACREAGE TO BE DISTURBED DUE TO DISPOSAL PIT = N/A acres
(to convert to acres, multiply total square footage of disposal pit by 0.0000229)

E. Other Supporting Equipment (check all that apply):

☒	4x4 Trucks/Vehicles	Quantity:	3
☒	Water Truck	Weight (lbs.):	~35,000 lbs
☐	Geophysical Truck	Weight (lbs.):	
☒	Pipe Truck (rig support)	Weight (lbs.):	~35,000 lbs
☒	Bulldozer	Type:	CAT® bulldozer (size = D6 or D7, weight ~80,000 lbs)
☒	Backhoe	Type:	Cat 420
☐	Trackhoe	Type:	
☐	Scaper/Grader	Type:	
☒	Trailers	Quantity/Type:	trailers (lowboys) to mobilize equipment
☒	Portable Toilet	Quantity:	one
☒	Other	List:	Fuel and lube truck, wheel loader, mud system tank

F. Roads and Overland Travel:
Access to the project is provided via the existing road in Graveyard Gulch, an ephemeral drainage.

Use of this existing road for access should not impact this ephemeral drainage feature. There are no other natural surface water features in the project area and the project will have no direct surface impact on wetlands, springs, perennial or intermittent streams, lakes, rivers, reservoirs, or riparian areas.

List of new roads to be constructed for this exploration project:

Description of *NEW* Roads	Length (ft)	Width (ft)	Total Acres (length x width x 0.0000229)
Access from DS 19 to DS 20	98.4	12	0.027427724
Access to relocated DS 15	175.5	12	0.048912775
Access from relocated DS 15 to relocated DS 14	181.1	12	0.050467013
Access to DS 12	190.2	12	0.053026934
Access from DS 13 to DS 18	229.7	12	0.063998023
TOTAL ACRES DISTURBED BY NEW ROAD CONSTRUCTION:			**0.24**

Describe how new roads will be constructed: See below

Road construction and widening will be completed using heavy equipment such as a bulldozer, wheel loader, backhoe, and track excavator. Equipment and operations will be maintained with light service vehicles (pick-ups), water tender, and lube/fuel truck. Construction will be located to minimize disturbance to land and wildlife and enhance stability. Road stability will be maintained by following the land contour to the extent possible and using good road building practices such as constructing water turn-outs and water bars at suitable intervals. Road construction and widening locations have been selected to make use of natural features such as shelves and to avoid drainages, excessively steep slopes, and loose soil material. To ensure good engineering methods are employed, the BLM/USFS Gold Book for road construction will be consulted.
If it is necessary for road construction or widening to be conducted in loose soil or tailings, adequate steps will be taken to ensure road stability. Steps may include the import of rip-rap and filter fabric to stabilize soil and avoid head-cuts, and the frequent installation of water bars.

List for extension or widening of existing roads:

Description of Modification to *EXISTING* Roads	Length (ft)	Width (ft)	Total Acres (length x width x 0.0000229)
Access to DS 28	98.4	5	0.011119348
Access to DS 22	167.3	5	0.018902891
Access to DS 19 from north	159.1	5	0.017976279
Access to DS 13	226.4	5	0.0255745
Access from DS 19 to DS 18	216.5	5	0.024462565
TOTAL ACRES DISTURBED BY ROAD IMPROVEMENTS:			**0.10**

Describe how existing roads will be extended or widened: See below

Road construction and widening will be completed using heavy equipment such as a bulldozer, wheel loader, backhoe, and track excavator. Equipment and operations will be maintained with light service vehicles (pick-ups), water tender, and lube/fuel truck. Construction will be located to minimize disturbance to land and wildlife and enhance stability. Road stability will be maintained by following the land contour to the extent possible and using good road building practices such as constructing water turn-outs and water bars at suitable intervals. Road construction and widening locations have been selected to make use of natural features such as shelves and to avoid drainages, excessively steep slopes, and loose soil material. To ensure good engineering methods are employed, the BLM/USFS Gold Book for road construction will be consulted.
If it is necessary for road construction or widening to be conducted in loose soil or tailings, adequate steps will be taken to ensure road stability. Steps may include the import of rip-rap and filter fabric to stabilize soil and avoid head-cuts, and the frequent installation of water bars.

List for routes of overland travel: N/A

Description of *OVERLAND TRAVEL* Routes	Length (ft.)	Width (ft.)	Total Acres (length x width x 0.0000229)
TOTAL ACRES DISTURBED BY OVERLAND TRAVEL:			N/A

G. Support Facilities

Describe (location and size) any support facility disturbances (equipment staging, equipment and material storage and/or lay down areas, vehicle parking, temporary housing and/or trailers) to be created or situated on the site during exploration operations.

The drill program will be staged from an off-site location. Vehicles and equipment will be parked on existing roads or on permitted drill pads while on-site.

H. **TOTAL ACREAGE TO BE DISTURBED BY PROJECT = 1.44 acres**
(include all disturbed acreage from drill pads, cuttings disposal pit, new roads, improved roads and overland travel routes)

SECTION 5 – CHEMICAL USE (§302.D.4)

A. Check any and all chemicals that will be used for this project.

☒	Drilling Mud (i.e., EZ Mud)	Type/Quantity:	Hydrous silica of alumina/Wyoming sodium bentonite/sodium montmorillonite. 3 5-gallon buckets.
☒	Diesel Fuel	Quantity:	For drill and heavy equipment 100 to 150 gallons/day
☒	Down-hole Lubricants	Type/Quantity:	Rod grease – 17kg pails
☒	Lost Circulation Materials	Type/Quantity:	Kwik-Plug
☒	Oils/Grease	Quantity:	5 gallons
☒	Gasoline	Quantity:	5 to 10 gallons/day
☒	Hydraulic Fluid	Quantity:	10 gallons
☐	Ethylene Glycol	Quantity:	
☒	Cement	Type/Quantity:	Portland II – 65 50-lb bags
☒	Water	Source:	Water tender
☒	Bentonite	Quantity:	Quick Gel – 65 50-lb bags
☐	Fertilizer	Type/Quantity:	
☐	Other	Type/Quantity:	

B. Describe, in detail, a plan for the containment, use and disposal of all chemicals listed above:

The proposed drilling program will not use cyanide, solvents, laboratory agents or mill processing. Drill samples will be taken off-site for analysis. The drilling fluid/mud is not considered hazardous and will be contained in an appropriately labeled aboveground mobile storage tank. Any lubricants or hydraulic fluids needed for operations will be stored in small quantities within vehicles in clearly labeled containers. It is not anticipated that significant quantities of hazardous or toxic substances will be used during the proposed exploration project. The most plausible scenario for a release of a hazardous substance would result from a leaking or overfilled fuel tank.

C. Describe where equipment fueling/refueling will occur:

Fuel for heavy equipment and the drill rig will be brought on-site in clearly labeled fuel tanks, mounted in the bed of a 4x4 pickup. Smaller more mobile equipment will be fueled off-site. Any lubricants or hydraulic fluids needed for operations will be stored in small quantities within vehicles in clearly labeled containers.

D. Describe how hazardous material spills/leaks will be handled:

Spill kits will be maintained on site within designated vehicles and on the drilling rig in case of a petroleum product release. A Stormwater Pollution Prevention Plan (SWPPP) will be prepared and initiated prior to the commencement of drilling operations. Personnel on site will receive training on best management practices (BMPs) outlined in the SWPPP prior to commencing operations. A copy of the SWPPP will be provided to the New Mexico Mining and Minerals Division upon request.

De minimis spills will be cleaned up with absorbent materials and the materials will be disposed of properly. Petroleum contaminated soils will be removed and taken to a certified disposal location. Reportable spills will be reported to the Environmental Protection Agency Spill Reporting Center and the New Mexico Environment Department.

E. Identify spill cleanup materials that will be kept on-site (check all that apply):

- ☒ Bentonite clay or cat litter
- ☒ Adsorbent pads, rolls, mats, socks, pillows, dikes, etc.
- ☒ Drum or barrel for containing contaminated soil/adsorbent materials
- ☐ Other/list: _____
- ☐ Other/list: _____
- ☐ Other/list: _____

F. Applicant/owner/representative agrees to immediately notify the State of New Mexico immediately of any spills of hazardous materials (see page 1 of this application for phone numbers to notify): ☒ Yes ☐ No

SECTION 6 – GROUNDWATER/SURFACE WATER INFORMATION (§302.D.5)

A. Provide an estimate of depth to ground water and the total dissolved solids (TDS) concentration.

Depth to groundwater (ft.): 55 ft. TDS concentration (mg/L): within Catron County TDS concentrations range from 120 mg/L to 1440 mg/L.

Describe the source of this information:

New Mexico State Engineer's W.A.T.E.R.S web site

http://nmwrrs.ose.state.nm.us/meterReport.html).

Historic Mining References

-1920. Scott, D. B., Ore deposits of the Mogollon district: Am. Inst. Min. Eng. Trans., vol. 63, pp. 289-310, 1920.

-1927. Ferguson, Geology and Ore Deposits: U.S.G.S. Bulletin 787

https://geoinfo.nmt.edu/resources/water/projects/home.cfml?id=105

Land, Lewis, 2016, Overview of Fresh and Brackish Water Quality in New Mexico - San Agustin Basin, Project Summary Sheet.

Land, Lewis, 2016, Overview of Fresh and Brackish Water Quality in New Mexico, New Mexico Bureau of Geology Mineral Resources, Open-file Report, v. 0583, pp. 55.

B. Will dewatering activities be conducted: ☐ Yes ☒ No

If yes, please describe: N/A

C. Is groundwater anticipated to be encountered during exploration: ☒ Yes ☐ No

If YES:

Have you completed Form WR-07 (Application for permit to drill a well with no consumptive use of water) and mailed it to the District Office of the State Engineer? ☐ Yes

Have you completed Form WD-08 (Well plugging plan of operations) and mailed it to the District Office of the State Engineer? ☐ Yes

Attachment F These attachments will be provided when the driller is selected. (copies of the completed WR-07 and WD-08 forms)

D. Exploration Borehole Abandonment

Dry Boreholes

☐ Dry hole abandonment (option 1): 100% bentonite pellets/chips (i.e. HOLEPLUG® manufactured by Baroid Industrial Products), dropped from surface then hydrated in place according to the manufacturer's recommendations, emplaced from total depth to within 12 feet of the original ground surface, followed by 10 feet of neat cement, followed by 2 feet of topsoil/topdressing.

☐ Dry hole abandonment (option 2): Neat cement slurry, mixed according to the manufacturer's recommendations, emplaced with a tremie pipe from total depth to within 2 feet of the original ground surface, followed by 2 feet of topsoil/topdressing.

☐ Dry hole abandonment (option 3): Cement + 6% bentonite slurry, mixed according to the manufacturer's recommendations, emplaced with a tremie pipe from total depth to within 2 feet of the original ground surface, followed by 2 feet of topsoil/topdressing.

☐ Dry hole abandonment (option 4): High-density bentonite clay (≥ 20% active solids; i.e. QUIK-GROUT® manufactured by Baroid Industrial Products), mixed according to the manufacturer's recommendations, emplaced with a tremie pipe from total depth to within 12 feet of the original ground surface, followed by 10 feet of neat cement, followed by 2 feet of topsoil/topdressing.

☐ Dry hole abandonment (option 5): Other materials / describe and justify use:

_____

_____

Wet Boreholes

☒ Wet hole abandonment (option 1): Neat cement slurry, mixed according to the manufacturer's recommendations, emplaced with a tremie pipe from total depth to within 2 feet of the original ground surface, followed by 2 feet of topsoil/topdressing.

☒ Wet hole abandonment (option 2): High-density bentonite clay (≥ 20% active solids; i.e. QUIK-GROUT® manufactured by Baroid Industrial Products), mixed according to the manufacturer's recommendations, emplaced with a tremie pipe from total depth to within 12 feet of the original ground surface, followed by 10 feet of neat cement, followed by 2 feet of topsoil/topdressing.

☐ Wet hole abandonment (option 3): Other sealing material approved by the Office of the State Engineer. Describe and include well plugging plan approval by the State Engineer:

_____

_____

_____

_____

_____

D. Applicant agrees to contain any water produced from the exploration borehole at the drill site and acknowledges that discharge of this water to a watercourse may be a violation of the Federal Clean Water Act: ☒ Yes ☐ No

E. Is any drilling proposed to occur within the channel of any perennial, intermittent, or ephemeral streams? ☐ Yes ☒ No

F. Is any drilling anticipated to occur within 100 feet of any perennial, intermittent, or ephemeral streams? ☐ Yes ☒ No

SECTION 7 – RECLAMATION & OPERATION PLAN (§302.D.6 AND 302.I.K)

A. Salvage/Preservation of Topsoil

Before any grading/blading or similar activities occur in relation to this project, operator agrees to salvage and preserve all topsoil and topdressing for use in future reclamation of this project ☒ Yes ☐ No

Describe how topsoil will be salvaged prior to initiation of exploration activities (check all that apply):

☐ N/A – no construction work will occur, therefore no soil salvage is needed.
☒ Excavated from drill pads and stored at each drill pad
☒ Excavated from road improvements/construction and stored adjacent to road
☐ Excavated from mud/fluid pits and storage at each pit
☐ Other, describe: _____

B. Erosion Control

Describe the best management practices that will be implemented to control erosion:

☐	Silt fencing	Location:	
☐	Straw waddles	Location:	
☐	Straw bales	Location:	
☐	Ditches/swales	Location:	
☒	Berms/dikes/dams	Location:	Around perimeter of drill pads
☐	Sediment basins	Location:	
☒	Other or N/A	Type/Location:	Drill pads will be constructed with no more than a 2% grade to minimize run off. Reconstructed slopes will have a minimal length and gradient.

Reclamation of drill pads will include re-vegetation with native species. Re-vegetation seed rows will be established perpendicular to the slope to minimize erosion.

C. Wildlife Protection / Noxious Weed Prevention

Will the perimeter of drill pits be fenced to prevent wildlife entrapment? ☐ Yes ☒ No

Proposed pit perimeter fence material: No mud pits but temporary fences will be installed around shallow cutting sumps. Chain link or high-visibility orange safety fencing will be used.

Describe how the pit perimeter fencing will be installed and secured (i.e., T-posts, wooden stakes, etc.):
Temporary sump fences will be secured with either T-posts or wooden stakes depending on fencing material.

Will at least one side of the interior of the drill pits be sloped at 3:1 as a ramp for wildlife escape? ☒ Yes ☐ No

If No, will another type of constructed escape ramp be installed? Describe:
Yes, a ramp will be constructed for the shallow cutting sumps.

Applicant/Owner/Operator commits to pressure-washing or steam-clean all equipment prior to entering the permit area: ☒ Yes ☐ No

D. Reclamation Details

Describe in general how re-contouring or re-establishment of the surface topography will be restored:
Disturbed areas will be returned to their original contour during reclamation as much as practicable. Stockpiled topsoil will be re-applied to the area from which it was removed upon completion of re-contouring disturbed areas. Soil application will be performed with a front-end loader or excavator. The topsoil will be smoothed and scarified to provide a good seed bed. Small seed rows will be created perpendicular to the slope of the land to slow storm water run-off, promote infiltration, and create micro-habitats conducive to seed germination.

Describe how the reclamation of portals, adits, drilling fluid/mud and/or waste pits, shafts, ponds, roads and other disturbances will be performed:
Reclamation of drill pads will be conducted upon completion of drilling activities.

Reclamation activities will proceed as described in Section 7.0 Part B. All disturbed areas will be re-contoured, covered with topsoil, prepped, and seeded with a mixture approved by the New Mexico Mining and Minerals Division. Seed mixtures will be certified "Free of Noxious Weeds." Seeding and scarifying will be conducted with the contour, to minimize erosion. Re-vegetation efforts will be monitored. Areas which fail to establish perennial vegetation will be re-seeded.

Summa Silver Corp. does not anticipate the installation of culverts or construction of bridges as part of the scope of work for the proposed exploration drilling project. If culverts are required, Summa Silver Corp. will provide drawings of the culvert crossing to the New Mexico Mining and Minerals Division. Culverts will not be installed without approval by the Division. If any culverts are installed, they will be removed upon completion of the project or road segment, and the area will be re-contoured and revegetated.

Mine tailing, sludges and waste rock will not be generated by the exploration drilling project. Care will be taken to avoid disturbing pre-existing structures, adits, shafts, and tailings piles.

Is seeding of the reclaimed areas proposed: ☒ Yes ☐ No

If no, provide a justification as to why no revegetation is needed:

_____

_____

_____

Plant mix to be used in the re-establishment of vegetation:

☐ US Forest Service specified mix applied through broadcast at their recommended rate
☐ BLM specified mix applied through broadcast at their recommended rate
☒ Other: New Mexico Mining and Minerals Division. Seed mixtures will be certified "Free of Noxious Weeds".

Plant Name	Seeding Rate (lbs./acre)
Blue grama	4.0
Sideoats grama	3.0
Bottlebrush squirrel tail	3.0
Mountain bromegrass	2.0
Slender wheatgrass	2.0
Mountain mahogany	2.0

Broadcast applied or drill-seeded: ☒ Broadcast ☐ Drill-seeded

Scarification Methods (check all that apply):

☐ Primary tillage to greater than 6-inches depth of all constructed drill pads and roads
☐ Secondary tillage of all constructed drill pads and roads, and/or overland travel routes
☒ Chain drag or tire drag over seeds in areas used for overland travel
☒ Light raking of soil over seeds in areas used for overland travel
☐ None
☐ Other/describe:_____

_____

Mulch Use:

☐ Certified weed-free straw mulch will be placed over areas that have been tilled/disced or ripped at a rate of 2 tons per acre, and will be crimped in place
☒ No mulch is proposed

E. Reclamation Timeline

Applicant/Owner/Operator commits to reclamation of the disturbed area as soon as possible following the completion or abandonment of the exploration operation, unless the disturbed area is included within a complete permit application for a new mining permit:

☒ Yes ☐ No

Anticipated Start of Reclamation:

☐ 0-30 days after completion of drilling
☐ 31-60 days after completion of drilling
☒ Other/specify: Within 90 days of final assay results.

SECTION 8 – PERMIT FEES AND FINANCIAL ASSURANCE (§302.I.2 AND 5)

A. Financial assurance must be posted with Mining and Minerals Division prior to approval of this application. The acceptable forms of financial assurance are surety bonds, letters of credit, and certificates of deposit. Provide an estimate of, and an instrument for, the proposed financial assurance required by Subpart 3.

☐ Surety Bond
☐ Letter of Credit
☐ Cash Account / Certificate of Deposit

☐ Estimated amount of financial assurance: _____

Or

☒ Applicant will provide the amount of financial assurance calculated by MMD.

B. Attach the permit fees as determined pursuant to Subpart 2. The application fee for a minimal impact exploration permit is $500.00.

☐ Money Order/Cashier's Check
☒ Check

Check Number: 138257

Financial Institution: BBVA Compass

SECTION 9 – CERTIFICATION REQUIREMENT (§302.I.3 & 4)

I certify that I have personally examined and am familiar with the information submitted herein, and based on my inquiry of those individuals responsible for obtaining the information; I believe the submitted information is true, accurate, and complete. I agree to comply with the reclamation requirements set forth in this permit application and related correspondence, the New Mexico Mining Act and the Rules. Further, I certify that I am not in violation of any other obligation under the New Mexico Mining Act or the Rules adopted pursuant to that Act and I allow the Director to enter the permit area, without delay, for the purposes of conducting inspections during exploration and reclamation.

Signature of Permittee or Authorized Agent: 

Name (type or print): Galen McNamara

Title/Position: CEO

Date: March 9, 2021

Everett Ecological

Component B

Cultural Resources Report

Submitted Under a Separate Cover

Everett Ecological

Component C

Environmental Evaluation

Mogollon Project
Baseline Habitat Assessment and Wildlife Evaluation

Prepared for: Summa Silver Corp.

918-1030 West Georgia St.

Vancouver, BC, V6E 2Y3

Prepared by: Everett Ecological

1810 E. Sahara Ave Ste 212 #1947

Las Vegas, NV 89104

April 10, 2023

Introduction

Summa Silver Corp. (Summa Silver) is a mineral exploration company focused on the acquisition and development of high-grade silver and gold Projects. The Mogollon Project (Project) is one of Summa Silver's key properties, located approximately 21 miles (35 km) south of Reserve in Catron County New Mexico. The Project covers an extensive silver-gold bearing epithermal vein field, with a history of past mining operations dating back to the late 1800s ((Summa Silver Corp., 2023)

New Mexico's Mining and Minerals Division (MMD) oversees the permitting process for mineral exploration and mining Projects in the state (New Mexico Mining and Minerals Division, 2023b). The Part 3 Minimal Impact Permit is a type of permit issued by the MMD for mineral exploration Projects that are anticipated to have minimal impacts on the environment. Everett Ecological, LLC was retained by Summa Silver to perform a baseline habitat assessment and wildlife evaluation (evaluation) in areas of proposed mineral exploration on the Project.

Purpose and Need

The purpose of the Part 3 Minimal Impact Permit is to ensure that the Project is conducted in a manner that protects the environment and public health, while also allowing for the responsible development of New Mexico's mineral resources. The permit outlines requirements and conditions that must be met by the Project, including those related to environmental protection. This evaluation is required as part of the permit application process to inform the assessment of the potential impacts Project on wildlife and habitat resources.

The New Mexico Department of Game and Fish (NMDGF) Habitat Handbook "Baseline Wildlife Study Guidelines" (Guideline(s)) serves as a valuable resource for carrying out comprehensive inventories that effectively record the presence, diversity, relative abundance, and distribution of wildlife and their habitats within the Project area ((New Mexico Department of Game and Fish, 2019). The Guidelines provide a framework for collecting and documenting information about ecological resources to ensure that wildlife and vegetation surveys are conducted in a scientifically rigorous manner and contribute valuable information to the understanding and conservation of wildlife populations in New Mexico.

Evaluation Overview

Key aspects of this evaluation, as they relate to the Guidelines, include:

- *Species selection*: Species were selected based on their conservation status, habitat requirements, and management objectives. This list includes Rare or Endangered Species, Big Game, Other Mammals, Birds, Reptiles and Amphibians, Fishes, and Aquatic Invertebrates.
- *Sampling design*: A sampling design was developed for this evaluation based on the target species taking into consideration the spatial and temporal distribution of sampling efforts, the efficacy of survey methods, and the number of survey sites or replicates needed.

- *Survey methods*: Implementation of standard Guideline survey methods for detecting and documenting wildlife species and vegetation types has been ongoing since November 2020 and is planned to continue into the foreseeable future. These methods include visual and auditory surveys, sign surveys (e.g., tracks, scat, nests, etc.), and bioacoustic sampling.
- *Data collection*: Desktop screening incorporated information acquired from the following databases: Biota Information System of New Mexico (BISON-M), the New Mexico Environmental Review Tool (NM-ERT), Environmental Resource Database of New Mexico (EnviroData-NM), Natural Heritage New Mexico (NHNM), U.S. Fish and Wildlife Service Information for Planning and Consultation (IPaC), and U.S. Forest Service Gila National Forest.

This evaluation is broken into five comprehensive sections: (1.) Habitat Assessment, (2.) Biological Assessment, (3.) Field Study Results, (4.) Impact Assessment, and (5.) Mitigation Actions.

1. Habitat Assessment

The purpose of this section is to provide a comprehensive evaluation of the wildlife habitats within the proposed Project area. This assessment aims to contribute to the understanding and conservation of local biodiversity while ensuring that Project development aligns with regulatory requirements and best management practices. In this section, the results of literature and database reviews are presented to describe the presence, distribution, and relative abundance of various vegetation communities in the Project area.

1.1 Study Area

For both the Habitat Assessment and Biological Assessment sections of this evaluation, the study area is comprised of a 0.5-mile buffer encompassing Summa Silver's patented properties (Figure 1). In this case, the study area is comprised of approximately 5,000 acres (20 km^2) and ranges between 5,370 ft (1,637 m) and 7,860 ft (2,396 m) in elevation. The use of a 0.5-mile buffer to delineate the boundaries of the study area is based on several practical and ecological considerations:

- *Wildlife movement and habitat use*: Many wildlife species have home ranges and movement patterns that extend beyond the immediate boundaries of a proposed Project. A 0.5-mile buffer helps to analyze wildlife populations that use areas adjacent to the Project site for foraging, breeding, nesting, or dispersal.
- *Edge effects*: Project activities can create "edge effects" that alter habitat quality and ecological processes near the Project boundaries. These effects can include changes in microclimate, vegetation structure, predator-prey dynamics, and species interactions. A 0.5-mile buffer can help assess and mitigate the potential impacts of edge effects on wildlife populations and their habitats.
- *Cumulative impacts*: The 0.5-mile buffer allows for the assessment of cumulative impacts on wildlife populations and habitats, including those resulting from multiple Projects or activities occurring within the same region. This helps ensure that the broader context of

landscape-level changes and potential cumulative effects is considered when evaluating ecological resources.

- *Indirect effects*: The buffer also helps account for potential indirect effects on wildlife populations, such as changes in habitat connectivity, increased human-wildlife conflicts, or alterations to ecological processes (e.g., hydrology, nutrient cycling) that may occur outside the immediate Project area.

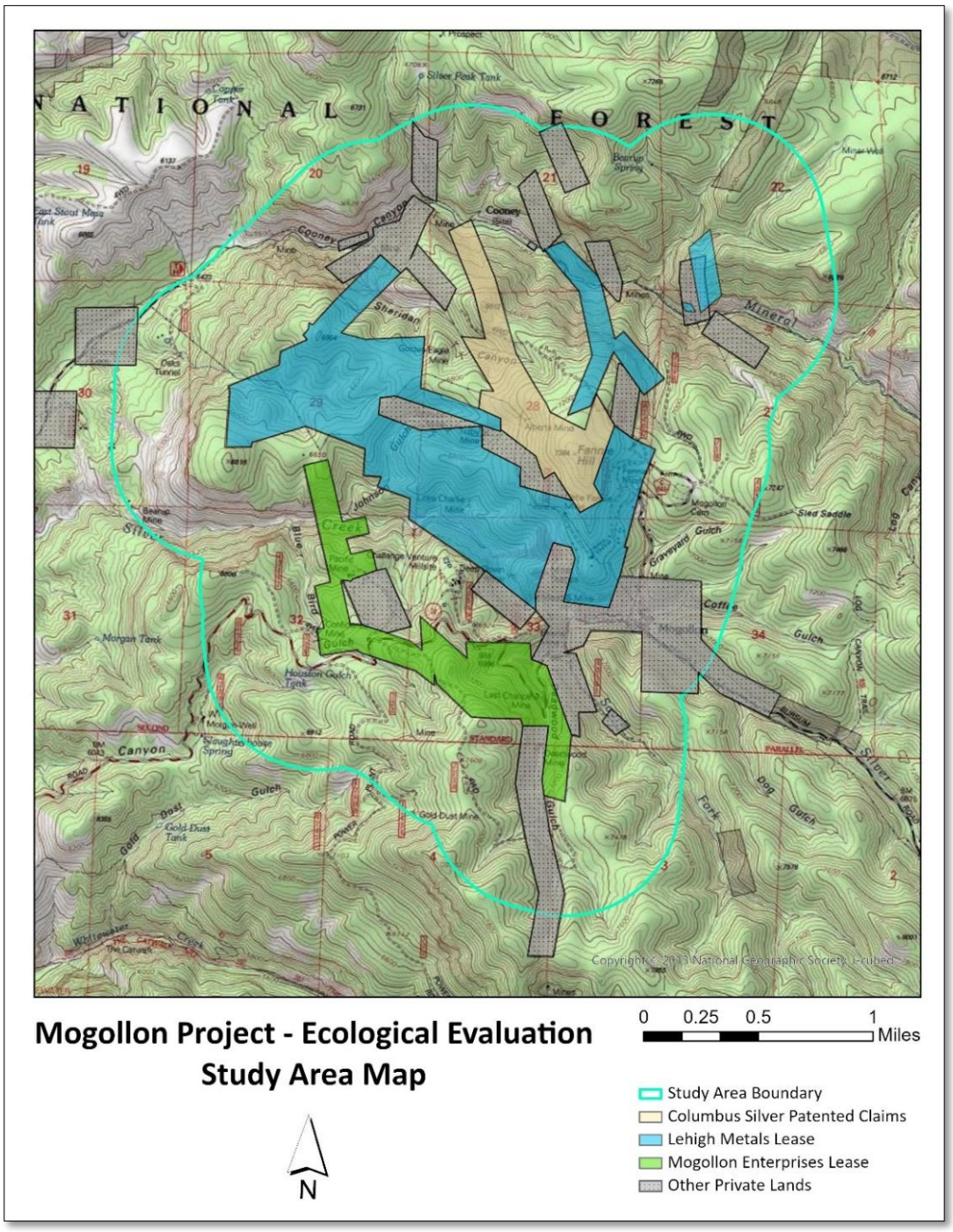


Figure 1 – The ~5,000 acre (20 km^2) study area is comprised of a 0.5-mile buffer encompassing Summa Silver's patented properties.

1.2 Methodology

Habitat characterizations and descriptions are based on Southwest Regional Gap Analysis Project (SWReGAP) databases. SWReGAP is a program developed to assess the conservation status of native terrestrial vertebrate species, natural land cover types, and plant communities in the southwestern United States (SWReGAP, 2004). It aims to identify biodiversity gaps and provide essential data to assist natural resource managers, land planners, and researchers in making informed decisions about land management and conservation priorities. SWReGAP employs a combination of methods to gather ecological data for the region, including remote sensing, Geographic Information Systems, and data integration:

- *Remote sensing*: Remote sensing techniques are used to generate land cover maps for the Southwest region. High-resolution satellite imagery, such as Landsat data, is used to classify different land cover types. These images are processed and analyzed to identify spectral signatures corresponding to various land cover types in the region.
- *Geographic Information Systems* (GIS): GIS tools are used to manage, analyze, and visualize spatial data related to land cover types and their distributions. GIS allows overlaying various types of data, such as remote sensing imagery, elevation data, and hydrological data, to better understand the relationships between land cover types and other environmental variables. For this evaluation, a SWReGAP model of land cover for Catron County, NM was clipped to
- *Integration of existing data sources*: SWReGAP utilizes several data sources, such as the National Land Cover Database (NLCD), the National Wetlands Inventory (NWI), and the U.S. Forest Service's Forest Inventory and Analysis (FIA) data, to generate comprehensive and accurate representations of land cover types in the Southwest region.

1.3 General Characterization of Study Area Land Cover

The study area broadly occurs in the Temperate Sierras Upper Gila Mountains ecoregion (U.S. Environmental Protection Agency, 2023b). The Temperate Sierras Upper Gila Mountains ecoregion is a level III ecoregion within the North American Terrestrial Ecoregions classification system. This ecoregion is part of the larger Arizona/New Mexico Mountains level II ecoregion and encompasses the higher elevation areas of Arizona and New Mexico. The area is characterized by its distinct topography, climate, and biological communities, which set it apart from the surrounding lower-elevation areas. Significant features of this ecoregion include:

- *Topography*: This ecoregion is characterized by high mountains and deep, rugged canyons. Elevations in this area typically range from 6,000 feet to over 10,000 feet, with some of the highest peaks in the region, such as Mount Graham in Arizona and Whitewater Baldy in New Mexico.
- *Climate*: The climate in this ecoregion is temperate, with cooler temperatures and higher precipitation than the surrounding lower-elevation areas. The higher elevations create a cooler, wetter microclimate, supporting a unique suite of plant and animal species adapted to these conditions.
- *Vegetation*: This ecoregion is characterized by diverse vegetation communities that vary with elevation and aspect. Lower elevations are dominated by pinyon-juniper woodlands and

ponderosa pine forests, while higher elevations feature mixed conifer forests consisting of species like Douglas-fir, white fir, and quaking aspen.

- *Conservation and land use*: The Temperate Sierras Upper Gila Mountains ecoregion is an important area for conservation, as it provides critical habitat for a wide range of plant and animal species. The region includes several protected areas, such as the Gila Wilderness and Gila Cliff Dwellings National Monument. Land use in this ecoregion primarily focuses on forestry, recreation, and grazing.

General land cover within the study area includes various types of forests, shrublands, grasslands, and riparian corridors. These common land cover types found include:

- *Forests and Woodlands*: Pinyon-juniper woodlands, ponderosa pine forests, and mixed-conifer forests that support a diverse array of plant and animal species.
- *Shrublands and Desert Scrub*: Characterized by various shrub species such as sagebrush, saltbush, and creosote bush that provide habitat for a variety of desert-dwelling species.
- *Grasslands*: Desert grasslands that support an array of species, including many grassland birds and ungulates.
- *Riparian Corridors*: These include riparian zones along streams that provide essential habitats for numerous species, including waterfowl, amphibians, and fish.
- *Barren and Sparsely Vegetated Areas*: These areas include rock outcrops with little to no vegetation which support unique species that have adapted to harsh environments.

1.4 Study Area Habitat Descriptions

The following analysis encompasses a range of distinct habitats found within the study area, The purpose of this section is to establish a foundation for understanding the study area's biodiversity and ecological dynamics, which will serve as a valuable resource for future conservation and management efforts aimed at preserving the integrity of these critical ecoregions. By documenting the unique characteristics and interrelationships within these habitats, a comprehensive habitat baseline is provided that will inform decision-making processes and facilitate the development of effective, adaptive management strategies.

The study area consists of thirteen specific SWReGAP ecoregions (habitats), each of which supports uniquely adapted plant and wildlife species (U.S. Geological Survey, 2004 [Figure 2]).

Table 1- Ecoregion coverage summary of ecoregion types within the Mogollon Project study area, including square meters, square kilometers, acres, and the percentage of each ecoregion type in relation to the total study area.

Mogollon Project - Study Area Ecoregion Coverage				
Study Area Ecoregion Type	**Square Meters**	**Square Kilometers**	**Acres**	**Percent of Study Area**
Apacherian-Chihuahuan Semi-Desert Grassland and Steppe	10,023.04	0.01	2.48	0.05%
Colorado Plateau Mixed Bedrock Canyon and Tableland	982,147.30	0.98	242.69	4.94%
Colorado Plateau Pinyon-Juniper Woodland	8,437,023.02	8.44	2,084.76	42.41%
Inter-Mountain Basins Semi-Desert Grassland	9,900.00	0.01	2.45	0.05%
Madrean Pine-Oak Forest and Woodland	282,599.96	0.28	69.83	1.42%

Mogollon Project - Study Area Ecoregion Coverage				
Study Area Ecoregion Type	**Square Meters**	**Square Kilometers**	**Acres**	**Percent of Study Area**
Madrean Pinyon-Juniper Woodland	2,865,654.79	2.87	708.09	14.40%
Mogollon Chaparral	115,989.42	0.12	28.66	0.58%
North American Warm Desert Lower Montane Riparian Woodland and Shrubland	4,500.00	0.00	1.11	0.02%
Rocky Mountain Cliff, Canyon and Massive Bedrock	41,400.00	0.04	10.23	0.21%
Rocky Mountain Gambel Oak-Mixed Montane Shrubland	6,300.00	0.01	1.56	0.03%
South Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland	80,080.71	0.08	19.79	0.40%
Southern Rocky Mountain Mesic Montane Mixed Conifer Forest and Woodland	111,749.54	0.11	27.61	0.56%
Southern Rocky Mountain Ponderosa Pine Woodland	6,947,159.70	6.95	1,716.62	34.92%
Total	**19,894,527.48**	**19.89**	**4,915.87**	**100%**

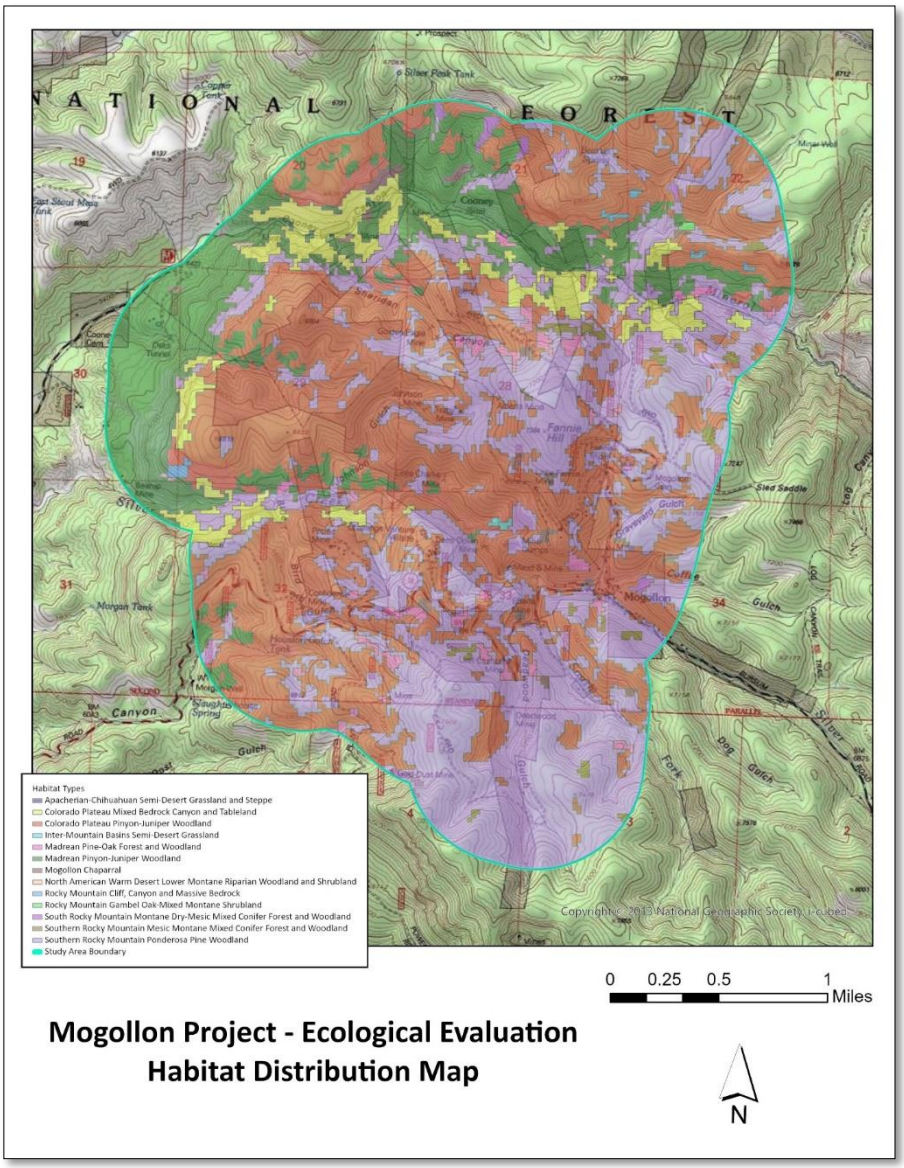


Figure 2 - The study area consists of thirteen specific SWReGAP ecoregions (habitats), each of which supports uniquely adapted plant and wildlife species

A. Apacherian-Chihuahuan Piedmont Semi-Desert Grassland and Steppe

Study Area Footprint: 2.48 acres (0.01 km^2) - 0.05% of the Study Area

The Apacherian-Chihuahuan Piedmont Semi-Desert Grassland and Steppe is a unique ecoregion that occurs in the southwestern United States and northern Mexico (U.S. Geological Survey, 2004 [Figure 3]). It is characterized by semi-desert grasslands and steppe habitats, which lie between higher-elevation mountain ranges and lower-elevation desert basins. The ecoregion is particularly associated with the Chihuahuan Desert and the Apacherian (or Madrean) region, which is influenced by both the Rocky Mountains and the Sierra Madre Occidental. The landscape consists of rolling plains, hills, and plateaus with scattered low mountain ranges and is interspersed with arroyos, playas, and other ephemeral water sources.

Vegetation in the Apacherian-Chihuahuan Piedmont Semi-Desert Grassland and Steppe is characterized by a mix of short to mid-height grasses and various shrubs. Common grass species include Black Grama (*Bouteloua eriopoda*), Sideoats Grama (*Bouteloua curtipendula*), and Tobosa (*Hilaria mutica*). The shrub component often consists of species such as Creosote Bush (*Larrea tridentata*), Mesquite (*Prosopis spp.*), and Tarbush (*Flourensia cernua*).

The ecoregion supports an array of mammals, birds, reptiles, and invertebrates. Some notable species found in the area include Pronghorn (*Antilocapra americana*), Mule Deer (*Odocoileus hemionus*), Black-tailed Jackrabbit (*Lepus californicus*), and various species of ground squirrels and pocket mice. Bird species like the Scaled Quail (*Callipepla squamata*), Loggerhead Shrike (*Lanius ludovicianus*), and Grasshopper Sparrow (*Ammodramus savannarum*) are also well-adapted to this environment.

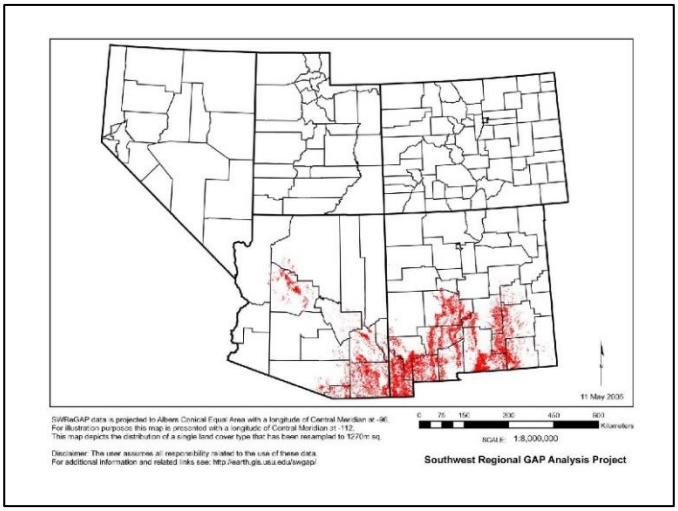


Figure 3 – Distribution map and representative photos of Apacherian-Chihuahuan Piedmont Semi-Desert Grassland and Steppe (graphic and images SWReGAP, 2004).

B. Colorado Plateau Mixed Bedrock Canyon and Tableland

Study Area Footprint: 242.69 acres (0.98 km^2) - 4.94% of the Study Area

The Colorado Plateau Mixed Bedrock Canyon and Tableland is an ecoregion found in the southwestern United States, primarily within the states of Utah, Colorado, Arizona, and New Mexico (U.S. Geological Survey, 2004 [Figure 4]). This area is characterized by a combination of deep canyons, tablelands, mesas, and buttes, which have been shaped by millions of years of geological processes such as erosion and tectonic activity. The Colorado Plateau is known for its diverse geological formations, with various types of bedrock, including sandstone, limestone, and shale.

Vegetation in this ecoregion varies depending on factors such as elevation, aspect, and soil type. At lower elevations, semi-desert shrublands and grasslands dominate, with species such as Sagebrush (*Artemisia spp.*), Blackbrush (*Coleogyne ramosissima*), and Four-wing Saltbush (*Atriplex canescens*). Pinyon-juniper woodlands can also be found at mid-elevations, while *ponderosa pine* (*Pinus ponderosa*) forests and Aspen (*Populus tremuloides*) groves occur at higher elevations.

Notable species that occur in this ecoregion include Bighorn Sheep (*Ovis canadensis*), *mule deer* (*Odocoileus hemionus*), Mountain Lions (*Puma concolor*), and Coyotes (*Canis latrans*). The area is also home to a variety of bird species, such as Peregrine Falcons (*Falco peregrinus*), Canyon Wrens (*Catherpes mexicanus*), and various raptors.

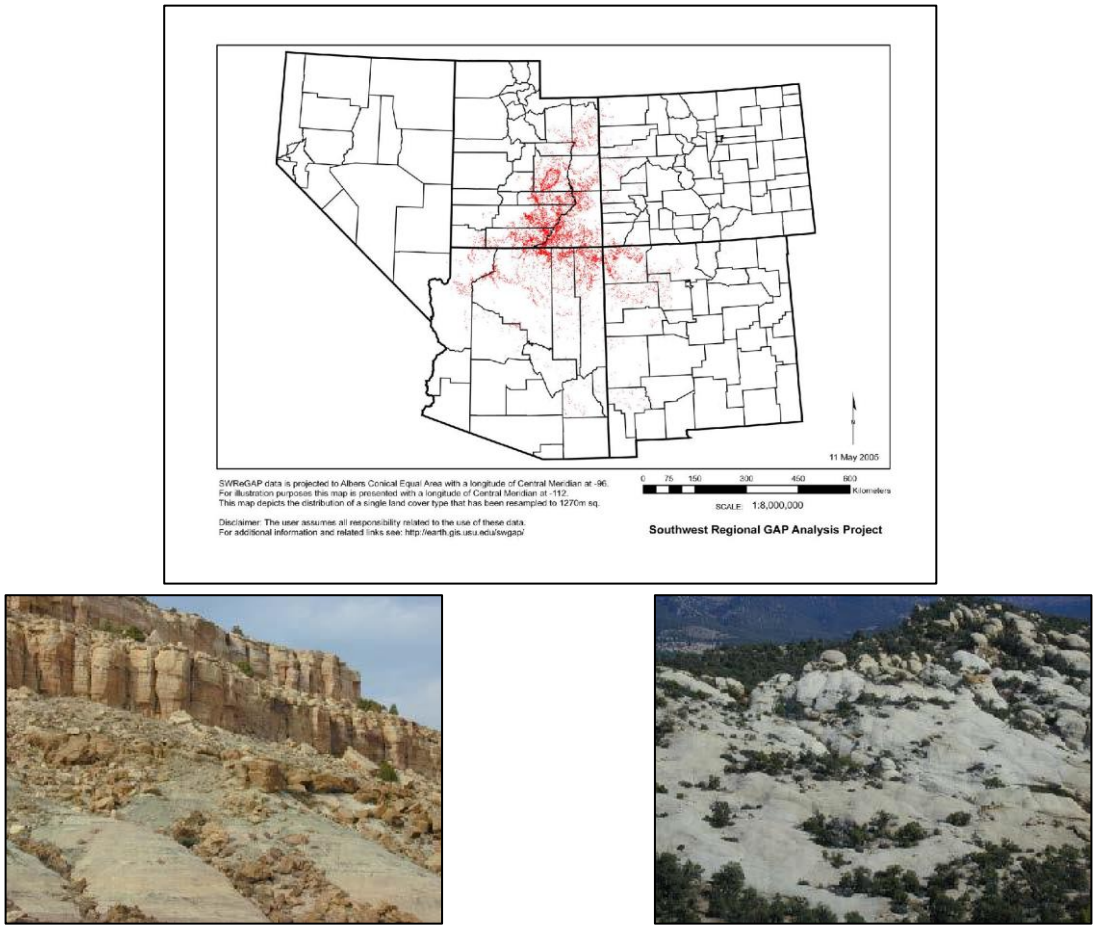


Figure 4 - Distribution map and representative photos of Colorado Plateau Mixed Bedrock Canyon and Tableland (graphic and images SWReGAP, 2004).

C. Colorado Plateau Pinyon-Juniper Woodland

Study Area Footprint: 2,084.76 acres (8.44 km^2) - 42.41% of the Study Area

The Colorado Plateau Pinyon-Juniper Woodland is an ecoregion found primarily within the southwestern United States, covering parts of Utah, Colorado, Arizona, and New Mexico (U.S. Geological Survey, 2004 [Figure 5]). Pinyon pines (*Pinus spp*.) and Juniper trees (*Juniperus spp*.) are the dominant tree species in this ecoregion, forming open to moderately dense woodlands. These slow-growing, drought-tolerant trees can thrive in the semi-arid climate of the Colorado Plateau, where precipitation is limited, and temperature fluctuations can be extreme. The understory in these woodlands typically includes various shrubs, grasses, and herbaceous plants adapted to the arid conditions, such as Sagebrush (*Artemisia spp*.), Rabbitbrush (*Chrysothamnus spp*.), and Indian Ricegrass (*Achnatherum hymenoides*).

The Woodlands provides habitat for a variety of wildlife species adapted to the region's conditions. Mammals such as Mule Deer (*Odocoileus hemionus*), Elk (*Cervus canadensis*), and Coyotes (*Canis latrans*) are common in this ecoregion. Several bird species, including Pinyon Jays (*Gymnorhinus cyanocephalus*), the Juniper Titmouse (*Baeolophus ridgwayi*), and various raptors can also be found in these woodlands, the woodlands provide important food and nesting resources for many of these animals.

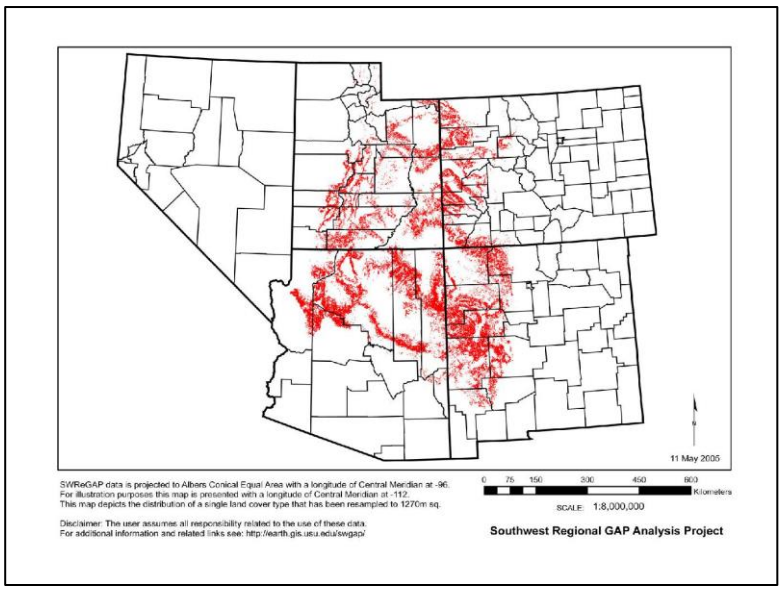


Figure 5 - Distribution map and representative photos of Colorado Plateau Pinyon-Juniper Woodland (graphic and images SWReGAP, 2004).

D. Inter-Mountain Basins Semi-Desert Grassland

Study Area Footprint: 2.45 acres (0.01 km^2) - 0.01% of the Study Area

Inter-Mountain Basins Semi-Desert Grassland is an ecoregion found in the western United States, particularly within the Great Basin and the Colorado Plateau (U.S. Geological Survey, 2004 [Figure 6]). This ecoregion is characterized by semi-desert grasslands that occur between mountain ranges in basins, valleys, and plateaus. The landscape is shaped by geological and climatic factors, resulting in a unique and diverse range of habitats.

Vegetation in this ecoregion is dominated by drought-tolerant grasses and shrubs. The grasses found in these semi-desert grasslands include species such as Bluebunch Wheatgrass (*Pseudoroegneria spicata*), Indian Ricegrass (*Achnatherum hymenoides*), and Needle-and-Thread Grass (*Hesperostipa comata*). The shrub component may consist of *sagebrush* (*Artemisia spp.*), *rabbitbrush* (*Chrysothamnus spp.*), and Saltbush (*Atriplex spp.*), among others.

The grasslands support a variety of wildlife species adapted to the region's harsh often conditions. Mammals such as Pronghorn (*Antilocapra americana*), Mule Deer (*Odocoileus hemionus*), and various small mammals like ground squirrels and kangaroo rats can be found in these grasslands. Bird species that inhabit the area include Brewer's Sparrow (*Spizella breweri*), and various raptors like the Golden Eagle (*Aquila chrysaetos*). Reptiles like the Great Basin Collared Lizard (*Crotaphytus bicinctores*) and the Western Rattlesnake (*Crotalus oreganus*) are also well-adapted to this environment.

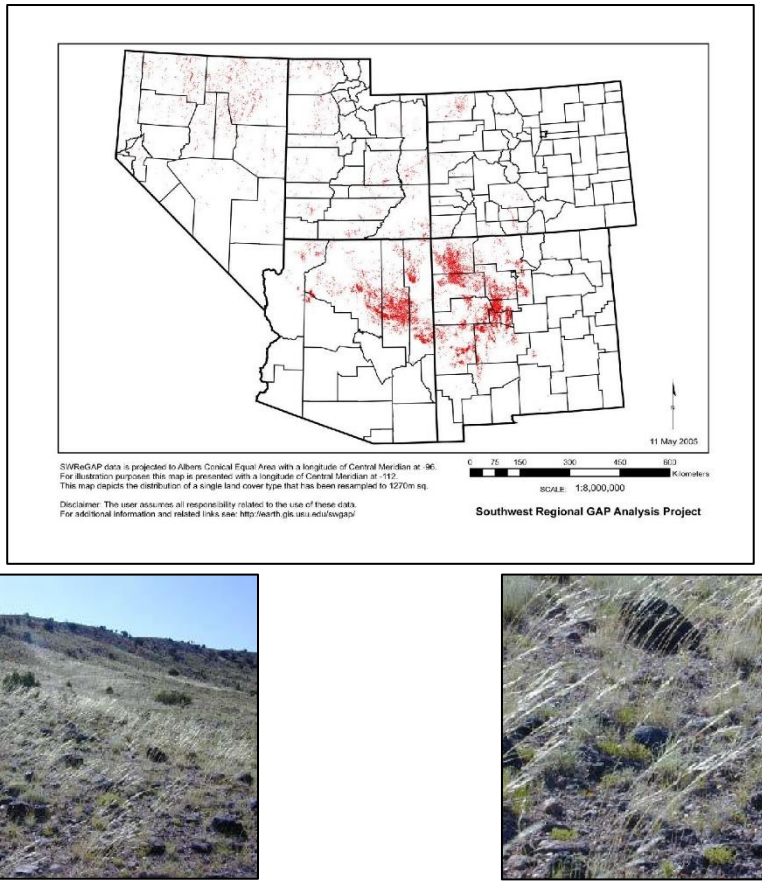


Figure 6 - Distribution map and representative photos of Inter-Mountain Basins Semi-Desert Grassland (graphic and images SWReGAP, 2004).

E. Madrean Pine-Oak Forest and Woodland

Study Area Footprint: 69.83 acres (0.28 km^2) - 1.42% of the Study Area

The Madrean Pine-Oak Forest and Woodland is an ecoregion found in the Madrean Archipelago, also known as the Sky Islands region (U.S. Geological Survey, 2004 [Figure 7]). This area is located primarily in southeastern Arizona, southwestern New Mexico, and northern Mexico. The Madrean Archipelago is characterized by isolated mountain ranges separated by vast expanses of desert and grasslands, creating unique ecological conditions that support a high level of biodiversity.

Vegetation in this ecoregion is dominated by a mix of pine and oak species, which form dense forests or more open woodlands. Common tree species include Ponderosa Pine (*Pinus ponderosa*), Silverleaf Oak (*Quercus hypoleucoides*), and Arizona White Oak (*Quercus arizonica*), among others. The understory of these forests typically consists of various shrubs, grasses, and herbaceous plants adapted to the montane environment.

The ecoregion supports a diverse array of wildlife species adapted to the region's varied environments. Mammals that inhabit this ecoregion include the Black Bear (*Ursus americanus*), Coues White-Tailed Deer (*Odocoileus virginianus couesi*), and various small mammals such as bats and rodents. Bird species that can be found in these forests include the Acorn Woodpecker (*Melanerpes formicivorus*), Mexican Spotted Owl (*Strix occidentalis lucida*), and various species of hummingbirds and woodpeckers.

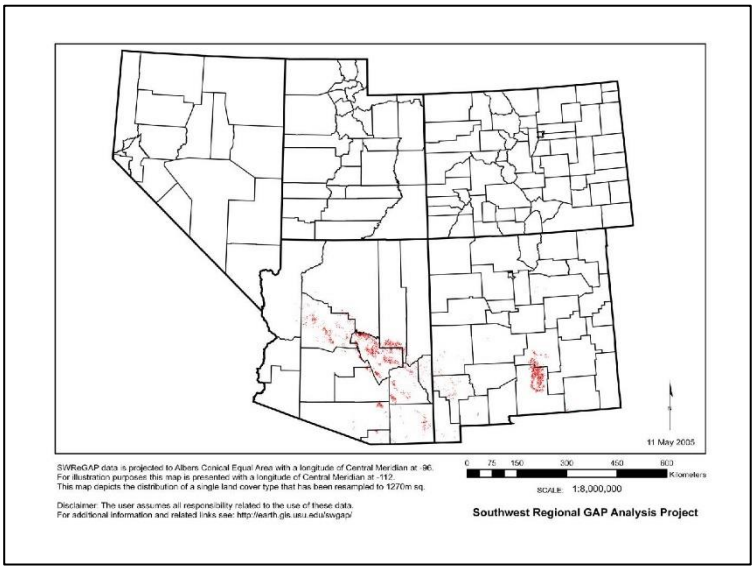


Figure 7 - Distribution map and representative photos of Madrean Pine-Oak Forest and Woodland (graphic and images SWReGAP, 2004).

F. Madrean Pinyon-Juniper Woodland

Study Area Footprint: 704.09 acres (2.87 km^2) - 14.40% of the Study Area

The Madrean Pinyon-Juniper Woodland is an ecoregion found primarily in the southwestern United States and northern Mexico (U.S. Geological Survey, 2004 [Figure 8]). This region is part of the larger Madrean Archipelago, also known as the Sky Islands, which consists of isolated mountain ranges separated by desert and grassland valleys. The Madrean Pinyon-Juniper Woodland is characterized by its distinct vegetation, primarily composed of Pinyon pines and Juniper trees, and is often found at mid-elevations between the desert scrublands and higher-elevation mixed-conifer forests.

Similar to Colorado Plateau Pinyon-Juniper Woodlands, Pinyon pines (*Pinus spp*.) and Juniper trees (*Juniperus spp*.) are the dominant tree species in this ecoregion, forming open to moderately dense woodlands. These species are well-adapted to the semi-arid climate of the Madrean region, where precipitation is limited and temperature fluctuations can be significant. The understory in these woodlands typically includes various shrubs, grasses, and herbaceous plants adapted to the arid conditions, such as Oaks (*Quercus spp*.), Mountain Mahogany (*Cercocarpus spp*.), and Bunchgrasses (*Eragrostis spp., Arisstida spp., Sporobolus spp*., etc.).

The Madrean Pinyon-Juniper Woodland provides habitat for wildlife species adapted to the region's varied environments. Some of the mammals found in this ecoregion include Mule Deer (*Odocoileus hemionus*), White-Tailed Deer (*Odocoileus virginianus*), Javelina (*Pecari tajacu*), and Black Bear (*Ursus americanus*). Bird species like the Mexican Jay (*Aphelocoma wollweberi*), Pinyon Jay (*Gymnorhinus cyanocephalus*), and Acorn Woodpecker (*Melanerpes formicivorus*) also thrive in these woodlands. The diverse habitats within this region support a unique mix of both temperate and subtropical species.

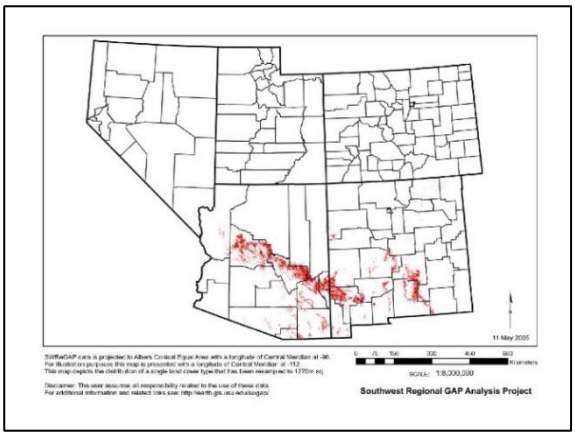


Figure 8- Distribution map and representative photos of Madrean Pinyon-Juniper Woodland (graphic and images SWReGAP, 2004).

G. Mogollon Chaparral

Study Area Footprint: 28.66 acres (0.12 km^2) - 0.58% of the Study Area

Mogollon Chaparral is an ecoregion primarily found in the southwestern United States, specifically in Arizona and New Mexico, with some extensions into Mexico (U.S. Geological Survey, 2004 [Figure 9]). The region is situated within the larger Mogollon Rim, which forms the southern boundary of the Colorado Plateau. The Mogollon Chaparral is characterized by its distinct vegetation, dominated by shrubs, with a mix of evergreen and deciduous species that are adapted to the area's Mediterranean-like climate.

Vegetation in the Mogollon Chaparral is dominated by dense shrubs, which form a nearly continuous canopy. Some of the characteristic shrub species include Scrub Oak (*Quercus spp*.) and Mountain Mahogany (*Cercocarpus spp*.). Other plant species that can be found in this ecoregion include Pinyon pines (*Pinus spp*.), Juniper trees (*Juniperus spp.),* and various types of grass and herbaceous plants adapted to the arid conditions.

The Mogollon Chaparral supports a diverse array of wildlife species adapted to the region's unique environment. Some of the mammals that inhabit this ecoregion include Mule Deer (*Odocoileus hemionus*), White-Tailed Deer (Odocoileus virginianus), Black Bear (*Ursus americanus*), and Mountain Lion (*Puma concolor*). Birds such as the Mexican Jay (*Aphelocoma wollweberi*), Spotted Towhee (*Pipilo maculatus*), and Ash-Throated Flycatcher (*Myiarchus cinerascens*) can also be found in this region.

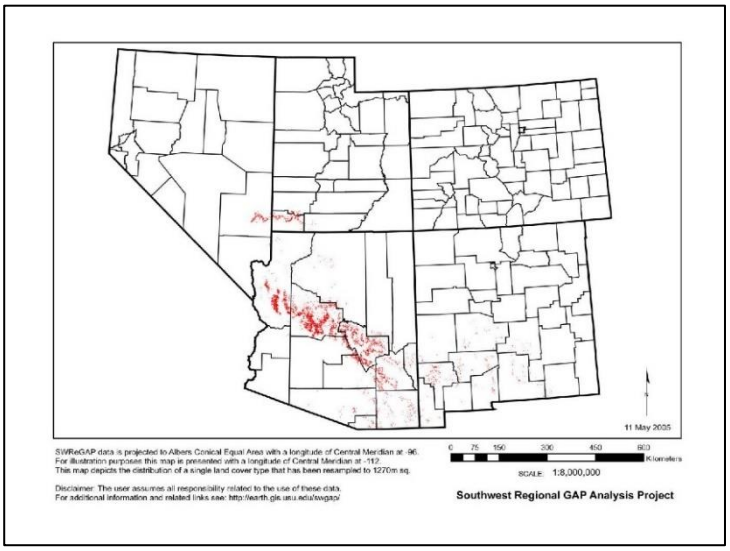


Figure 9- Distribution map and representative photos of Mogollon Chaparral (graphic and images SWReGAP, 2004).

H. North American Warm Desert Lower Montane Riparian Woodland and Shrubland

Study Area Footprint: 1.11 acres (<0.01 km^2) - 0.02% of the Study Area

North American Warm Desert Lower Montane Riparian Woodland and Shrubland is an ecoregion found in the warm deserts of the southwestern United States and northern Mexico (U.S. Geological Survey, 2004 [Figure 10]). This ecoregion is characterized by its unique vegetation, which is predominantly composed of riparian woodlands and shrublands that grow along streams, rivers, and other water sources in lower montane areas. These riparian habitats create important ecological corridors and oases within the arid desert landscape, supporting a wide variety of plant and animal species.

Vegetation in the ecoregion is typically dominated by trees and shrubs that are adapted to the region's arid conditions and can tolerate periodic flooding. Common tree species include Cottonwoods (*Populus spp.*), Willows (*salix spp.*), and Arizona Sycamore (*Platanus wrightii*). Understory vegetation may consist of shrubs like Seepwillow (*Baccharis spp.*), Saltbush (*Atriplex spp.*), and Desert Willow (*Chilopsis linearis*).

The presence of water and diverse vegetation in this ecoregion supports a wide variety of wildlife species, many of which are specially adapted to riparian environments. Mammals such as Beaver (*Castor canadensis*), Raccoon (*Procyon lotor*), and various bat species can be found in these habitats. Bird species that inhabit the area include the American Dipper (*Cinclus mexicanus*), Belted Kingfisher (*Megaceryle alcyon*), and various species of hummingbirds. Additionally, these riparian zones provide important breeding and foraging habitats for amphibians, reptiles, and fish.

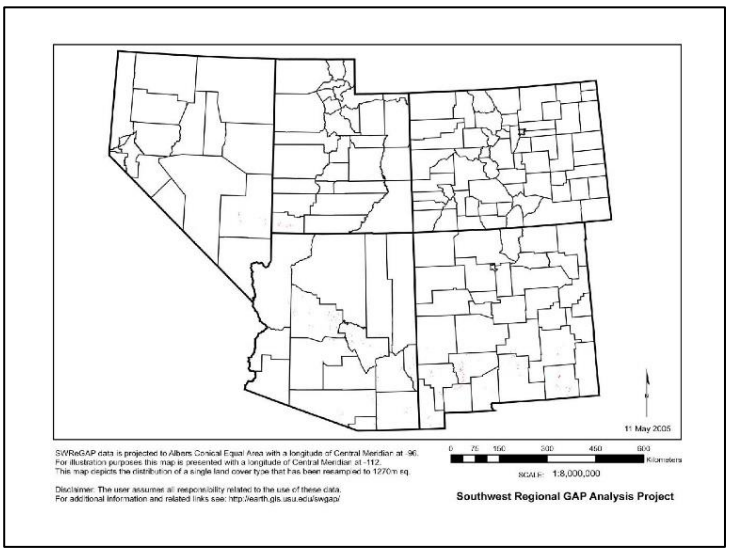


Figure 10- Distribution map and representative photos of North American Warm Desert Lower Montane Riparian Woodland and Shrubland (graphic and images SWReGAP, 2004).

I. Rocky Mountain Cliff and Canyon

Study Area Footprint: 10.23 acres (0.04 km^2) - 0.21% of the Study Area

The Rocky Mountain Cliff and Canyon ecoregion is found throughout the Rocky Mountains in the western United States and Canada (U.S. Geological Survey, 2004 [Figure 11]). This ecoregion is characterized by its steep, rugged cliffs and deep canyons, which create a diverse and dynamic landscape. The region's dramatic topography is the result of geological processes, such as erosion and tectonic uplift, which have shaped the landscape over millions of years. Vegetation in the ecoregion is highly diverse due to the range of elevations and microclimates present. Plant species are adapted to the harsh conditions found on cliffs and in canyons, such as thin soils, steep slopes, and exposure to extreme weather events. Common vegetation includes lichens, mosses, and hardy vascular plants.

The Rocky Mountain Cliff and Canyon ecoregion provides habitat for a variety of wildlife species that are adapted to the region's challenging terrain and climate. Mammals such as Bighorn Sheep (*Ovis canadensis*), and Mountain Lions (*Puma concolor*) can be found in these areas. Bird species like the Peregrine Falcon (*Falco peregrinus*), Golden Eagle (*Aquila chrysaetos*), and Cooper's Hawk (*Accipiter cooperii*) are also well-adapted to the cliff and canyon environment.

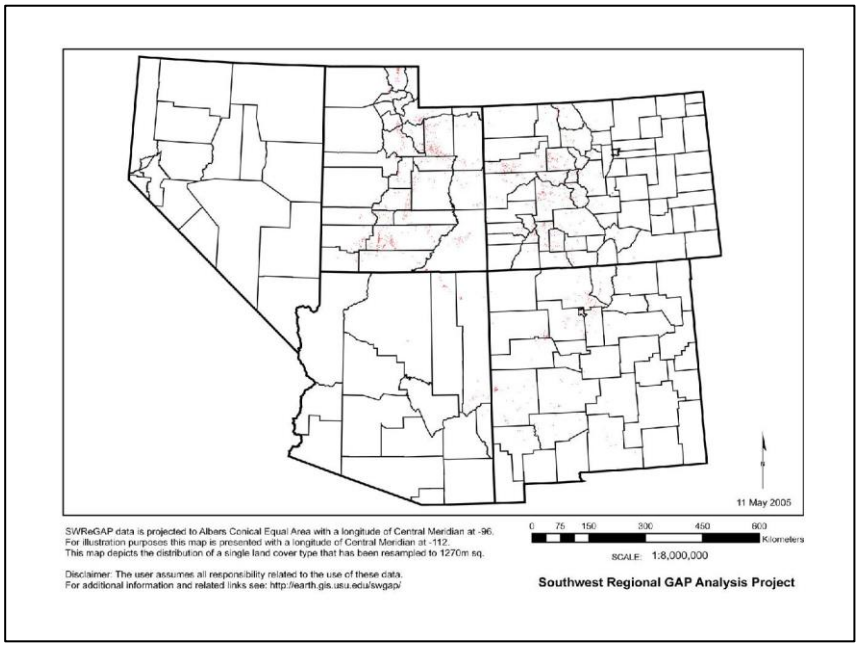


Figure 11- Distribution map and representative photos of Rocky Mountain Cliff and Canyon (graphic and images SWReGAP, 2004).

J. Rocky Mountain Gambel Oak-Mixed Montane Shrubland

Study Area Footprint: 1.56 acres (0.01km^2) - 0.03% of the Study Area

The Rocky Mountain Gambel Oak-Mixed Montane Shrubland is an ecoregion found within the larger Rocky Mountain range, stretching across the western United States and parts of Canada (U.S. Geological Survey, 2004 [Figure 12]). This ecoregion is characterized by its distinct vegetation, which primarily consists of mixed montane shrublands dominated by Oaks (*Quercus spp.*) and other associated shrub species. The shrublands typically occur at mid-elevations between lower montane forests and higher-elevation subalpine forests.

Vegetation in this ecoregion is dominated by Gambel Oak (*Quercus gambelii)*, which can form dense thickets or more open woodlands. Other common shrub species include Mountain Mahogany (*Cercocarpus spp*.), *serviceberry* (*Amelanchier spp*.), and Chokecherry (*Prunus virginiana*). These shrublands provide important habitat for various wildlife species and can act as transitional zones between different forest types.

The ecosystem supports a diverse array of wildlife species adapted to the region's varied environments. Mammals that inhabit this ecoregion include Mule Deer (*Odocoileus hemionus*), Elk (*Cervus canadensis*), Black Bear (*Ursus americanus*), and various small mammals such as rodents and rabbits. Bird species that can be found in these shrublands include the Mountain Bluebird (*Sialia currucoides*), Spotted Towhee (*Pipilo maculatus*), and various species of raptors, such as the Red-tailed Hawk (*Buteo jamaicensis*).

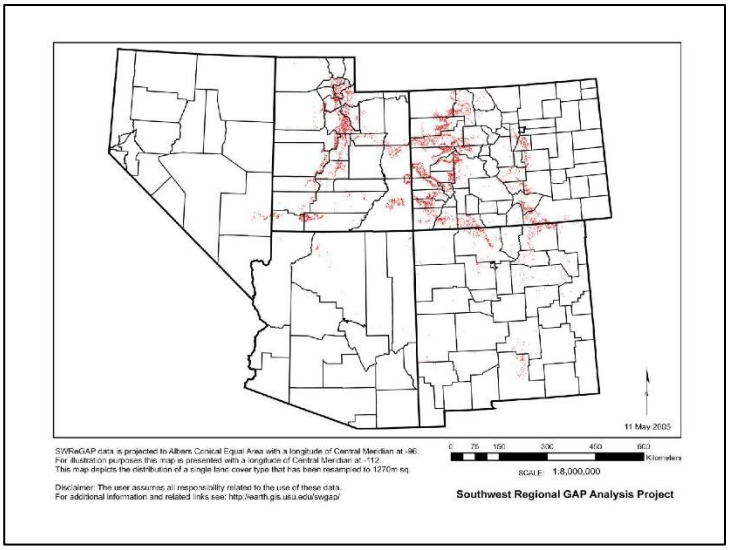


Figure 12- Distribution map and representative photos Rocky Mountain Gambel Oak-Mixed Montane Shrubland (graphic and images SWReGAP, 2004).

K. Southern Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland

Study Area Footprint: 19.79 acres (0.08 km^2) - 0.40% of the Study Area

The Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland is an ecoregion found within the southern Rocky Mountain range (U.S. Geological Survey, 2004 [Figure 13]). This ecoregion is characterized by its distinct vegetation, which primarily consists of mixed conifer forests and woodlands at montane elevations. These habitats can be found in areas with moderate precipitation and temperature gradients, between the lower montane shrublands and grasslands and the higher-elevation subalpine forests.

Vegetation in this ecoregion is dominated by a mix of conifer species, which can form dense forests or more open woodlands. Common tree species include Ponderosa Pine (*Pinus ponderosa*), Douglas-fir (*Pseudotsuga menziesii*), and Engelmann Spruce (*Picea engelmannii*). The understory of these forests typically consists of various shrubs, grasses, and herbaceous plants adapted to the montane environment.

The ecoregion supports a diverse array of wildlife species adapted to the region's varied environments. Mammals that inhabit this ecoregion include Elk (*Cervus canadensis*), Mule Deer (*Odocoileus hemionus*), Black Bear (*Ursus americanus*), and various small mammals such as squirrels, chipmunks, and voles. Bird species that can be found in these forests include the Clark's Nutcracker (*Nucifraga columbiana*), Western Tanager (*Piranga ludoviciana*), and various species of woodpeckers and owls.

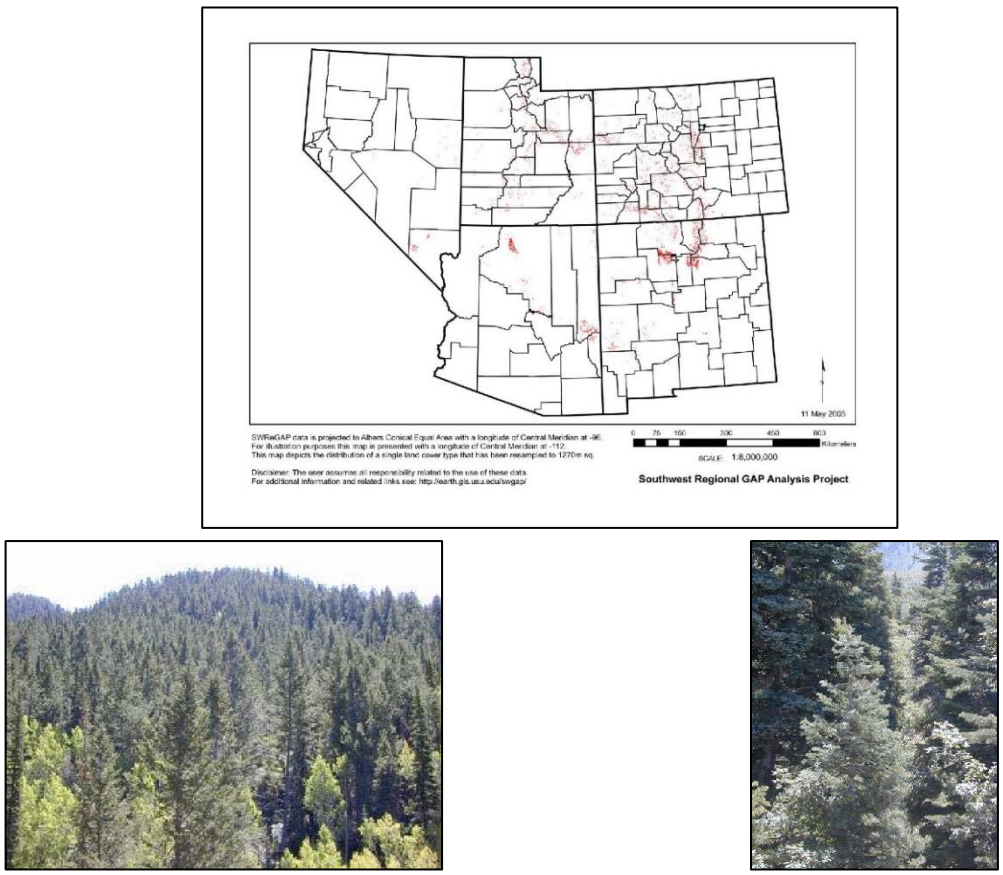


Figure 13- Distribution map and representative photos of Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland (graphic and images SWReGAP, 2004).

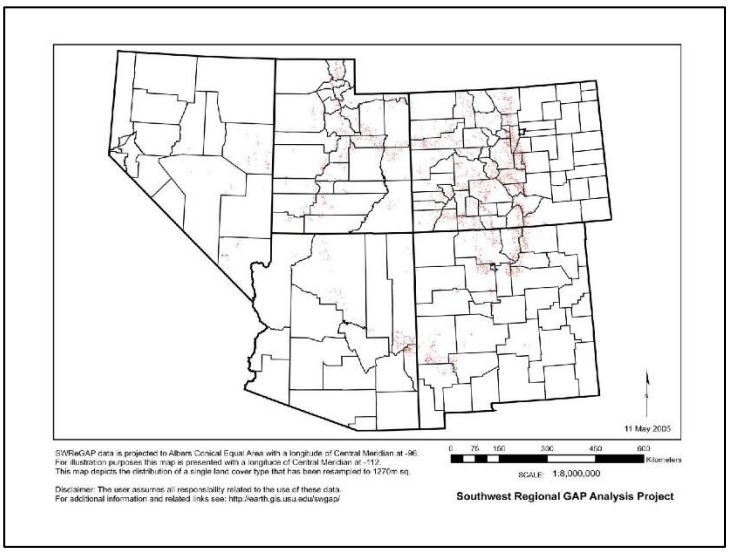
L. Southern Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland

Study Area Footprint: 27.61 acres (0.11 km^2) - 0.56% of the Study Area

The Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland is an ecoregion found within the southern Rocky Mountain range (U.S. Geological Survey, 2004 [Figure 14]). This ecoregion is characterized by its distinct vegetation, which primarily consists of mixed conifer forests and woodlands at montane elevations. These habitats are found in areas with relatively higher precipitation and cooler temperatures compared to the dry-mesic mixed conifer forests, creating a more mesic (moist) environment.

Vegetation in this ecoregion is dominated by a mix of conifer species, which form dense forests or more open woodlands. Common tree species include Engelmann Spruce (*Picea engelmannii*), Subalpine Fir (*Abies lasiocarpa*), Douglas-fir (*Pseudotsuga menziesii*), and Blue Spruce (*Picea pungens*). The understory of these forests typically consists of various shrubs, grasses, and herbaceous plants adapted to the montane environment, with a greater diversity of moisture-loving species compared to the dry-mesic mixed conifer forests.

The ecoregion supports a diverse array of wildlife species adapted to the region's varied environments. Mammals that inhabit this ecoregion include Elk (*Cervus canadensis*), Mule Deer (*Odocoileus hemionus*), Black Bear (*Ursus americanus*), and various small mammals such as squirrels, chipmunks, and voles. Bird species that can be found in these forests include the Steller's Jay (*Cyanocitta stelleri*), Pine Grosbeak (*Pinicola enucleator*), and various species of woodpeckers and owls.



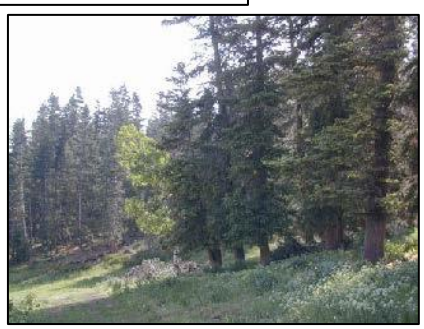


Figure 14- Distribution map and representative photos of Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland (graphic and images SWReGAP, 2004).

M. Southern Rocky Mountain Ponderosa Pine Woodland

Study Area Footprint: 1,716.62 acres (6.95 km^2) - 34.92% of the Study Area

The Rocky Mountain Ponderosa Pine Woodland is an ecoregion found within the southern Rocky Mountain range (U.S. Geological Survey, 2004 [Figure 15]). This ecoregion is characterized by its distinct vegetation, which primarily consists of Ponderosa Pine (*Pinus ponderosa*) forests and woodlands. These habitats are found at montane elevations, typically on lower slopes and foothills, and can also occur in transitional zones between grasslands and higher-elevation mixed conifer forests.

Vegetation in this ecoregion is dominated by Ponderosa Pine, which forms open woodlands or more dense stands, depending on factors such as soil, moisture, and fire history. The understory of these forests typically consists of various shrubs, grasses, and herbaceous plants adapted to the montane environment. Common understory species include Mountain Mahogany (*Cercocarpus spp*.), Gambel Oak (*Quercus gambelii*), and various grasses and forbs.

The ecoregion supports a diverse array of wildlife species adapted to the region's varied environments. Mammals that inhabit this ecoregion include Elk (*Cervus canadensis*), Mule Deer (*Odocoileus hemionus*), Black Bear (*Ursus americanus*), and various small mammals such as squirrels and chipmunks. Bird species that can be found in these forests include the Red-tailed Hawk (*Buteo jamaicensis*), Western Bluebird (*Sialia mexicana*), and the Lewis's woodpecker (*Melanerpes lewis*).

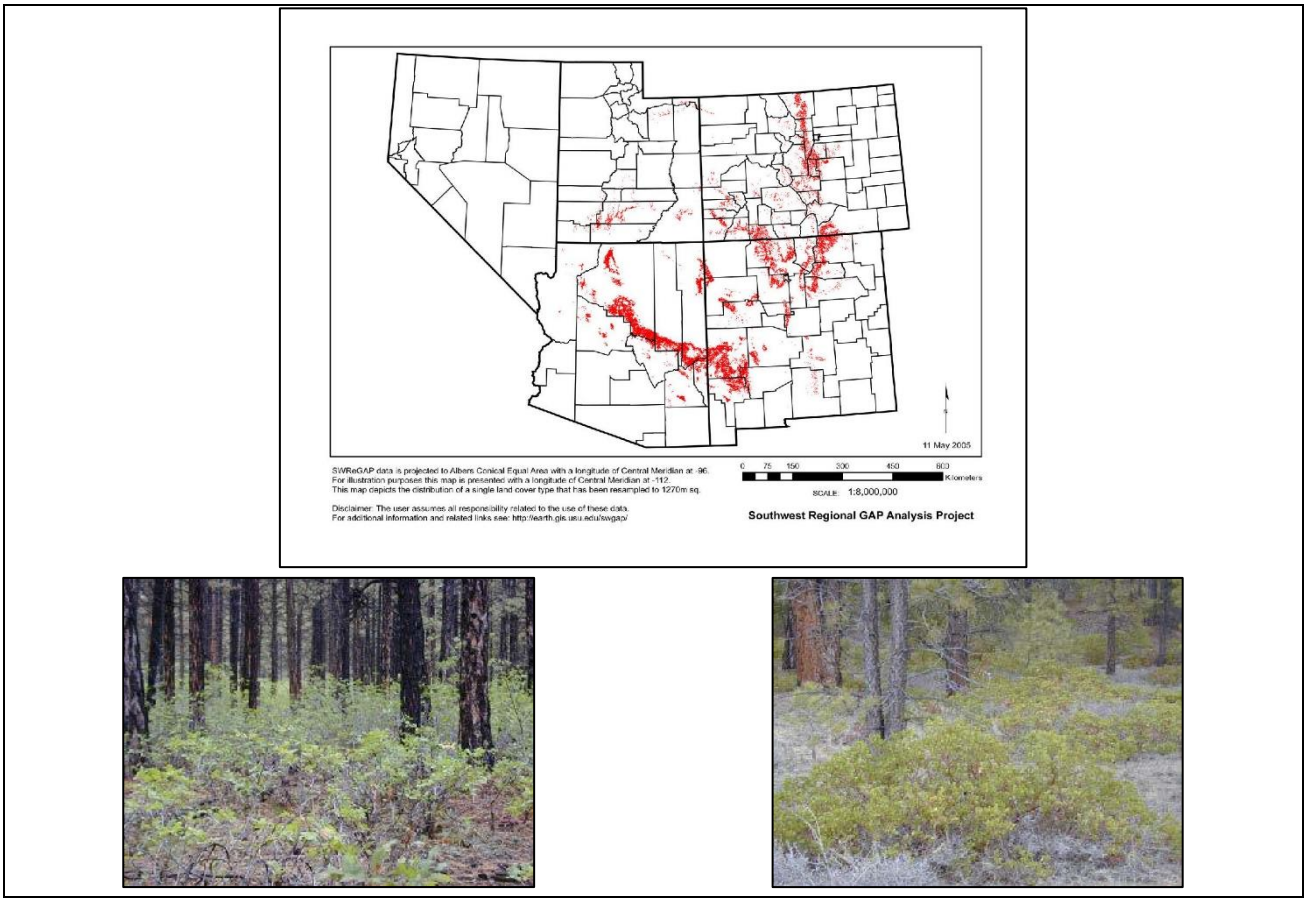


Figure 15- Distribution map and representative photos of Rocky Mountain Ponderosa Pine Woodland (graphic and images SWReGAP, 2004).

1.5 Study Area Photos

In this subsection, a collection of field photographs showcasing the diverse habitat types found in the study area is presented (Figure 16). These images provide a visual representation of the unique ecological characteristics, vegetation structure, and landscape features characteristic of the region. The Colorado Plateau Pinyon-Juniper Woodland, Southern Rocky Mountain Ponderosa Pine Woodland, Madrean Pinyon-Juniper Woodland, and Colorado Plateau Mixed Bedrock Canyon and Tableland ecoregions are the dominate habitat types in the study area, representing 96.67% of the study area. Conversely, the North American Warm Desert Lower Montane Riparian Woodland and Shrubland habitat represents the smallest coverage of the study area. However, these riparian habitats create important ecological corridors and oases within the arid desert landscape, supporting a wide variety of plant and animal species. Riparian areas and aquatic habitats are essential for the life cycles of nearly 80% of sensitive and specially classified vertebrate species in New Mexico (New Mexico Department of Game and Fish, 2006).

Figure 16 - photographs showcasing select habitat types found in the study area. North American Warm Desert Lower Montane Riparian Woodland (top left), Colorado Plateau Pinyon-Juniper Woodland (top-right), Southern Rocky Mountain Ponderosa Pine Woodland (bottom-left), and Colorado Plateau Mixed Bedrock Canyon and Tableland (bottom-right).

2. Biological Assessment

The purpose of this section on Biological Assessment is to provide a comprehensive evaluation of the flora and fauna in the proposed Project area, focusing on identifying sensitive species and habitats that may be impacted by Project activities. Through conducting detailed field surveys and reviewing existing literature and databases, a thorough understanding of the local biodiversity is provided to inform decision-making processes and ensure that the proposed development conforms to regulatory requirements and best management practices. This section outlines the methods employed to gather and analyze data on different plant and animal species, as well as their respective habitats within the Project area.

2.1 Species of Interest Selection Methodology

To ensure a comprehensive assessment of the potential impacts of the proposed Project on local wildlife, selected species of interest were carefully selected for evaluation based on their conservation status, ecological significance, and sensitivity to disturbance. The selection process involved consulting a range of authoritative data sources, which provided valuable information on species distribution, abundance, and habitat requirements within the Project area. These data sources included:

- *Biota Information System of New Mexico (BISON-M):* This database provides comprehensive information on the distribution, habitat associations, and conservation status of various plant and animal species in New Mexico (New Mexico Department of Game and Fish, 2023a).
- *Environmental Resource Database of New Mexico (EnviroData-NM):* EnviroData-NM is a repository of environmental data from various state and federal agencies, offering information on species occurrences, habitat types, and protected areas (Natural Heritage New Mexico, 2023a).
- *Natural Heritage New Mexico Conservation Information System (NHNM):* NHNM is a program that compiles and maintains data on the state's biological resources, focusing on species of conservation concern and their habitats (Natural Heritage New Mexico, 2023b) .
- *New Mexico Environmental Review Tool (NM-ERT):* The NM-ERT is an online tool designed to assist in environmental planning and Project review processes by providing access to spatial data on sensitive species, habitats, and ecosystems within the state (New Mexico Department of Game and Fish, 2023b).
- *New Mexico Rare Plant Conservation Strategy*: The New Mexico Rare Plant Conservation Strategy is a comprehensive plan aimed at conserving the state's rare and endangered plant species through prioritized listing, conservation actions, and collaborative efforts (EMNRD-Forestry Division, 2017).
- *Southwest Regional Gap Analysis Project (SWReGAP):* SWReGAP provides detailed spatial data on species distributions, land cover, and land stewardship, which can be used to identify species of interest and potential habitat impacts within the study area (See Section 1).
- *U.S. Fish and Wildlife Service Information for Planning and Consultation (IPaC):* IPaC is an online system that provides information on federally listed threatened and endangered

species, critical habitats, and other sensitive resources within a specified Project area (U.S. Fish and Wildlife Service, 2023a).

- *U.S. Forest Service Gila National Forest Species Checklist Pamphlets:* To help visitors and researchers better understand the biodiversity found within the forest, the Gila National Forest provides species checklist pamphlets (U.S. Forest Service Gila National Forest, 2023).
- *United States Geological Survey (USGS) GAP Analysis Project Species Data Download:* This resource provides access to various datasets on the SWReGAP ecoregion distribution and habitat preferences of animal species across the United States (U.S. Geological Survey, 2023b).

By reviewing the information available from these sources, a list of species of interest for evaluation within the study area is identified. This list includes all species known to occur within 0.5 miles of the greater study area (Figure 1) as associated with the specific habitat types identified in the Habitat Assessment. The New Mexico Baseline Wildlife Study Guidelines provide a framework for conducting comprehensive wildlife inventories within a proposed Project area (New Mexico Department of Game and Fish, 2019). As part of this process, the guidelines emphasize the importance of evaluating a range of species subsets to ensure that all relevant taxa are considered. The subsets of species to be evaluated, as identified by the guidelines, include:

- *Aquatic Invertebrates*: This subset comprises various species of aquatic insects, crustaceans, mollusks, and other invertebrates that play critical roles in aquatic ecosystems, such as nutrient cycling and providing a food source for larger organisms. Assessing the presence and abundance of these species can help determine the health of aquatic habitats.
- *Fishes*: This subset includes various native and non-native fish species inhabiting the waterbodies within and around the study area.
- *Big Game*: Big game species include large mammals such as elk, mule deer, and pronghorn, which are often the focus of wildlife management and recreational hunting activities.
- *Birds*: The bird subset encompasses a diverse range of species, from songbirds and raptors to waterfowl and shorebirds.
- *Other Mammals*: This category includes smaller mammals such as rodents, bats, and carnivores.
- *Rare or Endangered Species*: This subset consists of federal or state conservation status plant and animal species occurring within a one-mile study area buffer, including those listed as threatened or endangered under the Endangered Species Act. Assessing the presence and potential impacts of the proposed Project on these species is critical for ensuring compliance with regulatory requirements and minimizing adverse effects on their populations and habitats. No critical habitats were identified within the Project area under U.S. Fish and Wildlife Service New Mexico Ecological Services Field Office's jurisdiction (U.S. Fish and Wildlife Service, 2023b).
- *Reptiles and Amphibians*: This group includes various species of snakes, lizards, turtles, frogs, and salamanders.
- *Rare Plants*: This subset includes plant species that are federal and/or state listed threatened, endangered, or have a limited range and may occur within or near the study area. These

species may have ecological, cultural, or economic significance and require specialized conservation measures to ensure their survival.

2.2 Species of Interest Lists

This section provides comprehensive species lists for each subset detailed above, offering an extensive representation of the flora and fauna within the study area. By identifying species distributions and habitat affinities, these lists play a crucial role in evaluating potential effects on local biodiversity. This compilation of information not only fosters a comprehensive understanding of the area's ecological richness but also serves as a valuable resource for stakeholders and decision-makers.

The following species lists have been compiled to include important information regarding each species' affinity to the 13 Southwest Regional Gap Analysis Project (SWReGAP) ecoregions present in the study area and their conservation status under the U.S. Fish and Wildlife Service (FWS), New Mexico Department of Game and Fish (NMDGF) Wildlife Conservation Act (WCA), and NMDGF Species of Greatest Conservation Need (SGCN) designations.

The conservation status of each species is provided based on the following designations:

- *NMDGF*: Indicates if the species is listed as endangered (E) or threatened (T) under the New Mexico Department of Game and Fish Wildlife Conservation Act. This state-level designation focuses on species that are at risk of extinction or extirpation within New Mexico and guides conservation efforts within the state.
- *FWS*: Indicates if the species is listed as endangered (LE) or threatened (LT) under the Endangered Species Act. This designation highlights species that are at a high risk of extinction and require immediate conservation attention.
- *SGCN*: Indicates if the species is considered a Species of Greatest Conservation Need (Y) by the New Mexico Department of Game and Fish. These species may not be currently listed as endangered or threatened but require proactive conservation measures to prevent further declines or potential listing in the future.

The affinity to SWReGAP ecoregions indicates the ecological regions within the southwestern United States where each species is typically found. This information helps to understand the species' habitat preferences and provides context for their presence within the study area:

A. *Apacherian-Chihuahuan Semi-Desert Grassland and Steppe* - Table code: ACGS
B. *Colorado Plateau Mixed Bedrock Canyon and Tableland* - Table code: CPCT
C. *Colorado Plateau Pinyon-Juniper Woodland* - Table code: CPPJ
D. *Inter-Mountain Basins Semi-Desert Grassland* - Table code: IMDG
E. *Madrean Pine-Oak Forest and Woodland* - Table code: MPOW
F. *Madrean Pinyon-Juniper Woodland* - Table code: MPJW
G. *Mogollon Chaparral* - Table code: MCHP
H. *North American Warm Desert Lower Montane Riparian Woodland and Shrubland* - Table code: NARW
I. *Rocky Mountain Cliff, Canyon and Massive Bedrock* - Table code: RMCC
J. *Rocky Mountain Gambel Oak-Mixed Montane Shrubland* - Table code: RMGS

K. *Southern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest and Woodland* - Table code: SRDW
L. *Southern Rocky Mountain Mesic Montane Mixed Conifer Forest and Woodland* - Table code: SRMW
M. *Southern Rocky Mountain Ponderosa Pine Woodland* - Table code: SRPP

By incorporating these designations into the species lists, this section provides a comprehensive overview of the conservation status and ecological preferences of the species within the study area. This information is crucial for understanding the potential impacts of the proposed Project on local biodiversity and for informing decision-making processes to ensure that the Project adheres to regulatory requirements and best management practices.

Table 2 - List of Aquatic Invertebrate Species Potentially Occurring in the Mogollon Project Area, with Conservation Status and Habitat Preferences.

Mogollon Project - Aquatic Invertebrate Species List					
Common Name	**Scientific Name**	**NMGF**	**FWS**	**SGCN**	**North American Warm Desert Lower Montane Riparian Woodland and Shrubland**
Amber Glass Snail	*Nesovitrea hammonis*				✓
Bearded Mountainsnail	*Oreohelix barbata*				✓
Brine Shrimp	*Artemia franciscana*				✓
Brown Hive Snail	*Euconulus fulvus*				✓
Carved Glyph Snail	*Glyphyalina indentata*				✓
Cross Snaggletooth Snail	*Gastrocopta quadridens*				✓
Diablo Mountainsnail	*Oreohelix houghi*				✓
Dry Creek Woodlandsnail	*Ashmunella tetrodon inermis*				✓
Dry Creek Woodlandsnail	*Ashmunella tetrodon mutator*				✓
Dry Creek Woodlandsnail	*Ashmunella tetrodon tetrodon*				✓
False Marsh Slug	*Deroceras heterura*				✓
Forest Disc Snail	*Discus whitneyi*				✓
Gila Springsnail	*Pyrgulopsis gilae*	T			✓
Glossy Pillar Snail	*Cionella lubrica*				✓
High-spire Column	*Columella simplex*				✓
Median Striate Snail	*Striatura meridionalis*				✓
Mexican Coil Snail	*Helicodiscus eigenmani*				✓
Minute Gem Snail	*Hawaiia minuscula*				✓
Mogollon Woodlandsnail	*Ashmunella mogollonensis*				✓
Montane Snaggletooth Snail	*Gastrocopta pilsbryana*			Y	✓
New Mexico Hot Springsnail	*Pyrgulopsis thermalis*	T			✓
Northern Crayfish	*Faxonius virilis*				✓
Quick Gloss Snail	*Zonitoides arboreus*				✓
Ribbed Pinwheel Snail	*Radiodiscus millecostatus*				✓
Rocky Mtn. Column Snail	*Pupilla blandi*				✓
San Augustin Mountainsnail	*Oreohelix litoralis*				✓

Mogollon Project - Aquatic Invertebrate Species List					
Common Name	**Scientific Name**	**NMGF**	**FWS**	**SGCN**	**North American Warm Desert Lower Montane Riparian Woodland and Shrubland**
Silky Vallonia Snail	*Vallonia cyclophorella*				✓
Sluice Snaggletooth Snail	*Gastrocopta ashmuni*				✓
Small Spot Snail	*Punctum minutissimum*				✓
Sonoran Snaggletooth Snail	*Gastrocopta prototypus*				✓
Spruce Snail	*Microphysula ingersolli*				✓
Subalpine Mountainsnail	*Oreohelix subrudis*				✓
Thin-lipped Vallonia Snail	*Vallonia perspectiva*				✓
Vertigo Snail	*Vertigo arizonensis*				✓
Vertigo Snail	*Vertigo concinnula*			Y	✓
Western Glass Snail	*Vitrina pellucida*			Y	✓
Whitewater Creek Woodlandsnail	*Ashmunella danielsi danielsi*			Y	✓
Whitewater Creek Woodlandsnail	*Ashmunella danielsi dispar*				✓

Table 3 - List of Fish Species Potentially Occurring in the Mogollon Project Area, with Conservation Status and Habitat Preferences.

Mogollon Project - Fish Species List					
Common Name	**Scientific Name**	**NMGF**	**FWS**	**SGCN**	**North American Warm Desert Lower Montane Riparian Woodland and Shrubland**
Black Bullhead	*Ameiurus melas*				✓
Bluegill	*Lepomis macrochirus*				✓
Brook Stickleback	*Culaea inconstans*				✓
Brown Trout	*Salmo trutta*				✓
Channel Catfish	*Ictalurus punctatus*				✓
Chihuahua Catfish	*Ictalurus sp*				✓
Common Carp	*Cyprinus carpio*				✓
Desert Sucker	*Catostomus clarkii*			Y	✓
Fathead Minnow	*Pimephales promelas*				✓
Flathead Catfish	*Pylodictis olivaris*				✓
Gila Chub	*Gila intermedia*	E	E	Y	✓
Gila Trout	*Oncorhynchus gilae*	T	T	Y	✓
Grass Carp	*Ctenopharyngodon idella*				✓
Green Sunfish	*Lepomis cyanellus*				✓
Largemouth Bass	*Micropterus salmoides*				✓
Loach Minnow	*Rhinichthys cobitis*	E	E	Y	✓
Longfin Dace	*Agosia chrysogaster*				✓
Rainbow Trout	*Oncorhynchus mykiss*				✓
Red Shiner	*Cyprinella lutrensis*				✓
Rio Grande Sucker	*Catostomus plebeius*			Y	✓
Roundtail Chub	*Gila robusta*	E		Y	✓
Smallmouth Bass	*Micropterus dolomieui*				✓
Sonora Sucker	*Catostomus insignis*			Y	✓
Speckled Dace	*Rhinichthys osculus*				✓
Spikedace	*Meda fulgida*	E	E	Y	✓
Western mosquitofish	*Gambusia affinis*				✓
White Sucker	*Catostomus commersoni*				✓
Yellow Bullhead	*Ameiurus natalis*				✓

Table 4 - List of Big Game Species Potentially Occurring in the Mogollon Project Area, with Conservation Status and Habitat Preferences.

Mogollon Project - Big Game Species List																	
Common Name	**Scientific Name**	**NMGF**	**FWS**	**SGCN**	**ACGS**	**CPCT**	**CPPJ**	**IMDG**	**MPOW**	**MPJW**	**MCHP**	**NARW**	**RMCC**	**RMGS**	**SRDW**	**SRMW**	**SRPP**
Coues' White-tailed Deer	*Odocoileus virginianus couesi*			Y	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓
Elk	*Cervus canadensis nelsoni*						✓	✓	✓		✓		✓	✓		✓	✓
Mule Deer	*Odocoileus hemionus*				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Pronghorn	*Antilocapra americana*				✓			✓									
Rocky Mtn. Bighorn Sheep	*Ovis canadensis canadensis*				✓	✓	✓	✓	✓	✓			✓			✓	✓

Table 5 - List of Breeding Bird Species Potentially Occurring in the Mogollon Project Area, with Conservation Status and Habitat Preferences.

Mogollon Project - Gila National Forest Breeding Bird Species List																	
Common Name	**Scientific Name**	**NMGF**	**FWS**	**SGCN**	**ACGS**	**CPCT**	**CPPJ**	**IMDG**	**MPOW**	**MPJW**	**MCHP**	**NARW**	**RMCC**	**RMGS**	**SRDW**	**SRMW**	**SRPP**
Acorn Woodpecker	*Melanerpes formicivorus*								✓			✓					
American Coot	*Fulica americana*											✓					
American Crow	*Corvus brachyrhynchos*						✓		✓			✓	✓	✓	✓	✓	✓
American Dipper	*Cinclus mexicanus*				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
American Goldfinch	*Carduelis tristis*						✓		✓	✓		✓		✓	✓	✓	✓
American Kestrel	*Falco sparverius*				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
American Robin	*Turdus migratorius*						✓		✓	✓		✓			✓	✓	✓
American Three-Toed Woodpecker	*Picoides dorsalis*														✓	✓	✓
Ash-Throated Flycatcher	*Myiarchus cinerascens*				✓	✓	✓		✓	✓	✓	✓	✓	✓			
Band-Tailed Pigeon	*Patagioenas fasciata*						✓		✓	✓				✓	✓	✓	✓
Barn Owl	*Tyto alba*				✓			✓				✓	✓				
Barn Swallow	*Hirundo rustica*					✓		✓				✓		✓			
Bell's Vireo	*Vireo bellii*	T		Y					✓	✓		✓					

Mogollon Project - Gila National Forest Breeding Bird Species List																	
Common Name	**Scientific Name**	**NMGF**	**FWS**	**SGCN**	**ACGS**	**CPCT**	**CPPJ**	**IMDG**	**MPOW**	**MPJW**	**MCHP**	**NARW**	**RMCC**	**RMGS**	**SRDW**	**SRMW**	**SRPP**
Belted Kingfisher	*Megaceryle alcyon*	T				✓	✓		✓	✓	✓	✓		✓	✓	✓	✓
Bewick's Wren	*Thryomanes bewickii*					✓	✓		✓	✓	✓	✓		✓	✓	✓	✓
Black Phoebe	*Sayornis nigricans*												✓				
Black-Chinned Hummingbird	*Archilochus alexandri*						✓		✓			✓		✓			
Black-Chinned Sparrow	*Spizella atrogularis*			Y	✓	✓		✓		✓	✓	✓					
Black-Throated Gray Warbler	*Dendroica nigrescens*			Y		✓	✓		✓	✓	✓	✓		✓			
Black-Throated Sparrow	*Amphispiza bilineata*				✓		✓	✓		✓	✓					✓	
Blue Grosbeak	*Passerina caerulea*				✓		✓	✓	✓	✓		✓			✓	✓	✓
Blue Grouse	*Dendragapus obscurus*												✓	✓	✓	✓	✓
Blue-Gray Gnatcatcher	*Polioptila caerulea*						✓		✓	✓	✓	✓		✓	✓	✓	✓
Brewer's Blackbird	*Euphagus cyanocephalus*				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Bridled Titmouse	*Baeolophus wollweberi*								✓	✓		✓					
Broad-Tailed Hummingbird	*Selasphorus platycercus*								✓	✓	✓	✓	✓		✓	✓	✓
Bronzed Cowbird	*Molothrus aeneus*										✓						
Brown Creeper	*Certhia americana*						✓		✓	✓		✓			✓	✓	✓
Brown-Crested Flycatcher	*Myiarchus tyrannulus*								✓			✓					
Brown-Headed Cowbird	*Molothrus ater*				✓	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓
Bullock's Oriole	*Icterus bullockii*											✓					
Burrowing Owl	*Athene cunicularia*				✓			✓									
Bushtit	*Psaltriparus minimus*					✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓
Cactus Wren	*Campylorhynchus brunneicapillus*				✓						✓	✓					
Canyon Towhee	*Pipilo fuscus*				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓
Canyon Wren	*Catherpes mexicanus*				✓	✓	✓	✓		✓	✓	✓	✓	✓			✓
Cassin's Kingbird	*Tyrannus vociferans*				✓	✓	✓		✓	✓		✓			✓	✓	✓
Cassin's Sparrow	*Aimophila cassinii*			Y	✓			✓	✓	✓	✓			✓			
Clark's Nutcracker	*Nucifraga columbiana*			Y			✓		✓	✓					✓	✓	✓

Mogollon Project - Gila National Forest Breeding Bird Species List																	
Common Name	**Scientific Name**	**NMGF**	**FWS**	**SGCN**	**ACGS**	**CPCT**	**CPPJ**	**IMDG**	**MPOW**	**MPJW**	**MCHP**	**NARW**	**RMCC**	**RMGS**	**SRDW**	**SRMW**	**SRPP**
Cliff Swallow	*Petrochelidon pyrrhonota*					✓		✓			✓	✓	✓	✓			
Common Black Hawk	*Buteogallus anthracinus*	T		Y								✓					
Common Nighthawk	*Chordeiles minor*			Y	✓	✓	✓			✓			✓				✓
Common Poorwill	*Phalaenoptilus nuttallii*					✓	✓		✓	✓	✓		✓	✓			✓
Common Raven	*Corvus corax*				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Common Yellowthroat	*Geothlypis trichas*											✓		✓	✓	✓	
Cooper's Hawk	*Accipiter cooperii*				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Cordilleran Flycatcher	*Empidonax occidentalis*								✓			✓	✓		✓	✓	✓
Crissal Thrasher	*Toxostoma crissale*								✓	✓	✓	✓					
Curve-Billed Thrasher	*Toxostoma curvirostre*				✓			✓	✓	✓	✓	✓		✓			
Dark-Eyed Junco	*Junco hyemalis*				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Downy Woodpecker	*Picoides pubescens*						✓		✓	✓	✓	✓		✓	✓	✓	✓
Eastern Meadowlark	*Sturnella magna*				✓												
Elf Owl	*Micrathene whitneyi*			Y					✓	✓		✓					
European Starling	*Sturnus vulgaris*				✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
Evening Grosbeak	*Coccothraustes vespertinus*			Y		✓	✓		✓	✓			✓		✓	✓	✓
Flammulated Owl	*Otus flammeolus*			Y			✓		✓	✓	✓	✓		✓	✓	✓	✓
Gambel'S Quail	*Callipepla gambelii*				✓			✓	✓	✓	✓	✓		✓			
Gila Woodpecker	*Melanerpes uropygialis*	T		Y								✓					
Golden Eagle	*Aquila chrysaetos*	T			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Golden-Crowned Kinglet	*Regulus satrapa*						✓		✓	✓		✓	✓		✓	✓	✓
Grace's Warbler	*Dendroica graciae*			Y		✓	✓		✓	✓		✓		✓	✓	✓	✓
Gray Flycatcher	*Empidonax wrightii*				✓		✓		✓	✓	✓	✓		✓	✓		✓
Great Blue Heron	*Ardea herodias*							✓				✓					
Great Horned Owl	*Bubo virginianus*				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Greater Pewee	*Contopus pertinax*								✓	✓		✓					

Mogollon Project - Gila National Forest Breeding Bird Species List																	
Common Name	**Scientific Name**	**NMGF**	**FWS**	**SGCN**	**ACGS**	**CPCT**	**CPPJ**	**IMDG**	**MPOW**	**MPJW**	**MCHP**	**NARW**	**RMCC**	**RMGS**	**SRDW**	**SRMW**	**SRPP**
Greater Roadrunner	*Geococcyx californianus*				✓	✓	✓		✓	✓	✓			✓			
Great-Tailed Grackle	*Quiscalus mexicanus*				✓		✓		✓	✓	✓	✓		✓	✓	✓	✓
Hairy Woodpecker	*Picoides villosus*						✓							✓	✓	✓	✓
Hepatic Tanager	*Piranga flava*					✓	✓		✓	✓			✓		✓		✓
Hermit Thrush	*Catharus guttatus*						✓		✓		✓	✓			✓	✓	✓
Hooded Oriole	*Icterus cucullatus*								✓			✓					
Horned Lark	*Eremophila alpestris*				✓			✓									
House Finch	*Carpodacus mexicanus*				✓		✓	✓	✓	✓	✓	✓			✓		✓
House Wren	*Troglodytes aedon*				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Hutton'S Vireo	*Vireo huttoni*												✓		✓		✓
Indigo Bunting	*Passerina cyanea*				✓							✓					
Juniper Titmouse	*Baeolophus ridgwayi*			Y		✓	✓		✓	✓		✓		✓			
Killdeer	*Charadrius vociferus*				✓			✓									
Ladder-Backed Woodpecker	*Picoides scalaris*				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓
Lark Sparrow	*Chondestes grammacus*				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓
Lesser Goldfinch	*Carduelis psaltria*					✓	✓		✓	✓			✓	✓	✓		✓
Lewis's Woodpecker	*Melanerpes lewis*			Y					✓			✓			✓	✓	✓
Long-Eared Owl	*Asio otus*				✓			✓	✓	✓	✓				✓	✓	✓
Lucy's Warbler	*Vermivora luciae*			Y	✓				✓	✓		✓					✓
Macgillivray'S Warbler	*Oporornis tolmiei*											✓		✓		✓	
Magnificent Hummingbird	*Eugenes fulgens*								✓	✓		✓					
Mallard	*Anas platyrhynchos*											✓					
Mexican Jay	*Aphelocoma ultramarina*								✓	✓							
Mexican Spotted Owl	*Strix occidentalis lucida*		LT	Y		✓			✓			✓	✓		✓	✓	✓
Montezuma Quail	*Cyrtonyx montezumae*				✓				✓	✓		✓					
Mountain Bluebird	*Sialia currucoides*			Y	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓

Mogollon Project - Gila National Forest Breeding Bird Species List																	
Common Name	**Scientific Name**	**NMGF**	**FWS**	**SGCN**	**ACGS**	**CPCT**	**CPPJ**	**IMDG**	**MPOW**	**MPJW**	**MCHP**	**NARW**	**RMCC**	**RMGS**	**SRDW**	**SRMW**	**SRPP**
Mountain Chickadee	*Poecile gambeli*						✓		✓	✓		✓		✓	✓	✓	✓
Mourning Dove	*Zenaida macroura*				✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
Northern Cardinal	*Cardinalis cardinalis*				✓				✓	✓	✓	✓					
Northern Flicker	*Colaptes auratus*				✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
Northern Goshawk	*Accipiter gentilis*						✓		✓	✓		✓			✓	✓	✓
Northern Harrier	*Circus cyaneus*				✓			✓				✓					
Northern Mockingbird	*Mimus polyglottos*				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Northern Pygmy Owl	*Glaucidium gnoma*						✓		✓	✓					✓	✓	✓
Olive Warbler	*Peucedramus taeniatus*								✓	✓			✓			✓	✓
Olive-Sided Flycatcher	*Contopus cooperi*			Y		✓	✓		✓	✓		✓	✓		✓	✓	✓
Orange-Crowned Warbler	*Vermivora celata*						✓		✓	✓	✓		✓	✓	✓	✓	✓
Osprey	*Pandion haliaetus*					✓	✓		✓	✓		✓	✓		✓	✓	✓
Painted Redstart	*Myioborus pictus*			Y					✓	✓		✓					✓
Peregrine Falcon	*Falco peregrinus*	T		Y		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Phainopepla	*Phainopepla nitens*				✓				✓	✓	✓	✓			✓		
Pine Siskin	*Carduelis pinus*				✓		✓	✓	✓	✓	✓	✓			✓	✓	✓
Pinyon Jay	*Gymnorhinus cyanocephalus*			Y		✓	✓		✓	✓	✓			✓			✓
Plumbeous Vireo	*Vireo plumbeus*					✓	✓		✓	✓		✓	✓	✓	✓	✓	✓
Prairie Falcon	*Falco mexicanus*				✓	✓		✓			✓	✓	✓	✓			✓
Purple Martin	*Progne subis*					✓			✓			✓	✓		✓	✓	✓
Pygmy Nuthatch	*Sitta pygmaea*			Y		✓	✓			✓		✓		✓	✓	✓	✓
Red Crossbill	*Loxia curvirostra*					✓	✓		✓	✓			✓		✓	✓	✓
Red-Breasted Nuthatch	*Sitta canadensis*					✓	✓		✓	✓		✓		✓	✓	✓	✓
Red-Faced Warbler	*Cardellina rubrifrons*			Y					✓	✓		✓	✓		✓	✓	✓
Red-Naped Sapsucker	*Sphyrapicus nuchalis*								✓			✓			✓	✓	✓
Red-Tailed Hawk	*Buteo jamaicensis*				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Red-Winged Blackbird	*Agelaius phoeniceus*				✓		✓		✓	✓		✓			✓	✓	✓
Ring-Necked Pheasant	*Phasianus colchicus*														✓		

Mogollon Project - Gila National Forest Breeding Bird Species List																	
Common Name	**Scientific Name**	**NMGF**	**FWS**	**SGCN**	**ACGS**	**CPCT**	**CPPJ**	**IMDG**	**MPOW**	**MPJW**	**MCHP**	**NARW**	**RMCC**	**RMGS**	**SRDW**	**SRMW**	**SRPP**
Rock Pigeon	*Columba livia*					✓							✓				
Rock Wren	*Salpinctes obsoletus*				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rough-Winged Swallow	*Stelgidopteryx serripennis*				✓	✓	✓	✓		✓		✓	✓		✓	✓	✓
Ruby-Crowned Kinglet	*Regulus calendula*						✓		✓	✓	✓	✓		✓	✓	✓	✓
Rufous-Crowned Sparrow	*Aimophila ruficeps*				✓	✓	✓		✓	✓	✓			✓			
Say's Phoebe	*Sayornis saya*						✓	✓		✓		✓	✓				
Scaled Quail	*Callipepla squamata*				✓		✓	✓	✓	✓		✓					
Scott's Oriole	*Icterus parisorum*				✓		✓			✓	✓			✓			
Sharp-Shinned Hawk	*Accipiter striatus*				✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Sora	*Porzana carolina*											✓					
Southwestern Willow Flycatcher	*Empidonax traillii extimus*	E	LE	Y								✓					
Spotted Sandpiper	*Actitis macularius*				✓		✓	✓			✓	✓		✓	✓	✓	✓
Spotted Towhee	*Pipilo maculatus*						✓		✓	✓	✓	✓		✓			
Steller's Jay	*Cyanocitta stelleri*				✓	✓	✓		✓	✓			✓	✓	✓	✓	✓
Summer Tanager	*Piranga rubra*								✓			✓					
Swainson's Hawk	*Buteo swainsoni*				✓		✓	✓	✓	✓	✓		✓	✓	✓		
Townsend'S Solitaire	*Myadestes townsendi*				✓	✓	✓		✓	✓				✓	✓	✓	✓
Tree Swallow	*Tachycineta bicolor*				✓							✓			✓	✓	✓
Vermilion Flycatcher	*Pyrocephalus rubinus*				✓				✓		✓	✓		✓			
Violet-Green Swallow	*Tachycineta thalassina*					✓	✓	✓	✓	✓		✓	✓		✓	✓	✓
Virginia Rail	*Rallus limicola*											✓					
Virginia's Warbler	*Vermivora virginiae*			Y			✓		✓	✓	✓	✓		✓	✓	✓	✓
Warbling Vireo	*Vireo gilvus*					✓			✓			✓	✓		✓	✓	✓
Western Bluebird	*Sialia mexicana*			Y	✓	✓	✓	✓	✓	✓			✓		✓	✓	✓
Western Kingbird	*Tyrannus verticalis*				✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓
Western Meadowlark	*Sturnella neglecta*				✓			✓			✓	✓		✓			
Western Screech-Owl	*Megascops kennicottii*						✓		✓	✓		✓					

Mogollon Project - Gila National Forest Breeding Bird Species List																	
Common Name	**Scientific Name**	**NMGF**	**FWS**	**SGCN**	**ACGS**	**CPCT**	**CPPJ**	**IMDG**	**MPOW**	**MPJW**	**MCHP**	**NARW**	**RMCC**	**RMGS**	**SRDW**	**SRMW**	**SRPP**
Western Tanager	*Piranga ludoviciana*						✓		✓	✓		✓			✓	✓	✓
Western Wood Pewee	*Contopus sordidulus*						✓		✓	✓		✓			✓	✓	✓
Whip-Poor-Will	*Antrostomus arizonae*			Y			✓		✓	✓	✓	✓					✓
White-Breasted Nuthatch	*Sitta carolinensis*						✓							✓	✓	✓	✓
White-Throated Swift	*Aeronautes saxatalis*				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
White-Winged Dove	*Zenaida asiatica*				✓				✓	✓	✓	✓					
Wild Turkey	*Meleagris gallopavo*					✓	✓		✓	✓		✓		✓	✓	✓	✓
Williamson's Sapsucker	*Sphyrapicus thyroideus*			Y			✓		✓						✓	✓	✓
Yellow Warbler	*Dendroica petechia*								✓			✓		✓		✓	
Yellow-Billed Cuckoo (Western Pop)	*Coccyzus americanus occidentalis*	T	LT	Y								✓					
Yellow-Breasted Chat	*Icteria virens*							✓	✓	✓	✓	✓		✓	✓	✓	
Yellow-Headed Blackbird	*Xanthocephalus xanthocephalus*							✓									
Yellow-Rumped Warbler	*Dendroica coronata*					✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓
Zone-Tailed Hawk	*Buteo albonotatus*								✓			✓			✓	✓	✓

Table 6 - List of Mammal Species Potentially Occurring in the Mogollon Project Area, with Conservation Status and Habitat Preferences

Mogollon Project - Other Mammal Species List																	
Common Name	**Scientific Name**	**NMGF**	**FWS**	**SGCN**	**ACGS**	**CPCT**	**CPPJ**	**IMDG**	**MPOW**	**MPJW**	**MCHP**	**NARW**	**RMCC**	**RMGS**	**SRDW**	**SRMW**	**SRPP**
Abert's Squirrel	*Sciurus aberti; chuscensis; ferreus*						✓		✓	✓					✓	✓	✓
Allen's Big-eared Bat	*Idionycteris phyllotis*						✓		✓	✓		✓	✓		✓		✓
American Badger	*Taxidea taxus*				✓		✓	✓	✓	✓		✓		✓			✓
American Beaver	*Castor canadensis*											✓					
Arizona Gray Squirrel	*Sciurus arizonensis arizonensis*								✓	✓		✓		✓	✓		✓
Arizona Montane Vole	*Microtus montanus arizonensis*	E		Y				✓							✓	✓	✓

Mogollon Project - Other Mammal Species List																	
Common Name	**Scientific Name**	**NMGF**	**FWS**	**SGCN**	**ACGS**	**CPCT**	**CPPJ**	**IMDG**	**MPOW**	**MPJW**	**MCHP**	**NARW**	**RMCC**	**RMGS**	**SRDW**	**SRMW**	**SRPP**
Banner-tailed Kangaroo Rat	*Dipodomys spectabilis baileyi; clarencei; spectabilis*				✓	✓	✓	✓	✓	✓	✓		✓				✓
Big Brown Bat	*Eptesicus fuscus*				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Big Free-tailed Bat	*Nyctinomops macrotis*				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Black Bear	*Ursus americanus*					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Black-tailed Jackrabbit	*Lepus californicus*				✓	✓	✓	✓	✓	✓	✓			✓			
Bobcat	*Lynx rufus*				✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
Botta's Pocket Gopher	*Thomomys bottae*				✓		✓	✓	✓	✓	✓			✓	✓	✓	✓
Brazilian Free-tailed Bat	*Tadarida brasiliensis*				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Brush Mouse	*Peromyscus boylii*				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Cactus Mouse	*Peromyscus eremicus*				✓	✓	✓	✓	✓	✓	✓	✓					
California Myotis	*Myotis californicus*				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Canyon Bat (Western Pipistrelle)	*Parastrellus hesperus*				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	
Cave Myotis	*Myotis velifer*				✓	✓		✓	✓	✓	✓	✓					
Cliff Chipmunk	*Neotamias dorsalis*				✓		✓	✓	✓	✓		✓	✓		✓	✓	✓
Collared Peccary	*Peccari tajacu sonoriensis; angulatus*				✓				✓	✓	✓	✓					
Common Gray Fox	*Urocyon cinereoargenteus*				✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	
Common Hog-nosed Skunk	*Conepatus leuconotus*				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓
Common Muskrat	*Ondatra zibethicus pallidus; osoyooensis; cinnamominus*											✓					
Common Porcupine	*Erethizon dorsatum*				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Common Raccoon	*Procyon lotor*				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Coyote	*Canis latrans*				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Crawford's Desert Shrew	*Notiosorex crawfordi*				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓
Deer Mouse	*Peromyscus maniculatus*				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Desert Cottontail Rabbit	*Sylvilagus audubonii*				✓		✓	✓	✓	✓	✓			✓			✓
Dusky Shrew	*Sorex monticolus*				✓		✓		✓	✓	✓	✓		✓	✓	✓	✓
Fringed Myotis	*Myotis thysanodes*				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Mogollon Project - Other Mammal Species List																	
Common Name	**Scientific Name**	**NMGF**	**FWS**	**SGCN**	**ACGS**	**CPCT**	**CPPJ**	**IMDG**	**MPOW**	**MPJW**	**MCHP**	**NARW**	**RMCC**	**RMGS**	**SRDW**	**SRMW**	**SRPP**
Golden-mantled Ground Squirrel	*Callospermophilus lateralis*					✓	✓	✓	✓	✓			✓		✓	✓	✓
Gray-collared Chipmunk	*Neotamias cinereicollis*								✓	✓		✓	✓				✓
Gunnison's prairie dog	*Cynomys gunnisoni*			Y	✓			✓		✓	✓	✓			✓	✓	✓
Hispid Pocket Mouse	*Chaetodipus hispidus*				✓			✓	✓								
Hoary Bat	*Lasiurus cinereus*				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Holzner's Cottontail Rabbit	*Sylvilagus holzneri; robustus*				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Hooded Skunk	*Mephitis macroura*				✓			✓				✓					✓
House Mouse	*Mus musculus*				✓			✓	✓	✓		✓					
Kit Fox	*Vulpes macrotis*				✓	✓	✓	✓		✓	✓						
Long-eared Myotis	*Myotis evotis*					✓	✓		✓	✓			✓		✓	✓	✓
Long-legged Myotis	*Myotis volans*					✓	✓		✓	✓		✓	✓	✓	✓	✓	✓
Long-tailed Vole	*Microtus longicaudus; alticola; baileyi; mordax*								✓				✓	✓	✓	✓	✓
Long-tailed Weasel	*Mustela frenata*				✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
Meadow Jumping Mouse	*Zapus luteus luteus*	E		Y			✓			✓		✓			✓	✓	✓
Mexican Gray Wolf	*Canis lupus baileyi*	E	LE	Y	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
Mexican Woodrat	*Neotoma mexicana; inopinata; pinetorum; scopulorum*				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mogollon Vole	*Microtus mogollonensis guadalupensis*						✓		✓	✓	✓			✓	✓	✓	✓
Montane Vole	*Microtus montanus fusus*							✓							✓	✓	✓
Mountain Lion	*Puma concolor*				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Northern Grasshopper Mouse	*Onychomys leucogaster*				✓		✓	✓	✓	✓	✓	✓		✓			
Northern Rock Mouse	*Peromyscus nasutus*				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Ord's Kangaroo Rat	*Dipodomys ordii*				✓	✓	✓	✓		✓							
Osgood's Mouse (Saxicoline Deermouse)	*Peromyscus gratus*					✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓
Pale Townsend's Big-eared Bat	*Corynorhinus townsendii*			Y	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Pallid Bat	*Antrozous pallidus*				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓

Mogollon Project - Other Mammal Species List																
Common Name	**Scientific Name**	**NMGF**	**FWS**	**SGCN**	**ACGS**	**CPCT**	**CPPJ**	**IMDG**	**MPOW**	**MPJW**	**MCHP**	**NARW**	**RMCC**	**RMGS**	**SRDW**	**SRMW**	**SRPP**
Pinyon Mouse	*Peromyscus truei*				✓	✓	✓			✓	✓		✓	✓	✓	✓	✓
Red Fox	*Vulpes vulpes*				✓		✓	✓	✓	✓		✓		✓	✓	✓	✓
Red Squirrel	*Tamiasciurus hudsonicus*								✓				✓		✓	✓	✓
Ringtail	*Bassariscus astutus*				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rock Pocket Mouse	*Chaetodipus intermedius; crititus; phasma; umbrosus*											✓					
Rock Squirrel	*Otospermophilus variegatus grammurus*				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Silky Pocket Mouse	*Perognathus flavus flavus; hopiensis*				✓		✓	✓	✓	✓	✓						
Silver-haired Bat	*Lasionycteris noctivagans*					✓	✓		✓	✓		✓	✓		✓	✓	✓
Southern Plains Woodrat	*Neotoma micropus canescens*				✓		✓	✓	✓	✓	✓	✓	✓		✓	✓	✓
Southern Red-backed Vole	*Myodes gapperi*												✓		✓	✓	✓
Southwestern Little Brown Myotis (Arizona Myotis)	*Myotis occultus*					✓	✓		✓	✓		✓	✓		✓	✓	✓
Southwestern Myotis	*Myotis auriculus*				✓		✓		✓	✓		✓	✓		✓	✓	✓
Spotted Bat	*Euderma maculatum*	T		Y	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Spotted Ground Squirrel	*Xerospermophilus spilosoma*				✓			✓									
Springerville Pocket Mouse	*Perognathus flavus goodpasteri*						✓			✓	✓						
Stephen's Woodrat	*Neotoma stephensi*						✓										
Striped Skunk	*Mephitis mephitis*				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Tawny-bellied Cotton Rat	*Sigmodon fulviventer minimus*				✓			✓	✓	✓							
Western Harvest Mouse	*Reithrodontomys megalotis; aztecus*				✓		✓	✓	✓	✓	✓	✓			✓	✓	✓
Western Red Bat	*Lasiurus blossevillii*											✓					
Western Small-footed Myotis	*Myotis ciliolabrum*					✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓
Western Spotted Skunk	*Spilogale gracilis*				✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓
White Mountains Ground Squirrel	*Ictidomys tridecemlineatus monticola*						✓		✓	✓							✓
White-footed Mouse	*Peromyscus leucopus*				✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓
White-nosed Coati	*Nasua narica*				✓				✓	✓		✓					✓

Mogollon Project - Other Mammal Species List																	
Common Name	**Scientific Name**	**NMGF**	**FWS**	**SGCN**	**ACGS**	**CPCT**	**CPPJ**	**IMDG**	**MPOW**	**MPJW**	**MCHP**	**NARW**	**RMCC**	**RMGS**	**SRDW**	**SRMW**	**SRPP**
White-throated Woodrat	*Neotoma albigula*				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Yuma Myotis	*Myotis yumanensis*				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Table 7 - List of Rare or Endangered Species Potentially Occurring in the Mogollon Project Area, with Conservation Status and Habitat Preferences

Mogollon Project - Rare or Endangered Species List																	
Common Name	**Scientific Name**	**NMGF**	**FWS**	**SGCN**	**ACGS**	**CPCT**	**CPPJ**	**IMDG**	**MPOW**	**MPJW**	**MCHP**	**NARW**	**RMCC**	**RMGS**	**SRDW**	**SRMW**	**SRPP**
Arizona Black Rattlesnake	*Crotalus cerberus*			Y	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓
Arizona Toad	*Anaxyrus microscaphus*			Y					✓	✓	✓	✓					
Arizona Treefrog	*Hyla wrightorum*			Y					✓	✓		✓			✓	✓	✓
Bank Swallow	*Riparia riparia*			Y	✓	✓		✓			✓	✓	✓	✓			
Bendire's Thrasher	*Toxostoma bendirei*			Y	✓	✓		✓									
Black-chinned Sparrow	*Spizella atrogularis evura*			Y	✓		✓	✓		✓	✓	✓					
Black-Throated Gray Warbler	*Setophaga nigrescens*			Y		✓	✓		✓	✓	✓	✓		✓			
Boreal Chorus Frog	*Pseudacris maculata*			Y								✓					
Cassin's Finch	*Haemorhous cassinii*			Y			✓		✓	✓				✓	✓	✓	✓
Chestnut-collared Longspur	*Calcarius ornatus*			Y		✓		✓									
Chiricahua Leopard Frog	*Lithobates chiricahuensis*		LT	Y								✓					
Clark's Nutcracker	*Nucifraga columbiana*			Y			✓		✓	✓					✓	✓	✓
Common Black-hawk	*Buteogallus anthracinus*	T		Y								✓					
Common Nighthawk	*Chordeiles minor*			Y	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Elf Owl	*Micrathene whitneyi*			Y					✓	✓		✓					
Evening Grosbeak	*Coccothraustes vespertinus*			Y		✓	✓		✓	✓			✓		✓	✓	✓
Flammulated Owl	*Psiloscops flammeolus*			Y			✓		✓	✓	✓	✓		✓	✓	✓	✓
Gila Monster	*Heloderma suspectum*			Y	✓					✓	✓	✓					
Gila Trout	*Oncorhynchus gilae*	T	LT	Y								✓					
Grace's Warbler	*Setophaga graciae*			Y		✓	✓		✓	✓		✓		✓	✓	✓	✓
Gray Vireo	*Vireo vicinior*	T		Y		✓	✓			✓	✓	✓	✓	✓			

Mogollon Project - Rare or Endangered Species List																	
Common Name	**Scientific Name**	**NMGF**	**FWS**	**SGCN**	**ACGS**	**CPCT**	**CPPJ**	**IMDG**	**MPOW**	**MPJW**	**MCHP**	**NARW**	**RMCC**	**RMGS**	**SRDW**	**SRMW**	**SRPP**
Gunnison's Prairie Dog	*Cynomys gunnisoni*			Y			✓										
Jaguar	*Panthera onca*			Y	✓		✓		✓	✓		✓			✓	✓	✓
Juniper Titmouse	*Baeolophus ridgwayi*			Y		✓	✓		✓	✓		✓		✓			
Lewis's Woodpecker	*Melanerpes lewis*			Y					✓			✓			✓	✓	✓
Loggerhead Shrike	*Lanius ludovicianus*			Y	✓	✓	✓	✓	✓	✓	✓	✓		✓			
Lowland Leopard Frog	*Lithobates yavapaiensis*	E		Y								✓					
Lucy's Warbler	*Oreothlypis luciae*			Y	✓				✓	✓		✓					✓
Meadow Jumping Mouse	*Zapus hudsonius*	E		Y								✓					
Mexican Gartersnake	*Thamnophis eques megalops*		LT	Y					✓			✓			✓	✓	
Mexican Spotted Owl	*Strix occidentalis lucida*		LT	Y		✓			✓				✓			✓	✓
Mountain Bluebird	*Sialia currucoides*			Y	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓
Narrowhead Garter Snake	*Thamnophis rufipunctatus*	E		Y								✓					
Northern Leopard Frog	*Lithobates pipiens*			Y								✓					
Olive-sided Flycatcher	*Contopus cooperi*			Y		✓	✓		✓	✓		✓	✓		✓	✓	✓
Painted Redstart	*Myioborus pictus*			Y					✓	✓		✓					✓
Pale Townsend's Big-Eared Bat	*Corynorhinus townsendii pallescens*			Y	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Peregrine Falcon	*Falco peregrinus*	T		Y		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Pinyon Jay	*Gymnorhinus cyanocephalus*			Y		✓	✓		✓	✓	✓			✓			✓
Pygmy Nuthatch	*Sitta pygmaea*			Y		✓	✓			✓		✓		✓	✓	✓	✓
Red-faced Warbler	*Cardellina rubrifrons*			Y					✓	✓		✓	✓		✓	✓	✓
Rock Rattlesnake	*Crotalus lepidus*			Y					✓	✓		✓	✓	✓		✓	✓
Sonoran Mud Turtle	*Kinosternon sonoriense*			Y								✓					
Spotted Bat	*Euderma maculatum*	T		Y		✓	✓			✓		✓	✓	✓	✓	✓	✓
Vesper Sparrow	*Pooecetes gramineus*			Y	✓			✓				✓		✓			
Virginia's Warbler	*Oreothlypis virginiae*			Y			✓		✓	✓	✓	✓		✓	✓	✓	✓
Western Bluebird	*Sialia mexicana*			Y	✓	✓	✓	✓	✓	✓			✓		✓	✓	✓
Western Burrowing Owl	*Athene cunicularia hypugaea*			Y				✓									

Mogollon Project - Rare or Endangered Species List																	
Common Name	**Scientific Name**	**NMGF**	**FWS**	**SGCN**	**ACGS**	**CPCT**	**CPPJ**	**IMDG**	**MPOW**	**MPJW**	**MCHP**	**NARW**	**RMCC**	**RMGS**	**SRDW**	**SRMW**	**SRPP**
Williamson's Sapsucker	*Sphyrapicus thyroideus*			Y			✓		✓						✓	✓	✓

Table 8 - List of Reptile and Amphibian Species Potentially Occurring in the Mogollon Project Area, with Conservation Status and Habitat Preferences

Mogollon Project - Reptile and Amphibian Species List																	
Common Name	**Scientific Name**	**NMGF[1]**	**FWS[2]**	**SGCN[3]**	**ACGS**	**CPCT**	**CPPJ**	**IMDG**	**MPOW**	**MPJW**	**MCHP**	**NARW**	**RMCC**	**RMGS**	**SRDW**	**SRMW**	**SRPP**
Arizona Black Rattlesnake	*Crotalus cerberus*			Y	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓
Arizona Toad	*Anaxyrus microscaphus*			Y					✓	✓	✓	✓					
Arizona Treefrog	*Hyla wrightorum*			Y					✓	✓		✓			✓	✓	✓
Banded Rock Rattlesnake	*Crotalus lepidus klauberi*			Y					✓	✓			✓	✓		✓	✓
Black-necked Gartersnake	*Thamnophis cyrtopsis*				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Boreal Chorus Frog	*Pseudacris maculata*			Y								✓					
Bullfrog	*Lithobates catesbeianus*											✓					
Canyon Treefrog	*Hyla arenicolor*						✓		✓	✓		✓		✓			✓
Chihuahuan Nightsnake	*Hypsiglena jani*				✓		✓		✓	✓	✓						
Chihuahuan Spotted Whiptail	*Aspidoscelis exsanguis*				✓	✓	✓	✓	✓	✓			✓				✓
Chiricahua Leopard Frog	*Lithobates chiricahuensis*		LT	Y								✓					
Clark's Spiny Lizard	*Sceloporus clarkii*				✓	✓	✓	✓	✓	✓	✓	✓	✓				✓
Coachwhip	*Coluber flagellum*				✓	✓	✓	✓	✓	✓		✓		✓			
Common Lesser Earless Lizard	*Holbrookia maculata*				✓	✓	✓	✓	✓	✓							
Crevice Spiny Lizard	*Sceloporus poinsettii*				✓	✓	✓	✓	✓	✓			✓		✓	✓	✓
Desert Grassland Whiptail	*Aspidoscelis uniparens*				✓						✓						
Desert Striped Whipsnake	*Coluber taeniatus*				✓	✓	✓		✓	✓							
Eastern Collared Lizard	*Crotaphytus collaris*				✓	✓	✓	✓	✓	✓							
Glossy Snake	*Arizona elegans*				✓	✓		✓				✓		✓			
Gophersnake	*Pituophis catenifer*				✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
Great Plains Skink	*Plestiodon obsoletus*				✓	✓	✓	✓	✓	✓		✓					
Greater Earless Lizard	*Cophosaurus texanus*				✓			✓	✓			✓					

Mogollon Project - Reptile and Amphibian Species List																	
Common Name	**Scientific Name**	**NMGF[1]**	**FWS[2]**	**SGCN[3]**	**ACGS**	**CPCT**	**CPPJ**	**IMDG**	**MPOW**	**MPJW**	**MCHP**	**NARW**	**RMCC**	**RMGS**	**SRDW**	**SRMW**	**SRPP**
Hernandez's Short-horned Lizard	*Phrynosoma hernandesi*				✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓
Lowland Leopard Frog	*Lithobates yavapaiensis*	E		Y								✓					
Madrean Alligator Lizard	*Elgaria kingii*								✓			✓			✓	✓	
Many-lined Skink	*Plestiodon multivirgatus*				✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓
Marcy's Checkered Gartersnake	*Thamnophis marcianus*								✓			✓					
Milk Snake	*Lampropeltis triangulum*				✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
Mountain Patchnose Snake	*Salvadora grahamiae*				✓		✓		✓	✓							✓
Narrow-headed Gartersnake	*Thamnophis rufipunctatus*	E	LT	Y								✓					
New Mexico Spadefoot	*Spea multiplicata*				✓		✓	✓		✓	✓	✓					✓
Northern Leopard Frog	*Lithobates pipiens*			Y								✓					
Northern Tree Lizard	*Urosaurus ornatus*					✓	✓		✓	✓	✓		✓	✓			✓
Plains Spadefoot	*Spea bombifrons*				✓			✓						✓			✓
Plateau Striped Whiptail	*Aspidoscelis velox*				✓		✓	✓	✓	✓	✓			✓			✓
Prairie Rattlesnake	*Crotalus viridis*				✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
Pyro Mountain Kingsnake	*Lampropeltis pyromelana*						✓		✓	✓	✓	✓		✓	✓	✓	✓
Red-spotted Toad	*Anaxyrus punctatus*				✓		✓	✓		✓		✓					
Ringneck Snake	*Diadophis punctatus*				✓	✓	✓	✓	✓	✓		✓	✓		✓		✓
Sonoran Lyresnake	*Trimorphodon lambda*				✓	✓	✓		✓	✓	✓	✓		✓			✓
Sonoran Mud Turtle	*Kinosternon sonoriense sonoriense*			Y								✓					
Sonoran Spotted Whiptail	*Aspidoscelis sonorae*								✓	✓		✓					
Sonoran Whipsnake	*Coluber bilineatus*				✓				✓	✓		✓					
Southwestern Fence Lizard	*Sceloporus cowlesi*										✓	✓	✓	✓	✓		✓
Texas Long-nosed Snake	*Rhinocheilus lecontei*				✓							✓					
Tiger Salamander	*Ambystoma mavortium*				✓		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
Twin-spotted Spiny Lizard	*Sceloporus bimaculosus*				✓							✓					
Wandering Gartersnake	*Thamnophis elegans*				✓	✓		✓				✓	✓	✓	✓	✓	✓
Western Black-tailed Rattlesnake	*Crotalus molossus*				✓	✓	✓	✓	✓	✓	✓	✓					✓
Western Coral Snake	*Micruroides euryxanthus*				✓							✓					

Mogollon Project - Reptile and Amphibian Species List																	
Common Name	**Scientific Name**	**NMGF[1]**	**FWS[2]**	**SGCN[3]**	**ACGS**	**CPCT**	**CPPJ**	**IMDG**	**MPOW**	**MPJW**	**MCHP**	**NARW**	**RMCC**	**RMGS**	**SRDW**	**SRMW**	**SRPP**
Woodhouse's Toad	*Anaxyrus woodhousii*				✓	✓	✓	✓	✓	✓		✓		✓	✓	✓	

Table 9 - List of Rare Plant Species Potentially Occurring in the Mogollon Project Area, with Conservation Status and Habitat Preferences

Mogollon Project - Rare Plant Species List					
Common Name	**Scientific Name**	**NMRPTC[1]**	**FWS[2]**	**State of NM[3]**	**Habitat**
Davidson's Cliff Carrot	*Cymopterus davidsonii*	R		SS	Cool, rocky places in piñon-juniper woodland and lower montane coniferous forest; 1,980-2,440 m (6,500-8,000 ft).
Rock Fleabane	*Erigeron scopulinus*	R		SS	Crevices in cliff faces of rhyolitic rock in lower montane coniferous forest; 1,800-2,800 m (6,000-9,000 ft).
Wright's Campion	*Silene wrightii*	R		SS	Cliffs and rocky outcrops in Rocky Mountain montane and subalpine conifer forests; about 2,070-2,440 m (6,800-8,000 ft).
Zuni Fleabane	*Erigeron rhizomatus*	R	LT	E	North or east-facing moderate to steep slopes in open pinyon-juniper woodlands and ponderosa pine forests; 2,200 and 2,400 meters (7,300 to 8,300 ft).
1 - Rare Plant Technical Council List (NMRPTC) RARE (R) - Taxon either limited to a specific geographic feature or a small area within a plant region, where it can be locally common; or as a taxon that is more widespread but rarely abundant, only found in a few small, scattered habitats.					
2 - Strategy Species (SS) - A New Mexico Rare Plant Conservation Strategy species, which should be protected from land use impacts when possible because it is a unique and limited component of the regional flora.					
3 - U.S. Fish and Wildlife Service Listed Threatened (LT) - A species likely to become endangered within the foreseeable future throughout all or a significant portion of its range.					

3. Field Surveys

This section of the report presents the results of field surveys conducted for Mexican spotted owls, raptors, migratory birds, bats, and benthic macroinvertebrates within the study area. These surveys were specifically designed to assess the presence, distribution, and habitat use of these ecologically and conservationally significant species. By evaluating the results of each survey, we can better understand the potential impacts of the proposed Project on these species and their habitats, inform decision-making processes, and develop appropriate mitigation measures to minimize any adverse effects. The following subsections will provide an overview of the methods, findings, and implications of the surveys conducted for each of the aforementioned taxa.

3.1 Mexican Spotted Owl Surveys

3.1.1 Introduction and Background

Under a U.S. Fish and Wildlife Service (FWS) issued Section 10(a)(1)(a) research and recovery permit, Mexican spotted owl (*Strix occidentalis lucida*) surveys were conducted on behalf of Summa Silver near Mogollon, New Mexico. Summa Silver contracted NV5, with support from Everett Ecological and AtoZ Environmental Consulting, to perform Mexican spotted owl (MSO) surveys in compliance with New Mexico Mining and Minerals Division's minimal impact exploration permit requirements (New Mexico Mining and Minerals Division, 2023a). MSO surveys have been completed across the Project action area, referred to as the Area of Interest (AOI), which is a 0.5-mile (0.80kilometers [km]) buffer zone around current and latent work sites (Figure 17).

2022 MSO surveys were conducted over two phases. Phase 1 surveys were prioritized relative to Summa Silver's current work sites and were conducted at 11 calling stations from April 4 through April 29, 2022. Phase 1 surveys also considered raptor nest surveys which occurred May 17 – 19, 2022. Phase 1 results were discussed in the May 28, 2022, Biological Technical Memorandum (New Mexico Mining and Minerals Division, 2023a).

Phase 2 MSO surveys consisted of four field surveys conducted at 19 calling stations (CS, Figure 17) from June 7 through July 31, 2022, relative to Summa Silver's latent work sites. Phase 2 survey results were submitted to MMD as an amendment to the Biological Technical Memorandum. During Phase 2 protocol and follow-up surveys, two MSO roost sites (Silver Creek Roost #1 and Silver Creek Roost #2) were detected in Silver Creek. These roost sites are located greater than 0.5 miles from the current drilling area. Protocol data forms and location coordinates for these roost sites were submitted to the UFWS.

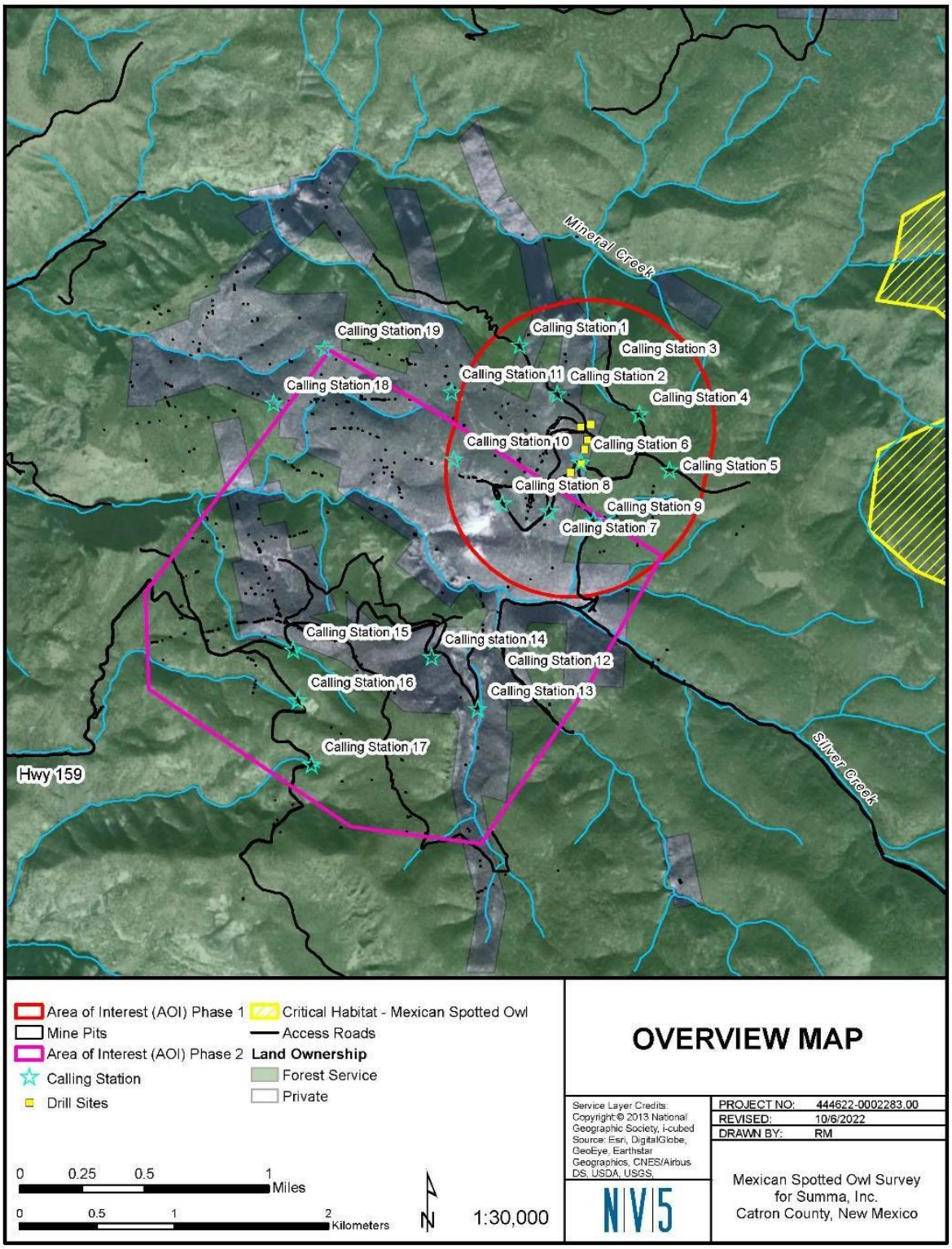


Figure 17 – Mexican spotted owl (MSO) surveys, field study Area of Interest (AOI)

3.1.2 MSO Survey Results

Graveyard Gulch Summary

On April 5, during Phase 1 Surveys, one MSO responded to a surveyor's vocalizations at CS9. This area was thoroughly searched, but no MSO signs, including feathers, whitewash, or roost sites were detected. A follow-up survey was conducted, but no MSO responded. As surveyors left their camp later that morning, they heard two MSOs as they drove by CS9 on their way to Hwy 159.

No MSOs were detected at CS9 during the following three surveys or follow-up surveys conducted in the Phase 1 AOI. It is important to note that in July, the MSOs identified at the Silver Creek Roost #1 could be heard over the ridge from Graveyard Gulch, which may account for the MSO responses that were initially detected on April 5 at CS9.

Silver Creek Survey Summary

MSO follow-up surveys were conducted during the day in Silver Creek. During the surveys conducted for Phase 1, an MSO was consistently heard in Silver Creek during surveys 1-4. During Phase 2 surveys and follow-up surveys, surveyors detected two roost sites in Silver Creek (Silver Creek Roost Sites #1 and #2).

Mineral Creek Summary

Follow-up surveys were also conducted outside of the Project AOI in Mineral Creek after an MSO was audibly detected there from CSs 1, 3, and 4 during the Phase 1 surveys. Additionally, during a follow-up survey in Mineral Creek, two MSOs were audibly detected on April 28. Their responses were heard within minutes of each other, less than 500 feet apart. The two MSOs were heard while surveyors actively listened in Mineral Creek as they walked down the canyon toward the trailhead. When surveyors returned to conduct Phase 2 surveys in Silver Creek, they also conducted additional follow-up surveys in Mineral Creek, but no MSOs were detected in the drainage after May 18. It is unknown if the two MSOs heard are a non-breeding pair this year or if they moved to a new location beyond the 2022 Project area boundaries.

3.1.3 Habitat Use

The results of our Mexican spotted owl surveys highlight a strong association between the species and riparian areas characterized by the SWReGAP North American Warm Desert Lower Montane Riparian Woodland and Shrubland ecoregion. These habitats provide the necessary structural complexity, food resources, and nesting opportunities that support the presence and reproductive success of Mexican spotted owls. The riparian woodlands and shrublands are particularly important for owls due to the availability of mature trees and dense understory vegetation, which offer suitable nesting and roosting sites, as well as protection from predators and harsh environmental conditions.

In addition to riparian areas, we also observed one detection of the Mexican spotted owl within the Southern Rocky Mountain Ponderosa Pine Woodland ecoregion. This finding suggests that, while the species may predominantly utilize riparian habitats, it can also occupy other woodland types when suitable habitat conditions are present. Further investigation is needed to better understand the habitat preferences and ecological requirements of the Mexican spotted owl in this ecoregion, which could have implications for management and conservation strategies targeting the species' long-term persistence in the region.

3.1.4 Discussion

In conclusion, our Mexican spotted owl surveys have provided valuable insights into the species' habitat use patterns in the study area, with a preference for riparian woodland and shrubland habitats such as those found in Silver Creek and Mineral Creek. As surveys continue through 2023, our focus will be on locating nest sites in Silver Creek and increasing survey efforts in Mineral Creek to better understand the distribution and nesting ecology of the owls in these areas.

With the collection of more survey data, we aim to collaborate with relevant agencies to delineate accurate Mexican spotted owl Protected Activity Center (PAC) boundaries. Establishing these boundaries

will be crucial for the effective management and conservation of the species, ensuring that potential impacts from development and land-use activities are minimized, and the long-term persistence of the Mexican spotted owl in the region is safeguarded.

3.2 Raptor Surveys

3.2.1 Introduction and Background

Raptor (i.e., hawks, eagles, falcons) nest surveys occurred on two occasions under a separate contract required to satisfy other permit compliance obligations pertaining to non-federally listed species. These surveys were conducted by Everett Ecological on April 18 -20, May 17-19, and September 9-10, 2022 and provide further insight regarding the status of raptor territories in and around the Project study area (Figure 18).

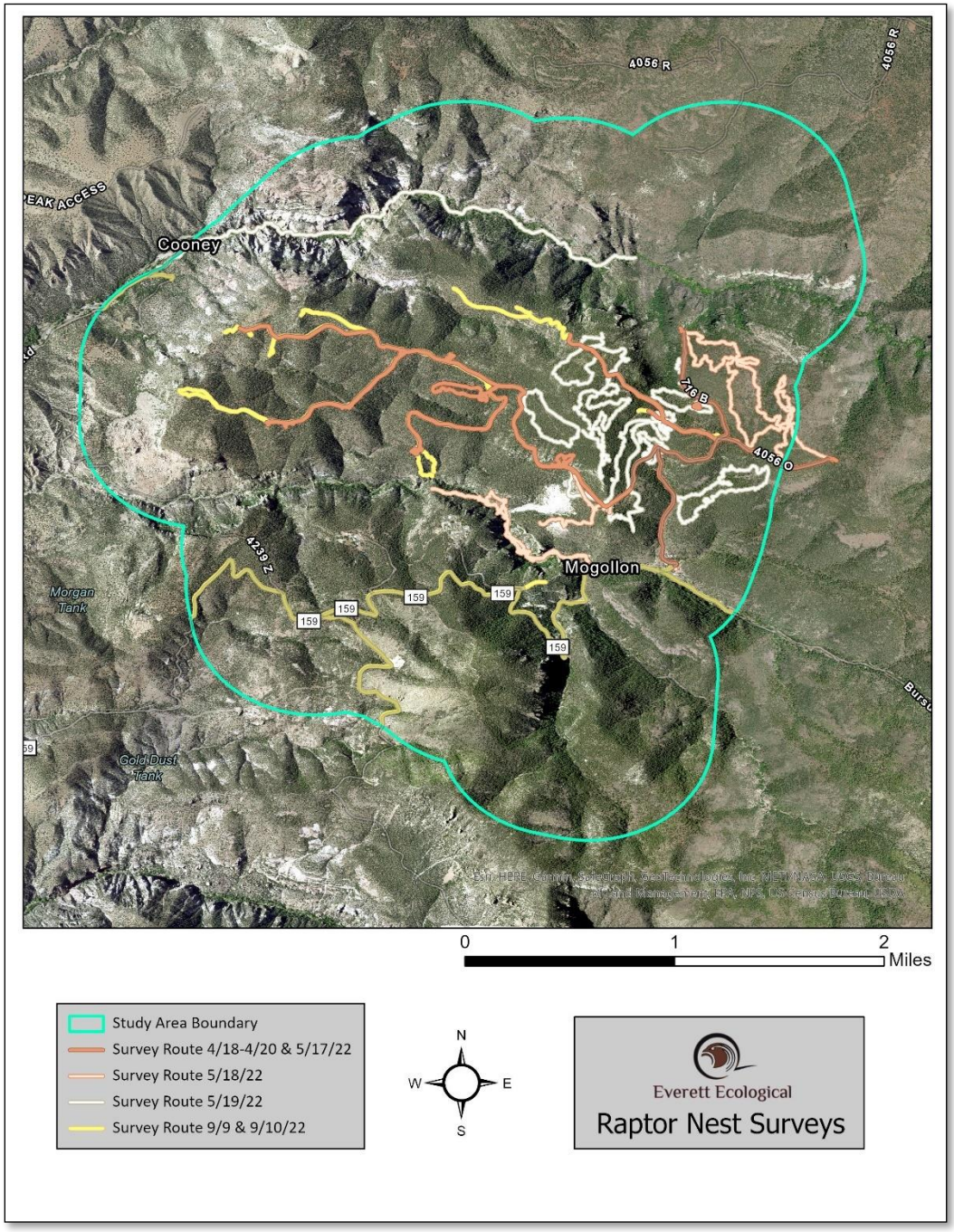


Figure 18 – Raptor nest survey study area and survey routes.

Raptor nest surveys were conducted following procedures established in the New Mexico Department of Game and Fish (NMDGF) Habitat Handbook "Baseline Wildlife Study Guidelines" (New Mexico Department of Game and Fish, 2019), which suggests that methods described in The Province of British Columbia Resources Inventory Committee "Inventory Methods for Raptors" be adapted to inventory raptor presence/absence (Province of British Columbia Resources Inventory Committee, 2001). Within and around the study area, call playback surveys, roadside surveys, standwatches, and ground nest searches occurred (Figure 18). Additionally, a high-resolution aerial photography dataset of the study area was examined before surveys to identify habitat quality and potential nest sites. Surveys occurred during the breeding season when raptor species are most prone to eliciting territorial responses in association with active nesting.

- *Call playback surveys* were conducted during daytime by broadcasting buteo (i.e., Red-tailed hawk [*Buteo jamaicensis*]) and accipiter (i.e., Cooper's hawk [*Accipiter cooperii*]) calls at the nine MSO calling stations along roadsides and while walking transects during ground searches. Raptors will travel long distances to respond, consequently, playback is sometimes not beneficial for directly locating nests, but it is very valuable when used in combination with ground searches.
- *Roadside surveys* were conducted during daytime along roads where surveyors used high powered binoculars and a spotting scope to scan the landscape for soaring and perched raptors. Furthermore, tree stands and cliff faces were scanned for the presence of nests (active, inactive, or dilapidated) or signs of nests (i.e., fecal deposits (whitewash), prey remains, moulted feathers).
- *Ground nest searches* were conducted during daytime by walking transects throughout the study area in and around low, medium and high-quality habitat types. Cliffs and trees were scanned along transects and call playbacks were also used. Surveyors searched for raptor presence, signs of nests, and presence of nests.
- *Standwatches* were used to supplement playback, roadside, and ground searches where a surveyor is positioned on a vantage point and uses binoculars to actively scan a slope for raptor presence, signs of nests, and presence of nests.

3.2.2 Survey Results

Through the course of the Raptor Nest Surveys, 13 nest sites were identified across the study area. However, only a single active Red-tailed Hawk nest in Silver Creek exhibited signs of activity defined by the presence of adult birds, eggs, chicks, and/or fresh nesting materials. The other 12 nest sites displayed no evidence of current raptor use and were frequently found in varying stages of disrepair.

Species observed during the surveys include Turkey Vulture (*Cathartes aura*) [> 50 individuals observed (obs.)], Red-tailed Hawk (*Buteo jamaicensis*) [5 obs.], Common Black Hawk (*Buteogallus anthracinus*) [1 obs.], Peregrine Falcon (*Falco peregrinus*) [1 obs.], Cooper's Hawk (*Accipiter cooperii*) [3 obs.], and Sharp-shined Hawk (*Accipiter striatus*) [1 obs.]. These species were observed soaring above or outside of the study area. With exception of the Red-tailed Hawk nest located during Mexican spotted owl surveys, all observations occurred incidentally during landscape scanning, and none elicited territorial behavior. Moreover, no responses to call playback surveys occurred over the duration of the surveys.

3.2.3 Habitat Use

In our raptor nest surveys, the majority of nest detections were found in habitats associated with three SWReGAP ecoregions. Most nest sites were located within North American Warm Desert Lower Montane Riparian Woodland and Shrubland, followed by Southern Rocky Mountain Mesic Montane Mixed Conifer

Forest and Woodland, and Southern Rocky Mountain Ponderosa Pine Woodland. This distribution pattern indicates that raptors in the study area demonstrate a preference for riparian woodland and shrubland habitats, as well as mesic montane mixed conifer and ponderosa pine woodlands containing denser vegetation and taller trees than found in ubiquitous Pinon-juniper habitats.

Raptors might prefer these habitat types over others because they offer a combination of suitable nesting sites, abundant prey resources, and favorable microclimatic conditions. Riparian woodland and shrubland habitats typically provide a diverse range of vegetation structures for nesting and perching, as well as access to water sources and a rich prey base including small mammals, birds, and reptiles. Mesic montane mixed conifer and ponderosa pine woodlands offer similar advantages, with the added benefits of higher elevations and cooler temperatures, which can provide thermal refugia during hot summer months.

3.2.4 Discussion

The study area contains pockets of high-quality raptor nesting habitat in cliff alcoves, ridge tops, and sheltered canyons with diverse vegetation assemblages. However, the presence of prey species (e.g., small mammals, reptiles, and amphibians) and recent prey sign (e.g., burrows, nests, middens, feces, latrines, etc.) within the study area was infrequent, potentially explaining the low raptor occupancy observed in otherwise suitable nesting habitats. This scarcity of prey may be attributed to the persistent extreme drought that has affected the region.

Fortunately, the 2022 monsoon season and 2023 snowpack have brought above-average precipitation to the region, significantly alleviating drought impacts. If mesic or hydric conditions persist, it is expected that prey populations will increase, leading to a subsequent rise in raptor activity. To better understand the dynamics of raptor nesting and occupancy, further surveys will be conducted to locate new nests and monitor the activity of known nests in the study area.

3.3 Migratory Bird Surveys

3.3.1 Introduction and Background

Acoustic bird monitoring is a powerful and non-invasive tool for studying avian species, and involves the use of audio recording devices to capture bird vocalizations in a specific area over a period of time (Abrahams, 2018). This section will provide an overview of the methods, equipment, and analytical techniques used to assess bird populations in the study area via vocal behavior. The primary aim of acoustic bird monitoring is to identify species presence and distribution patterns within the study area, while minimizing potential disturbance. Additionally, this method allows acquisition of information on the timing of bird activity, including breeding, and migration events:

- *Equipment*: Employ Wildlife Acoustics Song Meter Mini Acoustic Recorders, which are specialized recording devices designed to record bird vocalizations in the field, often over extended periods, with high-quality audio and minimal distortion.
- *Deployment*: Recorders are set up on private lands in the study area, taking into consideration habitat types, accessibility, and safety. They are mounted on trees or other structures and are positioned to minimize interference from wind, vegetation, and other sources of noise. The devices are programmed to record for five minutes every hour on a 24-hour basis for several days.
- *Data Analysis*: Analysis involves identifying the species present in the recordings and quantifying their vocal activity using Wildlife Acoustics' Kaleidoscope Pro software which streamlines analysis by offering automated species identification and various visualization options. The software also

includes tools for calculating metrics such as species richness, activity levels, and habitat use patterns.

Additionally, Encounter Transect Migratory Bird Nest Surveys occurred throughout work sites as required by Permit No. CA027EM, Section 10-D:

"In accordance with New Mexico Department of Game and Fish recommendations in a letter dated April 7, 2021, the Project area shall be surveyed for active bird nest sites (with birds or eggs present in the nesting territory), and when occupied, nest disturbance shall be avoided until young have fledged. For active nests, adequate buffer zones shall be established to minimize disturbance to nesting birds. Buffer distances shall be at least 100 feet from songbird and raven nests and 0.25 miles from raptor nests. Active nest sites in trees or shrubs that must be removed shall be mitigated by qualified biologists or wildlife rehabilitators in consultation with New Mexico Department of Game and Fish personnel."

The Encounter Transect Survey protocol, as described in the Standards for Components of British Columbia's Biodiversity No. 15 Inventory Methods, is a survey technique used to assess the presence, abundance, and distribution of songbirds (Province of British Columbia Resources Inventory Committee, 1999). This method involves establishing transects within a 110-foot buffer around work sites and actively searching for birds and nests along the transects. Actively searching is defined as attention to various signs, behaviors, and habitat features that may indicate the presence of nesting birds:

- *Vocalizations*: Listening for bird songs, calls, and alarm calls to help locate birds and lead to the discovery of their nests.
- *Behavior*: Observe behavior, such as carrying nesting material, feeding young, or exhibiting territorial defense.
- *Nest structures*: Look for various types of nest structures, such as cups, platforms, or cavities found in trees, shrubs, grasses, cliffs, or on the ground.
- *Habitat features*: Identify and focus on features that are suitable for nesting requirements such as tree cavities or dense shrubs.

3.3.2 Survey Results and Discussion

Acoustic bird monitoring results are forthcoming, as data analysis is ongoing. Specialized classifiers of known species vocalizations are being developed for use as training data required by Kaleidoscope Pro to identify species present in field recordings. To date, approximately 70 gigabytes of data consisting of nearly 6,00 recordings have been collected. Acoustic bird surveys are scheduled to occur seasonally through the duration of the Mogollon Project.

Encounter Transect Nest Surveys occurred on 5/19/22 and 9/12/22. Approximately five total miles of transects were actively searched for bird nests. No active or inactive nests were located. Encounter Transect Nest Surveys are scheduled to occur seasonally through the duration of the Mogollon Project.

3.4 Bat Surveys

3.4.1 Introduction and Background

Stationary acoustic bat surveys, following the North American Bat Monitoring Program (NABat) protocol, offer a systematic and reliable approach to monitoring bat populations and their activity patterns (Loeb et al., 2015). This non-invasive monitoring technique enables the identification of bat species present, relative abundance determinations, and distribution patterns within the study area while minimizing

disturbance to the animals and their environment. This section will introduce the rationale behind adhering to the NABat protocol and review the general methods and analytical techniques employed in conducting stationary acoustic bat surveys.

NABat is a continent-wide, standardized initiative designed to assess bat populations and trends across North America. By adhering to the NABat protocol, bat species be studied effectively within the study area, while minimizing disturbances to the bats and their environment. The results of these will ultimately support large-scale analysis, and inform effective conservation strategies for these ecologically significant species (U.S. Geological Survey, 2023a).

Stationary acoustic bat surveys, conducted using Wildlife Acoustics Song Meter SM4BAT and Song Meter Mini Bat detector devices, collected data on bat species presence, diversity, and activity levels by detecting and capturing bat echolocation calls (Wildlife Acoustics, 2023). These devices are specifically engineered to capture high-frequency ultrasonic calls emitted by bats for navigation and prey detection. Installing the detectors in preferred bat habitats enhances the accuracy and effectiveness of the data collection process. Four detectors were installed on private lands in preferred bat habitats in September 2022 and January 2023 and ran for four nights on each occasion.

Data analysis is conducted using Kaleidoscope Pro Software, a specialized tool designed to process the ultrasonic recordings collected from the bat detector devices. The software employs advanced algorithms to automatically identify bat species by analyzing their distinct echolocation calls. Upon processing the recordings, Kaleidoscope Pro generates species identification reports, enabling researchers to assess various aspects of the bat community. These include metrics such as species richness (the number of different species detected), activity levels (the frequency and intensity of bat calls), and habitat use patterns (how different bat species utilize various habitats within the study area). This comprehensive analysis provides valuable insights into the bat populations and informs conservation and management decisions.

3.4.2 Survey Results and Discussion

Acoustic bat surveys detected 20 bat species in the study area, with a total of 811 identified bat detections (Table 10). The most frequently detected species were the Brazilian Free-tailed Bat (*Tadarida brasiliensis*) with 232 detections, followed by the Western Small-footed Myotis (*Myotis ciliolabrum*) with 144 detections, and the Eastern Red Bat (*Lasiurus borealis*) with 76 detections. The least frequently detected species included the Long-eared Myotis (*Myotis evotis*) and the Pallid Bat (*Antrozous pallidus*), each with only one detection. In addition to the identified bat detections, there were 1,010 recordings with no species identification (No ID) and 4,587 recordings classified as noise. A total of 6,408 files were analyzed in this survey.

The diverse range of species detected, particularly in the months of September and January, highlights the importance of acoustic monitoring for understanding bat community composition and informing conservation efforts. The presence of a variety of bat species during these months may indicate seasonal activity patterns, migration behavior, and habitat preferences. Further acoustic bat surveys are scheduled to occur seasonally through the duration of the Mogollon Project, which will provide a deeper understanding of broad seasonal population trends and habitat use patterns.

Table 10 - Acoustic Bat Survey Results for the Mogollon Project Area, Including Species Detected and Number of Detections per Species.

Mogollon Project - Acoustic Bat Survey Results		
Common Name	**Scientific Name**	**Number of Detections**
Big Brown Bat	*Eptesicus fuscus*	14
Big Free-tailed Bat	*Nyctinomops macrotis*	4
Brazilian Free-tailed Bat	*Tadarida brasiliensis*	232
California Myotis	*Myotis californicus*	40
Canyon Bat	*Parastrellus hesperus*	20
Cave Myotis	*Myotis velifer*	3
Eastern Red Bat	*Lasiurus borealis*	76
Fringed Myotis	*Myotis thysanodes*	16
Hoary Bat	*Lasiurus cinereus*	46
Little Brown Myotis	*Myotis lucifugus*	72
Long-eared Myotis	*Myotis evotis*	1
Long-legged Myotis	*Myotis volans*	17
Pale Townsend's Big-eared Bat	*Corynorhinus townsendii*	18
Pallid Bat	*Antrozous pallidus*	1
Pocketed free-tailed bat	*Nyctinomops femorosaccus*	8
Silver-haired Bat	*Lasionycteris noctivagans*	21
Spotted Bat	*Euderma maculatum*	35
Tricolored Bat	*Perimyotis subflavus*	36
Western Small-footed Myotis	*Myotis ciliolabrum*	144
Yuma Myotis	*Myotis yumanensis*	7
	No ID	**1,010**
	NOISE	**4,587**
	Bat Detections	**811**
	Individual Recordings	**6,408**

3.5 Benthic Macroinvertebrate Surveys

3.5.1 Introduction and Background

The goal of the benthic macroinvertebrate survey is to collect and identify a representative sample of the macroinvertebrate community in a stream or river. Macroinvertebrates are organisms that are visible to the naked eye and live on the bottom of the stream, such as insects, crustaceans, and mollusks. These organisms are important indicators of stream health because they are sensitive to changes in water quality and habitat.

The New Mexico Environment Department Surface Water Quality Bureau has developed a standard operating procedure (SOP) for conducting these surveys (Montoya & Barrios, 2020). This includes selecting sampling sites, collecting samples, preserving and transporting samples, and identifying and counting macroinvertebrates. The SOP also includes guidance on how to analyze and interpret the data collected during the survey. The data can be used to calculate metrics that provide information about the health of the stream, such as the number of sensitive species present, the abundance of certain groups of organisms, and

the diversity of the macroinvertebrate community. The SOP for conducting benthic macroinvertebrate surveys includes the following steps:

- *Site selection*: The selection of the sampling sites (stream reaches) should be based on the expected variability in benthic macroinvertebrate assemblages. The variability in assemblages can be fluctuate relative to habitat and substrate types present within the sampling site. Habitat types include pools, glides, riffles, and rapids. Substrate types include sand, gravel, coarse material, and other (bedrock, hardpan, wood, aquatic vegetation).
- *Sample collection*: A standard D-frame kick net is used to collect macroinvertebrates from various habitat types in the stream reach. The samples are collected from at least 3 different collection locations within a sampling site.
- *Preservation and transport*: The collected macroinvertebrates are placed in 70% ethanol solution and transported to a laboratory for identification.
- *Sample processing*: The samples are sorted into different taxonomic groups based on morphological characteristics, and each taxonomic group is counted and recorded.
- *Data analysis*: The data are analyzed to assess the water quality of the stream by calculating various metrics such as species richness, EPT richness, Hilsenhoff Biotic Index, density, dominance, sensitive taxa, tolerant taxa, and Chironomidae abundance.

Below are explanations for the various metrics examined for this survey and how they reflect aquatic quality:

- *Species Richness:* Represents the relative total number of different taxa (i.e., species, genera, families, etc.) found in a sample site. Higher species richness indicates greater diversity and generally better water quality, as it suggests a healthier and more complex ecosystem. However, what is considered high richness can depend on factors such as the region or stream type being studied. (Leszczyska et al., 2017).
- *EPT Richness :* EPT stands for Ephemeroptera, Plecoptera, and Trichoptera, which are all orders of insects commonly used as bioindicators of stream health. This metric represents the number of EPT taxa present in a given sample. Higher EPT richness indicates better water quality, as these orders are often associated with clean, well-oxygenated water. EPT values can range from 0 to over 20, with values in the 5-10 range considered average (Watershed Science Institute, 2014).
- *Hilsenhoff Biotic Index:* A biotic index that measures the tolerance of benthic macroinvertebrates to pollution. HBI is calculated by assigning tolerance values to each taxon in the sample and calculating an index score based on the overall community. HBI values can range from 0 to 10, with higher values indicating a greater degree of organic pollution and decreased biological integrity. (Mwedzi et al., 2022). HBI values can be interpreted as follows:
    - 0-3.5: Excellent water quality
    - 3.6-5: Good water quality
    - 5.1-6.9: Moderate water quality with some level of organic pollution present
    - 7-8.5: Poor water quality
    - 8.6-10: Very poor water quality
- *Density:* The total number of individual organisms found in a sample site. Higher densities can be an indicator of good water quality if they are composed of a diverse community of benthic macroinvertebrates. In contrast, high densities of a single species can indicate a stressed ecosystem. Density can range from as low as 100 to over 5,000, with values in the 1,000-3,000-range considered average (Petrin et al., 2023).

- *Dominance:* This metric represents the proportion of the community composed of the most abundant taxon in the sample. Dominace values can range from 0 to 1, and higher dominance can indicate a stressed or degraded ecosystem, as it suggests a community dominated by a small number of organisms (Mwedzi et al., 2022).
- *Number of Sensitive Taxa:* The number of taxa that are classified as sensitive to pollution. Higher numbers of sensitive taxa can indicate better water quality, as it suggests a community composed of organisms that are sensitive to changes in water quality (Mwedzi et al., 2022).
- *% Tolerant Taxa*: Represents the percentage of the community composed of taxa that are tolerant of pollution. Higher percentages of tolerant taxa can indicate poorer water quality, as it suggests a community dominated by organisms that can tolerate changes in water quality (Mandaville, 2002).
- *% Chironomidae*: Represents the percentage of the community composed of chironomids, which are often considered as tolerant organisms. Values can range from 0 to over 90, where high values are usually indicative of polluted or disturbed conditions while low values indicate more diverse and healthy aquatic communities. However, not all chironomid taxa are tolerant, and some may indicate good water quality (Gresens et al., 2007).
- *% EPT Total*: Represents the percentage of the community composed of the orders Ephemeroptera, Plecoptera, and Trichoptera (EPT), which are often considered as sensitive to pollution and habitat degradation. Values can range from 0 to 100, where high values indicate better water quality and a more diverse and healthy aquatic community while low values indicate degraded or disturbed conditions (Watershed Science Institute, 2014).

3.5.2 Survey Results and Discussion

On September 12, 2022 Benthic macroinvertebrate surveys were conducted on private property in two stream reaches of Silver Creek: Upper Silver Creek (USC) and Lower Silver Creek (LSC). Both reaches were approximately 500 feet long and samples were collected from nine collection sites per reach. USC was located downstream of the small community of Mogollon, NM and upstream of the prominent Little Fannie Mine tailings dump that intersects Silver Creek. LSC was located downstream of Little Fannie tailings dump and upstream of the Johnson Gulch tributary. Macroinvertebrates were identified by the Sierra Stream Institute to standard taxonomic level 2 as specified by the Southwest Association of Freshwater Invertebrate Taxonomists (Richards & Rogers, 2011).

Table 11- Parameters of Upper and Lower Silver Creek, including Species Richness (S), EPT Richness (EPT), Hilsenhoff Biotic Index (HBI), Density, Dominance, No. Sensitive Taxa, % Tolerant Taxa, % Chironomidae, and % EPT Total.

Upper Silver Creek (USC)	
Parameter	**Result**
Species Richness (S)	34.00
EPT Richness (EIT)	10.00
Hilsenhoff Biotic Index (HBI)	5.53
Density (ind / sq. meter)	2,027.16
Dominance (DOM)	0.37
No. Sensitive Taxa	4.00
% Tolerant Taxa	9.14
% Chironomidae	3.78
% EPT total	75.88

Lower Silver Creek (LSC)	
Parameter	**Result**
Species Richness (S)	40.00
EPT Richness (EIT)	9.00
Hilsenhoff Biotic Index (HBI)	6.46
Density (ind / sq. meter)	1,916.05
Dominance (DOM)	0.60
No. Sensitive Taxa	3.00
% Tolerant Taxa	67.59
% Chironomidae	73.26
% EPT total	8.70

YEAR: 2022

SEASON> Fall
Stream> Silver Creek
Site> 1A Upper Silver
DATE> 9/12/2022
Method> modified EPA
EMAP #D-net-samples> 9
Total Area Surveyed (m^2)> 0.81
Split Fraction> 0.50
Split Multiplier> 2.00

Class	Order	Family	Genus and species	TV	FFG	Count:	
INSECTA	Ephemeroptera	Baetidae	Baetis	5	cg	289	
INSECTA	Ephemeroptera	Baetidae	Fallceon	6	cg	306	
INSECTA	Ephemeroptera	Heptageniidae	Afghanurus	4	g	10	
INSECTA	Ephemeroptera	Heptageniidae	Epeorus	0	g	1	
INSECTA	Ephemeroptera	Leptohyphidae	Tricorythodes	7	cg	1	
INSECTA	Ephemeroptera	Leptophlebiidae	Paraleptophlebia spp.	1	cg	3	
INSECTA	Trichoptera	Helicopsychidae	Helicopsyche	3	g	3	
INSECTA	Trichoptera	Lepidostomatidae	Lepidostoma spp.	1	sh	3	
INSECTA	Trichoptera	Leptoceridae	Oecetis	8	p	4	
INSECTA	Trichoptera	Polycentropodidae	Polycentropus	6	p	3	
INSECTA	Odonata	Aeshnidae	Oplonaeshna armata (New Mexico)	5	p	11	
INSECTA	Odonata	Coenagrionidae	Argia	7	p	30	
INSECTA	Odonata	Coenagrionidae	Enallagma	9	p	3	
INSECTA	Odonata	Libellulidae	Paltothemis lineatipes	9	p	1	
INSECTA	Hemiptera	Gerridae	Aquarius remigis	5	p	1	
INSECTA	Megaloptera	Corydalidae	Neohermes filicornis	0	p	1	
INSECTA	Coleoptera	Elmidae	Microcylloepus	4	cg	3	(1 Adult; 2 Larvae)
INSECTA	Coleoptera	Dryopidae	Postelichus	4	sh	1	(1 Adult)
INSECTA	Coleoptera	Hydraenidae	Hydraena	5	p	1	
INSECTA	Coleoptera	Dytiscidae	Sanfilippodytes	5	p	9	(4 Adults; 5 Larva)
INSECTA	Diptera	Dolichopodidae	undetermined Dolichopodidae	4	p	1	
INSECTA	Diptera	Empididae	Chelifera (=Neoplasta)	6	p	3	
INSECTA	Diptera	Muscidae	undeterminded Muscidae	6	p	1	
INSECTA	Diptera	Simuliidae	Simulium	6	cf	6	
INSECTA	Chironomidae	Tanypodinae	Ablabesmyia	6	p	1	
INSECTA	Chironomidae	Tanypodinae	Nilotanypus	6	p	1	
INSECTA	Chironomidae	Tanypodinae	Pentaneura	6	p	20	
INSECTA	Chironomidae	Tanypodinae	Thienemannimyia grp.	6	p	4	
INSECTA	Chironomidae	Tanypodinae	Zavrelimyia	6	p	3	(2 Pupua; 1 Larva)
INSECTA	Chironomidae	Chironominae	Stempellinella	6	cf	1	
INSECTA	Chironomidae	Chironominae	Virgatanytarsus	4	cg	1	
OLIGOCHAETA	undetermined	undetermined	undetermined oligochaetes	4	cg	56	
GASTROPODA	Pulmonates	Physidae	Physa	8	g	36	
HYDRACARINA	water mites	water mites	Sperchon	5	p	3	
				sum		821	

Species Richness	S	34
EPT Richness	EPT	10
Hilsenhoff Biotic Index	HBI	5.53
Density (ind / sq. meter)	ind / m2	2027
Dominance	Dom	0.373
No. Sensitive Taxa (0-1-2)	S-taxa	4
% Tolerant Taxa (7-8-9-10)	T-taxa	9.135
%Chironomidae	%C	3.776
%EPT total	%EPT	75.883

Figure 19 - Results of benthic macroinvertebrate surveys conducted on Upper Silver Creek.

YEAR: 2022 Data Set

SEASON> Fall
Stream> Silver Creek
Site> 1B Lower Silver
DATE> 9/12/2022
Method> modified EPA EMAP
#D-net-samples> 9
Total Area Surveyed (m^2)> 0.81
Split Fraction> 1.00
Split Multiplier> 1.00

Class	Order	Family	Genus and species	TV	FFG	
INSECTA	Ephemeroptera	Baetidae	Baetis	4	cg	61
INSECTA	Ephemeroptera	Baetidae	Fallceon	6	cg	52
INSECTA	Ephemeroptera	Heptageniidae	Afghanurus	4	g	1
INSECTA	Ephemeroptera	Leptohyphidae	Tricorythodes	7	cg	2
INSECTA	Trichoptera	Helicopsychidae	Helicopshe	3	g	3
INSECTA	Trichoptera	Hydropsychidae	Hydropsyche	4	cf	1
INSECTA	Trichoptera	Hydroptilidae	Hydroptila	6	ph	10
INSECTA	Trichoptera	Leptoceridae	Oecetis	8	p	3
INSECTA	Trichoptera	Rhyacophilidae	Rhyacophila ecosa grp.	0	p	2
INSECTA	Odonata	Aeshnidae	Oplonaeshna armata (New Mexico)	5	p	36
INSECTA	Odonata	Coenagrionidae	Argia	7	p	25
INSECTA	Odonata	Libellulidae	Paltothemis lineatipes	9	p	9
INSECTA	Hemiptera	Gerridae	Aquarius remigis	5	p	2
INSECTA	Hemiptera	Veliidae	Rhagovelia	6	p	1
INSECTA	Coleoptera	Dryopidae	Helichus	4	sh	1 (Adult)
INSECTA	Coleoptera	Dryopidae	Postelichus	4	sh	1 (Adult)
INSECTA	Coleoptera	Hydrophilidae	Laccobius	5	ph	1 (Adult)
INSECTA	Coleoptera	Dytiscidae	Agabus	5	p	4 (1 Larva; 3 Adults)
INSECTA	Coleoptera	Dytiscidae	Sanfilippodytes	5	p	19 (17 Larvae; 2 Adults)
INSECTA	Diptera	Ceratopogonidae	Bezzia-Palpomyia	6	p	7
INSECTA	Diptera	Ceratopogonidae	Culicoides (=Dasyhelea, correct ID)	6	p	3
INSECTA	Diptera	Dixidae	Dixa	2	cg	2
INSECTA	Diptera	Dolichopodidae	undetermined Dolichopodidae	4	p	1
INSECTA	Diptera	Empididae	Chelifera (=Neoplasta)	6	p	47 (42 Larvae; 5 pupae)
INSECTA	Diptera	Psychodidae	Maruina lanceolata	2	g	6
INSECTA	Diptera	Simuliidae	Simulium	6	cf	30 (29 Larvae; 1 Pupa)
INSECTA	Diptera	Stratiomyidae	Odontomyia (Catatasina)	5	cg	5
INSECTA	Diptera	Tabanidae	Tabanus	8	p	2
INSECTA	Chironomidae	Orthocladiinae	Cricotopus-Orthocladius complex	7	cg	56
INSECTA	Chironomidae	Orthocladiinae	Cricotopus (Nostococladius) nostocicola	7	g	933
INSECTA	Chironomidae	Orthocladiinae	Eukiefferiella brehmi grp.	8	cg	9
INSECTA	Chironomidae	Orthocladiinae	Parametriocnemus	6	cg	56
INSECTA	Chironomidae	Chironominae	Phaenopsectra	6	g	28
INSECTA	Chironomidae	Chironominae	Polypedilum	6	sh	37
INSECTA	Chironomidae	Chironominae	Rheotanytarsus	6	cf	9
INSECTA	Chironomidae	Chironominae	Tanytarsus	6	cg	9
OLIGOCHAETA	undetermined	undetermined	undetermined oligochaetes	4	cg	64
GASTROPODA	Pulmonates	Physidae	Physa	8	g	10
HYDRACARINA	water mites	water mites	Arrenurus	5	p	1
HYDRACARINA	water mites	water mites	Sperchon	5	p	3
				sum		1552

Species Richness	S	40
EPT Richness	EPT	9
Hilsenhoff Biotic Index	HBI	6.46
Density (ind / sq. meter)	ind / m2	1,916
Dominance	Dom	0.601
No. Sensitive Taxa (0-1-2)	S-taxa	3
% Tolerant Taxa (7-8-9-10)	T-taxa	67.590
%Chironomidae	%C	73.260
%EPT total	%EPT	8.698

Figure 20 - Results of benthic macroinvertebrate surveys conducted on Lower Silver Creek.

The results of the benthic macroinvertebrate surveys for USC and LSC suggest that the aquatic quality of the two stream reaches is different.

Upper Silver Creek (USC):

- High species richness (34) and EPT richness (10) suggest that the water quality is relatively good, and the ecosystem is diverse. The impact of the small upstream community of Mogollon might not be substantial enough to significantly affect these metrics.
- The Hilsenhoff Biotic Index (HBI) of 5.53 indicates moderate water quality, with some level of organic pollution. This could be due to wastewater or runoff from the small community upstream.
- High density (2,027.16 ind/sq. meter) with a relatively low dominance (0.37) implies a diverse community of macroinvertebrates, which might be less affected by the small community's potential pollution sources.
- The presence of 4 sensitive taxa and a low percentage of tolerant taxa (9.14%) further supports good water quality. The small community's impact might not be significant enough to change the overall composition of the macroinvertebrate community.
- Low percentage of Chironomidae (3.78%) and high percentage of EPT total (75.88%) indicate a healthy and diverse aquatic community, suggesting that USC is less affected by pollution or habitat degradation.

Lower Silver Creek (LSC):

- High species richness (40) but lower EPT richness (9) than USC, suggesting slightly lower water quality and a less diverse ecosystem. This might be due to the combined impact of the upstream mine tailing dumps and the small upstream community of Mogollon.
- The Hilsenhoff Biotic Index (HBI) of 6.46 indicates moderate to poor water quality with a higher level of organic pollution compared to USC. This can be attributed to the cumulative effect of pollutants from both the mine tailing dumps and the community.
- Density (1,916.05 ind/sq. meter) is slightly lower than USC, but with a higher dominance (0.60), suggesting a less diverse community of macroinvertebrates. This can be a result of pollution from the mine tailing dumps, which may have caused sensitive species to decline, leading to a less diverse community.
- The presence of fewer sensitive taxa (3) and a high percentage of tolerant taxa (67.59%) indicate poorer water quality compared to USC. This can be explained by the combined impact of pollution from the mine tailing dumps and the small community, causing a shift in the macroinvertebrate community towards more pollution-tolerant taxa.
- High percentage of Chironomidae (73.26%) and low percentage of EPT total (8.70%) indicate a less healthy and less diverse aquatic community, likely impacted by the pollution from the mine tailing dumps and the small upstream community.

In conclusion, it appears that Upper Silver Creek (USC) has relatively good water quality and a healthier aquatic ecosystem, which might be slightly influenced by the small community upstream. Lower Silver Creek (LSC), on the other hand, shows signs of pollution or habitat degradation, potentially due to the combined impact of the mine tailing dumps and the small community of Mogollon.

4. Impact Assessment

The following section aims to evaluate the potential effects of the proposed Project on wildlife and habitat resources within the study area. By utilizing the data gathered from the baseline habitat assessment and wildlife evaluation, a general assessment of direct, indirect, and cumulative impacts of the Project is provided as well as recommendations for appropriate mitigation measures to minimize any adverse consequences. This analysis is crucial in ensuring that the Project adheres to New Mexico's Mining and Minerals Division's (MMD) requirements outlined in the Part 3 Minimal Impact Permit, which emphasizes environmental protection and public health while promoting the responsible development of the state's mineral resources.

4.1 Definitions of Impacts and Effects

Clear definitions of direct, indirect, and cumulative impacts ensure a consistent understanding of the potential effects of the Project. Establishing these definitions is crucial for accurately assessing the consequences on species, their habitats, and the environment, as well as for considering the efficacy of appropriate mitigation measures:

- *Direct impacts*: These are the reasonably foreseeable immediate and primary effects of the Project on species, their habitats, or the environment (U.S. Environmental Protection Agency, 2023c). Examples of direct impacts include the loss of wildlife habitat due to construction activities, mortality or injury of wildlife caused by development-related activities, or direct disturbance to nesting, breeding, or feeding behaviors.
- *Indirect impacts*: These are the reasonably foreseeable effects of Project actions that occur later in time or are further removed in distance but are still reasonably likely to occur (U.S. Environmental Protection Agency, 2023c). Indirect impacts can be the result of a series of cause-and-effect relationships stemming from the initial action. Examples of indirect impacts include changes in land use patterns due to a new road, the spread of invasive species, or altered animal behavior due to increased human presence in a previously undisturbed area.
- *Cumulative impacts*: These represent the combined effects of multiple actions or Projects over time, including the proposed action, past actions, other current actions, and reasonably foreseeable future actions (U.S. Environmental Protection Agency, 2023c). Cumulative impacts consider the total impact on species, their habitats, and the environment, including the incremental impact of the Project when added to other past, present, and reasonably foreseeable future actions. Examples of cumulative impacts include the overall effect of multiple developments on wildlife populations and habitats, water quality, or landscape-level ecosystem changes.

Based on the evaluation of direct, indirect, and cumulative impacts, an Effects Determination will ultimately conclude with one of the following determinations (U.S. Fish and Wildlife Service, 1998):

- *No effect*: The proposed action will have no impact on species or habitat.
- *May affect, not likely to adversely affect*: The proposed action may have some impact on species or habitats, but the effects are expected to be insignificant, discountable, or wholly beneficial.
- *May affect, likely to adversely affect*: The proposed action is likely to have adverse effects on species or habitats, which may require further consultation, mitigation measures, or modification of the proposed action to minimize or avoid impacts.

4.2 Potential Impact Descriptions

In the following sub section, potential direct, indirect, and cumulative impacts of the Project on the environment, wildlife, and surrounding communities will be explored. It is important to note that these listed impacts are presented under a baseline assumption that no mitigation measures would be implemented, illustrating the potential consequences if proper management practices are not applied. This approach allows for the identification of the range of potential outcomes that may arise in the absence of proper management practices. In subsequent subsections, appropriate mitigation strategies and will be discussed to minimize or avoid adverse effects.

4.2.1 Direct Impacts:

I. *Air quality degradation*: Mineral exploration activities, such as vehicle emissions, dust generation from drilling and earth-moving, and emissions from generators, can contribute to the degradation of local air quality. This may negatively impact both wildlife and vegetation, particularly if the air pollution affects sensitive species or alters habitat conditions. Prolonged exposure to poor air quality may lead to respiratory issues and other health problems for both wildlife and nearby human populations (U.S. Environmental Protection Agency, 2023a).

II. *Altered microclimatic conditions*: The removal of vegetation and alteration of landscape features can lead to changes in microclimatic conditions, such as temperature, humidity, and wind patterns (Li et al., 2018). These changes may negatively affect species that rely on specific microclimatic conditions for their survival, growth, or reproduction. For instance, alterations in temperature and humidity may affect the availability of food resources, nesting sites, or suitable habitat for certain species.

III. *Disruption of ecological connectivity*: The construction of roads and other infrastructure associated may disrupt ecological connectivity by creating physical barriers that impede the movement of wildlife between habitats. This can result in reduced gene flow and increased isolation of wildlife populations, which may affect their long-term survival and resilience. Disrupted ecological connectivity may also hinder the ability of species to shift their ranges in response to climate change or other environmental stressors (Keeley et al., 2021).

IV. *Disturbance to wildlife*: Exploration activities, such as drilling, vehicular traffic, and the presence of personnel, can cause noise, vibrations, and artificial lighting that disturb wildlife. These disturbances may affect their behavior, breeding, and feeding patterns, leading to potential stress and population declines, particularly for sensitive species. Disturbances may also disrupt important ecological processes, such as pollination or seed dispersal, by affecting the behavior of pollinators or seed dispersers (Doherty et al., 2021).

V. *Erosion and sedimentation*: The construction of access roads, drill pads, and other infrastructure may lead to increased soil erosion and sedimentation in nearby water bodies. This can result in the loss of topsoil, the reduction of water quality, and the alteration of aquatic habitats, all of which can have detrimental effects on wildlife and vegetation (Grace, 2022). Excessive sedimentation can smother aquatic organisms, reduce light penetration in water bodies, and affect spawning habitat for fish species.

VI. *Habitat loss and fragmentation*: The construction of access roads, drill pads, and other infrastructure can lead to the direct loss or alteration of habitat, as well as fragmentation of larger ecosystems. This may result in reduced habitat availability for wildlife, altered movement patterns, and increased edge effects that can diminish the overall health and connectivity of ecosystems. Habitat fragmentation may also expose wildlife populations to increased predation, competition, and disease transmission (Haddad et al., 2015).

VII. *Increased mortality risk*: The presence of construction equipment, vehicles, and infrastructure can increase the risk of direct mortality to wildlife through collisions, entrapment, or other types of accidents. This may particularly affect slow-moving or ground-dwelling species that are more vulnerable to such hazards. Increased mortality risk may lead to localized declines in wildlife populations and reduced biodiversity in the study area (Moore et al., 2023).

VIII. *Soil and water contamination*: The use and disposal of drilling fluids, fuel, and other chemicals may lead to contamination of soil and water resources if not managed properly. Contamination can have cascading effects on ecosystems, impacting the health of plant and animal communities, and reducing the overall quality of the environment within and surrounding the Project area. Contaminated water resources may also pose risks to human health if they are used for drinking, irrigation, or recreation (Bayabil et al., 2022).

4.2.2 Indirect Impacts:

I. *Alteration of ecosystem services*: The Project may indirectly affect ecosystem services, such as pollination, seed dispersal, and nutrient cycling. These services are essential to maintaining healthy ecosystems and supporting local plant and animal populations. Disturbances caused by the Project could disrupt these services and potentially lead to cascading effects on the broader ecosystem. Conservation and restoration efforts that maintain or enhance ecosystem services can help to minimize these impacts (Kronenberg, 2014).

II. *Altered hydrology*: Construction of roads, drill pads, and other infrastructure can affect local hydrology. This may result in altered water flow patterns, increased erosion, sedimentation, or changes in the availability of water resources for wildlife and vegetation. These hydrological changes can have lasting effects on aquatic habitats, riparian zones, and the overall health and connectivity of ecosystems in the Project area. Proper design and implementation of erosion control measures, along with monitoring and adaptive management, can help to mitigate these impacts (Hasan et al., 2020).

III. *Changes in land use*: The presence of exploration may indirectly influence land use patterns in the surrounding areas. This can lead to increased development, habitat loss, fragmentation, or degradation, which in turn can affect the composition and distribution of wildlife and plant communities, and the overall ecological balance of the area. Careful planning, considering the potential indirect effects of the Project, is essential to minimize negative ecological consequences and maintain the integrity of local ecosystems (Hasan et al., 2020).

IV. *Increased human-wildlife conflict*: As the Project brings more human activity to the area, there may be an increased risk of human-wildlife conflicts, such as wildlife-vehicle collisions or habituation. This could result in harm to both humans and wildlife, however, proactive strategies such as public education, crew training, and conflict prevention measures, can help to minimize the potential for human-wildlife conflicts (International Union for Conservation of Nature (IUCN), 2022).

V. *Increased predation and disease transmission*: Changes in habitat structure and fragmentation can lead to increased exposure of certain species to predators or facilitate the spread of diseases. For example, edge habitats created by the Project may benefit certain predators or disease vectors, which could lead to an increase in predation or disease transmission among wildlife populations. Monitoring wildlife populations, as well as incorporating habitat restoration and connectivity strategies, can help to mitigate these risks (Laverty & Gibbs, 2007).

VI. *Spread of invasive species*: Disturbances caused by exploration activities, such as soil disruption and vegetation removal, can create conditions that favor the establishment and spread of invasive species. These invasive species may outcompete native species and alter ecosystems, potentially reducing biodiversity and negatively affecting habitat quality for other wildlife. Effective management

strategies, including monitoring, early detection, and eradication, are essential to control the spread of invasive species and protect native ecosystems (Meyer et al., 2021).

VII. *Wildlife displacement and habitat avoidance*: The increased presence of human activity and noise levels associated with mineral exploration Projects may cause wildlife to avoid areas near the Project site. This displacement could force species to move into less suitable habitats, increasing competition for resources and potentially affecting their survival and reproduction rates. Implementing best management practices to minimize disturbance, such as noise reduction measures and Dark Sky friendly lighting fixtures, can help to reduce wildlife displacement and maintain habitat quality (Capucchio et al., 2019).

4.2.3 Cumulative Impacts:

I. *Alteration of wildlife corridors and connectivity*: The cumulative impact of multiple seemingly unrelated actions and other land use activities may disrupt wildlife corridors and connectivity between habitats (i.e., oil and gas exploration, forest treatments, grazing activities, hunting, fishing, off-road vehicle use, camping, etc.). This can reduce genetic diversity, limit the movement of wildlife populations, and ultimately affect their long-term survival and resilience. Maintaining habitat connectivity is essential for supporting the ecological processes that sustain diverse and healthy ecosystems (DeStefano, 2009).

II. *Climate change*: Greenhouse gas emissions and fossil fuel consumption associated with exploration activities, when combined with emissions from other sources, contribute to global climate change. Climate change can have far-reaching and long-lasting effects on ecosystems, wildlife, and human communities. Changes in temperature, precipitation patterns, and the frequency of extreme weather events can alter habitat conditions and the distribution of species, as well as exacerbate existing environmental stressors (L. Reid & Lisle, 2008).

III. *Ecosystem-level changes*: The cumulative impacts of mineral exploration Projects and other land use activities can lead to significant changes in ecosystem structure and function. These changes may affect species composition, food web dynamics, nutrient cycling, and other ecological processes that maintain ecosystem health and biodiversity. Large-scale alterations to ecosystems can result in cascading effects, with consequences for the resilience and stability of ecological communities (Weber et al., 2012).

IV. *Impact on cultural and historical sites*: The combination of recreational activities, infrastructure development, and the mineral exploration Project might influence the preservation of cultural and historical sites, leading to disturbance or degradation of these sites over time. The loss or damage of these sites can have profound implications for cultural heritage, and may reduce opportunities for future research, education, and enjoyment of these important resources (Loureiro et al., 2022).

V. *Incremental habitat loss and fragmentation*: The cumulative effect of multiple Projects and other land use activities, such as forestry, grazing, recreation, residential development, agriculture, conservation, and research, can result in significant habitat loss and fragmentation at a larger scale. This affects the viability of wildlife populations and overall ecosystem health within and around the Gila National Forest. Habitat loss and fragmentation can lead to reduced biodiversity, disrupted ecosystem processes, and a decline in the provision of ecosystem services (Schultz, 2010).

VI. *Increased human-wildlife conflicts*: As human activities expand in and around Catron County, the likelihood of human-wildlife conflicts may increase. These conflicts can involve property damage, threats to human safety, and negative impacts on wildlife populations, such as increased stress, injury, or mortality. Preventing and managing human-wildlife conflicts requires collaboration among

stakeholders, as well as the implementation of effective mitigation strategies (Shackelford et al., 2018).

VII. *Increased risk of wildfires*: The combined effects of mineral exploration Projects and other human activities, such as recreational use and infrastructure development, may increase the risk of wildfires. Wildfires can have wide-ranging consequences for wildlife habitats, water resources, and air quality. Moreover, the increased frequency and severity of wildfires, in part due to climate change, can result in long-lasting changes to ecosystem structure and function (Reilly et al., 2018).

VIII. *Increased wildlife-vehicle collisions*: The development of infrastructure and transportation related to various land uses, including the mineral exploration Project, may result in habitat loss, altered animal behavior, and increased wildlife-vehicle collisions. These collisions can lead to injury or mortality for both wildlife and humans, and may have implications for wildlife populations and public safety (Hardy et al., 2008).

IX. *Cumulative water resource impacts*: The combined impacts of multiple Projects, along with other industrial, agricultural, and urban development, can contribute to the degradation of water resources. This affects water quality, quantity, and availability for wildlife, vegetation, and human use in the region. Cumulative effects on water resources may include increased sedimentation, nutrient pollution, contamination from chemicals, and altered flow regimes. These changes can negatively impact aquatic habitats, leading to declines in species richness, abundance, and distribution, as well as impairing the provision of ecosystem services, such as water filtration and flood regulation (L. M. Reid, 1998).

4.3 Minimal Impact Mitigation Measures and Best Management Practices

In the context of the previously identified potential direct, indirect, and cumulative impacts of the Project, this subsection focuses on the mitigation measures and best management practices associated with low-impact mineral exploration. Summa Silver will implement these measures to minimize potential adverse effects on the environment, wildlife, and local communities while facilitating responsible resource development (See Section 5). The following strategies address various aspects of exploration activities, reducing the overall ecological footprint, and promoting sustainable practices:

A. *Community engagement and consultation*: Engaging with local communities and stakeholders throughout the planning and implementation of exploration activities is crucial. This involvement helps address concerns, identify potential issues, and fosters a collaborative approach to environmental management. It also ensures that the interests of local communities and indigenous peoples are considered, promoting responsible development and minimizing social conflicts. Collaboration with local knowledge holders can contribute to more effective environmental stewardship and improved relationships between the mining industry and surrounding communities (Intergovernmental Working Group on the Mineral Industry, 2016).

B. *Minimizing land disturbance*: Employing low-impact drilling techniques, such as portable or track-mounted rigs, can significantly reduce land disturbance caused by exploration activities. Additionally, minimizing the size of drill pads, access roads, and other infrastructure limits the overall footprint of the Project, preserving more natural habitats and decreasing ecosystem disruption. Ensuring minimal land disturbance helps maintain the integrity of ecosystems and can contribute to quicker recovery after the completion of exploration activities (National Research Council, 2002).

C. *Noise and light reduction*: Implementing noise and light reduction measures is essential for minimizing disturbance to wildlife and nearby communities. Using quieter equipment and employing

directional lighting can help minimize negative impacts on animal behavior and community well-being (Erbe et al., 2022; Gaston et al., 2012).

D. *Planning and site selection*: Careful planning and site selection can help minimize the extent of disturbance and potential impacts on sensitive habitats and species. This process includes conducting thorough baseline environmental studies such as this evaluation, utilizing existing infrastructure whenever possible, and avoiding sensitive areas, such as wetlands, critical habitats, and cultural sites. Rigorous planning and site selection can lead to more efficient exploration activities and reduce the likelihood of unforeseen environmental or social issues (Davies et al., 2021).
E. *Reclamation and restoration*: Prompt and effective reclamation and restoration of disturbed areas are essential for minimizing long-term impacts. This process may include re-contouring and re-vegetating disturbed areas, removing infrastructure once it is no longer needed, and monitoring the success of restoration efforts to ensure the recovery of ecosystems and habitats. Successful reclamation and restoration can result in the return of native plant and animal species, while also reducing the risk of soil erosion, invasive species establishment, and other long-term environmental issues (Association for Mineral Exploration, 2020).
F. *Waste management*: Proper waste management practices, such as containment and disposal of drilling fluids and cuttings, are vital for minimizing environmental contamination. Recycling and reusing materials whenever possible can also help reduce the overall waste generated by the Project, further decreasing its environmental footprint. Effective waste management contributes to the protection of soil, water, and air quality and supports the overall health of ecosystems and communities in the Project area (Tayebi-Khorami et al., 2019).
G. *Water management*: Implementing effective water management strategies, such as minimizing water usage and recycling water whenever possible, helps reduce the potential impacts on local water resources. This approach conserves valuable water resources and protects aquatic ecosystems from degradation. Proactive water management can help maintain water quality, support the health of aquatic and riparian habitats, and reduce conflicts with other water users (U.S. Forest Service, 2012).

4.4 Effects Determination

Based on the comprehensive evaluation of potential direct, indirect, and cumulative impacts associated with the Project, and considering the implementation of Minimal Impact Mitigation Measures and Best Management Practices, the Effects Determination for the Project is as follows:

May Affect, Not Likely to Adversely Affect

The Project may have some impact on species or habitats, but these impacts are anticipated to be limited due to the rigorous implementation of low-impact mineral exploration practices and compliance with Part 3 Minimal Impact Permit stipulations. By utilizing carefully planned site selection and avoidance of sensitive areas, the Project minimizes direct disturbances to key habitats and reduces the likelihood of harming wildlife species. Additionally, the use of low-impact drilling techniques and infrastructure design will reduce land disturbance and the overall ecological footprint of the exploration activities.

Incorporating waste and water management strategies into the Project will help to prevent contamination of soil and water resources, maintaining the overall health of the ecosystem. Noise and light reduction measures will also be implemented to mitigate disturbance to wildlife and nearby communities, ensuring minimal disruption to natural behaviors and promoting coexistence between the Project and its surroundings.

Reclamation and restoration efforts will be prioritized to address any temporary disturbances caused by the Project, promoting the recovery of impacted habitats and reducing long-term effects on the environment. Regular monitoring of the Project site will enable the identification and rectification of any unforeseen impacts, further ensuring that adverse effects are minimized or avoided.

Community engagement and consultation throughout the planning and implementation process will enable the Project to address concerns and potential issues, fostering a collaborative approach to environmental management. This commitment to open communication and transparency will help build trust and support among local stakeholders.

By diligently adhering to the stipulations of the Part 3 Minimal Impact Permit and employing best management practices, the Project demonstrates a robust commitment to responsible mineral exploration. The potential effects on the environment, wildlife, and local communities are expected to be insignificant, discountable, or wholly beneficial as a result of these measures. This determination reflects confidence in the ability of the Project to be conducted in an environmentally responsible manner, minimizing or avoiding significant negative impacts on the ecosystem and its inhabitants through conscientious planning, execution, and monitoring.

5. Mitigation Action Matrix

The following section presents a Mitigation Action Matrix designed to outline and detail Best Management Practices (BMPs) for various aspects of the Project. The BMPs have been developed, based on Part 3 Minimal Impact Permit compliance measures, with the goal of minimizing potential adverse impacts on the environment, wildlife, and local communities. The plan encompasses a range of areas, including Borehole and/or Well Abandonment (Table 12), Cultural and Paleontological (Table 13), General Obligations - Work Sites (Table 14), Disturbance (Table 15), Noxious Weeds & Invasive Species (Table 16), Permit Area Access Description (Table 17), Project Completion Timeline/Termination Report (Table 18) Requirements, Reclamation and Revegetation (Table 19), and Wildlife Conservation (Table 20).

The Mitigation Action Matrix serves as a comprehensive guide for the Project team to ensure that all BMPs are followed throughout the duration of the Project. The BMPs outlined in the matrix have been carefully developed with the goal of minimizing any potential adverse impacts that the Project may have on the environment, wildlife, and local communities. By adhering to these BMPs, the Project team can ensure that they are operating in a manner that is environmentally responsible and sustainable. As such, the BMPs presented in the matrix are not optional but are mandatory for compliance with the permit. The Project team must ensure that all BMPs are followed at all times and that any deviations from the plan are documented and reported to the appropriate regulatory authorities. By doing so, the Project team can operate with the confidence that they are doing their part to protect the environment and minimize any potential adverse impacts on the local community.

Table 12 - Mitigation Action Matrix Guidelines for Permit Obligations and Best Management Practices for Borehole and Well Abandonment.

Borehole and /or Well Abandonment **This matrix describes general permit obligations regarding borehole abandonment procedures and mitigation**		
Permit Stipulation	**Stipulation Details**	**Best Management Practices (BMPs)**
The permittee shall close and abandon all exploratory boreholes, including all wells, within one (1) year of the permit issuance date.	• Each dry borehole shall be plugged from total depth with a column of high-density bentonite clay of sufficient composition, density, weight, and viscosity to form an impermeable plug unless another material is approved by the New Mexico Office of the State Engineer (NMOSE). • Bentonite shall be hydrated according to the manufacturer's requirements, and emplaced from the bottom upwards, to approximately 12 feet of the original ground surface. • A I0-foot column of cement shall then be added to within approximately 2 feet of the ground surface. • The remaining hole shall be backfilled with topdressing from above the cement plug to the original ground surface. • If a water-bearing stratum is encountered, the borehole shall be plugged before the drill rig is removed from the site and must satisfy the requirements of the NMOSE and the New Mexico Environmental Department (NMED) for proper plugging of such holes. • The hole shall be permanently plugged and abandoned as soon as is practical after drilling is complete.	✓ Wet hole abandonment (option 1): Neat cement slurry, mixed according to the manufacturer's recommendations, emplaced with a tremie pipe from total depth to within 2 feet of the original ground surface, followed by 2 feet of topsoil/topdressing. ✓ Wet hole abandonment (option 2): High-density bentonite clay (≥ 20% active solids; i.e., QUIK-GROUT® manufactured by Baroid Industrial Products), mixed according to the manufacturer's recommendations, emplaced with a tremie pipe from total depth to within 12 feet of the original ground surface, followed by 10 feet of neat cement, followed by 2 feet of topsoil/topdressing.
If groundwater is encountered, the boreholes shall be considered wells and shall be permitted and sealed pursuant to the NMOSE's Rules and Regulations.	• Permittee must consult with NMOSE personnel before plugging wet boreholes. • Well plugging records shall be sufficiently detailed to document plugging methodology, the proper constitution of approved sealant, and that an adequate volume of sealant was used to meet theoretical volumes of plugged intervals shall be provided to NMOSE and copied to MMD.	

Table 13 - Mitigation Action Matrix Guidelines for Permit Obligations and Best Management Practices for Borehole and Well Abandonment.

Cultural and Paleontological **This section describes general permit obligations regarding archeological conservation**		
Permit Stipulation	**Stipulation Details**	**Best Management Practices (BMPs)**
Protect such cultural items as human remains, associated funerary objects, sacred objects, and objects of cultural patrimony discovered inadvertently during the course of Project implementation.	• If cultural items previously listed are discovered during Project work, the permittee shall immediately halt the disturbance and contact the office of the medical investigator and the local law enforcement agency within 24 hours.	• An archeological survey was completed before Project implementation, and the discovery of cultural items is not anticipated. • If cultural items are discovered, disturbance shall immediately halt. The office of the medical investigator and local law enforcement will be contacted within 24 hours.

Table 14 - Mitigation Action Matrix Guidelines for Permit Obligations and Best Management Practices for General Obligations Regarding Work Sites.

General Obligations - Work Sites **This matrix describes general permit obligations regarding work sites and the degree to which they can be manipulated and utilized**	
Permit Stipulation	**Best Management Practices (BMPs)**
Disturb no more than 4.9 acres of total cumulative disturbance.	✓ Multiple HQ diameter, angled exploration holes will be completed for each pad following the listed permit stipulations.
Drill pad surface disturbance areas, no greater than 50'W X 50'L.	
Each borehole shall be a maximum of 5 inches in nominal outside diameter and up to 2,000 feet in depth each.	
Reclamation of the disturbed areas shall be initiated as soon as possible and completed in accordance with the schedule.	

Table 15 - Mitigation Action Matrix Guidelines for Permit Obligations and Best Management Practices for Ground Disturbance Procedures and Mitigation.

Disturbance **This section describes general permit obligations regarding ground disturbance procedures and mitigation**		
Permit Stipulation	**Stipulation Details**	**Best Management Practices (BMPs)**
A minimum setback of I00 feet away from any watercourse within the Permit Area is required.	• Watercourse means any channel having definable beds and banks capable of conducting generally confined runoff from adjacent lands. During floods, water may leave the confining beds and banks, but under normal flows, water is confined within the channel. A watercourse may be perennial, intermittent, or ephemeral. • No drilling or storage of fuels or chemicals shall occur within any watercourse. • No excavation or filling shall occur within any watercourse until the required permits or consultations are obtained.	✓ Fuel for heavy equipment and the drill rig will be brought on-site in clearly labeled fuel tanks mounted in the bed of a 4x4 pickup. ✓ Smaller, more mobile equipment will be fueled off-site. ✓ Any lubricants or hydraulic fluids needed for operations will be stored in small quantities within vehicles in clearly labeled containers. ✓ No drilling shall take place within any watercourse. ✓ No excavation or filling shall occur within any watercourse until the required permits or consultations are obtained (i.e., stream alteration permit).
Erosion Control	• Implement best management practices to control erosion.	✓ Berms/dikes/dams constructed around the perimeter of drill pads. ✓ Drill pads will be constructed with no more than a 2% grade to minimize runoff. ✓ Reconstructed slopes will have a minimal length and gradient. ✓ Reclamation of drill pads will include revegetation with native species. ✓ Re-vegetation seed rows will be established perpendicular to the slope to minimize erosion.
Appropriate spill clean-up materials, such as absorbent pads, shall be available on-site at all times during road construction, site preparations, and drilling activities.	• Drop cloths or plastic tarps will be placed and secured under rigs while drilling. • Drop cloths or plastic tarps will be placed and secured under rigs immobilized, staged, or temporarily stored equipment parked for durations extending longer than 48 hours. • Report all spills immediately to the New Mexico Environment Department.	✓ Drill samples will be taken off-site for analysis. ✓ The drilling fluid/mud is not considered hazardous and will be contained in an appropriately labeled aboveground mobile storage tank. ✓ Any lubricants or hydraulic fluids needed for operations will be stored in small quantities within vehicles in clearly labeled containers. ✓ Spill kits (bentonite clay or cat litter; Absorbent pads, rolls, mats, socks, pillows, dikes, etc.; drum or barrel for containing contaminated soil/adsorbent materials) will be maintained on-site within designated vehicles and on the drilling rig. ✓ Personnel on-site will receive training on BMPs. ✓ De minimis spills (<25 gallons) will be cleaned up with absorbent materials, and the materials will be disposed of properly. ✓ Reportable spills (>25 gallons) will be reported to the Environmental Protection Agency Spill Reporting Center and the New Mexico Environment Department.
Any water, drill cuttings, mud and drilling additives, and/or fluids produced from the exploration borehole shall be contained entirely within the Permit Area at all times.	• Mud pits, disposal pits, sumps, or above-ground tanks shall be sized to contain the calculated volume of drill cuttings and all drilling fluids and any produced water. • Discharge of any drilling fluids to the ground surface or an ephemeral watercourse may violate the Clean Water Act and is prohibited. • All drilling cores and any excess drill cuttings shall be collected and disposed of properly.	✓ Drill cuttings be buried at each drill site location.
Shall maintain current Material Safety Data Sheets (MSDS) for drilling additives and any other chemicals to be used and made available for review upon request.	• Obtain and possess current MSDS documentation for drilling additives and any other chemicals to be used throughout the operation, including exploration and reclamation activities, and made available for review upon request.	✓ MSDS documentation shall be obtained and in possession to be made available for review upon request.

Table 16 - Mitigation Action Matrix Guidelines for Permit Obligations and Best Management Practices for Noxious Weeds & Invasive Species.

Noxious Weeds & Invasive Species **This section describes general permit obligations regarding noxious weed prevention**		
Permit Stipulation	**Stipulation Details**	**Best Management Practices (BMPs)**
All heavy equipment to be used within the Permit Area shall be thoroughly pressure washed and/or steam cleaned prior to introducing any equipment into the Permit Area in order to help prevent the introduction of non-native species.	• This cleaning shall remove all soil, seed, vegetative matter, or other debris that could contain or hold seed or plant parts. • Any heavy equipment that subsequently operates outside this Permit Area shall be treated the same as during the initial mobilization onto the Permit Area. • Equipment shall be considered free of soil, seed, and plant debris when a visual inspection does not detect such material.	✓ All heavy equipment to be used within the Permit Area shall be thoroughly pressure washed prior to entering the Permit Area. ✓ The drill program will be staged from an off-site location. ✓ Vehicles and equipment will be parked on existing roads or on permitted drill pads while on-site.

Table 17 - Mitigation Action Matrix Guidelines for Permit Obligations and Best Management Practices for Permit Area Access.

Permit Area Access Description **This table describes how access routes to and within the permitted Project area are specified and the degree to which they can be manipulated**		
Permit Stipulation	**Stipulation Details**	**Best Management Practices (BMPs)**
Regarding roadway widths of existing roads that do not require any modification or improvement.	• Vehicle travel and/or disturbance outside the width of existing roads is prohibited unless stated below.	✓ Access to the permitted Project area is provided via the existing road in Graveyard Gulch.
Regarding existing roads that require modification or improvement.	• Existing roadways that require modification or improvement are allowed disturbance within 10 feet of *either* existing edge *or* within 5 feet of both existing edges.	✓ Road construction and widening will be completed using a bulldozer, wheel loader, backhoe, and track excavator. ✓ Equipment and operations will be maintained with light service vehicles (pick-ups), water tender, and lube/fuel truck. ✓ Construction will be located to minimize land and wildlife disturbance and enhance stability. ✓ Road stability will be maintained by following land contours to the extent possible and using road building BMPs (i.e., constructing water turn-outs and water bars at suitable intervals). ✓ Road construction and widening locations are selected to utilize natural features (i.e., avoid drainages, excessively steep slopes, and loose soil material). ✓ Engineering methods are employed under BLM/USFS Gold Book for Road Construction guidelines. ✓ If road construction or widening occurs in loose soil or tailings, adequate steps will be taken to ensure road stability (i.e., import of rip-rap and filter fabric to stabilize soil and avoid head-cuts, frequent installation of water bars). ✓ If culverts are required, drawings of culvert crossings will be provided to the New Mexico Mining and Minerals Division. Culverts will not be installed without approval by the Division. ✓ If culverts are installed, they will be removed upon completion of the Project or road segment, and the area will be re-contoured and revegetated.
Regarding new roads to be constructed.	• New construction of roadways allowed disturbance within 10 feet of road centerline.	✓ SEE ABOVE BMPs
Regarding overland travel.	• No overland travel is permitted to avoid unnecessary disturbance to natural resources.	✓ Access will be limited to routes described in the permit modification.

Table 18 - Mitigation Action Matrix Guidelines for Permit Obligations and Best Management Practices for Project Completion and Reporting Requirements .

Project Completion Timeline/Termination Report Requirements **This section describes general permit obligations regarding Project completion**		
Permit Stipulation	**Stipulation Details**	**Best Management Practices (BMPs)**
The Permittee shall close and abandon all exploratory boreholes, including all wells, within one (1) year of the date of permit issuance.	-	✓ Follow permit stipulation.
The Permittee shall submit a termination report at the conclusion of the exploration operation unless the Permittee has applied for renewal of the exploration permit or applied for a mining operation permit.	-	✓ Follow permit stipulation.
The termination report shall contain, at a minimum:	• A description of the reclamation measures utilized. • Evidence of the seed mix (seed tags from bags) and its application rate utilized. • Photographs of the reclaimed areas, including any BMPs utilized by the Permittee during exploration. • Global positioning system (GPS) coordinates for the drill pads, drill holes, and/or well locations drilled. • Copies of the drill hole abandonment and plugging records and forms that includes an affidavit signed by a certified driller, engineer, or the Project geologist, attesting to the fact that the holes have been plugged and abandoned according to the requirements of this permit.	✓ Follow permit stipulation.

Table 19 - Mitigation Action Matrix Guidelines for Permit Obligations and Best Management Practices for Reclamation and Revegetation.

Reclamation and Revegetation **This section describes general permit obligations regarding work site reclamation procedures**		**Best Management Practices (BMPs)**
Notify MMD at least 30 days prior to initiating any reclamation.	-	✓ Follow permit stipulation.
The seed mix and application rate presented in Section 7 of the PAP shall be implemented and shall be certified as weed-free.	-	
Reclamation of disturbed areas shall occur concurrently or directly after the completion of drilling operations as weather and field conditions allow.	-	✓ Reclamation of drill pads will be conducted upon completion of drilling activities within 90 days of final assay results. ✓ Reclamation of drill pads will include revegetation with native species. ✓ Re-vegetation seed rows will be established perpendicular to the slope to minimize erosion.
All lands, including overland access routes or terrain damaged in gaining access to or clearing the drill sites, or lands where vegetation is substantially disturbed or whose natural state has been substantially disturbed as a result of the exploration drilling, shall be restored as nearly as possible to their original condition and reseeded and mulched utilizing an appropriately certified weed-free, pure live seed mixture of native cool- and warm season grasses and shrubs beneficial to livestock and wildlife.	• Then raked, disked, or deep-scarified before seeding, to prepare a suitable seedbed for seed germination and root growth. • The seed mixture shall be broadcast sown immediately after site recontouring and seedbed preparation has been completed while the soil surface is still friable. • After the seed mix has been sown, the soil shall be dragged with a chain or harrow or raked into the surface using hand tools to cover the seed. • Each reclaimed site shall be mulched with certified weed-free straw or other mulching materials approved by MMD and then crimped or tacked in place. • Reclaimed areas not seeded before or during the summer shall be seeded in late fall to maximize the probability of successful revegetation. • Within any areas prohibitive to ripping or scarification, the seed shall be hand- or broadcast sown immediately after site re-contouring and seedbed preparation at an application rate double that of the rate prescribed and then raked into the soil and mulched.	✓ Disturbed areas will be returned to their original contour during reclamation as much as practicable. ✓ Stockpiled topsoil will be re-applied to the area from which it was removed upon completion of re-contouring disturbed areas. ✓ Soil application will be performed with a front-end loader or excavator. ✓ The topsoil will be smoothed and scarified to provide a good seed bed. ✓ Small seed rows will be created perpendicular to the slope of the land to slow storm water run-off, promote infiltration, and create micro-habitats conducive to seed germination. ✓ Use certified “Free of Noxious Weeds” New Mexico Mining and Minerals Division seed mixture. ✓ Chain drag or tire drag over seeds in areas used for overland travel ✓ Light raking of soil over seeds in areas used for overland travel.

Reclamation and Revegetation This section describes general permit obligations regarding work site reclamation procedures		
		Best Management Practices (BMPs)
Any salvaged topsoil material that is suitable as a plant growth medium, shall be spread over the surface of the drill site, including any other heavily compacted areas.	-	✓ Before any grading/blading or similar activities occur in relation to this Project, the operator agrees to salvage and preserve all topsoil and topdressing for use in future reclamation of this Project. ✓ Topsoil will be salvaged prior to initiation of exploration activities topsoil will be salvaged prior to initiation of exploration activities excavated from drill pads and stored at each drill pad excavated from road improvements/construction and stored adjacent to the road.
Sites will be considered reclaimed and eligible for release of financial assurance, once the following criteria have been met.	• Has re-seeded areas of disturbance. • No significant erosion is evident on reclaimed areas • All drill holes have been plugged and abandoned as described in the plugging plan.	✓ Reclamation activities will proceed as described in Section 7.0 Part B. ✓ All disturbed areas will be re-contoured, covered with topsoil, prepped, and seeded with a mixture approved by the New Mexico Mining and Minerals Division. ✓ Seed mixtures will be certified “Free of Noxious Weeds.” ✓ Seeding and scarifying will be conducted with the contour, to minimize erosion. ✓ Revegetation efforts will be monitored and areas which fail to establish perennial vegetation will be re-seeded.

Table 20 - Mitigation Action Matrix Guidelines for Permit Obligations and Best Management Practices for Wildlife Conservation.

Wildlife Conservation This section describes general permit obligations regarding wildlife conservation		
Permit Stipulation	**Stipulation Details**	**Best Management Practices (BMPs)**
The Project area shall be surveyed for active bird nest sites.	• When occupied, nest disturbance shall be avoided until young have fledged. • For active nests, adequate buffer zones shall be established. • Buffer distances shall be at least I00 feet from songbird and raven nests and 0.25 miles from raptor nests.	✓ Conduct nest searches of each worksite before any work operations begin.
Mexican Spotted Owl (MSO) - all drilling and disturbance activities should be performed outside of the breeding and fledgling-dependency period of March 1 through August 31.	-	✓ All drilling and disturbance activities should be performed outside of the breeding and fledgling-dependency period. ✓ MSO surveys will be conducted by permitted staff in accordance with US Fish & Wildlife protocols.
Netting used for the preclusion of wildlife shall be constructed of a sturdy plastic or metal material and adequately supported so that it will not contact the liquid surface if sagging occurs.	• Monofilament mesh shall not be used, as it can entangle birds and reptiles, causing mortalities. • Plastic or metal netting shall be anchored to the ground and maintained taut. If the mesh size is greater than one inch, it shall be wrapped with an additional finer mesh material around the bottom (up to approximately 12 inches) to exclude reptiles and small mammals.	✓ Mud pits are not anticipated, but temporary fences will be installed around shallow cutting sumps. ✓ Chain link or high-visibility orange safety fencing with mesh size less than one inch will be used. ✓ Temporary sump fences will be secured with either T-posts or wooden stakes, depending on the fencing material. ✓ At least one side of the interior of the drill pits be sloped at 3:1 as a ramp for wildlife escape.

References Cited

Abrahams, C. (2018). Bird Bioacoustic Surveys – developing a standard protocol. *In Practice*, *102*(102).

Association for Mineral Exploration. (2020). *Reclamation Guide for Mineral Exploration*. https://amebc.ca/wp-content/uploads/2020/08/Reclamation-Guide-Mineral-Exploration.pdf

Bayabil, H. K., Teshome, F. T., & Li, Y. C. (2022). Emerging Contaminants in Soil and Water. *Frontiers in Environmental Science*, *10*, 265. https://doi.org/10.3389/FENVS.2022.873499/BIBTEX

Capucchio, M. T., Colombino, E., Tarantola, M., Biagini, D., Alborali, L. G., Maisano, A. M., Scali, F., Raspa, F., Valle, E., Biasato, I., Schiavone, A., Salogni, C., Bar, V., Gili, C., Guarda, F., Capucchio, M. T., Colombino, E., Tarantola, M., Biagini, D., … Guarda, F. (2019). The Disturbed Habitat and Its Effects on the Animal Population. *Animal Behaviour [Working Title]*. https://doi.org/10.5772/INTECHOPEN.84872

Davies, R. S., Davies, M. J., Groves, D., Davids, K., Brymer, E., Trench, A., Sykes, J. P., & Dentith, M. (2021). Learning and Expertise in Mineral Exploration Decision-Making: An Ecological Dynamics Perspective. *International Journal of Environmental Research and Public Health*, *18*(18). https://doi.org/10.3390/IJERPH18189752

DeStefano, S. (2009). Wildlife corridors and developed landscapes. *The Planner's Guide to Natural Resource Conservation: The Science of Land Development Beyond the Metropolitan Fringe*, 85–102. https://doi.org/10.1007/978-0-387-98167-3_5/COVER

Doherty, T. S., Hays, G. C., & Driscoll, D. A. (2021). Human disturbance causes widespread disruption of animal movement. *Nature Ecology & Evolution 2021 5:4*, *5*(4), 513–519. https://doi.org/10.1038/s41559-020-01380-1

EMNRD- Forestry Division. (2017). *New Mexico Rare Plant Conservation Strategy*. https://www.emnrd.nm.gov/sfd/wp-content/uploads/sites/4/NMRarePlantConsStrategy_Final_reduced.pdf

Erbe, C., Dent, M. L., Gannon, W. L., McCauley, R. D., Römer, H., Southall, B. L., Stansbury, A. L., Stoeger, A. S., & Thomas, J. A. (2022). The Effects of Noise on Animals. *Exploring Animal Behavior Through Sound: Volume 1*, 459–506. https://doi.org/10.1007/978-3-030-97540-1_13

Gaston, K. J., Davies, T. W., Bennie, J., & Hopkins, J. (2012). Reducing the ecological consequences of night-time light pollution: options and developments. *The Journal of Applied Ecology*, *49*(6), 1256–1266. https://doi.org/10.1111/J.1365-2664.2012.02212.X

Grace, J. M. (2022). Sediment Movement from Forest Road Systems Roads: a major contributor to erosion and stream sedimentation. *American Society of Agricultural Engineers*, *13*(14). https://www.srs.fs.usda.gov/pubs/ja/ja_grace010.pdf

Gresens, S. E., Belt, K. T., Tang, J. A., Gwinn, D. C., & Banks, P. A. (2007). Temporal and spatial responses of Chironomidae (Diptera) and other benthic invertebrates to urban stormwater runoff. *Hydrobiologia*, *575*(1). https://doi.org/10.1007/s10750-006-0366-y

Haddad, N. M., Brudvig, L. A., Clobert, J., Davies, K. F., Gonzalez, A., Holt, R. D., Lovejoy, T. E., Sexton, J. O., Austin, M. P., Collins, C. D., Cook, W. M., Damschen, E. I., Ewers, R. M., Foster, B. L., Jenkins, C. N., King, A. J., Laurance, W. F., Levey, D. J., Margules, C. R., … Townshend, J. R. (2015). Habitat fragmentation and its lasting impact on Earth's ecosystems. *Science Advances*, *1*(2). https://doi.org/10.1126/SCIADV.1500052/SUPPL_FILE/E1500052_SM.PDF

Hardy, a., Kociolek, a., Clevenger, A. p., Smith, D., Ament, R., Fuller, J., Huijser, M. P., & McGowen, P. (2008). Wildlife-Vehicle Collision Reduction Study: Report to Congress. *Fhwa-Hrt-08-034*, *70*(August).

Hasan, S. S., Zhen, L., Miah, M. G., Ahamed, T., & Samie, A. (2020). Impact of land use change on ecosystem services: A review. *Environmental Development*, *34*, 100527. https://doi.org/10.1016/J.ENVDEV.2020.100527

Intergovernmental Working Group on the Mineral Industry. (2016). *Good Practices in Community Engagement and Readiness Second Edition Compendium of Case Studies from Canada's Minerals And Metals Sector*. https://natural-resources.canada.ca/sites/nrcan/files/mineralsmetals/files/pdf/rmd-rrm/GoodPractices2ed_En.pdf

International Union for Conservation of Nature (IUCN). (2022). *IUCN website IUCN issues briefs: Twitter: @IUCN www.iucn.org www.iucn.org/issues-briefs HUMAN-WILDLIFE CONFLICT*. https://www.iucn.org/sites/default/files/2022-06/iucn-issues-brief-human-wildlife-conflict_final.pdf

Keeley, A. T. H., Beier, P., & Jenness, J. S. (2021). Connectivity metrics for conservation planning and monitoring. *Biological Conservation*, *255*. https://doi.org/10.1016/J.BIOCON.2021.109008

Kronenberg, J. (2014). Environmental Impacts of the Use of Ecosystem Services: Case Study of Birdwatching. *Environmental Management*, *54*(3), 617. https://doi.org/10.1007/S00267-014-0317-8

Laverty, M. F., & Gibbs, J. P. (2007). *Network of Conservation Educators & Practitioners Ecosystem Loss and Fragmentation: Synthesis*. *1*, 72–96. http://ncep.amnh.org/linc

Leszczyska, J., Gowacki, L., & Grzybkowska, M. (2017). Factors shaping species richness and biodiversity of riverine macroinvertebrate assemblages at the local and regional scale. *Community Ecology*, *18*(3). https://doi.org/10.1556/168.2017.18.3.1

Li, X., Mitra, C., Dong, L., & Yang, Q. (2018). Understanding land use change impacts on microclimate using Weather Research and Forecasting (WRF) model. *Physics and Chemistry of the Earth*, *103*, 115–126. https://doi.org/10.1016/j.pce.2017.01.017

Loeb, S. C., Rodhouse, T. J., Ellison, L. E., Lausen, C. L., Reichard, J. D., Irvine, K. M., Ingersoll, T. E., Coleman, J. T. H., Thogmartin, W. E., Sauer, J. R., Francis, C. M., Bayless, M. L., Stanley, T. R., & Johnson, D. H. (2015). *A Plan for the North American Bat Monitoring Program (NABat)*. www.srs.fs.usda.gov

Loureiro, S. M. C., Al-Ansi, A., Ryu, H. B., Ariza-Montes, A., & Han, H. (2022). Culture, heritage looting, and tourism: A text mining review approach. *Frontiers in Psychology*, *13*, 4874. https://doi.org/10.3389/FPSYG.2022.944250/BIBTEX

Mandaville, S. M. (2002). *Benthic Macroinvertebrates in Freshwaters-Taxa Tolerance Values, Metrics, and Protocols (Professional Lake Manage.) (Project H-1) Soil & Water Conservation Society of Metro Halifax Email: limnes@chebucto.ns.ca Master Homepage: http://chebucto.ca/Science/SWCS/SWCS.html*. http://chebucto.ca/Science/SWCS/SWCS.html

Meyer, S. E., Callaham, M. A., Stewart, J. E., & Warren, S. D. (2021). Invasive Species Response to Natural and Anthropogenic Disturbance. *Invasive Species in Forests and Rangelands of the United States*, 85–110. https://doi.org/10.1007/978-3-030-45367-1_5/FIGURES/4

Montoya, E., & Barrios, K. (2020). *Title: Benthic Macroinvertebrate Sampling BENTHIC MACROINVERTEBRATE SAMPLING Approval Signatures Eliza Montoya Subject Matter Expert Date Miguel Montoya Quality Assurance Officer Date Kristopher Barrios Program Manager-Monitoring, Assessment, and Standards Section Date*.

Moore, L. J., Petrovan, S. O., Bates, A. J., Hicks, H. L., Baker, P. J., Perkins, S. E., & Yarnell, R. W. (2023). Demographic effects of road mortality on mammalian populations: a systematic review. *Biological Reviews*. https://doi.org/10.1111/BRV.12942

Mwedzi, T., Mangadze, T., Chakandinakira, A. T., & Bere, T. (2022). Stream biomonitoring: The role of diatoms, macroinvertebrates, and fish. *Emerging Freshwater Pollutants: Analysis, Fate and Regulations*, 9–24. https://doi.org/10.1016/B978-0-12-822850-0.00008-9

National Research Council. (2002). Evolutionary and Revolutionary Technologies for Mining. In *Evolutionary and Revolutionary Technologies for Mining*. National Academies Press. https://doi.org/10.17226/10318

Natural Heritage New Mexico. (2023a). *Home | EnviroData-NM*. https://nmedb.org/

Natural Heritage New Mexico. (2023b). *Tools for Biodiversity Conservation | Natural Heritage New Mexico*. https://nhnm.unm.edu/data

New Mexico Department of Game and Fish. (2006). *Comprehensive wildlife conservation strategy for New Mexico*.

New Mexico Department of Game and Fish. (2019). *Baseline Wildlife Study Guidelines*. https://ecos.fws.gov/ipac/.

New Mexico Department of Game and Fish. (2023a). *BISON-M*. https://bison-m.org/

New Mexico Department of Game and Fish. (2023b). *Home | New Mexico Environmental Review Tool*. https://nmert.org/

New Mexico Mining and Minerals Division. (2023a). *CA027EM Summa Silver Mogollon - Mining and Minerals*. https://www.emnrd.nm.gov/mmd/mining-act-reclamation-program/pending-and-approved-exploration-applications/minimal-impact/ca027em-summa-silver-mogollon/

New Mexico Mining and Minerals Division. (2023b). *MMD Home - Mining and Minerals*. https://www.emnrd.nm.gov/mmd/

Petrin, Z., Jensen, T. C., Lungrin, E., & Eikland, K. A. (2023). Road effects on benthic macroinvertebrate assemblages in boreal headwater streams. *Science of the Total Environment, 855*. https://doi.org/10.1016/j.scitotenv.2022.158957

Province of British Columbia Resources Inventory Committee. (1999). *Inventory Methods for Forest and Grassland Songbirds*. www.publications.gov.bc.ca

Province of British Columbia Resources Inventory Committee. (2001). *Inventory Methods for Raptors Standards for Components of British Columbia's Biodiversity No. 11 Prepared by Ministry of Sustainable Resource Management Environment Inventory Branch for the Terrestrial Ecosystems Task Force Resources Inventory Committee*. www.publications.gov.bc.ca

Reid, L., & Lisle, T. (2008). *Cumulative Effects and Climate Change | Climate Change Resource Center*. https://www.fs.usda.gov/ccrc/topics/cumulative-effects

Reid, L. M. (1998). Cumulative Watershed Effects and Watershed Analysis. In *River Ecology and Management*. https://doi.org/10.1007/978-1-4612-1652-0_19

Reilly, M. J., Elia, M., Spies, T. A., Gregory, M. J., Sanesi, G., & Lafortezza, R. (2018). Cumulative effects of wildfires on forest dynamics in the eastern Cascade Mountains, USA. *Ecological Applications*, *28*(2). https://doi.org/10.1002/eap.1644

Richards, A. B., & Rogers, D. C. (2011). *Southwest Association of Freshwater Invertebrate Taxonomists (SAFIT) List of Freshwater Macroinvertebrate Taxa from California and Adjacent States including Standard Taxonomic Effort Levels*.

Schultz, C. (2010). Challenges in Connecting Cumulative Effects Analysis to Effective Wildlife Conservation Planning. *BioScience*, *60*(7), 545–551. https://doi.org/10.1525/BIO.2010.60.7.10

Shackelford, N., Standish, R. J., Ripple, W., & Starzomski, B. M. (2018). Threats to biodiversity from cumulative human impacts in one of North America's last wildlife frontiers. *Conservation Biology*, *32*(3), 672–684. https://doi.org/10.1111/COBI.13036

Stewardson, M. J., Acreman, M., Costelloe, J. F., Fletcher, T. D., Fowler, K. J. A., Horne, A. C., Liu, G., McClain, M. E., & Peel, M. C. (2017). Understanding Hydrological Alteration. *Water for the Environment: From Policy and Science to Implementation and Management*, 37–64. https://doi.org/10.1016/B978-0-12-803907-6.00003-6

Summa Silver Corp. (2023). *Summa Silver - High grade gold and silver developer (TSXV:SSVR)*. https://summasilver.com/

SWReGAP. (2004). *Southwest Regional Gap Analysis Project (SWReGAP)*. https://swregap.org/

Tayebi-Khorami, M., Edraki, M., Corder, G., & Golev, A. (2019). Re-Thinking Mining Waste through an Integrative Approach Led by Circular Economy Aspirations. *Minerals 2019, Vol. 9, Page 286*, *9*(5), 286. https://doi.org/10.3390/MIN9050286

U.S. Environmental Protection Agency. (2023a). *Air Pollution: Current and Future Challenges | US EPA*. https://www.epa.gov/clean-air-act-overview/air-pollution-current-and-future-challenges

U.S. Environmental Protection Agency. (2023b). *Ecoregions of North America | US EPA*. https://www.epa.gov/eco-research/ecoregions-north-america

U.S. Environmental Protection Agency. (2023c). *Title 40-Protection of Environment Chapter V-Council on Environmental Quality Subchapter A-National Environmental Policy Act*

Implementing Regulations. https://www.ecfr.gov/current/title-40/chapter-V/subchapter-A/part-1508

U.S. Fish and Wildlife Service. (1998). *Endangered Species Consultation Handbook*. https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.pdf

U.S. Fish and Wildlife Service. (2023a). *IPaC: Home*. https://ipac.ecosphere.fws.gov/

U.S. Fish and Wildlife Service. (2023b). *List of Threatened And Endangered Species That May Occur in Your Proposed Project Location or May Be Affected by Your Proposed Project. Project Code: 2023-0029320, Project Name: Mogollon*. https://ipac.ecosphere.fws.gov/

U.S. Forest Service. (2012). *National Best Management Practices for Water Quality Management on National Forest System Lands Volume 1: National Core BMP Technical Guide*. https://www.fs.usda.gov/naturalresources/watershed/pubs/FS_National_Core_BMPs_April2012.pdf

U.S. Forest Service Gila National Forest. (2023). *Gila National Forest - Maps & Publications*. https://www.fs.usda.gov/main/gila/maps-pubs

U.S. Geological Survey. (2004). *Southwest Regional GAP Analysis Project - Land Cover Descriptions* . https://rsgis-swregap.s3-us-west-2.amazonaws.com/public/docs/swgap_legend_desc.pdf

U.S. Geological Survey. (2023a). *North American Bat Monitoring Program (NABat)*. https://sciencebase.usgs.gov/nabat/#/results

U.S. Geological Survey. (2023b). *Species Data Download | U.S. Geological Survey*. https://www.usgs.gov/programs/gap-analysis-project/science/species-data-download

Watershed Science Institute. (2014). Watershed Condition Series: Techical Note 3 : The EPT INdex. *Watershed Science Institute*, *38*(1).

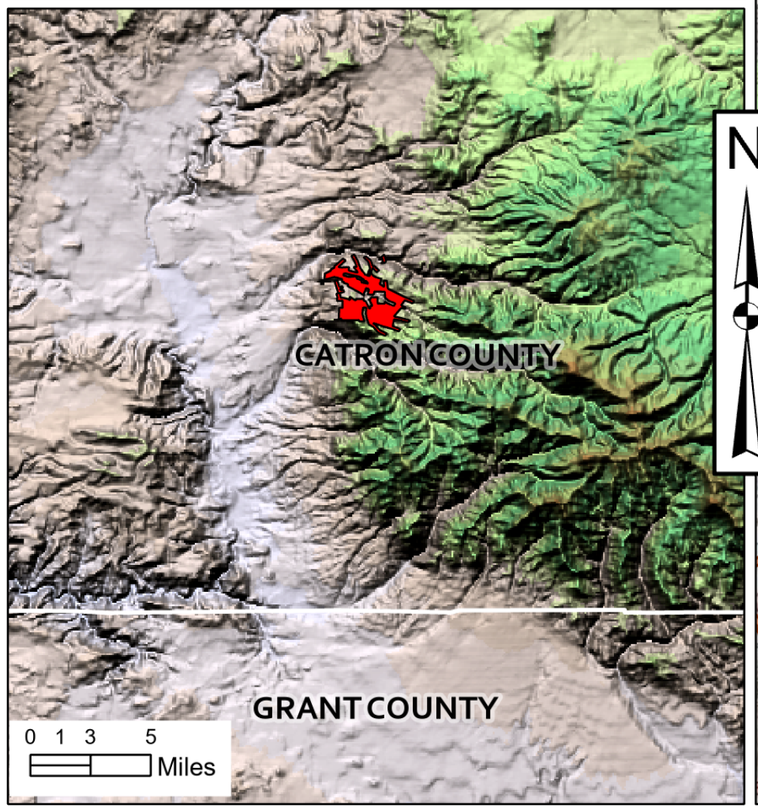
Weber, M., Krogman, N., & Antoniuk, T. (2012). *Cumulative Effects Assessment: Linking Social, Ecological, and Governance Dimensions*. *17*(2). https://doi.org/10.5751/ES-04597-170222

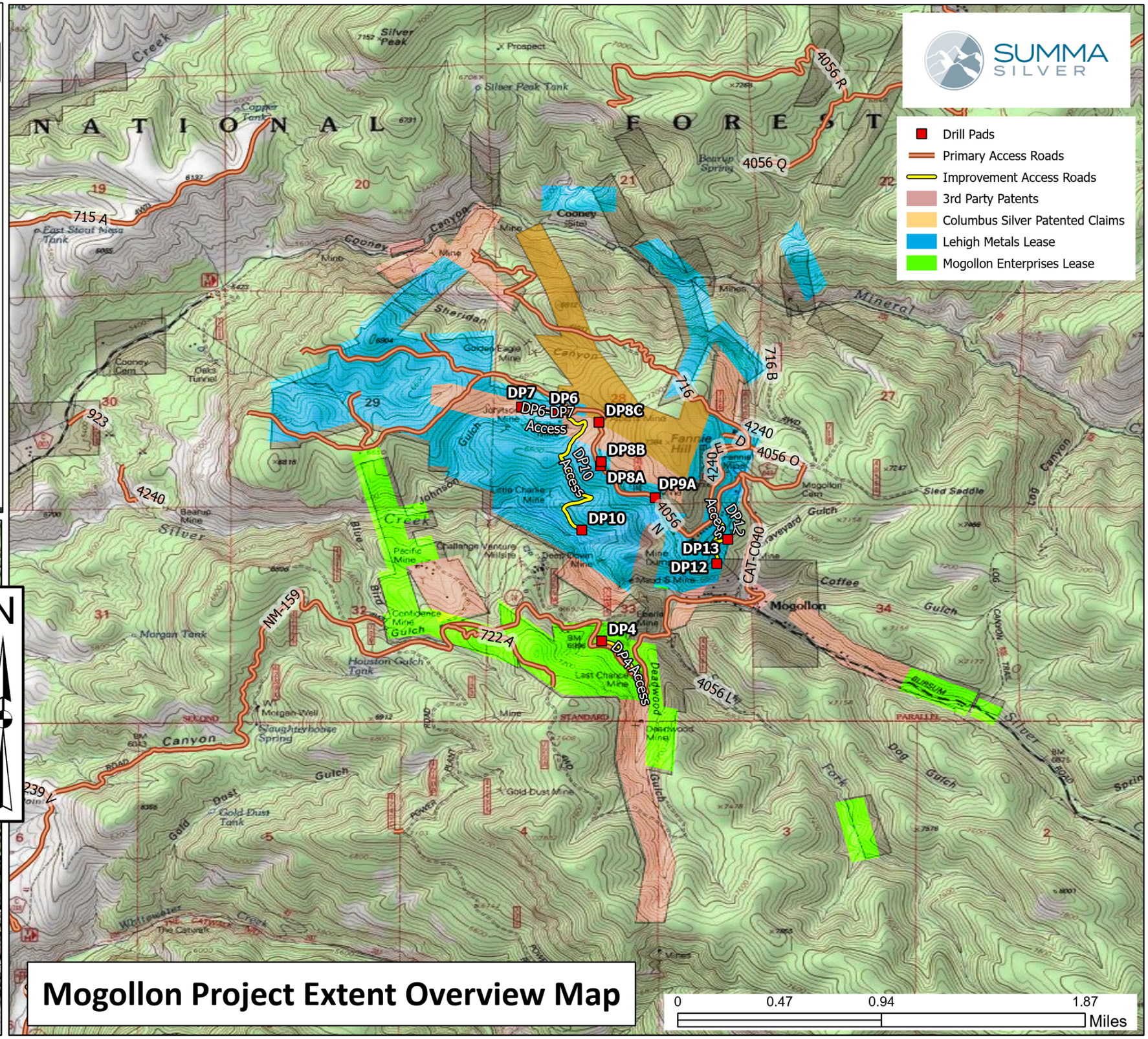
Wildlife Acoustics. (2023). *Song Meter SM4BAT-FS Ultrasonic Bat Detector &… | Wildlife Acoustics*. https://www.wildlifeacoustics.com/products/song-meter-sm4bat

Everett Ecological

Component D

Mogollon Project Map Series





Mogollon Project Extent Overview Map

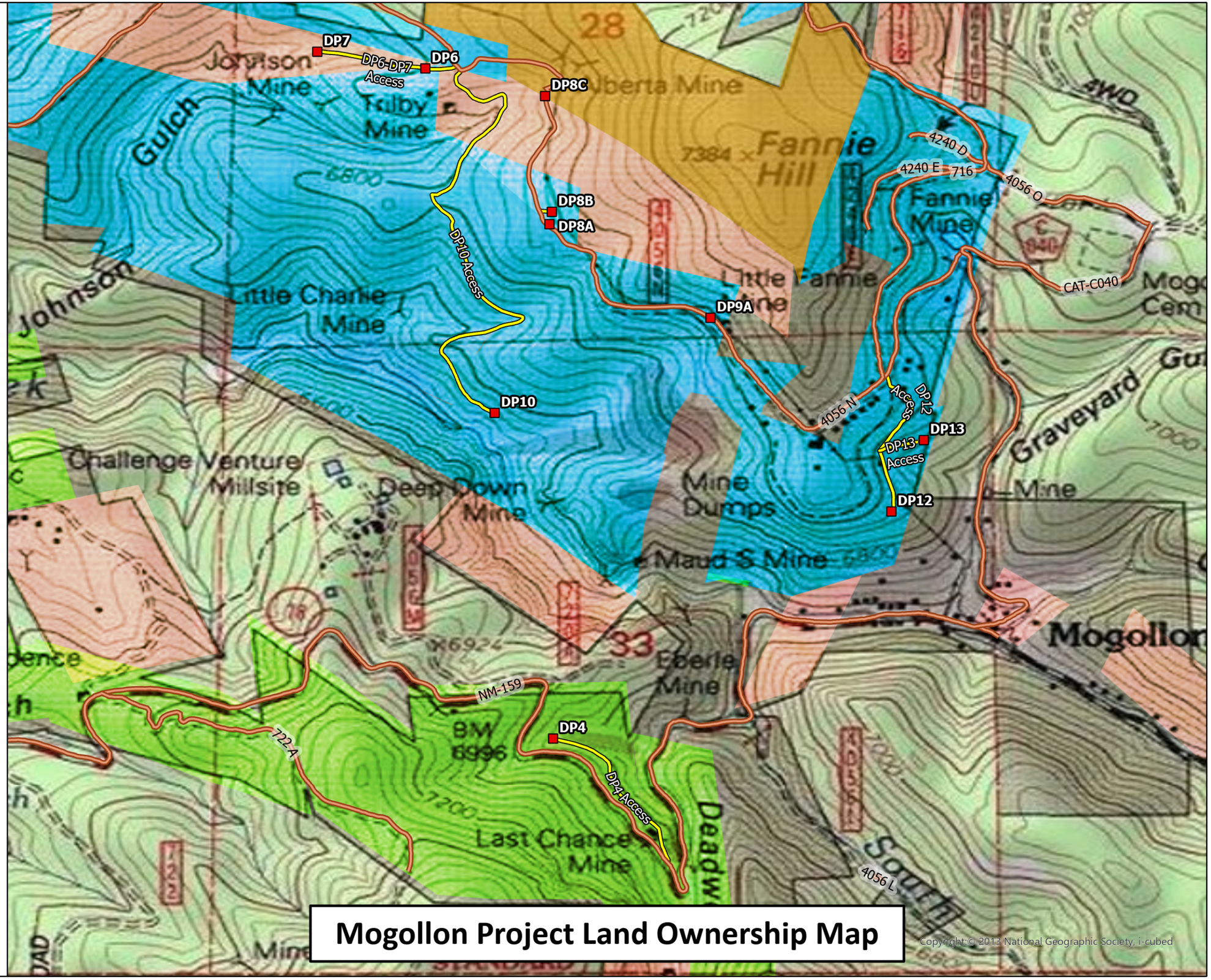
SUMMA SILVER

- Drill Pads
- Primary Access Roads
- Improvement Access Roads
- 3rd Party Patents
- Columbus Silver Patented Claims
- Lehigh Metals Lease
- Mogollon Enterprises Lease

N

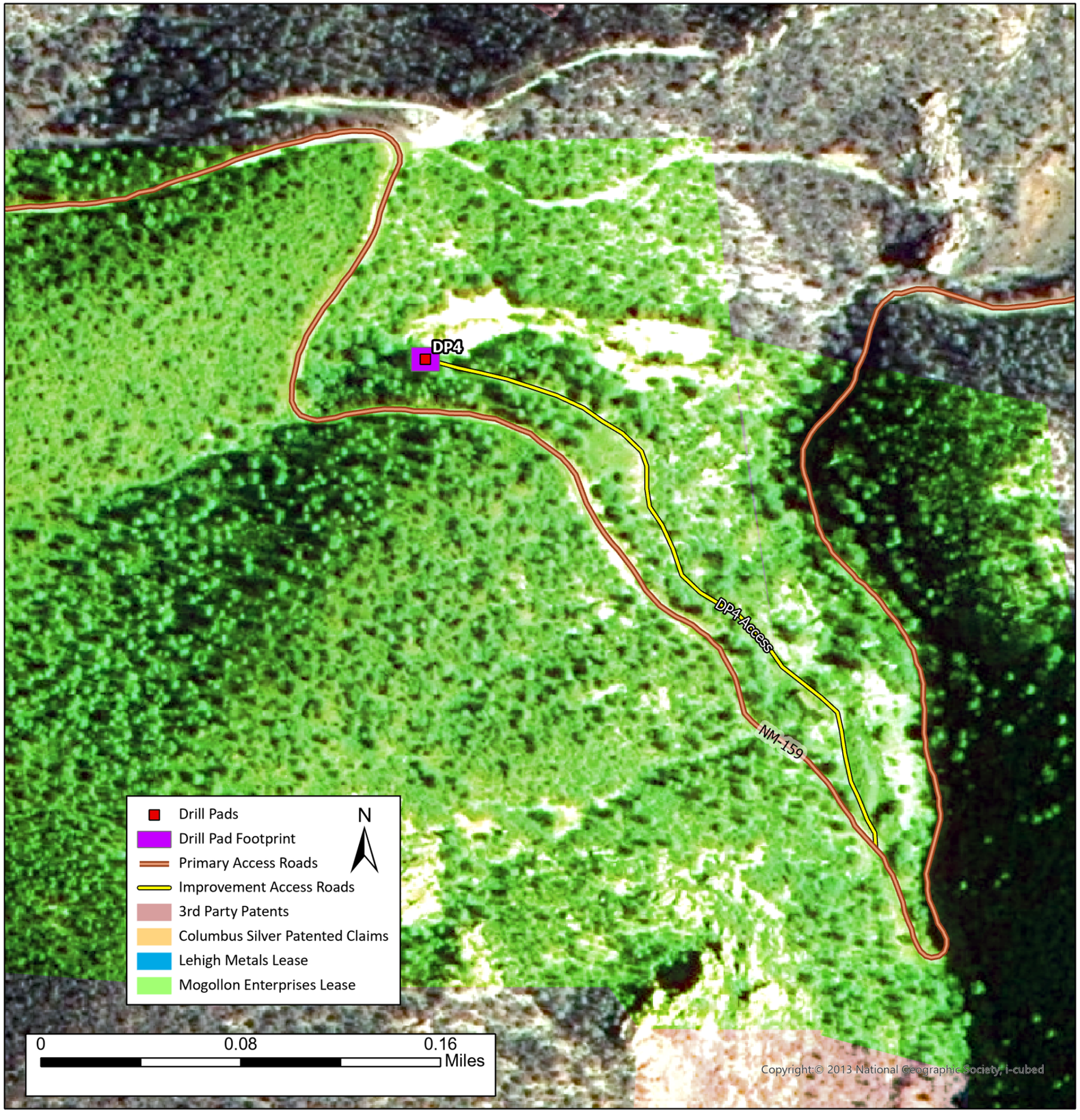
0 0.06 0.13 0.25 Miles

Spatial Reference
Name: GCS North American 1983
GCS: GCS North American



Mogollon Project Land Ownership Map

Drill Pad 4
Site-specific Map



Drill Pad Four (DP4)

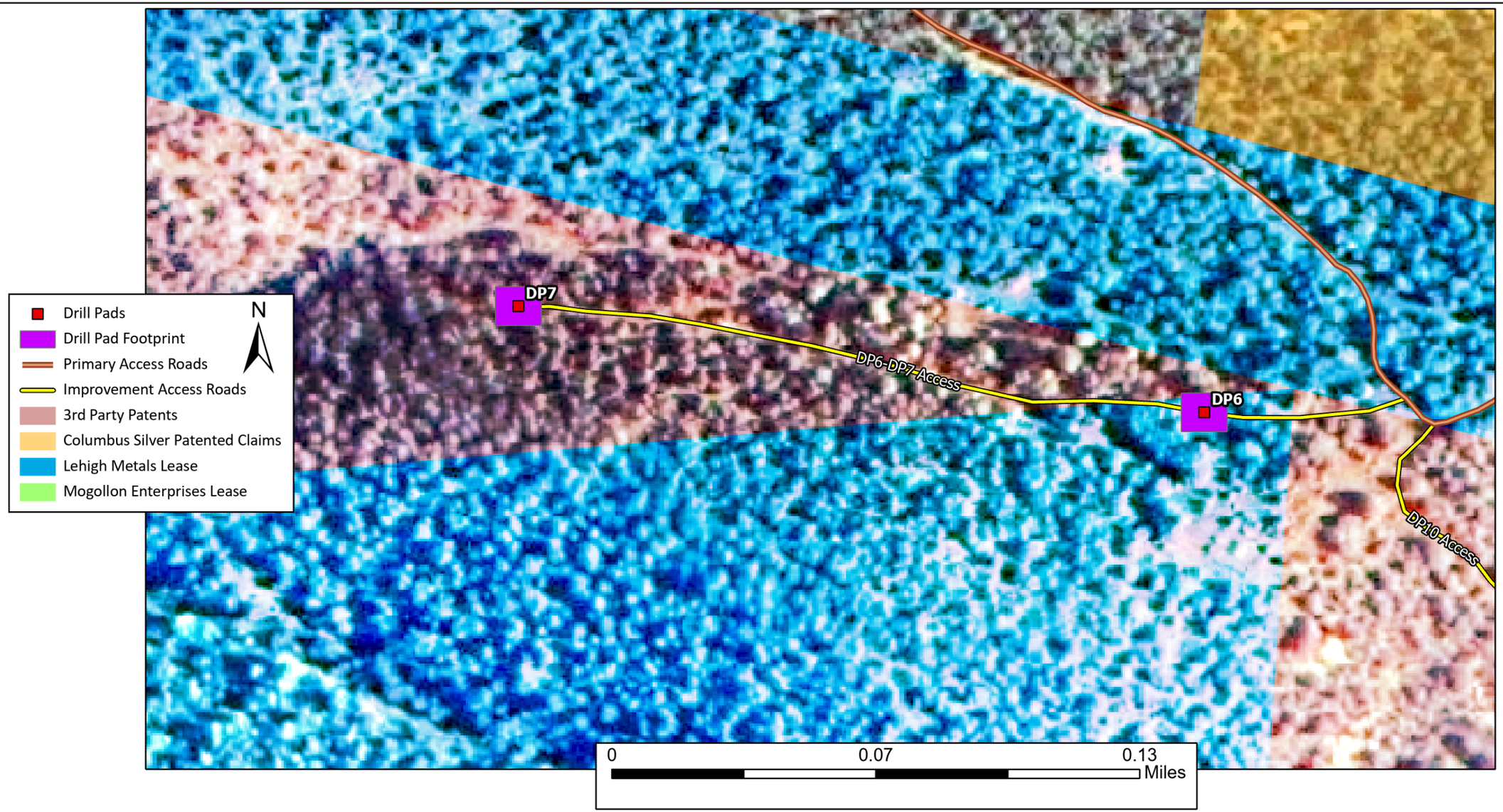
Land Jurisdiction: Located on Summa Silver's patented Mogollon Enterprise Lease.

Access: Via a preexisting unimproved road connected to NM-SR 159. Access requires improvements to approximately 428 meters of the preexisting road surface.

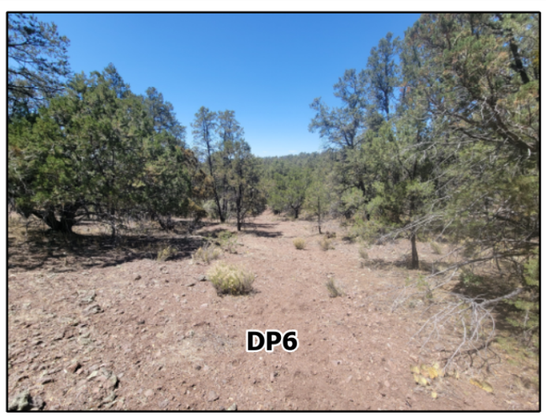
Moderately disturbed land located within SWReGAP Colorado Plateau Pinyon-Juniper Woodland.

Drill Pad 6 - Drill Pad 7

Site-specific Map



SUMMA SILVER



Drill Pad Six (DP6)

Land Jurisdiction: Located on Summa Silver's patented Lehigh Metals Lease.

Access: Via preexisting USFS road 4056N. Access will require improvements to approximately 68 meters of the preexisting road surface.

Pre-disturbed land within The U.S. Geological Survey's Southwest Regional Gap Analysis Project (SWReGAP) Rocky Mountain Ponderosa Pine

Drill Pad Seven (DP7)

Land Jurisdiction: Located on a 3rd party patent.

Access: Via preexisting USFS road 4056N. Access to the site will require improvements to approximately 232 meters of the preexisting road surface.

Moderately disturbed land within SWReGAP Colorado Plateau Pinyon-Juniper Woodland.

Drill Pad 8A - Drill Pad 8C

Site-specific Map

SUMMA SILVER

Drill Pad Eight A (DP8A)

Land Jurisdiction: Located on Summa Silver's patented Lehigh Metals Lease.

Access: Via preexisting USFS road 4056N.

Pre-disturbed land located on USFS road 4056N. Located within The U.S. Geological Survey's Southwest Regional Gap Analysis Project (SWReGAP) Colorado Plateau Pinyon-Juniper Woodland.

Drill Pad Eight B (DP8B)

Land Jurisdiction: Located on Summa Silver's patented Lehigh Metals Lease.

Access: Via preexisting USFS road 4056N. Access to the site will require the installation of approximately 28 meters of new road surface.

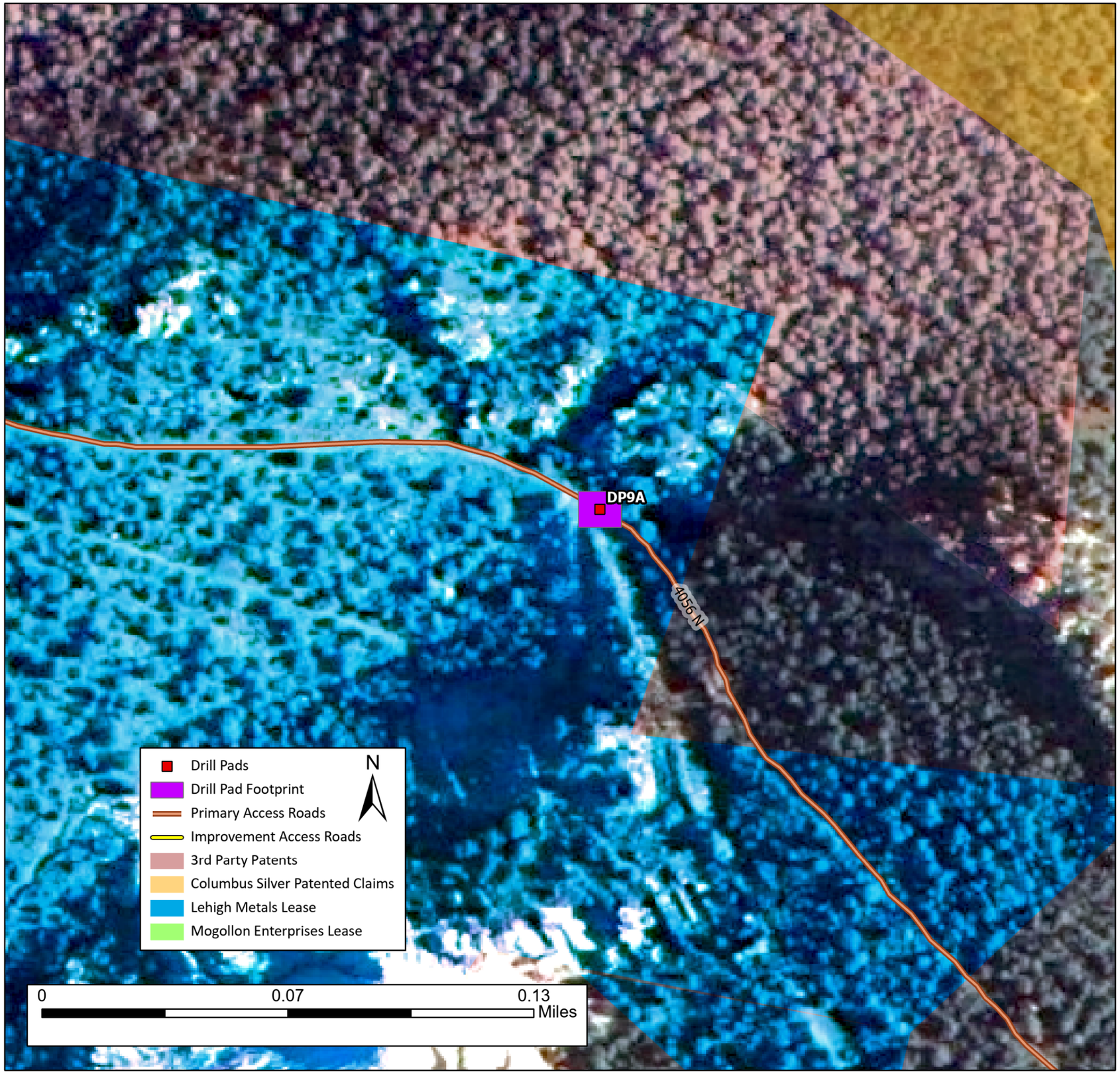
Undisturbed land adjacent to USFS road 4056N. Located within SWReGAP Colorado Plateau Pinyon-Juniper Woodland.

Drill Pad Eight C (DP8C)

Land Jurisdiction: Located on Summa Silver's patented Columbus Silver Claim.

Access: Via preexisting USFS road 4056N.

Pre-disturbed land located on USFS road 4056N. Located within SWReGAP Rocky Mountain Ponderosa Pine Woodland.



SUMMA SILVER

Drill Pad 9A

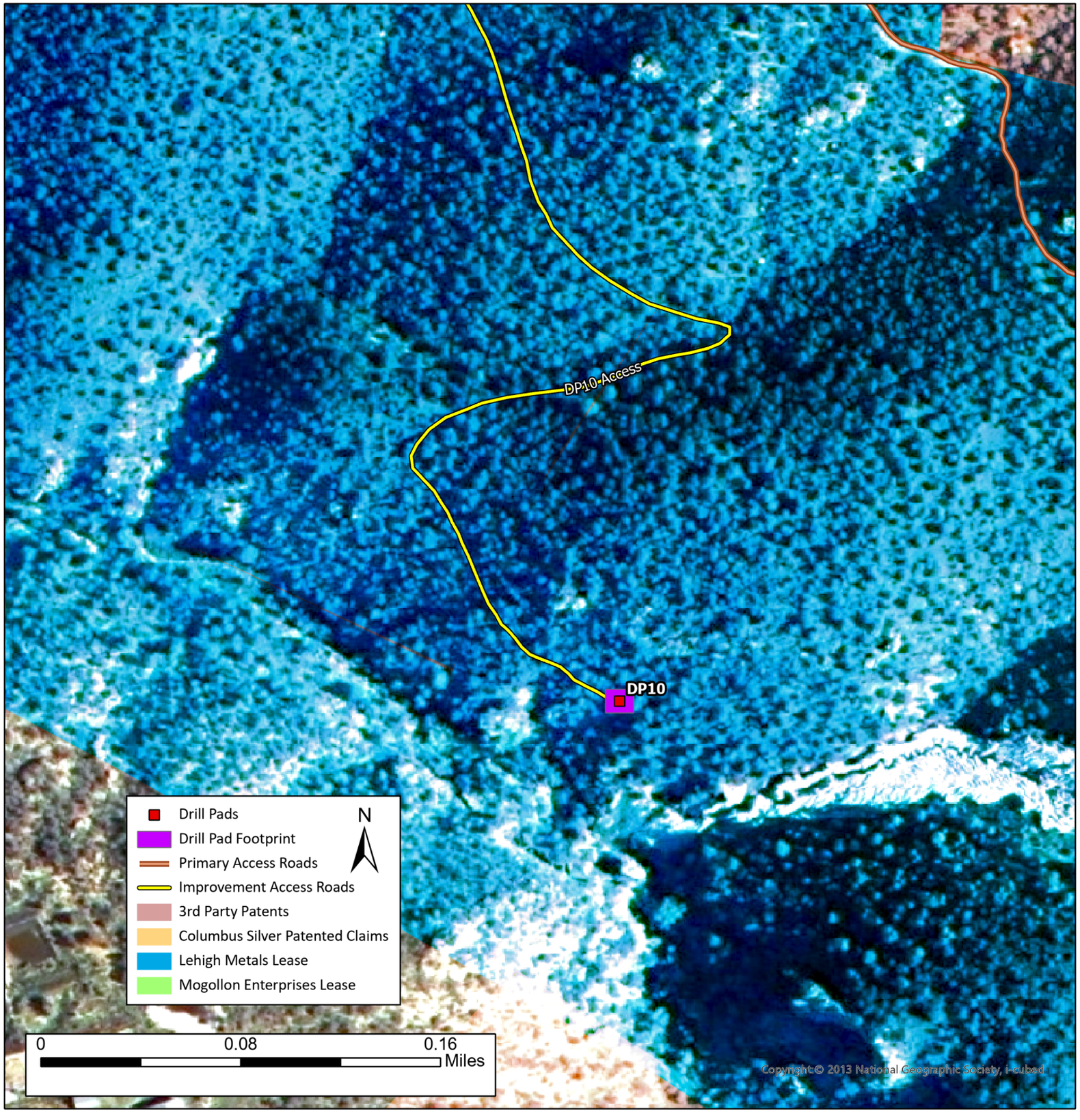
Site-specific Map

Drill Pad Nine-A (DP9A)

Land Jurisdiction: Located on Summa Silver's patented Lehigh Metals Lease.

Access: Via USFS road 4056N.

Pre-disturbed land located on USFS road 4056N. Located within The U.S. Geological Survey's Southwest Regional Gap Analysis Project (SWReGAP) Colorado Plateau Pinyon-Juniper Woodland.



SUMMA SILVER

Drill Pad 10

Site-specific Map

Drill Pad Ten (DP10)

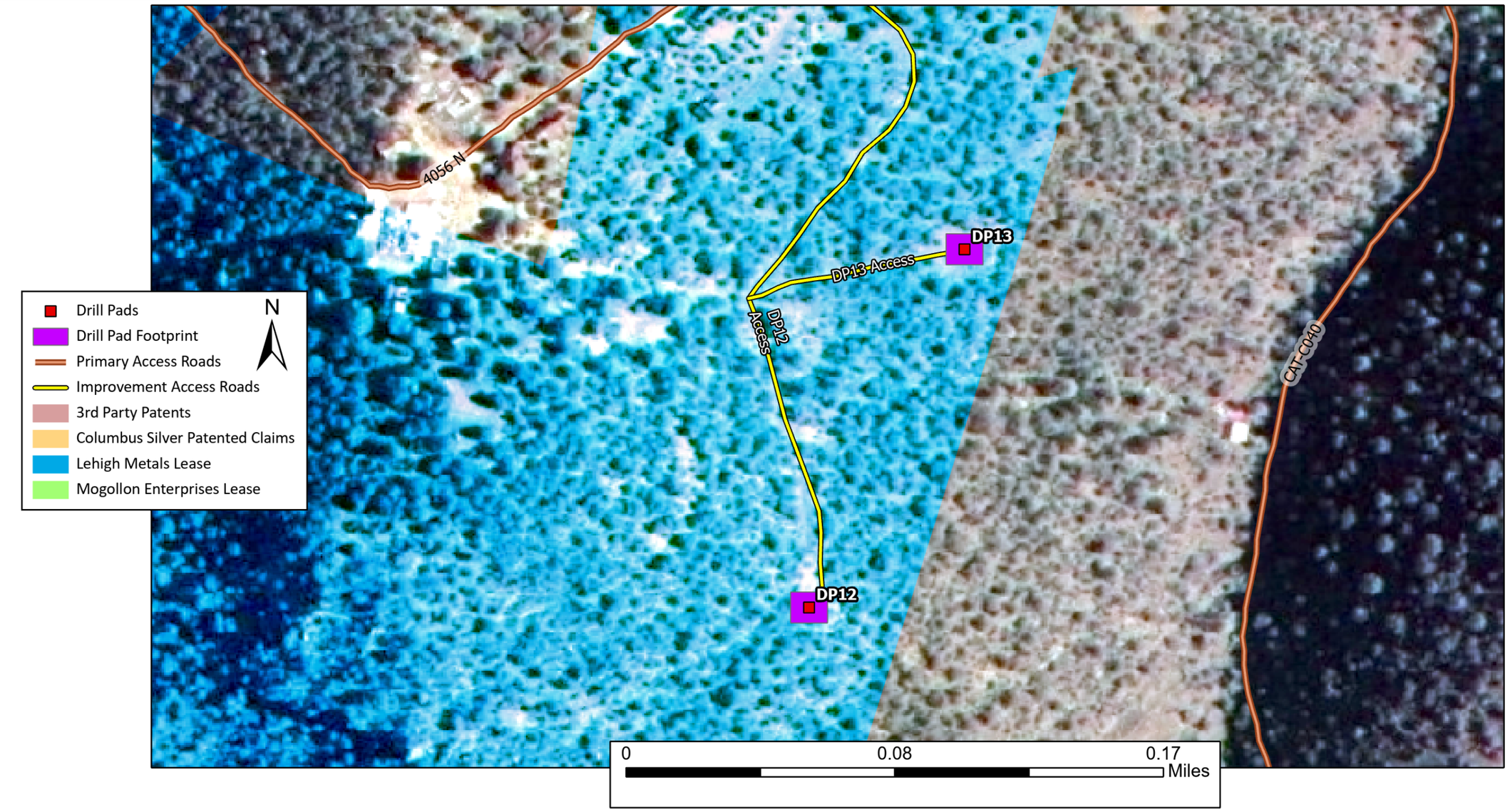
Land Jurisdiction: Located on Summa Silver's patented Lehigh Metals Lease.

Access: Via preexisting USFS road 4056N. Access to the site will require improvements to approximately 1,258 meters of the preexisting road surface.

Moderately disturbed land within The U.S. Geological Survey's Southwest Regional Gap Analysis Project (SWReGAP) Colorado Plateau Pinyon-Juniper Woodland.

Drill Pad 12 - Drill Pad 13

Site-specific Map



Drill Pad Twelve (DP12)

Land Jurisdiction: Located on Summa Silver's patented Lehigh Metals Lease.

Access: Via a preexisting unimproved road connected to USFS road 4056N. Access to the site will require improvements to approximately 387 meters of the preexisting road surface.

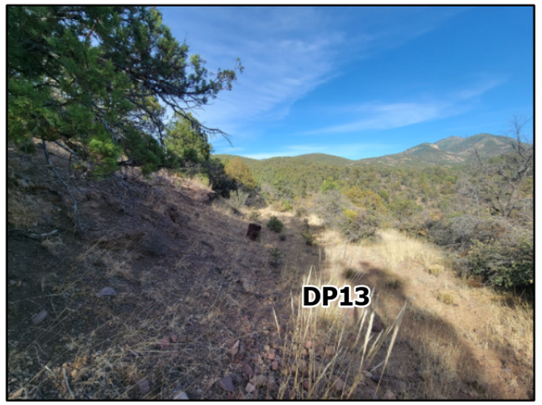
Moderately disturbed land within SWReGAP Colorado Plateau Pinyon-Juniper Woodland.

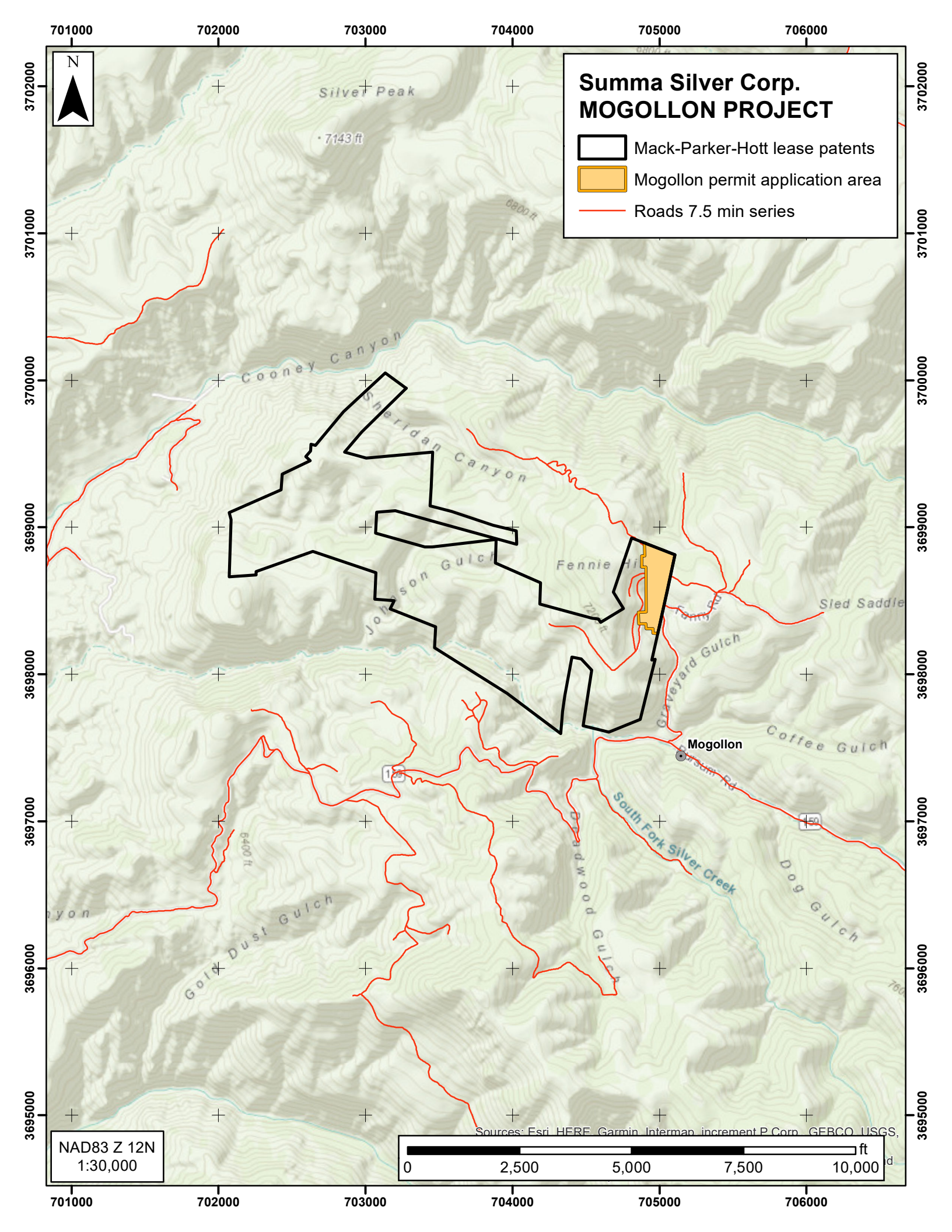
Drill Pad Thirteen (DP13)

Land Jurisdiction: Located on Summa Silver's patented Lehigh Metals Lease.

Access: Via a preexisting unimproved road connected to USFS road 4056N. Access to the site will require improvements to approximately 95 meters of the preexisting road surface.

Moderately disturbed land within SWReGAP Colorado Plateau Pinyon-Juniper Woodland.




Summa Silver Corp.
MOGOLLON PROJECT
Mack-Parker-Hott lease patents
Mogollon permit application area
Roads 7.5 min series
N
Silver Peak
7143 ft
6800 ft
Cooney Canyon
Sheridan Canyon
Johnson Gulch
Fennie Hill
Graveyard Gulch
Sled Saddle
Mogollon
Coffee Gulch
South Fork Silver Creek
Dog Gulch
Gold Dust Gulch
6400 ft
NAD83 Z 12N
1:30,000
0
2,500
5,000
7,500
10,000
ft
701000
702000
703000
704000
705000
706000
3702000
3701000
3700000
3699000
3698000
3697000
3696000
3695000

Date: 1/21/2021 User: naydin

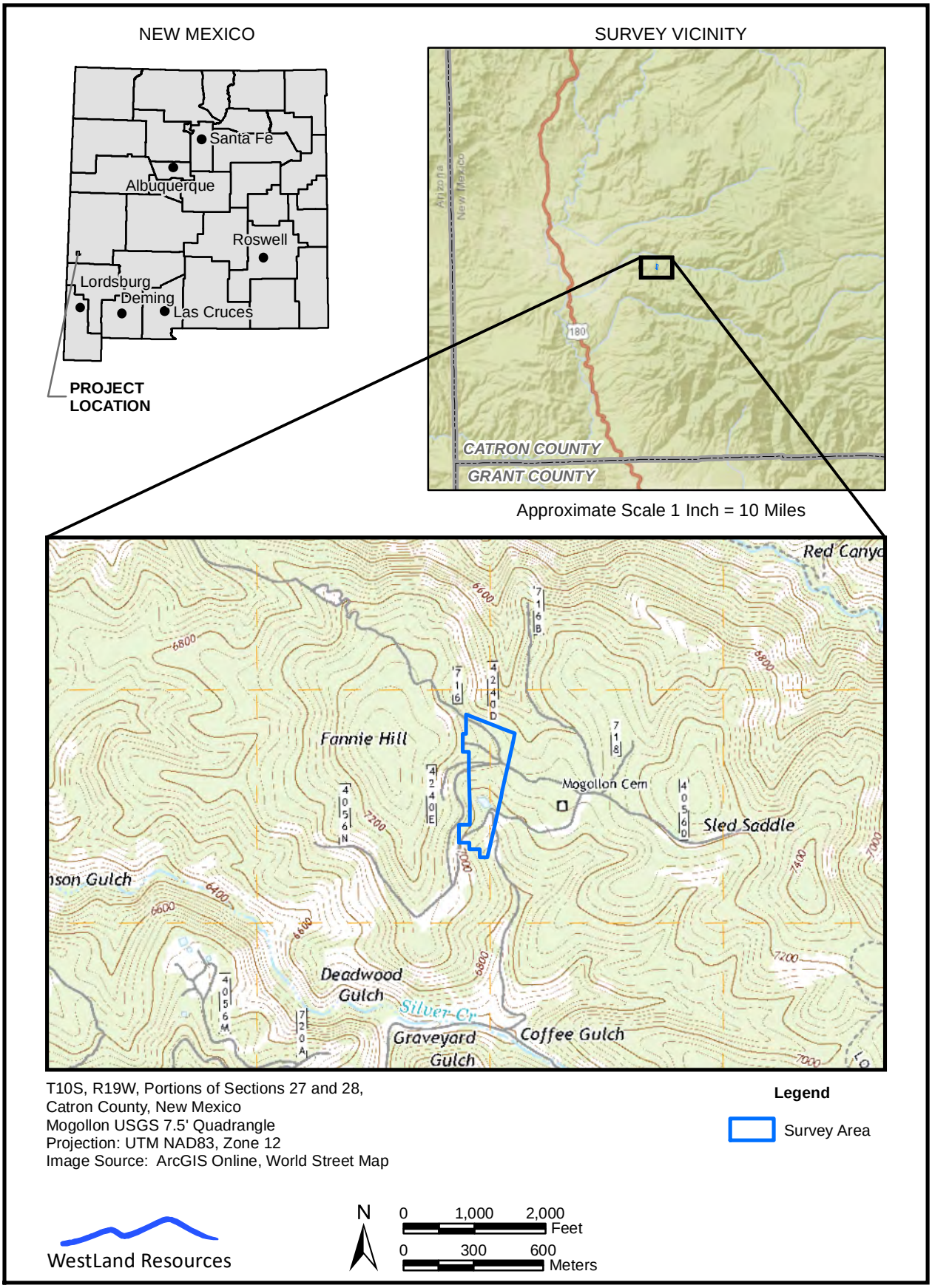
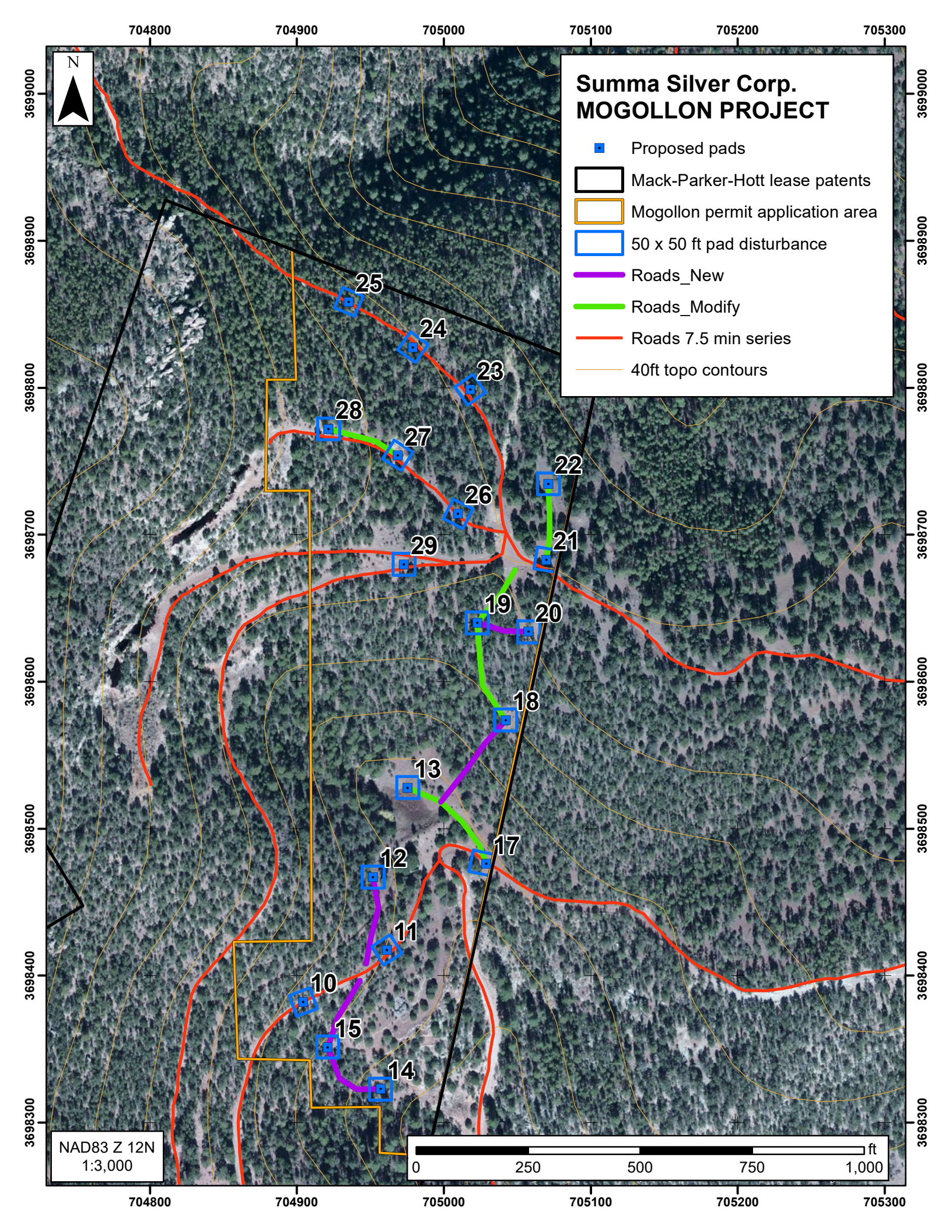
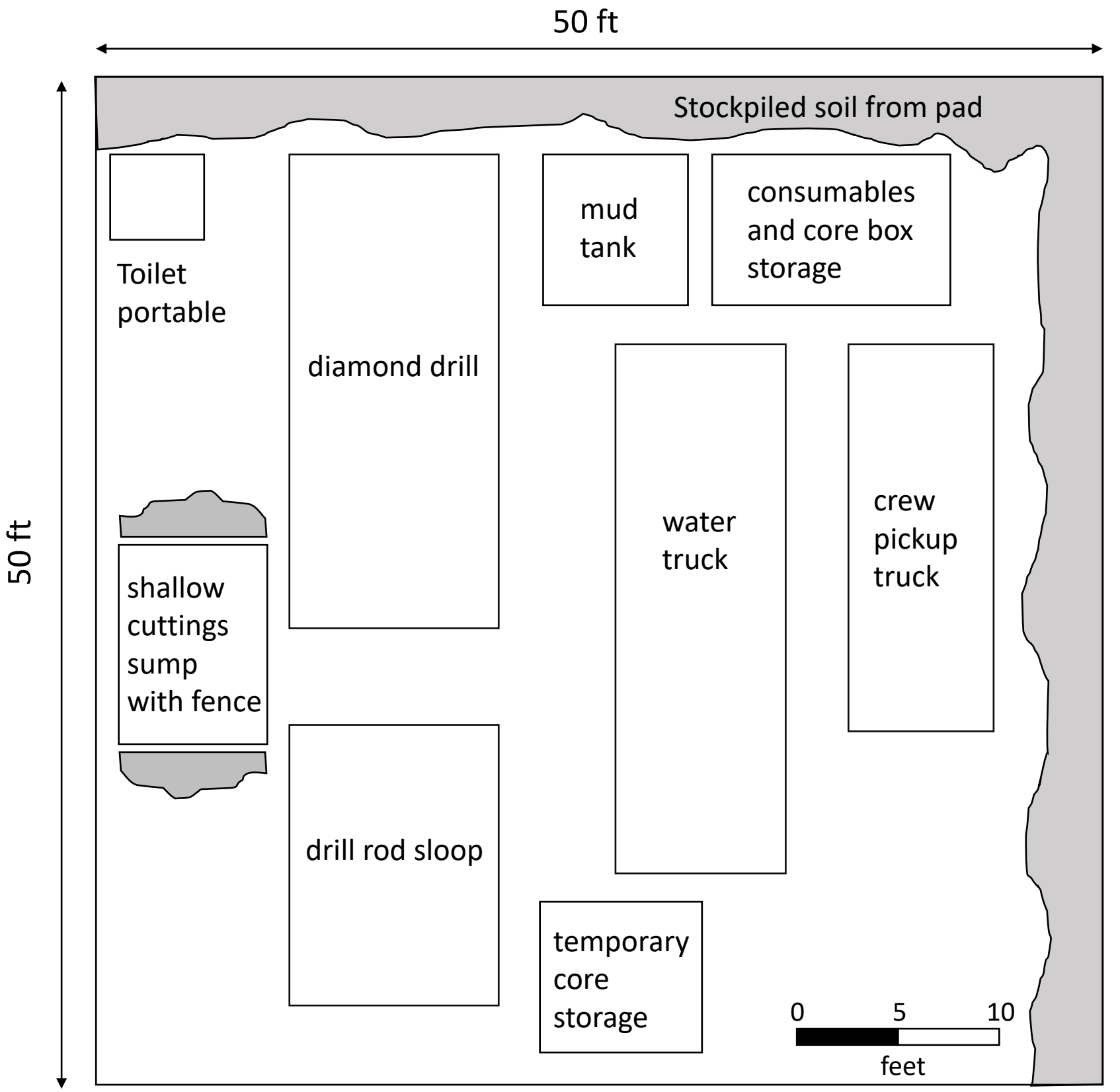


Figure 1. Vicinity map


Summa Silver Corp.
MOGOLLON PROJECT
Proposed pads
Mack-Parker-Hott lease patents
Mogollon permit application area
50 x 50 ft pad disturbance
Roads_New
Roads_Modify
Roads 7.5 min series
40ft topo contours
N
704800
704900
705000
705100
705200
705300
3699000
3698900
3698800
3698700
3698600
3698500
3698400
3698300
25
24
23
28
27
26
29
22
21
19
20
18
13
17
12
11
10
15
14
NAD83 Z 12N
1:3,000
0
250
500
750
1,000
ft


50 ft
50 ft
Stockpiled soil from pad
Toilet
portable
diamond drill
mud
tank
consumables
and core box
storage
water
truck
crew
pickup
truck
shallow
cuttings
sump
with fence
drill rod sloop
temporary
core
storage
0
5
10
feet