BLM

U.S. Department of the Interior
Bureau of Land Management

Environmental Assessment

DOI-BLM-NV-B020-2021-0015-EA

Clayton Valley Lithium Pilot Plant Project

March 2021

PREPARING OFFICE

U.S. Department of the Interior
Bureau of Land Management
Tonopah Field Office, Nevada

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BLM: $34,950
Proponent: $600,000

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Abbreviations

ARPA	Archaeological Resources Protection Act of 1979
BLM	Bureau of Land Management
BMPs	Best Management Practices
BMRR	Bureau of Mining Regulation and Reclamation
BSCs	biological soil crusts
CARB	California Air Resources Board
CEQ	President's Council on Environmental Quality
CFR	Code of Federal Regulations
CO_2e	CO_2 equivalent
EA	Environmental Assessment
EJ	Environmental Justice
EO	Executive Order
EPA	US Environmental Protection Agency
EPMs	Environmental Protection Measures
ESD	Ecological site description
FEMA	Federal Emergency Management Agency
FLPMA	Federal Land Policy and Management Act of 1976
FR	Federal Register
gpm	gallons per minute
hp	horsepower
hr/yr	hours per years
ID	Interdisciplinary
kW	kilowatt
MW	megawatt
NAC	Nevada Administrative Code
NDOA	Nevada Department of Agriculture
NDOT	Nevada Department of Transportation
NDOW	Nevada Department of Wildlife
NDEP	Nevada Division of Environmental Protection

NDEP-BWPC	Nevada Department of Environmental Protection Bureau of Water Pollution Control
NDWR	Nevada Division of Water Resources
NEPA	National Environmental Policy Act of 1969
NRCS	Natural Resources Conservation Service
OSHA	Occupational Safety and Health Administration
Plan	Plan of Operations
Plan Area	Project-related disturbance areas
RCRA	Resource Conservation and Recovery Act
RIB	Rapid Infiltration Basin
SER	Supplemental Environmental Report
tpy	tons per year
USFWS	US Fish and Wildlife Service
WPCP	Water Pollution Control Permit

1.0 Introduction/Purpose of and Need for Action

1.1 Introduction

Schlumberger Technology Corporation (Schlumberger) proposes to assemble, operate, and reclaim a temporary pilot plant (Pilot Plant) as part of the Clayton Valley Lithium Pilot Plant Project (Project). The Project is located on Federal surface lands and unpatented placer mineral claims administered by the Bureau of Land Management (BLM), Battle Mountain District, Tonopah Field Office. The Project is located on the eastern side of Clayton Valley, Nevada, approximately 30 miles southwest of Tonopah, Nevada. The Project is located in parts of Sections 29, 31, and 32, Township 2 South (T2S), Range 40 East (R40E); Sections 6 and 7, T3S, R40E; and Section 12, T3S, R39E, Mount Diablo Base and Meridian, Esmeralda County, Nevada (Project Area) as shown on Figure 1-1.

The Project Area can be accessed from Tonopah, Nevada, by traveling approximately 34 miles west on United States Highway 95 (US 95), turning south onto NV-265, traveling approximately 20 miles to the town of Silver Peak and continuing south on NV-265 for approximately another 5 miles to an unnamed road, turning east and traveling approximately 3 miles to the Project Area. The Project Area is considerably larger than the proposed Pilot Plant disturbance areas because it includes an existing access road and a large area surrounding the Pilot Plant location which was included in the baseline studies to enable Schlumberger to adjust the Pilot Plant location should more suitable areas be identified.

The Plan of Operations #NVN-99670 (Plan; Stantec, 2021) was submitted to the BLM and the Nevada Division of Environmental Protection (NDEP) Bureau of Mining Regulation and Reclamation (BMRR) in September 2020 and revised in January 2021, in accordance with BLM Surface Management Regulations 43 Code of Federal Regulations (CFR) 3809, as amended.

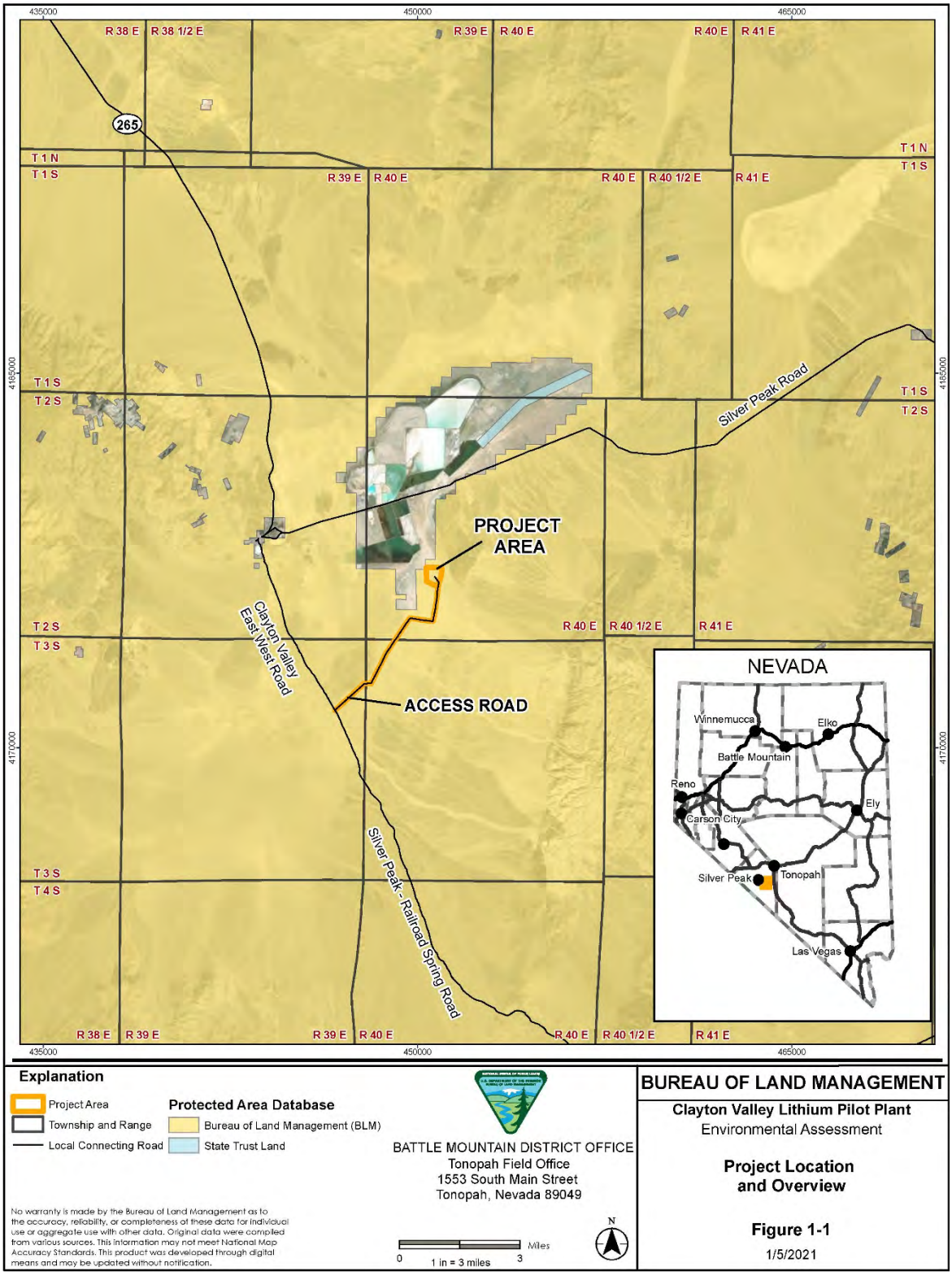

Figure 1-1 Project Location and Overview

1.2 Purpose of and Need for Action

On lands open to location under the General Mining Law of 1872, as amended (Mining Law), the BLM administers the surface of Federal land and federal subsurface mineral estate under the Mining Law and the Federal Land Policy and Management Act of 1976 (FLPMA). FLPMA also governs BLM's administration of Federal land not open to location under the Mining Law. The purpose of the Proposed Action is to provide Schlumberger the opportunity to explore, locate, delineate, and extract mineral deposits on its mining claims on Federal lands, as provided under the Mining Law. The need for the action is established by the BLM's responsibility under Section 302 of the FLPMA and the BLM Surface Management Regulations at 43 CFR 3809, to respond to a plan of operations to allow an operator to prospect, explore, and assess locatable mineral resources on Federal lands, and to take any action to prevent unnecessary or undue degradation of the Federal lands.

1.3 Decision to be Made

The decisions the BLM would make based on this Environmental Assessment (EA) include any of the following: 1) approve the proposed Plan with no modifications; 2) approve the Plan with additional mitigation measures that are needed to prevent unnecessary or undue degradation of Federal lands and reduce or eliminate the effects of the proposed action or alternatives; or 3) deny approval of the Plan and not authorize the Project if it is found the Proposed Action does not comply with the 3809 and 2800 regulations and the FLPMA mandate to prevent unnecessary or undue degradation.

1.4 Relationship to BLM and Non-BLM Policies, Plans, and Programs and Land Use Plan Conformance

BLM is responsible for the preparation of this EA, which was prepared in conformance with National Environmental Policy Act of 1969 (NEPA), applicable laws and regulations passed subsequently, including the President's Council on Environmental Quality (CEQ) regulations implementing NEPA (40 CFR 1500-1508), US Department of Interior requirements, and the policy guidance provided in the BLM NEPA Handbook H-1790-1 (BLM, 2008). This document was prepared following the Update to the Regulations Implementing the Procedural Provisions of the National Environmental Policy Act, effective September 14, 2020. Under 43 CFR 3809.415 and 43 CFR 2801.2, applicants must prevent unnecessary or undue degradation to the Federal lands. The Proposed Action conforms with the BLM's Tonopah Resource Management Plan Record of Decision dated October 1997 (BLM, 1997), the Esmeralda County Master Plan (Esmeralda County, 2011), and Esmeralda County Public Lands Policy Plan (Esmeralda County, 2013).

1.5 Scoping

An Interdisciplinary (ID) Team of BLM resource specialists was assigned to evaluate the Plan in February 2020. The ID Team identified the elements associated with supplemental authorities and other resources and uses to be addressed in this EA. Issues and potential impacts related to specific resources associated with the Proposed Action were identified. Supplemental environmental reports (SERs), available as part of the Project Administrative Record, were prepared for the following resources that were identified as Present/May Be Affected by Project activities: Air Quality, Environmental Justice, Migratory Birds, Social and Economic Values, Special Status Species (including bald and golden eagles [Aquila chrysaetos]), Water Resources, and General Wildlife. During the Plan evaluation, the following resources were identified as not present in the Project Area and are not discussed further in this EA: Areas of Critical Environmental Concern, Farm Lands (Prime or Unique), Fire Management, Fish Habitat, Forests and Rangelands, Human Health and Safety, Threatened and Endangered Species, Wild and Scenic Rivers, and Wilderness.

The EA will be made available for a 30-day public comment period. Notifications of the availability of the EA will be sent to persons and agencies on the Project mailing list, and the EA will be posted on the BLM National NEPA Register and the Battle Mountain District website. The BLM will issue a press release the same day that the EA is posted with a link to the EA and instructions on how to comment.

2.0 Description of the Proposed Action and Alternatives

2.1 Proposed Action

The Proposed Action is to assemble and operate the Pilot Plant to test Schlumberger's approach to extracting lithium from the Clayton Valley underground brine resource and produce either lithium carbonate or lithium hydroxide monohydrate (lithium hydroxide). The Project duration would be approximately 18 months. The Project would include a Pilot Plant, the existing exploration well CV-9 and other disturbance associated with that notice (previously authorized under Notice NVN-99507), a rapid infiltration basin (RIB), up to three road pullouts and the use and of an existing Access Road (see Figure 2-1). No right-of-way authorization is requested for use of the Access Road because it is an existing road and project-related maintenance would be limited to the existing road width and depth. Regarding Notice N-99507, CV-9 and the area disturbed for drilling (approximately 120 feet square), and the disturbance area remaining around CV-1 and CV-3 (both plugged and abandoned) are within the Plan Area (described subsequently) and will be included in this EA. The disturbance areas associated with CV-2, CV-4, CV-5, and CV-6 (see Figure 2-1) are outside of the Plan Area and will remain part of Notice N-99507. Notice N-99507 would be amended subsequent to processing and bonding of the Plan to clarify the areas that remain associated with the Notice.

Phase 1 of the Project would include a RIB Investigation; Phase 2 would include assembly and operation of the Pilot Plant, creating the pullouts and maintenance of the Access Road; while Phase 3 would include construction and operation of the RIB. Phases 2 and 3 would be conducted concurrently. The Plan Area, shown on Figure 2-1, includes the Project-related disturbance areas associated with the individual features listed above. Additional details of the Proposed Action can be found in the Plan (Stantec 2021).

Because this is a Pilot Plant, various unit operations would be tested for potential applicability in the overall process. Pilot-scale testing is a necessary step along the path of developing, proving, marketing, and eventually constructing lithium brine mines without the need for large evaporation ponds.

Lithium-bearing brine would be pumped from well CV-9 for the pilot study, pursuant to water rights administered by the Nevada Division of Water Resources (NDWR). The feed brine to the Pilot Plant would be drawn by submersible pump from the underground resource approximately 600 to 1,500 feet below ground surface in Clayton Valley. The brine is not potable due to high concentrations of total dissolved solids. Once the lithium is removed from the brine in the Pilot Plant, the lithium-depleted brine would be

delivered to a RIB where it would reinfiltrate, thus maintaining the existing groundwater balance in the area. The Pilot Plant and RIB would be located near CV-9.

The total surface disturbance within the Project Area would be 7.23 acres, as shown in Table 2-1. Much of this acreage is previously disturbed.

Table 2-1 Plan Area and Estimated Project Disturbance

Plan Area	Area in Acres
RIB Investigation Areas (Phase 1, includes 6 RIB Investigation Areas, see Figure 2-1)	0.44
Pilot Plant (Phase 2, includes Pilot Plant, Monitoring Well, CV-9 and CV-1*, see Figure 2-2)	3.5
Residual Reclamation of CV-3* (Phase 2, see Figure 2-2)	0.02
Access Road Pullouts (Phase 2, see Figure 2-3)	0.07
Total Pilot Plant Project Disturbance	**4.03**
RIB (Phase 3, see Figure 2-2)	3.2
Total Disturbance Associated with this Plan	**7.23**

* Disturbance area is associated with residual reclamation from Notice N-99507.

Clayton Valley East West Road is maintained by Esmeralda County and would require no project-specific improvement or maintenance. Turning northeast off Clayton Valley East West Road, site access follows an existing road that is open to public use and proposed maintenance activities would be limited to those that do not create additional disturbance. BLM Right of Way authorization is not requested or required for project use. Up to three pullouts may be constructed along the road in order to facilitate efficient mobilization, operations, and demobilization of the Pilot Plant.

Stormwater controls would be constructed on the site. Diversion berms would be constructed upgradient of the Pilot Plant to divert stormwater around the site. Storm channels and culverts would be constructed within the site to route stormwater to a storm pond located at the lowest point. The stormwater controls were sized to contain the peak flow generated by the 100-year, 24-hour storm in addition to 110 percent of the fluids stored onsite. Stormwater accumulated in the storm pond would be removed, as needed, using a vacuum truck and would be disposed of offsite.

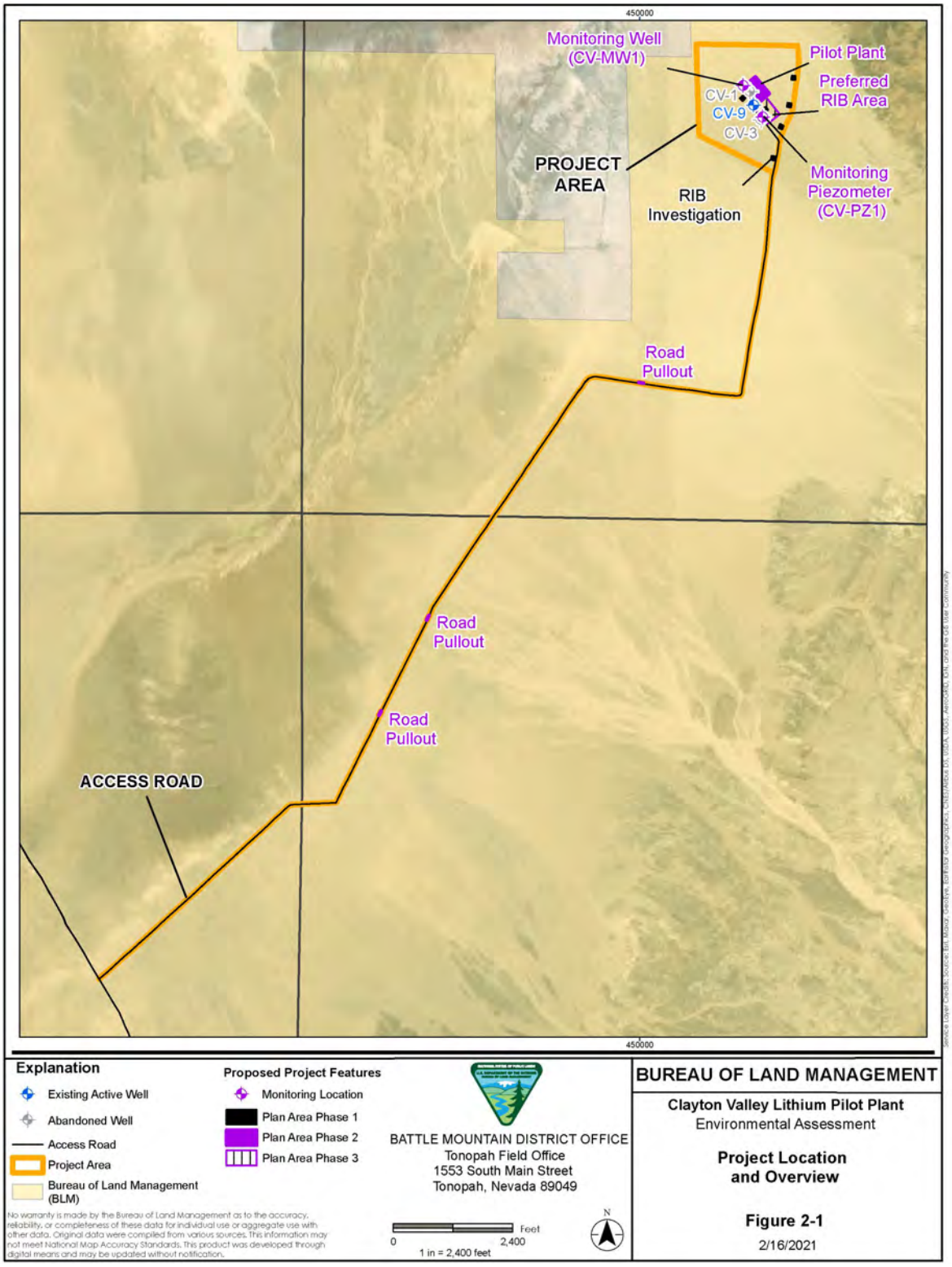

Figure 2-1 Plan Area

2.1.1 Phase 1 RIB Investigation

Schlumberger proposes to re-introduce lithium-depleted brine from the proposed Pilot Plant, assembled as part of Phase 2 discussed below, into the brine aquifer using a RIB which would help to preserve the hydrologic balance in the area. A Water Pollution Control Permit (WPCP), authorized by the Nevada Department of Environmental Protection Bureau of Water Pollution Control (NDEP-BWPC), is required prior to operating a RIB. As part of the siting of a RIB, NDEP-BWPC requires acceptable demonstration of water infiltration and permeability. In accordance with this requirement, in Phase 1 of the Project, Schlumberger proposes to conduct exploration drilling and test pit excavation to evaluate near-surface lithology and to test percolation.

2.1.2 Phase 2 Pilot Plant

The Pilot Plant would be less than 5 acres and would operate for approximately 18 months. During this operational period, the Pilot Plant would test Schlumberger's developing process for extracting lithium from brine and producing high-purity lithium compounds.

Fluid containment and leak detection system would be primary components of the overall Pilot Plant design. A monitoring well would be installed downgradient from the Pilot Plant to the depth of the uppermost saturated interval, which is anticipated to be less than 100 feet below ground surface. The Pilot Plant design seeks to limit impacts to groundwater and surface water in accordance with NDEP-BWPC WPCP conditions for mining operations.

The Pilot Plant components would be transported to the site on flatbed and semi-trailer trucks primarily using existing roads. Operations would be intermittent during the approximate 18-month period as different aspects of the lithium extraction process are tested.

During assembly, operation, and reclamation of the Project, Schlumberger may conduct maintenance on the existing Access Road across BLM land and may add a maximum of three pullouts.

2.1.3 Phase 3 RIB

Once the Phase 1 RIB Investigation is complete, Schlumberger would locate and engineer a RIB, in accordance with NDEP-BWPC WPCP conditions for groundwater discharge. Based on the NDEP WTS-3A guidance (NDEP, 2017a) and the expected Pilot Plant discharge rate, the estimated RIB size would be 308 feet by 447 feet and the disturbance area would not exceed 3.2 acres in size. This Plan assumes the maximum RIB size and the preferred RIB location. A Minor Plan Amendment would be filed once the RIB investigation and engineering are complete. A piezometer would be installed near the RIB to the depth of the uppermost saturated interval, which is anticipated to be

less than 100 feet below ground surface. The purpose of the piezometer would be to monitor potential mounding of the groundwater table as water is reinfiltrated through the RIB.

2.1.4 Brine and Water Supply and Management

Pursuant to water right 87617, administered by the NDWR, Schlumberger may pump a maximum of 50 acre-feet (16,291,440 gallons) of brine for use in the Pilot Plant. Brine would be pumped from CV-9 intermittently for approximately 18 months. On average, the Pilot Plant would use 88 gallons per minute (gpm) of brine from the existing CV-9 well with a maximum pumping rate of 116 gpm. In addition, water would be applied as needed to the Access Road for dust control. Water for dust control would be purchased from Silver Peak or other water suppliers.

Once the lithium is removed from the brine extracted from CV-9, the lithium-depleted brine would be conveyed to a RIB where it would reinfiltrate, thus maintaining the existing groundwater balance in the area.

Two WPCPs, authorized by the NDEP-BWPC, would be obtained, one for the Pilot Plant (less than 5-acres) and one for the RIB (approximately 2 acres).

2.1.5 Solid and Hazardous Material Storage and Use

Solid wastes that may be generated include various chemicals or wastes from the processing plant or from maintenance activities. Municipal solid waste would be collected and stored in a closed dumpster and would be hauled off-site as needed by a managed contractor. Portable toilets would be available for staff use during assembly, operations, and reclamation. They would be exchanged as needed by a managed contractor.

Several chemicals would be used while operating the temporary Pilot Plant including diesel fuel, kerosene, lime, sodium carbonate, solvents, strong bases, strong acids, ferric chloride, sodium bisulfate, antiscalants, a biocide, hydrochloric acid, and a coagulant. Additional chemicals may be used as Schlumberger adjusts the Pilot Plant operations.

Geomembrane liner would be installed during site preparation to form the secondary containment for chemicals and fuel oil stored onsite. Hazardous chemical waste would be separated into acidic, non-acidic, and organic. The amount of hazardous waste that would be generated is expected to be minimal and would be properly stored while onsite, then would be documented, transported, and disposed of in accordance with Resource Conservation and Recovery Act (RCRA) and the Nevada Department of Transportation (NDOT) standards.

2.1.6 Site Infrastructure

2.1.6.1 Power Supply

Temporary mobile generators driven by diesel engines located at the Pilot Plant would supply the power necessary for Project operations. Anticipated generation plans consist of ten 450 kilowatts (kW) (~ 603 horsepower [hp]) diesel engines for power generation. Each engine would be a Volvo Penta TAD1671VE EPA certified Tier 4 unit. These engines are also certified by the California Air Resources Board (CARB). Additionally, four Tier 2 EPA certified small Isuzu 15 hp engines would be utilized. Engines #1 through #5 are proposed to be limited to a combined 13,140 hours per year (hr/yr). Engines 6-10 are proposed to be limited to a combined 20,000 hr/yr. Lastly, the four small units (Engines #11-14) are proposed to be limited to a combined 20,000 hr/yr.

2.1.6.2 Major Components

Flatbeds and semi-trailer trucks would transport skid-mounted equipment to the site where the components would be assembled. Major components and site features include brine pre-treatment, divalent salt polishing system, solvent extraction column and tanks to extract lithium from brine, scrubbing and stripping vessels - solvent regeneration, electrolysis cell to produce lithium hydroxide, proprietary lithium hydroxide conversion process, conventional lithium hydroxide conversion process, proprietary lithium hydroxide conversion process, conventional lithium hydroxide conversion process, dryer and crystallizer, reverse osmosis unit, carbon adsorption canister, brine storage tanks, chemical storage tanks, RIB, diesel storage, diesel-powered generators, and emergency management systems.

Trailers would be placed onsite including office and breakroom, laboratory, workshop, main control room, diesel generator, and transformer. Two concrete pads would be constructed for stability of the solids separation unit and the solvent extraction column.

2.1.7 Safety and Fire Protection

Site security would be maintained by Schlumberger staff or representatives who would be continually present onsite, even during times when the Pilot Plant is not operating. Security cameras and privacy fencing may also be set up around the perimeter of the Pilot Plant.

Schlumberger’s Pilot Plant Emergency Response Plan provides specific guidance to the personnel working in the Pilot Plant for responding to an emergency to ensure all predetermined actions are followed. Emergency response and safety equipment would be available in the office, laboratory, and workshop. Specialized eye wash stations and fire extinguishers would be located throughout the Pilot Plant as required by the US Occupational Safety and Health Administration (OSHA). Spill containment absorbents would be located in the Workshop.

2.1.8 Surface Occupancy, Schedule, and Staffing

The Surface Resources Act of July 23, 1955, and associated regulations at 43 CFR 3715 authorize surface occupancy of unpatented placer claims for ‘‘prospecting, mining, or processing operations and uses reasonably incident thereto’’. Mineral processing is the focus of Schlumberger’s activities and access road use is reasonably incident.

Surface occupancy in association with mineral processing and reasonably incident uses would continue for the life of the Project, currently estimated at 18 months, however, results of the pilot testing and other factors may extend the life of the Project. Depending on permitting and assembly timelines pilot-scale mineral processing is expected begin in the Spring of 2021.

Standard operating schedules would be up to 24 hours per day for approximately 18 months. The schedule would likely be variable based on operational needs of the Pilot Plant, with some periods of 24-hour per day operations and other periods of reconfiguration or low-intensity operation during day shifts only. Ten or fewer Schlumberger representatives are expected to be on site per shift.

Unnecessary or undue degradation of the Federal lands and resources would be prevented or avoided during use and occupancy. Use and occupancy would conform to the applicable Federal and State environmental standards and necessary local, state, and federal permits would be obtained, as required under 43 CFR 3800. Structures on public lands would conform with applicable State and local building, fire, and electrical codes and occupational safety and health standards.

2.2 Reclamation Plan

Schlumberger agrees to assume responsibility for the reclamation of any surface area affected by the work proposed under the Plan. In all project phases, disturbed areas would be reseeded using a BLM-approved seed mix and on a BLM-approved timetable. The land use would remain the same after reclamation is complete. Further details regarding reclamation can be found in the Plan (Stantec, 2021).

2.2.1 Phase 1 Reclamation

After Phase 1 permeability tests and sampling are complete, boreholes would be grouted and backfilled in accordance with state and federal guidelines, including the State of Nevada Administrative Code (NAC) 534.420. Backfilling and grading of the test pits would also take place when the testing and sampling are complete. The drilling contractor would bring spill control and fire suppression equipment with them. Given the small Phase 1 disturbance area, seeds could be hand-spread at a seasonal timing specified by BLM.

2.2.2 Phase 2 Reclamation

When pilot testing is complete, any remaining brine would be returned to the aquifer through the RIB. Residual chemicals, solvents, solid waste, and diesel fuel would be removed from the site and disposed of in accordance with state and federal regulations.

A Final Plan for Permanent Closure would be submitted to NDEP and BLM before the anticipated date of permanent closure. The Final Plan for Permanent Closure would incorporate procedures, methods, and schedules for stabilizing spent process materials based on information and experience gathered throughout the active life of the Pilot Plant, and from results of storage tanks rinsing and other testing that may be conducted related to closure. Closure would be conducted in compliance with NDEP and BLM rules and regulations in effect at the time of closure.

The components of the temporary Pilot Plant would be disassembled, placed on flatbeds and semi-trailer trucks, and would be transported off site. All foundations and liner material would be removed and reused elsewhere or disposed of at an appropriately licensed facility.

The submersible pump would be removed from well CV-9 and stored at an off-site location. Riser pipe, discharge piping, control equipment, and electrical cabling would be removed and disposed of at an appropriately licensed facility or stored at an off-site location for future use. After the pump, piping, and control equipment is removed a removable cap would be installed on well CV-9 and a locked protective cover placed on the well to prevent unauthorized use. During final reclamation of CV-9, the well would be plugged pursuant to NAC534.420, using grout emplaced by tremie pipe under wet hole conditions.

The monitoring well and piezometer would be reclaimed promptly. Internal equipment would be removed and reused elsewhere or disposed of at an appropriately licensed facility, then the well and piezometer would be plugged pursuant to NAC534.420 using grout emplaced by tremie pipe under wet hole conditions.

The site would be regraded to match the surrounding topography using the material pushed aside to flatten the area. The shrubs pushed aside during site preparation would be spread loosely around the reclaimed pad to aid in reclamation success. Given the small Phase 2 disturbance area, seeds could be hand-spread at a seasonal timing specified by BLM.

The access road improvements and the residual disturbance areas associated with previous wells would be reclaimed along with Phase 2 of the Project. The pullouts are the only improvements proposed outside of the existing road width. These areas would be regraded and scarified if needed and would be reseeded with the same seed mix proposed for the Pilot Plant. The pullouts could be allowed to remain at the request of BLM and Esmeralda County.

2.2.3 Phase 3 Reclamation

Once the Pilot Plant project is complete, the RIB would be backfilled and regraded to match surrounding ground contours using the material that was removed during site preparation. The shrubs pushed aside during site preparation would be spread loosely around the reclaimed pad to aid in reclamation success. Given the small Phase 3 disturbance area, seeds could be hand-spread at a seasonal timing specified by BLM.

2.3 Applicant-Committed Environmental Protection Measures

Schlumberger would implement the following environmental protection measures (EPMs) to prevent unnecessary or undue degradation during assembly, operation, and reclamation of the Project. The measures are derived from the general requirements established in the BLM's Surface Management Regulations at 43 CFR 3809 and BMRR mining reclamation regulations, as well as water, air quality, and other environmental protection regulations and guidelines.

Schlumberger representatives and contracted personnel at the Project would participate in environmental, health and safety training prior to working at the project. The training would cover the commitments made in the Plan including the following EPMs.

2.3.1 Air Quality

- Emissions of fugitive dust from disturbed surfaces would be minimized by the application of water from a water truck as a method of dust control.

2.3.2 Cultural and Paleontological Resources

- Pursuant to 43 CFR 10.4(g), Schlumberger representatives would notify the BLM-authorized officer immediately by telephone and in writing within 72 hours upon the discovery of human remains, funerary objects, sacred objects, or objects of cultural patrimony (as defined in 43 CFR 10.2). Further pursuant to 43 CFR 10.4, Schlumberger representatives would immediately stop all activities within 100 meters of the discovery and not commence again until a notice to proceed is issued by the BLM-authorized officer.
- Schlumberger would inform field personnel of the Archaeological Resources Protection Act of 1979 (ARPA) and the Native American Graves Protection and Repatriation Act (P.L. 101 601) responsibilities and their associated penalties.
- Cultural resources discovered by Schlumberger representatives during the course of activities on federal land would be immediately reported to the BLM-authorized officer by telephone and in writing within 72 hours. The permit holder would suspend all operations within 100 meters of such discovery and protect it until an evaluation of the discovery can be made by the BLM-authorized officer. This evaluation would

determine the significance of the discovery and what mitigation measures are necessary to allow activities to proceed. Schlumberger representatives would be responsible for the cost of evaluation and mitigation. Operations would resume only upon written authorization to proceed from the BLM-authorized officer.

- Schlumberger representatives would not knowingly disturb, alter, injure, or destroy scientifically important paleontological deposits. In the event that previously undiscovered paleontological resources are discovered by Schlumberger representatives in the performance of surface disturbing activities, the item(s) or condition(s) would be left intact and immediately brought to the attention of the BLM authorized officer. If significant paleontological resources are found, avoidance, recordation, and/or data recovery would be required.

2.3.3 Fire Management

- Applicable state and federal fire laws and regulations would be complied with and reasonable measures would be taken to prevent and suppress fires in the Project Area.
- In the event the proposed Project activities start or cause a wildland fire, Schlumberger would be responsible for the costs associated with the suppression. The following precautionary measures would be taken to prevent and report wildland fires:
  - Vehicles would carry fire extinguishers and a minimum of five gallons of water;
  - Adequate fire-fighting equipment (i.e., shovel, Pulaski, extinguishers), and an ample water supply would be kept at the Pilot Plant;
  - Vehicle catalytic converters would be inspected often and cleaned of brush and grass debris;
  - Welding operations would be conducted in an area free from or mostly free from vegetation. A minimum of ten gallons of water and a shovel would be on hand to extinguish fires created from the sparks. Extra personnel would be at the welding site to watch for fires created by welding sparks. Welding aprons would be used when conditions warrant (i.e., during red flag warnings);
  - Wildland fires would immediately be reported to the BLM Central Nevada Interagency Dispatch Center at (775) 623-3444. Information reported would include the location (latitude and longitude if possible), fuels involved, time started, who or what is near the fire, and the direction of fire spread; and
  - When conducting operations during the months of May through September, the BLM Battle Mountain District Office, Division of Fire and Aviation would be contacted at (775) 635-4000 to determine if fire restrictions are in place for the Project and to provide approximate beginning and ending dates for Project activities.

2.3.4 Hazardous or Solid Wastes

- Pursuant to 43 CFR 8365.1-1(b)(3) and 43 CFR 3809.420(b)(5) and (6), no sewage, petroleum products, or refuse would be dumped from any trailer or vehicle.
- Hazardous and solid waste storage and disposal are discussed in Section 2.1.5 as well as the Secondary Containment Plan and Spill Prevention, Control, and Countermeasure Plan (Stantec, 2021).
- Regulated wastes, including hazardous and miscellaneous solid wastes, would be removed from the Project Area and disposed of in a state, federal, or local designated area.
- As discussed in the Secondary Containment Plan and Spill Prevention, Control, and Countermeasure Plan, spills, regardless of quantity, would be addressed and the material would be removed for proper disposal.
- If a spill of a petroleum constituent is considered to meet the reportable quantity per the NDEP's guidelines (greater than 25 gallons or greater than three cubic yards of impacted material or any quantity of a water body is impacted), or a reportable quantity for hazardous waste is released based on the Federal Environmental Protection Agency guidelines established under Title III List of Lists (40 CFR Part 302), the NDEP and BLM would be notified within 24 hours, and the appropriate remedial actions and confirmation sampling would be conducted under direction of the NDEP.

2.3.5 Migratory Birds

- In order to avoid potential impacts to breeding migratory birds, a nest survey would be conducted by a qualified biologist prior to surface disturbance associated with exploration activities during the avian breeding season (March 1 through July 31 for raptors and April 1 through July 31 for other avian species). Pre-disturbance surveys for migratory birds are only valid for 14 days. If the disturbance for the specific location does not occur within 14 days of the survey, another survey would be needed. If active nests are located, or if other evidence of nesting is observed (i.e., mated pairs, territorial defense, carrying nest material, transporting food), a protective buffer (the size depending on the habitat requirements of the species) would be delineated after consultation with the BLM resource specialist.

2.3.6 Eagles and Raptors

- Field surveys were conducted on April 14 and May 20, 2020 and no nesting golden eagles were identified (Stantec, 2020a). To minimize impacts to potential future golden eagle nests, Project activities would not be conducted between January 1 and August 31 within one mile of a nest. However, if that is not practicable, a survey would be conducted after March 21 at eagle nest sites that are within one mile of the Project Area to determine occupancy. The timing of the surveys may be adjusted due to winter weather conditions and is subject to approval from the NDOW based

on consideration of bighorn sheep (Ovis canadensis) lambing activity. If a nest has a bird in an incubating/brooding posture, it would be assumed that the nest is active that year, and a one-mile disturbance buffer would be applied until August 31, or until it has been determined that 1) the nest has failed; or 2) the young have fledged and are no longer dependent on the nest. The buffer sizes may be reduced with approval from the US Fish and Wildlife Service (USFWS). If the nest is not active at the time of the surveys, the one-mile buffer would not apply, and Project activities could commence.

- During the field surveys conducted on April 14 and May 20, 2020, one nest was active by prairie falcon. If it, or other nests within 2 miles of the Project, are found to be occupied during pre-construction nesting bird surveys, a ¼ mile buffer would be drawn around it and ground disturbing activities would not take place within that buffer until 1) the nest has failed; or 2) the young have fledged and are no longer dependent on the nest. The buffer sizes may be reduced with approval from the USFWS.
- If other breeds of nesting raptors are identified during future surveys, Schlumberger would coordinate with BLM and the NDOW and would refer to the following guidance to determine appropriate avoidance buffers: The Utah Field Office Guidelines for Raptor Protection from Human and Land Use Disturbances, Table 2 Nesting periods and recommended buffers for raptors in Utah (USFWS, 2002).

2.3.7 Night Skies

- To minimize adverse effects from lighting, Schlumberger would utilize hooded stationary lights and light plants. Lighting would be directed onto the pertinent site only and away from adjacent areas not in use, with safety and proper lighting of the active work areas being the primary goal. Lighting fixtures would be hooded and shielded as appropriate. Schlumberger would utilize lighting designed to reduce the impacts to night skies.

2.3.8 Noxious Weeds

- Plant surveys were conducted on May 13, 2020 (Stantec, 2020a). No species from either the BLM Battle Mountain District sensitive species list or the State of Nevada Noxious Weeds List, as listed under NAC 555.010 were documented during surveys. Schlumberger representatives would monitor for and attempt to control noxious weeds during assembly and continuing through operations and reclamation. Management strategies may include prevention (i.e., awareness and education and protective management practices), treatment (i.e., mechanical treatment, chemical treatment, and biological treatment), and monitoring.

2.3.9 Public Safety and Access

- Public safety would be maintained throughout the life of the Project. Equipment and other facilities would be maintained in a safe and orderly manner.

- Survey monuments, witness corners, or reference monuments would be protected.
- Final reclamation of the pullouts, Pilot Plant, and RIB areas would consist of recontouring the ground surface to original grade and reseeding at a seasonal timing specified by BLM.
- In the event that existing roads are degraded as a result of Project activities, Schlumberger representatives would return them as close as possible to their original condition.

2.3.10 Special Status Species

- Plant surveys were conducted on May 13, 2020 (Stantec, 2020a). No species from either the BLM Battle Mountain District sensitive species list or the State of Nevada Noxious Weeds List, as listed under NAC 555.010 were documented during surveys. Should special status plant species be found in the Project Area during assembly, operations, or reclamation they would be avoided.
- Animals found crushed on the access roads would be relocated and buried promptly to avoid subsidizing predators.

2.3.11 Vegetation

- Reseeding would be consistent with BLM recommendations for seed mix species, application rate, and seeding methods.

2.3.12 Water Quality

- Best management practices (BMPs) would be used to limit erosion and reduce sediment in runoff from Project facilities and disturbed areas during assembly, operations, and initial stages of reclamation. BMPs may include, but are not limited to, diversion and routing of stormwater using accepted engineering practices, such as construction of diversion berms, stormwater channels and culverts, and stormwater ponds.
- Schlumberger would follow the secondary containment procedures for chemicals and fuel oil stored onsite outlined in the Secondary Containment Plan prepared for the Project (Stantec, 2021).
- Schlumberger would follow the spill contingency measures outlined in the Spill Prevention, Control, and Countermeasure Plan prepared for the Project (Stantec, 2021). Measures would include spill response, cleanup, and reporting procedures.
- Revegetation of disturbed areas would reduce the potential for wind and water erosion. Following reclamation activities, reseeding would be consistent with BLM recommendations for seed mix species, application rate, and seeding methods.
- CV-9 would be reclaimed in accordance with authorized Notice N-99507.

2.3.13 Wild Burros

- The Project would not impact existing habitat or water sources for wild burros. Schlumberger representatives would immediately report conflicts with or concerns about wild burros in the Project Area to the Field Office Wild Horse and Burro Specialist.

2.3.14 Wildlife

- The Pilot Plant and RIB areas would be fenced to preclude wildlife access. The stormwater pond and RIB cells would be constructed to allow for safe egress of wildlife.
- Refuse would be stored in a sealed container to preclude wildlife access. The Project Area would be kept clean of refuse to avoid attracting wildlife.
- Personnel would be instructed not to feed or harass wildlife.

2.3.15 Visual Resources

- To reduce impacts on the viewshed, Schlumberger would paint equipment a BLM approved color. Based on discussions with BLM staff, the preferred color would be Carlsbad Canyon, an alternate color would be Shadow Gray.

2.4 Tier 2 Engine Usage Alternative

Under this alternative, all details described for the Proposed Action would be the same including the EPMs and Reclamation except for those discussed below. Schlumberger would utilize EPA certified Tier 2 diesel engines for power generation. This alternative would consist of three 1 megawatt (MW) engines, one 608 kW engine and four 15 hp units. The 1 MW units would operate at a maximum of 13,640 hr/yr in aggregate. The 15 hp engines would operate 20,000 hr/yr in aggregate and the 608 kW engine unit would operate 500 hr/yr. The total surface disturbance would remain unchanged from the Proposed Action.

2.5 No Action Alternative

Under the No Action Alternative, the Project would not be approved by the BLM; however, the area would remain available for other multiple use activities as approved by the BLM and NDEP. Schlumberger would continue Notice-level exploration activities under the authorized exploration Notice NVN-99507 in the Project Area. The area would remain available for future exploration and mining activities or for other purposes, as approved by the BLM. The objective of the No Action Alternative is to describe the impacts that would result if the Project were not implemented. The No Action Alternative forms the baseline from which the impacts of all other alternatives can be measured.

2.6 Alternatives Considered but Eliminated from Detailed Analysis

2.6.1 Pump Brine from CV-7 and CV-8 and Locate Pilot Plant at CV-7

Under this alternative, the brine would be pumped from existing exploration wells CV-7 and CV-8 and the Pilot Plant would be located near CV-7. Pursuant to the terms of Water Right 87617 and the Monitoring and Observation waivers in place for CV-7 and CV-8, NDWR determined that it was necessary for Schlumberger to drill a new well for the purpose of pumping brine for pilot testing. In addition, CV-8 was drilled in a location prone to standing water which would have complicated operations. Therefore, this alternative is removed from further analysis.

2.6.2 Locate Pilot Plant on Private Land

Under this alternative, the Pilot Plant would be located on private land in the town of Silver Peak. This would necessitate hauling the brine from CV-9 to a private parcel in Silver Peak, approximately 9.6 miles, then hauling it back to a RIB located near CV-9 for re-infiltration. To achieve the needed volume of brine, approximately 25 round-trip journeys would be needed per day when the Pilot Plant would be operating at full capacity. Fewer trips would be needed when the Pilot Plant would be operating at reduced capacity. This volume of road travel could impact BLM and Esmeralda County road conditions, air quality through increased production of fugitive dust, and access to Clayton Valley Sand Dunes Special Recreation Management Area. Therefore, this alternative is removed from further analysis.

2.6.3 Alternative Brine Disposal

Under this alternative, spent brine would not be disposed of in a RIB located near CV-9 but would be disposed of in a deep injection well or at a wastewater treatment plant. An existing, permitted deep injection well was not identified within a reasonable hauling distance of the Pilot Plant. The town of Tonopah, which operates the nearest wastewater treatment plant was approached and declined to accept the volume of spent brine that would be produced. Hauling spent brine to an off-site disposal location would also require the round-trip traffic described in Section 2.6.2. Therefore, this alternative is removed from further analysis.

3.0 Affected Environment and Environmental Consequences

3.1 Introduction

The purpose of this section of the EA is to describe the existing environment of the Project Area, as well as potential environmental consequences from implementation of the Proposed Action, or any of the listed alternatives, of affected resources including the No Action Alternative. EPMs are incorporated as necessary in the relevant resource section. Regarding reasonably foreseeable environmental trends and planned actions in the area, there is a potential for additional lithium exploration and development in the Clayton Valley area due to an Executive Order (EO; 14017) to leverage the domestic lithium supply to expand the manufacture of high-capacity batteries. At this time, it would be speculative to analyze specific resource impacts from this potential increase in development due to the inability to predict the successful development of these projects and the nature of each project's resource-level impacts. Consequently, reasonable foreseeable impacts to resources due to potential lithium exploration and development are not analyzed further.

Supplemental Authorities that are subject to requirements specified by statute or EO must be considered in all BLM environmental documents. The elements associated with the supplemental authorities listed in the NEPA Handbook (BLM 2008, Appendix 1) and in the Nevada Instruction Memorandum 2009-030, Change 1, are listed in Table 3-1. The following elements have been determined as Not Present in the Project Area, Present/Not Affected, or Present/May Be Affected subsequent to the February 2020 meeting, and the following table provides the rationale for those determinations, or the section of the EA where the resource is discussed. The elimination of non-relevant elements complies with CEQ policy.

Potentially affected elements are analyzed beginning in Section 3.2. Those elements listed under the supplemental authorities that do not occur in the Project Area and elements present but would not be affected are not evaluated further in this EA, based on the rationale provided in Table 3-1. In addition to the elements listed under supplemental authorities, the BLM considers other resources and uses that occur on Federal lands and the issues that may result from the Proposed Action. Other resources or uses of the human environment considered for this EA are listed in Table 3-2.

Potentially affected resources or uses are discussed and analyzed beginning in Section 3.2. Those other resources listed that do not occur in the Project Area and resources present but would not be affected are not evaluated further in this EA, based on the rationale provided in Table 3-2.

The potential effect of the Tier 2 Engine Usage Alternative and No Action Alternative on both supplemental authorities and other resources or uses are also discussed in these sections.

The Project Area discussed below is identified above. The analysis areas discussed in the resource sections below are larger than the Project Area and refer to the area analyzed in the referenced SER or Baseline Study.

Table 3-1 Elements Associated with Supplemental Authorities and Rationale for Elimination from Detailed Analysis for the Proposed Action

Supplemental Authority Element	Not Present	Present/ Not Affected	Present/May Be Affected	Rationale/Reference Section
Air Quality			X	See Section 3.2.
Areas of Critical Environmental Concern	X			This element is not present within the Project Area or vicinity.
Cultural Resources	X			A Class III cultural resources inventory was conducted in the Project Area in Spring 2020. There were no sites recommended as eligible for listing on the National Register of Historic Places. As outlined in the applicant-committed EPMs in Section 2.3.2, all unevaluated sites would be avoided by a buffer of 100 meters. This element is not analyzed further in this EA.
Environmental Justice			X	See Section 3.3.
Farmlands (Prime or Unique)	X			This element is not present within the Project Area or vicinity.
Fire Management	X			This element is not present within the Project Area or vicinity.
Fish Habitat	X			Native fish habitat is not present within the Project Area or vicinity.
Floodplains	X			See Section 3.4.
Forests and Rangelands (Healthy Forests Restoration Act [HFRA] of 2003 projects only)	X			This Project does not meet the requirements to qualify as an HFRA project; therefore, this element is not further analyzed in this EA.
Human Health and Safety (Herbicide Projects)	X			The Project may use herbicides to eradicate noxious weeds; however, EO 13045, “Protection of Children from Environmental Health Risks and Safety Risks,” would not apply to this Project as there would be no children on the site during application of the herbicides. Therefore, this element is not further analyzed in this EA.
Migratory Birds			X	See Section 3.6.
Native American Religious Concerns			X	See Section 3.7.
Noise		X		Noise resources would not be affected by the Project because the generators would meet industrial specifications that ensure they are compatible with OSHA noise requirements. This element is not further analyzed in this EA.

Supplemental Authority Element	Not Present	Present/ Not Affected	Present/May Be Affected	Rationale/Reference Section
Noxious Weeds, Invasive and Non-native Species			X	See Section 3.8.
Wastes, Hazardous or Solid		X		As part of the applicant-committed EPMs, including the use of BMPs, materials and equipment necessary for spill clean-up would be kept in the Workshop. Solid wastes that may be generated include various chemicals or wastes from the processing plant or from maintenance activities. Hazardous chemical waste would be separated into acidic, non-acidic, and organic. The amount of hazardous waste that would be generated is expected to be minimal and would be properly stored while onsite, then would be documented, transported, and disposed of in accordance with RCRA and NDOT standards. Municipal solid waste would be collected and stored in a closed dumpster and would be hauled off-site as needed by a managed contractor. No refuse would be disposed on site. As a result of these measures and stipulations, this element is not further analyzed in this EA.
Water Resources			X	See Section 3.14.
Wetlands/Riparian Zones	X			See Section 3.15.
Wild and Scenic Rivers	X			This element is not present within the Project Area or vicinity.
Wilderness	X			Wilderness or wilderness study areas are not present within the Project Area or vicinity.

Table 3-2 Resources or Uses Not Associated with Supplemental Authorities

Other Resources or Uses	Not Present	Present/ Not Affected	Present/May Be Affected	Rationale/Reference Section
Geology and Minerals			X	See Section 3.5.
Grazing Management		X		The Project Area is within the Yellow Hills grazing allotment. The Project would not affect grazing due to the small size of the Project Area. This resource is not further analyzed in this EA.
Lands and Realty		X		The Project Area is entirely located on Federal lands administered by the BLM. Authorized Rights of Way in the Project Area include Esmeralda County Access road (N-92359) of a varied width and is known as the Pearl Spring Road. This road is shown on Figure 1-1 and would be the main access road for the Project. The Project would not impact land uses in the vicinity of the Project Area. The addition of three pullouts would facilitate efficient mobilization along the road. Consequently, the Project would not impact the Right of Way along the access road. This resource is not further analyzed in this EA.
Paleontological Resources	X			This resource is not present within the Project Area or vicinity. However, Section 2.3.2 includes protection measures for undiscovered paleontological resources. This resource is not further analyzed in this EA.
Recreation			X	See Section 3.9.
Social and Economic Values			X	See Section 3.10.
Soils			X	See Section 3.11.
Special Status Species (Plants and Wildlife, Eagles and Raptors)			X	See Section 3.12.
Threatened and Endangered Species (Plants and animals)	X			This element is not present within the Project Area or vicinity.
Vegetation			X	See Section 3.13.
Visual Resources		X		Visual resources would not be affected by the Project.
Wild Horses and Burros	X			This element is not present within the Project Area or vicinity.
Wildlife			X	See Section 3.16.

3.2 Air Quality

3.2.1 Affected Environment

Information on air quality in the analysis area is described in the Air Quality SER (BLM, 2021b). This SER is included in the Project Administrative Record and is incorporated by reference.

3.2.2 Environmental Consequences

3.2.2.1 Proposed Action

Proposed air emission sources include ten 450 kW (~ 603 hp) diesel engines. Each engine is a Volvo Penta TAD1671VE EPA Tier 4 certified unit. It is also certified by the CARB. Additionally, four Tier 2 EPA certified small Isuzu 15 hp engines would be utilized. Emissions estimates are derived from the CARB certification data, EPA Tier 2 standards or EPA AP-42, Sections 3.3 and 3.4 engine emission factors as appropriate. Other potential sources such as fugitive dust, process fugitives, and project-related vehicle emissions are expected to be negligible.

Engines #1 through #5 are proposed to be limited to a combined 13,140 hr/yr. Engines 6-10 are proposed to be limited to a combined 20,000 hr/yr. Lastly, the four small units (Engines #11-14) are proposed to be limited to a combined 20,000 hr/yr. Table 3-3 identifies the proposed annual criteria pollutant emissions of the Pilot Plant. Overall emissions are considered minor, short-term, and localized (BLM, 2021b).

Table 3-3 Facility Annual Emission Estimates (Tons per Year)

Source	$PM_{2.5}$	PM_{10}	NO_x	CO	SO_2	VOC
Engines 1-5	0.05	0.05	0.98	0.26	0.05	4.56E-02
Engines 6-10	0.07	0.07	1.49	0.40	0.07	6.94E-02
Engines 11-14	0.20	0.20	1.85	1.63	0.31	3.71E-01
Total	**0.31**	**0.31**	**4.32**	**2.29**	**0.43**	**0.49**

The total annual emissions are below the NDEP Class II Permitting thresholds as shown in Table 3-4.

Table 3-4 Facility Emissions Comparison to Class II Permitting Threshold (Tons per Year)

Pollutant	Class II Threshold	Facility Emissions Estimates	Above Threshold
$PM_{2.5}$	5	0.31	No
PM_{10}	5	0.31	No
CO	50	2.29	No
VOC	20	0.49	No
NO_x	5	4.32	No
SO_2	5	0.49	No
Pb	0.3	--	No
H_2S	1	--	No

Based on the low criteria pollutant emissions estimated for this project, which are below reference standards such as the nearby Mojave Desert AQMD CEQA Significant Emission Thresholds as well as NDEP permit thresholds, BLM concludes that no further air quality analysis would be required to demonstrate that the proposed action would not have a substantial impact on air quality.

Table 3-5 Facility Emissions Comparison to Mojave Desert AQMD CEQA Significant Threshold (Tons per Year)

Pollutant	MDAQMD Threshold	Facility Emissions Estimates	Above Threshold
$PM_{2.5}$	12	0.31	No
PM_{10}	15	0.31	No
CO	100	2.29	No
VOC	25	0.49	No
NO_x	25	4.32	No
SO_2	25	0.49	No
Pb	0.6	--	No
H_2S	10	--	No

With the exception of lead, there are currently no National or Nevada air quality standards for emissions for HAPs. The EPA thresholds define a major source as one with potential to emit more than ten tons per year (tpy) of any one HAP or 25 tpy of combined HAPs. Project HAP emissions were calculated to determine if the total Project emissions exceed the HAPs thresholds. A summary of the estimated total HAP emissions in tpy emitted from the Proposed Action is presented in Table 3-5. The combined HAP emissions from the Proposed Action were estimated to be 0.321 tpy.

Table 3-6 Facility HAP Emissions (Tons per Year)

Pollutant	Emission Factor (lb/MMBtu) Engines: 1-10	Emission Factor (lb/MMBtu) Engines: 11-14	Facility Emissions Total (tpy)
Benzene	7.76E-04	9.33E-04	5.53E-02
Toluene	2.81E-04	4.09E-04	2.01E-02
Xylene	1.93E-04	2.85E-04	1.38E-02
Propylene	2.79E-04	2.58E-03	1.98E-01
1,3-Butadiene	N/A	3.91E-05	4.11E-05
Formaldehyde	7.89E-05	1.18E-03	6.76E-03
Acetaldehyde	2.52E-05	7.67E-04	2.57E-03
Acrolein	7.88E-06	9.25E-05	6.48E-04
Naphthalene	1.30E-04	8.48E-05	9.18E-03
PAH	2.12E-04	1.68E-04	1.50E-02
Totals			**0.321**

The Proposed Action internal combustion engines emits relatively low levels of GHGs, specifically carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). The estimated maximum GHG emissions for the Proposed Action under the maximum emissions scenario is 10,515 metric tpy CO_2 equivalent (CO_2e). This maximum is calculated on the same basis as for other pollutants. CO_2e levels are based on multiplying the emissions of CO_2, CH_4, and N_2O by their global warming potential factors of 1, 25, and 298, respectively (78 FR 71904). Direct emissions of CO_2 comprise 10,479 tpy or 99.7 percent of the total predicted CO_2e emissions.

The national annual emissions of GHG were reported to be 6,457 million metric tpy in 2017 (EPA, 2019). In comparison the estimated GHG emissions from the Proposed Action are approximately 0.0002 percent of the national annual GHG emissions.

3.2.2.2 Tier 2 Engine Usage Alternative

Under the Tier 2 Engine Usage Alternative, three 1 MW (~ 1340 hp) diesel engines would be used. Each engine would be a QST30-G5 NR2 Cummins EPA Tier 2 certified unit. Additionally, one Tier 2 MTU 12V1600 608 kW (~ 814.7 hp) is proposed. Lastly, four Tier 2 EPA certified small Isuzu 15 hp engines would be utilized. Estimated emissions are derived from the Cummins emissions data, MTU emissions data, EPA Tier 2 standards or EPA AP-42, Sections 3.3 and 3.4 engine emission factors as appropriate.

Engines #1 through #3 are proposed to be limited to a combined 13,640 hr/yr. Engine #4 is proposed to be limited to 500 hours per year. Lastly, the four small units (Engine #5-8) are proposed to be limited to a combined 20,000 hours per year. Table 3-7 below

identifies the estimated annual criteria pollutant emissions of the Tier 2 Engine Usage Alternative.

Table 3-7 Facility Annual Emission Estimates (Tons per Year)

Source	$PM_{2.5}$	PM_{10}	NO_x	CO	SO_2	VOC
Engines 1-3	2.22	2.22	80.59	11.69	2.01	1.61
Engine 4	0.02	0.02	2.10	0.11	0.00	0.06
Engines 5-8	0.20	0.20	1.85	1.63	0.31	0.37
Total	**2.43**	**2.43**	**84.54**	**13.42**	**2.32**	**2.04**

As illustrated in Table 3-4, the Tier 2 Alternative would be considered a Class II source and would require a Nevada state permit as well as dispersion modeling to demonstrate that there would be no substantial air quality impact. Table 3-8 outlines the potential HAP emissions.

Table 3-8 Facility HAP Emissions (Tons per Year)

Pollutant	Emission Factor (lb/MMBtu) Engs: 1-4	Emission Factor (lb/MMBtu) Engs: 5-8	Pilot Plant Total (tpy)
Benzene	7.76E-04	9.33E-04	5.17E-02
Toluene	2.81E-04	4.09E-04	1.88E-02
Xylene	1.93E-04	2.85E-04	1.29E-02
Propylene	2.79E-04	2.58E-03	1.85E-01
1,3-Butadiene	N/A	3.91E-05	4.11E-05
Formaldehyde	7.89E-05	1.18E-03	6.40E-03
Acetaldehyde	2.52E-05	7.67E-04	2.45E-03
Acrolein	7.88E-06	9.25E-05	6.12E-04
Naphthalene	1.30E-04	8.48E-05	8.59E-03
PAH	2.12E-04	1.68E-04	1.40E-02
Totals			**0.301**

Total GHG emissions associated with the Tier 2 Alternative is 9,842 metric tons. This would have a minimal impact on the overall air quality.

Overall emissions are considered major, short-term, and localized. The HAP and GHG emissions would be considered minor (BLM, 2021b).

3.2.2.3 No Action Alternative

Under the No Action Alternative, there is expected to be no adverse air quality impacts as the engines would not be onsite and minimal emissions could occur from authorized exploration activities (BLM, 2021b).

3.3 Environmental Justice

3.3.1 Affected Environment

Executive Order 12898 - Federal Actions to Address Environmental Justice (EJ) in Minority Populations and Low-Income Populations - was issued by President William J. Clinton in 1994. Its purpose is to focus federal attention on the environmental and human health effects of federal actions on minority and low-income populations with the goal of achieving environmental protection for all communities (United States Environmental Protection Agency [EPA], 2018). Evaluating the potential EJ effects of projects requires specific identification of minority populations when either: 1) a minority population exceeds 50 percent of the population of the affected area; or 2) a minority population represents a meaningfully greater increment of the affected population than of the population of some other appropriate geographic unit, as a whole. For the purposes of the analysis, ten or more percentage points above the reference population is considered to be a meaningfully greater increment (59 Federal Register [FR] 32). In addition, it is necessary to evaluate whether or not any concentrated populations of American Indians are present.

Information on environmental justice in the analysis area is described in the Social and Economic Values and Environmental Justice SER (BLM, 2021a). This SER is included in the Project Administrative Record and is incorporated by reference.

3.3.2 Environmental Consequences

3.3.2.1 Proposed Action

Low income and American Indian EJ population types are present in the Analysis Area for the Proposed Action. However, it is not anticipated there would be any disproportionate adverse impacts to these EJ populations as a result of the Proposed Action. EJ populations are present although they are not likely to be disproportionately impacted by the Project (BLM, 2021a).

3.3.2.2 Tier 2 Engine Usage Alternative

Low income and American Indian EJ population types are present in the Analysis Area for the Tier 2 Engine Usage Alternative. It is not anticipated that there would be any disproportionate adverse impacts to these EJ populations as a result of the Tier 2 Engine Usage Alternative. EJ populations are present although they are not likely to be impacted by the Tier 2 Engine Usage Alternative (BLM, 2021a).

3.3.2.3 No Action Alternative

Low income and American Indian EJ population types are present in the Analysis Area for the No Action Alternative. It is not anticipated there would be any disproportionate adverse impacts to any of the existing EJ populations as a result of the No Action Alternative (BLM, 2021a).

3.4 Floodplains

3.4.1 Affected Environment

Information on floodplains in the analysis area is described in the Surface and Groundwater Resources SER (BLM, 2020c). This SER is included in the Project Administrative Record and is incorporated by reference. The Federal Emergency Management Agency (FEMA) has not completed studies near the Project Area to evaluate flood hazard.

3.4.2 Environmental Consequences

3.4.2.1 Proposed Action

Given the topography and surface drainage features within and near the Project Area, floodplains may occur near the Project Area. The Project Area is not within the lowlands for the valley, and the slope of the Project Area is greater than the nearby potential floodplain. It is unlikely the potential floodplain would overflow to the extent that it may reach chemical storage within the Pilot Plant and cause discharge. Impacts to floodplains are not expected from the Proposed Action (BLM, 2020c).

3.4.2.2 Tier 2 Engine Usage Alternative

Under the Tier 2 Engine Usage Alternative the Project Area is the same as the Proposed Action; therefore, impacts to floodplains are not expected from the Tier 2 Engine Usage Alternative (BLM, 2020c).

3.4.2.3 No Action Alternative

Under the No Action Alternative, up to 5 acres of surface disturbance could continue within the Project Area under authorized Notice-level exploration activities. Impacts to floodplains are not expected from the No Action Alternative (BLM, 2020c).

3.5 Geology and Mineral Resources

3.5.1 Affected Environment

Information on geology and minerals in the analysis area is described in the Surface and Groundwater Resources SER (BLM, 2021c). This SER is included in the Project Administrative Record and is incorporated by reference.

3.5.2 Environmental Consequences

Effects Assessment Methodology

Predictions about short-term and long-term impacts to geologic resources were based on previous experience of projects of similar scope and characteristics. Analyses of the potential intensity of impacts to geologic resources were derived from the available information, best professional judgment, and previous project investigations.

Effects Level Definitions

Intensity

Negligible – Impacts to geologic resources would occur, but they would be so slight as to not be detectable.

Minor – Impacts to geologic resources would occur; they would be permanent but small and limited to resources within the Project Area.

Moderate – Impacts to geologic resources would occur and would be readily detectable, permanent, and limited to the Project Area.

Major – Impacts to geologic resources would occur and would be extensive, permanent, and would exceed the Project Area.

Duration

Short-term – Impacts lasting up to the duration of construction through reclamation.

Long-term – Impacts extend after the reclamation of the Project is completed and could be permanent.

Context

Localized – Impacts would be limited to the Project Area.

Regional – Impacts would extend beyond the Project Area.

3.5.2.1 Proposed Action

Over the 18-month duration of the Project, a maximum of 50 acre-feet of brine may be extracted for use at the Pilot Plant. The Pilot Plant would extract an estimated maximum of 12.9 tonnes of lithium. The resource estimate for the Project is 40,900 tonnes, therefore the lithium extracted would be 0.03 percent of the estimated resource (Molnar et al., 2018). Impacts to geology and mineral resources would be negligible, long-term, and localized.

3.5.2.2 Tier 2 Engine Usage Alternative

Under the Tier 2 Engine Usage Alternative, operation of the Pilot Plant would be the same as for the Proposed Action, negligible, long-term, and localized.

3.5.2.3 No Action Alternative

Under the No Action Alternative activities under the authorized Notice-level exploration activities would continue. Exploration activities would only result in small amounts of brine removed from drill holes. Impacts to geology and mineral resources under the No Action Alternative would be similar, but proportionally less than impacts associated with the Proposed Action and are anticipated to be negligible, long-term, and localized.

3.6 Migratory Birds

3.6.1 Affected Environment

Information on migratory birds in the analysis area is described in the Ecological Resources SER (BLM, 2021d). This SER is included in the Project Administrative Record and is incorporated by reference.

3.6.2 Environmental Consequences

3.6.2.1 Proposed Action

Impacts to migratory birds with suitable habitat in the Project Area would consist of habitat loss and disturbance from human activity and noise. Vegetation removal associated with surface disturbing activities would result in a temporary reduction of approximately 8 acres of foraging and breeding habitat for migratory birds within the Project Area. This acreage would not be disturbed all at one time due to the phased nature of the activities associated with the Project. All surface disturbance would be temporary and reclaimed, and post-reclamation land use is expected to return disturbed land to a level of productivity comparable to pre-Project levels.

As outlined in the EPM in Section 2.3, a qualified biologist would conduct nest surveys prior to surface disturbing activities during the avian breeding season. This measure

would verify that impacts to nesting migratory birds are unlikely to occur under the Proposed Action. Vegetation removal could lead to temporary spatial redistribution of individuals or habitat-use patterns during the life of the Project. It is unlikely that implementing the Proposed Action would result in a decline in local or regional migratory bird populations because birds would be able to redistribute to undisturbed and suitable habitat outside of the Project Area. Impacts to the loss of potential foraging and breeding habitat in the Project Area would be negligible, short-term, and localized. Impacts to individual migratory birds in the Project Area would be negligible, short-term, and localized (BLM, 2021d).

3.6.2.2 Tier 2 Engine Usage Alternative

Under the Tier 2 Engine Usage Alternative, surface disturbing activities would result in the same activities and disturbance as the Proposed Action, therefore Impacts are anticipated to be the same as the Proposed Action, negligible, short-term, and localized (BLM, 2021d).

3.6.2.3 No Action Alternative

Under the No Action Alternative, up to 5 acres of surface disturbance could continue within the Project Area under authorized Notice-level exploration activities. This could result in the temporary loss of approximately 5 acres of migratory bird nesting or foraging habitat. Reclamation of surface disturbance would gradually eliminate potential impacts to migratory birds. Impacts to migratory birds under the No Action Alternative would be similar, but proportionally less than the Proposed Action (approximately 5 acres of surface disturbing activities versus approximately 8 acres associated with the Proposed Action) and are anticipated to be negligible, short-term, and localized (BLM, 2021d).

3.7 Native American Religious Concerns

3.7.1 Affected Environment

Two Native American tribes, the Timbisha Shoshone Tribe and the Duckwater Shoshone Tribe are located near the Project Area. The Timbisha Shoshone Tribe are primarily located in south central California in the Death Valley region, approximately 90 miles south of the Project Area. Members of the Tribe also live in other regions nearby including the Great Basin Saline Valley and Mojave Desert Panamint Valley. The Duckwater Shoshone Tribe are primarily located in northern Nye Country in the high desert Railroad Valley of the Duckwater Reservation, approximately 130 miles northeast of the Project Area. BLM sent letters regarding the Proposed Action to the two tribes on March 25, 2020. No response has been received.

3.7.2 Environmental Consequences

3.7.2.1 Proposed Action

Under the Proposed Action, approximately 8 acres of land surface would be disturbed. No concerns regarding the Proposed Action have been identified through tribal consultation at this time, although consultation process will continue with the tribes throughout the life of the project and reclamation. This disturbance would not effect Native American Religious Concerns. Since no concerns have been identified the Proposed Action is not expected to have any adverse effect on Native American Religious Concerns.

3.7.2.2 Tier 2 Engine Usage Alternative

Similar to the Proposed Action, under the Tier 2 Engine Usage Alternative, approximately 8 acres of land surface would be disturbed. This disturbance would not effect Native American Religious Concerns. Consequently, the Tier 2 Engine Usage Alternative is not anticipated to have adverse effects effect on Native American Religious Concerns.

3.7.2.3 No Action Alternative

Under the No Action Alternative, up to 5 acres of surface disturbance could continue within the Project Area under authorized Notice-level exploration activities. No concerns regarding the No Action have been identified through tribal consultation at this time, although consultation process will continue with the tribes throughout the life of the No Action and reclamation. Since no concerns have been identified at this time, the No Action Alternative is not expected to have any adverse effect on Native American Religious Concerns.

3.8 Noxious Weeds, Invasive and Non-native Species

3.8.1 Affected Environment

No noxious weed species were identified within the Project Area during baseline surveys (Stantec, 2020a). The following invasive and non-native plant species were observed: saltlover (Halogeton glomeratus) and Russian thistle (Salsola sp.).

3.8.2 Environmental Consequences

Effects Assessment Methodology

Determination of the significance of potential impacts on noxious weeds, invasive, and non-native species is based on the context, duration, type, and intensity of impact that could result from surface disturbance activities and other actions associated with Project

implementation. The essential qualities of noxious weeds, invasive, and non-native species communities include their spatial extent, integrity (consistency) of species composition, repeated association with natural features, and vigor in terms of the growth and reproduction of constituent species.

Effects Level Definitions

Intensity

Negligible – Effects on noxious weeds, invasive, and non-native species would not be perceptible and would be within the range of variability for that species. Annual monitoring would not be able to detect trend changes.

Minor – Effects on noxious weeds, invasive, and non-native species would be detectable, measurable, and outside the normal range of variability but not readily apparent without detailed monitoring. With mitigation, impacts would become imperceptible.

Moderate – Effects from noxious weeds, invasive, and non-native species, adverse or beneficial, would be measurable and perceptible, localized, but large and of consequence. Mitigation efforts would need to be implemented repeatedly and there would be a slight risk of failure and increased proliferation.

Major – Effects on noxious weeds, invasive, and non-native species would be readily apparent to even a casual observer. Extensive eradication and restoration efforts would be required if the intent is to return to pre-disturbance conditions.

Duration

Short-term – One year or less for herbaceous species, and one to five years for woody species.

Long-term – Greater than one year.

Context

Localized – Impacts are limited to work sites, areas immediately adjacent, and do not alter overall species composition and diversity within the Project Area.

Regional – Impacts could incorporate an entire vegetative community, or experience measurable changes in noxious weeds, invasive, and non-native species populations within the Project Area or greater than one-half mile from the disturbance area.

3.8.2.1 Proposed Action

Invasive and non-native plant species readily invade areas that have been disturbed and which typically lack or have minimal vegetation cover. Development and operation

of the Project would disturb approximately 8 acres of vegetation over the life of the Project.

The EPMs outlined in Section 2.3 would substantially reduce the introduction and spread of noxious weeds, invasive, and non-native species. The EPMs include the implementation of a noxious weed monitoring and control plan during assembly and throughout operations and reclamation.

Reclamation would reduce the establishment of noxious weeds in the Project Area. Successful reclamation of mine related surface disturbance areas would result in the establishment of a permanent vegetative cover, which would minimize the potential establishment of noxious weeds in the long term.

Impacts from noxious weeds, invasive, and non-native species would be negligible, long-term, and localized.

3.8.2.2 Tier 2 Engine Usage Alternative

The Tier 2 Engine Usage Alternative would have the same footprint as the Proposed Action with approximately 8 acres of proposed disturbance, therefore impacts to noxious weeds, invasive, and non-native species are expected to be the same as the Proposed Action , negligible, long-term, and localized.

3.8.2.3 No Action Alternative

Under the No Action Alternative, up to 5 acres of surface disturbance could continue within the Project Area under authorized Notice-level exploration activities. Reclamation would reduce the establishment of noxious weeds in the Project Area. Impacts from noxious weeds, invasive, and non-native species would be negligible, long-term, and localized.

3.9 Recreation

3.9.1 Affected Environment

Recreational uses of the Federal land in the vicinity of the Project Area consist primarily of dispersed recreation activities including motorcycle and off highway vehicle (OHV) riding; mountain bicycling; camping; hiking; hunting; photography; and dispersed recreation. The Project will not affect access or recreational values of the Special Recreation Management Area Clayton Valley Sand Dunes, which is near the Project.

The Project Area is located within NDOW Hunt Unit 212. Hunting of mule deer and desert bighorn sheep occurs in this hunt unit, as well as small mammals and upland and migratory game birds.

3.9.2 Environmental Consequences

Effects Assessment Methodology

The methodology used for analysis was mainly derived from the Project's potential ability to restrict recreation activities in the vicinity of the Project Area.

Effects Level Definitions

Intensity

Negligible – The majority of recreationists would not notice any impacts or changes in recreation patterns and levels and the impacts would not change their experience of recreation resources and values. Mitigation would not be necessary.

Minor – Recreationists might be able to detect the effects of changes in recreation patterns and levels, and the changes might have a slight but detectable effect on their experience of recreation resources and values. If mitigation was needed to offset adverse effects to the recreation experience, it would be relatively simple to implement and would likely be successful.

Moderate – Recreationists would be aware of the effects in recreation patterns and levels, as well as the effects on their experience of recreation resources and values. Some recreationists might feel displaced and need to pursue their desired activity in another recreation area. Mitigation measures would probably be necessary to offset adverse impacts and would likely be successful.

Major – The majority of recreationists would be highly aware of the effects associated with changes in recreation patterns and levels, as well as the effects on their experience of recreation resources and values. Many recreationists would feel displaced and need to pursue their desired activity in other areas. Mitigation measures to offset adverse effects would be needed, they would have to be extensive, and their success could not be guaranteed.

Duration

Short-term – The effect is transitory or that largely disappears over a period of months.

Long-term – The effect lasts more than six months.

Context

Localized – Impacts would be limited to the Project Area.

Regional – Impacts would extend beyond the Project Area.

3.9.2.1 Proposed Action

The Project, including associated fencing, would temporarily restrict access to approximately 8 acres of dispersed recreation opportunities within the Project Area. The Disturbance would be reclaimed at the end of the Project. Impacts would be considered negligible, long-term, and localized.

3.9.2.2 Tier 2 Engine Usage Alternative

Under the Tier 2 Engine Usage Alternative restricted access would be the same as the Proposed Action. Impacts are anticipated to be the same as the Proposed Action, negligible, long-term, and localized.

3.9.2.3 No Action Alternative

Under the No Action Alternative, up to 5 acres of surface disturbance could continue within the Project Area under authorized Notice-level exploration activities. Surface disturbance would be reclaimed at the end of activities. Impacts would be considered negligible, long-term, and localized.

3.10 Social and Economic Values

3.10.1 Affected Environment

Information on social and economic values in the analysis area is described in the Social and Economic Values and Environmental Justice SER (BLM 2021a). This SER is included in the Project Administrative Record and is incorporated by reference.

3.10.2 Environmental Consequences

3.10.2.1 Proposed Action

Activities associated with the Proposed Action would occur for approximately 18 months. The number of workers for the Project is projected at eight to ten. Workers are anticipated to reside in Silver Peak or Tonopah, most likely by renting a long-term residence such as a home, apartment, RV, mobile home, or similar. Alternately, employees may obtain short-term lodging in Tonopah. Lodging represents a positive influx to the economy of Silver Peak and/or Tonopah. Most employees are likely to reside in the area during their shifts and return to their homes outside of the area during their time off. Impacts to social and economic values are considered negligible, long-term, and localized (BLM 2021a).

3.10.2.2 Tier 2 Engine Usage Alternative

Under the Tier 2 Engine Usage Alternative, the number of workers at the Project would not change and the duration of the Project would not change. Impacts are anticipated to be the same as the Proposed Action; negligible, long-term, and localized (BLM 2021a).

3.10.2.3 No Action Alternative

Under the No Action Alternative, there would be up to five workers on site at any one time. These workers would most likely stay in temporary housing facilities, such as hotels, in Tonopah during exploration activities. These workers would temporarily supplement revenue in Tonopah, but at a much smaller scale than the Proposed Action. Therefore, impacts to socioeconomics under the No Action Alternative would be similar to, but proportionally less than under the Proposed Action and are anticipated to be negligible, long-term, and localized (BLM 2021a).

3.11 Soils

3.11.1 Affected Environment

Information regarding soils within the Project Area was obtained from the United States Department of Agriculture Natural Resources Conservation Service (NRCS). The soil associations within the Project Area consist of the Gynelle-Gynelle-Orcito association (312) and Slaw-Kawich-Playas association (432).

The Gynelle-Gynelle-Orcito association is comprised of 35 percent Gynelle very gravelly sandy loam to extremely cobbly sand, 0 to 8 percent slopes; 30 percent Gynelle, warm very gravelly sandy loam to extremely cobbly sand, 8 to 15 percent slopes; 20 percent Orcito very gravelly sandy clay loam to extremely gravelly sand, 0 to 8 percent slopes; and 15 percent minor components including the Izo (six percent), Wardenot (5 percent), and Leo (4 percent) series.

The Gynelle and Gynelle, warm series consists of very deep, well-drained soils that formed in mixed alluvium. The Orcito series consists of very deep, excessively drained soils that formed in alluvium derived from various kinds of rock.

The Slaw-Kawich-Playas association is comprised of 35 percent Slaw silty clay to loam, 0 to 2 percent slopes; 25 percent Kawich, fine sand, 4 to 15 percent slopes; 25 percent Playas silty clay to silty clay loam, 0 to 1 percent slopes; and 15 percent minor components including the Cirac (nine percent), Luning (three percent), and Gynelle (three percent) series.

The Slaw series consists of very deep, well-drained soils that formed in mixed alluvium. The Kawich series consists of very deep, well-drained soils that formed in eolian sands.

The Playas series consists of very shallow, poorly drained soils that formed in mixed alluvium.

Additional information on soils in the analysis area is described in the Ecological Baseline Surveys Report (Stantec 2020a) and the Work Plan for Ecological Baseline Surveys (Stantec 2020b). This Report and Work Plan are included in the Project Administrative Record and incorporated by reference.

3.11.2 Environmental Consequences

Effects Assessment Methodology

Soils analysis was based on a qualitative assessment of the soil types in the Project Area. Types of soil impacts include those resulting from soil removal, profile mixing, compaction, erosion, contamination, and restoration.

Effects Level Definitions

Intensity

Negligible – Adverse impacts to soils, including biological soil crusts (BSCs), would not be perceptible or measurable. Beneficial impacts would improve the condition of soils at minute levels. Any changes to soil productivity, integrity, stability, or fertility would be imperceptible.

Minor – Beneficial or adverse impacts to soils and BSCs would be barely perceptible or measurable. Any adverse impacts to soil productivity, integrity, stability, or fertility would be small and reversible. Beneficial impacts would improve the condition of soils slightly. If mitigation was needed to offset adverse impacts, it would be relatively simple to implement and would likely be successful. A beneficial impact would slightly reduce the level of mitigation needed.

Moderate – Beneficial or adverse impacts to soils and BSCs would be readily perceptible and measurable. Impacts to soil productivity, integrity, stability, or fertility would be readily apparent and they would result in a change to the soil character. Mitigation measures would be necessary to offset adverse impacts and would likely be successful. Beneficial impacts would substantially improve the condition of soils, greatly reducing the amount of necessary mitigation.

Major – Adverse impacts to soils and BSCs would be readily perceptible, measurable, and constitute a substantial change from natural conditions. Impacts to soil productivity, integrity, stability, or fertility would be readily apparent and would substantially change the character of the soils. Mitigation measures to offset adverse impacts would be needed, they would be extensive, and their success would not be guaranteed. Beneficial impacts would return soils back to natural conditions, and mitigation would not be necessary.

Duration

Short-term – One year or less and soils return to pre-disturbance conditions the next year.

Long-term – Greater than one year.

Context

Localized – A single site or within the Project Area.

Regional – Beyond the Project Area.

3.11.2.1 Proposed Action

Approximately 8 acres of soils would be disturbed by activities associated with the Proposed Action. Impacts from surface disturbing activities would primarily include potential increases in soil erosion due to wind and stormwater runoff and compaction in limited areas. BMPs would be used to limit erosion and reduce sediment in precipitation runoff from proposed Project facilities and disturbed areas during assembly, operations, and initial stages of reclamation. Diversion ditches, sediment traps, or other BMPs would be used to prevent migration of eroded material until reclaimed surfaces have demonstrated erosional stability. Compaction of soils types dominated by sand would increase stability and water holding capacity for both BSCs and plants slightly. In addition, surface grading, engineered surface water diversion channels, and temporary sediment control facilities would be used to reduce erosion and sedimentation.

Revegetation of disturbance areas would be conducted as soon as practicable following completion of the Project to reduce the potential for wind and water erosion, minimize impacts to soils and vegetation, and help prevent the spread of invasive and non-native species in disturbance areas. As a result of the implementation of the EPMs in Section 2.3 and reclamation efforts, impacts to soil with implementation of the Proposed Action would be minor, long-term, and localized.

3.11.2.2 Tier 2 Engine Usage Alternative

Under the Tier 2 Engine Usage Alternative, surface activities are the same as the Proposed Action Impacts to soils with implementation of the Tier 2 Engine Usage Alternative would be minor, long-term, and localized.

3.11.2.3 No Action Alternative

Under the No Action Alternative, up to 5 acres of surface disturbance could continue within the Project Area under authorized Notice-level exploration activities. Surface disturbance would be reclaimed at the end of activities. Impacts would be considered minor, long-term, and localized.

3.12 Special Status Species

3.12.1 Affected Environment

Information on special status species in the analysis area is described in the Ecological Resources SER (BLM, 2021d). This SER is included in the Project Administrative Record and is incorporated by reference.

3.12.2 Environmental Consequences

3.12.2.1 Proposed Action

No special status plant species were observed in the Project Area during the surveys conducted in May 2020 (BLM, 2021d). Impacts to special status wildlife species with suitable habitat in the Project Area would consist of disturbance from anthropogenic activities and potential collisions with Project equipment or vehicles. Habitat loss associated with vegetation removal from surface disturbing activities would result in a reduction of approximately 8 acres of special status wildlife species habitat within the Project Area. The Project Area would be reclaimed and revegetated, returning the land to special status wildlife species access and habitat.

Invasive, non-native species (Section 3.8) may reduce the quality of habitat for special status wildlife species. Project-related activities increase the potential for the spread of these species further reducing the quality of wildlife habitat in the Project Area. EPMs outlined in Section 2.3 would help reduce impacts from noxious weeds, invasive, and non-native species to special status wildlife species habitat as a result of Project activities.

BLM Sensitive Avian Species

Even though loggerhead shrike and prairie falcon were the only BLM sensitive avian species observed throughout the Project Area during the April and May 2020 field surveys, several other species have potential habitat in the area. Impacts to BLM sensitive avian species would consist of disturbance from anthropogenic activities and would primarily consist of habitat loss. Vegetation removal associated with surface disturbing activities would result in a reduction of approximately 8 acres of foraging and breeding habitat for BLM sensitive avian species within the Project Area. This acreage would not be disturbed all at one time due to the phased nature of Project activities. All surface disturbance would be temporary and reclaimed.

As outlined in the EPM in Section 2.3, Schlumberger has committed to providing a qualified biologist to conduct nest surveys prior to surface disturbing activities during the avian breeding season. This measure would verify that impacts to individual BLM sensitive avian species are unlikely to occur under the Proposed Action. Vegetation

removal could lead to temporary spatial redistribution of individuals or habitat-use patterns during the life of the Project. It is unlikely that implementing the Proposed Action would result in a decline in local or regional BLM sensitive avian species populations because birds would be able to redistribute. Also undisturbed and suitable habitat exists outside of the Project Area. Impacts to the loss of potential foraging and breeding habitat in the Project Area would be negligible, short-term, and localized. Impacts to individual BLM sensitive avian species in the Project Area would be negligible, short-term, and localized.

Reptiles

BLM sensitive reptile species would be impacted by surface disturbing activities, which would remove vegetation and disturb soil. Surface disturbance would remove potential areas for the BLM sensitive reptile species to lay their eggs or could destroy eggs laid within disturbance areas. Loss of vegetative cover and burrows could result in greater mortality due to predators. The distribution range of BLM sensitive reptile species is widespread throughout the west; therefore, potential impacts would not result in a decline in the local or regional population. Impacts to BLM sensitive reptile species are considered negligible, short-term, and localized.

Small Mammals

Although no BLM sensitive small mammals were observed in the project area, potential habitat is available for several BLM sensitive small mammals (Stantec 2020a). BLM sensitive small mammals may be impacted by anthropogenic activities as well as loss of habitat. Noise from equipment and vehicles, and other human disturbances has the potential to disturb BLM sensitive small mammals, but impacts are anticipated to be temporary, as the individuals would most likely disperse and return to the area. Habitat for BLM sensitive small mammals occurs throughout the vicinity of the Project Area, so surface disturbance is not anticipated to cause a long-term permanent decline in the local or regional population. Impacts to BLM sensitive mammal species are considered negligible, short-term, and localized.

Bats

Bat foraging habitat would be impacted by surface disturbing activities associated with the Proposed Action. Impacts to bats would include the removal or alteration of approximately 8 acres of potential foraging habitat. All disturbed land would be reclaimed. Impacts to bat habitat would be reduced through the implementation of the EPMs outlined in Section 2.3. Impacts to bats are considered negligible, short-term, and localized.

Golden Eagle and Other Raptors

There were no golden eagle nests observed within the Analysis Area during the 2020 surveys. One active prairie falcon nest was observed within 2 miles of the Project Area

during the 2020 surveys. Approximately 8 acres of foraging habitat would be removed by Project activities. Individual golden eagles and other raptors foraging in the Project Area would likely avoid the immediate area due to the loss of foraging habitat or anthropogenic activity such as noise or other human disturbances, since there is undisturbed and suitable habitat within the vicinity of the Project Area. This may result in the temporary spatial redistribution of individuals or change in habitat-use patterns. All disturbed land would be reclaimed.

As outlined in the EPM in Section 2.3, a qualified biologist would conduct nest surveys prior to surface disturbing activities during the avian breeding season. Additional EPMs identified in Section 2.3 would reduce impacts to golden eagles and other raptors that could result from Project activities. Impacts to golden eagles and other raptors are considered negligible, short-term, and localized (BLM, 2021d).

3.12.2.2 Tier 2 Engine Usage Alternative

Under the Tier 2 Engine Usage Alternative, disturbance within the project area would be the same as under the Proposed Action. Impacts to special status wildlife groups would be the same as described for the Proposed Action (BLM, 2021d).

3.12.2.3 No Action Alternative

Under the No Action Alternative, up to 5 acres of surface disturbance could continue within the Project Area under authorized Notice-level exploration activities. Impacts to special status species and their habitat under the No Action Alternative would be similar to but proportionally less than the Proposed Action (approximately 5 acres of surface disturbing activities versus approximately 8 acres associated with the Proposed Action) (BLM, 2021d).

3.13 Vegetation

3.13.1 Affected Environment

The two primary ecological sites observed within the Project Area and include: Coarse Gravelly Loam 3-5” P.Z. (Ecological Site ID No. R027XY043NV) and Sodic Flat (Ecological Site No. R029XY076NV) (Stantec 2020a).

Coarse Gravelly Loam 3-5” P.Z.

The Cobbly Gravelly Loam 3-5” P.Z. (R027XY043NV) ecological site covers approximately 91 percent of the Project Area. An ecological site description (ESD) is not available for R027XY043NV, consequently the information summarized below is for Coarse Gravelly Loam 3-5” P.Z. (Ecological Site ID No. R029XY039NV).

The ecological site occurs on lower fan piedmonts and inset fans. Slopes range from 0 to 15 percent, but slope gradients of 2 to 4 percent are typical. Elevations range from 4000 to about 5400 feet (NRCS 2020).

The reference plant community is dominated by Indian ricegrass and shadscale. Other important species include white bursage, Shockley's wolfberry, and Bailey's greasewood. Potential vegetative composition is about 10 percent grasses, 5 percent forbs and 85 percent shrubs. Approximate ground cover (basal and crown) is 15 to 25 percent. The dominant plant species observed at the Project Area associated with the site were Greasewood (*Sarcobatus vermiculatus*), Indian ricegrass (*Achnatherum hymenoides*), and Shadscale (*Atriplex confertifolia*).

Sodic Flat

The Sodic Flat (R029XY076NV) ecological site occurs in approximately 9 percent of the Project Area. This site occurs on lake plains and lake plain terraces, usually immediately adjacent to playas. Slopes range from 0 to 30 percent. Slopes gradients of 0 to 2 percent are typical. Elevations are 2300 to about 6600 feet. The climate associated with this site is arid, characterized by cool, moist winters and hot, dry summers. Average annual precipitation is 5 to 8 inches (NRCS 2020).

The reference plant community is dominated by black greasewood and inland saltgrass. Vegetation on this site is normally restricted to coppice mound areas that are surrounded by playa-like depressions. Potential vegetative composition is about 20 percent grasses, 5 percent forbs, and 75 percent shrubs. Approximate ground cover (basal and crown) is 10 to 20 percent. The dominant plant species observed at the Project Area associated with the site were Greasewood (*Sarcobatus vermiculatus*), Saltgrass (*Distichlis spicata*), and Shadscale (*Atriplex confertifolia*).

3.13.2 Environmental Consequences

Effects Assessment Methodology

An ecological site survey was conducted in accordance with BLM protocols in the Project Area on May 13, 2020. The ecological sites in the Project Area were surveyed by walking meandering transects (i.e., an intuitive controlled method) for the purpose of observing changes in the soil surface or vegetation. Environmental conditions were evaluated to determine if the site conditions conformed to the corresponding ESD.

Effects Level Definitions

Intensity

Negligible – Impacts on native vegetation – beneficial or adverse – would be so small they would not be measurable or perceptible.

Minor – Effects on native vegetation - beneficial or adverse - would be detectable, measurable and perceptible but small, localized, and of little consequence. Adverse effects can be minimized or fully mitigated and would be relatively simple to implement and would have a high probability of success.

Moderate – Effects on native vegetation - beneficial or adverse - would be readily apparent, measurable, large and of consequence, but localized. Adverse effects would require mitigation and restoration. Mitigation could be extensive, but likely to be effective.

Major – Effects on native vegetation - beneficial or adverse - would be readily apparent and would substantially change the biological value of the native plant community in the context of the project area or region. Changes would be widespread and could have permanent consequences for the resource. Restoration would be necessary to reduce or rectify adverse effects, and its success could not be guaranteed.

Duration

Short-term – One year or less for herbaceous species, and one to five years for woody species.

Long-term – Greater than one year for herbaceous species, and greater than five years for woody species.

Context

Localized – Impacts are limited to work sites, areas immediately adjacent and do not alter overall species composition and diversity within the Assessment Area (Proposed Plan Area).

Regional – Impacts to vegetation communities could incorporate an entire vegetative community or experience measurable composition and diversity changes within the Assessment Area or greater than one-half mile from the disturbance area.

3.13.2.1 Proposed Action

Surface disturbing activities associated with the Proposed Action would remove approximately 8 acres of vegetation. Revegetation of disturbance areas would be conducted as soon as practicable following completion of the Project to minimize impacts to vegetation and help prevent the spread of invasive and non-native species in disturbance areas. As a result of the implementation of the EPMs in Section 2.3 and reclamation efforts, impacts to vegetation under the Proposed Action would be minor, long-term, and localized.

3.13.2.2 Tier 2 Engine Usage Alternative

Under the Tier 2 Engine Usage Alternative surface disturbance activities would be the same as the Proposed Action Impacts to vegetation associated with implementation of the Tier 2 Engine Usage Alternative would be minor, long-term, and localized.

3.13.2.3 No Action Alternative

Under the No Action Alternative, up to 5 acres of surface disturbance could continue within the Project Area under authorized Notice-level exploration activities. Surface disturbance would be reclaimed at the end of activities. Impacts would be considered minor, long-term, and localized.

3.14 Water Resources

3.14.1 Affected Environment

Information on water resources (surface and groundwater) in the Analysis Area is described in the Surface and Groundwater Resources SER (BLM 2021c). This SER is included in the Project Administrative Record and is incorporated by reference. There are no natural perennial streams in the vicinity of the Project. There are some ephemeral drainages that cross the Project Area.

3.14.2 Environmental Consequences

3.14.2.1 Proposed Action

Surface Water

Flow in ephemeral drainages occurs in response to storm events; therefore, the potential impacts to surface water quality could result from spills and sedimentation or erosion from surface disturbing activities. The potential impacts to surface water quality from spilled chemicals or petroleum products would be minimized by the implementation of the Secondary Containment Plan and Spill Prevention, Control, and Countermeasure Plan prepared for the Project. The potential impacts to surface water quality from sedimentation would be minimized by the designed stormwater diversion and containment structures and implementation of the EPMs outlined in Section 2.3. Therefore, impacts to surface water resources would be considered negligible, short-term, and localized (BLM 2021c).

Groundwater

Over the 18-month duration of the Project, a maximum of 50 acre-feet of brine may be extracted for use at the Pilot Plant. This is equivalent to 33 acre-feet per year or 0.3 percent of the water extracted from Clayton Valley in 2015 (NDWR, 2017b) and 0.1

percent of the total approved or requested usage within 5 miles of the Project Area based on review of the NDWR water rights database. Brine would be extracted intermittently over the 18-month duration of the project. Based on the typical pumping rate for the Pilot Plant, brine would be extracted for less than 4.5 months total over the life of the Project. Given the brine extracted from well CV-9 would be returned to the aquifer after processing in the Pilot Plant through a RIB, the drawdown of the aquifer is expected to be small and temporary. Therefore, impacts to groundwater resources would be considered negligible, short-term, and localized (BLM 2021c).

3.14.2.2 Tier 2 Engine Usage Alternative

Surface Water

Under the Tier 2 Engine Usage Alternative, impacts to surface water would be the same as the Proposed Action. Therefore, impacts to surface water resources would be considered negligible, short-term, and localized (BLM 2021c).

Groundwater

Under the Tier 2 Engine Usage Alternative, groundwater usage would not change from the Proposed Action. Therefore, impacts to groundwater resources would be the same as the Proposed Action; negligible, short-term, and localized (BLM 2021c).

3.14.2.3 No Action Alternative

Under the No Action Alternative, up to 5 acres of surface disturbance could continue within the Project Area under authorized Notice-level exploration activities. Impacts to water quality would not be anticipated (BLM 2021c).

3.15 Wetlands and Riparian Zones

3.15.1 Affected Environment

Information on wetlands and riparian zones in the Analysis Area is described in the Surface and Groundwater Resources SER (BLM 2021c). This SER is included in the Project Administrative Record and is incorporated by reference.

3.15.2 Environmental Consequences

3.15.2.1 Proposed Action

Wetlands or riparian zones are not present within the Project Area. Further, the Project Area is not within existing ephemeral drainage paths for surface water. In addition, no wetlands are mapped within the Project Area (USFWS, 2020). Consequently, wetlands and riparian zones would not be affected by the Proposed Action (BLM 2021c).

3.15.2.2 Tier 2 Engine Usage Alternative

The Project Area for the Tier 2 Engine Usage Alternative would be the same as for the Proposed Action. Consequently, wetlands and riparian zones would not be affected by the Tier 2 Engine Usage Alternative (BLM 2021c).

3.15.2.3 No Action Alternative

Under the No Action Alternative, up to 5 acres of surface disturbance could continue within the Project Area under authorized Notice-level exploration activities. No wetland or riparian areas have been identified in the area associated with the No Action Alternative. Consequently, wetlands and riparian zones would not be affected by the No Action Alternative (BLM 2021c).

3.16 Wildlife

3.16.1 Affected Environment

Information on wildlife in the analysis area is described in the Ecological Resources SER (BLM 2021d). This SER is included in the Project Administrative Record and is incorporated by reference.

3.16.2 Environmental Consequences

3.16.2.1 Proposed Action

Impacts to general wildlife with suitable habitat in the Project Area would consist of habitat loss and disturbance from anthropogenic activities and potential collisions with Project equipment or vehicles. Impacts resulting from habitat loss associated with vegetation removal from surface disturbing activities would result in a reduction of approximately 8 acres of wildlife habitat within the Project Area. The disturbed land would be reclaimed and revegetated. Noise from equipment and vehicles and other human disturbances has the potential to disturb small mammals, but impacts are anticipated to be temporary, as the individuals would most likely disperse and return to the area.

No noxious weed species were identified in the Project Area during the May 2020 field surveys; however, the following invasive and non-native plant species were observed: saltlover (*Halogeton glomeratus*) and Russian thistle (*Salsola sp.*). These invasive, non-native species may reduce the quality of habitat for wildlife. Project-related activities increase the potential for the spread of these species further reducing the quality of wildlife habitat in the Project Area. EPMs outlined in Section 2.3 would help reduce impacts from noxious weeds, invasive, and non-native species to wildlife habitat as a

result of Project activities. Impacts to wildlife would be negligible, short-term, and localized (BLM 2021d).

3.16.2.2 Tier 2 Engine Usage Alternative

Under the Tier 2 Engine Usage Alternative, similar habitat loss and anthropogenic disturbance would occur as under the Proposed Action. EPMs outlined in Section 2.3 would help reduce impacts from noxious weeds, invasive, and non-native species to wildlife habitat as a result of Project activities. Impacts to wildlife would be negligible, short-term, and localized (BLM 2021d).

3.16.2.3 No Action Alternative

Under the No Action Alternative, up to 5 acres of surface disturbance could continue within the Project Area under authorized Notice-level exploration activities. Reclamation of existing surface disturbance would gradually reduce impacts to wildlife. Impacts to wildlife under the No Action Alternative would be similar, but proportionally less than the Proposed Action (approximately 5 acres of surface disturbing activities versus approximately 8 acres associated with the Proposed Action) and are anticipated to be negligible, short-term, and localized (BLM 2021d).

4.0 Consultation and Coordination

The following is a list of persons, groups, and agencies consulted, as well as a list of individuals responsible for the preparation of this EA.

4.1 Native American Consultation

The BLM initiated Native American Consultation on March 25, 2020. Letters providing a description of the Project, including maps, were mailed to the Timbisha Shoshone Tribe and the Duckwater Shoshone Tribe. No comments have been received to date.

4.2 Persons, Groups, and Agencies Consulted

Federal Agencies

USFWS

State Agencies

Nevada Natural Heritage Program
NDOW
NDWR

4.3 List of Preparers and Reviewers

BLM

Perry Wickham: Field Manager
Jonah Blustain: Assistant Field Manager, Non-Renewable Resources
Cindy Sundblad: Project Manager
Frank Giles: Air Quality
Cassandra Albush: Cultural Resources; Paleontological Resources
Julie Suhr Pierce: Environmental Justice; Socioeconomics
K. C. Shedden: Fire Management
Justin Ferris: Floodplains, Water Quality, Wetlands/Riparian Zones
Brian Truax: Grazing Management, Noxious Weeds, Invasive and Non-native Species, Soils
Wendy Seley: Lands and Realty
Brandon Crosby: Migratory Birds, Special Status Wildlife Species, Threatened and Endangered Species, Vegetation, Wildlife
Kristin Reid: Minerals, Mining Engineering
Juan Martinez: Native American Consultation
Alexandra Bettinger: Recreation, Visual Resources, Wilderness
Kelsey White: Hazardous Materials

Stantec

Andrea Reither	EA Manager
Kelly Greaser	Document Preparation
Joan Kester	GIS Data Management and Figure Production
Walter Weinig	Technical Review

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APPENDIX A. PUBLIC COMMENTS AND RESPONSES
(TO BE ADDED WHEN COMMENTS ARE RECEIVED)