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Department of  
Agriculture

Forest  
Service

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# **DRAFT Environmental Assessment**

## **Kilgore Gold Exploration**

**Dubois Ranger District, Caribou-Targhee National Forest  
Clark County, Idaho**

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# INTRODUCTION

## Background

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The U.S. Forest Service (FS) received a proposed plan of operations on July 22, 2020 from the Otis Capital USA Corp. (Otis), a wholly owned subsidiary of Excellon Resources Inc., to conduct mineral exploration drilling in the Dubois Ranger District of the Caribou-Targhee National Forest. Exploration activities would occur within Sections 17–21 and 28–30 of Township 13 North, Range 38 East (Boise Meridian), in Clark County, Idaho. This project is for mineral exploration drilling only.

The 2020 proposed plan of operations replaces a previous plan of operations that was analyzed with an environmental assessment (EA) for which the Final Decision Notice and Finding of No Significant Impact for the Kilgore Project (DN-FONSI) was issued on August 20, 2018. That plan was subsequently approved September 9, 2019 and mineral exploration commenced on October 12, 2019. Otis completed some drilling and road construction in the fall of 2019, but then the final DN-FONSI was appealed and ultimately vacated by a U.S. District Court Judge on May 4, 2020. In order for Otis to continue exploration drilling as previously planned, they submitted a new proposal for which the FS is conducting a new environmental review pursuant to the National Environmental Policy Act (NEPA).

The changes between the plan of operations approved in 2019 and the new plan are summarized as follows:

- Exploration drilling conducted under the previously approved plan of operations in the fall of 2019 resulted in the construction of ten drill sites and completion of eleven drill holes in the Mine Ridge and Prospect Ridge target areas. Thus the new proposal is for the construction of 130 drill stations rather than the original 140 stations.
- Under the 2019 approved plan, Otis constructed 1,876 feet of road. Using the road categories described in this and the 2018 EA, this results in 1,876 feet more of Existing Roads and 1,876 feet less of Proposed Roads than in the previously approved plan. The Total Road Length (70,977 feet) is the same in both plans.
- A new drafting site has been proposed for the Dog Bone Ridge target area. Previously, water for drilling at Dog Bone Ridge would have been supplied from Corral Creek. The current proposal identifies an alternate off-forest water drafting site on Beaver Creek.

The project area has been one of interest to numerous operators and companies over the years. Underground gold mining occurred in the area as early as the 1930s with modern mineral exploration beginning in earnest in the early 1980s. Otis began their exploration drilling program in 2008 and the proposed drilling plan is intended to allow further assessment of mineral deposits for grade, tonnage, and extent.

## Purpose and Need for Action ---

The purpose of and need for this analysis is to consider a proposal for exploration drilling, submitted to the Dubois Ranger District pursuant to 36 CFR 228A, on National Forest System (NFS) lands within the Kilgore Gold Exploration project area. The statutory right of Otis to explore mineral resources on federally administered lands open to mineral entry is recognized by the General Mining Law of 1872 and is consistent with the 1997 Targhee National Forest Revised Forest Plan (RFP; III-9 and III-139 to III-142).

## Public Involvement ---

This draft EA is being released to the public as part of the scoping and 30-day opportunity to comment period. A legal notice announcing the start of the 30-day period has been published concurrently in the newspaper of record, the Post Register. The draft EA is being sent to the Shoshone-Bannock Tribes, and to multiple individuals and groups who previously requested this information. The project was listed on the Schedule of Proposed Actions on January 1, 2021 and made available on the Caribou-Targhee National Forest's project website on October 26, 2020.

## Decision Framework

Given the purpose and need, the deciding official will review the proposed action and the other alternatives in order to make the following decisions:

- Whether or not to approve Otis's plan of operations as submitted; or
- Approve the plan with additional project design features; or
- Whether an environmental impact statement (EIS) is needed.

Selection of the proposed action would not constitute approval of the proponent's plan of operations. Plan approval would be contingent upon the proponent's acceptance of the project design features developed to minimize effects of the operation on surface resources (as described in Appendix A of this document). A full reclamation bond sufficient for this project was remitted to the Dubois Ranger District as part of the 2019 plan of operations approval. Although a decision commensurate with this analysis would support plan approval, it is a separate action regulated under FS minerals regulations at 36 CFR 228 Subpart A.

Should Otis intend to conduct additional activities that are beyond the scope of this document, a plan of operations supplement or modification would be required which would be subject to additional review and approval.

## Forest Plan Direction

This analysis tiers to the 1997 RFP, which provides guidance and direction for forest management decisions and allocates uses across forest landscapes. The RFP was developed from an interdisciplinary process with public and community involvement and uses

prescription areas to apportion uses and emphasize resource priorities. Specific forest-wide plan direction for resources and uses and management prescription area direction relative to the proposed action are discussed below. Discussion of the effects of this guidance on specific resource areas and uses is discussed in Chapter 3 of the RFP. The management prescription applicable for the project area is 5.1.4 (b), Timber Management (Big Game Security Emphasis).

The RFP provides standards and guidelines for minerals (III-9), stating that “The Forest is open to exploration and development and production of locatable, leasable, and mineral material resources unless otherwise specified in the management prescriptions.” Consistency with applicable standards and guides for each resource is included in individual specialist reports, which are included in the project record.

## Issues

Information from internal scoping, as well as relevant public comments received on the 2018 EA, was considered in developing this draft EA. Issues that were analyzed in depth are effects to surface water; groundwater; and threatened, endangered, and sensitive plants and wildlife. Heritage resources and climate change are included in the “Other Resources Considered” section.

### *Surface Water*

Ground disturbing activities associated with the proposed mineral exploration, if not properly designed, have the potential to degrade water quality by delivering excessive sediment or other pollutants to streams.

### *Groundwater*

Drilling activities have the potential to alter groundwater quality as the exploration drill holes could periodically encounter groundwater.

### *Threatened, Endangered and Sensitive Plants*

Proposed road placement and construction have the potential to impact threatened, endangered, proposed, and sensitive plant species and their habitat. Road construction could impact whitebark pine individuals in or adjacent to the proposed road location.

### *Wildlife*

Ground disturbing activities such as road construction and exploration drilling have the potential to impact wildlife species and habitat. New roads could cause direct mortality of individuals and/or contribute to habitat loss or fragmentation. Increased human activity and noise from the project could displace wildlife.

## ALTERNATIVES

The No Action and Proposed Action alternatives were considered for this analysis. The Proposed Action evaluates FS approval of the Otis gold exploration project as presented in their 2020 plan of operations, conditional upon agreement to specific design features, appropriate reclamation, and remittance of a reclamation bond. The analysis conducted for this EA is intended to aid in determining measures needed to minimize project impacts to the extent practicable.

### No Action ---

Under the No Action alternative, the FS would not authorize Otis's proposed mineral exploration project. The previously authorized surface disturbance in the project area would be reclaimed. The No Action alternative violates the operator's statutory right to conduct mineral exploration on lands open to such activities under the General Mining Law of 1872. It is not within the discretion of the authorized officer to take no action on a plan of operations for purposes reasonably incident to the prospecting, mining, or processing of locatable minerals (36 CFR 228.5). There is no requirement for the FS to include a no action alternative in an EA (FSH 1909.15). However, for this analysis it is provided as a basis for comparison with the action alternative. The No Action alternative for this project is simply the existing condition of the project area. Ongoing and permitted uses on NFS lands would continue within the project area.

### Proposed Action (Action Alternative) ---

The Proposed Action is FS authorization of the Kilgore Gold Exploration project as described in the plan of operations submitted by Otis on July 22, 2020 with the inclusion of additional design features to minimize potential impacts to surface resources.

Mineral exploration is proposed to occur within Otis's unpatented mining claims located on NFS lands. Drilling would occur in the Mine Ridge, Gold Ridge, Prospect Ridge, and Dog Bone Ridge target areas as identified by Otis (Figure 1). All drilling stations would be located within new and previously authorized (i.e., existing) roads (Figure 2). It is anticipated that the drilling program will last between 3 and 5 years. Project activities would commence annually on July 15. Demobilization and seasonal stabilization would be completed the following November, unless weather (and prior FS authorization) allows drilling to continue until December 15. All project disturbance, including roads, would be reclaimed by the end of this project, unless Otis formally requests a timing extension or submits a new plan of operations to the FS for review before the approved plan of operations expires.

#### *Equipment and Personnel*

Drilling will include the use of a core rig and a reverse circulation rig and conducted as two 12-hour shifts, 24 hours per day. There may be up to three drill rigs operating at one time in the project area. Equipment for project construction and reclamation activities may include a

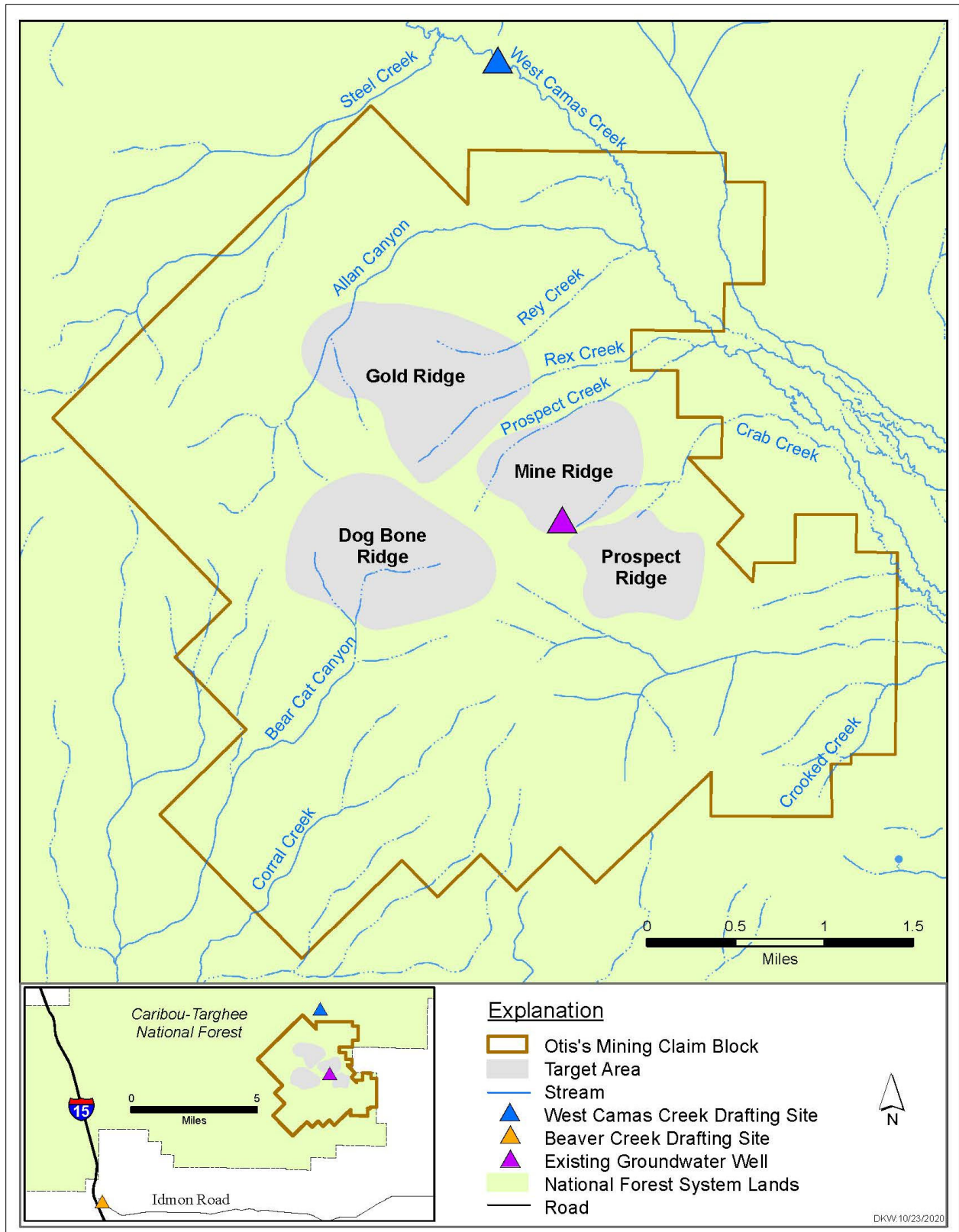


Figure 1. Project target areas and water withdrawal sites.



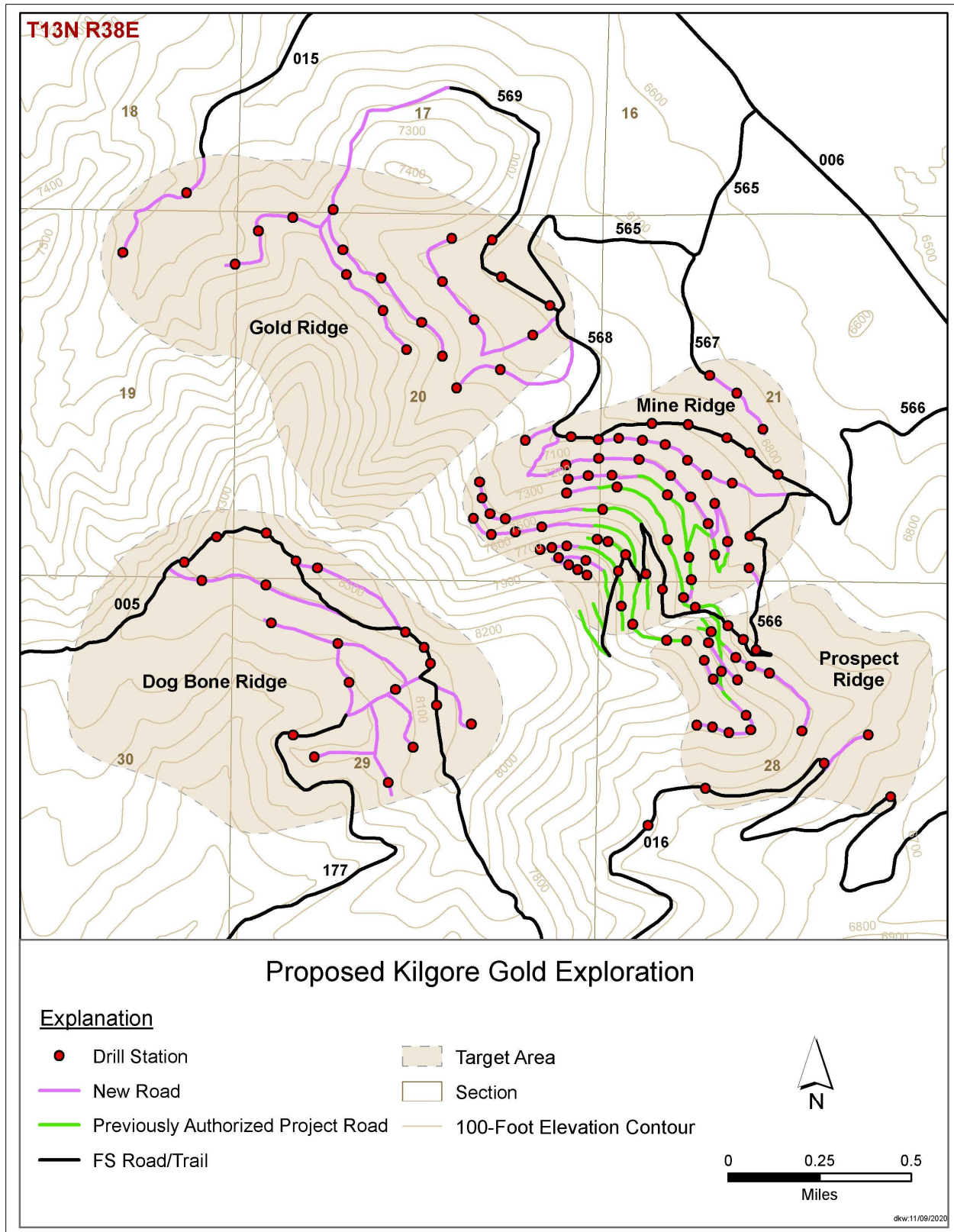


Figure 2. Proposed road and drill station locations.



hydraulic excavator, a bulldozer, and skidsteers. Support equipment could include power packs for the drill core rig, rod storage trailers, water trucks, water pumps, pickups for hauling fuel and/or water, small service trucks, ATVs, forklifts, and other similar equipment. Equipment would be initially transported to the site using a lowboy and/or gooseneck trailer.

Generally four people are required for each drill rig crew. Road construction personnel, site geologists, and other support staff would also be on site as needed. There may be five to ten people besides the drill crews on site at any given time performing these various duties. It is anticipated that some project personnel may camp onsite in RVs or tents at locations within the mining claims. Project personnel camping on site during drilling operations will not be subject to stay limits, but otherwise must follow the same rules as the general public for dispersed camping. Past practice indicates that most personnel will drive/carpool daily to the project site.

Occupancy and Use Order #04-15-117 (food storage order) applies to the Ashton-Island Park District and portions of the Dubois and Teton Basin Districts on the Caribou-Targhee National Forest annually from March 1 to December 1. This project is located on the Dubois District in the food storage order area. Project personnel working and camping in the project area would need to abide by the food storage order, which is detailed in Appendix A.

#### *Regulated/Hazardous Material Handling Plan*

Otis's proposed plan of operations includes a hazardous material handling plan describing the measures that would be implemented to prevent spills of material and to identify the safe, effective, and timely actions that would be taken should a spill occur.

No large volumes of lubricants/oils or fuel would be stored in the project area.

Lubricants/oils are generally brought to the site in 5-gallon containers which are stored in plastic storage bins as secondary containment to minimize the potential for spills. Some products may be stored at the site in 55-gallon drums. Where applicable and appropriate, material transported would use overpack containers to minimize the risk of spillage.

Fuel would be purchased off site and delivered daily to the various pieces of equipment. Fuel would be transported to the site using a pick-up truck mounted with a slip-tank with a capacity of approximately 100 gallons and then transferred directly from the slip-tank to the piece of equipment. Operators will monitor refueling at all times and sorbent pads will be placed around tanks being refueled to catch spills should they occur. Spill remediation kits will be available at each staging area, active drill station, and in vehicles transporting fuels and lubricants.

#### *Drill Stations and Proposed Holes*

Drill stations, which include the drill pad and sump, would be constructed within new or existing road prisms (Figure 2). Drill pads would be leveled for a distance of 50 feet and occupy the width of the road. Sumps would also be included in the width of the road. They would be excavated, and that material used to construct a berm adjacent to the sump. Sumps would be located on the uphill side of the road whenever possible. Sumps are approximately

15 feet long by 6 feet wide by 8 feet deep on average and would be reclaimed at the completion of drilling at the respective stations.

Ten of the 140 drill sites previously approved under the 2019 plan of operations were drilled in the fall of 2019. The current proposed action includes drilling at the remaining 130 drill stations. A maximum of three vertical and/or angle holes may be drilled at each of these stations. The average hole depth is anticipated to be approximately 1,300 feet; however, the actual depth and angle would be dependent on drilling results. The locations of drill stations are based on existing knowledge of the geology including past and current exploration information. The actual location of constructed or reopened roads and drill stations may be field-adjusted or eliminated based on drill results, geology, or sensitive resources. Drilling would be accomplished in phases and the particular sequence of drilling needs to remain flexible. Significant variations in drill station locations that would require relocating a portion of the road would not occur without FS approval.

Drilling would start at the drill stations which represent a wider drill spacing. If the holes are successful, step-in (i.e., infill) drilling would be completed. The proposed drill stations are located based on an overall drill program with assumed successful assay results.

Drill holes will be plugged concurrently with drilling as soon as the data collection at each drill hole is complete. In most cases this will occur before the drill rig leaves that site. The State of Idaho does not have regulations specific to the abandonment of mineral exploration drill holes. Therefore, if the elevation of the bottom of the borehole is higher than the pre-existing natural elevation of the uppermost saturated groundwater stratum (i.e., dry exploration hole), the borehole will be backfilled with uncontaminated native soil and the upper 20 feet of each hole plugged with concrete grout, cement grout, or neat cement. Holes which encounter groundwater must be backfilled the entire length with swelling bentonite clay to prevent possible cross-contamination of aquifers, and the upper 20 feet plugged with concrete grout, cement grout, or neat cement. For all holes, an aluminum drill hole identifier will be indelibly inscribed and placed on the cement cap of each hole.

Otis has proposed to retain up to five drill holes for the purposes of hydrological characterization. These holes would be selected to be representative of specific groundwater conditions. Multiple drawdown tests would be performed during different seasons, requiring the holes to be open for one full year (two drilling seasons) to ensure all seasons are captured. Water quality would be sampled as part of the pump tests. Hole depths would be expected to be less than 1,000 feet and would be cased for the first few feet. The holes will be secured by the use of locking caps.

#### *Drill Water*

The primary water source for the project would be the existing on-site groundwater well. Supplemental water needed to support drilling operations would be obtained from West Camas Creek and Beaver Creek (Figure 1). Otis would be required to obtain temporary water appropriations permits on an annual basis from the State of Idaho for all three locations. Typically, such appropriations are for 5 acre-feet per year and at a diversion rate of 0.04

cubic feet per second (18 gallons per minute) from each source. Water drafted from these streams would be transported by water truck to a central storage tank. It would then be pumped to a smaller storage tank or gravity fed to the drill stations. Beaver Creek, located off NFS lands, would be used to provide water for drilling at Dog Bone Ridge. West Camas and the groundwater well, both located on the NFS lands, would provide water for drilling at Gold Ridge, Mine Ridge, and Prospect Ridge.

### *Project Access*

Primary access to the project area would be via existing FS system roads including FS Roads 15, 16, 177, 565, 566, 568, and 569, and motorized FS Trail 005 (Figure 2). Access to Trail 005 may be closed during drilling operations to ensure public safety. Otis would coordinate directly with the District Ranger to schedule drilling activities on Trail 005 to minimize potential impacts to trail users. Trail disturbance would include minimal widening for drill pads and potential clearing to allow for equipment passage. Clearing would be minimized to maintain the character of the trail. Documentation of the number of trips and/or other required information would be provided as directed by the FS. Existing gates on FS administrative roads would remain closed during any project activities. Otis would obtain a key from the FS for access on such roads.

### *Project Roads*

All surface disturbance associated with this project is due to road construction; all drill stations would be located within roads. All roads have a 20-foot wide corridor, which includes the running surface and cut/fill, unless specified otherwise. Project roads fit into one of the two following categories:

- Previously Authorized Project Roads. These are roads that were approved by the FS for recent drilling operations conducted by Otis and for which the FS still holds the associated reclamation bond. (These roads have not been reclaimed because Otis has proposed them for use as part of their proposed plan currently under analysis.)
- New Roads. This category includes roads that would require earthwork to establish a road prism. This category also includes roads that have an existing road prism on the ground but would require some brushing and/or blading for project equipment access. The cut/fill disturbance for these roads would have occurred when the road was first constructed, so only the existing 12-foot running width of the road corridor is considered. Although the level of disturbance associated with these roads is expected to be less than that for new construction, they are included in this category for the purpose of disclosing potential resource impacts. It is estimated that roads that require only brushing/blading make up 20 percent of the New Roads category.

The total area associated with previously authorized project roads and new roads for this project is approximately 30 acres. The total new surface disturbance expected to result from the proposed action is 22 acres (Table 1).

Table 1. Summary of road disturbance for the project by category.

Road Category	Length (feet)	Width (feet)	Area	
			Square Feet	Acres
Previously Authorized Project Roads (prior to 2019)	15,044	20	300,880	6.9
Previously Authorized Project Roads (constructed in 2019)	1,876	20	37,520	0.9
<b>Previously Authorized Project Roads, Total</b>	<b>16,920</b>	<b>-</b>	<b>338,400</b>	<b>7.8</b>
New Roads, Brushing/Blading	10,811	12	129,732	3.0
New Roads, Earthwork	41,370	20	827,400	19.0
<b>New Roads, Total (New Surface) Disturbance)</b>	<b>54,057</b>	<b>-</b>	<b>957,132</b>	<b>22.0</b>

Project roads would be utilized for the storage of materials and equipment for ready access (i.e., laydown areas). Gates and berms would be used to limit public access to roads as determined by the FS.

New road construction would utilize favorable topography or locations where road prisms exist on the ground and require only minimal brushing/blading for project equipment access. In addition, roads would be constructed to the following standards:

- Grades would be 8 percent or less where practical, 8–12 percent for short sections +/- 15 feet as topography necessitates, and no greater than 12 percent unless approved by the FS.
- Rolling dips would be constructed where designated or approved by the FS to facilitate surface drainage.
- Where berms are constructed for equipment safety, the FS will designate the spacing and/or placement of cutouts for drainage.
- Sag vertical curves would be out sloped, unless deemed unsafe due to topography, and approved by the FS.
- Cut slopes would be no steeper than 1:1 and fill slopes no steeper than 1.3:1 based on soil types unless approved by the FS.
- Seasonal stabilization of new road disturbance would occur at the end of each drilling season.

#### *Road Reclamation*

There are two types of reclamation associated with the proposed project. Seasonal reclamation is that which is done to stabilize and protect surface resources in the short term. An example would be a road that is constructed in the fall but will still be needed for access

to drill sites the following year. Seasonal reclamation of that road may include seeding the road with FS-approved native and sterile grass species.

Final reclamation would be required when a road is no longer needed for drilling or for access to other drill sites during this project. Reclamation of new roads (i.e., roads that did not previously have an existing road prism) would require full obliteration to match pre-existing topography. Reclamation required for roads with a previously existing road prism (but requiring some brushing and/or blading) and previously authorized project roads would be determined by the FS on a case-by-case basis. A site evaluation would be conducted to assess the extent and condition of existing vegetation, and any evidence of soil compaction and erosion. Seeding would be in accordance with rates and types prescribed by the forest botanist. All road reclamation would require slash and woody debris available on site to be scattered across the reclaimed slope to support stability, wildlife habitat, and long-term organic matter addition to the surface.

Both seasonal and final reclamation must be evaluated by the FS on a case-by-case basis to determine the most appropriate method for entrance closure. If weather precludes such evaluation by the FS, Otis should assume seasonal entrance closure is required. Methods may include constructing a berm at the road entrance, recontouring the initial section of the road, or using rock and/or woody debris to close the route.

All disturbance must be fully reclaimed at the end of the project unless Otis formally requests a timing extension or submits a new plan of operations to the FS for review before the approved plan of operations expires. Otis must notify the FS prior to any road reclamation/closure activities.

Otis must routinely monitor the project area, including the status of reclaimed areas, at least twice annually. This should occur in early summer to identify and address any issues that may have occurred during the winter, and in early fall to ensure access control/restrictions are working as designed.

### *Facilities*

No permanent on-site facilities are proposed for this project. Enclosed equipment trailers may be used by the drill contractor to store tools and supplies to conduct equipment repairs. A portable shed, already onsite, would be used to protect the groundwater well head, generator, and pump year-round. RVs and/or tents may be used for onsite camping by project personnel. Sanitary commodes sufficient for the number of personnel routinely present would be on site at all times. The units would be moved as needed to provide toilet facilities to employees and contractors. The contractor services the units regularly; all effluents are pumped into portable tanks and trucked to local waste disposal facilities. Units would be removed at the end of each operating season.

### *Bonding*

The FS currently holds a reclamation bond from Otis for the proposed plan of operations which, as previously explained was approved and partially implemented in 2019. The bond

instrument currently in place is deemed sufficient to cover costs related to the existing road disturbance and abandonment of the on-site groundwater well. Regardless of the FS decision issued for this EA, the FS has financial assurance that the surface disturbance for all of Otis's approved exploration activities to date will be complete.

## Development of Project Design Features

Internal and public comments received on the 2018 EA and during the preparation of this EA were used to develop additional project design features, or required best management practices (BMPs), intended to reduce or eliminate potential impacts from the proposed action. These features, which are incorporated into the proposed action, are included in Appendix A of this document. Required monitoring and reporting are described in Appendices B and C.

## Potentially Affected Environment

The potentially affected environment for both alternatives includes the ongoing and/or reasonably foreseeable effects from other projects within the analysis area<sup>1</sup>.

The Dubois District Ranger issued a project initiation letter September 24, 2020 for the Porcupine Lookout Vegetation Project. This project could result in up to 4,000 acres of surface disturbance related to the harvest of forested stands. Most of this would be the logging of merchantable timber, with a small percentage of forested stands being treated by activities such as noncommercial thinning, piling, pile burning, chopping, and mastication.

The Porcupine Lookout Vegetation Project would overlap with the Kilgore Gold Exploration project. There are two small harvest areas totaling 60 acres within the Dog Bone Ridge target area. Harvest activities associated with the Porcupine project would occur as early as 2023. Kilgore exploration drilling could occur between 2021 and 2025.

No other land management activities are currently ongoing or planned for the foreseeable future that would spatially or temporally overlap the project area. The potentially affected environment would not be expected to change with respect to the level of recreational activities such as camping and hunting currently occurring. Forest management actions, including minor road maintenance and noxious weed treatment, are expected to continue at present levels.

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<sup>1</sup> On July 16, 2020, the Council on Environmental Quality (CEQ) published the final *Update to the Regulations Implementing the Procedural Provisions of the National Environmental Policy Act*, which became effective September 14, 2020 (85 FR 43304). CEQ's revised regulations eliminate the use of the term cumulative impacts. In place of conducting a cumulative impact analysis, all ongoing and reasonably foreseeable future effects within an analysis area not caused by the proposed action are to be considered in the environmental baseline as the "potentially affected environment".

## ENVIRONMENTAL CONSEQUENCES

Resource specialist reports were prepared to analyze the effects of the proposed action. Information from these reports for surface water; groundwater; and threatened, endangered, and sensitive plants and wildlife are discussed in the following sections. Specialist reports for fisheries, range, recreation, and soils are not summarized in this EA because effects to these resources were determined to be negligible as described in the specialist reports. Specialist reports for all resources are available for review in the project record.

Unless specifically stated otherwise, the project record (40 CFR 1501.12) is incorporated by reference and contains the detailed data, methodologies, analyses, references, and other technical documentation used in the assessment. A reference section for citations used in the specialist reports summarized here has not been included in this EA; interested readers should reference the original specialist reports in the project record.

### Surface Water

#### ***Spatial and Temporal Context for Effects Analysis***

The project area is located within two Targhee principal watersheds (TPWs); TPW 025—Camas Creek and TPW 026B—Beaver Creek (east), and three sixth-level hydrologic unit codes (HUCs). Hydrologic disturbance is evaluated at the TPW and subwatershed scales. The Beaver Creek drafting site is also addressed. The analysis considers relevant past and present activities (i.e., within the last 30 years) and foreseeable future activities.

#### ***Existing Conditions***

The Idaho Department of Environmental Quality (IDEQ) identifies surface water beneficial uses and the water quality standards necessary to support those uses (IDEQ 2020a). The beneficial uses of streams relevant to the proposed action are listed in Table 2. Through a memorandum of understanding (MOU) with the IDEQ, the forest is responsible for implementing nonpoint source pollution controls (i.e., BMPs) to protect State water quality on NFS lands (USDA FS 2020).

*Table 2. Beneficial uses of streams relevant to the proposed action (IDEQ 2020a).*

<b>Streams</b>	<b>Beneficial Uses</b>
Allen, McGarry, and Bear Cat Canyon and Crooked/Crab, West Camas, Corral, and East Rattlesnake Creeks along with all other unnamed streams	Coldwater Aquatic Life, Primary Contact Recreation, Agricultural and Industrial Water Supply, Wildlife Habitats, and Aesthetics; Protected for all recreational uses and the propagation of fish, shellfish, and wildlife, wherever attainable
Beaver Creek (drafting site)	Coldwater Aquatic Life, Salmonid Spawning, Primary Contact Recreation, Domestic, Agricultural and Industrial Water Supply, Wildlife Habitats, and Aesthetics



Otis has collected water quality data for all project area streams. This data set provides reasonable baseline information regarding water quality.

The federal Clean Water Act (CWA) requires states to report on the quality of their surface waters and to identify and prioritize those waters that are impaired (i.e., on the Section 303(d) list) and need a total maximum daily load (TMDL). A TMDL is a water quality improvement plan that defines a pollutant budget or target with the goal of restoring water quality and beneficial uses.

The IDEQ (2020b) has identified all the water quality assessment units in the project area as not supporting the beneficial uses of coldwater aquatic life and salmonid spawning due to sediment, water temperature, or biota/habitat assessments. The water drafting sites on Beaver Creek and West Camas Creek are also not supporting secondary contact recreation due to *E. coli*. Increased water temperatures are attributed to streambank erosion, reduced riparian vegetation, and low flow conditions (IDEQ 2005). IDEQ (2005) identified riparian grazing as the principal source of temperature and sediment impairments. Table 3 lists the assessment units and streams, and whether they have an approved TMDL or if they have been designated as impaired (on the 303(d) list) but do not yet have a TMDL.

*Table 3. Streams in the project area and TMDL status (IDEQ 2020b).*

<b>Assessment Unit and Relevant Stream(s)</b>	<b>Beneficial Use Support</b>	<b>Approved/Needed TMDLs</b>
ID17040214SK018_04: Beaver Creek	<ul style="list-style-type: none"> <li>• Not supporting coldwater aquatic life and salmonid spawning (temperature) or secondary contact recreation (<i>E. coli</i>)</li> </ul>	<ul style="list-style-type: none"> <li>• Approved TMDL for temperature</li> <li>• Section 303(d) listed—bacteria TMDL needed</li> </ul>
ID17040214SK013_03: West Camas Creek		
ID17040214SK013_02: West Camas tributaries – Allen Canyon, Rey, Rex, and Prospect Creeks	<ul style="list-style-type: none"> <li>• Not supporting coldwater aquatic life (sediment and temperature) and salmonid spawning (sediment)</li> </ul>	<ul style="list-style-type: none"> <li>• Approved TMDL for temperature</li> <li>• Section 303(d) listed—sediment TMDL needed</li> </ul>
ID17040214SK008_02: Crooked/Crab Creek – McGarry Canyon, Crooked and Crab Creeks and unnamed tributaries	<ul style="list-style-type: none"> <li>• Presumed supporting secondary contact recreation</li> <li>• Not supporting coldwater aquatic life and salmonid spawning (biota/habitat assessments)</li> </ul>	<ul style="list-style-type: none"> <li>• Section 303(d) listed—TMDL needed due to combined biota/habitat bioassessments</li> </ul>
ID17040214SK016_02: Rattlesnake tributaries – Bear Cat Canyon, Spring, and Corral Creeks		

The 1997 RFP contains management direction for the Aquatic Influence Zone (AIZ) management prescription. AIZs are areas that control the hydrologic, geomorphic, and ecological processes that shape lakes, ponds, streams, and wetlands and that directly affect aquatic life. This management prescription is defined on the ground using boundary widths

which may vary by water type and geographic characteristics. There are several AIZs in the project area. AIZ widths for perennial fish bearing streams are 200 feet, each side. This includes Allen, McGarry, West Camas, Corral, and Beaver creeks. Non-fish bearing perennial and intermittent streams, reservoirs, ponds, and wetlands in the project area have AIZ widths of 75 feet each side. This includes Rey, Rex, Prospect, Crab, and Bear Cat Canyon creeks.

## ***Environmental Consequences***

### **No Action Alternative**

This alternative would not directly change existing watershed conditions, water quality, or hydrologic disturbance. Watershed conditions would continue to function properly. The 3.2 miles (approximately 8 acres) of previously authorized road in the project area would be reclaimed. Water quality would continue to slowly improve as past disturbances recover and improved management practices result in better riparian and stream conditions. Hydrologic disturbance would continue to decrease as past hydrologic disturbances recover.

### **Proposed Action Alternative**

Construction of approximately 10.2 miles of new road associated with the proposed action would result in an estimated 22 acres of watershed disturbance. Roads can affect watershed processes and conditions through decreased infiltration, increased runoff, and erosion/sediment production. Long-term watershed integrity would be protected with the inclusion of recommended design features and as concurrent reclamation occurs during the project and final reclamation at project conclusion. As a result, the proposed action would result in negligible changes to watershed conditions, water quality, and hydrologic disturbance.

### ***Water Quality***

Water quality may be slightly affected in the short term by sediment delivery to stream channels from new roads during precipitation and runoff events. The proposed action incorporates BMPs as project design features, detailed in Appendix A of this EA, to minimize those impacts to watershed processes and water quality. Proper implementation of BMPs is expected to protect overall water quality in perennial stream channels downstream of the project area. Additional measures outlined in Appendix B and C require continued monitoring of local streams for water quality.

The Idaho antidegradation policy states that the existing in-stream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected (IDEQ 2020a). It is also FS policy to maintain or improve water quality (1997 RFP and FSM 2520.3). The IDEQ recognizes BMPs as an effective tool for protecting water quality. As per the MOU with the IDEQ (USDA FS 2020), the FS must ensure that BMPs are properly implemented. BMPs to protect water quality are included in the project design.

The temperature TMDL (IDEQ 2005) applies to Beaver Creek, West Camas Creek, and the West Camas Creek tributaries (Table 3). For these streams, the FS must implement BMPs that protect streamside vegetation. The target values are based on the percentage of effective shade at potential natural vegetation (PNV). Natural stream width, channel type, and riparian community are important factors to evaluate when determining the effective shade potential. The proposed action includes BMPs to minimize activities in the AIZ and thereby protect stream vegetation.

Water temperature in Beaver and West Camas Creek is not expected to be impacted as water drafting will be minimal and sporadic. No measurable changes to stream discharge rates and water temperature are expected.

For 303(d) listed streams (Table 3), the FS must protect water quality through BMPs. The greatest potential for sediment inputs and biota/habitat alterations come from road use and construction and exploration drilling. The proposed action includes BMPs to minimize impacts from these activities. Bacteria pollution (e.g., *E. coli*) is often associated with animal or human waste. Worker sanitation BMPs are included in the project. The project is not anticipated to contribute to bacterial pollution that would affect water quality.

Approximately 0.5 miles of new road would be in AIZs. Most of this would be in AIZs of the intermittent streams Rey, Rex, Prospect, and Bear Cat Canyon creeks. The Allen Canyon AIZ is the only perennial AIZ where new road construction would occur, and it would be on an existing road prism so as to minimize impacts. During project activities, sediment delivery to stream channels would be minimized through the use of BMPs. The BMPs will also protect streamside vegetation in a manner that protects water temperature. Intermittent streams are not as likely to affect downstream water temperatures because they only flow during spring runoff when high water temperatures are typically not a concern.

#### *Hydrologic Disturbance*

The proposed action would result in the surface disturbance of approximately 22 acres. This amount of hydrologic disturbance is negligible at the Targhee Principal Watershed and subwatershed scales (Table 4).

The Porcupine Lookout Vegetation Project is currently being planned in the analysis area. This project could create up to 4,000 acres of hydrologic disturbance across TPWs 025 and 026B. It will be designed such that no watershed would exceed 30 percent hydrologic disturbance as per the 1997 RFP guidelines (Table 4). The potential water quality impacts from this will be addressed through project design and BMPs. It may be possible to achieve some long-term water quality benefits through improving aspen stands, which could enhance beaver habitat that provides for riparian health and water quality improvements. Other beneficial measures in the analysis areas will include continuing rangeland management improvements to address water quality concerns.

Table 4. Cumulative hydrologic disturbance.

Watershed	Watershed Area (acres)	Hydrologic Disturbance (percent)			
		Current	Project	Project Cumulative	Project and Porcupine Lookout Cumulative
TPW 025 – Camas Creek	67,750	18	<0.1	18	≤30
170402140102 – Lower West Camas Creek	15,010	12	<0.1	12	12
170402140108 – Upper Camas Creek	3,030	14	0.2	14	≤30
TPW 026B – Beaver Creek (East)	40,871	4	<0.1	4	≤30
170402140205 – Corral Creek	11,930	8	<0.1	8	≤30

## Groundwater Resource

### *Spatial and Temporal Context for Effects Analysis*

The groundwater analysis area encompasses all of the proposed drill stations, plus a one-mile buffer measured from the outermost drill station. The time period considered was the duration of the project, which is expected to be up to 5 years.

### *Existing Conditions*

The project area is located in the northeast corner of the Snake River Plain, an approximately 370-mile-long arcuate depression crossing southern Idaho (Leeman, 1982; Mabey, 1982). The mineralization characteristics of the project area are most consistent with low sulfidation type epithermal deposits—a style of mineralization produced by near neutral pH fluids in geothermal environments (Hedenquist et al., 2000; Sillitoe and Hedenquist, 2003; Simmons et al., 2005). Mineralization appears to be localized by west-northwest and northeast trending geologic fault structures possibly associated with the inferred northern margin of the Kilgore Caldera.

Geological formations in the area are primarily of volcanic origin. Sedimentary rocks of the Aspen Formation underlie the volcanics. Fractured zones have been mapped in the project area (KMS 2017c and 2020b). Groundwater flow is assumed to be primarily along these preferential flow paths. Groundwater levels and characteristics vary throughout the project area and are likely due to the high variability in permeability/porosity between rock types with some acting as aquitards. These rocks are of little importance as an aquifer in the area but furnish water to springs and streams.

The occurrence and movement of water in an aquifer depends on the porosity (primary and secondary) and permeability of the rocks or deposits, and the degree of interconnection of open spaces within them. Bedrock aquifer flow occurs within fractures, or other structures such as faults and bedding planes. Primary permeability is low but secondary permeability in well-developed fracture systems can be locally moderate to high.

Stream flows show significant variations between high and low flow conditions, with many stream segments going dry early in the summer. Based on the flow patterns observed, storage in the groundwater system appears to be limited. Most flow graphs look very similar with higher flows in the spring from snowmelt reducing quickly to low flow conditions (KMS, 2020b).

The groundwater system is replenished each year through snowmelt with precipitation and run-off infiltrating through porous rock where it finds flow pathways through geological contacts and/or structural features. Not all previous drill holes encountered water during drilling activities. Drill holes located near the dominant northwest-southeast trending faults seem to encounter groundwater more readily and this trend decreases with holes drilled furthest from the faults. Not all faults are known to convey groundwater.

A total of 79 distinct springs and seeps were identified for the Kilgore Project area in 2017 (KMS, 2017c). By June of that year, 17 were documented as being dry. These were all located on the east side of the project and drain towards Camas Creek drainage. Those sites which dried up are likely “perched” spring systems and are not tied to deeper groundwater systems. Springs and seeps were found below 7,380 feet elevation with most occurring below 7,200 feet. Although baseflow elevations in the stream have not been specifically determined, spring and seep elevations are good indications of the elevation of the local water table and surface/groundwater connections. Based on spring occurrences, groundwater elevations are expected to range from 7,150 to 7,380 feet across the project area.

#### *Hydrogeology of Dog Bone Ridge*

The Dog Bone Ridge area includes the upper reaches of Corral Creek and Bear Cat Creek on the west side of the project area. Stream flow data and water quality data for this area, collected and reported by KMS (2020b and 2020c), are available in the project record. The local geology consists of tuff rhyolite and explosion breccia. Springs are sparse in the area and canyon bottoms are dry with perennial flow beginning approximately 2 miles downstream of Dog Bone Ridge. Many of the rock types in this area have low permeability that can inhibit groundwater flow. In the Dog Bone area groundwater likely flows southerly to Corral Creek. These are very steep drainages with small recharge areas. Data show stream flows dropping very quickly during the summer season (KMS, 2020b). These streams tend to dry up from top and bottom leaving small segments of water flow between baseflow elevation and at the contact with the alluvial fans where surface flow terminates. Bear Cat Canyon Creek flows into East Fork Rattlesnake Creek which generally parallels Corral Creek. There is a prominent ridge that separates Corral and East Fork Rattlesnake Creek. Similar to Corral Creek, East Fork Rattlesnake Creek flows out into the plains and naturally infiltrates.

Bear Cat Canyon Creek is a relatively dry drainage with little or no flow in the headwaters. A surface water monitoring site located close to a mid-point between the headwaters of Bear Cat Canyon Creek and its confluence with East Fork Rattlesnake Creek has not had water flow since monitoring started in 2018, and there is no bed and bank established in the upper

headwater area (KMS 2020b). During summer, the majority of the upper reaches are dry, with the exception of the last 100 feet or so. Baseflow elevation at this point, which is over 3 miles (stream reach length) from Dog Bone Ridge, is between 6,600 and 6,640 feet.

Corral Creek runs a short distance from the mountains into the plains where it naturally infiltrates. Populations of Yellowstone cutthroat trout are found only in Corral Creek. The upper reaches of Corral Creek are dry. A monitoring site located in the headwater area of Corral Creek approximately one mile from Dog Bone Ridge had no flow in the summer and fall of 2020; however, an established bank and bed at that site indicates water is present during high flow conditions (KMS 2020b). Another monitoring site located approximately 2 miles from Dog Bone Ridge has consistent flows year-round (KMS 2020b). There is a topographic slump in this area with thick vegetation that is likely the origin of flows.

## ***Environmental Consequences***

### **No Action Alternative**

Without the approval to continue exploration activities, the project would not affect the groundwater resources in the project area. Water quantity and quality would remain the same. No exploration drilling would occur, the previously authorized surface disturbance in the project area would be reclaimed, the existing water well would be plugged, and no further withdrawals of water would occur.

### **Proposed Action Alternative**

Drilling would be conducted in four main target areas identified in the plan: Dog Bone Ridge, Gold Ridge, Mine Ridge, and Prospect Ridge. There are 130 drill stations proposed for the project (KMS 2020a). A maximum of three drill holes may be drilled at each location. These may be vertical and/or angle holes. The average hole depth would be approximately 1,300 feet; however, actual depth and angle would be dependent on drilling results. Drilling water would be used from the on-site water well that has been used in the past and from two surface water drafting locations (Beaver Creek and West Camas Creek). Water withdrawal from the well is limited to 5 acre-feet per year by the State of Idaho's authorization. Otis has the only state approved use of groundwater in the project area.

Exploration drilling activities in the past encountered groundwater in some, but not all, of the exploration drill holes. It is anticipated that the proposed drilling would continue to periodically encounter groundwater.

### **Groundwater Quality**

Groundwater and surface water monitoring data collected and reported by KMS (2017b and 2020c) demonstrate similarities in water quality. Metals detected include arsenic, antimony, iron, lead, nickel, selenium, and zinc. Elevated metals concentrations are not unusual for geochemical conditions in mineralized areas. Concentrations of metals are higher in groundwater than in surface waters. This may suggest that groundwater connectivity near the monitoring locations are not well established and that the primary source of water for surface

flows is not deeper groundwater but rather shallower, near surface groundwater. The local groundwater is high in iron as is evident from the iron oxide staining in some drainages.

Elevated levels of metals have been detected in the on-site water well (KMS 2020c) but all have been below Idaho groundwater standards (IDAPA 58.01.11). These levels have periodically exceeded surface water standards for selenium and zinc. In 2020, selenium was elevated above standards and zinc was below standards. Therefore, natural and drilling induced surface water/groundwater interactions are important to consider for this project.

One water quality sample was collected in 2017 from a sump (KMS 2018) and provides information on the water quality reporting to sumps. The sump water was of good quality, similar to surface water quality collected at other monitoring sites for the project.

#### *Drilling Fluid Mixing with Groundwater*

The volume of drilling fluid lost from drill holes that could enter groundwater is minimized by the formation of filter cake on the walls of the hole and the sealing of permeable zones. The drilling fluid would be composed of the makeup water used to mix the drilling mud, bentonite, and a small quantity of drilling additives. In order to comply with direction in the Idaho Ground Water Quality Rule (IDAPA 58.01.11) to maintain or improve existing groundwater quality, the makeup water quality would be equal to or better than the expected groundwater quality that could be encountered in a drill hole. Otis is proposing to use water from their on-site water well and from area streams. Since water quality analysis of available makeup water sources in the area indicate no water quality exceedances (KMS 2020c), the effects to groundwater quality would be insignificant.

Otis has proposed to use drilling polymers that are soy based and biodegradable and will not cause environmental impacts when used in accordance with manufacturer's directions. Even though all products are in regular usage for water well drilling, the question is sometimes raised as to whether differences in the chemical composition of the drilling fluid and the groundwater could result in significant detrimental effects to an aquifer if substantial mixing occurred. The low permeability of the filter cake allows only a small volume of filtrate to enter the formation and filtrate production is limited to the time the hole is open. Regardless, the effects would be localized and negligible with respect to the aquifer water quality as a whole.

#### *Groundwater Mixing*

The primary mechanism by which groundwater can mix with other groundwater of differing chemical composition is by aquifer crossflow. If flow from an aquifer containing elevated levels of metals or contaminants of concern enters an aquifer having lower concentrations of those elements, then degradation of water quality in the receiving aquifer could result.

The risk of groundwater mixing due to crossflow during the active drilling phase is minimized by sealing off any inflows or outflows of water as they are encountered. The potential for crossflow between shallow alluvial aquifers and bedrock aquifers is reduced by



casing and cementing all holes through any near-surface unconsolidated formations into bedrock when holes are abandoned.

In order for crossflow to occur, a zone of inflow and a zone of outflow (a net pressure differential between zones) would have to be encountered in the same hole. Such zones are sealed off as they are drilled through so there should never be an inflow and outflow zone open simultaneously. As with other impacts analyzed here, even the limited potential for residual crossflow is relatively short-lived since the holes are promptly abandoned after reaching their total planned depth. Overall effects to the receiving aquifer would be negligible and temporary.

After abandonment there is little risk of crossflow occurring through either the annular grout seal or the drill hole seal. Both bentonite and cement are highly effective sealants. Since the permeability of the seal is much lower than the permeability of the aquifer there would be no vertical flow paths through the annular space or the drill hole itself that could interconnect aquifers.

Not all drill holes completed in the past have encountered groundwater; and this is expected to continue in future drilling. Drill holes would be plugged prior to the drill rig leaving the site, minimizing potential impacts to groundwater quality and quantity.

#### *Surface Fluids/Substances Mixing with Groundwater*

There are two mixing situations that can occur, when surface water is the contributing source and groundwater is the receiving water and vice-versa. Storm water runoff would be the only surface water of concern and this would be prevented from flowing down the drill hole during active drilling because all the drill holes have surface casing that typically rises several feet above the surrounding pad surface which is graded to shed water. Flow of surface water into an aquifer via the annular space would be prevented by proper sealing of the casing with the approved materials. In addition, the various material handling protocols and BMPs would prevent or contain spills of hazardous materials stored on the drill site that could then infiltrate into shallow groundwater.

Groundwater may affect surface water if it discharges from a seep or a spring. The low permeability of the local aquifers, slow rate of groundwater flow, and the low probability of groundwater quality being affected by drilling fluid or aquifer crossflow minimize the probability of groundwater contaminants migrating to a discharge point (assuming a hydraulic connection between the drill hole and the discharge point exists).

#### *Drilling Fluid and Cuttings Disposal*

Sumps would be used to contain drilling fluids which would contain drill cuttings. The sumps would be sized appropriately and monitored to ensure the sumps do not overtop. Drilling would be shut down if the capacity of the sump is in question and adjustments made to ensure overtopping does not occur. Fluids in the sumps would be permitted to evaporate and infiltrate prior to closure and reclamation. Water monitoring of the project area streams would continue, providing regular checks on surface water quality.

Most of the drying of a collection sump takes place by evaporation, but a small volume of fluid would infiltrate into the soil. This fluid is not expected to move far beyond the immediate vicinity of the sump. A common concern is the potential for high-sulfide drill cuttings contained in the mud to generate acid rock drainage and/or leach metals which might then migrate into shallow groundwater. This possibility is unlikely primarily because the very low permeability of bentonite clay (contained in the drill mud) makes it an ideal material for isolating potential contaminants from the environment. In addition to bentonites low permeability, it has a high cation exchange capacity and tends to adsorb, and thus immobilize, metal ions.

During previous drilling at the site, a water quality sample was collected from one of the drill sumps. The only detected metals (dissolved) were arsenic and cadmium, and both were at or near the detection level. The data indicate that from a metals perspective, water quality associated with the drill cuttings is generally of good quality.

The quantity of sulfides is not fully defined for each of the geologic units. Data collected to date through drilling indicates it is variable and is overall less than 2 percent by volume. The Aspen Formation contains carbonate minerals that may neutralize acid potential. There are veinlets in the mineralized rock that may also provide acid neutralization. Sulfides must become oxidized to liberate hydrogen ions into solution and create acid rock drainage. Commonly this takes place naturally in areas where seasonal fluctuations of the water table produce alternating wet and dry conditions. The sulfides enclosed in bentonitic material within the sumps would have limited exposure to air and water, thus would not be expected to generate any significant amount of acidity. The quantity of cuttings and material generated from the drill hole is relatively small and inconsequential in terms of the potential for acid generation. Disposal of cuttings will be localized and poses little risk of groundwater contamination.

### **Groundwater Quantity**

The potential impacts to groundwater resources from well pumping and drafting from streams to supply water in support of exploration drilling are assessed in terms of whether the estimated extraction will be injurious to:

- Public interests in groundwater resources (wildlife, recreation, etc.),
- Existing water rights to appropriate groundwater, or
- Protectable interests in domestic wells.

Water will be obtained from the water well or surface water near the project area (West Camas Creek and Beaver Creek). Surface water uses in the area are primarily irrigation. Groundwater wells are not present and there is no recorded use of groundwater for domestic or industrial uses in the project area.

Overall, the quantity of groundwater used for the project is a small percentage of the total groundwater system covered by the project area. Pumping rates and duration are limited. Groundwater pumping from the on-site well is not expected to cause drawdown that could

impact groundwater or surface water resources. A test performed on this well showed that pumping at 6 gallons per minute only results in 5 feet of temporary drawdown. Effects of drilling on the hydraulic properties of an aquifer are likely to be negligible. Diversions of surface water for drilling purposes are minimal and would not cause detrimental reductions in-stream flow. Potential impacts to water quantity are avoided or minimized by using multiple points of diversion.

In Idaho, the quantity of water that can be authorized under a temporary water right is 5 acre-feet per year. The diversion rate will be 0.04 cubic feet per second (18 gallons per minute) from each source. Reclamation/closure of the water well would be completed when the exploration activity is complete.

### **Summary**

Overall, the potential impacts to groundwater resources from the proposed exploration drilling activities are assessed to be minimal and negligible. Adherence to the BMPs in Appendix A will eliminate or minimize the risk of contaminating or depleting water resources. The project would be consistent with direction in the 1997 RFP objectives to maintain water quality. The project would also be in compliance with the Idaho Ground Water Quality Rule which requires maintaining existing high-quality water, which would be achieved through implementation of proper drill hole abandonment.

Drilling operations are expected to have little effect on groundwater quantity or quality near exploration drilling as demonstrated by groundwater and surface monitoring results (KMS, 2020c). No changes in-stream baseflow have been observed from past monitoring completed by Otis during active and inactive exploration phases. Otis proposes to continue to use environmentally-friendly drilling fluids to protect groundwater resources. For the small quantities of water that are likely to mix as a result of drilling, the net effect to the receiving groundwater system can be viewed as neutral. Future monitoring of water resources would continue and any significant changes to field parameters, water quality constituents, and spring discharge would be reported to FS personnel.

Drilling activities would be located far from the perennial reaches of Corral Creek and East Fork Rattlesnake Creek where Yellowstone cutthroat trout reside, minimizing the potential for water quality or quantity concerns. The biological evaluation for the species, available in the project record, determined the project “may impact individuals or habitat, but will not likely contribute to a trend towards federal listing or loss of viability to the population or species”. As stated in the biological evaluation, “The likelihood of impacts is slight since project activities within the AIZs of the Corral and East Fork Rattlesnake drainages are limited to existing roadways (Corral Creek) or in the headwaters of ephemeral drainages (Bear Cat Canyon).”

Overall effects to groundwater resources are limited in scope and nature. The Porcupine Lookout Vegetation Project would have negligible impacts on groundwater resources in the Corral Creek watershed. There are no other activities in the project area that would impact groundwater resources. As a result, groundwater quality and quantity are expected to remain

consistent with past monitoring results. Monitoring would continue to ensure protection of groundwater resources.

## Threatened, Endangered, and Sensitive Plants \_\_\_\_\_

The only plant species currently listed under the Endangered Species Act (ESA) found on the Caribou-Targhee National Forest is Ute ladies'-tresses (*Spiranthes diluvialis*). This rare orchid, designated as a threatened species, is not known to occur in Clark County or the immediate surrounding area and thus is not further considered in the analysis. There are no plants listed as endangered on the forest.

There are no known or expected occurrences of any sensitive plant species designated by the FS Intermountain Region Forester in the project analysis area so there would be “no impact” as a result of the proposed action. A discussion of these species can be found in the herbaceous plant biological evaluation.

On December 2, 2020 the U.S. Fish and Wildlife Service announced a proposal to list whitebark pine (*Pinus albicaulis*) as a threatened species under the ESA. Potential impacts to whitebark pine are summarized as follows.

### ***Spatial and Temporal Context for Effects Analysis***

The project area (approximately 4,000 acres) was considered for the impact analysis. The potentially affected environment is the Centennial Mountain Subsection as described in the 1997 RFP, which was selected because it includes the project area and is a meaningful area at the landscape scale when considering the species viability and meaningful active restoration for the species' continued existence within the planning area.

### ***Existing Conditions***

Surveys indicate that the whitebark pine population within the project area appeared to be healthy (Otis, 2018). Current mature whitebark pine in the area suggest the species is stable in the project area with a high representation of immature age classes; however, it is likely that many of the immature trees will be mortally impacted by blister rust. This is because saplings have less stores to fight than older trees, and their thinner bark is easier to penetrate.

Stress and mortality to whitebark pine from blister rust and other natural causes are expected to continue throughout the range of whitebark pine, which includes the Centennial Mountains and the project area. Some areas within the Centennial Mountains have been identified as priority areas for whitebark pine restoration and restoration activities do occur. Neither active restoration of whitebark pine nor indirect vegetation management, such as the removal of competing trees, has been common in the project area.

## ***Environmental Consequences***

### **No Action Alternative**

Under the no action alternative, the previously authorized surface disturbance in the project area would be reclaimed. Current whitebark pine distribution would remain the same and no habitat displacement would occur by the creation of temporary roads.

### **Proposed Action Alternative**

Removal of some seedling and sapling individuals for road placement is likely unavoidable due to the high number of well distributed individuals found during project surveys (Otis 2018). This will have a direct effect on individual whitebark pine seedling and saplings trees where they occur within the 22 acres of surface disturbance. Otis's (2018) field survey estimate of 22 whitebark pine trees per acre could translate to approximately 500 seedlings/saplings being directly impacted by the project. Using a very conservative estimate of 22 trees per acre for the 4,000-acre project area yields a total of 88,000 trees. Five hundred of 88,000 individual whitebark pines is 0.6 percent. This is arguably a gross estimate, but provides a clear example that the potential loss of some seedlings/saplings in the area from the project would not lead to localized extirpation of the species or jeopardize the continued existence of the species.

Existing healthy mature whitebark pine will be avoided to the extent possible by the BMPs included as part of the proposed action. By leaving healthy, mature, cone-bearing whitebark pine and creating linear disturbance where whitebark pine could re-establish would allow for reestablishment over time and a diversity of age classes. As a pioneer or early successional species, it may be the first conifer to become established after disturbance, subsequently stabilizing soils and regulating runoff (Tombach 2017).

Surface disturbance will be short-term (between 3 and 5 years) and all disturbed areas will be reclaimed using BMPs that allow for natural succession over time; this includes whitebark pine. Surface disturbance may create the opportunity for noxious weed establishment, which would have a negative impact on whitebark pine and other desirable vegetation within the project area if allowed to establish and spread. The required BMPs mitigate this risk.

The Porcupine Lookout Vegetation Project would result in up to 4,000 acres of surface disturbance, most of which would be due to the logging of merchantable timber. Since whitebark pine is not a merchantable tree and is a species of conservation concern, it is expected that the Porcupine Lookout Vegetation Project would include a design feature of leaving whitebark pine and would provide an overall benefit to the species where it occurs within the project area.

The determination for whitebark pine under the proposed action is "not likely to jeopardize the continued existence of the species." The project would not have a measurable effect on whitebark pine at the landscape scale either by increase the magnitude of the threats to whitebark pine or by a reduction in the ability for active management for whitebark pine to occur.

## Wildlife Resources

The following table summarizes the spatial context, affected environment, environmental consequences, determination, and regulatory framework for wildlife species impacted by the proposed action. The temporal context for all wildlife species is ten years.

Additional information on all impacted wildlife species and rationale for non-impacted species is provided in the wildlife specialist report available in the project record. A biological assessment for Canada lynx and grizzly bear, currently listed as threatened on the ESA, is also available in the project record.

<b>Canada lynx (<i>Lynx canadensis</i>)</b>	
Spatial Context	Project area (approximately 4,000 acres).
Affected Environment	From 1874 to present, there have been no reliable observations of Canada lynx on the Dubois District. The Dubois Ranger District is in a secondary lynx area.
Environmental Consequences	Disturbance to lynx appears unlikely because there is no evidence of presence. Up to 24 acres of lynx habitat may be removed by road construction to facilitate mineral exploration.
Determination	Not likely to adversely affect (NLAA).
Regulatory Framework	The 2007 Northern Rockies Lynx Management Direction provides management direction for lynx on the Targhee National Forest. All management direction is met for this project.
<b>Grizzly bear (<i>Ursus arctos</i>)</b>	
Spatial Context	The area that includes a 500-meter buffer on all of the existing and proposed roads for access to and used for exploration drilling (6,069 acres).
Affected Environment	There have been no radio locations of grizzly bears within the analysis area from 2000 to 2019. There are no important habitats in the analysis area and overall, the analysis area is likely to be low quality habitat due to the road density and human disturbance in the project area from exploration activities.
Environmental Consequences	Disturbance to grizzly bears appears unlikely because there is no evidence of presence. Secure habitat would be decreased by 606 acres from project activity. The loss of secure habitat is temporary because roads would be reclaimed.
Determination	NLAA
Regulatory Framework	Occupancy and Use Order #04-15-117 (food storage order) applies to the project area annually from March 1 to December 1.

<b>American Three-toed Woodpecker (<i>Picoides tridactylus</i>)</b>	
Spatial Context	Noise effects zone (2,672 acres).
Affected Environment	A three-toed woodpecker was detected at the edge of the analysis area in 2013. Up to 1,131 acres of potential three-toed woodpecker habitat may be present.
Environmental Consequences	Up to 9.3 acres of potential American Three-toed Woodpecker habitat would be removed. Up to 1,131 acres of potential breeding habitat may be disturbed by drilling noise.
Determination	May impact individuals or habitat, but will not likely contribute to a trend towards federal listing or loss of viability to the population or species (MIIH).
Regulatory Framework	The 1997 RFP contains management direction for woodpeckers, but it applies to timber harvest practices and pertains to snag and live tree retention.
<b>Boreal Owl (<i>Aegolius funereus</i>)</b>	
Spatial Context	Noise effects zone.
Affected Environment	Boreal Owls have not been detected in the analysis area at this time. Up to 2,577 acres of potential habitat may be present.
Environmental Consequences	Approximately 25 acres of potential Boreal Owl habitat would be removed. Up to 2,577 acres of potential breeding habitat may be disturbed by drilling noise.
Determination	MIIH.
Regulatory Framework	The 1997 RFP contains management direction for Boreal Owls. Management direction will be met.
<b>Columbia spotted frog (<i>Rana luteiventris</i>)</b>	
Spatial Context	Project area.
Affected Environment	The West Camas Creek drafting site and a small seep in the project area are spotted frog breeding sites. Overall, Columbia spotted frogs are common on the Dubois District and it is reasonable to expect their presence in most aquatic habitats.
Environmental Consequences	Water withdrawal from Camas Creek could impact spotted frogs by reducing water levels necessary for survival. However, water withdrawal would not occur until July 15 or later and spotted frog tadpoles may have metamorphosed. Movements occur in July or from August to October. Columbia spotted frogs are mostly confined to aquatic areas for movements but may travel overland if the route is more direct. If spotted frogs travel overland and cross roads, their probability of road mortality is increased with project activity.
Determination	MIIH.
Regulatory Framework	The 1997 RFP does not contain management direction for Columbia spotted frogs.
<b>Gray wolf (<i>Canis lupus</i>)</b>	
Spatial Context	Project area.
Affected Environment	No dens or rendezvous sites are present in the analysis area. Gray wolves are habitat generalists in the Rocky Mountains.



Environmental Consequences	Gray wolves from nearby packs or dispersers could be disturbed by project activities. Some habituation to project activities may have occurred in previous years of activity. Project activities could disturb or impact the habitat of the primary prey of gray wolves, elk.
Determination	MIIH.
Regulatory Framework	The 1997 RFP contains management direction for gray wolves, but it is related to livestock grazing and not mineral exploration.
<b>Great Gray Owl (<i>Strix nebulosa</i>)</b>	
Spatial Context	Noise effects zone
Affected Environment	Breeding Great Gray Owls have not been detected in the analysis area at this time. Up to 2,577 acres of potential Great Gray Owl habitat may be present.
Environmental Consequences	Approximately 25 acres of potential Great Gray Owl habitat would be removed. Up to 2,577 acres of potential breeding habitat may be disturbed by drilling noise.
Determination	MIIH.
Regulatory Framework	The 1997 RFP contains management direction for Great Gray Owls. Management direction will be met.
<b>Migratory birds</b>	
Spatial Context	Noise effects zone.
Affected Environment	Common birds, birds of conservation concern, Partners in Flight (PIF) watchlist species, and Idaho species of greatest conservation need bird species are present in the project area. Population trends vary; some are stable, downward, or unknown. Up to 2,672 acres of migratory breeding habitat is present in the analysis area.
Environmental Consequences	Approximately 25 acres of migratory bird breeding habitat would be removed. Up to 2,672 acres of migratory bird breeding habitat may be disturbed by drilling noise. However, noise disturbance would occur for the latter month of the 4.5-month migratory bird breeding season (July 15 to August 15).
Determination	Neutral, negative, or positive.
Regulatory Framework	Executive Order 13186, signed by President Clinton in 2001, outlined the responsibilities of federal agencies to protect migratory birds. This direction is met.
<b>Elk (<i>Cervus elaphus</i>)</b>	
Spatial Context	The security analysis area was the three twelfth-code watersheds where they exist on the Targhee National Forest (30,082 acres). The habitat effectiveness analysis area was the same as the security analysis area, except that identified winter range was excluded (26,692 acres).
Affected Environment	Elk populations in the Island Park Zone are at state objective. There is a total of 10,000 acres in the analysis area that meet requirements for elk security. This is 33 percent of the analysis area. Habitat effectiveness is 60 percent in the analysis area (1.1 mile per square mile).
Environmental Consequences	Elk security decreases by 600 acres. Overall, the percent of the analysis area that is secure for elk declines from 33 to 31 percent. With or

	without project activity, the acreage of elk security is at least 30 percent of the analysis unit, as recommended. Elk habitat effectiveness declines from approximately 60 percent to 50 percent (1.4 miles per square mile). However, habitat effectiveness should be at least 50 percent if elk are a primary resource consideration. And, with or without project activity, habitat effectiveness is at least 50 percent.
Determination	Neutral to negative.
Regulatory Framework	The 1997 RFP contains management direction for elk. Management direction will be met.

## Other Resources Considered \_\_\_\_\_

### ***Heritage Resources***

Surveys were conducted for the proposed project activities in October 2017. One previously recorded site was re-recorded and re-evaluated as not eligible for inclusion in the National Register of Historic Places. It was determined the project would have “no effect” on any known historic properties. The State Historic Preservation Office concurred with this determination on March 23, 2018.

A copy of this draft EA is being sent to the Shoshone-Bannock Tribes.

If previously unknown cultural resources are encountered during the course of the project, the forest archaeologist would be notified immediately, and all ground disturbing activities would cease in that area until the forest archaeologist takes appropriate action in consultation with the State Historic Preservation Office.

### ***Climate Change***

Measurable and meaningful increases in greenhouse gases that contribute to global climate change are not expected with the project. The proposed exploration will include drill rigs and other types of equipment, but the increase would be a small percentage of existing vehicle travel in the area.

The project is consistent with climate change adaptation strategies recommended for infrastructure and forest vegetation in the Intermountain Region. Concerning infrastructure, such as roads, the project includes BMPs that reduce the chance of resource degradation that could occur from hydrological events such as extreme rainfall, snowmelt events and flooding. Concerning forest vegetation, the project retains the area as forest and allows for natural recovery of areas disturbed by the creation of temporary roads.

## CONSULTATION AND COORDINATION

The FS has consulted with numerous individuals, Federal, State, and local agencies, tribes and non-FS persons during the development of this EA. A complete list of individuals can be found in the project record.

### ***Federal, State, and Local Agencies:***

U.S. Fish and Wildlife Service  
U.S. Army Corps of Engineers  
U.S. Environmental Protection Agency  
Idaho Department of Agriculture  
Idaho Department of Environmental Quality  
Idaho Department of Fish and Game  
Idaho Department of Parks and Recreation  
Idaho Department of Water Resources  
Clark County Board of Commissioners

### ***Tribes:***

Shoshone-Bannock Tribes

## APPENDIX A: PROJECT DESIGN FEATURES

This appendix described the additional project design features, or required BMPs, that were developed from internal and public comments received on the 2018 EA and this draft EA. These measures are incorporated into the proposed action to reduce or eliminate potential impacts from the project. Terms and conditions of approval of the proposed plan of operations will include the items listed below. The operator must formally agree to implement these design criteria prior to plan approval.

### ***Pre-Season Requirements***

1. Operator and Dubois District Ranger, each with a field staff representative, shall meet at least two weeks in advance of commencing operations for each season. Otis will provide a written workplan for activities planned for the season. (Changes to the workplan must also be made in writing.) The workplan will be reviewed and any pre-season surveys/inspections required (AIZs, stream crossings, wildlife) will be scheduled. Applicable resource maps will be provided to Otis.
2. Operator must designate in writing to the FS a representative or key point of contact to provide project oversight for each operating season. Any changes must also be made in writing.
3. Three drill stations are mapped in/near the following AIZs: 18-1 at Allen Canyon; 18-40 at Crab Creek; and 18-80 at Prospect Creek. These locations must be inspected by a FS hydrologist or fisheries biologist and Otis representative prior to any ground disturbance. If these sites are found to be within AIZs, they will be relocated outside the AIZs.
4. Proponent must provide the District Ranger with copies of all State and Federal permits required for the project. This includes temporary water appropriation permits from the State for the water well, West Camas Creek, and Beaver Creek; the U.S. Environmental Protection Agency (EPA) storm water permit and associated storm water pollution prevention plan, Idaho Stream Channel Alteration Permits, and any other applicable permits.
5. Operations will not commence prior to July 15 each year.

### ***General***

6. All project personnel must be familiar with the terms and conditions of approval of the plan of operations. A copy of the approved plan of operations must be maintained on site during operations.
7. The District Ranger will coordinate with Otis as needed to ensure field staff are aware of any FS activities (e.g., range allotment movements, road culvert replacement) do not affect planned exploration activities and/or site access.

8. Project personnel camping on site during drilling operations will not be subject to stay limits, but otherwise must follow the same rules as the general public for dispersed camping.
9. If unanticipated cultural materials, historic sites, or vertebrate fossils are encountered, Otis will notify the FS and halt operations in the vicinity of the discovery until inspected by a qualified FS representative and a mitigation plan developed if determined necessary.

### **Equipment**

10. Prior to entry onto NFS lands, all vehicles and equipment must be power-washed such that they are free of dirt and/or caked mud that may contain weeds or weed seeds. Qualified FS personnel will inspect vehicles and equipment prior to use.
11. All motorized equipment must have working mufflers to minimize noise, and spark arresters to minimize potential for ignition of a wildland fire. Electrical equipment must be properly insulated. Adequate fire protection is required and includes at least one handheld implement (e.g., shovel, ax) per person and one fire extinguisher per vehicle.

### **Road Construction/Use**

12. Roads to be used for project activities but not open for public use will be gated. Gates and locations must be pre-approved by the District Ranger. Operator must maintain all FS-approved gates to allow access by FS personnel and prohibit access by the general public.
13. Otis will control dust generated from project activities with dust suppressant water applied by water trucks. Dust suppressing chemicals such as magnesium chloride or calcium chloride are not authorized for use.
14. Operations may not occur when ground conditions are wet enough that rutting could exceed 6–8 inches in depth.
15. Existing healthy mature whitebark pine should be avoided when flagging routes for temporary road construction and clearing limits (i.e., areas adjacent to road construction where trees may be removed for safety or other considerations). The road centerline and upper and lower clearing limits will be flagged and approved by the FS prior to any ground disturbing activities or felling operations.
16. Slash generated during construction would be scattered on exposed slopes and windrowed along the toe of the fill slope. Stumps that would interfere with the operation and use of the road would be grubbed and buried +/- 3 feet below the existing ground surface within the right-of-way corridor.
17. Any available topsoil would be stockpiled along the new road system as approved by the FS to expedite topsoil replacement during reclamation activities. Slash, logs, and boulders moved during construction may also be stockpiled for use in reclamation or to block road access during reclamation.

18. Road construction within AIZs will be avoided where possible. The location and type of road/stream crossings must be inspected by a FS hydrologist or fisheries biologist and Otis representative prior to use.

### ***Drilling Operations***

19. No drill holes or sumps shall be located within AIZs.
20. Operator will use soy-based and biodegradable drilling fluids.
21. Sumps must be of sufficient capacity to prevent water or sediment overflow. Drill/sump water may not be discharged to natural waterways, including intermittent or ephemeral channels. Sumps will be closely monitored and drilling activities temporarily suspended and appropriate action taken (e.g. enlargement of sump, allow additional time for infiltration) if unexpected quantities of water are encountered that could potentially overwhelm the sump.
22. Sumps should be located on the uphill side of the road whenever possible. BMPs such as silt fencing will be used on the downhill sides of sumps and other locations as needed.
23. Drill/sump water may not be discharged to surface water, including intermittent or ephemeral channels. Sumps may not be reclaimed until water has infiltrated completely into the ground.
24. Water storage tanks and pipelines must be checked daily during operations for leaks.
25. Light pollution during night operations will be prevented by shielding all overhead lighting to deflect light downward onto the specific work area.
26. Drill holes must be properly abandoned according to the approved plan of operations, which must meet all current State guidelines and requirements. Copies of abandonment records for all drill holes must be provided to the FS as part of the annual report.
27. Operator will maintain spill prevention measures on site. A spill remediation kit must be available at each staging area and active drill station and be employed immediately in the event of a spill. In addition, vehicles transporting fuels and lubricants will be equipped with spill kits.

### ***Water Drafting***

28. A FS hydrologist or fisheries biologist will assess the water withdrawal locations at West Camas Creek and Beaver Creek before they may be used by Otis. Otis will implement any additional site-specific BMPs (i.e. hardening of surface) determined by the FS for off-road sites.
29. During drafting operations, signs must be placed on the road in front of and behind the water truck to alert other vehicles of potential traffic.
30. All equipment used for water transport will be solely dedicated to this project for each season of its duration. Prior to entry onto NFS lands, all equipment used for water transport, including pumps, tanks, and draft hoses must be cleaned, flushed with culinary

water, drained, and dried to the extent possible to minimize the risk of introducing aquatic invasive species when drafting from approved sources.

31. Intake pumps will be primed with source water or culinary water (not tank water).
32. Foot valves must be tested at both low and high pressures to certify they are leak free.
33. Intake hoses must be screened to meet National Marine Fisheries Service fry criteria of 3/32 inch and an approach velocity of 0.20 feet per second to avoid entrainment and impingement concerns.
34. Operator will avoid locating staging areas or storing any hazardous materials within AIZs. The District Ranger may grant some exceptions for staging areas along existing roads based upon consultation with a FS hydrologist and/or fisheries biologist.

### **Wildlife**

35. Project personnel, including those camping on the forest, must follow the food storage order (Occupancy and Use Order #04-15-117) for grizzly bear conservation. When personnel are asleep at the camp or away, all bear attractants (food, garbage, coolers, toiletries, dish soap, dishes, cutlery, cookware, and antifreeze) will need to be unavailable to bears. Acceptable storage for attractants may include a recreational trailer with windows and doors closed, the bed of a pick-up with a closed topper, the cab of a truck with doors and windows closed, a fully enclosed utility trailer, or certified bear-resistant containers. Certified bear-resistant coolers are not bear-resistant unless the cooler is closed with two Master locks or locking carabiners. Grills used for cooking should either be secured or burned off for one hour and have drip trays wiped. Propane stoves should be burned off and kept clean. Garbage should be routinely removed from the camp and from the project area. Compliance with the food storage order will be checked during site inspections by FS personnel.
36. Surveys will occur for Boreal and Great Gray Owls in the project area. If a Boreal or Great Gray Owl nest is located, vegetation may not be removed for road construction within a 30-acre or 20-acre buffer, respectively, around the nest.
37. The Allan Canyon Northern Goshawk nest territory is in the project area. Project activities including new road construction, road use, and drilling may only occur within the Allan Canyon goshawk nest area and post-fledging family area from October 1 to February 28. This affects road ND569A and drill sites 18-4, 18-5, and 18-6; and road ND14 and drill sites 18-1 and 18-2.

### **Reclamation**

38. Seasonal closure for the project will occur at the end of each operating season. Prior to demobilization, surface disturbances not fully reclaimed will be stabilized (e.g., seeded with sterile grass species). All project equipment, consumable materials, fuel, and other similar items will be removed from the site.

39. Obliteration of new roads that have been determined to be no longer needed for this plan of operations will consist of full recontouring of the cut/fill slope and restoring natural drainage in drainages. Compacted road prisms will be ripped to a minimum depth of 12 inches prior to full recontouring.
40. All project disturbance, including roads, would be reclaimed by the end of this project, unless Otis formally requests a timing extension or submits a new plan of operations to the FS for review before the approved plan of operations expires.



## APPENDIX B: REQUIRED MONITORING AND REPORTING

This appendix describes the required monitoring and reporting required for the project. These are intended to ensure project requirements are being met, and that BMPs are implemented and working as intended. of approval of the proposed plan of operations will include the items listed below. The operator must formally agree to these terms and conditions prior to plan approval.

1. Operator must routinely monitor the project area, including the status of reclaimed areas, at least twice annually. This should occur in early summer to identify and address any issues that may have occurred during the winter, and in early fall to ensure access control/restrictions are working as designed.
2. Operator will conduct water quality monitoring and reporting as defined in Appendix C of this document.
3. Operator will routinely monitor the occurrence of noxious weeds in the project area. State-listed noxious weeds will be treated with an FS-approved herbicide, and herbicide quantities and locations used will be reported as part of the annual report submitted to the FS District Ranger. This will generally be the months of June through November. Monitoring and treatment of noxious weeds will continue for three years after final site reclamation (i.e., expiration date of approved plan).
4. Operator will provide the District Ranger an annual report of activities conducted each year by January 31. This should include a description of roads constructed, areas reclaimed, and interim stabilization; abandonments records for all drill holes; storm water management monitoring and BMP effectiveness; areas monitored and treated for noxious weeds; and water quality monitoring results. Report should be provided in electronic format unless directed otherwise by the FS.

## APPENDIX C: WATER MONITORING PLAN

This appendix describes the water monitoring plan required for the project including data analysis and reporting requirements. Groundwater and surface water quality are managed and protected by the Idaho Department of Environmental Quality (IDEQ) through its implementation of water quality standards (IDAPA 58.01.11 and IDAPA 58.01.02 ) and published guidance (<http://www.deq.idaho.gov/water-quality/>).

Water monitoring in the project area initially commenced in 2013 as part of baseline studies conducted by Otis. Monitoring has since been required by the FS for exploration activities conducted at the Kilgore site. This water monitoring plan expands on those previously approved by adding additional monitoring locations, clarifying and updating parameters/constituents to be analyzed, providing specific reporting requirements, and clarifying notification requirements.

### ***Sampling Frequency***

Sampling will be conducted monthly by qualified project personnel except when designated sampling locations are dry or inaccessible due to snow. This will generally be the months of June through November. Sampling will continue for one year after final site reclamation (i.e., expiration date of approved plan).

### ***Sampling Locations***

Sampling will continue at the five locations previously identified by Otis as part of their baseline studies initiated in 2013. These locations are the four surface water sites CC-1, CB-2, CB-30, and MG-5; and the one groundwater site KW-3. An additional nine surface water monitoring sites have been tentatively identified by Otis to correspond to the target areas identified in the proposed plan of operations. These sites are listed in Table C-1 and shown in Figure C-1.

### ***Sampling Methodology***

#### **Surface Water**

Surface water sampling will include measurement of field parameters and collection of samples for lab analysis. All analytical work will provide results comparable to the respective water quality standard. EPA 200.8 Series Methods or equivalent methods will be used to provide standard detection limits for lab reports, and only EPA-certified laboratories will be used to analyze water samples.

Lab analyses of the water samples may include measurements for the following parameters/constituents: pH, total suspended solids; turbidity; hardness (calcium carbonate; CaCO<sub>3</sub>); conductivity; the elements silver (Ag), aluminum (Al), arsenic (As), barium (Ba), beryllium (Be), cadmium (Cd), chromium (Cr), copper (Cu), iron (Fe), mercury (Hg), nickel (Ni), lead (Pb), antimony (Sb), selenium (Se), thallium (Tl), zinc (Zn); and the compound sulfate (SO<sub>4</sub>). Any parameters/constituents with an associated State water quality standard must be measured.

Table C-2. Water monitoring sites for the project.

Surface Water	Monitoring Site <sup>1</sup>	Target Area
Allen Creek	AC-4	Gold Ridge
Camas Creek Bridge	CC-1	Upgradient of project
Crab Creek, upstream	CB-2	Mine and Prospect Ridge
Crab Creek, downstream	CB-30	Mine and Prospect Ridge
McGarry Creek	MG-5	Prospect Ridge
Prospect Creek	PC-3	Mine Ridge
Rex Creek	RXC-3	Gold Ridge
Rey Creek	RYC-3	Gold Ridge
Corral Creek	COC-1	Dog Bone Ridge
Upper Corral Creek	UCOC-1	Dog Bone Ridge
EF Rattlesnake Creek	EFRC-1	Dog Bone Ridge
Bear Cat Canyon	BCC-1	Dog Bone Ridge
Bear Cat Canyon	BCC-2	Dog Bone Ridge
Groundwater	Monitoring Site	Target Area
Existing well	KW-3	Mine Ridge (groundwater)
Proposed monitoring holes	Up to 5 holes <sup>2</sup>	Locations to be determined
<sup>1</sup> These sites may be relocated in the event site conditions prove not conducive to sampling (e.g., stream goes dry, poor site access).		
<sup>2</sup> Drill holes selected for monitoring will be left open for two drill seasons.		

Copper sampling for surface water sites must include field and lab parameters consistent with the copper Biotic Ligand Model and include: temperature; pH; the dissolved major cations calcium (Ca), magnesium (Mg), sodium (Na), and potassium (K); dissolved copper (Cu); sulfate (SO<sub>4</sub>); chloride (Cl); alkalinity; and dissolved organic carbon (DOC).

Implementation guidance for the copper criterion is published on the IDEQ website at: <https://www2.deq.idaho.gov/admin/LEIA/api/document/download/4835>.

### Groundwater

Groundwater sampling will include initial drawdown metrics, measurement of field parameters, and collection of samples for lab analysis. As is the case for surface water, all analytical work will provide results comparable to the respective water quality standard. EPA 200.8 Series Methods or equivalent methods will be used to provide standard detection limits for lab reports, and only EPA-certified laboratories will be used to analyze water samples.

Lab analyses of the groundwater samples may include measurements for the following parameters/constituents: temperature; pH; total dissolved solids; hardness (calcium carbonate; CaCO<sub>3</sub>); conductivity; sulfate (SO<sub>4</sub>); and total concentrations of the metals silver (Ag), aluminum (Al), arsenic (As), barium (Ba), beryllium (Be), cadmium (Cd), chromium (Cr), copper (Cu), iron (Fe), mercury (Hg), nickel (Ni), lead (Pb), antimony (Sb), selenium (Se), thallium (Tl), and zinc (Zn).

### Reporting Requirements

Otis will provide the water monitoring data as part of the annual report submitted to the District Ranger each year by January 31. This will include a description of the monitoring

activities conducted for the year, any problems encountered, lab reports, cumulative data, and data interpretation.

### **Notification Requirements**

Data showing a substantial increase of a sampled constituent or a substantial change in pH must be reported by Otis to the FS within 30 days of receipt of analytical results. A “substantial increase” of a constituent is defined as a measured result above the calculated Alternative Concentration Limit (ACL) as outlined in Appendix A of the IDEQ Statistical Guidance for Determining Ground Water Quality and Degradation (2014). These methods are suggested for setting an upper limit on datasets when there are insufficient data to meet the statistical assumptions for more detailed analysis. Based on the site-specific data available to date, it is recommended that one of the three methods for calculating an ACL be used consistently for all monitoring locations rather than optimizing for the lowest of the limits, as referenced in Appendix A of the IDEQ Statistical Guidance. For non-detect lab values, the method detection limit will be used for a numerical value when calculating the mean and standard deviation. A “substantial change” in pH is defined as one standard deviation from the mean (plus/minus). The mean is the sum of the baseline data collected at each site divided by the number of samples. The standard deviation is the dispersion of a set of data from the mean and is calculated as the square root of the variance.

For substantial increases in groundwater, Otis will implement additional best management practices (BMPs) for any site with sample results greater than those calculated by the selected method, as directed by the FS.

For surface water, Otis must initiate an investigation of the substantial increase or change in water quality parameters by performing the following action(s) as applicable:

1. Otis will contact the lab that conducted the initial analysis of the water sample and request the sample be re-analyzed for the parameter(s) in question. If re-analysis indicates no substantial increase for the parameter(s) in question, no further response will be required. Otis will submit a report including both lab analyses to the FS confirming that the initial analysis was an anomalous report. If the value is verified in the re-analysis, Otis will notify the FS in writing and the site resampled as soon as practicable.
2. Otis will resample the site in question and submit for analysis as soon as practical, but within holding times for preserved samples. If resampling indicates no substantial increase for the parameter(s) in question, no further response will be required. Otis will submit a report including both lab analyses to the FS confirming that analysis of the initial sample was an anomalous report. If the value is verified in the analysis of the confirmation sample, Otis will notify the FS in writing and implement an agency-determined response strategy.

Acute or chronic standard violations of surface water quality standards must be reported to the FS and IDEQ within 5 business days, Otis will confer with the FS and the IDEQ within 45 days to develop monitoring and BMPs consistent with Idaho rules to address the source of contamination. For surface water significant increases below any criteria, Otis will compare the analytical values to the assimilative capacity for the constituent, defined as ten percent of the relevant surface water quality standard (IDEQ Antidegradation Guidance,

<https://www2.deq.idaho.gov/admin/LEIA/api/document/download/4834>) and consult with IDEQ on future actions.

Otis will submit a written report to the FS within 30 days of confirmation of an issue based on this sampling protocol. The report must contain a description of the issue, methods/data used to confirm the issue, how the issue has been addressed, and what additional monitoring and/or mitigation actions have been incorporated into the project as a result. The surface water parameters/constituents sampled and the methods for determining a substantial increase of a sampled constituent or a substantial change in pH may be changed based on guidance from the IDEQ.

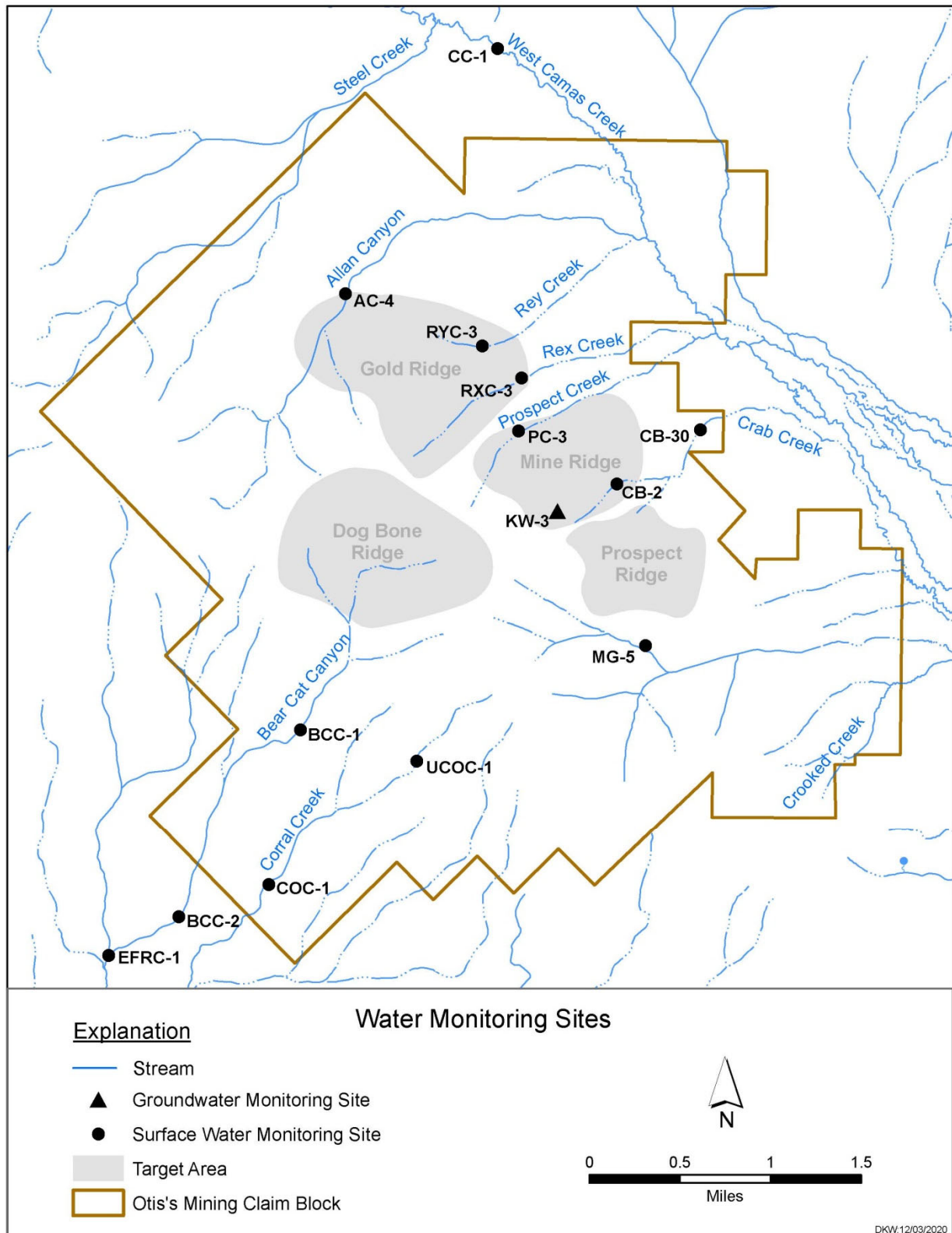


Figure C-1. Water monitoring sites.