



**June 2022**

**A1 Lithium Incorporated Mineral Exploration Project  
Draft Environmental Assessment  
DOI-BLM-UT-Y010-2021-0068-EA**

Grand County, Utah

Locations:

Mineral Canyon Federal #1-3  
Sec. 03 T26S 19E, SE ¼ NE ¼

Sunburst #1

Sec. 14 T26S R19E, SW ¼ SW ¼

Applicant/Address:

A1 Lithium Incorporated  
1635 Village Center Circle  
Las Vegas, NV 89134

**Moab Field Office  
82 East Dogwood Avenue  
Moab, UT 84532  
435-259-2100**

# CONTENTS

<b>CHAPTER 1. INTRODUCTION.....</b>	<b>1</b>
<b>1.1. Purpose and Need.....</b>	<b>2</b>
1.1.1. Decision to be Made .....	2
<b>1.2. Conformance with BLM Land Use Plan(s) .....</b>	<b>2</b>
<b>1.3. Relationship to Statutes, Regulations, or other Plans.....</b>	<b>3</b>
<b>1.4. Scoping and Issues.....</b>	<b>3</b>
<b>CHAPTER 2. ALTERNATIVES.....</b>	<b>4</b>
<b>2.1. Alternative A – No Action Alternative .....</b>	<b>4</b>
<b>2.2. Alternative B – Proposed Action.....</b>	<b>4</b>
2.2.1. Access Roads .....	5
2.2.2. Drill Pad .....	6
2.2.3. Exploration Operations .....	7
2.2.4. Reclamation .....	9
2.2.5. Summary of Surface Disturbance .....	10
2.2.6. Design Features and Conditions of Approval.....	10
<b>2.3. Alternatives Considered but Eliminated.....</b>	<b>13</b>
<b>CHAPTER 3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL IMPACTS .....</b>	<b>13</b>
<b>3.1. General Location .....</b>	<b>13</b>
<b>3.2. Issue 1 – Visual and Auditory Resources .....</b>	<b>14</b>
3.2.1. Affected Environment.....	14
3.2.2. Environmental Impacts .....	16
<b>3.3. Issue 2 – Recreation Resources .....</b>	<b>18</b>
3.3.1. Affected Environment.....	18
3.3.2. Environmental Impacts .....	19
<b>3.4. Issue 3 – Geology/Minerals/Energy Production .....</b>	<b>21</b>
3.4.1. Affected Environment.....	21
3.4.2. Environmental Impacts .....	22
<b>3.5. Issue 4 – Water Quality and Quantity.....</b>	<b>23</b>
3.5.1. Affected Environment.....	23
3.5.2. Environmental Impacts .....	25
<b>CHAPTER 4. PUBLIC INVOLVEMENT, CONSULTATION, AND COORDINATION .....</b>	<b>25</b>
<b>4.1. Consultation and Coordination .....</b>	<b>25</b>
<b>4.2. List of Preparers.....</b>	<b>26</b>

## CHAPTER 1. INTRODUCTION

Anson Resources Ltd, through its United States subsidiary A1 Lithium Inc. (A1 Lithium), proposes to conduct mineral exploration activities in accordance with the General Mining Law of 1872 and Surface Management Regulations of 43 CFR Subpart 3809.

On March 4, 2021, A1 Lithium submitted a Plan of Exploration to the Bureau of Land Management (BLM) Moab Field Office (MFO) to explore for locatable minerals on its unpatented placer claims located in Grand County, Utah. The BLM accepted this plan as complete, and it is now being evaluated in this EA.

A1 Lithium is proposing to reopen two previously cored, plugged, and abandoned wells named the Mineral Canyon Federal #1–3 and Sunburst #1 (see location maps in Appendix B) to test the fluids contained in the sedimentary sequences located approximately 6,200 feet below the surface for economic quantities of lithium, bromine, and other locatable minerals. Table 1 provides the location details on each of the two wells.

**Table 1. Identifying details of the existing wells proposed for re-entry**

Well Name	API #	Original Operator	UTM Z12, NAD 83		Public Land Survey System
Mineral Canyon Federal #1-3	4301931119	Enserch Exploration	604073E	4269985N	Sec. 3 T26S R19E, SE1/4, NE1/4
Sunburst #1	4301930357	Energy Reserves	604689E	4265978N	Sec14 T26S R19E, SW1/4, SW1/4

The proposed well locations are along State Route 313, approximately nine air miles west of the town of Moab, Utah, 3 miles north of Canyonlands National Park and 2 miles northwest of Dead Horse Point State Park. The project area includes area of land in which A1 Lithium would conduct exploration operations, to include the Mineral Canyon Federal #1-3 (3.17 acres) and Sunburst #1 (3.43 acres) wells and access routes.

The BLM MFO approved two Notice-level lithium exploration proposals in 2017 and 2019 from A1 Lithium to test for lithium at three well locations within a 5-mile radius of the current proposed project area. One of the exploration actions is active until November 2022; and the other exploration action is complete, and the bond released. The current proposal is to determine the economic feasibility of the locatable resources determined to be present by the prior Notice-level exploration activities. The sedimentary horizon labeled Clastic Zone 31 in the Paradox Formation appears to be the most viable resource target due to the artesian flow of the brine and associated higher grades of lithium. The assays for the minerals sampled from Clastic Zone 31 are shown in Table 2.

Currently, there are no additional related mining operations proposed. If economic quantities of locatable minerals are found to be present within the brines sampled from Mineral Canyon Federal #1-3 and Sunburst #1, A1 Lithium may submit a Plan of Development to the BLM. In the event of production, additional site-specific NEPA analysis on the mining operations would occur.

**Table 2. Assays for Clastic Zone 31 from A1 Lithium Notice-level exploration, Grand Co.**

Hole ID	UTU	Lithium (ppm)	Bromine (ppm)	Boron (ppm)	I (ppm)
Gold Bar Unit 2	92750	21	680	8.3	NA
Skyline Unit 1	93817	193.5	4427	163.8	NA
Long Canyon Unit 2	93817	253	2282	189	NA

**1.1. Purpose and Need**

The purpose of the proposed action is to respond to A1 Lithium’s permit application to explore for economically viable mineral deposits by re-entering existing plugged and abandoned wellbores to test for lithium, bromine, and other potential locatable minerals contained in brines within the subsurface sedimentary sequences.

The need is established by the BLM’s responsibilities under the General Mining Act of 1872, 43 CFR Subpart 3809, and the Federal Land Policy Management Act (FLPMA) as amended (1976). FLPMA recognizes mineral exploration and production of mineral resources as a “principal” land use within the BLM’s multiple-use mandate 43 USC 1702(l). Multiple use is defined as the “management of the public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American people . . .” 43 USC § 1702(c).

**1.1.1. Decision to be Made**

The BLM will decide whether to authorize the proposed action to reenter wellbores and explore for locatable minerals, and if authorized, the BLM would apply terms, conditions of approval or stipulations specific to the proposal and the Moab Field Office.

**1.2. Conformance with BLM Land Use Plan(s)**

The Proposed Action and alternative(s) are in conformance with the 2008 Moab Field Office Record of Decision and Approved Resource Management Plan (2008 Moab RMP). Specifically, the Proposed Action is provided for in the following sections of the 2008 Moab RMP:

**Minerals (MIN):**

**MIN-7. Locatable Minerals:** Operations on BLM-administered lands open to mineral entry must be conducted in compliance with BLM’s surface management regulations (43 CFR 3715, 3802, 3809, and 3814). BLM surface management regulations do not apply to operations on other Federal lands but do apply to split-estate lands (page 74).

**MIN-9. Locatable Minerals:** To the extent possible, the stipulations developed for oil and gas leasing are applicable to all mineral activities (leasable, locatable, and salable). These stipulations are found in Appendix A [of the 2008 Moab RMP]. Leasable minerals include oil and gas, coal, and potash. Locatable minerals include gold, copper, and uranium. Salable minerals include sand and gravel, clay, and building stone (page 74).

**MIN-17. Locatable Minerals:** A no surface occupancy stipulation cannot be applied to locatable minerals with a withdrawal. All public lands overlaying Federal minerals are open to mining claim location unless specifically withdrawn from mineral entry by Secretarial order or by a public land law. Therefore, other than the existing withdrawals (Three Rivers, Westwater, and Black Ridge Wilderness), all public lands within the MPA remain open under the mining laws. Future withdrawals may be recommended in areas identified as closed or with a no surface occupancy stipulation if it becomes necessary to prevent unacceptable resource impacts (page 76).

### **1.3. Relationship to Statutes, Regulations, or other Plans**

The following laws, regulations are directly related to the Proposed Action:

- Federal Lands Policy Management Act (FLPMA) (1976) – establishes the agency’s multiple-use and sustained-yield mandate to manage the lands and various resource values, including minerals.
- General Mining Law of 1872 – authorizes the mining of mineral resources on public lands.
- Mineral Leasing Act of 1920 – enables leasing of public lands for development of mineral resources.
- Mining and Minerals Policy Act of 1970 – declares it is the continuing policy of the Federal Government to foster the development of domestic mineral resources.

### **1.4. Scoping and Issues**

Identification of issues and alternatives were accomplished through internal BLM resource specialist review. On July 12, 2021, the Moab Field Office Interdisciplinary Team (IDT) met with the applicant onsite at the two proposed wellsite locations to discuss potential resource impacts. The conclusions from this meeting and subsequent discussions are presented in the IDT Checklist in Appendix A. The IDT Checklist provides a rationale for issues that were considered but not analyzed further.

The IDT developed issues for analysis based on resources determined to be present and potentially impacted by the alternatives. The issues carried forward for detailed analysis in Chapter 3 are presented in Table 3.

**Table 3. Issues Analyzed in Detail**

<b>Issue #</b>	<b>Resources</b>	<b>Issue Statement</b>
<b>Issue 1</b>	<b>Visual and Auditory Resources</b>	How would activities that are associated with well re-entry (road construction and drilling operations) and brine fluid sampling impact visual resources? How would well re-entry and brine fluid sampling impact the sound scape of Horsethief Campground? How would well re-entry and brine fluid sampling impact the dark night skies?
<b>Issue 2</b>	<b>Recreation Resources</b>	How would activities that are associated with well re-entry (road construction and drilling operations) and brine fluid sampling impact recreational activities such as mountain biking, scenic driving, and camping, in and around the project area?
<b>Issue 3</b>	<b>Geology/Minerals/Energy Production</b>	How would re-opening the wells impact the geological, mineral and energy resources in the area? How would sampling brine fluids located within the subsurface sedimentary sequence impact the geological, mineral, and energy resources in the project area?
<b>Issue 4</b>	<b>Water Quality and Quantity</b>	How would re-opening and exploring abandoned wells and extracting brine fluids impact the quality of the water resources, including aquifers, surface water and ground water? How would re-opening and improving existing access routes impact surface water runoff? How would the water quantity caps of the city of Moab be impacted from water needs of the project?

**CHAPTER 2. ALTERNATIVES**

**2.1. Alternative A – No Action Alternative**

The No Action alternative is to reject the applicant’s application to re-enter abandoned wellbores to explore for lithium, bromine, and other locatable minerals.

**2.2. Alternative B – Proposed Action**

Under Alternative B, the BLM would approve A1 Lithium’s Plan of Exploration to conduct mineral exploration by re-entering two previously cored, plugged, and abandoned oil and gas wells to test brines for economic quantities of lithium, bromine, and other potential economic locatable minerals in its unpatented placer mining claims. The proposed wells for exploration are Mineral

Canyon Federal #1-3 and Sunburst #1, located off State Route 313 in Grand County, Utah. The proposed timeline would not exceed 24 months for all phases of operation, including:

- Access road improvement and drill pad development – maximum ten days per site.
- Drilling operations – maximum twenty days per site.
- Brine sampling – immediately after drilling and up to 24 months.
- Hole abandonment and reclamation – maximum 42 days per site.

A1 Lithium would not produce at intervals where comingled resources are previously leased without entering into an agreement with existing lessee. The Multiple Mineral Development Act of 1954 provides, “where the same lands are being utilized for mining operations and Leasing Act operations, each of such operations shall be conducted, so far as reasonably practicable, in a manner compatible with such multiple use. Mining operations shall be so conducted as to not endanger or materially interfere with any existing surface or underground improvements, workings, or facilities which may have been made for the purpose of Leasing Act operations.” 30 U.S.C. § 526.

#### 2.2.1. Access Roads

Access roads to the Mineral Canyon Federal #1-3 and Sunburst #1 would follow previously used routes from prior well operations. These routes would need to be reconstructed in short sections to recontour the land to allow the passage of vehicles. Other road improvements would be needed including widening the travel surface to a width of 14 feet to facilitate the passage of vehicles needing to access the drill pad. Improvements would include grading, contouring and minor cuts and fills. Access roads would remain dirt. Significant cuts/fills are not anticipated with the construction and improvements needed for either access road. Mineral Canyon Federal #1-3 would utilize a previously used route that is 1,040-foot-long that connects the drill pad to Mineral Canyon Road (maintained road). Five turnouts would be constructed on the access road to Mineral Canyon Federal to allow for equipment to pass safely; each turnout would be approximately 0.1 acres in size. Sunburst #1 would utilize a previously used 520-foot-long route that connects to a designated but unmaintained road. These two routes were chosen because they were the original routes utilized in past drilling operations and would require the least amount of disturbance.

Two Army Corp of Engineers (ACOE) jurisdictional channels would be crossed by the proposed project features. Both channels were dry at the time of the biological survey. If any construction occurs within a channel demonstrating an ordinary high-water mark, consultation with the ACOE would take place.

Turnouts would be in areas of least visual and vegetative disturbance to mitigate potential impacts. Road construction would not be conducted during wet conditions when soils are saturated. Dust abatement would be used along the access roads

Access road improvement equipment may include:

- Caterpillar D8 with 14-foot blade or similar sized bulldozer
- Caterpillar 140G Road Grader or similar sized equipment
- Backhoe or small excavator
- Hydraulic rock breaker
- Dump truck for hauling fill dirt
- Water truck for periodic dust control

### 2.2.2. Drill Pad

The re-entering of abandoned oil and gas wells would require the construction of a level ground surface drill pad and installation of equipment used in the operation, followed by the temporary occupancy of the drill by a drill rig of up to 20 days. The reclaimed original drill pads for the Mineral Canyon Federal #1-3 and Sunburst #1 wells would be re-constructed by grading and leveling the site to a size of 375 feet x 350 feet (3.0 acres), building berms along the edges of the pad for containment of operations on the site and for storm water diversion around the site, and digging a reserve pit 20 feet x 80 feet in size (see Figure 2.1). If water is encountered during construction of a pit, construction would cease, and A1 Lithium would immediately contact the BLM.

Vegetation removal and/or ground disturbance would be limited to the minimum amount necessary to create a safe and effective surface for drilling and sampling activities.

#### 2.2.2.1. *Drill Pad Construction*

Drill pads would be constructed by contractors hired by A1 Lithium. Quality assurance for the construction phase would be the responsibility of the construction contractor completing pad development. Drill pad preparation activities would include clearing, earthwork, drainage, and other improvements necessary for safe operations. Each drill pad would be prepared to create a level pad for the drill rig and support equipment.

Clearing activities would include removal of topsoil, organic material, stumps, brush, and slash. Topsoil would be stored separately to avoid mixing with other organic materials during construction, storage, and reclamation. Stockpiles would be located so that wind and water erosion would be minimized, and reclamation potential maximized.

The drill pads are in areas that have very little topographic relief, with surfaces sloping to the west at a rate of 2.0-4.0 degrees per 1000 feet; therefore, surface run-on/run-off would not be anticipated to be rapid or cause ruts or rills as a result of water flowing fast from high angles. If surface water does accumulate after a rainfall, small berms constructed on the uphill side of the drill pad would direct flow around the drill pad. A small sump at the downgradient end of the diversion ditch would collect any run-off and dissipate the velocity of flow prior to entering undisturbed ground.

A reserve pit would be constructed on each well pad for the containment of materials extracted from the drill hole during operations. Reserve pits would be placed in an area of the drill pad that avoids shallow groundwater. Reserve pits would be fenced and lined with impermeable liners to prevent groundwater and soil contamination.

Equipment on-site the drill pad would-be valve tree, mud tanks and pumps, water tanks, drilling rig, doghhouse, pipe tubs/racks and solids control units.



Figure 2.1. Layout of A1 Lithium Drill Pad



### 2.2.3. Exploration Operations

A1 Lithium would contract a petroleum drill rig to re-enter the two abandoned wells, one at a time. Drilling operations would involve drilling out the cement plugs to a depth of 8184 feet (Mineral Canyon) and 8262 feet (Sunburst) below ground level, to the predicted depth of the targeted clastic brine zones. 5 ½ -inch casing would be installed after reaching total depth; casing would be installed from surface of the well to its total depth. Surface casing will be cemented back to the surface and is subject to BLM inspection and verification. If the primary cement job does not circulate back to surface, remedial cementing will be required. Integrity of the well bore would also be tested during these drilling operations.

The drilling rig would have a 10,000 pounds per square inch (psi) blow-out prevention, hydrogen sulfide (H<sub>2</sub>S) monitors and breathing apparatus rigged up and operational while re-entering the well bore. A pit volume totalizer system would be used to monitor mud for losses and/or gains.

Brine horizons would be perforated for sampling following drilling operations. Sampling of brine fluids would first occur when the drill rig is onsite. A valve tree would be installed to facilitate additional sampling and testing once the drill rig is off-site. The valve tree, an assembly that regulates the flow in the well is constructed of valves, casing spools, and fittings. The valve tree, along with all other facilities on site, would be painted to match the natural landscape and to comply with the BLM Gold Book.

A1 Lithium personnel would be onsite during drilling operations. Drilling operations are anticipated to take twenty days per site.

#### 2.2.3.1. *Well Testing*

The primary target in the well re-entries is Clastic Bed 31 (6,260 to 6,290 feet depth), though A1 Lithium would also test Clastic Beds 17, 19 and 33 which occur above and below Clastic Bed 31 at both wells.

At each well, two to three, 1,000-liter samples would be collected in IBC containers from each clastic zone listed above. From these bulk samples, smaller samples would be extracted (approximately 1-liter in size) and dispatched to a certified laboratory for analysis. While bulk samples are being collected, flow rate would be evaluated (assuming artesian flow). Temperature and brine weight would also likely be tested.

Samples would be collected when the drill rig is still in place. Once the drill rig is removed from the drill pad, further sampling would not be anticipated. In the event further sampling is needed, the drill rig would return to the drill pad.

#### 2.2.3.2. *Water*

A petroleum drill rig would be used to re-enter the abandoned wells and is therefore subject to the applicable Federal and State drilling and operating requirements to protect surface and subsurface waters in all stages of the project.

The proposed drilling and casing methods are in accordance with Federal regulations as described in 43 CFR 3594.5 (a) (b) and 42 CFR 3593.1 (a) (b) (c) (d); and the Utah Division of Oil, Gas and Mining requirements in Rule R649-3 that are put in place to protect groundwaters.

Water associated with the drilling operations would be managed by using tanks and pits situated on the drill pad. Approximately 200 barrels (7,200 gallons) of water would be purchased from a contractor who purchases water from Grand Water and Sewer Service Agency. This water would be used to control the weight of the drilling mud which is used to negate water flow during the re-entry process. Drilling muds are purchased from oil service companies and managed by using the tanks on site at the drill pad. The use of drilling muds eliminates the production of water during the drilling phase, which in this project would only be the drilling out the cement plugs that were installed when abandoning the wells.

In previous exploration programs adjacent to the project area, artesian flow only occurred from Clastic Bed 31. This artesian flow has been previously recorded in numerous historic drilling reports and USGS publications. Due to the artesian flow from Clastic Bed 31, a large sample of brine (2,000 to 3,000 liters) would be collected in 1,000-liter IBC containers. The other targeted Clastic Beds are not predicted to result in artesian flow and much smaller samples (approximately 300-400 liters) would be collected from those beds. These samples would not flow to the surface and would need to be “swabbed” from the drill tubing.

The proposed project would be a zero-discharge facility, with any liquids generated during drilling contained in tanks prior to transport and disposal off-site.

Temporary diversion structures and sumps at the drill locations would be used for surface water management. Diversion structures would redirect any surface flow around the drill pad to reduce the amount of water needing to be contained on site. A small sump would be placed at the downgradient end of the diversion ditch to collect and detain any run-off and disperse the velocity of flow prior to entering undisturbed ground.

#### 2.2.4. Reclamation

The reclamation plan objective is to re-establish a stable configuration of all disturbed areas to minimize erosion potential and provide an environment for the establishment of a self-sustaining vegetation community. When sampling and exploration is completed, A1 Lithium would contact the BLM in writing with submittal of Form 3160-5 to plug and abandon the wells, following the recommendations and procedures set forward by the BLM. A workover rig would be brought on site to plug and abandon the wells. Well abandonment would be done one well at a time.

Over the course of the project, interim reclamation would take place by reclaiming all portions of the well site not needed for testing operations. Sufficient level area would remain for setup of a workover rig and to park equipment. The portion of the cleared drill pad not needed for operational safety purposes would be recontoured to a final or intermediate contour that blends with the surrounding topography as much as possible.

All structures would be removed from the drill pads. The fenced and lined reserve pits would have their liners folded inside the pit and backfilled.

Drill pads would be regraded to blend with the adjacent topography, and to prevent future erosion and foster revegetation of the native plant community. Access roads would be regraded to establish a stable configuration and reclaimed back to pre-existing conditions. Berms and turnouts would be completely removed and reclaimed. Plant medium, including organic matter, brush, rocks, and shrub/tree debris, taken during grading activities would be used as windthrow on disturbed areas to promote regeneration and foster environments for successful seeding. Disturbed areas would be reseeded by hand with an approved native seed mix to promote the growth of native vegetation. The seed would be tracked in by a dozer to create microsites to enhance establishment.

Disturbed areas would be reseeded with an approved native seed mix to promote the growth of native vegetation. Seeding should be accomplished by drilling on the contour whenever practical or by other approved methods such as dozer track walking followed by broadcast seeding.

Seeding or planting may be required to be repeated until revegetation is successful, as determined by the BLM authorizing officer. Regular monitoring of revegetated and reclaimed areas would be conducted with regular maintenance or reseeding as needed.

#### 2.2.5. Summary of Surface Disturbance

Total surface disturbance would amount to approximately 6.6 acres between both Mineral Canyon Federal #1-3 and Sunburst #1 wells. Table 4 shows the amount of surface disturbance area in detail. Surface disturbance activities would include clearing the drill pad and constructing a level area, three acres in size, to facilitate safe operations. Improvements to access routes would include approximately 0.6 acres of surface disturbance to recontour and widen the route surface to allow safe passage of vehicles.

**Table 4. Proposed surface disturbance in project area**

Well Name	Route Length (feet)	Route Area (acres)	Number of Turnouts	Turnout Area (acres)	Pad area (acres)	Total Disturbance (acres)
Mineral Canyon Federal #1-3	524.7	0.17	0	0.0	3.0	3.17
Sunburst #1	1040.8	0.33	5	0.10	3.0	3.43
Total	1565.5	.50	5	0.10	6.0	6.6

#### 2.2.6. Design Features and Conditions of Approval

Design features apply to each well being proposed. Design features and Conditions of Approval were discussed during internal scoping and taken from the A1 Lithium Revised Plan of Operations (Millcreek Mining Group, 2021), the 2016 Moab Field Office Record of Decision and Approved Master Leasing Plan (2016 MLP), 2008 Moab RMP, and The Gold Book (BLM, 2007).

Activity at each proposed location would be limited from 7:00am to 6:00pm throughout the project to limit disturbances to campers at the Horsethief Campground and protect night sky resources. Noise levels would be kept to 120 decibels or lower during daytime activities. Dust abatement would be used along the access roads when appropriate to further protect the visual and recreational resources in the area.

Should a need arise to change or modify the drilling or sampling plans submitted, A1 Lithium would contact the BLM’s MFO to discuss and coordinate a plan for modifications.

Proponent would avoid creating soil conditions that promote weed germination and establishment. All equipment, including on-road and off-road equipment, shall be cleaned to remove weed seed and soil (may contain weed seed) prior to commencing operations on public lands within the project area. The operator and contractor shall monitor disturbed areas in the project area for project-related establishment and spread of noxious and exotic weeds.

#### Minimum Air Pollution Controls for Drilling Rig Operations:

- Tier II or better drilling rig engines.
- Stationary internal combustion engine standard of 2g NOx/bhp-hr for engines <300 HP and 1g NOx/bhp-hr for engines >300HP.
- Low bleed or no bleed pneumatic pump valves.
- Dehydrator Volatile Organic Compound (VOC) emission controls to +95 percent efficiency.
- Tank VOC emission controls to +95 percent efficiency.

The following Drilling Operation BMPs are applied to minimize long-term disruption of the surface resources and existing uses, and to promote successful reclamation.

- Proposed casing and cementing programs shall be conducted as approved to protect and/or isolate all usable water zones. All isolating medium other than cement shall receive approval prior to use.
- Casing setting depth shall be calculated to position the casing seat opposite a competent formation based on relevant factors, including the presence/absence of hydrocarbons; fracture gradients; usable water zones; formation pressures; lost circulation zones; other minerals; or unusual characteristics.
- All indications of usable water will be reported to the BLM MFO Authorized Officer.
- Surface casing will be set at a minimum depth of 50 feet below the deepest usable source drinking water.
- All formations bearing usable quality water will be protected by employing casing and cement.
- Run cement bond logs to verify the effectiveness of the casing cement job to ensure the protection of usable water bearing zones. When needed, or as directed by the Authorized Officer, the operator shall conduct reasonable tests and/or surveys, which will demonstrate the mechanical integrity of the down hole equipment.
- Any cement plug that is the only isolating medium for a usable water interval shall be tested by tagging with the drill string. Any plugs placed where the fluid level will not remain static will also be tested.
- At a minimum, the operator and the BLM will adhere to BLM Instruction Memorandum 2010-055 regarding the Protection of Groundwater in Association with Oil and Gas Leasing, Exploration, and Development. Areas identified with shallow unconfined aquifers and potential unconsolidated aquifers will require additional mitigation that may include closed loop drilling, no surface pits, offsite location of production storage facilities; a spill prevention, control and countermeasure plan (as specified by the Environmental Protection Agency [EPA]); and a storm water management plan. A water monitoring plan may be required to ensure the effectiveness of mitigation to protect water resources.
- Disposal or use of water produced from Federal wells must be approved by the BLM before such operations begin, even if the operator has approval from the surface management agency. In cases of water disposal into pits or other impoundments, the structures must conform to approved construction requirements in accordance with Onshore Order No. 7, BLM Manual 9172, and applicable State agency requirements.
- Pits, water impoundments, and surface discharges that present a potential hazard to humans, livestock, wildlife, and other resources should be subject to appropriate mitigation, such as

fencing, netting, caging, or covers, as appropriate. Refer to the BLM Gold Book for enclosure fence construction standards.

- Any materials removed from the drill holes during drilling operations would be collected in the reserve pit for each drill hole.
- Disposal or emergency pits will be in cut material rather than fill material.
- All chemicals and hydrocarbon products (including used oil) shall be contained and controlled in accordance with the Spill Prevention Control and Countermeasure Plan (SPCCP) pursuant to 40 CFR Part 112.
- A spill contingency plan includes appropriate containers and secondary containment for tanks and smaller containers, such as drums and barrels of fuels and lubricants required for drilling, in accordance with all applicable environmental and safety regulations.
- Spill response materials (absorbents, drums) would be used to contain spills at the source, prevent a release to the environment, and complete the required clean-up. All hazardous constituents would be stored in approved containers and volumes and all safety protocols would be followed. All fuels/lubricants would be properly disposed and/or recycled according to specific product direction.
- Any chemical/fluid/oil/grease accidental spills from equipment, should be cleaned up, collected, and taken to a proper disposal site or landfill. Waste from portable sanitation facilities shall be properly disposed of at an approved facility.

The following safety practices would be followed throughout the project:

- Hydrogen sulfide (H<sub>2</sub>S) monitors and operational breathing apparatuses would be ready onsite while re-entering the old hole.
- Signs would be posted at access points prohibiting unauthorized personnel from entering the well sites. Unauthorized personnel would not be allowed on the rig floor, and all information would be kept confidential.
- No smoking would be permitted on the pits or rig floor. Smoking areas would be provided at a predetermined location.
- Safety meetings would be held on a regular basis to discuss upcoming operations and procedures.
- Re-entry would utilize blowout prevention procedures.
- Quality assurance would occur frequently by A1 Lithium personnel.

If fossil material is encountered in the area during operations, cease activity at that location and notify the MFO.

All phases of the Proposed Action would adhere to stipulations put in place by the 2008 Moab RMP to protect wildlife, including migratory birds. If drilling were to occur during owl breeding season, an owl survey would be done prior to commencing any activities.

Project construction that removes vegetation that supports nesting structure for migratory birds will be avoided from April 1 to July 31 to ensure nesting migratory birds will not be disturbed.

A temporary snow fence would be placed along the southern edge of Mineral Canyon Federal # 1-3 pad for cultural resource protection of resources just below the ledge. The snow fence would be removed at the end of the project period. All persons who are associated with mineral operations

will be informed of the temporary fencing that they will be subject to prosecution for knowingly disturbing archaeological sites or collecting artifacts.

If any previously unidentified cultural resources or human remains are discovered as a result of mineral operations, activity in the vicinity of the discovery will cease and will be immediately reported to the BLM Field Office. Work may not resume at that location until approved by the BLM Authorized Officer.

All vehicular traffic, personnel and equipment movement, and construction activities will be confined to the locations surveyed for cultural and paleontological resources, or to the existing roadways and/or inventoried access routes.

### **2.3. Alternatives Considered but Eliminated**

The alternative of building new access roads to the drill pads instead of improving the existing access roads was considered but eliminated as an alternative. This alternative was found to be ineffective as access roads already exists, and economically infeasible.

No other alternatives were discussed in detail during internal scoping or with A1 Lithium.

## **CHAPTER 3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL IMPACTS**

This chapter describes the existing conditions relevant to the issues presented in Table 1 in Section 1.3 and discusses the potential impacts of the Proposed Action and alternatives. The affected environment provides the baseline for comparison of impacts/effects described under environmental impacts. For a discussion of issues not described, see the IDT Checklist (Appendix A).

### **3.1. General Location**

Situated within the Colorado Plateau physiographic province, the landscape is flat and marked by mesas and buttes (Stokes 1986:241). The project's elevation ranges between 5,800-6,100 feet above mean sea level and lies within Blackbrush and Pinyon-Juniper vegetation biomes. The Mineral Canyon Federal #1-3 location is on the Kayenta Formation sandstone and the Sunburst #1 is located on the Navajo Formation sandstone, and each site is covered with 0-10 feet of mixed alluvial and aeolian deposits (Doelling, 2002).

The project area is in the Upper Sonoran life zone in the Intermountain Colorado Plateau region, and as such, the climate is predominately arid to semi-arid, but subject to seasonal monsoonal storms which deposit most of the annual rainfall of 9.0 inches and average total annual snowfall of 9.8 inches (See Table 5: Summary of Climate Data: Moab UT).

**Table 5. Summary of Climate Data from 1893-2021: Moab, Utah**

Climate Component	Typical Value*
Temperature	Maximum: 98.2°F; Annual max average 71.4°F Minimum: 18.2 °F; Annual min average 40.5°F
Precipitation	Average total annual rainfall: 9.0 inches Average total annual snowfall: 10.0 inches

\* Source: WRCC, 1889-2021: <https://wrcc.dri.edu/>; 1893-2016 totals; <https://wrcc.dri.edu/Climate/>

### 3.2. Issue 1 – Visual and Auditory Resources

How would activities that are associated with well re-entry (road construction and drilling operations) and brine fluid sampling impact the visual resources?

How would well re-entry and brine fluid sampling impact the sound scape of Horsethief Campground?

How would well re-entry and brine fluid sampling impact the dark night skies?

#### 3.2.1. Affected Environment

The BLM manages public lands for visual resources using the Visual Resources Management (VRM) system. The VRM system classifies land based on visual appeal, public concern for scenic quality, and visibility from travel routes or other Key Observation Points (KOPs). A visual resources inventory (VRI) class is used to place BLM-administered lands into one of four VRM classes. The VRI class is used as a baseline for the inventoried characteristics of the landscape and is not the indicator used for determining land management for a specific tract of land. VRM is used to guide the management decision throughout the BLM-administered lands as they are designated in the approved 2008 Moab RMP. Both the Mineral Canyon Federal #1-3 and Sunburst #1 wells are within VRI Class II. VRI classes range from I to IV, with Class I being assigned to areas designated to preserve a natural landscape. Class II, III, and IV are assigned based on a combination of characteristics present in overlays: scenic quality, sensitivity level, and distance zones. Both wells fit under all three overlays, thus possessing all three characteristics.

Using the VRI Class determinations, the area in which Mineral Canyon Federal #1-3 is located was designated as VRM Class III in the 2008 Moab RMP; the Sunburst #1 location is within designated VRM Class II. See Table 6 for objectives of visual resource classes.

**Table 6. Objectives for Visual Resource Classes**

VRM Class	Objective
Class I	The objective of this class is to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.
Class II	The objective of this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.



VRM Class	Objective
Class III	The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.
Class IV	The objective of this class is to provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.

State Route 313, designated the Dead Horse Mesa Scenic Byway by the State of Utah in 2002, is managed for its scenic driving enjoyment. State Route 313 is a KOP in its entirety; over one million people per year travel on State Route 313 to enjoy the scenery. It is designated as a Focus Area – Scenic Driving Corridor in the 2008 Moab RMP. The corridor is defined as having a width of ½ mile from the centerline. State Route 313 is also managed according to VRM Class II objectives, where levels of change to the landscape should be low and not attract the attention of the casual observer.

Drivers on State Route 313 often access Canyonlands National Park or Dead Horse Point State Park via the Scenic Byway, enjoying the vistas on the way to their destinations. Dead Horse Point State Park receives over one million visitors per year, all of whom arrive via State Route 313.

Many recreational activities can be found in the vicinity of State Route 313 including hiking, biking, and camping. Horsethief Campground and Rodeo Bike Trail are located within the general project area and managed with VRM Class III objectives, where levels of change to the landscape should be moderate and activities may attract attention but should not dominate the view of the casual observer.

The Rodeo Bike Trail, also considered a KOP, is part of a larger system of popular mountain biking trails accessed from State Route 313. This bike trail receives a substantial, but unknown number of users. The Mineral Canyon Federal #1-3 location is located along this bike trail.

Horsethief Campground is a popular spot for campers, offering both individual and group campsites. This campground, the largest in the Moab Field Office, is located off State Route 313 and attracts campers year-round. Seasonal closures for portions of the campground occur during winter months when visitation rates dip. The Horsethief Campground is within one mile of the Mineral Canyon Federal location, making it within earshot of that location. Visitors using the Rodeo Bike Trail and/or State Route 313 may be temporarily impacted by noise production from the wells when in the vicinity. See Map 2 in Appendix B.

Both Canyonlands National Park and Dead Horse Point State Park are International Dark Sky Parks, representative of the largely undeveloped and unpopulated nature of the surround area in which the project area would be located.

### 3.2.2. Environmental Impacts

The analysis area for visual resources is the viewshed within a 5-mile radius from the project area. A 5-mile buffer was selected based on the likelihood that the proposed structures or surface disturbance would not be noticeable to viewers based on their visual magnitude (apparent size) at that distance. Modifications that occupy less than 5 degrees of the field of view are considered insignificant and have low visual prominence to an observer, especially if contrast is low. (Haack et al. 2013)

#### 3.2.2.1. *Impacts of Alternative A – No Action Alternative*

Under the No Action Alternative, the BLM would not permit drilling, sampling, or reclamation. Impacts to visual resources would occur as previously permitted or occurring as part of the affected environment presented in Section 3.1.1. Drivers on State Route 313 would have unimpeded views of the VRM Class II and III scenery, no temporary structures would be in place to impact the visual aesthetics of the area for any duration, and campers at Horsethief Campground would not hear sounds of operations. Any potential impact to night skies from exploration activities would not occur.

#### 3.2.2.2. *Impacts of Alternative B – Proposed Action*

The Mineral Canyon Federal #1-3 well is approximately 0.5 miles from State Route 313 and intersects with Rodeo Bike Trail. The number of individuals frequenting the project area varies based on the season, with the highest visitation being in the spring (March-May) and fall (September-October) months. Over the two-year course of this project, an estimated one million individuals per year may be impacted concerning their enjoyment of the quality of visual resources in the area.

Visual resources would be potentially impacted during each phase of the project, including road work and drill pad development, drilling operations, sampling, and reclamation. Initial road work and drill pad development, drilling operations, and reclamation activities are expected to cause the greatest impacts on visual resources. Although these activities would cause the most impact, they are anticipated to be of relatively short duration (five months in total of the 24-month period). Those visitors who travel State Route 313, use the Rodeo Bike Trail, or camp at Horsethief Campground during these activities would be most impacted.

During the remainder of the project a 16-foot-tall valve tree and a 12-foot by 20-foot storage tank would be left on the drill pad to facilitate sampling. Sampling of brine fluids would potentially occur on a bi-monthly to quarterly basis at a maximum. During periods of sampling there are likely to be a few pick-up trucks on site along with several IBC containers to collect brine fluids which will then be trucked off site for analytical testing.

Drill rigs, the well tree and storage tank would temporarily intrude on the visual character of the project area, but no long-term increment in visual contrast would result. To reduce effects to visual resources, all semi-permanent infrastructure (i.e., valve tree) would be painted a pre-approved color from the BLM Gold Book to blend into the surrounding environment. The Proposed Action would be in previously disturbed areas (i.e., existing wells), access would be limited to existing access roads, and no permanent structures would remain after the 24-month project period. Therefore, the level of change to the landscape would be low and would meet VRM Class II

objectives. It is expected that all visual and auditory resources would return to pre-existing conditions once the elements of the Proposed Action were completed.

Auditory resources in the project area would also be impacted. Noise modeling undertaken as part of the 2016 MLP shows that areas located within 2.5 miles of a location are audible. The Horsethief Campground is less than one mile (4,230 feet) from the Mineral Canyon Federal #1-3 well. Horsethief Campground is the largest campground in the Moab Field Office, with 83 individual sites, and five group sites. Construction and drilling activities, which would take a combined 60 days for each site, would generate noise up to 120 decibels. Best Management Practices (BMPs) in the 2016 MLP suggest noise levels not exceed 50 decibels above background noise where equipment is located within the proximity of sensitive receptors. Horsethief Campground is considered a sensitive receptor. Natural barriers such as vegetation and topography would help dissipate the noise heard at the campground.

Following drilling operations, A1 Lithium would limit activity between 7:00am and 6:00pm to reduce effects to recreationists. Minimal auditory impacts are expected after drilling operations. As another design feature to reduce effects, the BLM would hang signs at the campground warning visitors of potential disturbances. During the sampling phase, no nighttime work would occur at either well, which would lessen the impacts on campers. Additionally, to protect night sky resources, no lights would be affixed to the well infrastructure.

#### 3.2.2.3. *Cumulative Impacts*

The Cumulative Impact Analysis Area (CIAA) to visual resources is the Paradox Basin and the lands within its viewshed.

The Paradox Basin, in which the project area is located, is thought to contain economically viable quantities of locatable minerals, including lithium. Past exploration in the area by A1 Lithium has shown certain beds within the formation to be a viable target for lithium due to artesian flow of brines and high grades of lithium located within those brines. Oil and gas development also occurs in the area surrounding the proposed locations for exploration.

Past, present or reasonably foreseeable actions contributing to cumulative impacts of the visual resources within the CIAA include:

- Recreation activities including hiking, mountain biking, 4x4 driving, camping (camping within campgrounds and dispersed camping)
- Mineral exploration and development including oil and gas and locatable minerals such as lithium.
- Livestock grazing and associated range infrastructure.
- Extended drought and wildfires.

Past, present or reasonably foreseeable actions contributing to cumulative impacts of the sound scape and dark nights skies include recreation activities and mineral exploration and development, including oil and gas.

Cumulative impacts to visual resources include changes in the form, line, color or texture of the existing character and natural features of the landscape. The CIAA includes areas of VRM Class I, II, III and IV, where objectives range from preserving the existing character (Class II) to allowing

for major changes in the landscape (Class IV). Impacts may result from mineral exploration activities and development of recreational, mineral or oil and gas and livestock facilities.

Under the No Action Alternative, there would be no changes to the character or natural features of the landscape. Impacts to the CIAA would be a continuation of the current activities in the area and no new development would occur.

The Proposed Action would include surface disturbing activities and installation of facilities on drill pads that would directly impact the viewshed as seen from certain areas within the CIAA, such as State Route 313 and the Rodeo Bike Trail. Design features would be applied to the temporary development of the access road and drill pad to reduce impacts on the visual resource. These design features would limit surface disturbance to the minimal amount necessary for safe operations, facilities would be painted an approved color that would blend in with the surrounding landscape, and reclamation activities would return the area to pre-existing conditions upon completion of exploration activities. While these changes to the landscape would be temporary, they would cumulatively change the lines, forms and color of the natural landscape, albeit in a low-moderate sense. Once the facilities are removed and reclamation is complete, the cumulative impacts to the natural landscape would overtime return to pre-existing conditions.

### **3.3. Issue 2 – Recreation Resources**

How would well re-entry and sampling activities impact recreational activities such as mountain biking, scenic driving, and camping in and around the project area?

#### **3.3.1. Affected Environment**

The proposed Project Area and access roads are in the Labyrinth Rims/Gemini Bridges Special Recreation Management Area (SRMA) (Map 17, 2008 Moab RMP). The Labyrinth Rims/Gemini Bridges SRMA is 300,650 acres in size and is managed as a Destination SRMA (majority of visitation is from outside the area).

The analysis area is heavily used by those seeking recreation activities including scenic driving, biking, hiking, camping, and 4x4 driving. State Highway 313 is a designated State Scenic Byway and Scenic Driving Corridor Focus Area for the Moab Field Office. Drivers on Highway 313 are often accessing Canyonlands National Park or Dead Horse Point State Park, enjoying the vistas on the way to their destinations. Drivers also access the many bike trails, four-wheel drive trails, campgrounds and other recreation facilities off State Route 313. Dead Horse Point State Park receives over one million visitors per year, all of whom arrive via State Route 313. In 2019, 700,000 people visited the BLM sites in the Labyrinth Rims/Gemini Bridges SRMA (RMIS, 2019).

The Rodeo Bike Trail, also in the analysis area, is part of a larger system of popular mountain biking trails accessed from State Route 313. This bike trail receives a substantial, but unknown number of users. The access road to Mineral Canyon Federal #1-3 crosses the bike trail.

Horsethief Campground is a popular spot for campers, offering both individual and group campsites. This campground, the largest in the Moab Field Office, is located off State Route 313 and attracts campers year-round. Seasonal closures for portions of the campground occur during

winter months when visitation rates dip. In 2019, the campground hosted approximately 58,000 people.

### 3.3.2. Environmental Impacts

#### 3.3.2.1. *Impacts of the Alternative A – No Action Alternative*

Labyrinth Rims/Gemini Bridges SRMA would not be impacted under the No Action Alternative. There would be no route maintenance and no disruption to any designated bicycle trail. Additional impacts to recreational experiences would not occur beyond baseline impacts already present in the project area as described in Section 3.3.1. The original access routes (undesigned routes) would be expected to continue to deteriorate in a consistent manner with unmaintained routes in the area and return to natural conditions.

#### 3.3.2.2. *Impacts of the Alternative B – Proposed Action*

State Route 313, which intersects the project area and would be used as the primary access route to the wells, is a popular driving destination and used to access many recreational activities, including access to Canyonlands National Park and Dead Horse Point State Park. Dead Horse Point State Park receives over one million visitors per year. Recreational visits vary by season, with spring and fall averaging the highest visitation rates. Based on the data from Dead Horse Point State Park, an estimated one million visitors visit the general project area for recreational purposes within a year.

The greatest impacts to recreational resources would occur during the initial road work and drilling (approximately 30 days per site) and well abandonment and reclamation (approximately 42 days per site). These activities would create more impacts than the routine sampling of the well due to the associated noise, traffic, and dust created. Although these activities are expected to cause the most impacts, they are of relatively short duration (five months total) out of the 24-month period of the project.

The Rodeo Bike Trail is located immediately adjacent to the Mineral Canyon Federal #1-3 drill site; the access road to the drill site crosses this designated bike trail. Road improvement at the beginning of the project period would temporarily impact recreational resources on this section of bike trail. Design features would include posting signs alerting users of operational activities where the bike path crosses the road. Additional impacts would be expected throughout the length of the project during intermittent well sampling and reclamation efforts. These impacts would be temporary in nature and recreational resources on the Rodeo Bike Trail would be expected to return to pre-existing conditions once the project is completed.

Horsethief Campground is located 4,230 feet from Mineral Canyon Federal #1-3 drill site. The drill site would not be visible from the campground but would be audible during initial drilling activities. See section 3.1.2.2 for auditory analysis. Recreational resources at Horsethief Campground would not be heavily impacted by the Proposed Action.

A1 Lithium would implement BLM Best Management Practices (BMPs) and additional Conditions of Approval (COA) set forth by the Moab Field Office as addressed in Section 2.2.6 to further reduce impacts to recreational resources. The Moab Field Office sees an influx of one million visitors per year, therefore approximately two million visitors' recreational experience may

be impacted. Impacts to recreational resources including State Route 313, Rodeo Bike Trail, and Horsethief Campground would be temporary in nature and would not exceed the length of the project (24-months). Short-term impacts would include visible equipment, noise production (as analyzed in section 3.1.2.2), and an increase in daily traffic (not to exceed eight vehicles per day). Long-term impacts to recreation and access would not be expected.

### 3.3.2.3. *Cumulative Impacts*

The CIAA for recreation is the area that includes recreation facilities, including trailheads and associated trails, campgrounds and scenic pull-outs along State Route 313. These recreation facilities include but are not limited to the Horsethief Campground and Rodeo Bike Trail.

Past, present or reasonably foreseeable actions contributing to cumulative impacts to recreation within the CIAA include:

- Recreation activities including hiking, mountain biking, 4x4 driving, camping (camping within campgrounds and dispersed camping)
- Mineral exploration and development including oil and gas and locatable minerals such as lithium.
- Livestock grazing and associated range infrastructure.

Cumulative impacts to recreation within the CIAA include accessibility and enjoyment of the recreation facilities, user conflicts between user groups and loss of solitude due to development.

The No Action Alternative would not limit accessibility or enjoyment of the recreation facilities. User groups would not encounter construction equipment or personnel associated with mineral exploration and their solitude would not change from its current condition.

The Proposed Action has the potential to cause limited accessibility issues that would be temporary in nature and only result in areas where access routes to the wells intersect roads or trails used by recreationists. Users' enjoyment of certain facilities has the potential to be impacted from exploration operations or personnel traveling to and from the well sites. The access route to Mineral Canyon Federal #1-3 is accessed from a popular maintained road that provides access to many recreation opportunities. Traffic on this road from A1 Lithium personnel and contractors would not create cumulative impacts to other user groups as their use would be solely for accessing the well. The same access route crosses the Rodeo Bike Trail. Mountain bikers riding this trail may find themselves impacted by construction activities during route improvement and personnel traveling to and from the well. The Horsethief campground hosts many campers throughout the year; some campers may be able to hear construction and drilling operations from the Mineral Canyon Federal #1-3. User groups of the Rodeo Bike Trail and Horsethief Campground may be impacted by the activities associated with mineral exploration at the Mineral Canyon Federal well by loss of solitude and recreation enjoyment, and the potential for conflicts between recreationists and A1 Lithium personnel.

Recreation activities abound in the MFO and visitors who are impacted by the activities associated with the Proposed Action may choose to recreate or camp elsewhere. Because there are ample opportunities for hiking, mountain biking, 4x4 driving and camping, it is anticipated that the impacted users would be able to disperse to other areas and not bring high levels of increased visitation to any one area.

### 3.4. Issue 3 – Geology/Minerals/Energy Production

How would the re-opening of the two wells impact the geological, mineral and energy resources in the area? How would sampling brine fluids located within the subsurface sedimentary sequences impact the geological, mineral, and energy resources in the project area?

#### 3.4.1. Affected Environment

The proposed project area is in an area that is open to the location of mining claims and oil and gas mineral leasing subject to standard terms and conditions as outlined in 2008 Moab RMP.

The Proposed Action is within the Paradox Basin (Map 3, Appendix B) which is defined as an asymmetric foreland basin located mostly in southeast Utah and southwest Colorado. On the east it is bordered by the tectonically uplifted Uncompahgre Plateau, on the northwest by the San Rafael Swell and on the west by the Circle Cliffs Uplift. The formation and burial history of the basin are key to why locatable mineral deposits have been found and are the determining factors of the minerals likely to be present in the area. The sediments that make up the rock formations in the Paradox Basin were deposited in a marginal marine environment that underwent episodes of restricted marine circulation throughout Mid-Pennsylvanian time, resulting in thick packages of evaporite sedimentation. The lithology of these evaporite cycles contain halite and anhydrite facies with chemistries conducive to mineral exploration. (Nuccio and Condon, 1996).

The Paradox Basin comprises an area of approximately 33,000 square miles (85470 km<sup>2</sup>), and its boundary reflects the extent of the potential mineral deposits. The principal productive horizons in the basin include the Mississippian age Leadville Limestone, the Pennsylvanian Age Hermosa Group (Honaker Trail, Paradox, and Pinkerton Trail formations) and the Permian age Cutler Formation (Brown, Alan Lee, 2002). Historically the Paradox Basin, and specifically the Big Flat Field in which the proposed action is located, has been active with oil and gas exploration and is now being investigated for locatable minerals.

The production from the Big Flat and Cane Creek oil and gas fields is recorded in the Utah Division of Oil, Gas, and Mining (UDOGM) Summary Production Report from September 2021 (Table 7).

**Table 7. UDOGM Summary Production Report by Field from September 2021**

Field	Total wells	Cumulative Oil Produced (BBL)*	Active wells	Monthly Oil (BBL)*	Monthly Gas (MCF)*	Monthly Water (BBL)*
Big Flat	170	6,584,772	22	10,212	7,209	10,584
Cane Creek	377	114,966	3	323	48	2

\*Barrel (BBL) is 42 U.S. gallons; gas is volume measured in increments of a thousand cubic feet (MCF). <https://oilgas.ogm.utah.gov/oilgasweb/publications/monthly-rpts-by fld.xhtml>

The Big Flat field has produced over 6,584,772 barrels (BBLs) of oil since the Big Flat #1 discovery well in 1957 (Smith, 1978), and is currently producing over 10,000 BBLs/month from 22 active wells. The active wells are producing from the Pennsylvanian Hermosa Group targeting the Honaker Trail Formation or the Cane Creek interval (6,000-7,000 feet below the surface) of the Paradox Formation (3,000-7,000 feet below the surface), and the Mississippian Leadville Formation at depths of 7,000-7,800 feet below the surface. Both the Mineral Canyon Federal #1-

3 and the Sunburst #1 locations are situated within 8,000ft (~1.5miles) of an active horizontal well producing oil from the Honaker Trail or Cane Creek intervals (UDOGM, <https://datamining.ogm.utah.gov/>).

There are currently no active mineral mining operations in the proposed Project Area, and the Proposed Action does not intersect, nor would it interfere with the 16 existing active placer mineral claims in T26S R19E Sections 03 and 14.

Potash has been historically mined in this area from deposits ranging in depth from 100-3,00 feet below the surface. The Proposed Action is not within a designated Potash Leasing Area as outlined in the 2016 Moab Master Leasing Plan.

### 3.4.2. Environmental Impacts

#### 3.4.2.1. *Impacts of Alternative A – No Action Alternative*

Under the No Action Alternative, no well re-entry would occur, therefore there would be no impact on geological resources. Additionally, no interference of commingled resources would occur.

#### 3.4.2.2. *Impacts of Alternative B – Proposed Action*

The Proposed Action would enter the Paradox formation of the Hermosa Group to perforate and extract fluids for testing from clastic beds within the Paradox Formation numbered 17, 19, 31 and 33 for mineral testing of the fluids in the formation. Clastic bed 31 is the main interval of interest and will receive most of the testing. The depth of each of these clastic beds is listed in Table 8.

**Table 8. Depth of clastic beds to be explored:**

Clastic Interval	Mineral Canyon Fed 1-3 (Feet below the surface)		Sunburst 1 (Feet below the surface)	
	From:	To:	From:	To:
<b>33</b>	6430	6445	6090	6105
<b>31</b>	6260	6290	5925	5945
<b>29</b>	6200	6220	5875	5885
<b>19</b>	5585	5620	5375	5415
<b>17</b>	5405	5450	5230	5270

The original drilling reports, mudlogs, and electric logs collected from the two wells were used to determine the formation intervals that contain oil and gas and the formation intervals that contain brines. Clastic beds identified for testing could change based on the results of the geophysical data collected during the operation, and either more or fewer intervals could be tested. BMPs (see Appendix C) would be utilized throughout the life of the Proposed Action and during procedural and operational plans.



The clastic beds in the Paradox Formation proposed for testing are sandwiched between intervals with known and producing leasable commodities. Clastic beds 17-31 are situated approximately 500 feet below recorded potash intervals and 100-500 feet above oil & gas producing intervals in the Cane Creek Formation. Because active oil and gas exploration and development in the surrounding area is targeting formations above and below the target intervals in the Proposed Action, the potential to encounter leasable minerals contained in the Paradox Formation while exploring for locatable minerals is not zero. The leasable minerals are subject to valid existing rights as outlined in the 2016 Moab MLP and cannot be produced during the extraction of locatable mineral resources.

If the locatable minerals are found to be in economic quantities due to the Proposed Action, any plans to mine and produce the resource would have to account for potential resource interference and create a plan to keep the commodities separate during development.

The Proposed Action is not expected to result in any long-term environmental impacts because of its use of previous disturbance and adherence to BMPs during operations. The BLM recognizes the potential impacts to mineral resources upon the development of either mineral in the future due to the interbedded nature of the leasable and locatable deposits in the sedimentary Paradox Basin. Short term, temporary impacts may occur to the ground surface from the use of drill pads and access routes; however, the Applicant would return them to the conditions that existed before the exploration operations in their reclamation of the project area.

### **3.5. Issue 4 – Water Quality and Quantity**

How would re-opening and exploring abandoned wells and extracting brine fluids impact the water resources, including aquifers, surface water and ground water? How would re-opening and improving existing access routes impact surface water runoff?

#### **3.5.1. Affected Environment**

The proposed project area is situated in the Upper Colorado-Kane Springs Hydrologic Unit between the Green River and Colorado Rivers. The aquifer systems are found in shallow Mesozoic porous sandstone intervals and in deep Upper Paleozoic sandstone beds sandwiched between confining evaporite beds down to 8,000 feet below the surface (Rush, et. al., 1982). The topography in the project area has little relief and is relatively flat. Groundwater from aquifer systems may be found at a depth starting at approximately 75 feet below the surface and potable groundwaters can be found approximately 75-500 feet below the surface (Rush, et. al., 1982. U.S. Geological Survey report on the Regional Hydrology of the Green River – Moab Area, Northwestern Paradox Basin, Utah).

There are no springs, seeps, or perennial streams in, adjacent to or near the proposed project area, and it is not within a municipal watershed. No riparian or wetland vegetation exist in the proposed project area or along proposed access routes (Moab RMP, 2008), and no river segments in the National System of Wild and Scenic Rivers, or river segments eligible for inclusion in the system (Map 22, Moab RMP, 2008). Access routes to the proposed project area cross ephemeral drainages. These drainages only flow for short periods of time during and after precipitation events.

Because the project area has little relief and is relatively flat, surface run-on/run-off is not anticipated to be an issue. In the event surface water is encountered at a particular site, the contractor would construct a small diversion on the uphill side of the drill pad to redirect any surface flow around the site. A small sump at the downgradient end of the diversion ditch would collect and detain any run-off and dissipate the velocity of flow prior to entering undisturbed ground. The use of temporary diversion and sumps at the drill locations for surface water management as described in the A1 Lithium Plan of Exploration on pg. 11, (iv) would be sufficient to control surface water drainage until reclamation.

Water associated with the drilling operations would be managed by using tanks and pits shown on the drill site layouts for each hole (see Figure 2.1). Water used in the operations would be purchased from a contractor who purchases water from Grand Water and Sewer Service Agency. The contractor has a metered hydrant and metered water trucks and are charged monthly on water used based on the meter readings. The contractor would haul in two truckloads of water to the site for the re-entry of each abandoned oil well; approximately 200 barrels would be held in reserve tanks on the drill pad. The proposed project would be a zero-discharge facility, with any liquids generated during drilling contained in tanks prior to transport and disposal off-site.

The water stored in the tanks would be used for drilling operations and to control the consistency and weight of the drilling mud fluids used in the drill hole during these operations. The drilling muds are composed of water, bentonite clay and barite for viscosity and weight, and emulsifiers and detergents for lubricity; drilling muds are used to move rock cuttings and debris out of the bore hole and provide a physical and chemical barrier between the borehole and the rock formation.

On re-entry of each well, A1 Lithium would sample the formation bed horizons cited in Table 8. The original drilling reports from the Mineral Canyon Federal #1-3 and the Sunburst #1 report artesian water flow from Clastic Zone 31. This artesian flow has been previously recorded in numerous historic drilling reports and USGS publications.

The produced waters are expected to be a brine and the volumes that would be collected for sampling are in Table 9, below. The brine fluid samples would be collected in 1,000-liter IBC containers. Formation intervals with artesian flow would produce more water and the sample size collected would be larger than those intervals that do not have artesian flow. The maximum amount of fluid collected for testing from each well would be 4,300 liters (1,136 gallons).

**Table 9. Volume of produced water, brine, planned to be collected.**

Clastic Zone	Mineral Canyon Fed 1-3		Sunburst 1	
	Artesian Flow	Brine Volume (liter)	Artesian Flow	Brine Volume (liter)
33	No	300	No	300
31	Yes	2,000 – 3,000	Yes	2,000 – 3,000
29	No	400	No	400
19	No	300	No	300
17	No	300	No	300

### 3.5.2. Environmental Impacts

#### 3.5.2.1. *Impacts of Alternative A – No Action Alternative*

Under the No Action Alternative, no road or drill pad improvement would take place and well re-entry would not occur. Thus, aquifers and ground water resources would remain in their current condition with no impacts from well re-entry associated with the proposed action. Surface water resources would remain unaltered.

#### 3.5.2.2. *Impacts of Alternative B – Proposed Action*

The Proposed Action would re-enter existing well bores and potentially encounter the surrounding potable water resources. With potable ground water resources found at approximately 75-500 feet below ground level, there is potential for encountering groundwater during exploration operations. The following proposed procedures would reduce the impacts to water resources and ensure the isolation of the testing procedures used in the wellbore from the surrounding connate formation waters:

- Installation of 5 ½” casing with cement to surface.
- Run cement bond and casing inspection logs to surface.
- Pressure testing at numerous steps and intervals for mechanical integrity of casing.
- Blowout prevention (BOP).
- Closed-loop, salt-saturated mud system with monitors to track volume gains and losses.

The topographic features of the area surrounding the drill pads are generally flat, with little topographic relief. In the event of heavy rains, surface runoff would be less likely to cause flooding or erosion issues compared to areas with more topography. The ephemeral drainages within the project area could cause flash flooding or damage to roads in the event of heavy storms. These occurrences would be more impactful to the infrastructure present than to the water resources themselves. Berms, diversion channels and sumps would be built to reduce any potential impacts that may arise from heavy monsoon events. These features would ensure surface water follows the least impactful path and would keep surface water out of areas of potential contamination, such as the reserve pit.

## CHAPTER 4. PUBLIC INVOLVEMENT, CONSULTATION, AND COORDINATION

### 4.1. Consultation and Coordination

**Table 9: List of all Person, Agencies, and Organizations Consulted for Purposes of this EA.**

Name	Purpose & Authorities for Consultation or Coordination	Findings & Conclusions
Utah State Historic Preservation Office	National Historic Preservation Action Section 106	“No Historic Properties affected” – SHPO concurrence on 10/13/2020 (Case No. 20-3421)

#### 4.2. List of Preparers

The specialists listed in the following tables assisted in the preparation of this EA.

**Table 10: List of Preparers (BLM)**

<b>Name</b>	<b>Title</b>	<b>Responsible for the Following Section(s) of this Document</b>
Jennifer Whittington	Geologist	Project Lead, Geology, Wastes, Water
Nate Huber	Air Quality Specialist	Air Quality, Green House Gas Emissions
Gabe Bissonette	Hydrologist	Wetlands, Floodplains
Aaron Vollmer	Rangeland Specialist	Soils, Grazing, Vegetation, Forestry
Katie Stevens	Outdoor Recreation Planner	Recreation, Visual Resources
Bill Stevens	Outdoor Recreation Planner	WSA, LWC, Wild and Scenic Rivers, Socioeconomics, Environmental Justice
Ami Schlosser	Archaeologist	Cultural Resources
Pam Riddle	Biologist	Wildlife (Sensitive Species, T&EC, General, Migratory Birds)
Charles Fischer	Natural Resource Specialist Fuels	Invasive Species/Noxious Weeds, Fire/Fuels
Lisa Wilkolak	Realty Specialist	Lands/Access
Bob Hartman	Petroleum Engineer	Engineering

**Table 11: Other Preparers**

<b>Name</b>	<b>Title</b>	<b>Responsible for the Following Section(s) of this Document</b>
Jared Bigler	Principle Ecologist	Project Manager
Rebecca Steely	NEPA Specialist	Primary Author
Caroline Brown	NEPA Specialist	Revisions, Secondary Author
Tyson Schreiner	GIS Specialist	GIS, Maps, Graphics
Heather Boekweg	NEPA Specialist	Review, Secondary Author
Chuck Easton MA, RPA	Senior Environmental Planner	Review, Quality Assurance

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## **Appendices**

Appendix A: IDT Checklist

Appendix B: Maps of Proposed Locations

**APPENDIX A:  
INTERDISCIPLINARY TEAM CHECKLIST**

**Project Title:** A-1 Lithium Incorporated Mineral Exploration Project

**NEPA Log Number:** DOI-BLM-UT-Y010-2021-0068-EA

**Project Leader:** Jennifer Whittington, Geologist, Moab Field Office

**DETERMINATION OF STAFF:** *(Choose one of the following abbreviated options for the left column)*

NP = not present in the area impacted by the proposed or alternative actions

NI = present, but not affected to a degree that detailed analysis is required

PI = present with potential for relevant impact that need to be analyzed in detail in the EA

The following elements are not present in the Moab Field Office and have been removed from the checklist:

Farmlands (Prime or Unique), Wild Horses and Burros.

**RESOURCES AND ISSUES CONSIDERED (INCLUDES SUPPLEMENTAL AUTHORITIES APPENDIX 1 H-1790-1)**

Determination	Resource	Rationale for Determination*	Signature	Date
NI	Air Quality Greenhouse Gas Emissions	Minimal drilling would occur due to entering previously drilled wellbore. The emissions from the drill rig equipment would be negligible, rapidly disperse and would not violate the National Ambient Air Quality Standards. Dust abatement measures will be implemented as necessary reducing impacts of dust on air quality.	Nate Huber	4/13/2021
NP	Floodplains	No floodplains are present with the project area.	Gabe Bissonette	4/1/2021
NI	Soils	Well pad and access road disturbance would equal approximately 6.6 acres of soil disturbance. Reclamation activities described in Design Features would reduce impacts to soils by regrading and revegetating the area to reduce future runoff or continued soil disturbance	Aaron Vollmer	3/30/2021
PI	Water Resource Quality and Quantity (drinking/surface/gr ound)	Drilling practices must protect surface and subsurface waters in all stages by adhering to Utah Division of Oil, Gas and Mining applicable well requirements outlined in Rule R649-3: Drilling and Operating Practices.  The drilling procedures that would affect water resource quality are addressed in the proposed Plan for Exploration in Appendix II and in the Description of Operations Part II, pg. 6; and the procedures satisfy the regulation in 43 CFR 3594.5 (a) (b) and the regulation at 42 CFR 3593.1 (a) (b) (c) (d).  The use of temporary diversion and sumps at the drill locations for surface water management as described in section 2.2.6 in the EA are sufficient to control surface water drainage until reclamation.	Jennifer Whittington	7/26/2021
NP	Wetlands/Riparian Zones	No Riparian or Wetlands are present within the project area. This is determination is based on riparian datasets from the Properly Functioning Condition (PFC) geocortex, AIM geoportal, and through the inspection of aerial imagery.	Gabe Bissonette	4/1/2021
NP	Areas of Critical Environmental Concern	No Areas of Critical Environmental Concern are present within the project area. See Map 21 in 2008 Moab RMP.	Katie Stevens	7/20/2021



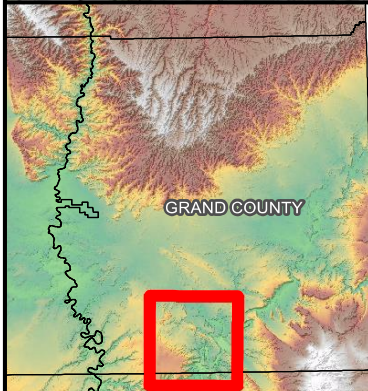
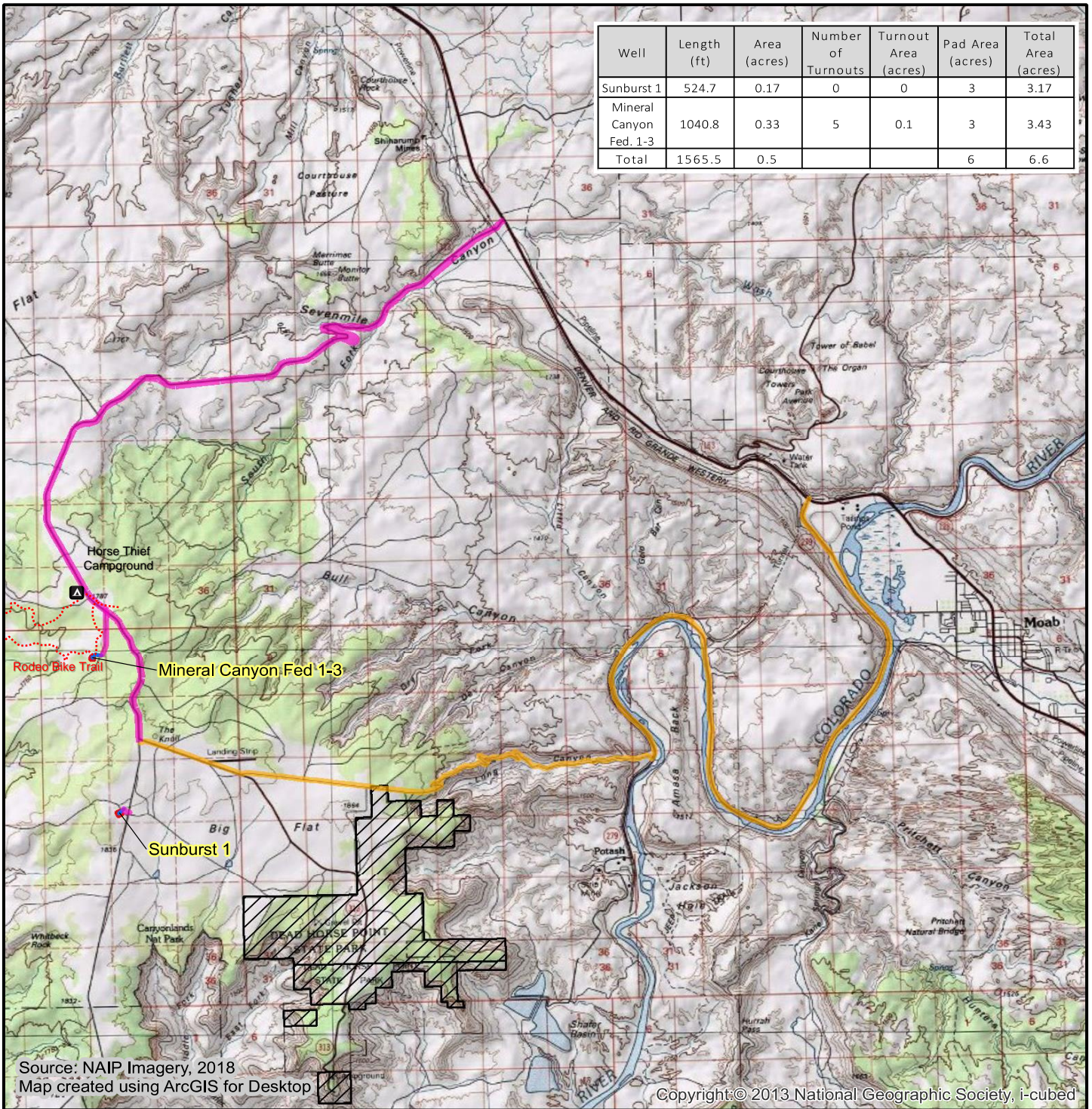
Determination	Resource	Rationale for Determination*	Signature	Date
PI	Recreation	Up to one million visitors utilize the area – on way to Dead Horse Point State Park as well as Island in the Sky District of Canyonlands National Park. Access to Mineral wellsite crosses Rodeo bike trail Sunrise well site is visible from Utah Highway 313, a State of Utah Scenic Byway.	Katie Stevens	7/20/21
NP	Wild and Scenic Rivers	No Wild and Scenic Rivers are present within the project area. See Map 22 in 2008 Moab RMP.	Bill Stevens	4/1/21
PI	Visual Resources	Proposed Action is within VRM Class II. Sunburst wellsite is visible from the Utah State Scenic Byway (Highway 313) corridor. Mineral wellsite is visible from the Mineral Bottom Road (access to the White Rim and the Green River) as well as from the Horsethief and Cowboy Camp Campgrounds.  Auditory impacts may be incurred by campers, especially at night.	Katie Stevens	7/20/21
NP	BLM Natural Areas	No BLM Natural Areas are present within the project area. See Map 16 in 2008 Moab RMP.	Bill Stevens	4/1/21
NI	Socioeconomics	Minimal impact relative to overall economy of planning area. According to data from U.S. Department of Commerce (2021), Census Bureau and County Business Patterns, all mining in Grand County (including oil and gas) accounted for 0.3 percent of total county employment in 2019. The type of exploration proposed in this action is highly likely to involve spending on labor and services from outside the local economy, given the lack of mining infrastructure in Grand County.	Bill Stevens	4/1/21
NP	Wilderness/WSA	No Wilderness or WSAs are present within project area. See Map 16 in 2008 Moab RMP.	Bill Stevens	4/1/21
NP	Lands with Wilderness Characteristics	No lands with wilderness characteristics as identified by BLM are present within the project area. See Map 15 in 2008 Moab RMP.	Bill Stevens	4/1/21
NI	Cultural Resources	Placement of temporary snow fence along southern edge of Mineral Canyon Fed 1-3 pad for cultural resource protection of resources just below the ledge.  “No Historic Properties Affected” – SHPO concurrence 10/13/2020 - Case No. 20-3421	Ami Schlosser	7/20/2021
NP	Native American Religious Concerns	Tribal Consultation was initiated on 10/13/2020 with letters mailed to tribes. Tribal responses did not identify any concerns within project area.	Ami Schlosser	7/20/2021
NI	Environmental Justice	No EJ populations identified in planning area. See <a href="https://headwaterseconomics.org/apps/economic-profile-system/49019">https://headwaterseconomics.org/apps/economic-profile-system/49019</a> .	Bill Stevens	4/1/21
NI	Wastes (Hazardous or solid)	Drilling fluids, produced water, and other wastes associated with the exploration for lithium/bromine minerals are excluded as a hazardous waste under 40 CFR 261.4(a)(17).  The surface use and drilling procedures contained in the proposed plan include containment and disposal measures of hazardous solid	Jennifer Whittington	4/2/21

Determination	Resource	Rationale for Determination*	Signature	Date
		<p>wastes or spills (Description of Operations, pg. 14, part vii-ix; and pg. 31 section 8 General Performance Standards).</p> <p>Sumps and cuttings pits must be lined to prevent water seepage, monitored for wildlife and cleaned of trash and debris during the drill and testing phases of the proposed operations, and before final reclamation.</p> <p>All non-exempt waste generated during the proposed operations must be collected and disposed of in a landfill</p>		
NP	Threatened, Endangered or Candidate Animal Species	No Mexican spotted owl habitat in the vicinity of the Sunburst & Mineral 1-3 locations.	Pam Riddle	3/29/21
NI	Migratory Birds	<p>WestWater Engineering Surveys June 2020: no raptor nests with 0.5 miles of Sunburst 1 &amp; Mineral 1-3. Due to the absence of cliff structure and minimal vegetative structure, cliff and tree nesting raptors are not expected to nest in the vicinity of these two locations. If additional locations other than the Sunburst 1 &amp; Mineral 1-3 are proposed for project construction, resurveying a during the active nesting season by a qualified biologist will be required. Project construction that removes vegetation that supports nesting structure for migratory birds will be avoided from April 1 to July 31 to ensure nesting migratory birds with not be disturbed.</p> <p>Non-nesting migratory birds &amp; raptors are not tied to a nesting location with young and therefore can readily avoid away from disturbances that may occur as a result of this project.</p> <p>Due to lack of nesting habitats, seasonal avoidances, and mobility of non- nesting migratory birds &amp; raptors. These species will not be affected to a degree that detailed analysis is required.</p>	Pam Riddle	7/05/21
NI	Utah BLM Sensitive Species	<p>WestWater Engineering Surveys June 2020:</p> <p>Minimal SSS animal habitats, no SSS animals were observed during surveys.</p> <p>BLM Sensitive Species animal habitat is minimal in the project areas; occupancy is not expected. No BLM Sensitive Species (plants or animal) were observed during surveys; therefore, BLM Sensitive Species will not be affected to a degree that detailed analysis is required.</p>	Pam Riddle	3/29/21
NI	Fish and Wildlife Excluding USFW Designated Species	<p>Minimal, short-term impacts to general wildlife during surface disturbing activities. No bighorn lambing habitat in the vicinity of these two locations. General wildlife can readily move into nearby suitable habitats during surface disturbing activities, permanent displacement is not expected. Approximately 3 acres per pad adjacent to existing roads (less than 7 acres total) will be disturbed. Minimal, short-term impacts on less than 7 acres is not expected to affect wildlife and their habitats to a degree that detailed analysis is required.</p>	Pam Riddle	3/29/21

Determination	Resource	Rationale for Determination*	Signature	Date
NI	Invasive Species/Noxious Weeds	Design features including cleaning vehicles and equipment prior to entering site so as not to bring in invasive species and reclamation activities, reduce the potential for impact of invasive species spread and establishment. Native species would be seeded over all disturbed areas upon completion of operations.	Charles Fischer	7/26/21
NP	Threatened, Endangered or Candidate Plant Species	WestWater Engineering Surveys June 2020: Navajo Sedge - no seep-springs or hanging gardens present within 100 meters of the proposed project features Jones cycladenia, occurs on gypsiferous saline soils derived from the Chinle, Cutler, and Summerville Formations. The proposed project would be located on soils derived from the: Kayenta, Wingate sandstone, and mixed eolian alluvial deposits. No suitable habitat for Jones cycladenia was observed during surveys.	Pam Riddle	3/29/21
NI	Livestock Grazing	Livestock usage will not be impacted by the 6.6 acres of disturbance because the Big Flat Ten Mile allotment is 160,000 acres in size, allowing the cattle ample grazing area.	Aaron Vollmer	3/25/21
NI	Rangeland Health Standards	There is a potential for 6.6 acres of rangeland to be impacted, but due to reclamation activities as outlined in Design Features to regrade soil and reseed area with native vegetation, rangeland health standards would not be impacted to a degree requiring further analysis.	Aaron Vollmer	3/25/21
NI	Vegetation Excluding USFW Designated Species	The well pads and access routes would cause 6.6 acres of disturbance, potentially impacting 6.6 acres of vegetation. Reclamation activities outlined in Design Features require reseeding of native seed after the project is complete (24 months after start date).	Aaron Vollmer	3/25/21
NI	Woodland / Forestry	Proposed disturbance would be within area of previous disturbance in a sparsely wooded area. Some individual trees may be impacted by road and drill pad construction but not to a degree requiring detailed analysis. Revegetation would scatter removed vegetation material to promote growth of future trees.	Aaron Vollmer	3/25/21
NI	Fuels/Fire Management	Both proposed well locations fall within Fire Management Unit (FMU) 8 – Dead Horse Point. Fuels within this FMU are generally sparse and consist of a mixture of sagebrush, blackbrush, salt brush, native grasses and pinyon-juniper (PJ). When the proposed action is overlaid with the fire history layer and buffered ½ mile there have been a total of 4 fires over the past 30 years; all fires were 1/10 <sup>th</sup> acre or less. Due to the sparse fuels and lack of historical fires within the area, the proposed action does not warrant further analysis, as no impacts are anticipated.	Josh Relph	5/11/22
PI	Geology / Mineral Resources/Energy Production	Oil and gas resource exploration and development is active in the proposed exploration area. The depths proposed for mineral exploration and testing (6200-6300ft) are stratigraphically above the historic oil and gas producing Cane Creek formation (>7400ft). Subject to valid existing rights. See 2016 MLP.	Jennifer Whittington	4/2/21

Determination	Resource	Rationale for Determination*	Signature	Date
NI	Lands/Access	Access to drill pads are subject to valid, existing rights-of-way in area of proposed action. No existing rights-of-way would be impacted.	Lisa Wilkolak	7/20/21
NI	Paleontology	The geologic formations at the surface in the areas of the proposed locations have a potential fossil yield classification of PFYC3 (moderate). If fossil material is encountered in the area during operations, cease activity at that location and notify the Moab Field Office.	Jennifer Whittington	4/2/21

Appendix B: Map of Proposed Locations for A1 Lithium Incorporated Mineral Exploration Project  
 Map 1: Location of Proposed Activity and Existing Well Sites



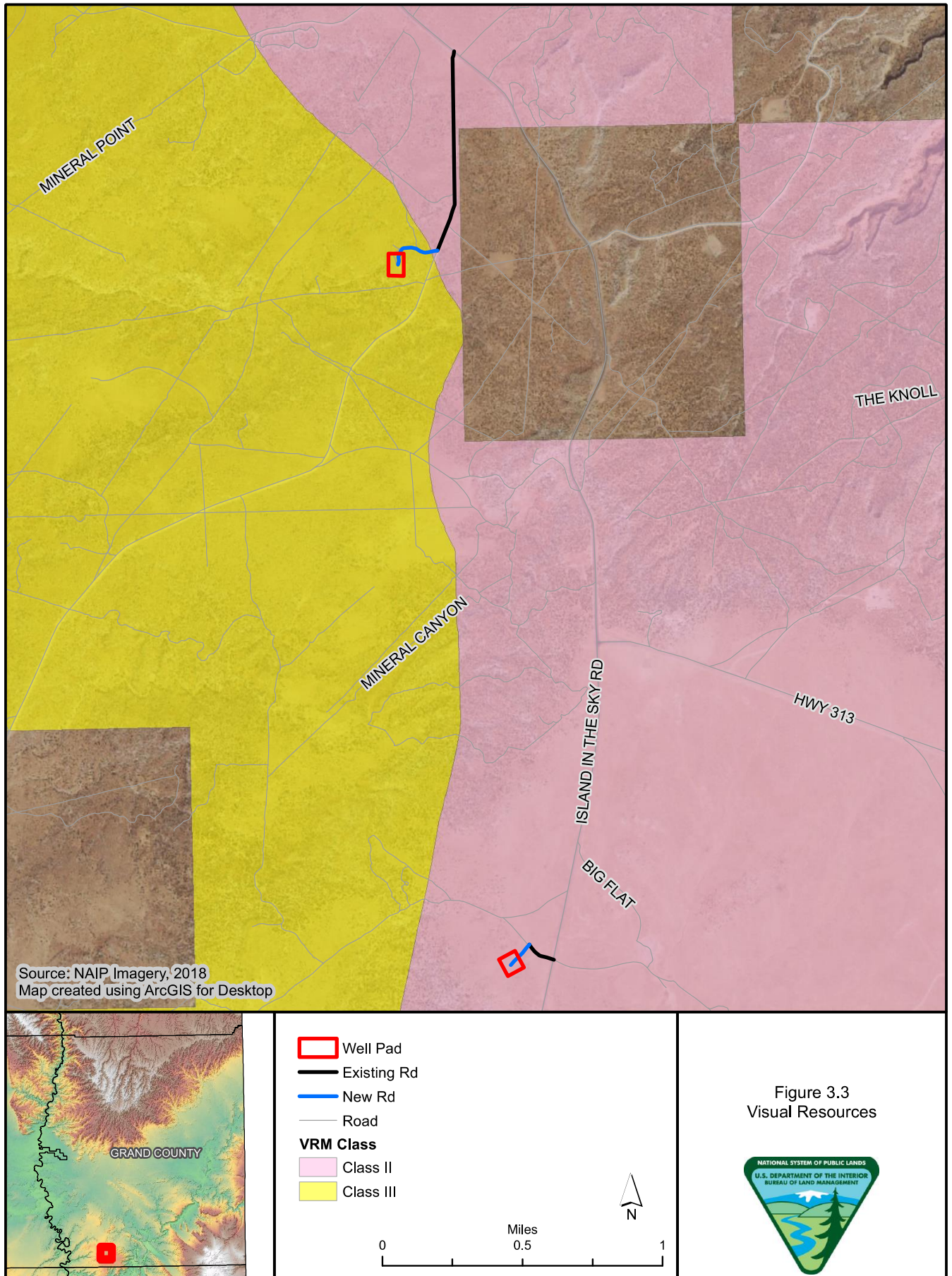
- Alternate Access Route
- Existing Access Route
- New Rd
- Well Pad
- State Park

Miles  
 0      2      4

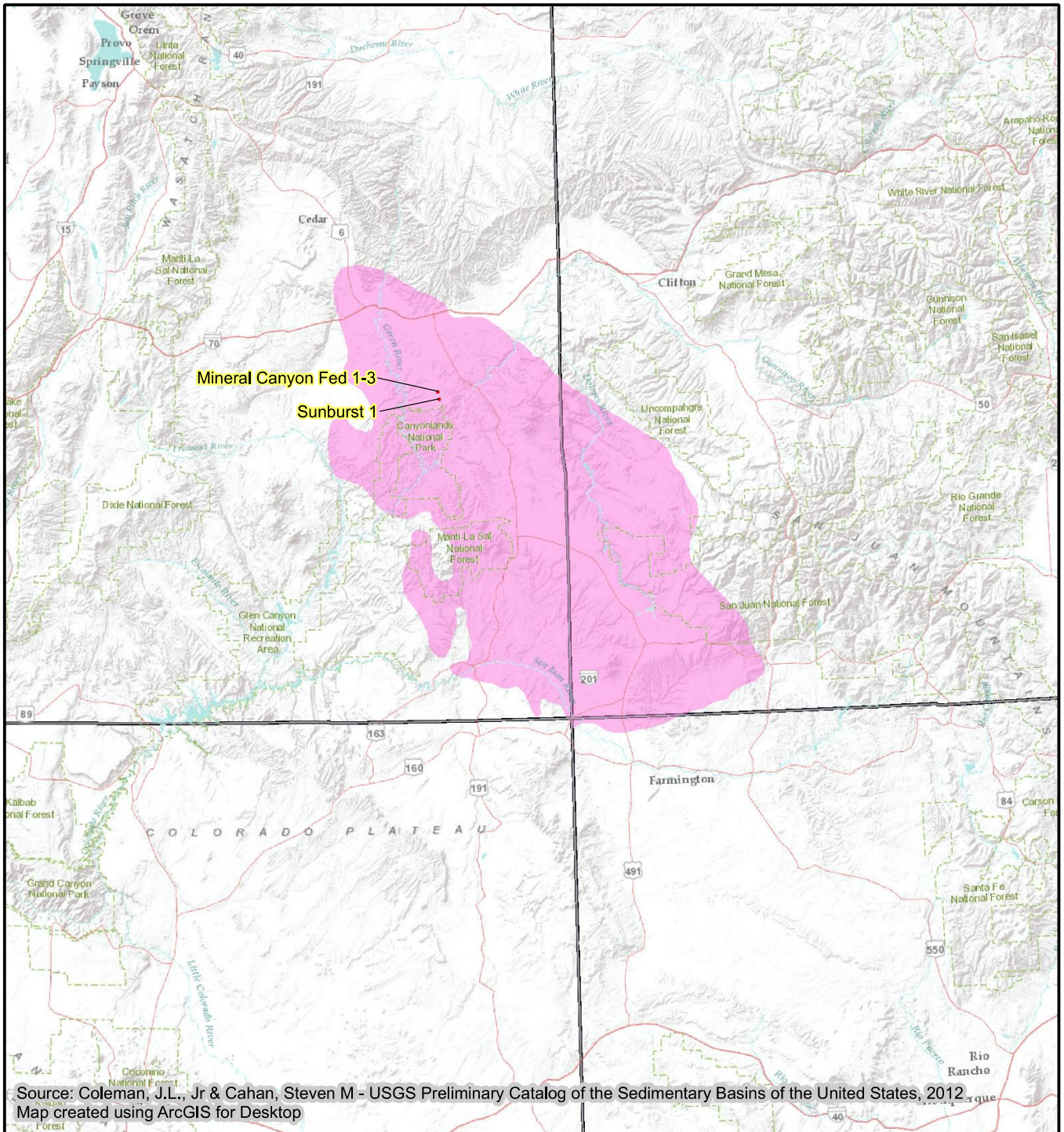
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**Figure 1-1**  
 Location of Proposed Activity  
 and Existing Well Sites

Map 2: Visual Resources




### Map 3: Geological Resources - Paradox Basin



Source: Coleman, J.L., Jr & Cahan, Steven M - USGS Preliminary Catalog of the Sedimentary Basins of the United States, 2012.  
 Map created using ArcGIS for Desktop



Well Pad  
 Paradox Basin

  
 Miles  
 0      50      100

**Figure 4-2**  
**Geological Resources**

