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

**Gibellini Vanadium Mine Project** 

## Final Supplemental Environmental Report 5 Grazing Management

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**Preparing Office** 

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## **Executive Summary**

#### Affected Environment

The Project is within the Fish Creek Ranch Allotment, which consists of 289,292 acres of Bureau of Land Management (BLM)-managed land. Within the allotment there are six pastures and three leases that utilize the allotment for cattle and sheep grazing, and the allotment contains 4,815 animal unit months (AUMs). An AUM represents the quantity of forage necessary to sustain one cow-calf pair. one horse, or five sheep for 1 month. The Fish Creek Ranch Allotment is categorized by the BLM as an allotment in the "Improve" category. Improve category allotments receive the highest priority for both range improvement developments and changes to terms and conditions in the grazing authorization because grazing management is expected to be a contributing factor in the nonachievement of land health standards in these allotments. Riparian resources, wild horses and Greater sage-grouse occur in the allotment. The majority of riparian resources in the allotment occur within the Antelope and Fish Creek Mountain Ranges outside of the pastures associated with the Project. The Fish Creek Herd Management Area overlaps much of the allotment and current populations are within the Appropriate Management Level at 125 wild horses post-foaling. Additionally, there are Greater Sage-grouse Priority Habitat Management Areas, General Habitat Management Areas and Other Habitat Management Areas within the allotment; however, only General Habitat Management Areas and Other Habitat Management Areas are in the pastures associated with the Project.

The Project area covers approximately 6,456 acres of rangeland in the Fish Creek Ranch Allotment, which is approximately 2 percent of the total allotment area. The current grazing management plan for the Fish Creek Ranch Allotment was implemented on September 27, 2004. There are three lessees that utilize the Fish Creek Ranch Allotment. There are no non-structural or structural range improvements within the Project area.

#### **Environmental Consequences**

The primary issues related to impacts on grazing resources would include a temporary and permanent loss of active AUMs in the Fish Creek Ranch Allotment, either through disturbance to range resources or losses due to reduced forage production. No impairments to existing range improvements and stock water resources are anticipated.

#### Proposed Action

Potential effects on grazing may include the short-term, long-term, and permanent reduction or loss of rangeland available for grazing use within the allotment. Short-term effects arise from forage removal and disturbance from Project-related activities. Effects on grazing would cease within the completion of linear construction activities (water line and powerline), mine closure, and successful reclamation. Long-term effects consist of changes to vegetation communities, irrespective of reclamation success. Permanent effects typically would be associated with the construction of open pits and facilities that permanently alter the vegetation, soil, and topography of the landscape.

The Project would result in new disturbance to 806 acres and exclusion of 413 acres of undisturbed land as a result of Project fencing of the 289,292-acre Fish Creek Ranch Allotment, which would equate to 15.1 AUMs lost during the duration of the Project, or 0.42 percent (a minor impact) of the total AUMs available in the Fish Creek Ranch Allotment. The disturbance associated with the Project would be reclaimed following completion of mining operations with the exception of 85 acres in the

Fish Creek Ranch Allotment associated with the unreclaimed pit. This would equate to approximately 1.4 AUMs permanently lost from the Fish Creek Ranch Allotment (1.3 and 0.1 AUMs from the Fish Creek Valley South and Antelope Valley pastures, respectively), or 0.04 percent of the total AUMs available within the pastures. Therefore, direct impacts on grazing resources from disturbance are anticipated to be minor, long term (permanent for the 85 acres associated with the unreclaimed pit), and localized.

During construction it is likely that livestock would avoid the Project area. However, over time, they are likely to become accustomed to the mining activity and begin to reoccupy areas initially avoided. Direct effects on livestock may include limited direct mortalities from Project-related activities (e.g., vehicle collisions). However, fencing in the main Project area would preclude these impacts. The unfenced borrow would only be active for six months during daytime hours so direct mortality to livestock would be unlikely. Impacts on livestock anticipated to be minor, short term, and localized.

#### South Access Road Alternative

Under the South Access Road Alternative, the change in location of the access road would result in 38 additional acres of surface disturbance. The South Access Road Alternative would result in disturbance to 844 acres, plus the exclusion of 413 acres as a result of Project fencing, of the 289,292-acre Fish Creek Ranch Allotment. This would result in 15.7 AUMs temporarily lost from the Fish Creek Valley South and Antelope Valley pastures during the duration of the Project. The disturbance associated with the Project would be reclaimed following completion of mining operations with the exception of 85 acres in the Fish Creek Ranch Allotment associated with the unreclaimed pit. This would equate to approximately 1.4 AUMs permanently lost from the Fish Creek Ranch allotment (1.3 and 0.1 AUMs from the Fish Creek Valley South and Antelope Valley South and Antelope Valley pastures, respectively), or 0.04 percent of the total AUMs available within the pastures. Aside from the increased disturbance acreage, the effects under this alternative would be comparable to the Proposed Action.

#### Renewable Energy Alternative

Under the Renewable Energy Alternative, construction of the solar field would result in 33 additional acres of permanent surface disturbance. The Renewable Energy Alternative would result in disturbance to 839 acres, plus the exclusion of 412 acres as a result of Project fencing, of the 289,292-acre Fish Creek Ranch Allotment. This would result in approximately 15.6 AUMs temporarily lost from the Fish Creek Valley South and Antelope Valley pastures during the duration of the Project. The disturbance associated with the Project would be reclaimed following completion of mining operations with the exception of 85 acres in the Fish Creek Ranch Allotment associated with the unreclaimed pit and 33 acres associated with the solar field, which would remain operational. The pit and solar field would equate to approximately 1.9 AUMs permanently lost from the Fish Creek Ranch Allotment (1.8 and 0.1 AUMs from the Fish Creek Valley South and Antelope Valley pastures, respectively), or 0.06 percent of the total AUMs available within the pastures. Aside from the increased disturbance acreage, the effects under this alternative would be comparable to the Proposed Action.

#### No Action Alternative

Under the No Action Alternative, the Project would not be developed and associated impacts on grazing resources would not occur. Under the No Action Alternative, no new rights-of-way authorizations, pipelines, or roadways would be required.

#### **Cumulative Effects**

The Cumulative Effects Study Area (CESA) for grazing resources is the same as the area of analysis, encompassing the Project area and the Fish Creek Ranch Allotment. The CESA consists of 289,292 acres of BLM-managed land and 5,938 acres of a mixture of private and other public lands for a total of 295,230 acres. The CESA encompasses the extent of potential effects from activities associated with the Project and interrelated actions that may result in cumulative effects when combined with potential effects from past, present, and reasonably foreseeable future actions (RFFAs).

#### Proposed Action

Cumulative effects on grazing resources would primarily be directly related to forage loss in either quality or quantity due to disturbance. The cattle and sheep that occur in the CESA would continue to graze in the Fish Creek Ranch Allotment throughout the Project, although use may be concentrated in other areas due to loss of grazing resource availability in the area of disturbance due to the Project.

The Project would result in a reduction of grazing resources on an additional 1,219 acres (0.41 percent of the CESA) due to construction of mining facilities and roads and removal of soil. Impacts on grazing resources as a result of the Project would be mostly temporary in nature. Pending completion of successful reclamation, grazing resources on 1,134 acres would return to pre-Project conditions, and 85 acres would be permanently lost from the Project area. This would result in 15.1 AUMs temporarily lost during the duration of the Project and 1.4 AUMs permanently lost. The reclaimed areas would be capable of supporting grazing use; however, densities and distribution may change in the long term but are anticipated to be minor and localized.

The Project is not anticipated to affect the amount and extent of available surface water (e.g., seeps and springs) in the Project vicinity or associated wetland habitat for livestock within the CESA.

#### South Access Road Alternative

Under South Access Road Alternative, the change in location of the access road would result in 38 additional acres of surface disturbance. The South Access Road Alternative would reduce grazing resources on an additional 1,257 acres, or 0.43 percent of the 295,230-acre CESA. This would result in 15.7 AUMs temporarily lost and 1.4 AUMs permanently lost due to the Project. The disturbance associated with the Project would be reclaimed following completion of mining operations with the exception of 85 acres in the Fish Creek Ranch Allotment associated with the unreclaimed pit. Aside from the increased disturbance acreage, the effects in the CESA under this alternative would be comparable to the Proposed Action.

#### Renewable Energy Alternative

Under the Renewable Energy Alternative, the construction of the solar field would result in 33 additional acres of permanent surface disturbance compared to the Proposed Action. The Renewable Energy Alternative would reduce grazing resources on an additional 1,252 acres, or 0.42 percent of the 295,230-acre CESA. This reduction of rangeland available for livestock grazing would result in approximately 15.6 AUMs temporarily lost during the duration of the Project and long-term loss of approximately 1.9 AUMs due to the Project. The disturbance associated with the Project would be reclaimed following completion of mining operations with the exception of 85 acres in the Fish Creek Ranch Allotment associated with the unreclaimed pit and 33 acres associated with the solar field. Aside from the increased surface disturbance acreage, the cumulative effects in the CESA under this

alternative would be comparable to the Proposed Action. Therefore, cumulative grazing impacts as a result of the Renewable Energy Alternative are anticipated to be minor, long term, and localized.

#### No Action Alternative

Under the No Action Alternative, the Project would not be constructed, and past, present, and RFFAs would continue in the CESA. As a result, there would be no potential for the Project to contribute to cumulative impacts on grazing resources. Cattle and sheep and the Fish Creek Ranch Allotment would continue to be managed as they currently are. Cumulative impacts on grazing resources under the No Action Alternative would be less than those under the Proposed Action but would still be anticipated to be negligible, long term, and localized.

#### **Residual Impacts**

Residual effects on grazing resources under the Proposed Action would include the permanent loss of 85 acres of the Fish Creek Herd Management Area due to the open, unreclaimed pit mine. In areas that would be disturbed by the Project but later reclaimed, the loss of shrub or tree-dominated communities within these would represent a long-term change in vegetation community composition (i.e., shrub-dominated communities to grass/forb dominated communities) because it would take approximately 25 years for mature shrubs to become re-established in these communities, though this would likely benefit livestock which prefer herbaceous forage.

Any reduction in permitted grazing would be done through a subsequent BLM decision based on livestock carrying capacity and resource conditions (per 43 Code of Federal Regulations 4100.0-5), accounting for actual forage unavailable for grazing.

## ACRONYMS AND ABBREVIATIONS

AUM	animal unit month
BLM	Bureau of Land Management
BMP	best management practice
CESA	Cumulative Effects Study Area
CFR	Code of Federal Regulations
NVV	Nevada Vanadium Company
Project	Gibellini Vanadium Mine Project
PV	photovoltaic
RFFA	reasonably foreseeable future action

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## 1.0 INTRODUCTION

## 1.1 Proposed Action

The Gibellini Vanadium Mine Project (Project) is a proposed Vanadium Mine Project located along the eastern slope of the Fish Creek Mountains in Eureka County, Nevada, which would be developed and operated by the Nevada Vanadium Company (NVV) (**Figure 1**). The Project would include the construction and operation of an open pit mine that would produce approximately 24 million tons of ore material containing 66,000 tons of vanadium and 168 tons of uranium over the mine life. Approximately 2 million tons of waste rock material would be mined during the life of the Project.

A full Project description, including the facility layout, is provided in the Supplemental Environmental Report 1 – Proposed Action and Project Alternatives (BLM 2021a). The following new mine components associated with this operation would include:

- Open pit;
- Rock disposal area;
- Mine office and facilities;
- Crushing facilities and stockpile;
- Heap leach pad;
- Process facility;
- Various process and make-up water ponds;
- Borrow areas;
- Mine and access roads;
- Water pipeline and power supply lines; and
- Ancillary facilities.

Exploration activities in the Project area would generally include construction of access roads, drill pads, sumps, trenches, surface sampling, bulk sampling, staging areas, and monitoring well installation. Total surface disturbance associated with the Proposed Action, including exploration activities, would be 806 acres of public land.

## 1.2 South Access Road Alternative

The South Access Road Alternative would consist of the same components as noted for the Proposed Action except the access road alignment would be moved to the south adjacent to the main power line that would be connected to the Pan Mine 69-kilovolt power line. This alternative would result in approximately 38 additional acres of surface disturbance as compared to the Proposed Action. Total surface disturbance for the South Access Road Alternative would be 844 acres of public land.

## 1.3 Renewable Energy Alternative

The Renewable Energy Alternative would consist of the same overall activities as described for the Proposed Action except this alternative would include supporting the mine operations with a combination of renewable energy and a utility interconnection with future large-scale battery storage.

This alternative would include the installation of enough solar electric photovoltaic (PV) capacity so the site would become a net generation facility with battery storage to perform peak smoothing and daily load management as well as providing a sustainable long-term power source servicing the remote electrical needs of southern Eureka County and Northern Nye County.

This alternative would result in approximately 33 additional acres of permanent surface disturbance compared to the Proposed Action because the solar facility would not be reclaimed at the end of the Project. Total surface disturbance for the Renewable Energy Alternative would include 839 acres of public land.

#### **1.4 No Action Alternative**

Under the No Action Alternative, the Project would not be developed and associated impacts in the Project area would not occur.

#### Figure 1. Project Location Map



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SER 5 – Grazing Management

## 2.0 AFFECTED ENVIRONMENT

The Project is within the Fish Creek Ranch Allotment. The Fish Creek Ranch Allotment consists of 289,292 acres of Bureau of Land Management (BLM)-managed land with a current average stocking rate of 60 acres per animal unit month (AUM) based on a total of 4,815 AUMs (BLM 2020a). An AUM represents the quantity of forage necessary to sustain one cow-calf pair, one horse, or five sheep for 1 month.

## 2.1 Area of Analysis

The Project is in the southeastern portion of Eureka County, Nevada, at the southern end of the Fish Creek Range (**Figure 1**). The utility corridor and portions of the Project area extend into Fish Creek Valley, to the east of Fish Creek Range. Little Smoky Valley is to the east and south of the Project area and Antelope Valley is west of the Project area.

The area of analysis for Project-related grazing impacts encompasses the Project area (**Figure 2**), which is contained within the Fish Creek Ranch Allotment. This area of analysis captures the area in which construction, operation, and reclamation activities would occur, including transportation and transmission line routes. Supplemental Environmental Report 1 – Proposed Action and Project Alternatives (BLM 2021a), provides additional information and figures detailing the planned mined facilities.

## 2.2 Regulatory Framework

The regulatory framework described in this section is specific to grazing management. Supplemental Environmental Report 1 – Proposed Action and Project Alternatives (BLM 2021a) for additional federal, state, and county regulatory information.

The BLM administers public land grazing in accordance with the Taylor Grazing Act of 1934, and currently manages public land in a manner aimed at achieving and maintaining rangeland health. The BLM has established Standards and Guidelines approved by the Secretary of the Interior (43 Code of Federal Regulations [CFR] 4180). In accordance with 43 CFR 4180.2, Standard and Guidelines are developed in consultation with the affected resource advisory councils. The BLM Resource Management Plan that covers the Project area includes rangeland programs that authorize livestock grazing on public lands (43 CFR 1601.0-5(b) and CFR 4100.08). The regulations require that the BLM manage livestock grazing on public lands under the principles of multiple use and sustained yield. To accomplish this, rangeland has been broken down into controllable land areas called allotments to manage both short- and long-term objectives for livestock grazing. Allotments are leased to permittees for a defined period of time. BLM Mount Lewis Field Office allotments are managed to achieve Northeast Great Basin Resource Advisory Council standards and guidelines (BLM 2007). They are evaluated periodically by the BLM to determine whether management goals are being met. If an allotment is determined to not be meeting the standards, or making significant progress toward meeting the standards, for rangeland health, the BLM identifies opportunities and methods needed to improve rangeland health (BLM 2014).

The BLM is also mandated by the Public Rangeland Improvement Act of 1978 to "manage, maintain and improve the condition of the rangelands so that they become as productive and feasible for all rangeland values in accordance with management objectives and the land use planning process" (43 United States Code §1901). The BLM administers livestock grazing through permits and leases, which authorize a certain amount of AUMs for a specific type of livestock during specific dates, and other related terms and conditions. An AUM is the amount of forage needed to sustain one cow, or its equivalent, for a period of 1 month (43 CFR 4100.0-5). AUMs can be permitted for other livestock types using animal unit equivalents.

The main objectives of the Shoshone-Eureka Rangeland Program (BLM 1988) are to establish a grazing management program designed to provide key forage plants with adequate rest from grazing during critical growth periods, improve ecological condition, and achieve utilization levels consistent with those recommended by the Nevada Rangeland Monitoring Handbook (Swanson et al. 2018).

#### Figure 2. Area of Analysis



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## 2.3 Existing Conditions

Grazing allotment information for the area of analysis was obtained from the BLM's Rangeland Administration Reports (BLM 2020a) and associated geographic information system data (BLM 2020b). BLM grazing allotment management categories are in accordance with BLM Handbook 1740-1 Rel. 1-1509 (BLM 1987), which has been augmented with additional criteria from BLM IM No. 2009-018 (BLM 2008).

The Project area is within a portion of the Fish Creek Ranch Allotment (**Figure 2**). The Fish Creek Ranch Allotment consists of 289,292 acres of BLM-managed land with a current average stocking rate of 60 acres per AUM based on a total of 4,815 AUMs (**Table 1**). An AUM is the amount of forage required to sustain a cow/calf pair, one horse, or five sheep for 1 month. This equates to approximately 800 pounds of dry forage per month (Alberta Agriculture and Food 2007). Although forage production varies within an allotment, for the purpose of calculating acres per AUM, uniform production is assumed. Additionally, a minor Forest Service land inclusion of 61 acres is part of the Fish Creek Ranch Allotment and 5,877 acres of the allotment are managed privately. **Table 2** present the pastures, Fish Creek Valley South and Antelope Valley, which occur in the Project area.

The Project area covers approximately 6,456 acres of rangeland in the Fish Creek Ranch Allotment, which is approximately 2 percent of the total allotment area. The current grazing management plan for the Fish Creek Ranch Allotment was implemented on September 27, 2004. There are three lessees that utilize the Fish Creek Ranch Allotment.

#### Table 1. Grazing Allotment Intersecting the Project Area

Allotment Name/Number	Total Acres	Active AUMs <sup>1</sup>	Pastures	Average Acres per AUM	Livestock Type
Fish Creek Ranch/10038	289,292	4,815	6	60	Cattle and Sheep

Source: BLM 2020b.

<sup>1</sup> One AUM represents the amount of forage necessary for the sustenance of one cow or its equivalent for a period of 1 month (43 CFR 4100.0-5).

Note that allotment information reflects the BLM-managed portion of the allotment only.

Pasture	Total Acres	Project Area Acres	Active AUMs <sup>1</sup>	Stocking Rate	Livestock Type	Season of Use
Fish Creek Valley South	44,331	5,490	612	72 acres/AUM	Cattle	3/1–3/31
Antelope Valley	156,870	966	2,512	62 acres/AUM	Cattle	11/1–3/31

#### Table 2. Pastures Intersecting the Project Area

Source: BLM 2020b.

<sup>1</sup> One AUM represents the amount of forage necessary for the sustenance of one cow or its equivalent for a period of 1 month (43 CFR 4100.0-5).

In addition to issuing grazing permits, BLM is also responsible for the administration of range improvements throughout the allotment. There are two kinds of range improvements: non-structural and structural. Seedings or prescribed burns are examples of nonstructural range improvements. Fences or facilities, such as wells or water pipelines, are examples of structural improvements. There are no non-structural or structural range improvements within the Project area.

The BLM also evaluates allotment rangeland health in accordance with standards and guidelines as outlined in the Nevada Rangeland Monitoring Handbook (Swanson et al. 2018) and may assign an allotment a status such as "Improve," although these statuses do not apply solely to grazing In these cases, where standards are not met, the authorized officer will analyze and authorize changes in grazing management to improve resource conditions. The Fish Creek Ranch Allotment is categorized as an Improve allotment. Improve allotments are assigned where current livestock grazing management or level of use on public land is, or is expected to be, a significant causal factor in the non-achievement of land health standards, or where a change in mandatory terms and conditions in the grazing authorization is or may be necessary. Improve category allotments receive the highest priority both range improvement developments and changes to terms and conditions in the grazing authorization, because grazing management is expected to be a contributing factor in the non-achievement of land health standards in these allotments. However, while evaluation and categorization of these allotments aims to reflect the full range of physical and biological factors addressed by land health standards, not all categorizations fully consider contributing factors in indicators of ecosystem function or adjoining areas (BLM H-4180-1).

The majority of riparian resources on the allotment occur within the Antelope and Fish Creek Mountain Ranges outside of the pastures associated with the Project. The Fish Creek Herd Management Area overlaps much of the allotment and current populations are within the Appropriate Management Level at 125 head post-foaling. Additionally, there are Greater sage-grouse Priority Habitat Management Areas, General Habitat Management Areas and Other Habitat Management Areas within the allotment; however, only General Habitat Management Areas and Other Habitat Management Areas are in the pastures associated with the Project.

## 3.0 APPLICANT-COMMITTED ENVIRONMENTAL PROTECTION MEASURES

NVV has developed the following practices to prevent unnecessary and undue degradation during the life of the Project. These practices are derived from the general requirements established in the BLM's surface management regulations at 43 CFR 3809 and Nevada Division of Environmental Protection-Bureau of Mining Regulation and Reclamation mining reclamation regulations, as well as other water regulations and BLM guidance documents. These measures are informed by the Enhanced Baseline Reports that identified potential resource conflicts and measures that could be taken to avoid or minimize those resource conflicts and are to be considered part of the operating plan and procedures. The Applicant-committed environmental protection measures listed in this section would apply to all alternatives.

- 1. NVV would implement regular fence inspections/maintenance to ensure livestock do not get into the active mining area and NVV would work with the BLM and permittee to resolve any unexpected issues that may arise.
- 2. A noxious weed monitoring and control plan would be implemented during construction and mining operations in consultation with the BLM and Eureka County Weed District. The plan contains management strategies and provisions for annual monitoring and treatment. The results from annual monitoring would be the basis for updating the plan and developing annual treatment programs.
- 3. Disturbed areas would be seeded with an interim seed mix to minimize fugitive dust emissions from un-vegetated surfaces where appropriate.
- 4. The dust generated from the use of roads and excavation activities would be minimized to the extent reasonable and practicable by minimizing vehicular traffic, application of dust suppressants on gravel roads, including Eureka County gravel access roads, and using prudent vehicle speeds.
- 5. To quantify the Project-specific impacts on grazing capacity, a production survey within the Project area would be conducted during the peak of the growing season as much of the area of the mine is of low grazing forage value and would not result in a measurable loss of actual AUMs. NVV would conduct the production survey both prior to construction and post-reclamation to assist the permittee, BLM and Eureka County in the quantification of any forage potentially lost as well as improvements in range productivity following reclamation.
- 6. NVV would develop a compensation agreement with the permittee and Eureka County to ensure no economic impact would occur either during operations or post closure. This compensation agreement would be based on the production survey within the fenced area precluded from grazing.

Best management practices (BMPs) would be used to limit erosion and reduce sediment in precipitation runoff from Project facilities and disturbed areas during construction, operations, and initial stages of reclamation. Specific BMPs would include, but would not be limited to the use of:

- 1. Erosion and sediment control structures such as diversions (e.g., runoff interceptor trenches, check dams, or swales), siltation or filter berms, filter or silt fences, filter strips, sediment barriers, and/or sediment basins;
- 2. Collection and conveyance structures, such as rock lined ditches and/or swales;
- 3. Vegetative soil stabilization practices such as seeding, mulching, and/or brush layering and matting;

- 4. Non-vegetative soil stabilization practices such as rock and gravel mulches, jute and/or synthetic netting;
- 5. Slope stabilization practices such as slope shaping, and the use of retaining structures and riprap; and
- 6. Infiltration systems such as infiltration trenches and/or basins.
- 7. Following construction activities, areas such as cut and fill slopes and embankments and growth media/cover stockpiles would be seeded as soon as practicable and safe.
- 8. Concurrent reclamation would be maximized to the extent practicable to accelerate revegetation of disturbed areas. All sediment and erosion control measures would be routinely inspected, and maintenance/repairs performed, as needed.

Additional specific erosion and sediment control protection measures Include:

- 1. The surfaces of the growth media stockpiles would be shaped after construction with overall slopes of 3H:1V to reduce erosion.
- 2. To further minimize wind and water erosion, the growth media stockpiles would be seeded after shaping with an interim seed mix developed in conjunction with the BLM.
- 3. Diversion channels and/or berms would be constructed around the growth media stockpiles, as needed, to prevent erosion from overland runoff.
- 4. BMPs such as straw wattles or staked straw bales would be used as necessary to contain sediment liberated from direct precipitation.

## 4.0 ENVIRONMENTAL CONSEQUENCES

The Project's primary issues related to rangeland and grazing resources include:

- Potential loss of active AUMs by allotment due to disturbance to range resources or losses due to reduced forage production
- Potential loss or impairment to existing range improvements and stock water sources

## 4.1 Effects Level Definitions

Effects on grazing resources are discussed in terms of intensity, duration, and context, based on the following definitions.

#### 4.1.1 Intensity

<u>Negligible:</u> Effects on livestock grazing would be slight and no reductions to AUMs or change in livestock management would be required.

<u>Minor:</u> Effects on livestock grazing would alter the availability of resources that livestock grazing depends on. Small reductions to AUMs may be necessitated. No adjustments to grazing management should be required.

<u>Moderate:</u> Effects on livestock grazing directly affect livestock access to limiting resources. Reductions to AUMs are necessary and adjustments to livestock grazing should be considered. Adverse effects would be minimized with implementation of Applicant-committed environmental protection measures and BMPs, but reclamation would require long-term monitoring and maintenance.

<u>Major:</u> Effects on livestock grazing management occur on a pasture or allotment level. Reductions in AUMs and a significant change in authorized use would be required. Adverse effects could be minimized with implementation of Applicant-committed environmental protection measures and BMPs, but reclamation would require long-term monitoring and maintenance.

#### 4.1.2 Duration

Short-term: Effects would last for the duration of the Project.

Long-term: Effects would last following Project reclamation.

Permanent: Effects on available forage for livestock would be permanent.

#### 4.1.3 Context

Localized: Effects would be limited to one site within one allotment.

Regional: Effects would occur throughout one or more allotments; multiple lessees may be affected.

## 4.2 Proposed Action

Proposed surface disturbance in the Project area consisting of mining infrastructure, communication, water pipelines, powerlines, exploration, and roads would total 806 acres of BLM-administered land. Refer to Supplemental Environmental Report 1 – Proposed Action and Project Alternatives (BLM 2021a), for further details of planned mine infrastructure. Project fencing would also preclude livestock grazing from 413 acres of undisturbed lands. All mine-related features would be reclaimed after the Project, with the exception of the pit. The pit accounts for 85 acres, which would result in 1.4 AUMs permanently lost after the life of the Project. Project-related disturbance and exclusion would result in temporary loss of 15.1 AUMs from the Fish Creek Ranch Allotment (**Table 3**) in the Fish Creek Valley South and Antelope Valley pastures. CFR 4110.4–2(a)(1) grants BLM the authority to modify grazing permits to reflect changes to areas of grazing use. Any reduction in permitted grazing would be done through a subsequent BLM decision based on livestock carrying capacity and resource conditions (per 43 CFR 4100.0-5), accounting for actual forage unavailable for grazing.

The Project would include direct removal of vegetation on 806 acres which would temporarily decrease available forage. Successful reclamation of surface disturbance likely result in enhanced rangeland condition relative to the pre-mining rangeland condition due to revegetation efforts. The reclaimed plant communities would be dominated by grasses and forbs, while shrubs slowly establish. The seeded grasses and forbs typically have higher forage production and palatability than the existing vegetation communities. Livestock grazing may be resumed after reestablished vegetation is capable of supporting grazing (approximately three to five growing seasons after final revegetation, depending on the vegetation). Increased presence of invasive and noxious species may occur after reclamation of Project disturbances, but NVV would implement a weed management plan to avoid and minimize those impacts. Therefore, direct impacts on grazing from surface disturbance are anticipated to be minor, long term (permanent for the 85 acres associated with the unreclaimed pit), and localized.

During construction it is likely that livestock would avoid the Project area. However, over time, they are likely to become accustomed to the mining activity and begin to reoccupy areas initially avoided. Direct effects on livestock may include limited direct mortalities from Project-related activities (e.g., vehicle collisions). However, fencing in the main Project area would preclude these impacts. The unfenced borrow would only be active for 6 months during daytime hours so direct mortality to livestock would be unlikely. Impacts on livestock are anticipated to be minor, short term, and localized.

Loss of key grazing areas that would necessitate major revisions in the grazing management approach for the remainder of the Fish Creek Ranch Allotment is not expected, given that there are no areas within the disturbance footprint where grazing resources are of notable quality or quantity compared to grazing resources that would remain undisturbed.

The Project would not affect spring or stream flows (see the Supplemental Environmental Report for Water Resources and Geochemistry [BLM 2021b]) or affect the supplemental watering locations in the grazing allotment.

Injury or mortalities of livestock would be minimized to the extent possible through the use of posted speed limits and the use of reduced speeds when road conditions are poor.

#### Table 3. Acres of Surface Disturbance and Loss of AUMs Under the Proposed Action

Pasture	Acres of Disturbance to BLM-Managed Land <sup>1,2</sup>	Reclaimed/ Reopened Acres	Acres Not Reclaimed	Stocking Rate	Temporary Loss of AUMs <sup>3</sup>	Permanent Loss of AUMs	Percent AUMs Temporarily Lost	Percent AUMs Permanently Lost
Fish Creek Valley South	1,043	1,040	3	72 acres/ AUM	14.4	0.1	2.4	0.02
Antelope Valley	127	45	82	62 acres/ AUM	0.7	1.3	0	0.05
Total	1,170	1,085	85		15.1	1.4	2.4	0.04

Source: BLM 2020b.

<sup>1</sup> Including 2.4 acres of existing Notice-Level disturbance and Project fencing exclusions.
 <sup>2</sup> Does not include 46 acres of exploration disturbance.
 <sup>3</sup> Additional 0.6 AUM would be temporarily lost in the Fish Creek Valley South pasture as a result of 38 acres in the South Access Road Alternative and 0.5 AUM would be permanently lost in the Fish Creek Valley South pasture as a result of 38 acres in the South Access Road Alternative and 0.5 AUM would be

## 4.3 South Access Road Alternative

Under South Access Road Alternative, the change in location of the access road would result in 38 additional acres of surface disturbance compared to the Proposed Action. The South Access Road Alternative would result in disturbance to 844 acres, plus the exclusion of 413 acres as a result of Project fencing, within the 289,292-acre Fish Creek Ranch Allotment. This would result in approximately 15.7 AUMs temporarily lost during the duration of the Project. The disturbance associated with the Project would be reclaimed following completion of mining operations with the exception of 85 acres in the Fish Creek Ranch Allotment associated with the pit, which would not be reclaimed. This would equate to approximately 1.4 AUMs permanently lost from the Fish Creek Ranch Allotment, or 0.04 percent of the total AUMs available within the allotment. Aside from the increased disturbance of 38 acres during the life of the Project, the effects under this alternative would be comparable to the Proposed Action. The Project would not impact spring or stream flows (see the Supplemental Environmental Report for Water Resources and Geochemistry [BLM 2021b]), nor would it impact the supplemental watering locations in the grazing allotment. Therefore, grazing impacts as a result of South Access Road Alternative are anticipated to be minor, long term, and localized.

#### 4.4 Renewable Energy Alternative

The Renewable Energy Alternative would result in 33 additional acres of permanent surface disturbance, compared to the Proposed Action. The Renewable Energy Alternative would result in disturbance to 839 acres, plus the exclusion of 413 acres as a result of Project fencing, within the 289,292-acre Fish Creek Ranch Allotment. This would result in approximately 15.6 AUMs temporarily lost during the duration of the Project. The disturbance associated with the Project would be reclaimed following completion of mining operations with the exception of 85 acres associated with the open pit and 33 acres associated with the solar PV field within the Fish Creek Ranch Allotment. This would equate to approximately 1.9 AUMs permanently lost from the Fish Creek Ranch Allotment. Aside from the increased disturbance of 33 acres during the life of the Project and left unreclaimed thereafter, the effects under this alternative would be comparable to the Proposed Action. The Project would not impact spring or stream flows (see the Supplemental Environmental Report for Water Resources and Geochemistry [BLM 2021b]), nor would it impact the supplemental watering locations in the grazing allotment. Therefore, grazing impacts as a result of the Renewable Energy Alternative are anticipated to be minor, long term, and localized.

## 4.5 No Action Alternative

Under the No Action Alternative, the Project would not be developed and associated impacts on grazing resources would not occur. Under the No Action Alternative, no new rights-of-way authorizations, pipelines, or roadways would be required.

## 5.0 CUMULATIVE IMPACTS

## 5.1 Introduction

The Cumulative Effects Study Area (CESA) for grazing resources is the Fish Creek Ranch Allotment, which includes the Project area (**Figure 3**). The CESA consists of 289,292 acres of BLM-managed land and 5,938 acres of a mixture of private and other public lands for a total of 295,230 acres. The CESA encompasses the extent of potential effects from activities associated with the Project and interrelated actions that may result in cumulative effects when combined with potential effects from past, present, and reasonably foreseeable future actions (RFFAs).

## 5.2 Past, Present, and Reasonably Foreseeable Future Actions

Within the CESA, past and present land uses include mineral development and exploration projects, oil and gas development, sand and gravel operations, utilities, including water, power, roads, and telecommunications rights-of-way; infrastructure and public purpose activities; dispersed recreation; wild horse use, and livestock grazing. **Table 4** details the RFFAs in the CESA. Of the 295,230 acres covered by the CESA, 60,946 acres of surface disturbance are associated with past, present, and RFFAs, which is a disturbance of approximately 21 percent of the CESA.

Oil and gas leases have the highest amount of acreage in approved authorizations. Mineral and gravel mining are the dominant land disturbances in the CESA. This precludes other land uses, such as grazing, recreation, habitat restoration, or development of other resources. These impacts typically are concentrated in local areas over long timespans. Reclamation plans focus on returning these land uses to the area after mine closure.

Public infrastructure, such as utilities and roads, often have long-term impacts on lands but facilitate other land uses. These can increase access for all other types of disturbances, while easements can limit the types of land use in the immediate area. Some types of infrastructure can prevent other land uses, such as for rangeland or recreation.

Rangeland management, wild horse management, and recreational land uses are other activities that can occur throughout the CESA. Other types of land uses may be compatible and even facilitate these activities (e.g., rural roads).

RFFAs in the CESA would include mineral development and exploration projects and utilities, infrastructure, and public purpose activities. Wildland fires in the CESA may occur in the future, as would restoration projects, livestock grazing, and dispersed recreation. These activities would have similar impacts as described for past and present actions.

Past, Present, and RFFAs, Disturbances and Projects	Acres			
CESA Acres (Fish Creek Ranch Allotment)	295,230			
Past Actions				
Mineral Development and Exploration	203			
Sand & Gravel	69			
Mining Notice	103			
Mining Exploration/Mine Plan	31			
Utilities and Infrastructure	15			
Power/Communications	12			
Water Pipelines/Infrastructure	2			
Other ROW	1			
Renewables Test Site	1,308			
Geothermal Lease & Development <sup>1</sup>	101			
Roads	12			
Oil & Gas Leases 1	22,859			
Past Actions Total	24,498			
Present Actions				
Mineral Development and Exploration	140			
Sand & Gravel	76			
Nevada Fluorspar/Tertiary Minerals - Mining Notice	4			
Allegiant Gold LTD - Mining Notice	4			
BH Minerals USA Inc - Mine Plan	56			
Utilities and Infrastructure	714			
Power/Communications	641			
Water Pipelines/Infrastructure	25			
ROW Other	48			
Oil & Gas Leases <sup>1</sup>	10,229			
Roads	211			
Present Actions Total	11,294			
Reasonably Foreseeable Future Actions				
Mineral Development and Exploration	161			
American Selco - Buck Mountain Gold - Mine Plan	11			
BH Minerals - Windfall - Mine Plan	150			
Utilities and Infrastructure	76			
Power/Communications	76			
Oil & Gas Leases	24,917			
Reasonably Foreseeable Future Actions Total	25,154			
Total	60,946			

#### Table 4. Past, Present, and RFFAs, Disturbances and Projects

<sup>1</sup> Assumed that 2% of past projects were developed.



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SER 5 – Grazing Management

## 5.3 Proposed Action

Cumulative effects on grazing resources primarily would be directly related to forage loss in either quality or quantity due to disturbance. The cattle and sheep that occur in the CESA would continue to graze in the Fish Creek Ranch Allotment, although use may be concentrated in other areas due to loss of grazing resource availability in the area of disturbance due to the Project.

The Project would result in a reduction of grazing resources on an additional 1,219 acres (0.41 percent of the CESA). Pending completion of successful reclamation, the incremental additional effects on grazing resources as a result of the Project would be mostly temporary in nature for the majority of the Project's disturbance area. The permanent loss of 85 acres of rangeland associated with the unreclaimed pit would be permanently lost from the CESA. This would result in approximately 15.1 AUMs temporarily lost during the duration of the Project and 1.4 AUMs permanently lost. The reclaimed areas would be capable of supporting grazing use; however, densities and distribution of grazing resources may change in the long term but are anticipated to be minor and localized.

The Project is not anticipated to affect the amount and extent of available surface water (e.g., seeps and springs) in the Project vicinity or associated wetland habitat for livestock within the CESA.

## 5.4 South Access Road Alternative

Under the South Access Road Alternative, the change in location of the access road would result in 38 additional acres of new surface disturbance compared to the Proposed Action. The South Access Road Alternative would result in 1,257 acres of rangeland that would be unavailable for livestock grazing, or 0.43 percent of the 295,230-acre CESA. This reduction of rangeland available for livestock grazing would result in the short-term loss of approximately 15.7 AUMs during the duration of the Project and long-term loss of 1.4 AUMs. The disturbance associated with the Project would be reclaimed following completion of mining operations with the exception of 85 acres associated with the unreclaimed pit. Aside from the increased surface disturbance acreage, the cumulative effects in the CESA under this alternative would be comparable to the Proposed Action. Therefore, cumulative grazing impacts as a result of South Access Road Alternative are anticipated to be minor, long term, and localized.

## 5.5 Renewable Energy Alternative

Under the Renewable Energy Alternative, the construction of the solar field would result in 33 additional acres of permanent surface disturbance compared to the Proposed Action. The Renewable Energy Alternative would result in disturbance to 839 acres, plus the exclusion of 413 acres as a result of Project fencing, for a total of 1,252 acres of rangeland that would be unavailable for livestock grazing, or 0.43 percent of the 295,230-acre CESA. This reduction of rangeland available for livestock grazing would result in the short-term loss of approximately 15.6 AUMs during the duration of the Project and long-term loss of 1.9 AUMs. The disturbance associated with the Project would be reclaimed following completion of mining operations with the exception of 85 acres associated with the unreclaimed pit and 33 acres associated with the solar field. Aside from the increased surface disturbance acreage, the cumulative effects in the CESA under this alternative would be comparable to the Proposed Action. Therefore, cumulative grazing impacts as a result of the Renewable Energy Alternative are anticipated to be minor, long term, and localized.

## 5.6 No Action Alternative

Under the No Action Alternative, the Project would not be constructed, and past, present, and RFFAs would continue in the CESA. As a result, there would be no potential for the Project to contribute to cumulative impacts on grazing resources. Cattle and sheep and the Fish Creek Ranch Allotment would continue to be managed as they currently are. Cumulative impacts on grazing resources under the No Action Alternative would be less than those under the Proposed Action but would still be anticipated to be negligible, long term, and localized.

## 6.0 RESIDUAL IMPACTS

Residual effects on grazing resources under the Proposed Action would include the permanent loss of 85 acres of the Fish Creek Ranch Allotment due to the unreclaimed pit. In areas that would be disturbed by the Project but later reclaimed, the loss of shrub-dominated communities within the Fish Creek Ranch Allotment would represent a long-term change in vegetation community composition (i.e., shrub-dominated communities to grass/forb dominated communities) because it would take approximately 25 years for mature shrubs to become re-established in these communities, though this would likely benefit livestock which prefer herbaceous forage.

Any reduction in permitted grazing would be done through a subsequent BLM decision based on livestock carrying capacity and resource conditions (per 43 CFR 4100.0-5), accounting for actual forage unavailable for grazing.

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## 7.0 REFERENCES

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