prehistoric and ethnohistoric sites and associated artifacts exist within the general area of the proposed expansion, no Native American traditional use sites, activities, or associated resources are known to exist in proposed disturbance areas. Therefore, no mitigation measures specific to contemporary tribal uses is proposed.

However, for those archaeological sites (prehistoric and historic) scheduled or proposed for treatment (i.e., data recovery/excavation), tribal participants would be given the opportunity to monitor the data recovery efforts, and provide interpretation of any artifacts or features discovered during the process. In addition, the BLM or a contracted Cultural Resources Specialist/Archaeologist, accompanied by designated tribal representatives and/or descendants, may conduct periodical or stipulated monitoring of sites scheduled for avoidance before, during, and after Project construction. Monitoring of identified archaeological sites within and in close proximity to proposed disturbance areas could occur throughout the life of the Project to ensure agreed upon avoidance.

3.22.3.7.5 Residual Adverse Impacts

The Slower, Longer Project Alternative would have an unavoidable impact to pine nut gathering and potentially to springs and perennial streams in the vicinity of the Project. The Slower, Longer Project Alternative would have an unavoidable and adverse impact to cultural sites within the footprint of the Project facilities.

## 3.23 Wildlife and Fisheries Resources

### 3.23.1 Regulatory Framework

This section discusses the laws, regulations, guidelines, and procedures that apply to management of wildlife resources potentially affected by the Project.

3.23.1.1.1 BLM/NDOW Memorandum of Understanding

Wildlife and fish resources and their habitat on public lands are managed cooperatively by the BLM and NDOW under a MOU as established in 1971. The MOU describes the BLM's commitment to manage wildlife and fisheries resource habitat, and the NDOW's role in managing populations. The ecological definition of population is a group of organisms of one species that interbreed and live in the same place at the same time. The BLM meets its obligations by managing public lands to protect and enhance food, shelter, and breeding areas for wild animals. The NDOW assures healthy wildlife numbers through a variety of management tools including wildlife and fisheries stocking programs, hunting and fishing regulations, land purchases for wildlife management, cooperative enhancement projects, and other activities.

3.23.1.1.2 Nevada Department of Wildlife Programs

The NDOW is the state agency responsible for the restoration and management of fish and wildlife resources within the state. The NDOW administers state wildlife management and protection programs as set forth in NRS Chapter 501, Wildlife Administration and Enforcement, and NAC Chapter 503, Hunting, Fishing and Trapping; Miscellaneous Protective Measures. NRS 501.110 defines the various categories of wildlife in Nevada, including protected categories.

NAC 503.010-503.080, 503.110, and 503.140 list the wildlife species currently placed in the state's various legal categories, including protected species, game species, and pest species.

3.23.1.1.3 Special Status Wildlife Species

Species in need of additional management and protection, due to declining numbers or loss of habitat are termed “special status species.” These animals are protected under provisions of the ESA or the Nevada BLM sensitive status (BLM Manual 6840.06 C). In addition, there is a Nevada State Protected Animal List (NAC 501.100 - 503.104) that BLM has incorporated, in part, into the sensitive list. The BLM sensitive species list is included as Appendix F.

3.23.1.1.4 Endangered Species Act

The ESA safeguards the continued existence of any species classified as “endangered” or “threatened”, as well as habitat that is determined by the Secretary of the Interior to be critical to such species. The ESA is administered by the USFWS, in consultation with other federal and state agencies. The ESA defines the following terms:

- Endangered species: "... any species which is in danger of extinction throughout all or a significant portion of its range..."

- Threatened species: "... any species which is likely to become an endangered species within the foreseeable future..."

- Critical habitat: "... the specific areas within the geographical area occupied by the species... on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection...”

The ESA prohibits the "take" (i.e., killing, harming, or harassment) of listed threatened or endangered species without special exemptions. Protection under the ESA also extends to species and habitat proposed for listing (proposed). Candidate species are species for which sufficient information on the vulnerability and threats to the species exists to warrant listing as threatened or endangered, but for which development of a proposed listing regulation is precluded by other higher priority listing activities. Candidate species receive no statutory protection under the ESA. The USFWS encourages cooperative conservation efforts for these species because they are, by definition, species that may warrant future protection under the ESA. Analogous to the ESA, Nevada State law (NRS 527.270-.300) prohibits removal or destruction of species listed as “threatened with extinction” except by special permit from the USFWS.

In addition to listed threatened or endangered and candidate species, the USFWS identifies another group of species known as species of concern (formerly candidate, Category 2 species). Species of concern are not specifically afforded the same protection under the ESA as Threatened or endangered species, but federal agencies are required to afford them consideration in their planning and decision-making processes. The BLM evaluates species of concern in a manner analogous to threatened or endangered species. On May 1, 1996, the NSO incorporated all former USFWS-designated Category 2 candidate species into the Nevada Special Status Species List and classified them as sensitive. Sensitive species are protected by BLM policy that

requires that actions authorized, funded, or carried out by the agency do not contribute to the listing of any candidate or sensitive species as threatened or endangered under the ESA.

3.23.1.1.5 Migratory Bird Treaty Act

Migratory bird means any bird listed in the 50 CFR 10.13. All native birds commonly found in the U.S., with the exception of native resident gallinaceous birds, are protected under the provisions of the MBTA. Under this act, nests with eggs or the young of migratory birds may not be harmed, nor may any migratory birds be killed. Measures to prevent bird mortality must be incorporated into the Project's design as discussed in Section 2.1.15.5.

3.23.1.1.6 Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (16 U.S.C. 668) applies primarily to taking, hunting, and trading activities that involve any bald (*Haliaeetus leucocephalus*) or golden eagle (*Aquila chrysaetos*). The act prohibits the direct or indirect take of an eagle, eagle part or product, nest, or egg. The term "take" as used in the act includes "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb."

Golden eagles are protected by the MBTA and the Bald and Golden Eagle Protection Act, both of which prohibit take. The Interim Golden Eagle Technical Guidance: Inventory and Monitoring Protocols; and Other Recommendations in Support of Golden Eagle Management and Permit Issuance provides guidance to conduct informed impact analyses and mitigation during the NEPA process (USFWS 2010).

### 3.23.2 Affected Environment

3.23.2.1 Study Methods

Surveys for wildlife, including mammals, birds, and reptiles were conducted aerially and on the ground in June 2005 and in July and August of 2006 for the majority of the Project Area (SRK 2007b, 2007c). The Kobeh Valley portion of the Project Area was surveyed for wildlife in July 2008 (Great Basin Ecology 2008).

Survey information for special status species in the Project Area was requested from the NNHP and the USFWS. The lists provided by the NNHP and the USFWS identified the following animal species with potential to occur within the region: pygmy rabbit (*Brachylagus idahoensis*), BLM sensitive species; and the yellow-billed cuckoo (*Coccyzus americanus*), a USFWS candidate species. The BLM identified the following additional special status species with potential to occur in the region: greater sage-grouse, a USFWS candidate species; Lahontan cutthroat trout (*Oncorhynchus clarki henshawi*), a federally listed threatened species; burrowing owl (*Athene cunicularia*), BLM sensitive species; and migratory birds and raptors protected under the MBTA.

3.23.2.1.1 Pygmy Rabbits

A helicopter survey was conducted on April 28, 2006, for wildlife and to search for raptor nests in the higher elevations including rock outcrops and ledges of the Project Area. During aerial surveys in the spring of 2006, pygmy rabbit habitat was aerially mapped using big sagebrush

vegetation. Two separate areas of potential habitat were identified from the aerial surveys conducted in the spring, the Kobeh Valley site and the eastern flank of Mount Hope. Surveys were conducted in August 2006 in all locations that were determined to be suitable for pygmy rabbits. These areas typically occurred in elevations ranging between 6,000 and 7,000 feet amsl.

Meandering transects were surveyed through suitable habitat according to NDOW protocol and both pygmy rabbits and their burrows were noted when located. UTM coordinates (North American Datum [NAD] 27) were recorded, along with photographs and habitat descriptions for each observation or burrow site. Often burrow sites are a multi-entranced burrow complex and were identified when adequate pellets in the area suggested annual use. A diverse composition of pellets was assumed to signify both historic and current use of the burrow. If only older pellets were located, the site was noted as inactive. Any burrow with recent fecal pellets was noted as active and an actual pygmy rabbit observation indicated an active site. The same survey protocol was utilized during the July 2008 survey of the Kobeh Valley portion of the Project Area.

3.23.2.1.2 Springsnails

A presence/absence survey for springsnails (*Pyrogulopsis* sp.) was conducted in the Project Area on July 9, 2007. The survey was conducted in the middle of summer when perennial springs were flowing and intermittent springs would be at low flow (SRK 2007d). A subsequent presence or absence springsnail survey was conducted between September 27 and October 31, 2007 (SRK 2010). Streams in the larger regional area, including streams near the ten-foot water drawdown contour, were surveyed. Although no springsnails were present within the Project Area or the predicted ten-foot water drawdown contour surveyed, springsnails were noted in locations near the predicted drawdown boundary (to the northwest of the northern boundary and to the southeast of the southern boundary) (SRK 2010).

3.23.2.1.3 Bats

Twenty-one openings provided access to 12 discrete mines. These openings were surveyed during warm and cold seasons for bat species and habitat in the Project Area (Sherwin 2007).

3.23.2.1.4 Risk Assessment

A SLERA of the proposed pit lake was prepared for the analysis of the Project (SRK 2009). The SLERA has four main objectives: 1) identification of those inorganic chemical constituents and chemical characteristics (e.g., pH, TDS) based on model predictions that may have the potential to contribute to adverse affects on mammal and avian wildlife as per NAC 445B.429; 2) identify ecological receptors, or appropriate surrogate species occupying similar niches, with the highest potential for exposure to chemical constituents in the pit water; 3) identify complete exposure pathways between the post-mining pit lake and the identified receptors; and 4) quantitatively or qualitatively assess the ecological risks to select mammal and avian wildlife receptors exposed to inorganic chemical constituents in water whose concentration in the post-mining pit lake is predicted to exceed the calculated screening level toxicity criteria.

### 3.23.2.2 Existing Conditions

#### 3.23.2.2.1 General Wildlife and Fisheries

Wildlife species and habitats occurring in the Project Area are typical of the northern Great Basin desert region. Results for the 2005, 2006, and 2008 surveys are included below. The general wildlife species are listed to indicate which species are commonly encountered in the Project Area and vicinity.

Important wildlife habitat in the Project Area is located in the big sagebrush (mountain and Wyoming big sagebrush), piñon-juniper woodlands, black sage, low sagebrush, and salt desert scrub vegetation types. The components of these habitats are described in the vegetation section (Section 3.9). Big sagebrush provides important habitat for many sagebrush obligate and facultative wildlife species. Piñon-juniper woodlands provide structural diversity for wildlife species as both thermal cover and food sources, particularly during the winter season. The salt desert scrub vegetation type also provides habitat for wildlife species. As a result of the limited water availability associated with salt desert scrub, the habitat is used seasonally by larger animals and provides a lower abundance of smaller animals than found in the more mesic plant communities. Similarly, the low sagebrush areas provide seasonal habitat for some species and year-round habitat for smaller animal species. Wetlands and riparian communities within the Project Area are limited to small seeps and springs (see Section 3.11).

Common wildlife species, those that are not special status species or migratory birds, are relatively abundant within and adjacent to the Project Area. Migratory birds and special status species, such as those listed as threatened, endangered, or sensitive by government agencies are covered below under special status species.

*Mammals*

The mammal species within the Project Area include those typically found in lower and mid-elevation Great Basin habitats. Mammalian species observed in or near the Project Area include mule deer, pronghorn antelope, black-tailed jackrabbits (*Lepus californicus*), yellow-bellied marmots (*Marmota flaviventris*), coyote (*Canis latrans*), bobcat (*Lynx rufus*), badger (*Taxidea taxis*), mountain cottontail (*Sylvilagus nuttallii*), and a variety of other small mammals (i.e., mice, voles, chipmunks) (SRK 2007b).

Mountain lions prey on mule deer and are known to occur within the Project Area. The topography of the Project Area is desirable for mountain lions and two lions were harvested just west and north of the Project Area (NDOW Public Scoping Comments March 16, 2007).

Mule deer utilize the wooded hills and sagebrush habitats within and adjacent to the Project Area. The mule deer population in NDOW hunt units 141 through 145 has been stable to decreasing in the last five years. The trend for the Roberts Mountains (unit 143) portion of the overall management area follows the current trend of stable to downward. The Roberts Mountains deer are migratory in nature. Mule deer leave the Roberts Mountains in October or November and migrate south into the Mountain Boy and Fish Creek Ranges south of U.S. Highway 50. The migration pattern includes moving south from Roberts Creek Ranch to Lone Mountain and from Henderson Summit along Whistler Mountain to Devil's Gate (NDOW Public Scoping Comments, March 16, 2007). Mule deer corridors are illustrated on Figure 3.23.1.

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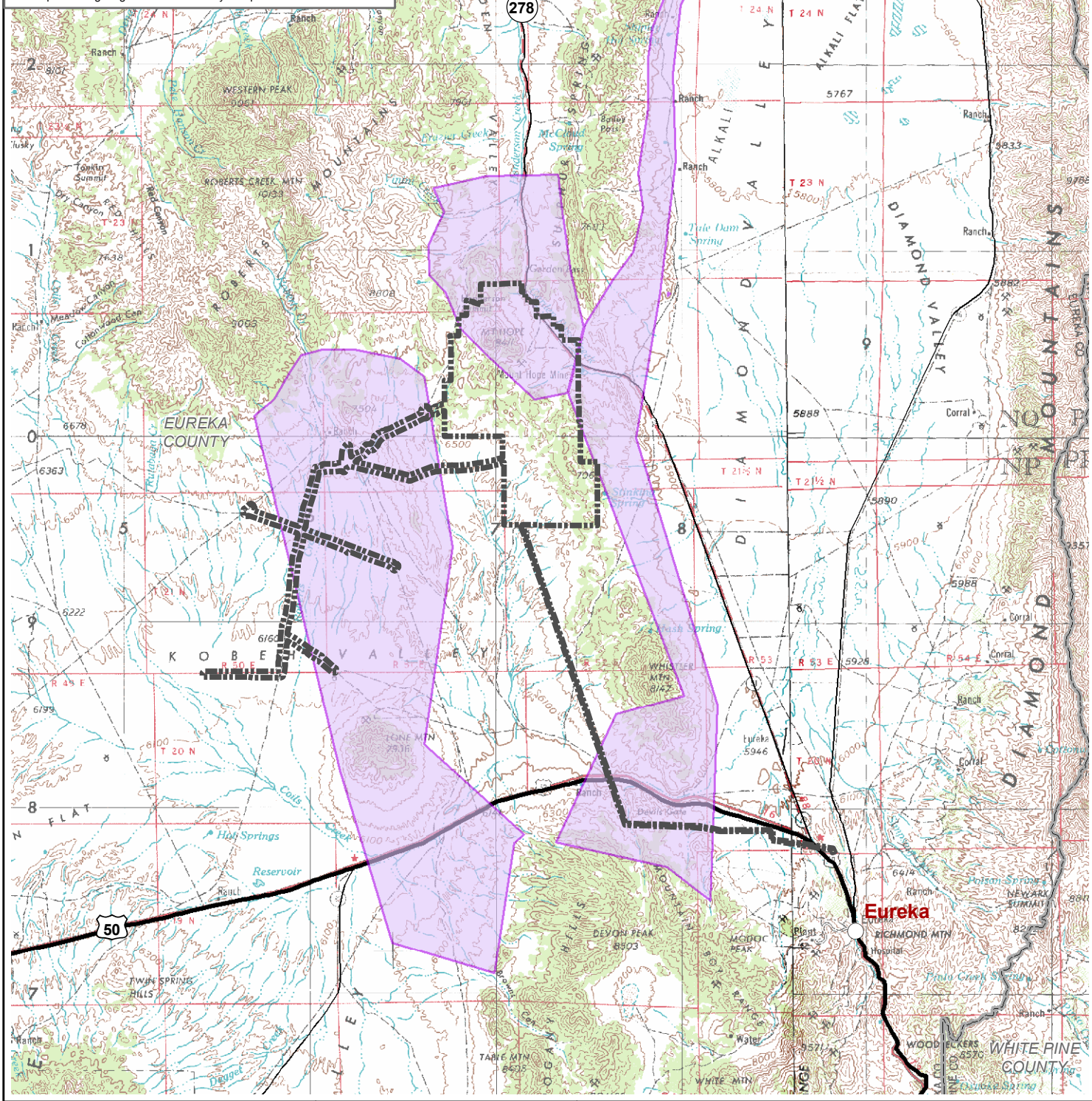


## EXPLANATION

- Project Area Boundary
- Deer Corridors

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**BUREAU OF LAND MANAGEMENT**
**MOUNT HOPE PROJECT**

DRAWING TITLE:

**Deer Corridors in the Vicinity of the Mount Hope Project**

**Figure 3.23.1**

The immediate area around Mount Hope has limited summer range for mule deer due to the lack of water and mountain brush vegetation community. There are a few deer that reside on Mount Hope. Increased numbers of deer migrate through the Mount Hope area from summer ranges in the north and west during the fall and spring (NDOW Public Scoping Comments, March 16, 2007).

Pronghorn antelope were observed on the west side of the Project Area during the quarterly water sampling in November 2006 (SRK 2007b) and were observed in the lower elevations of the Project Area that are located in Kobeh Valley where low sagebrush and rabbitbrush were prominent. The population of pronghorn antelope in NDOW units 141, 143, and 151 through 155 has been in an upward trend, increasing every year between 2001 and 2006. The 2006 population estimate was 450 animals, up from 240 in 2002. The pronghorn antelope population in Kobeh Valley is low and variable with most of the antelope observed in the southern part of the valley near Lone Mountain and U.S. Highway 50 (NDOW Public Scoping Comments, March 16, 2007).

*Game Birds*

Few game birds are known to occur within the Project Area; however, chukar and mourning dove, occur in and adjacent to the Project Area. Even though greater sage-grouse is a game bird, this species is discussed under special status species.

Chukar typically inhabit rock outcrops and ledges adjoining grassy and sagebrush hillsides. Chukar are common in the Roberts Mountains, Whistler Mountain, and Sulphur Springs Ranges (NDOW Public Scoping Comments, March 16, 2007). Seasonal habitat occupation occurs in accordance with increased moisture and heavy snows. The birds typically move to lower elevations and south-facing slopes during heavy snow events and concentrate around spring sources in the summer months. Mourning doves usually forage on seeds in more open terrain and nest and roost in the trees. Mourning doves are commonly found along unimproved roads where they obtain gravel for food digestion. During the summer months the doves are commonly found near springs and artificial water sources (e.g., cow troughs, guzzlers, etc.) and migrate south for the winter (SRK 2007b). Mourning doves nest and forage in the area from spring to early autumn (NDOW Public Scoping Comments, March 16, 2007).

*Reptiles*

There are a variety of reptiles (i.e., snakes and lizards) that are commonly found in the sagebrush or rock outcrops and talus slopes in the Project Area. No reptilian surveys were conducted; however, it is likely that species such as the western fence lizard (*Sceloporus occidentalis*), northern sagebrush lizard (*Sceloporus graciosus*), leopard lizard (*Gambelia wislizenii*), western whiptail lizard (*Cnemidophorus tigris*), and horned lizard (*Phrynosoma* spp.) occur within the Project Area. The Great Basin rattlesnake (*Crotalus viridis lutosis*) is also likely to occur in the broken rocks and brush habitats within the Project Area. It is possible that other species not mentioned may occur within the Project Area.

*Fisheries*

Within the perennial drainages of the Roberts Mountains, recreational fisheries are present in Roberts Creek and Pete Hanson Creek. Fisheries may be present in other perennial drainages. NDOW data for 2010 on Roberts Creek document an average of 72.6 fish per mile for brook trout (*Salvelinus fontinalis*), 39.6 for rainbow trout (*Oncorhynchus mykiss*), and 13.2 for brown trout (*Salmo trutta*). An estimated 1,016.5 game fish existed along 5.5 miles of Roberts Creek. A ten-year study on Pete Hanson revealed an average of six anglers a day, ten days of fishing, and 85 fish caught per year. The same study on Roberts Creek averaged 17 anglers a day, 58 days of fishing, and 171 fish caught per year. A discussion of surface water resources (streams) is included in Section 3.2.2.3.1.

3.23.2.2.2 Special Status Wildlife Species

*Greater Sage-Grouse*

Greater sage-grouse are largely dependent on sagebrush for nesting and brood rearing and feed almost exclusively on sagebrush leaves during the winter. Greater sage-grouse are known to occur in foothills, plains, and mountain slopes where sagebrush meadows, and aspen, are in close proximity. Dense sagebrush overstory and an herbaceous understory of grasses are important to provide shade and security, and both new herbaceous growth and residual cover are important in the understory. Greater sage-grouse have specific habitat requirements to carry out their life cycle functions. Early spring habitat or breeding sites called "leks," are usually situated on ridge tops or grassy areas surrounded by a substantial brush and herbaceous component (Schroeder et al. 1999). Leks have less herbaceous and shrub cover than surrounding areas. In early spring males gather in leks where they strut to attract females.

The distribution of greater sage-grouse in Nevada is closely tied to the sagebrush ecosystem that provides nesting, brood, and fall/winter cover as well as forage throughout the year. Summer habitat consists of sagebrush mixed with areas of wet meadows, riparian, and irrigated agricultural fields. Fall habitat consists of mosaics of low-growing sagebrush and Wyoming big sagebrush. Winter habitat is contingent on the severity of winter weather, topography, and vegetative cover (NDOW 2004). Late spring habitat or nesting sites are located in thick cover in sagebrush habitat beneath sagebrush or other shrubs. Nests are situated on the ground in a shallow depression with an average distance between nest sites and nearest leks of 0.7 to 3.9 miles; however, females may move greater than 12.4 miles from a lek to nest (NatureServe 2010). Individual greater sage-grouse move seasonally between habitat types throughout the year.

The NDOW defines lek status as active, inactive, historic, or unknown. An active lek is defined as a lek that had two or more birds present during at least one of three or more visitations in a given breeding season. For a strutting ground to attain this status it must also have had two or more birds present during at least two years in a five-year period. An inactive lek is a lek that has been surveyed three or more times during one breeding season with no birds detected during the visitations and no sign observed on the lek. If a lek is only visited once during a breeding season and was surveyed under adequate conditions and no birds were observed at the location during the current and the previous year and no sign was observed at the lek, then an inactive status can be applied to the lek. An unknown lek is a lek that may not have had birds present during the last visitation, but could be considered viable due to the presence of sign at the lek. This designation

could be especially useful when weather conditions or observer arrival at a lek could be considered unsuitable to observe strutting behavior. The presence of a single strutting male would invoke the classification of the lek as unknown. A lek that was active in the previous year, but was inadequately sampled (as stated above) in the current year with no birds observed could also be classified as unknown. A historic lek is a lek that has not had bird activity for twenty years or more and has been checked according to protocol at least intermittently. Another means of classifying a lek as historic is to photograph a lek location and determine if the habitat is suitable for normal courtship displays. For example, if a lek location lies in a monotypic stand of sagebrush that is three to four feet tall, then conditions are no longer suitable for lekking activity.

The NDOW also designates a notice status for active, inactive, and unknown status leks. As a result of the number of documented lek locations in the State of Nevada and the limited personnel available to visit all leks each year, the status applied to a lek through its most recent visitation will be upheld in subsequent years until the lek is revisited to verify its status. These descriptions are the most current attempt at applying a definition to the status of a lek and are subject to change to compensate for any unforeseen scenarios. All the leks in Nevada have not yet had these classification applied to them; however, the NDOW is committed to standardizing lek status across regions and field verifying lek status over time.

Greater sage-grouse are known to inhabit Kobeh, Diamond, and Garden Valleys and the Roberts Mountains. Greater sage-grouse are known to move from Kobeh Valley to the Roberts Mountains during their life cycle. Within the Project Area, there are 3,795 acres in greater sage-grouse nesting and early brood rearing habitat (located primarily in the well field and transmission line), 13,480 acres in greater sage-grouse summer and winter distribution (located throughout the entire Project Area), and 3,844 acres in 2011 core breeding habitat (located in the wellfield and around the mine area) (Figure 3.23.2). Summer habitat is also late brood rearing habitat for greater sage-grouse. Core breeding habitat is based on the location of active leks, which could change from year to year based on the history of a lek.

An ongoing study is being conducted in relationship to the Falcon-Gondor transmission line and the effects on greater sage-grouse populations. The Falcon-Gondor line is approximately 180 miles long and has 735 towers that vary in height from 75.5 to 131 feet, depending on the topography. The path of the Falcon-Gondor line places it in the middle of Eureka County's prime greater sage-grouse habitat. The study site for the transmission line is located in central Nevada within Eureka County and is bounded by the Cortez and Simpson Park Mountains to the west and the Diamond and Sulphur Spring Mountains to the east. This area includes the Denay, Pine, Kobeh, Diamond, Horse Creek, Grass, and Garden Valleys. The study area encompasses approximately 2,500 square miles of sagebrush steppe and piñon-juniper mountain ranges with many ephemeral streams. The study area includes 74.6 miles of the Falcon-Gondor line and focuses on 13 active leks at various distances from the Falcon-Gondor line. Five of these leks have been monitored by the NDOW and BLM for the past thirty years. The Falcon-Gondor line crosses through the proposed Project Area and this region was the focus of the Roberts Creek greater sage-grouse population. The Cortez greater sage-grouse population was also studied. The most recent summary of the results of these studies indicate that there are substantial demographic differences between the Roberts Creek and Cortez populations, and suggest that greater sage-grouse in the Cortez Range are at higher risk. Variation in habitat conditions, driven at least in part by wildland fire, partially explain this variation for male survival and nest success, whereas variation in predator communities and challenges associated with reproduction may limit female survival. The greater sage-grouse population in the area monitored appeared to have

stabilized in 2010, based on patterns in lek attendance and male capture-recapture estimates (Blomberg et al. 2010).

The greater sage-grouse trend in Eureka County is described below. The peak male attendance at the ten comparable areas surveyed in 2006 was 411 for an average of 41.1 males per ground. This resulted in a 31 percent increase from 2005 when 314 males were counted for an average of 31.4 males per ground. The 41 males per ground was the highest average since 1986 when the average was 47 males. The 20-year average (1986 through 2005) for comparable grounds was 26 males and the ten-year average (1996 through 2005) was 24. In addition to trend counts, there were nine active leks surveyed by the NDOW, BLM, and UNR graduate students in 2006. The 19 active leks monitored in Eureka County in 2006 had 673 males in attendance for an average of 35 males per lek. In 2005, there were 18 active leks checked with 483 males yielding an average of 27 males per lek. There was one new active lek found in the Cortez Range with 34 males in attendance (NDOW Public Scoping Comments, March 16, 2007). Greater sage-grouse are a USFWS candidate species, BLM sensitive species, NNHP watch species, and State of Nevada protected species (NRS 501). Individual greater sage-grouse counts can vary year to year and approximately ten years of data are required to establish population trends.

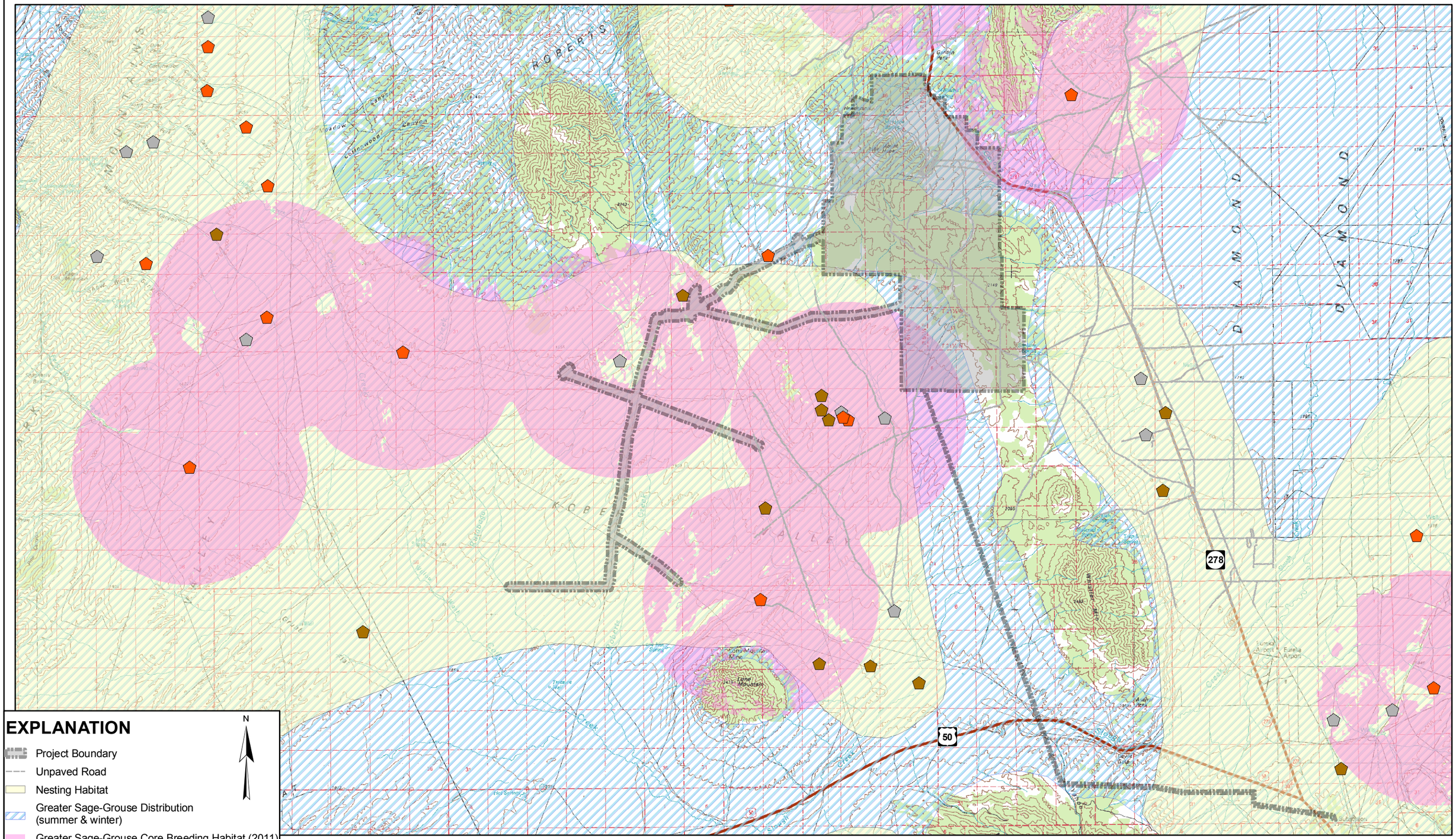
Potential greater sage-grouse habitat within the Project Area was surveyed and no active leks were identified within the area of proposed disturbance and no individual greater sage-grouse were observed (SRK 2007b). Although no leks have been identified within the Project Area, the BLM has recorded the following greater sage-grouse use in the Project Area: hens; nests; additional brood, hen, and lek locations are located near the well field corridor and near the powerline (Personal Communication, Duane Crimmins, BLM Biologist, April 4, 2008). One greater sage-grouse dropping was recorded in the northeast portion of the proposed well field in the Project Area.

The BLM and NDOW have identified known greater sage-grouse leks within the vicinity of the Project Area (Figure 3.23.2). As illustrated on Figure 3.23.2, the area covers approximately 38 miles east-west and 21 miles north-south centered on the Project's well field. The figure illustrates 15 active leks, 13 historic leks, and 13 unknown leks. Four leks were surveyed by SRK and found to be active: the Pony Express Lek; Kobeh 8-1 Lek; Lone Mountain Lek; and Dome House Lek. The Pony Express Lek only had two greater sage-grouse present on the lek during the time of the survey. A third bird flushed upon approach, approximately 1,000 feet from the lek. The area adjacent to the lek was overgrown with Wyoming big sagebrush and the birds used the road to strut, since it was the only open feature in the vicinity (SRK 2007b).

The Kobeh 8-1 Lek was active with approximately 15 birds present. The lek was fairly typical of greater sage-grouse lek sites with open, low vegetation at the lek surrounded by taller shrub cover (SRK 2007b).

The Lone Mountain Lek was active with approximately 36 birds present. This lek was large with birds scattered over approximately 650 feet. The lek was on a ridge covered with low sagebrush and adjacent Wyoming big sagebrush (SRK 2007b).

The Dome House Lek was active with 25 to 30 birds present. The lek area was fairly small and relatively close to piñon-juniper trees (SRK 2007b).




## EXPLANATION

- Project Boundary
- Unpaved Road
- Nesting Habitat
- Greater Sage-Grouse Distribution (summer & winter)
- Greater Sage-Grouse Core Breeding Habitat (2011)

**2008 Greater Sage-Grouse Lek Status**

- Active
- Historic
- Unknown

N

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**BUREAU OF LAND MANAGEMENT**

**MOUNT HOPE PROJECT**

DRAWING TITLE:

**Greater Sage-Grouse Leks and Distribution**

**Figure 3.23.2**

The Henderson Pass lek has also been identified as active by the BLM and was first documented in 2008 with 27 males in attendance, in 2009 with 16 males, and in 2010 with seven males.

The highest single day lek attendance at the Pony Express Lek, Kobeh 8-1 Lek, Lone Mountain Lek, Dome House Lek, and Henderson Pass Lek were recorded in the most recent Falcon-Gondor Study and are summarized in Table 3.23-1 (Blomberg et al. 2010). The cyclic nature of greater sage-grouse populations is illustrated in Table 3.23-1 as lek attendance dropped in 2007. To date, there has not been a recovery to pre-2007 numbers and the effects to these leks as a result is not known. Results from the 2010 study indicate that male attendance in the Horse Creek, Pinefield, Pony Express, Lone Mountain, and Kobeh Leks have decreased from approximately 60 to 30 between 1970 and 2010; however, male attendance in these leks has been relatively stable at approximately 30 since 2000.

There are additional leks throughout the region and outside of the Project Area (Figure 3.23.2).

*Migratory Birds and Raptors*

The following raptors (also migratory birds) or their sign were observed in or near the Project Area: Cooper's hawk (*Accipiter cooperii*); ferruginous hawk (*Buteo regalis*); golden eagle; prairie falcon (*Falco mexicanus*); and kestrels (*Falco sparverius*) (SRK 2007b) (Figure 3.23.3). It is possible that other species of raptors not mentioned may utilize the Project Area.

**Table 3.23-1 Highest Single Lek Attendance for Each Lek by Sex and Year from the Falcon-Gondor Study**

| Year | Lek | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Pony Express | | Kobeh 8-1 | | Lone Mountain | | Dome House | | Henderson Pass | |
| | Males | Females | Males | Females | Males | Females | Males | Females | Males | Females |
| 2003 | 14 | 1 | 14 | 5 | 32 | 3 | 15 | 1 | - | - |
| 2004 | 11 | 1 | 10 | 3 | 33 | 7 | 17 | 5 | - | - |
| 2005 | 15 | 1 | 12 | 2 | 50 | 17 | 28 | 4 | - | - |
| 2006 | 15 | 6 | 54 | 4 | 63 | 11 | 47 | 5 | - | - |
| 2007 | 10 | 3 | 6 | 1 | 56 | 14 | 22 | 3 | - | - |
| 2008 | 6 | 1 | 7 | 1 | 34 | 12 | 23 | 8 | 27 | 8 |
| 2009 | 8 | 0 | 6 | 2 | 22 | 6 | 12 | 5 | 16 | 6 |
| 2010 | 0 | 0 | 9 | 7 | 17 | 2 | 17 | 1 | 7 | 3 |

Two raptor nests were located in the Project Area. A Cooper's hawk was observed on the west side of Mount Hope during the aerial survey. The hawk nest was observed in subsequent field work in the southwest 1/4 of Section 1, T22N, R51E. A ferruginous hawk nest was also observed in the Project Area. A pair of ferruginous hawks was observed on April 28, 2006, in Section 20, T22N, R52E, near Tyrone Creek. The male was flushed from the ground and the female was observed in a nearby piñon tree on the nest (SRK 2007b).

Steep and extensive rock ledges are located at the eastern edge of the Project Area. This rock formation was the site of many inactive raptor nests. Just east of the Project Area boundary in the same rock formation, two active prairie falcon nests were located. Kestrels, which normally nest in tree cavities or crevices within rock ledges, were also observed in this rock formation. Although it is likely that kestrel nests were present in the rock formation east of the Project Area, specific locations could not be determined at the time of the survey (SRK 2007b).

Golden eagle nesting habitat is located in the rock ledges found east of the Project Area (SRK 2007b). Three golden eagle nests are located within ten miles of the Project Area. SRK located an active golden eagle nest approximately 1.25 miles east of the Project Area boundary and three miles from Project activities in Section 22 (SRK 2007b). This nest is located on the east side of the ridge, approximately 40 to 60 feet below the ridgeline (i.e., facing Diamond Valley and away from Project activities). SRK also located an inactive golden eagle nest approximately 1.5 miles east of the Project Area in Section 27. This nest is also located on the east side of the ridge and more than 60 feet below the ridgeline. The NDOW identified an active nest approximately 8.4 miles southeast of the Project Area. Golden eagle foraging habitat is found throughout the Project Area (SRK 2007b).

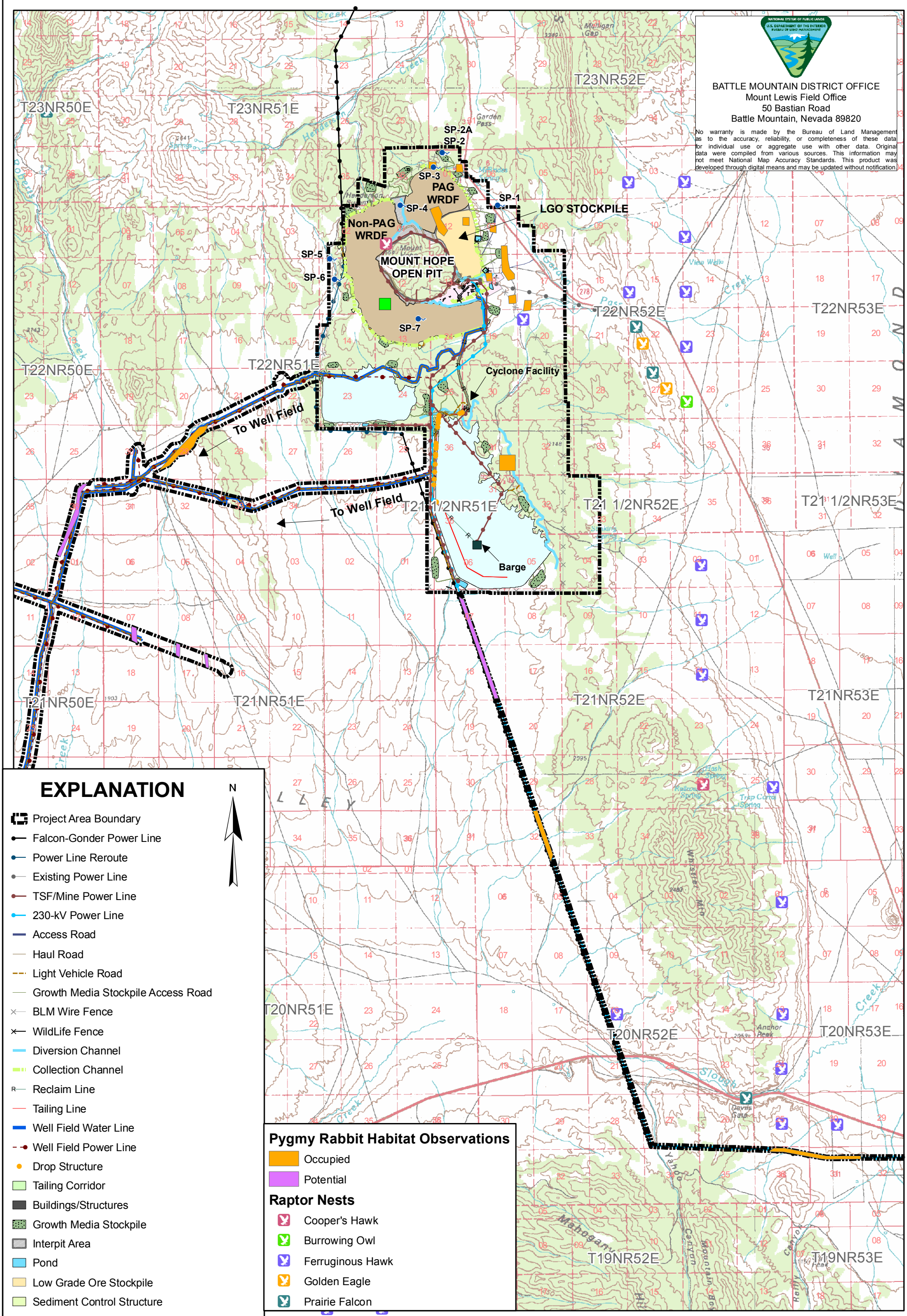
No nests were observed on the Falcon-Gondor Power Transmission Line towers. This line was constructed with materials designed to discourage nesting by raptors and ravens (*Corvus corax*). Although a red-tailed hawk (*Buteo jamaicensis*) was observed perched on a cross bar, and the whitewash typical of raptor perch sites was common on many of the powerline poles, no nests were observed (SRK 2007b).

A number of migratory birds that breed in North America and winter in the neotropical region of South America also breed in the Project Area and vicinity. Species commonly occurring in piñon-juniper habitats include the piñon jay (*Gymnorhinus cyanocephalus*), gray flycatcher (*Empidonax wrightii*), mountain bluebird (*Sialia currucoides*), western bluebird (*Sialia mexicana*), Virginia's warbler (*Vermivora virginiae*), and Scott's oriole (*Icterus parisorum*) have the potential to occur in the Project Area. Other species such as the sage thrasher (*Oreoscoptes montanus*), sage sparrow (*Amphispiza belli*), loggerhead shrike (*Lanius ludovicianus*), and black rosy finch (*Leucosticte atrata*) have potential to occur in the sagebrush habitats in the Project Area (SRK 2007b). Green-tailed towhee (*Pipilo chlorurus*) also has the potential to occur in the sagebrush habitat in the Project Area (NDOW Public Scoping Comments, March 16, 2007). The piñon jay, loggerhead shrike, and black rosy finch are also BLM sensitive species.

Common nighthawk (*Chordeiles minor*) and common raven *(Corvus corax)* were observed in the survey of the Kobeh Valley portion of the Project Area (Great Basin Ecology 2008). The following migratory birds are located in Kobeh Valley and have the potential to occur in the Project Area: black-throated gray warbler (*Dendroica nigrescens*), black-throated sparrow (*Amphispiza bilineata*), Brewer's sparrow (*Spizella passerina*), lark sparrow (*Chondestes grammacus*), and western meadowlark (*Sturnella magna*) (Great Basin Ecology 2008). It is likely that there are some migratory bird species not mentioned here that may utilize the Project Area for nesting or foraging.

*Pygmy Rabbits*

The Project Area and vicinity contains suitable habitat for occupation by pygmy rabbits. Known pygmy rabbit locations and previously occupied habitat are shown on Figure 3.23.3. The pygmy rabbit is a BLM sensitive, NNHP watch, and State of Nevada protected species. Pygmy rabbits are often found in dense big sagebrush and rubber rabbitbrush areas. Such vegetation is associated with deeper soils, which is an important component of pygmy rabbit habitat, occur in many areas on the alluvial fans located in the Project Area. Nineteen burrows and ten pygmy rabbits were documented during the surveys conducted on August 3, 4, and 18, 2006, in the proposed mine portion of the Project Area. The majority of the sightings and burrow locations occurred along the old railroad grade that parallels SR 278 to the west. The deep soil

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**BUREAU OF LAND MANAGEMENT**

**MOUNT HOPE PROJECT**

DRAWING TITLE:

**Pygmy Rabbit and Raptor Observations within the Mount Hope Project Area**

**Figure 3.23.3**

embankments along with the railroad timbers provided necessary structure and vegetation for pygmy rabbits to thrive. Burrows or pygmy rabbits were found along the entire length of the historical structure. Numerous sightings and burrow complexes were located along the alluvial fan east of Mount Hope Spring. These areas were vegetated by tall (i.e., greater than four feet in height) dense big sagebrush and rubber rabbitbrush and contained adequate understory for cover and forage (SRK 2007b).

Additionally, one isolated colony of pygmy rabbits was located in the southern portion of the Project Area surveyed in 2006. This colony was located within a small island of basin big sagebrush. The height of the shrubs exceeded four feet within the piñon-juniper vegetation type. The site was typical for pygmy rabbits except for the surrounding piñon-juniper trees and small size of the sagebrush island (SRK 2007b).

The proposed transmission line corridor is located adjacent to U.S. Highway 50 and extends north toward the Project Area. The corridor contains suitable pygmy rabbit habitat. Pygmy rabbit habitat within the proposed transmission line corridor consists of a length of approximately 0.76 mile of occupied habitat, 1.37 miles of potential habitat, and 1.95 miles of previously occupied habitat (SRK 2007c).

During the survey of the proposed well field in Kobeh Valley on July 1 and 2, 2008, pygmy rabbits were observed in three areas. One occupied site was located in the Wyoming big sagebrush vegetation type in higher elevations and the two other sites were located in basin big sagebrush associated with drainages. Additional unoccupied areas in Kobeh Valley were identified as suitable pygmy rabbit habitat, which were associated with ephemeral drainages where basin big sagebrush grew between ridges of low sagebrush (Great Basin Ecology 2008).

*Burrowing Owls*

Burrowing owls breed throughout the western U.S. in open grassland areas. In northern Nevada, the burrowing owl occurs as a summer breeder and migrates south during the winter (Herron et al. 1985). Burrowing owl breeding sites are strongly dependent on the presence of burrows constructed by prairie dogs, ground squirrels, or badgers. Prime burrowing owl habitat must be open, have short vegetation, and contain an abundance of burrows. If soil conditions allow, burrowing owls can also dig their own burrows.

Burrowing owl habitat is located in the Kobeh Valley portion of the Project Area; however, none of the burrows examined during the field survey exhibited signs of recent use by burrowing owls (Great Basin Ecology 2008). Burrowing owls are a BLM sensitive species, NNHP watch species, and State of Nevada Protected Species.

*Yellow-billed Cuckoo*

The yellow-billed cuckoo is a candidate for listing as threatened or endangered west of the Rocky Mountains. Available data suggest that the yellow-billed cuckoo's range and population numbers have declined substantially across much of the western U.S. over the past 50 years (USFWS 2001). Habitat continuity is an important landscape feature for yellow-billed cuckoos. Unfragmented riparian woodland patches of at least 50 acres have been suggested to meet minimal habitat requirements in California populations, although occupancy of patches this small was estimated at less than ten percent (Laymon 1998). More suitable habitat consists of

unfragmented riparian woodland patches of 100 acres or larger. Suitable breeding habitat for yellow-billed cuckoos consists of healthy shrub thickets, multi-aged riparian woodland stands, wet meadows, and open water (GBBO 2005). Threats to the yellow-billed cuckoo have been identified following loss or degradation of riparian habitat from human activities including agricultural development, river flow management, stream alterations, and livestock grazing (USFWS 2001). Yellow-billed cuckoos nesting west of the Continental Divide occur almost exclusively close to water, and biologists have hypothesized that the species may be restricted to nesting in moist river bottoms because of humidity requirements for successful hatching and rearing of young (Hamilton and Hamilton 1965; Rosenberg et al. 1991).

Riparian thicket habitat is nonexistent within the Project Area. No yellow-billed cuckoos were observed during the field surveys of the Project Area (SRK 2007b). Riparian thicket habitat does exist adjacent to perennial stream in the Roberts Mountains; however, this habitat is very limited in extent (less than 50 acres).

*Bats*

Several bat species have the potential to occur within the Project Area. The historic underground mine workings serve as potential habitat for bats. The survey conducted in the Project Area found hibernation habitat for small-footed myotis (*Myotis ciliolabrum*), a BLM sensitive species and NNHP watch species, and Townsend's big-eared bat (*Corynorhinus townsendii*), a BLM sensitive species, NNHP at-risk species, and State of Nevada protected species. The most notable use was documented in the largest and most complex of the mines within the Project Area, the Mount Hope Mine. Cold season use by bats of other workings in the Project Area was relatively low. Virtually all mines in the Project Area experienced some warm season use. Evidence of extensive summer habitat for Townsend's big-eared bat was located in the Mount Hope Mine. Evidence of maternity use was documented in portions of the Mount Hope Mine closely associated with Adit 9. Additionally, the distribution of Townsend's big-eared bat guano in the Lorraine Mine suggests that this or another maternity colony utilizes these workings (Sherwin 2007).

#### 3.23.2.2.3 Special Status Fish Species

*Lahontan Cutthroat Trout*

Lahontan cutthroat trout (LCT) is the only ESA-listed species of potential concern under consideration as a result of the proposed Project. LCT were originally listed as endangered under the ESA on October 13, 1970 (35 FR 16047-16048), then reclassified as threatened on July 16, 1975, under the ESA to facilitate management and allow regulated angling (40 FR 29863-29864). The Recovery Plan for LCT was approved on January 30, 1995.

LCT is an inland subspecies of cutthroat trout (family Salmonidae). The species may be either riverine or lacustrine and are endemic to the Lahontan Basin of northeast California, southeast Oregon, and northern Nevada. The range for LCT in Nevada includes the Truckee, Carson, Walker, Quinn, and Humboldt River basins, the Honey and Coyote Lake basins, and Black Rock Desert basin. A portion of the Project Area, and a portion of the wildlife study area falls within the Humboldt River basin, which is the basin that supports the greatest number of fluvial LCT populations (USFWS 1995). The Humboldt River basin is broken up into subbasins. A portion of the wildlife study area is located within the Pine Creek subbasin. Within the Pine Creek

subbasin, there are two streams, Birch Creek and Pete Hanson Creek, with five miles of occupied habitat and two streams, Henderson Creek and Vinini Creek, with 15.6 miles of potential habitat (seven and 8.6 miles respectively) for this species with no metapopulation potential (Figure 3.23.4).

Riverine, or stream-dwelling, LCT usually live less than five years and may reach ten to 15 inches in length. Females mature at three to four years of age and males at two to three years of age (USFWS 1995). As with all cutthroat trout, the LCT is an obligate riverine spawner. Spawning occurs from April to July, depending on discharge, elevation, and water temperature. Spawning and nursery habitat is characterized by cool water, pools in close proximity to instream cover, velocity breaks, well-vegetated and stable streambanks, and relatively silt-free rocky substrate in riffle-run areas (USFWS 1995). This species spawns in riffles over gravel substrate when water temperatures are between 41 to 60 ˚F. Intermittent tributaries are sometimes used as spawning sites during high-water years. Fry may develop in the tributary stream until flushed into the mainstream during high runoff (Coffin 1981; Trotter 1987).

General characteristics of riverine cutthroat habitat include a relatively stable flow regime, a 1:1 pool to riffle ratio, well-vegetated stable streambanks, instream cover exceeding 25 percent, and relatively silt-free riffle-run areas. Cutthroat trout waters generally have a stable summer temperature regime with less than 39 ˚F fluctuation in water temperature and maximum water temperatures less than 72 ˚F (Hickman and Raleigh 1982). LCT may have a higher thermal tolerance than other cutthroat trout and can tolerate temperatures exceeding 80 ˚F for short periods of time and 57 to 63 ˚F fluctuations of temperature (Coffin 1983; Dickerson and Vinyard 1999). Beaver ponds may provide thermal refuge for trout in the summer and winter. Habitat requirements may vary somewhat with life stage and season (USFWS 1995). LCT primarily feed on terrestrial and aquatic invertebrates, although larger fish may be picivorous (fish eating).

The decline of LCT has been primarily attributed to the loss and degradation of habitat. Agricultural and municipal uses of water from streams or lakes have reduced or altered the stream discharge in habitat for this species. Livestock and wild horse grazing have altered the physical characteristics of stream channels and increased the sediment loads in many LCT streams. Mining, urban development, logging, road construction, and dam building have also been associated with changes in stream channel morphology and water quality (USFWS 1995; NDOW 2004b).

LCT compete with or are displaced by nonnative trout species that were historically stocked for recreational fishing opportunities. Dunham and Vinyard (1996) found that the distribution of LCT can be truncated when brook trout are present, although they noted that the results were variable. Furthermore, LCT have hybridized with nonnative rainbow trout in many areas (USFWS 1995; NDOW 2004b).

LCT conservation efforts are ongoing and involve fish transplants, population and habitat surveys, genetic evaluations, habitat improvement projects, new grazing practices, use of riparian fencing, and the creation of fishery management plans for several basins. The objective of these management efforts is the protection or restoration of habitats that sustain viable self-sustaining populations of this species. A self-sustaining population is defined as having been established five or more years and having three or more age classes (USFWS 1995).

The USFWS has recommended an ecosystem management approach for the conservation of this species with a streamside management zone that includes the green line and riparian areas (USFWS 1995). Even in areas where LCT populations have declined, annual year class production is highly variable and the species has the capability of responding to improved environmental conditions with rapid increases in abundance (Platts and Nelson 1983; 1988). Site-specific opportunities may exist to improve the status of LCT, including mitigation for permitted land use activities (NDOW 2004b).

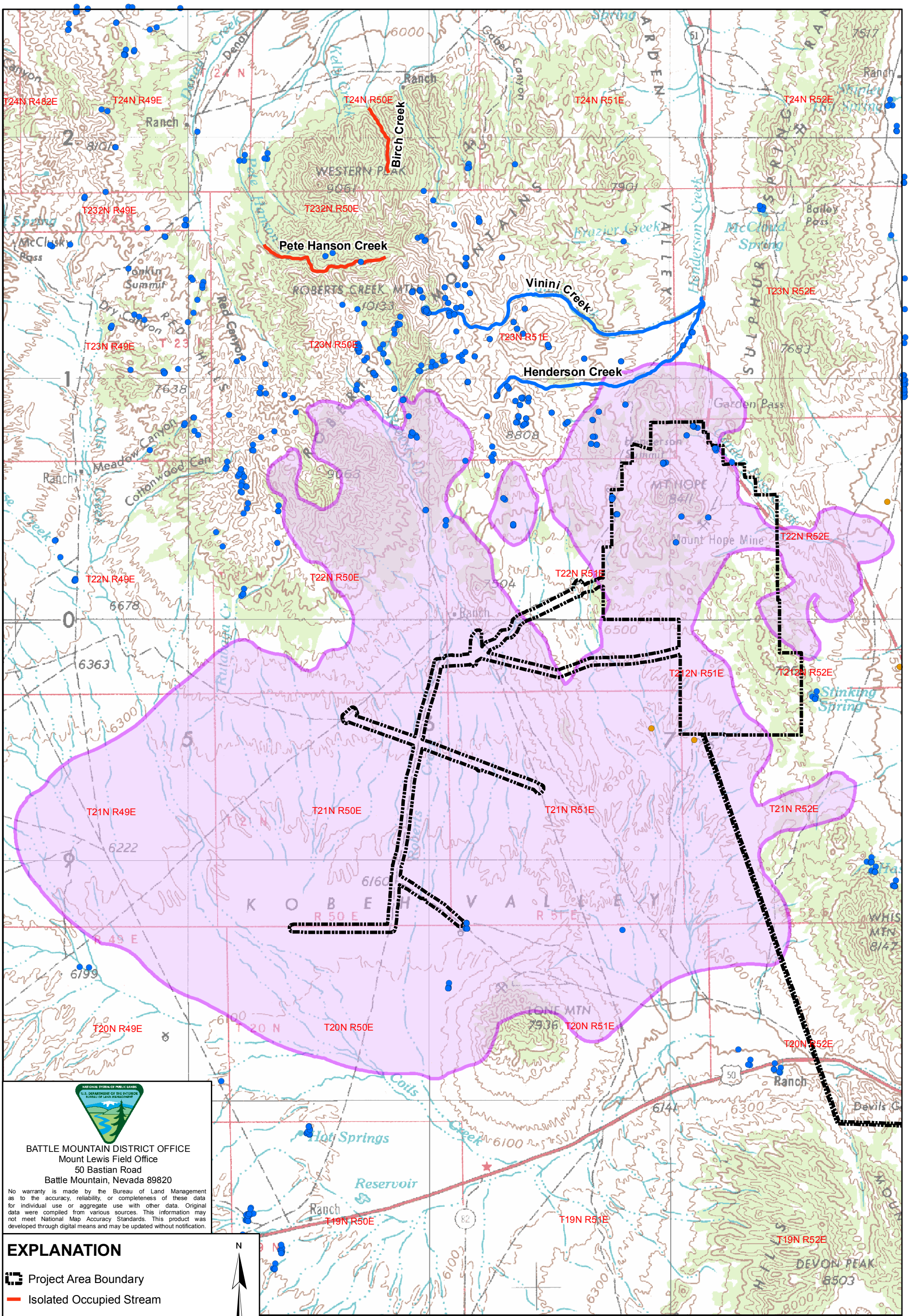
Status within the Pine Creek Subbasin

The Pine Creek subbasin contains two creeks, Birch Creek and Pete Hanson Creek, with LCT occupying approximately five miles of habitat (NDOW 2004b) (Figure 3.23.4). These creeks are isolated occupied streams as identified by the NDOW (i.e., LCT is present in these isolated stream segments of larger river systems with no opportunity for natural recolonization) (USFWS 1995). Both Birch Creek and Pete Hanson Creek currently support LCT (NDOW 2009a). Birch Creek is located on the northeastern flank of Western Peak approximately 10.5 miles northwest of the Project. Pete Hanson Creek is located on the northwest side of Roberts Mountains approximately eight miles northwest of the Project. In the summer of 2011, the NDOW located a population of LCT in Willow Creek which is located east of Birch Creek and northeast of the Project Area (Personal Communication, Ryan Sandefur, September 23, 2011).

Birch Creek originates from the north side of Cooper Peak at approximately 8,200 feet amsl in the Roberts Mountains from four separate springs along three different reaches. Birch Creek flows north until it reaches the valley floor at 6,400 feet amsl where it is diverted for agriculture.

The first fish population survey was conducted in 1957 and subsequent surveys occurred in 1984, 1998, 2003 (NDOW 2003a), and 2009 (NDOW 2009a). During the 1957 survey, two stations were electroshocked and what was believed to be cutthroat trout/rainbow trout (*Oncorhynchus mykiss*) hybrids were found at an average population of 95.9 fish per mile. The stream had last been stocked with trout in 1952; however, the numbers and species were not reported. An intensive habitat and fish population survey conducted in 1984 found what was thought to be cutthroat trout/rainbow trout hybrids at four stations (191.4 fish per mile average) and rainbow trout at two stations (184.8 fish per mile average). Four age classes were represented in the hybrid sample while three age classes were found in the rainbow trout sample; however, post-1984 genetic sampling found those hybrids to be pure LCT (NDOW 2009a).

Both of these surveys questioned whether the fish sampled were actually hybrids. The origin of LCT found in Birch Creek is not known. In 1988 ten fish were sampled and collected for biochemical genetic analysis. The sample found that the fish were pure LCT (Bartley and Gall 1989). It is not known if the fish were stocked in the early 1900s or if the fish are descendants from cutthroat trout native to the Pine Creek drainage. Further, in 2003, LCT from Birch Creek were sampled to identify the probable origin of transplanted populations and to assess the degree of introgression in other populations. Phylogenetic analysis of Birch Creek LCT found that they clustered most closely with East Fork Carson River populations (Peacock 2003). Peacock (2003) also noted evidence of multiple source populations and significant genetic barriers in the Birch Creek population of LCT; however, Peacock also states that sampling is incomplete and phylogenetic relationships can easily be influenced by incomplete sampling.


Birch Creek
Pete Hanson Creek
Vinini Creek
Henderson Creek
T24N R482E
T24N R49E
T24N R50E
T24N R51E
T24N R52E
T232N R49E
T232N R50E
T23N R49E
T23N R50E
T23N R51E
T23N R52E
T22N R49E
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T20N R52E
T19N R50E
T19N R51E
T19N R52E
WESTERN PEAK
ROBERTS CREEK MTS
MT HOPE
Mount Hope Mine
LONE MTN
DEVON PEAK
Hot Springs Reservoir
Stinking Spring
Garden Pass
Bailey Pass
McClelland Spring
Henderson Summit
Ranch
K O B E H V A L L E Y
BATTLE MOUNTAIN DISTRICT OFFICE
Mount Lewis Field Office
50 Bastian Road
Battle Mountain, Nevada 89820
No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data. Original data were compiled from various sources. This information may not meet National Map Accuracy Standards. This product was developed through digital means and may be updated without notification.
EXPLANATION
Project Area Boundary
Isolated Occupied Stream
Recovery Reach
Spring/Seep
Well
10-foot Drawdown Contour Maximum Extent
N
0 1 2 3 4 Miles
DESIGN: EMLLC
DRAWN: GSL
REVIEWED: RFD
CHECKED: -
APPROVED: -
DATE: 05/12/2011
FILE NAME: p1635_Fig3-23-4_LCT_Habitat.mxd
BUREAU OF LAND MANAGEMENT
MOUNT HOPE PROJECT
DRAWING TITLE:
Lahontan Cutthroat Trout Occupied Habitat and Recovery Areas
Figure 3.23.4

In 1998, LCT occupied approximately 1.5 miles of Birch Creek with an average population of 153.2 fish per mile. The ratio of adult to sub-adult was 26 percent to 74 percent. The total population including young-of-year was 229.9 and the fish caught ranged from fair to excellent body condition (NDOW 2009b).

The NDOW (2003a) reported that the 2003 electrofishing survey was comparable to the 1984 and 1998 surveys for occupied habitat (1.5 miles), number of age classes (three age classes), and ratio of adult to sub-adult (46.7 percent/53.3 percent). Ocular estimation of habitat conditions on the survey ranged from fair to excellent with the lack of quality pools and cemented substrate being limiting factors (NDOW 2003a). In 2003, LCT had an average population of 198.0 fish per mile (NDOW 2009a).

The most recent fish population survey of Birch Creek was conducted in July 2009. LCT occupy approximately 1.9 miles of Birch Creek at an average population of 116.2 fish per mile. There were two age classes and the ratio of adult to sub-adult is 18 percent to 82 percent. The total population including young-of-year was 220.8 and all of the fish caught were considered to be in good body condition (NDOW 2009b).

Pete Hanson Creek originates south of Western Peak, on the southwest side of Cooper Peak at approximately 7,200 feet amsl in the Roberts Mountains. Pete Hanson Creek flows northwest until reaching the valley floor where it is diverted for agriculture. The first fish population survey was conducted in 1957 and subsequent surveys occurred in 1984, 1998, and 2003 (NDOW 2003b).

The first fish population survey of Pete Hanson Creek occurred in 1957. Three stations were electroshocked below a 20 to 25 foot waterfall that occurs in the upper portion of the creek. Although no fish were found during this survey, it was estimated that there was 2.4 miles of suitable fish habitat below the waterfall. It was also noted that brook trout had been stocked in 1918 and rainbow trout in 1952. In November of 1983, 55 LCT were taken from Shoshone Creek (Big Smokey Valley Drainage) and stocked above the waterfall. The Shoshone Creek LCT had originally come from Kingston Creek (via Washington Creek of the Reese River Drainage) around 1895. In 1978, the Shoshone Creek fish were analyzed and found to be pure LCT. A more intensive habitat and fish population survey of Pete Hanson Creek conducted in 1984, found LCT at an estimated population of 184.8 fish per mile with an occupied range of one-half-mile.

In 1998, LCT occupied approximately 3.5 miles of Pete Hanson Creek with an average population of 381.7 fish per mile. The ratio of adult to sub-adult was 40 percent to 60 percent. The total population including young-of-year was 1,335.8 and the fish caught were all in good body condition (NDOW 2009b).

In 2003, LCT were found at all but the lowermost stations with an average population of 823.0 fish per mile (excluding young-of-year) and had an estimated occupied range of 3.5 miles. All fish were considered to be in fair to excellent body condition. The results of this survey are very comparable to what was found in 1998. The only difference found was in the fish per mile figures. The 1998 survey had an average of 381.7 fish per mile, while the 2003 survey had an average of 823.0 fish per mile. All other population parameters (occupied habitat, number of age classes, ratio of adult to sub-adult) were very similar. This population has occupied the majority of the available habitat in Pete Hanson Creek (NDOW 2009a). Ocular estimation of habitat

conditions on the survey ranged from fair to good with the lack of quality pools and moderate amounts of sedimentation being the limiting factors (NDOW 2003b).

The most recent fish population survey of Pete Hanson Creek was conducted in July 2009. LCT occupy approximately 3.5 miles of Pete Hanson Creek at an average population of 445 fish per mile. There were five or more age classes and the ratio of adult to sub-adult is 34 percent to 66 percent. The total population including young-of-year was 1,558 and all of the fish caught were considered to be in good body condition (NDOW 2009b). When estimates are adjusted for the high rate of miss (number of fish caught was 30 and 29 were missed), the new estimates reflect 580 fish per mile and a total population estimate of 2,032.8 fish.

Trout Creek, Henderson Creek, and Vinini Creek are listed as possible recovery creeks for LCT in the Pine Creek subbasin (USFWS 1995). Trout Creek is located on the western flank of the Piñon Range approximately 43 miles north of the Project. Trout Creek had a remnant population of LCT in 1980; however, a subsequent survey in 1984 found only rainbow trout, brook trout, and possible hybrids. In 1999 a range fire destroyed the majority of the Trout Creek watershed and the riparian area along Trout Creek (NDOW 2004b). As a result of the significant distance and separation from Trout Creek to the Project, Trout Creek is not further analyzed.

Henderson Creek has a tributary that originates in the northern portion of the Project Area (Figure 3.23.4). Henderson Creek is located approximately one mile north of the Project and originates at approximately 7,830 feet amsl. Henderson Creek flows northeast, then north where it reaches the confluences of Pine Creek at approximately 5,415 feet amsl. Vinini Creek is located approximately 2.5 miles north of the Project and originates at approximately 9,180 feet amsl. Vinini Creek flows east until it reaches the confluence of Henderson Creek at approximately 6,420 feet amsl. The most recent NDOW survey completed in Henderson Creek on June 5, 2007, found no LCT or trout.

Stream Riparian Assessment Data

Riparian assessments were conducted by the NDOW in 2001 for Birch Creek and Pete Hanson Creek to assess the riparian zones ability to dissipate stream energy, protect stream banks, and minimize erosion. Assessing the functioning condition of a stream involves qualitatively analyzing channel morphology, hydrologic, soil, and vegetative parameters to determine a rating. The rating system ranges from Proper Functioning Condition (PFC) to Functional at Risk (FAR) - Upward Trend (FAR-UP), Trend Not Apparent (FAR-NA), Downward Trend (FAR-DN), Non-Functional (NF), and Dry/Intermittent (DRY/INT). Technical Reference Series 1737 developed by the BLM, NRCS, and the USFS explains the methodology of the riparian PFC assessments. Tables 3.23-2 through 3.23-5 below summarize the riparian assessments conducted in 2001 for Birch Creek and Pete Hanson Creek.

## Table 3.23-2: Stream Riparian Assessment Data from 2001 for Birch Creek

| Stream Resources for Birch Creek Watershed | | | | | | | |
|---|---|---|---|---|---|---|---|
| Site Name | Riparian Functioning Condition Rating | | | | | | Total Miles |
| | PFC | FAR-UP | FAR-NA | FAR-DN | NF | DRY/INT | |
| Birch Creek E. Trib. 1 | 0.00 | 0.00 | 0.00 | 0.44 | 0.00 | 0.00 | 0.44 |
| Birch Creek R01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.31 | 0.31 |
| Birch Creek R02 | 0.33 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.33 |
| Birch Creek R03 | 0.37 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.37 |
| Birch Creek R04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.92 | 1.92 |
| Birch Creek R04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.17 | 1.17 |
| Birch Creek R05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.85 | 0.85 |
| **Total** | **0.70** | **0.00** | **0.00** | **0.44** | **0.00** | **4.25** | **5.38** |

## Table 3.23-3: Stream Riparian Assessment Data from 2001 for Birch Creek Springs

| Stream Resources for Birch Creek Watershed | | | | | | |
|---|---|---|---|---|---|---|
| Site Name | Riparian Functioning Condition Rating | | | | | Total Acres |
| | PFC | FAR-UP | FAR-NA | FAR-DN | NF | |
| Birch Creek Spring 1 | 0.00 | 0.10 | 0.00 | 0.00 | 0.00 | 0.10 |
| Birch Creek Spring 1a | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 |
| Birch Creek Spring 2 | 0.00 | 0.00 | 0.05 | 0.00 | 0.00 | 0.05 |
| Birch Creek Spring 3 | 0.00 | 0.00 | 0.00 | 0.27 | 0.00 | 0.27 |
| **Total** | **0.00** | **0.11** | **0.05** | **0.27** | **0.00** | **0.43** |

## Table 3.23-4: Stream Riparian Assessment Data for Pete Hanson Creek

| Stream Resources for Pete Hanson Creek Watershed | | | | | | | |
|---|---|---|---|---|---|---|---|
| Site Name | Riparian Functioning Condition Rating | | | | | | Total Miles |
| | PFC | FAR-UP | FAR-NA | FAR-DN | NF | DRY/INT | |
| Pete Hanson S. Fork (2006) | 0.79 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.79 |
| Pete Hanson S. Fork (2006) | 0.90 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.90 |
| Pete Hanson R1 (2006) | 0.00 | 0.38 | 0.00 | 0.00 | 0.00 | 0.00 | 0.38 |
| Pete Trib 2 (2008) | 1.15 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.15 |
| Pete Hanson (2009) | 0.18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.18 |
| Pete Hanson 1 (2008) | 1.75 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.75 |
| Pete Hanson 2 (2008) | 0.51 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.51 |
| Pete Hanson 3 (2008) | 0.00 | 1.18 | 0.00 | 0.00 | 0.00 | 0.00 | 1.18 |
| Pete Hanson Creek R11 | 0.00 | 0.00 | 0.15 | 0.00 | 0.00 | 0.00 | 0.15 |
| Pete Hanson Creek R12 | 0.00 | 0.00 | 1.19 | 0.00 | 0.00 | 0.00 | 1.19 |
| Pete Hanson Creek R13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.31 | 1.31 |
| **Total** | **0.00** | **0.00** | **1.34** | **0.00** | **0.00** | **1.31** | **9.49** |

**Table 3.23-5: Stream Riparian Assessment Data from 2001 for Pete Hanson Creek Springs**

| Stream Resources for Pete Hanson Creek Watershed | | | | | | |
|---|---|---|---|---|---|---|
| Site Name | Riparian Functioning Condition Rating | | | | | Total Acres |
| | PFC | FAR-UP | FAR-NA | FAR-DN | NF | |
| Pete Hanson Creek Spring Complex | 0.00 | 0.00 | 0.00 | 1.88 | 0.00 | 1.88 |
| **Total** | **0.00** | **0.00** | **0.00** | **1.88** | **0.00** | **1.88** |

Stream riparian assessment data from 2001 for Birch Creek stream data indicate that of the 5.38 miles surveyed, 0.7 mile is in PFC, 0.44 mile is in a FAR-DN, and the remaining 4.25 acres was dry/intermittent. Stream riparian assessment data from 2001 for Birch Creek springs indicates that out of 0.43 acre surveyed, 0.11 acre is in a FAR-UP, 0.05 acre is classified FAR-NA, and 0.27 acre is in a FAR-DN.

Aquatic Habitat Data

Aquatic habitat surveys were conducted along with fish population surveys by the NDOW in Birch Creek and in Pete Hanson Creek in 2009 (Figure 3.23.4). A three transect aquatic habitat survey was conducted on Birch Creek on July 7 and 8, 2009, and on Pete Hanson Creek on July 6, 7, and 8, 2009 using General Aquatic Wildlife Survey (GAWS) protocol. The GAWS protocol involves capturing, measuring, and weighing native and nonnative trout. An electro-shocker is used to stun the fish so they can be netted with a large dip net. This habitat sampling was intended to capture stream conditions in the fish population sample area and was not intended to serve as a full habitat survey. Habitat transects were located at zero, 50, and 100 feet with multiple stream and habitat parameters being collected (NDOW 2009b).

Birch Creek was flowing clear and cold during the early July 2009 survey with discharge ranging from 1.02 cfs to 4.3 cfs and water temperatures ranging 55 to 61˚F. Data indicate that flows experienced during the survey were higher than normal based on precipitation data from the nearest SNOTEL site on Diamond Peak. The NRCS data indicate that the 2009 water year (October 2008 to September 2009) was approximately ten percent above the 25 year average. Average station water width was 4.4 feet with an average water depth of 4.6 inches. The width to depth ratios of Birch Creek observed during the survey ranged from 6.5 to 13.8 with an average wetted ratio measurement of 12.2.

Stream habitat conditions on the surveyed portion of Birch Creek were rated from poor to good with an overall rating of good. This rating was derived by using a Habitat Condition Index (HCI) generated by the six habitat parameters of percent pool measure, percent pool structure, percent age of stream bottom, percent bank cover, percent bank soil stability, and percent bank vegetation stability. HCIs of less than 100 percent can indicate a degree of improvement or potential to increase the habitat condition of stream. These six parameters are used as indicators in determining which areas would be of greater benefit to improve a stream or stream reach (NDOW 2009b).

Overall the lack of quality pools was considered the primary limiting factor. All areas surveyed except for two had a rating of zero percent pool structure (quality pools). Pool structure is a rating of the percent of the pools in a stream or station that are class one, two, and three quality

pools. Quality pools are an important component of a stream because they contribute desirable habitats for the rearing, resting, and wintering of fish. Pool measure is the rating of the pool/riffle ratio for a stream or stream reach. An optimum rating would be 100 percent. Although a pool to riffle ratio of one to one is the accepted standard for LCT, recent studies have shown that ratios that range between 0.5 to 1.5:1, tend to produce high numbers of individuals. The measured ratio for Birch Creek was 0.6:1 (38 to 62) (NDOW 2009b).

Stream bottom is a rating of the amount of gravel and rubble (preferred substrate material) at each survey station. During the Birch Creek survey, preferred substrate constituted 55.8 percent of the stream bottom (38.1 percent rubble and 17.8 percent gravel). Embeddedness averaged 31.1 percent (moderate) with values ranging from 6.7 to 66.7 percent. Elevated embeddedness of gravels by fine sediments can negatively affect LCT spawning success. Although the amount of desirable substrate (gravel and cobble) was good, the majority of desirable substrate was cemented and would be unfavorable for LCT spawning and invertebrate production (NDOW 2009b).

Bank cover for Birch Creek in the areas surveyed rated 77.1 percent with approximately 47.2 percent covered with trees, 30.6 percent covered by shrubs, and 22.2 percent of the banks covered with grasses and forbs. No exposed or barren banks were documented. Riparian species on Birch Creek consisted primarily of wild rose (*Rosa woodsii*), perennial herbaceous plants, water birch, willow, cottonwood, aspen, and chokecherry (*Prunus virginiana*). All plant species exhibited fair to excellent density and vigor. The survey protocol would consider a plant community of 100 percent shrubs as the optimum rating. Canopy densities were measured with a concave spherical densiometer. The mean canopy density for Birch Creek in the areas surveyed was 65.9 percent (NDOW 2009b).

Bank soil stability ratings are based upon the banks resiliency to impact. Incorporated in this rating is an evaluation of the associated riparian plant species root mass and depth, the bank material, assessment of raw or eroding banks, and the degree of deposition or scouring occurring in the stream bottom. Bank soil stability ratings on the surveyed areas of Birch Creek had an average rating of 73.6 percent with scores ranging from 54.2 at S6 to 83.3 at S4. Bank stream channel stability of the survey stations on Birch Creek averaged 72.7 (fair), with a range of 60 (good) to 81 (fair). Stability ratings are based on scores of zero to 38 (excellent), 39 to 76 (good), 77 to 114 (fair), and 115 and higher (poor) (NDOW 2009b).

Bank vegetation stability ratings relate to the stability generated by vegetation cover on the stream banks. The rating factors in the amount of the stream bank covered with vegetation or materials that do not allow erosion are boulders, rubble, and gravel. Bank vegetation stability ratings for the survey stations on Birch Creek ranged from 58.3 to 87.5 percent with an average of 72.2 percent. There was no current year livestock use documented at any of the survey sites (NDOW 2009b).

The major invertebrates found during the 2009 survey on Birch Creek include the following: Trichoptera; Ephemeroptera; Plecoptera; Diptera; Coleoptera; and Hirudinea). Invertebrates were common to abundant at all sites along Birch Creek (NDOW 2009b). As a result of their sensitivity to water pollution, the presence and abundance of macroinvertebrates in the Ephemeroptera, Plecoptera, and Trichoptera (common names are, respectively, mayfly, stoneyfly, and caddisfly) indicate good water quality. The presence of insects from these orders in Birch Creek indicates good water quality and prey base for LCT.

Pete Hanson Creek was flowing clear and cold during the July 2009 surveys with discharge ranging from 1.02 cfs to 4.3 cfs and water temperatures ranging from 46 to 59 ˚F. The data indicate that the flows experienced during the survey were higher than normal based on precipitation data from the nearest SNOTEL site on Diamond Peak. The NRCS data indicates that the 2009 water year (October 2008 to September 2009) was approximately ten percent above the 25 year average. The average station water width on Pete Hanson Creek was 4.4 feet with an average water depth of 5.2 inches. The width to depth ratios were determined by dividing the average station stream water widths in meters by the average station stream water depths in meters. The width to depth ratios observed during the survey ranged from 6.2 to 16.3 with an average wetted ratio measurement of 10.6 (NDOW 2009b).

Stream habitat conditions on the surveyed portion of Pete Hanson Creek were rated from poor to good with an overall rating of fair and were derived by using the HCI. Overall the lack of pools, especially quality pools, were considered the primary limiting factors. All areas surveyed except for two had less than 50 percent pool measure (Figure 3.23.4). The measured ratio for Pete Hanson Creek was 0.2:1 (16 to 84). Of the pools measured, only two areas surveyed contained quality pools. During the Pete Hanson Creek survey preferred substrate constituted 71.4 percent of the stream bottom (27.6 percent rubble and 43.8 percent gravel). Embeddedness averaged 35.2 percent (moderate) overall with values ranging from 13.3 percent to 53.3 percent (NDOW 2009b).

Bank cover for Pete Hanson Creek rated 72.6 percent with approximately 45.2 percent of the bank coverage was composed of grasses and forbs, 35.7 percent was composed of shrubs, and 19 percent was composed of trees. No exposed or barren banks were documented. The bank cover ratings of survey stations S5, S6, and SF1 were rated at 50 percent based on the lack of shrub species and dominance of grasses. The mean canopy density was 58.6 percent (NDOW 2009b).

Bank soil stability ratings for the areas surveyed on Pete Hanson Creek averaged 74.4 percent with scores ranging from 54.2 to 83.3. Bank Stream channel stability of the survey stations on Pete Hanson Creek averaged 75.6 (fair) with a range of 61 (good) to 95 (fair). Bank vegetation stability ratings ranged from 50.0 to 83.3 percent with an average value of 70.2 percent. There was no current year livestock use documented at any of the survey sites along Pete Hanson Creek; however, evidence of past livestock damage was found at some of the survey sites (NDOW 2009b).

The major invertebrates found during the 2009 surveys include the following: Trichoptera; Ephemeroptera; Plecoptera; Diptera; Hirudinea; Gastropoda; and Hemiptera. Invertebrates were common to abundant at all survey sites along Pete Hanson Creek (NDOW 2009b).

*Springsnails*

Although no springsnails were observed at any of the 22 springs surveyed in July 2007, many of the springs surveyed were either dry or not flowing. Flowing springs were impacted by cattle or wild horse use (SRK 2007d). Snails were encountered at 15 of the 229 springs surveyed in September and October 2007 (SRK 2010). Snails were observed within the following hydrographic basins: Pine Valley; Diamond Valley; Huntington Valley; Kobeh Valley; and Little Smokey Valley (northern part).

Further, although snails were not observed within the ten-foot water drawdown contour (Figure 3.12.1), two streams where snails were found in the October 2007 survey are located near the predicted ten-foot drawdown boundaries. Survey site KV015 (surveyed October 4, 2007) exists generally northwest from the boundaries. Snail density was found to exceed 500 per square foot. Habitat included gravel, cobble, water cress and a flowing stream. Survey site KV065 (surveyed October 11, 2007) is located roughly southeast of the boundary. Snail density was estimated at 100 per square foot and habitat was noted as a flowing stream. Livestock sign was noted at this site.

The snails species observed during this survey were not collected for positive identification because of the destructive nature of species identification for springsnails. The NDOW identifies that the White Pine mountain snail (*Oreohelix hemphilli*), western glass snail (*Vitrina pellucida*), and the silky vallonia (*Vallonia cyclophorella*) were located in a spring approximately seven miles west of the Project Area (NDOW Public Scoping Comments, March 16, 2007).

3.23.2.2.4 Climate Change

The consequences of weather and climate change on wildlife and fisheries use can be subtle and complex. The projected changes in climate (e.g., increases in temperature, reductions in soil moisture, and more intense rainfall events) may affect habitat, composition, shifts to higher elevation/latitudes, reduced vegetation food sources, altered migration routes, less available water sources, and stream flow change impacts on migratory aquatic species.

### 3.23.3 Environmental Consequences and Mitigation Measures

3.23.3.1 Significance Criteria

Based upon NEPA guidelines and commonly accepted criteria, the Proposed Action or alternatives would normally be considered to have a significant effect on wildlife resources if the following occurred:

- Substantially disturbed critical wildlife habitat. Substantial disturbance would be ten percent loss of any critical wildlife species habitat in the short term, or the life of the project, and 20 percent loss cumulatively;
- Impacts to special status species, including direct or indirect disturbance of federally threatened or endangered terrestrial or aquatic wildlife species or their associated critical habitat, or disturbance of USFWS Candidate Species or BLM sensitive species in a manner and a degree that would contribute to their being listed as either federally threatened or endangered;
- Cause loss of birds or nests with eggs protected by the MBTA;
- Result in acute or chronic toxicity resulting from exposure to toxic materials in the process facilities;
- Result in wildlife risks above a threshold for chronic toxic effects from exposure to toxic materials in the pit lake;
- Result in a reduction in flow in Birch or Pete Hanson Creeks, which are identified in the Lahontan Cutthroat Recovery (LCR) Plan;
- Result in a reduction in flow in Henderson Creek or Vinini Creek, which are identified in the LCR Plan and may, in the future, play an important role as habitat for the LCT metapopulations;

- Result in a discharge or change in water quality in the Henderson Creek or Vinini Creek drainages, including ephemeral or seasonal tributaries, which results in quality that is lower than that allowed by the LCT Recovery Plan; or
- Cause destruction of active bat hibernacula or maternity sites.

#### 3.23.3.2 Assessment Methodology

Potential effects on wildlife resources are described as direct or indirect, short term (i.e., during the life of the Project) and long term. Direct impacts are those that would result in the death or injury of an animal. Indirect impacts include the degradation of wildlife habitat to the extent that population numbers decline. Short-term impacts are those that could occur during implementation of the Project and until reclamation is complete. Long-term impacts are those occurring after reclamation is complete. The effects are determined to be significant or not significant based on the applicable significance criteria listed in Section 3.24.3.1.

#### 3.23.3.3 Proposed Action

##### 3.23.3.3.1 General Wildlife

Construction and operation of the Project would directly affect wildlife habitat through removal of vegetation in areas proposed for surface disturbance, as detailed in Section 3.9. The majority of the surface disturbance resulting from the Proposed Action would occur in the big sagebrush vegetation community. Approximately 8,318 acres of wildlife habitat would be directly removed over the 44-year mine life as a result of implementation of the Proposed Action. Due to incremental reclamation, this acreage would not be disturbed all at one time. Upon completion, the reclamation portion of the Proposed Action would be completed for 7,656 acres (92 percent of the disturbed area). Approximately 734 acres of the previous wildlife habitat in the open pit would be removed and not reclaimed, leaving a pit lake and steep rocky cliffs. Surface disturbance would be revegetated with a BLM-approved seed mix that includes native seeds or plants that are compatible with native soils located in the Project Area and includes forb and shrub species to provide forage for wildlife.

Mule deer migrate along routes from Pine Valley south around to the Roberts Mountains in to Kobeh Valley and Diamond Valley. Although it is possible that the proposed mine and well field, including the fences, roads, and human activity, may affect deer migration, it is not possible to quantify the potential impact.

Mitigation developed for water resources (Section 3.2.3), wild horses (Section 3.13.3), and special status species (Section 3.23.3.3.2) would reduce Project-related impacts to general wildlife species. These mitigation measures include the following: development of six water sites, which would increase water availability in the Project Area; buried pipelines that would not limit wildlife movement; fences constructed around areas of disturbance that would keep wildlife out of dangerous areas; antiperching devices on transmission lines that would decrease predation of smaller mammalian, reptilian, and avian species; electrocution prevention measures; the removal of nesting material from transmission lines and equipment that would ensure that the anti-perching devices are effective; noise reducing enclosures or sound barriers on walls on pumps in the greater sage-grouse habitat that would also benefit other wildlife species in the area; and speed limits on Project roads that would decrease the potential of vehicular mortality of wildlife species.

- **Impact 3.23.3.3-1:** Approximately 8,318 acres of wildlife habitat would be directly removed as a result of the Proposed Action over the 44-year mine life.

  **Significance of the Impact:** Based on the conclusions from the analysis, no additional mitigation is proposed.

Post-reclamation wildlife habitat would differ from pre-Project habitat in vegetation compositions and age class. A portion of the Project Area would be converted from a shrub-dominated community to a grass/forb dominated community in the short term, as described in Section 3.9. Many game and nongame wildlife species may breed, forage, or roost in or near the Project Area. Potential long-term impacts to these species could include loss of nesting, brooding, roosting, foraging, and cover habitats. Once reclaimed, the vegetation that became established would, through succession, create a more shrub dominant habitat within three to five years; however, it may take 15 to 20 years to establish mature shrubs. In the short term, only seed-eating and early forb/grass-eating species such as rabbits and seed eating birds would benefit from reclamation efforts. Other game and most nongame wildlife would benefit more over time, as diversity, cover, nesting habitat potential, and forage quality increase.

- **Impact 3.23.3.3-2:** Modification of wildlife habitat and subsequent reclamation efforts would result in less available mature vegetation for cover, forage, and nesting habitat for many species of wildlife in the short term.

  **Significance of the Impact:** The impact is not considered significant. Based on the conclusions from the analysis, no additional mitigation is proposed.

Noise disturbance would be continuous for approximately 44 years during implementation of the Proposed Action. Sudden loud noises such as blasts could cause wildlife to disperse in directions away from the sound. This behavior could send wildlife into unfamiliar terrain. Some wildlife may avoid the area while others may tolerate the noise and continue foraging and breeding activities in the vicinity of the Project Area.

- **Impact 3.23.3.3-3:** Loud and sudden noises associated with the Proposed Action could result in wildlife displacement for the life of the Project.

  **Significance of the Impact:** The proposed Project may produce noise in exceedance of 55 dBA, which can be detrimental to greater sage-grouse. Therefore, the impact is considered significant and the following mitigation measure has been identified.

- **Mitigation Measure 3.23.3.3-3:** Mitigation for noise impacts is included in Mitigation Measure 3.23.3.3-6 (as identified in the Sage Grouse Mitigation Plan in Appendix C) and includes noise reducing enclosures or sound barrier walls would be installed on pumps within the two-mile buffer around recognized active leks.

  **Effectiveness of Mitigation and Residual Effects:** Implementation of Mitigation Measure 3.23.3.3-3 would be effective to reduce any impacts from noise to greater sage-grouse to less than significant.

The mine water supply system and the dewatering and subsequent refilling of the open pit is expected to drawdown the ground water table in an area surrounding the open pit and the Kobeh

Valley Well Field. As discussed in Section 3.2.3, modeling results show that a water table drawdown of ten feet or more in the aquifer would occur in an area measuring approximately 232 square miles around the Project Area including the northern two-thirds of Kobeh Valley and the southern portion of the Roberts Mountains, from Lone Mountain to Roberts Creek Ranch, and from the 3 Bars Road in Kobeh Valley to the western Whistler Mountains.

Water sources utilized by wildlife within the ten-foot drawdown contour from Proposed Action pumping include springs within the Kobeh Valley, Diamond Valley, and Pine Valley Hydrographic Basins. As discussed in Section 3.2.3.3, there would be 22 springs and 7.7 miles of perennial streams located within the ten-foot drawdown contour. Table 3.2-6 outlines the springs that would be affected. There are eight wildlife water rights associated with some of these springs that would be affected by the drawdown (Table 3.2-7). In addition, wildlife utilize stock watering sites and there are 12 water rights associated with stock watering within the ten-foot drawdown contour that would be affected by the Project activities. Impacts to water rights are discussed in detail in Section 3.2.3.3.

Game species (i.e., mule deer and pronghorn) require water year round, as needed, to satisfy physiological requirements. The reduction or loss of existing water sources could impact big game use and movements. As discussed above, relatively small big game populations currently occupy the Project Area; however, based on the mule deer habitat available within the projected ground water drawdown area, some individuals could be displaced due to the reduction of surface water and wetlands and riparian vegetation and may move into adjacent areas that are already at their carrying capacity. These displaced individuals could be lost from the population; however, this loss cannot reasonably be quantified.

A reduction in surface water and wetlands and riparian habitat would affect the amount of nesting, brooding, and foraging habitat for upland game birds (e.g., greater sage grouse, mourning dove) and denning and foraging habitat for small game mammals and furbearers. A decline in surface water availability would also impact the extent of available vegetation along portions of springs and streams. Since wetlands and riparian communities are limited within and adjacent to the Project Area, it would be difficult for displaced individuals to relocate into adequate breeding or foraging habitat in adjacent areas, as it is assumed that these habitats already would be at carrying capacity. As a result some animals could be lost from the population.

- **Impact 3.23.3.3-4:** Wildlife dependent on vegetation growing near perennial streams, springs, and seeps would potentially experience water stress due to the water table drawdown associated with mine dewatering and subsequent filling of the open pit. Lowering of the water table in the area of these plants would potentially cause a decline in the wetland vegetation community and the associated wildlife species. The lowering of the water table would also potentially result in less water for wildlife consumption.

  **Significance of the Impact:** The impact could be significant. The BLM has identified the following mitigation that would benefit wildlife.

- **Mitigation Measure 3.23.3.3-4**: Mitigation for the potential loss of water would include the development of six water sites (Figure 3.13.1). Although the sites were identified as part of mitigation for wild horses (Section 3.13), development of the sites would also result in indirect beneficial impacts to wildlife species throughout the Project Area.

Additional mitigation has been proposed for wetland vegetation in Section 3.11 (Mitigation Measure 3.11.3.3-1), which includes a replacement of riparian vegetation at a three to one ratio with local cuttings, plugs, or seeds.

- **Effectiveness of Mitigation and Residual Effects:** Mitigation Measures 3.11.3.3-1 and 3.23.3.3-4 would reduce impacts to the loss of riparian habitat during Project activities. Replacement with local cuttings, plugs, or seeds would ensure no long-term impacts to the temporary loss of riparian vegetation.

The evaluation of the potential effects of the pit lake on terrestrial and avian wildlife was completed with the use of a SLERA. Only terrestrial and avian wildlife species were evaluated since no fish are expected to populate the pit lake. The general approach used in the preparation of the SLERA is similar to that developed by the Environmental Sciences Division and Life Sciences Division of Oak Ridge National Laboratory for the U.S. Department of Energy. In addition, the SLERA incorporated recent TRVs for certain inorganic chemical constituents derived by the EPA (SRK 2009). Together, these were used to develop species-specific toxicity criteria to which the predicted constituents in the pit water were compared.

The toxicity criteria were developed based on species-specific No Observed Adverse Effects Levels (NOAELs) and TRVs, published and calculated water ingestion rates, and average individual body weights. Criteria were developed for eight species, including the little brown bats (*Myotis lucifugus*), white-footed mouse (*Peromyscus leucopus*), cottontail rabbit (*Sylvilagus audubonii*), white-tailed deer (*Odocoileus virginianus*), red-tailed hawk (*Buteo jamaicensis*), mallard duck (*Anas platyrhynchos*), common barn owl, (*Tyto alba*) and rough-winged swallow (*Stelgidopteryx serripennis*). These species are considered reasonable surrogate species for the populations that would likely inhabit the region in and around the pit lake. A surrogate species, while not necessarily occurring in the area, typically occupies similar niches, has similar body masses, and similar exposure parameters to the known occupants of the area. For example, the white-tailed deer was selected as a substitute species for evaluation because literature data are limited on mule deer, which is a common animal in the area. This same approach holds true for the other species expected to be in the Project Area.

Protective criteria for the surrogate species are likely to be protective of local species occupying similar ecological niches at the Project Area. Additionally, it was assumed that the wildlife receptors would consume water from the pit lake and that this water would constitute 100 percent of daily water requirements for each individual species (i.e., no outside sources of water would be utilized over the life of the animal). This is considered to be a conservative assumption. On the basis of a comparison of the estimated concentrations of phosphorus in the future pit lake with general information about concentrations of nutrients expected in lakes (Horne and Goldman 1994), the pit lake is expected to be oligotrophic, i.e., to have low productivity, after the first 200 years. An oligotrophic pit lake is not expected to support significant primary productivity or development of littoral vegetation. Therefore, food web exposures were considered incomplete for most receptor surrogates, and complete but minor for insectivorous birds and bats. Risks due to ingestion of contaminated foods by wildlife were therefore not evaluated.

- **Impact 3.23.3.3-5:** The result of the assessment for wildlife (terrestrial and avian) indicates a low risk based on calculated species-specific toxicity criteria using recent EPA developed TRVs. None of the chemicals of potential ecological concern identified

in the predicted pit lake water poses a credible risk to wildlife that may inhabit the area and use the pit lake as a drinking water source.

**Significance of the Impact:** The potential to adversely affect the health of terrestrial or avian life is considered negligible. Based on the predicted pit lake chemistry, calculated toxicity criteria, and predicted utilization of the open pit water by wildlife, the overall ecological risk of the Proposed Action is considered to be low. The impact is not considered significant. Based on the conclusions from the analysis, no mitigation has been proposed.

3.23.3.3.2 Special Status Wildlife Species

*Greater Sage-Grouse*

Core breeding habitat, nesting habitat, and summer and winter distribution for greater sage-grouse is located within the Project Area (Figure 3.23.2). Approximately 6,537 acres (77.9 percent) of Project-related surface disturbance would occur within summer and winter distribution, 686 acres (8.2 percent) would occur within nesting habitat, and 1,280 acres (15.3 percent) would occur within core breeding habitat (the total percentage exceeds 100 percent because the greater sage-grouse habitat layers overlap within the Project Area).

Impacts to greater sage-grouse and core breeding habitat within and adjacent to the Project Area are expected as a result of the development of the Kobeh Valley Well Field. The well field would be located directly west and southwest of the proposed open pit mine and processing operations and could impact the movement of greater sage-grouse between Kobeh Valley and the Roberts Mountains. The proposed well field would target both the carbonate and alluvial aquifers located in Kobeh Valley. The carbonate aquifers are generally located at the foot of the Roberts Mountains in the area of Roberts, Rutabaga, and Coils Creeks. The targeted alluvial aquifers are located primarily in the northeastern quadrant of Kobeh Valley, north of Lone Mountain, to the base of the Roberts Mountains, west of Whistler Ridge and east of Coils Creek.

Impacts to greater sage-grouse as a result of the Proposed Action include the following: increased raptor or scavenger predation from elevated equipment and power poles; visual encroachment or interruptions created by elevated equipment, power poles, vehicular travel and dust; interruption of "bird foot traffic" created by above ground pipes, extended elevated berms, or other linear features that may block passage; noise created by pumps, vehicles, and equipment; collision with fences and other structures; habitat fragmentation; and unreclaimed surface disturbance resulting in habitat loss.

- **Impact 3.23.3.3-6:** Greater sage-grouse individuals and habitat could be impacted as a result of the Proposed Action.

  **Significance of the Impact:** This impact is considered potentially significant with respect to greater sage-grouse, a USFWS candidate species and a BLM sensitive species, and greater sage-grouse habitat and the following mitigation measure has been identified.

- **Mitigation Measure 3.23.3.3-6:** Mitigation measures are identified in the Sage Grouse Mitigation Plan (Appendix C). Additional mitigation developed for pygmy rabbits (Mitigation Measure 3.23.3.3-8) would reduce the effect to sagebrush habitat utilized by

greater sage-grouse. Mitigation Measure 3.13.3.3-1 also minimizes habitat fragmentation from the wellfield pipeline.

- **Effectiveness of Mitigation and Residual Effects:** Mitigation Measure 3.23.3.3-6 would reduce impacts to greater sage-grouse during Project activities to less than significant through the implementation of seasonal restrictions, minimizing surface disturbance, installation of sound barrier walls, and installation of predator anti-perching devices (Appendix C).

*Migratory Birds and Raptors*

Construction and operation of the Project would directly affect migratory bird and raptor habitat through removal of vegetation in areas proposed for surface disturbance, as detailed in Section 3.9.3. The majority of the surface disturbance resulting from the Proposed Action would occur in the big sagebrush vegetation community. Approximately 8,318 acres of migratory bird and raptor habitat would be directly removed over the 44-year mine life as a result of implementation of the Proposed Action. Potential impacts to breeding migratory birds from the Project would include possible direct loss of nests (e.g., crushing) or indirect effects (e.g., abandonment) from increased noise and human presence within close proximity to an active nest site. Vegetation removal would result in a reduction of breeding habitat for migratory birds in the Project Area. This acreage would not all be disturbed at one time due to incremental reclamation. Approximately 734 acres of migratory bird habitat in the vicinity of the open pit would be converted to a pit lake and steep cliffs. This conversion would increase raptor perching habitat.

Golden eagles nesting and foraging habitat are present in the Project Area. In order to avoid impacts to individual golden eagles and their nesting habitat, implementation of the environmental protection measure outlined in Section 2.2.13 for migratory birds would ensure that prior to surface disturbance a nesting survey for migratory birds (including golden eagles) would be conducted and nests avoided. Impacts to golden eagle foraging habitat would be reduced through reclamation including revegetation. Indirect impacts to golden eagles nests and habitat within ten miles of the Project could include noise and dust. These impacts are expected to last the duration of the Project and reclamation.

- **Impact 3.23.3.3-7:** Approximately 8,318 acres of migratory bird and raptor habitat would be directly removed over the 44-year mine life as a result of the Proposed Action.

  **Significance of the Impact:** This impact is considered potentially significant with respect to vegetation removal during the avian breeding season that results in a violation of the MBTA and the following mitigation measure has been identified.

- **Mitigation Measure 3.23.3.3-7:** Land clearing would be conducted outside the avian breeding season, which is March 1st through August 31st for raptors and April 1st through August 1st for other migratory birds. If this is not possible, then a qualified biologist would survey the area to be cleared prior to clearing, within 14 days of disturbance. If disturbance has not occurred within 14 days of the survey, another survey would be conducted. If active nests were identified, or if other evidence of nesting (mated pairs, territorial defense, carrying nesting material, transporting food) was observed as a result of this survey, then a protective buffer (the size of which would depend on the requirements of the species) would be delineated and the delineated protective buffer

avoided to prevent destruction or disturbance to nests until the nests were no longer active or nesting activities were no longer observed.

- **Effectiveness of Mitigation and Residual Effects:** Mitigation Measure 3.23.3.3-7 would reduce impacts to migratory birds during Project activities to less than significant by ensuring no direct impacts to nesting birds would occur.

- **Impact 3.23.3.3-8:** Loud or sudden noises associated with the Proposed Action could result in an indirect impact (i.e., disturbance) to golden eagles nesting east of the Project Area.

  **Significance of the Impact:** This impact is considered potentially significant with respect to Project activities during the golden eagle breeding season that may result in a violation of the Bald and Golden Eagle Protection Act and the following mitigation measure has been identified.

- **Mitigation Measure 3.23.3.3-8:** The golden eagle nesting habitat located east of the Project Area would be surveyed twice a year by a qualified biologist for the life of the Project to check the use status of golden eagle nests and habitat. If a nest is determined to be active, the nests would be monitored by a qualified biologist once a week until the young have fledged. During the 18-month construction phase, the timing of weekly monitoring of active nests would occur from sunrise to sunset. During the 44-year mine life, the weekly monitoring for active nests would coincide with blasting activities. The biologist would survey the nest beginning two hours before the blast and end two hours after the blast. Annual reports would be submitted to the BLM biologist summarizing the results of the surveys. If a negative impact to nesting golden eagles is detected during monitoring, the BLM biologist would be contacted by electronic mail or phone by the next business day.

- **Effectiveness of Mitigation and Residual Effects:** Mitigation Measure 3.23.3.3-8 would reduce impacts to golden eagles during Project activities to less than significant by ensuring no direct impacts to nesting birds would occur.

*Pygmy Rabbits*

As shown on Figure 2.23.2, the pygmy rabbits and burrows located to the east and north of Mount Hope would be impacted by Project activities. The PAG and the LGO Stockpile would be constructed over burrows and areas where pygmy rabbits have been sighted. In addition, the Project access road and growth media stockpiles may cover burrows and areas where pygmy rabbits have been sighted. This impact would be limited to selected burrows and a limited number of individuals may be extirpated; however, this impact is not expected to result in a population-level effect that would affect the potential listing of the species under the ESA. Additionally, the BLM has calculated that approximately 475 acres of pygmy rabbit habitat would be disturbed by the Project. Of those 475 acres, 211 acres were occupied during the wildlife surveys and 264 acres are considered potential habitat.

- **Impact 3.23.3.3-9:** Pygmy rabbit individuals and habitat could be impacted as a result of the Proposed Action.

**Significance of the Impact:** This impact is not considered significant with respect to pygmy rabbits; however, the BLM proposes the following mitigation measure.

- **Mitigation Measure 3.23.3.3-9:** EML would create a funding source for future sagebrush habitat improvement projects in the area. In this case, an interest-bearing account would be created specifically for use on future sagebrush habitat projects that may occur in the area. The amount of funding to be placed into the account would be based on a negotiated price per acre of disturbed habitat. It would also be based off of a ratio of two acres per every acre disturbed.

- **Effectiveness of Mitigation and Residual Effects:** Although direct effects to pygmy rabbits and their habitat would occur in the Project Area, this mitigation would ensure additional pygmy rabbit habitat is created to replace the habitat removed at a two to one ratio.

*Burrowing Owls*

Potential habitat for burrowing owls was identified in the Kobeh Valley portion of the Project Area. Since no burrowing owl nests were found in the Project Area, Project-related surface disturbance could result in impacts to burrowing owls by a reduction in available habitat. This reduction is unlikely to result in a reduction in population viability in the Project Area. Nest surveys implemented prior to construction (as described in Mitigation Measure 3.23.3.3-7) would ensure that no nesting activity would be affected.

*Lahontan Cutthroat Trout*

No direct impacts to LCT would occur as a result of implementation of the Proposed Action. Potential indirect impacts to LCT from aquifer drawdown would not be anticipated. As shown on Figure 3.23.3 the ten-foot drawdown contour would not intercept any of the springs and perennial reaches in the Birch or Pete Hanson Creeks, which are identified in the Lahontan Cutthroat Trout Species Management Plan (SMP) for the Upper Humboldt River Drainage Basin, or Willow Creek. A reduction in flow may occur in Henderson Creek, which, along with Vinini Creek, are identified in the SMP as streams that may, in the future, play an important role as habitat for the LCT metapopulations. A discharge or change in water quality could occur in the Henderson Creek drainage, including ephemeral or seasonal tributaries, which may result in water quality that is lower than that allowed by the SMP. In a memorandum dated October 19, 2011, the USFWS concurred with the determination that the Project may affect, but is not likely to adversely affect LCT.

- **Impact 3.23.3.3-10:** There may be a decrease in flows within Henderson Creek, which may affect the creek's criteria for use in LCT recovery.

  **Significance of the Impact:** This impact is considered potentially significant with respect to a LCT recovery creek. The following mitigation has been identified by the BLM to limit to potential effects to Henderson Creek and to ensure that there would not be an effect to Birch Creek or Pete Hanson Creek.

- **Mitigation Measure 3.23.3.3-10:** The mitigation measures identified in Section 3.2.3 would be sufficient to mitigate the impacts to LCT from the Proposed Action.

- **Effectiveness of Mitigation and Residual Effects:** Implementation of Mitigation Measure 3.2.3.3-2b and the use of any of the options outlined in Section 3.2.3 would be effective to very effective at mitigating the impacts from reduced surface water flows. The effectiveness of Mitigation Measure 3.2.3.3-2c, if implemented, is less certain since the implementation would be many decades in the future. However, if measures used in Mitigation Measure 3.2.3.3-2b are implemented, then the measure should be effective at mitigating the impacts from reduced surface water flows. Over a long period of time (tens to 100s of years) the effects to most surface water flows would diminish; however, for the springs nearest to the open pit, flows would be reduced or eliminated in perpetuity.

*Yellow-billed Cuckoo and Springsnails*

No suitable or occupied habitat for yellow-billed cuckoos was identified in the Project Area or within the ten-foot drawdown contour; therefore, the Proposed Action is not expected to impact yellow-billed cuckoos. Although springs are located in the Project Area, there are not any springs identified that springsnails would occupy. No springsnails were located in the Project Area or within the ten-foot drawdown contour; therefore, the Proposed Action is not expected to impact springsnails. The mitigation measures identified in Section 3.2.3 to ensure that the development of the ten-foot drawdown contour is consistent with the analysis in this EIS (Mitigation Measures 3.2.3.3-2a and 3.2.3.3-2b) and that impacts to springs do not occur after the end of mining and milling operations (Mitigation Measure 3.2.3.3-2c) mitigate any potential impacts to springsnails from the Proposed Action.

*Bats*

Surveys within the Project Area identified the small-footed myotis and Townsend's big-eared bat as occurring within the Project Area. Impacts to the small-footed myotis and Townsend's big-eared bat would be the same as the impacts described above for general wildlife, which is a loss of foraging habitat.

- **Impact 3.23.3.3-11:** Bat foraging habitat would be impacted as a result of the Proposed Action over the 44-year mine life.

  **Significance of the Impact:** This impact is not considered significant; however, the following mitigation is proposed.

- **Mitigation Measure 3.23.3.3-11:** In order to minimize impacts to bat habitat, prior to the initiation of Project activities, EML would close those mine workings that would be removed over the life of the Project (after bats have been evacuated) and install bat-friendly closures on openings that would not be directly impacted by the Project in order to preserve access to the remaining bat habitat (also see Appendix C).

- **Effectiveness of Mitigation and Residual Effects:** The protection of specific mine openings in the Project Area would be effective as mitigation for the loss of habitat associated with those mines that would be removed as a result of Project activities. Bats excluded from the closed mines in the Project Area are familiar with the mine openings that would remain accessible and would take advantage of its preservation.

3.23.3.3.3 Residual Adverse Impacts

The Proposed Action would result in the unavoidable loss of up to 734 acres of terrestrial wildlife habitat resulting from surface disturbance in the open pit area. Approximately 7,656 acres of wildlife habitat would be removed in the short term and then reclaimed as a result of mine development, operation, and closure. The reclaimed land would have more grass and forb forage and less mature shrub forage in the short term. Browsers would benefit the most from the early seral stage vegetation in the short term. As the plant communities within the Project Area mature, within a period of 15 to 20 years, larger shrubs would provide additional cover for larger animals and less of a forage prey base for raptors, similar to the existing conditions.

3.23.3.4 No Action Alternative

Under the No Action Alternative, the proposed Project would not be developed and associated impacts to wildlife would not occur. EML would continue existing activities under previously permitted Notices and the area would remain available for future mineral development or for other purposes as approved by the BLM.

3.23.3.4.1 Residual Adverse Impacts

There would be no residual adverse impacts to wildlife under the No Action Alternative.

3.23.3.5 Partial Backfill Alternative

The Partial Backfill Alternative would result in the unavoidable loss of up to 734 acres of wildlife foraging habitat resulting from surface disturbance in the open pit area. Approximately 7,863 acres of foraging habitat would be removed in the short term and then reclaimed as a result of mine development, operation, and closure. The reclaimed land would have more grass and forb forage and less mature shrub forage in the short term.

3.23.3.5.1 General Wildlife

Impacts to wildlife under this alternative would be similar to the impacts described above for the Proposed Action.

- **Impact 3.23.3.5-1:** Approximately 8,318 acres of wildlife habitat would be directly removed as a result of the Proposed Action over the 44-year mine life.

  **Significance of the Impact:** The impact is not considered significant. Based on the conclusions from the analysis, no mitigation has been proposed.

- **Impact 3.23.3.5-2:** Modification of wildlife habitat and subsequent reclamation efforts would result in less available mature vegetation for cover, forage, and nesting habitat for many species of wildlife in the short term.

  **Significance of the Impact:** The impact is not considered significant. Based on the conclusions from the analysis, no mitigation has been proposed.

- **Impact 3.23.3.5-3:** Loud and sudden noises associated with the Partial Backfill Alternative could result in wildlife displacement for the life of the Project.

  **Significance of the Impact:** The proposed Project may produce noise in exceedance of 55 dBA, which can be detrimental to greater sage-grouse. Therefore, the impact is considered significant and the following mitigation measure has been identified.

- **Mitigation Measure 3.23.3.5-3:** Mitigation for noise impacts is included in Mitigation Measure 3.23.3.3-6 (as identified in the Sage Grouse Mitigation Plan in Appendix C) and includes noise reducing enclosures or sound barrier walls that would be installed on pumps within the two-mile buffer around recognized active leks.

  **Effectiveness of Mitigation and Residual Effects:** Implementation of Mitigation Measure 3.23.3.5-3 would be effective to reduce any impacts from noise to greater sage-grouse to less than significant.

- **Impact 3.23.3.5-4:** Wildlife dependent on vegetation growing near perennial streams, springs, and seeps would potentially experience water stress due to the water table drawdown associated with mine dewatering and subsequent filling of the open pit. Lowering of the water table in the area of these plants would potentially cause a decline in the wetland vegetation community and the associated wildlife species. The lowering of the water table would also potentially result in less water for wildlife consumption.

  **Significance of the Impact:** The impact could be significant. The BLM has identified the following mitigation that would benefit wildlife.

- **Mitigation Measure 3.23.3.5-4:** Mitigation for the potential loss of water would include the development of six water sites (Figure 3.13.1). Although the sites were identified as part of mitigation to wild horses (Section 3.13), development of the sites would also result in indirect beneficial impacts to wildlife species throughout the Project Area. Additional mitigation has been proposed for wetland vegetation in Section 3.11 (Mitigation Measure 3.11.3.3-1), which includes a replacement of riparian vegetation at a three to one ratio with local cuttings, plugs or seeds.

- **Effectiveness of Mitigation and Residual Effects:** Mitigation Measures 3.11.3.3-1 and 3.23.3.3-4 would reduce impacts to the loss of riparian habitat during Project activities. Replacement with local cuttings, plugs, or seeds would ensure no long-term impacts to the temporary loss of riparian vegetation.

- **Impact 3.23.3.5-5:** The result of the assessment for wildlife (terrestrial and avian) indicate a low risk based on calculated species-specific toxicity criteria using recent EPA developed TRVs. None of the chemicals of potential ecological concern identified in the predicted pit lake water poses a credible risk to wildlife that may inhabit the area and use the pit lake as a drinking water source.

  **Significance of the Impact:** The potential to adversely affect the health of terrestrial or avian life is considered negligible. Based on the predicted pit lake chemistry, calculated toxicity criteria, and predicted utilization of the open pit water by wildlife, the overall ecological risk of the Proposed Action is considered to be low. The impact is not

considered significant. Based on the conclusions from the analysis, no mitigation has been proposed.

While a permanent pit lake is not anticipated to form under the Partial Backfill Alternative, it is possible that an ephemeral pond could form on top of the backfill in the pit during times of high runoff or when ground water approaches the surface of the backfill. If this shallow water body persisted for any length of time, it could develop littoral biologic habitats. The water quality of this pond would be expected to exceed screening levels for the constituents that are elevated in pit wall runoff (Cd, fluoride, and Mn). If this pond would become permanent, it would continuously evapoconcentrate, which would create elevated levels of other constituents. Though no specific analysis is provided, the potential for a perpetual lake is assumed for this analysis and the resultant evapoconcentration in the lake would create the potential for an ecological risk to mammalian and avian species that would utilize the water.

- **Impact 3.23.3.5-6:** The development of a perpetual lake over the backfill would create a potential ecological risk to mammalian and avian species that used the lake.

  **Significance of the Impact:** This impact is considered potentially significant with respect to those mammalian and avian species and the following mitigation measure has been identified.

- **Mitigation Measure 3.23.3.5-6:** Mitigation under the Partial Backfill Alternative would be the same as mitigation under the Water Resources - Water Quality for the Partial Backfill Alternative (Mitigation Measure 3.3.3.5-3).

- **Effectiveness of Mitigation and Residual Effects:** Mitigation for this impact would require the removal of sufficient backfill material for the formation of an evaporative ground water sink. Implementation of this mitigation would otherwise be inconsistent with the reasoning for selecting this alternative.

3.23.3.5.2 Special Status Wildlife Species

Impacts to special status wildlife species under this alternative would be similar to the impacts described above for the Proposed Action.

- **Impact 3.23.3.5-7:** Greater sage-grouse individuals and habitat could be impacted as a result of the Proposed Action.

  **Significance of the Impact:** This impact is considered potentially significant with respect to greater sage-grouse, a USFWS candidate species and a BLM sensitive species, and greater sage-grouse habitat and the following mitigation measure has been identified.

- **Mitigation Measure 3.23.3.5-7:** Mitigation under the Partial Backfill Alternative would be the same as mitigation under the Proposed Action (Mitigation Measure 3.23.3.3-6).

- **Effectiveness of Mitigation and Residual Effects:** Mitigation Measure 3.23.3.3-6 would reduce impacts to greater sage-grouse during Project activities to less than significant through the implementation of seasonal restrictions, minimizing surface disturbance,

installation of sound barrier walls, and installation of predator anti-perching devices (Appendix C).

- **Impact 3.23.3.5-8:** Approximately 8,318 acres of migratory bird and raptor habitat would be directly removed over the 44-year mine life as a result of the Proposed Action.

  **Significance of the Impact:** This impact is considered potentially significant with respect to vegetation removal during the avian breeding season that results in a violation of the MBTA and the following mitigation measure has been identified.

- **Mitigation Measure 3.23.3.5-8:** Mitigation under the Partial Backfill Alternative would be the same as mitigation under the Proposed Action (Mitigation Measure 3.23.3.5-7).

- **Effectiveness of Mitigation and Residual Effects:** Mitigation Measure 3.23.3.3-7 would reduce impacts to migratory birds during Project activities to less than significant by ensuring no direct impacts to nesting birds would occur.

- **Impact 3.23.3.5-9:** Loud or sudden noises associated with the Partial Backfill Alternative could result in an indirect impact (i.e., disturbance) to golden eagles nesting east of the Project Area.

  **Significance of the Impact:** This impact is considered potentially significant with respect to Project activities during the golden eagle breeding season that may result in a violation of the Bald and Golden Eagle Protection Act and the following mitigation measure has been identified.

- **Mitigation Measure 3.23.3.5-9:** Mitigation under the Partial Backfill Alternative would be the same as mitigation under the Proposed Action (Mitigation Measure 3.23.3.3-8).

- **Effectiveness of Mitigation and Residual Effects:** Mitigation Measure 3.23.3.3-8 would reduce impacts to golden eagles during Project activities to less than significant by ensuring no direct impacts to nesting birds would occur.

- **Impact 3.23.3.5-10:** Pygmy rabbit individuals and habitat could be impacted as a result of the Proposed Action.

  **Significance of the Impact:** This impact is not considered significant with respect to pygmy rabbits; however, the BLM proposes the following mitigation measure.

- **Mitigation Measure 3.23.3.5-10:** Mitigation under the Partial Backfill Alternative would be the same as mitigation under the Proposed Action (Mitigation Measure 3.23.3.3-9).

- **Effectiveness of Mitigation and Residual Effects:** Although direct effects to pygmy rabbits and their habitat would occur in the Project Area, this mitigation would ensure additional pygmy rabbit habitat is created to replace the habitat removed at a two to one ratio.

- **Impact 3.23.3.5-11:** There may be a decrease in flows within Henderson Creek, which may affect the creek's criteria for use in LCT recovery.

**Significance of the Impact:** This impact is considered potentially significant with respect to a LCT recovery creek. The following mitigation has been identified by the BLM to limit the potential effect to Henderson Creek and to ensure that there would not be an effect to Birch Creek or Pete Hanson Creek.

- **Mitigation Measure 3.23.3.5-11:** Mitigation under the Partial Backfill Alternative would be the same as mitigation under the Proposed Action (Mitigation Measure 3.23.3.3-10).

- **Effectiveness of Mitigation and Residual Effects:** Implementation of Mitigation Measure 3.2.3.3-2b and the use of any of the options outlined in Section 3.2.3 would be effective to very effective at mitigating the impacts from reduced surface water flows. The effectiveness of Mitigation Measure 3.2.3.3-2c, if implemented, is less certain since it would be many decades in the future. However, if measures used in Mitigation Measure 3.2.3.3-2b are implemented, then the measure should be effective at mitigating the impacts from reduced surface water flows. Over a long period of time (tens to 100s of years) the effects to most surface water flows would diminish; however, for the springs nearest to the open pit, flows would be reduced or eliminated in perpetuity.

- **Impact 3.23.3.5-12:** Bat foraging habitat would be impacted as a result of the Partial Backfill Alternative for the duration of the Project.

  **Significance of the Impact:** This impact is not considered significant; however, the following mitigation is proposed.

- **Mitigation Measure 3.23.3.5-12:** In order to minimize impacts to bat habitat, prior to the initiation of Project activities, EML would close those mine workings that would be removed over the life of the Project (after bats have been evacuated) and install bat-friendly closures on openings that would not be directly impacted by the Project in order to preserve access to the remaining bat habitat (also see Appendix C).

- **Effectiveness of Mitigation and Residual Effects:** The protection of specific mine openings in the Project Area would be effective as mitigation for the loss of habitat associated with those mines that would be removed as a result of Project activities. Bats excluded from the closed mines in the Project Area are familiar with the mine openings that would remain accessible and would take advantage of its preservation.

#### 3.23.3.5.3 Residual Adverse Impacts

The Partial Backfill Alternative would result in the unavoidable loss of up to 527 acres of wildlife foraging habitat resulting from surface disturbance in the open pit area. Approximately 8,318 acres of foraging habitat would be removed over the 44-year mine life, and then all but 527 acres would be reclaimed as a result of mine development, operation, and closure. The reclaimed land would have more grass and forb forage and less mature shrub forage in the short term, and therefore, the full 734 acres of disturbance is considered in this impact analysis.

### 3.23.3.6 Off-Site Transfer of Ore Concentrate for Processing Alternative

Although the Off-Site Transfer of Ore Concentrate for Processing Alternative would result in approximately 20 acres less surface disturbance compared to the Proposed Action, impacts to

wildlife from this alternative would be similar to those for the Proposed Action since the acreage would decrease by only 0.2 percent.

3.23.3.6.1 General Wildlife

Impacts to wildlife under this alternative would be similar to the impacts described above for the Proposed Action.

- **Impact 3.23.3.6-1:** Approximately 8,318 acres of wildlife habitat would be directly removed as a result of the Proposed Action over the 44-year mine life.

  **Significance of the Impact:** The impact is not considered significant. Based on the conclusions from the analysis, no additional mitigation is proposed.

- **Impact 3.23.3.6-2:** Modification of wildlife habitat and subsequent reclamation efforts would result in less available mature vegetation for cover, forage, and nesting habitat for many species of wildlife in the short term.

  **Significance of the Impact:** The impact is not considered significant. Based on the conclusions from the analysis, no additional mitigation is proposed.

- **Impact 3.23.3.6-3:** Loud and sudden noises associated with the Proposed Action could result in wildlife displacement for the life of the Project.

  **Significance of the Impact:** The impact is not considered significant. Based on the conclusions from the analysis, no additional mitigation is proposed.

- **Impact 3.23.3.6-4:** Wildlife dependent on vegetation growing near perennial streams, springs, and seeps would potentially experience water stress due to the water table drawdown associated with mine dewatering and subsequent filling of the open pit. Lowering of the water table in the area of these plants would potentially cause a decline in the wetland vegetation community and the associated wildlife species. The lowering of the water table would also potentially result in less water for wildlife consumption.

  **Significance of the Impact:** The impact would not be significant; however, the BLM has identified the following mitigation that would benefit wildlife.

- **Mitigation Measure 3.23.3.6-4:** Mitigation for the potential loss of water would include the development of six water sites (Figure 3.13.1). Although the sites were identified as part of mitigation to wild horses (Section 3.13), development of the sites would also result in indirect beneficial impacts to wildlife species throughout the Project Area. Additional mitigation has been proposed for wetland vegetation in Section 3.11 (mitigation measure 3.11.3.3-1), which includes a replacement of riparian vegetation at a three to one ratio with local cuttings, plugs or seeds.

- **Effectiveness of Mitigation and Residual Effects:** Mitigation Measures 3.11.3.3-1 and 3.23.3.3-4 would reduce impacts to the loss of riparian habitat during Project activities. Replacement with local cuttings, plugs, or seeds would ensure no long-term impacts to the temporary loss of riparian vegetation.

- **Impact 3.23.3.6-5:** For wildlife (terrestrial and avian), the results of the SLERA assessment indicate a low risk based on calculated species-specific toxicity criteria using more recent EPA developed TRVs. None of the chemicals of potential ecological concern identified in the predicted pit lake water poses a credible risk to wildlife that may inhabit the area and use the pit lake as a drinking water source.

  **Significance of the Impact:** The potential to adversely affect the health of terrestrial or avian life is considered negligible. Based on the predicted pit lake chemistry, calculated toxicity criteria, and predicted utilization of the open pit water by wildlife, the overall ecological risk from the Off-Site Transfer of Concentrate for Processing Alternative is considered to be low. The impact is not considered significant. Based on the conclusions from the analysis, no mitigation has been proposed.

3.23.3.6.2 Special Status Wildlife Species

Impacts to special status wildlife species under this alternative would be similar to the impacts described above for the Proposed Action.

- **Impact 3.23.3.6-6:** Greater sage-grouse individuals and habitat could be impacted as a result of the Proposed Action.

  **Significance of the Impact:** This impact is considered potentially significant with respect to greater sage-grouse, a USFWS candidate species and a BLM sensitive species, and greater sage-grouse habitat and the following mitigation has been identified.

- **Mitigation Measure 3.23.3.6-6:** Mitigation under the Off-Site Transfer of Ore Concentrate for Processing Alternative would be the same as mitigation under the Proposed Action (Mitigation Measure 3.23.3.3-6).

- **Effectiveness of Mitigation and Residual Effects:** Mitigation Measure 3.23.3.6-6 would reduce impacts to greater sage-grouse during Project activities to less than significant through the implementation of seasonal restrictions, minimizing surface disturbance, installation of sound barrier walls, and installation of predator anti-perching devices (Appendix C).

- **Impact 3.23.3.6-7:** Approximately 8,318 acres of migratory bird and raptor habitat would be directly removed over the 44-year mine life as a result of the Proposed Action.

  **Significance of the Impact:** This impact is considered potentially significant with respect to vegetation removal during the avian breeding season that results in a violation of the MBTA and the following mitigation measure has been identified.

- **Mitigation Measure 3.23.3.6-7:** Mitigation under the Off-Site Transfer of Ore Concentrate for Processing Alternative would be the same as mitigation under the Proposed Action (Mitigation Measure 3.23.3.5-7).

- **Effectiveness of Mitigation and Residual Effects:** Mitigation Measure 3.23.3.3-7 would reduce impacts to migratory birds during Project activities to less than significant by ensuring no direct impacts to nesting birds would occur.

- **Impact 3.23.3.6-8:** Loud or sudden noises associated with the Off-Site Transfer of Ore Concentrate for Processing Alternative could result in an indirect impact (i.e., disturbance) to golden eagles nesting east of the Project Area.

  **Significance of the Impact:** This impact is considered potentially significant with respect to Project activities during the golden eagle breeding season that may result in a violation of the Bald and Golden Eagle Protection Act and the following mitigation measure has been identified.

- **Mitigation Measure 3.23.3.6-8:** Mitigation under the Off-Site Transfer of Ore Concentrate for Processing Alternative would be the same as mitigation under the Proposed Action (Mitigation Measure 3.23.3.3-8).

- **Effectiveness of Mitigation and Residual Effects:** Mitigation Measure 3.23.3.3-8 would reduce impacts to golden eagles during Project activities to less than significant by ensuring no direct impacts to nesting birds would occur.

- **Impact 3.23.3.6-9:** Pygmy rabbit individuals and habitat could be impacted as a result of the Proposed Action.

  **Significance of the Impact:** This impact is not considered significant with respect to pygmy rabbits; however, the BLM proposes the following mitigation measure.

- **Mitigation Measure 3.23.3.6-9:** Mitigation under the Off-Site Transfer of Ore Concentrate for Processing Alternative would be the same as mitigation under the Proposed Action (Mitigation Measure 3.23.3.5-7).

- **Effectiveness of Mitigation and Residual Effects:** Although direct effects to pygmy rabbits and their habitat would occur in the Project Area, this mitigation would ensure additional pygmy rabbit habitat is created to replace the habitat removed at a two to one ratio.

- **Impact 3.23.3.6-10:** There may be a decrease in flows within Henderson Creek, which may affect the creek's criteria for use in LCT recovery.

  **Significance of the Impact:** This impact is considered potentially significant with respect to a LCT recovery creek. The following mitigation has been identified by the BLM to limit the potential effect to Henderson Creek and ensure that there would not be an effect to Birch Creek or Pete Hanson Creek.

- **Mitigation Measure 3.23.3.6-10:** Mitigation under the Off-Site Transfer of Ore Concentrate for Processing Alternative would be the same as mitigation under the Proposed Action (Mitigation Measure 3.23.3.5-8).

- **Effectiveness of Mitigation and Residual Effects:** Implementation of Mitigation Measure 3.2.3.3-2b and the use of any of the options outlined in Section 3.2.3 would be effective to very effective at mitigating the impacts from reduced surface water flows. The effectiveness of Mitigation Measure 3.2.3.3-2c, if implemented, is less certain since it would be many decades in the future. However, if measures used in Mitigation

Measure 3.2.3.3-2b are implemented, then the measure should be effective at mitigating the impacts from reduced surface water flows. Over a long period of time (tens to 100s of years) the effects to most surface water flows would diminish; however, for the springs nearest to the open pit, flows would be reduced or eliminated in perpetuity.

- **Impact 3.23.3.6-11:** Bat foraging habitat would be impacted as a result of the Partial Backfill Alternative for the duration of the Project.

  **Significance of the Impact:** This impact is not considered significant; however, the following mitigation is proposed.

- **Mitigation Measure 3.23.3.6-11:** In order to minimize impacts to bat habitat, prior to the initiation of Project activities, EML would close those mine workings that would be removed over the life of the Project (after bats have been evacuated) and install bat-friendly closures on openings that would not be directly impacted by the Project in order to preserve access to the remaining bat habitat (also see Appendix C).

- **Effectiveness of Mitigation and Residual Effects:** The protection of specific mine openings in the Project Area would be effective as mitigation for the loss of habitat associated with those mines that would be removed as a result of Project activities. Bats excluded from the closed mines in the Project Area are familiar with the mine openings that would remain accessible and would take advantage of its preservation.

3.23.3.6.3 Residual Adverse Impacts

The Off-Site Transfer of Ore Concentrate for Processing Alternative would result in the unavoidable loss of up to 734 acres of wildlife foraging habitat resulting from surface disturbance in the open pit area. Approximately 8,298 acres of foraging habitat would be removed in the short term, and then 7,656 would be reclaimed as a result of mine development, operation, and closure. The reclaimed land would have more grass and forb forage and less mature shrub forage in the short term.

3.23.3.7 Slower, Longer Project Alternative

Impacts from the Slower, Longer Project Alternative would occur over a period approximately twice as long in duration compared to the Proposed Action. As discussed in Section 3.2.3, the surface area predicted to be impacted by the drawdown by this alternative is similar to, but slightly different than, the Proposed Action. The differences between the predicted drawdown area is illustrated on Figure 3.2.28. Impacts to wildlife as a result of the Slower, Longer Project Alternative are expected to be similar to the Proposed Action at the end of the Project.

3.23.3.7.1 General Wildlife

- **Impact 3.23.3.7-1:** Approximately 8,318 acres of wildlife habitat would be directly removed as a result of the Slower, Longer Project Alternative over the extended mine life.

  **Significance of the Impact:** The impact is not considered significant. Based on the conclusions from the analysis, no additional mitigation is proposed.

- **Impact 3.23.3.7-2:** Modification of wildlife habitat and subsequent reclamation efforts would result in less available mature vegetation for cover, forage, and nesting habitat for many species of wildlife for the duration of this alternative.

  **Significance of the Impact:** The impact is not considered significant. Based on the conclusions from the analysis, no additional mitigation is proposed.

- **Impact 3.23.3.7-3:** Loud and sudden noises associated with the Slower, Longer Project Alternative could result in wildlife displacement for the life of the Project.

  **Significance of the Impact:** As a result of the longer duration of activities under this alternative, impacts to wildlife and habitat would span multiple generations and populations of some species; therefore, this impact meets the significance criteria listed in Section 3.23.3. No mitigation is proposed at this time.

- **Impact 3.23.3.7-4:** Wildlife dependent on vegetation growing near perennial streams, springs, and seeps would potentially experience water stress due to the water table drawdown associated with mine dewatering and subsequent filling of the open pit. Lowering of the water table in the area of these plants would potentially cause a decline in the wetland vegetation community and the associated wildlife species. The lowering of the water table would also potentially result in less water for wildlife consumption.

  **Significance of the Impact:** The impact would not be significant; however, the BLM has identified the following mitigation that would benefit wildlife.

- **Mitigation Measure 3.23.3.7-4**: Mitigation for the potential loss of water would include the development of six water sites (Figure 3.13.1). Although the sites were identified as part of mitigation to wild horses (Section 3.13), development of the sites would also result in indirect beneficial impacts to wildlife species throughout the Project Area. Additional mitigation has been proposed for wetland vegetation in Section 3.11 (mitigation measure 3.11.3.3-1), which includes a replacement of riparian vegetation at a three to one ratio with local cuttings, plugs or seeds.

- **Effectiveness of Mitigation and Residual Effects:** Mitigation Measures 3.11.3.3-1 and 3.23.3.3-4 would reduce impacts to the loss of riparian habitat during Project activities. Replacement with local cuttings, plugs, or seeds would ensure no long-term impacts to the temporary loss of riparian vegetation.

- **Impact 3.23.3.7-5:** For wildlife (terrestrial and avian), the results of the SLERA assessment indicate a low risk based on calculated species-specific toxicity criteria using more recent EPA developed TRVs. None of the chemicals of potential ecological concern identified in the predicted pit lake water poses a credible risk to wildlife that may inhabit the area and use the pit lake as a drinking water source.

  **Significance of the Impact:** The potential to adversely affect the health of terrestrial or avian life is considered negligible. Based on the predicted pit lake chemistry, calculated toxicity criteria, and predicted utilization of the Mount Hope open pit water by wildlife, the overall ecological risk from the Slower, Longer Project Alternative is considered to

be low. The impact is not considered significant. Based on the conclusions from the analysis, no mitigation has been proposed.

3.23.3.7.2 Special Status Wildlife Species

- **Impact 3.23.3.7-6:** Greater sage-grouse individuals and habitat could be impacted as a result of the Slower, Longer Project Alternative.

  **Significance of the Impact:** This impact is considered potentially significant with respect to greater sage-grouse, a USFWS candidate species and a BLM sensitive species, and greater sage-grouse habitat and the following mitigation is proposed.

- **Mitigation Measure 3.23.3.7-6:** The mitigation measures identified in the Sage Grouse Mitigation Plan (Appendix C).

- **Effectiveness of Mitigation and Residual Effects:** Mitigation Measure 3.23.3.6-6 would reduce impacts to greater sage-grouse during Project activities to less than significant through the implementation of seasonal restrictions, minimizing surface disturbance, installation of sound barrier walls, and installation of predator anti-perching devices (Appendix C).

- **Impact 3.23.3.7-7:** Approximately 8,318 acres of migratory bird and raptor habitat would be directly removed over the extended mine life as a result of the Slower, Longer Project Alternative.

  **Significance of the Impact:** This impact is considered potentially significant with respect to vegetation removal during the avian breeding season that results in a violation of the MBTA and the following mitigation is proposed.

- **Mitigation Measure 3.23.3.7-7:** Land clearing would be conducted outside the avian breeding season. If this is not possible, then a qualified biologist would survey the area to be cleared prior to clearing. If active nests were identified, or if other evidence of nesting (mated pairs, territorial defense, carrying nesting material, transporting food) was observed as a result of this survey, then a protective buffer (the size of which would depend on the requirements of the species) would be delineated and the delineated protective buffer avoided to prevent destruction or disturbance to nests until the nests were no longer active or nesting activities were no longer observed.

- **Effectiveness of Mitigation and Residual Effects:** Mitigation Measure 3.23.3.3-7 would reduce impacts to migratory birds during Project activities to less than significant by ensuring no direct impacts to nesting birds would occur.

- **Impact 3.23.3.7-8:** Loud or sudden noises associated with the Slower, Longer Project Alternative could result in an indirect impact (i.e., disturbance) to golden eagles nesting east of the Project Area.

  **Significance of the Impact:** This impact is considered potentially significant with respect to Project activities during the golden eagle breeding season that may result in a

violation of the Bald and Golden Eagle Protection Act and the following mitigation measure has been identified.

- **Mitigation Measure 3.23.3.7-8:** Mitigation under the Slower, Longer Project Alternative would be the same as mitigation under the Proposed Action (Mitigation Measure 3.23.3.3-8).

- **Effectiveness of Mitigation and Residual Effects:** Mitigation Measure 3.23.3.3-8 would reduce impacts to golden eagles during Project activities to less than significant by ensuring no direct impacts to nesting birds would occur.

- **Impact 3.23.3.7-9:** Pygmy rabbit individuals and habitat could be impacted as a result of the Proposed Action.

  **Significance of the Impact:** This impact is not considered significant with respect to pygmy rabbits; however, the BLM proposes the following mitigation measure.

- **Mitigation Measure 3.23.3.7-9:** Mitigation under the Slower, Longer Project Alternative would be the same as mitigation under the Proposed Action (Mitigation Measure 3.23.3.3-7).

- **Effectiveness of Mitigation and Residual Effects:** Although direct effects to pygmy rabbits and their habitat would occur in the Project Area, this mitigation would ensure additional pygmy rabbit habitat is created to replace the habitat removed at a two to one ratio.

- **Impact 3.23.3.7-10:** There may be a decrease in flows within Henderson Creek, which may affect the creek's criteria for use in LCT recovery.

  **Significance of the Impact:** This impact is considered potentially significant with respect to a LCT recovery creek. The following mitigation has been identified by the BLM to limit to potential effects to Henderson Creek and to ensure that there would not be an effect to Birch Creek or Pete Hanson Creek.

- **Mitigation Measure 3.23.3.7-10:** The mitigation measure identified in Section 3.2.3 to ensure that the development of the ten-foot drawdown contour is consistent with the analysis in this EIS (Mitigation Measure 3.2.3.3-2a and 3.2.3.3-2b) would be sufficient to mitigate the impact to LCT from the Proposed Action.

- **Effectiveness of Mitigation and Residual Effects:** Implementation of Mitigation Measure 3.2.3.3-2b and the use of any of the options outlined in Section 3.2.3 would be effective to very effective at mitigating the impacts from reduced surface water flows. The effectiveness of Mitigation Measure 3.2.3.3-2c, if implemented, is less certain since it would be many decades in the future. However, if measures used in Mitigation Measure 3.2.3.3-2b are implemented, then the measure should be effective at mitigating the impacts from reduced surface water flows. Over a long period of time (tens to 100s of years) the effects to most surface water flows would diminish; however, for the springs nearest to the open pit, flows would be reduced or eliminated in perpetuity.

- **Impact 3.23.3.7-11:** Bat foraging habitat would be impacted as a result of the Slower, Longer Project Alternative for the duration of the Project.

  **Significance of the Impact:** This impact is not considered significant; however, the following mitigation is proposed.

- **Mitigation Measure 3.23.3.7-11:** In order to minimize impacts to bat habitat, prior to the initiation of Project activities, EML would close those mine workings that would be removed over the life of the Project (after bats have been evacuated) and install bat-friendly closures on openings that would not be directly impacted by the Project in order to preserve access to the remaining bat habitat (also see Appendix C).

- **Effectiveness of Mitigation and Residual Effects:** The protection of specific mine openings in the Project Area would be effective as mitigation for the loss of habitat associated with those mines that would be removed as a result of Project activities. Bats excluded from the closed mines in the Project Area are familiar with the mine openings that would remain accessible and would take advantage of its preservation.

3.23.3.7.3 Residual Adverse Impacts

The Slower, Longer Project Alternative would result in the unavoidable loss of up to 734 acres of terrestrial wildlife habitat resulting from surface disturbance in the open pit area. Approximately 7,656 acres of wildlife habitat would be removed over the course of this alternative and then reclaimed as a result of mine development, operation, and closure. The reclaimed land would have more grass and forb forage and less mature shrub forage. Browsers would benefit the most from the early seral stage vegetation immediately following reclamation. As the plant communities within the Project Area mature, larger shrubs would provide additional cover for larger animals and less of a forage prey base for raptors, similar to the existing conditions. In addition, the impacts from this alternative would create prolonged habitat disturbance on wildlife.

## 3.24 Transportation and Access

### 3.24.1 Regulatory Framework

The transportation system associated with, and in the vicinity of, the Project consists of a network of roads that are maintained by either Eureka County, the NDOT, BLM, or are existing roads on public lands that are not maintained.

Public lands under BLM jurisdiction are managed "...on the basis of multiple use and sustained yield unless otherwise specified by law" (Sec. 102 (a)(7), FLPMA). Under the FLPMA, access to public lands is generally considered open, unless the BLM RMP has designated otherwise. All public lands in the vicinity of the Project Area, except for the Roberts Mountain WSA are in an open status.