SUPPLEMENT TO

CARSON CITY FIELD OFFICE
GEOTHERMAL LEASING
ENVIRONMENTAL ASSESSMENT
(EA-NV-030-06-025)

Aurora Area
Bridgeport Ranger District
Humboldt-Toiyabe National Forest
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**SUPPLEMENT TO**
CARSON CITY FIELD OFFICE
GEOTHERMAL LEASING ENVIRONMENTAL ASSESSMENT (EA-NV-030-06-025)

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INTRODUCTION AND BACKGROUND

History of the Analysis

A Geothermal Leasing Environmental Assessment (EA-NV-030-06-025) addressing 61 non-competitive leases (109,884 acres) was prepared by the Bureau of Land Management (BLM) Carson City Field Office (CCFO) and published in July 2006. The BLM engaged the U.S. Forest Service (USFS) in the process by requesting their concurrence for nominations on National Forest System (NFS) land. Nineteen (19) of the 61 noncompetitive lease applications (covering 56 land sections and approximately 33,000 acres) are located on NFS land within the Bridgeport Ranger District (Figure 1). The 2006 environmental assessment (EA) evaluated the impacts on the natural and human environment that could result from the CCFO of the BLM issuing leases for geothermal resources.

On April 17, 2007, the Forest Supervisor signed a Decision Notice and Finding of No Significant Impact (DN/FONSI) making 22 sections of NFS land available for leasing, including 14 sections within the North and South Aurora lease areas (Figure 2 and Table 1). The decision deferred 34 sections of land within the North Aurora (6 sections), South Aurora (27 sections) and Wilson Canyon (1 section) lease areas because of their unknown risk of impact. Biological and cultural resource data available at the time of the 2007 decision were limited and could not support a “finding of no significant impact” determination for these 34 sections. Following this decision, the BLM subsequently issued leases on the 14 Aurora sections.

Following the 2007 decision, the BLM requested USFS concurrence to lease the previously deferred sections in the North and South Aurora areas (totaling 33 sections). The one section in Wilson Canyon is not analyzed in this document due to its small size, isolated location, and lack of industry interest. The USFS responded to the BLM that further NEPA analysis and additional data collection was necessary in order to determine if the lands could be made available for leasing. In 2009, the USFS hired a contractor (Tetra Tech) to gather and compile additional site-specific biological and cultural resource information for the deferred North and South Aurora sections. This data consisted of a literature search from USFS files, Nevada State Historic Preservation Office (SHPO) files, state and federal wildlife agencies, university and public sources, and geophysical exploration surveys. The additional data was analyzed and incorporated into the project record to supplement the July 2006 EA.

Scope of the Supplement

The USFS has prepared this supplemental EA to evaluate and incorporate the additional data for 25 of the deferred 33 Aurora sections (as shown in Table 2). The remaining eight sections (Sections 4, 8-9, T. 6 N., R. 27 E.; Sections 17, 18, 31, 32, & 33, T. 5 N., R. 28 E.) are deferred for future analysis.

The USFS National Environmental Policy Act (NEPA) Handbook (FSH) allows for supplementation or revision of an EA “if the interdisciplinary review of new information or changed circumstances indicates that changes in the EA are needed to address environmental concerns that have a bearing on the action or its impacts” (FSH 1909.15, Section 18.4).

An introductory paragraph at the beginning of each chapter in this supplement summarizes the changes to the EA, and specific, more detailed narrative changes will follow.
Figure 1. Vicinity Map of the Bridgeport Ranger District Area
Figure 2. Map of the North and South Aurora Areas showing the 2007 Decision Deferred Sections and Lease with Stipulation Sections.
### Table 1. Summary of Original 2007 Leasing Decisions, Deferred Sections, and Associated Environmental Risk Levels*

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* Environmental Risk Levels: L=Low, M=Moderate, H=High. Resource specific risk based on the presence and extent of resources within a proposed lease section; extent of resources in the surrounding area; quality of existing data; and implementation of Standard Operating Procedures and Conditions of Approval (EA, Appendix B), and USFS Standard Lease Stipulations (2007 Decision, Attachment C).

** Approximate NFS lands acreage (2006 EA Table 2-1 revised and adjusted to exclude BLM and private land acreage)
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CHAPTER 1: PURPOSE AND NEED

All of the information presented in Chapter 1 of the original 2006 EA remains valid and unchanged. The following new information is being presented for this supplement.

1.1. Decision Framework

The Forest Supervisor of the Humboldt-Toiyabe National Forest, as the Responsible Official, will decide:

- Whether to consent to lease all or some of the 25 sections being evaluated.
- What stipulations, if any, would be applied to the sections consented to lease.

1.2. Public Involvement

Public involvement for this supplemental EA included a public mailing and a 30-day notice and comment period, as required by 36 CFR 215 (Notice, Comment, and Appeal Procedures for National Forest System Projects and Activities). The 30-day public comment period began on May 6, 2011. Comments were analyzed and considered by the Responsible Official, consistent with 40 CFR 1503.4.

1.3. Tribal Involvement

Additional tribal consultation was carried out for this supplemental EA in late 2010 and throughout 2011 to ensure Native Americans were fully aware of the USFS proposed action and to discuss tribal concerns. Letters were sent to the tribes listed in Chapter 5 (Section 5.3). Presentations and consultation were carried out with the tribal councils of the Yerington Paiute Tribe, the Bridgeport Indian Colony, and the Walker River Paiute Tribe. These tribes have stated their support of the proposed action, contingent on implementation of the proposed modified stipulations (Appendix A). The tribes are aware that leasing itself has no impact and further geothermal exploration, development, production, and closeout proposals would require on-the-ground surveys and additional analysis that would provide specific information on resource and tribal concerns.
CHAPTER 2: PROPOSED ACTION AND ALTERNATIVES

All of the information presented in Chapter 2 of the original 2006 EA remains valid and unchanged, except for the following additions and changes.

2.1. Modified Proposed Action

The modified proposed action consists of three primary components: 1) Sections/acreage proposed for leasing availability; 2) Stipulations and Notices proposed to minimize impacts; and 3) the Reasonably Foreseeable Development Scenario (RFD).

2.1.1. Land Sections/Acreages

The May 2011 Notice of Proposed Action and Opportunity to Comment/Supplemental EA proposed to make available for non-competitive geothermal lease approximately 11,390 acres of NFS land on the Bridgeport Ranger District in the North Aurora and South Aurora lease areas including all or part of 22 sections. Based on comments from the lease applicant and additional review completed by the USFS, the proposed action (May 2011) has been modified to include three additional sections for leasing (Sections 22, 23, and 26, T. 6 N., R. 28 E., MDM). In total, approximately 12,809 acres of NFS land, including all or part of 25 sections, are being proposed for non-competitive leasing availability in the North Aurora and South Aurora lease areas (Table 2 and Figure 3).

Table 2. Sections Proposed for Leasing in the 2012 Supplement to EA

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<th>Township and Range</th>
<th>Section</th>
<th>Acres*</th>
<th>Notes</th>
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<td>7N-27E</td>
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<td>Lot 4, N/2NE/4, SW/4NE/4 of Section 30 is excluded from mineral entry, including geothermal leasing (see Ch. 4 for discussion).</td>
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<td><strong>Sub-total for North Aurora Lease Area</strong></td>
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*Acreage figures are only for the NFS lands within that section

Figure 3 highlights the land sections proposed for analysis in this supplement and clarifies the status of all other land sections within the project area.

2.1.2. Stipulations and Lease Notices

In response to public, tribal, agency comment, and USFS review, the proposed action modifies Attachment C FS Lease Stipulations from the 2007 Decision. The stipulations for the proposed 25 sections are attached in Appendix A of this EA supplement. Standard exceptions, modifications, and waivers may apply. Lease notices for the proposed 25 sections are attached in Appendix B of this EA supplement. The following stipulations and notices lower the risk rating (impact potential) to a low to moderate level to protect the various resources.

2.1.2.1. No Surface Occupancy Stipulations

1. On lands administered by the USFS, no surface occupancy or other surface disturbance will be allowed on slopes in excess of 40 percent.

2. On lands administered by the USFS, no surface occupancy would be allowed within 200 feet of eligible National Register sites, historic properties, or unevaluated archeological historic sites.

3. No surface occupancy is allowed within 300 feet of Lahontan cutthroat trout habitat (LCT) within the East Fork Walker River and Bodie Creek.

4. No surface occupancy is allowed for all of Section 5, T. 5 N., R. 28 E., due to steep slopes and Native American concerns. No surface occupancy is allowed for all of Section 21, T. 5 N., R. 28 E. due to steep slopes.

5. No surface occupancy is allowed within three (3) miles of an active sage-grouse lek.

6. No surface occupancy is allowed on lands falling within priority habitat for sage-grouse as identified by the Nevada Department of Wildlife (Nevada Sage-grouse Habitat Categorization Map), or as identified based on pre-construction field surveys. Priority habitat for sage-grouse includes Category 1 (irreplaceable, limited, and essential) and Category 2 (important, high-quality habitat) (Governor’s Sage-grouse Conservation Team 2010).

7. No surface occupancy is allowed within 0.25 mile buffer on either side of the East Fork of the Walker River to protect visual and recreational resources.

8. No surface occupancy is allowed within a 0.25 mile buffer on either side of Forest Road 765 in Section 30, T. 7 N., R. 27 E. to protect visual resources.
Figure 3. Map of the North and South Aurora Areas displaying the Proposed Action.
2.1.2.2. Controlled Surface Use Stipulations

1. No sagebrush would be removed in known, occupied pygmy rabbit habitat to protect their burrows. Habitat would be defined with an inclusive polygon around all active burrows plus a 100 meter buffer.

2. No road construction or reconstruction would be authorized in designated inventoried roadless areas (IRA). Timber would not be cut or sold within the IRAs. Overland or cross-country travel would be restricted to ensure a temporary road is not created.

2.1.2.3. Timing Limitations

1. In areas identified as *Mono phacelia* habitat, ground-disturbing activities would be limited to periods outside of the growing season, which extends from March 1 to July 1.

2. Migratory Bird Habitat – No ground disturbing activities would be allowed during the avian breeding season (approximately April 1 through August 30) unless a nest survey is completed prior to ground disturbance. A nest survey would be conducted by a qualified biologist within migratory bird breeding habitat prior to any surface disturbance associated with exploration activities being approved. If nests are located, or if other evidence of nesting (e.g., mated pairs, territorial defense, carrying of nest material, transporting food) is observed, a protective buffer would be delineated and the entire buffer area avoided to prevent destruction or disturbance to nests until they are no longer active. The buffer would be species-dependent and established by a qualified wildlife biologist. The start and end dates of the seasonal restriction may be altered based on site-specific information such as elevation and winter weather patterns, which would affect breeding chronology and the presence of the species.

2.1.2.4. Lease Notices

For leases within NFS lands, the lessee/operator must comply with all the rules and regulations of the Secretary of Agriculture set forth in Title 36, Chapter II of the Code of Federal Regulations governing the use and management of the NFS when not inconsistent with the rights granted by the Secretary of Interior in the lease/permit. The secretary of Agriculture’s rules and regulations are applicable to:

1. All use and occupancy of the NFS lands prior to approval of an exploration plan by the Secretary of Interior;

2. Uses of all existing improvements on NFS land, such as forest development roads, within and outside the area permitted by the Secretary of Interior; and

3. Use and occupancy of the NFS lands not authorized by an exploration plan approved by the Secretary of Interior.

The following lease notices have been developed to accompany geothermal leasing with regard to geothermal exploration and development within the Humboldt-Toiyabe National Forest.

A. The lands within this lease may now or hereafter include plants, animals, or their habitat listed as threatened, endangered, proposed, or have candidate status with the US Fish and Wildlife Service (USFWS). The BLM, in coordination with the USFS, may require modifications to proposed activity that is likely to jeopardize the continued existence of a proposed, threatened, and endangered or candidate species or result in the destruction or adverse modification of a designated or proposed critical habitat. The BLM, in coordination with the USFS, will not approve any ground-disturbing activity that may affect any such species or critical habitat until it completes its obligations under applicable requirements of the Endangered Species
Act (ESA) as amended, 16 USC 1531 et seq., including completion of any required procedure for conference or consultation.

B. The lands within this lease may now or hereafter include plants, animals or their habitat listed as USFS Sensitive or that have designation through other federal and state agencies such as the Nevada Department of Wildlife. Surveys for USFS sensitive species will be conducted prior to initiating any ground disturbing activities. The BLM, in coordination with the USFS, may require modifications to proposed activity that is likely to lead to the listing of a sensitive species or loss of viability. Restrictions related to sensitive species include, but are not limited to:

1. Operations in occupied rare plant habitat would be restricted to protect species. Additional restrictions may be added to protect rare/sensitive plants.

C. In addition to protection for all species, the following restrictions are in place to limit impacts to the bi-state distinct population segment (DPS) of the greater sage-grouse by becoming conditions of approval:

1. The BLM, in coordination with the USFS, will be consulted regarding the location of sage-grouse strutting grounds (leks), nesting, brood-rearing, wintering habitats, and movement corridors. The distances and times that these areas will be avoided will be determined by the BLM in coordination with the USFS.

2. Areas outside priority habitats (Category 1 and 2) as defined by the Nevada Department of Wildlife (Nevada Sage-grouse Habitat Categorization Map) may be designated as no surface occupancy or otherwise restricted from development if they are determined to be important movement corridors for sage-grouse.

3. A comprehensive monitoring plan would be required to monitor sage-grouse demographics and movement patterns before, during, and after construction in any affected, occupied areas. If any work is conducted within any Category 3 sage-grouse habitat, a company representative would be on site to provide training to construction personnel on relevant avoidance/minimization/mitigation measures and oversee compliance during construction.

4. Additional restrictions (e.g., timing) for all potentially ground-disturbing activities to sage-grouse (e.g., drilling, project-related driving), regardless of location, would be analyzed under NEPA and subject to approval by the BLM, in coordination with the USFS, given the most current guidance and standards for sage-grouse conservation. These restrictions would also protect the bi-state DPS from losing habitat needed during all phases of its life cycle: strutting grounds (leks); nesting, brood-rearing, wintering habitats; and movement corridors. As of this writing, current guidance and standards are those found in the following documents:

   • *Nevada Energy and Infrastructure Developments Standards to Conserve Greater Sage-grouse Populations and their Habitats* (Governor’s Sage-grouse Conservation Team 2010).

   • *The Draft Nevada Sage-grouse Habitat Categorization Map* (NDOW January 2012).

• The Draft Bi-state Action Plan (Bi-state Technical Advisory Team January 2012).

D. The lands within this lease may now or hereafter contain historic properties, traditional cultural properties, and/or sacred sites currently unknown to the BLM or USFS, that were not identified in the Land and Resource Management Plan or during the lease parcel review process. These resources are protected under the National Historic Preservation Act (NHPA), American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, Executive Order 13007, or other statutes and executive orders. All activities proposed under the authority of this lease are subject to compliance with Section 106 of the NHPA and Executive Order 13007. The BLM, in coordination with the USFS, will not approve any ground disturbing activities that may affect any such properties or resources until it completes its obligations (e.g., State Historic Preservation Officer (SHPO) and tribal consultation) under applicable requirements of the NHPA and other authorities. The BLM may require modification to exploration or development proposals to protect such properties, or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized, or mitigated. Depending on the nature of the lease developments being proposed and the cultural resources potentially affected, compliance with Section 106 of the National Historic Preservation Act and Executive Order 13007 could require intensive cultural resource inventories, Native American consultation, and mitigation measures to avoid adverse effects—the costs for which will be borne by the lessee.

1. Lessee is advised that if previously undiscovered cultural resources (historic or prehistoric objects, artifacts, or sites) are exposed as a result of operations, those operations will not proceed until notification is received from the Authorized Officer that provisions for mitigating unforeseen impacts has been carried out.

2. Lessee would be held responsible for damage to cultural resource sites.

3. In areas of high archaeological sensitivity, as defined by the BLM in coordination with the USFS, access would be restricted.

4. If impacts occur to continued traditional tribal cultural practices, exploration/development would be restricted to protect tribal traditions.

2.1.3. Reasonably Foreseeable Development Scenario —Aurora Project Area

The RFD scenario has been modified from the 2006 EA due to the smaller parcel size on NFS lands taking into account the geothermal resource potential of the area. The proposed action involves consent or non-consent to issue leases for geothermal resources by the USFS to the BLM, who has authority to issue the leases. It is reasonable to assume that the investment in obtaining a lease could eventually result in development of geothermal resources. In order to assess the potential for environmental impacts that may result in the Aurora area because of lease approval, a RFD scenario has been developed. The complete development of a geothermal resource involves four sequential phases: (1) exploration, (2) development, (3) production, and (4) closeout. The success or failure of each phase affects the implementation of subsequent phases, and, therefore, subsequent
environmental impacts. If the BLM leases NFS land, exploration is likely, while further development and production are less predictable.

The general assumptions outlined in the following four phases serve to establish reasonable development possibilities for analyzing future environmental impacts that may result from the BLM issuing leases for geothermal resources following determination of consent to lease by the USFS. The RFD scenario provides for a general evaluation of the types of impacts that may occur; however, the RFD cannot accurately predict the magnitude and extent of those impacts. This is due, in part, to the inability to predict future development scenarios, including types of development, timing, and location. It is also due to the fact that the development scenario is based on expected activities undertaken for a single lease. Since a lease can range in size from a portion of one section of land (less than 640 acres) up to four sections of land (2,560 acres), potential impacts may be concentrated or diffuse depending on the size of a lease development and the number of developments in an area. The following discussion related to the four phases is taken from the 2006 Carson City Field Office Geothermal Leasing Environmental Assessment.

This RFD scenario is also based on the assumption that resource development would be for electrical generation and not for direct geothermal use or geothermal spas.

2.1.3.1. Phase One: Geothermal Resource Exploration

The first step in determining if a geothermal resource exists and is economically viable is exploration. Exploration involves geophysical surveying, followed by drilling temperature gradient wells, and finally deep exploration well(s) drilling and would normally take between one to five years to complete.

**Geophysical Surveys**

Geophysical surveying potentially includes gravity, magnetic, magnetotelluric, electromagnetic, and seismic surveys. Gravity and magnetic surveys are carried out by a single person on foot carrying a backpack or other small device to take instrument readings and would not create surface disturbance. Magnetotelluric, electromagnetic, and seismic surveys require burying a series of recording devices on the surface to a depth of less than one foot. Once compiled, geologists and geophysicists examine the data and make inferences about where the higher geothermal temperature gradients may occur. High geothermal temperature gradients can indicate the location of potential underground geothermal reservoirs capable of supporting commercial uses.

A geothermal resource developer would be required to obtain authorization from the BLM, in coordination with the USFS, prior to conducting these surveys. Additional environmental analysis would occur prior to approval.

**Temperature Gradient Wells**

The second step of the exploration phase is to drill temperature gradient wells on leased land. This allows the lessee to confirm a more precise location of high geothermal temperature gradients. Temperature gradient wells can be drilled using a truck or track-mounted rig and range from 200 feet to over 4,000 feet deep, although usually 1,000-2,000 feet deep. Geologists examine either rock fragments or long cores of rock that are brought up from within the well. Temperatures are also measured at depth. Both well temperatures and the results of rock sample analyses are used to determine if additional exploration is necessary to identify the presence and characteristics of an underground geothermal reservoir.

Whenever possible, a driller would access the temperature gradient well site using existing roads. When existing roads are not available, new access roads may need to be constructed for the truck-
mounted rig to reach the site. If slope is not a concern, low-impact overland (cross-country) routes may be utilized. Track-mounted rigs have the ability to access a location cross-country.

Preparing the site for drilling could include leveling the surface and clearing vegetation. The lessee could drill several temperature gradient wells on a lease to determine both the lateral extent of the temperature anomaly and location of the highest temperature gradient. Each drill site could disturb approximately 0.07 acre. In addition to the drill rig, a diesel generator may also be used at the site to power equipment.

As with geophysical surveys, a geothermal resource developer would be required to obtain authorization from the BLM, in coordination with the USFS, through additional environmental analysis requirements prior to constructing roads, creating drill sites, and drilling.

All surface disturbances would be reclaimed to the satisfaction of the USFS and BLM. If a temperature gradient well was unsuccessful, it would be abandoned according to state laws, and the drill site would be reclaimed. Abandonment includes plugging, capping, and covering the well. Reclamation includes removing all surface equipment and structures, regrading the site to pre-disturbance contours, and re-establishing native vegetation.

Deep Exploratory Wells

The third and final step of the exploration phase is to drill deep exploratory wells on leased land. This allows the lessee to identify the presence and characteristics of an underground geothermal reservoir. Exploratory wells can be drilled using a truck-mounted rig or for deep wells by truck-transported components, which are assembled on the site. These wells range up to 10,000 feet deep.

Whenever possible, a driller would access the drill sites using existing roads. When existing roads are not available, new access roads usually need to be constructed for the truck-mounted rig or truck-transported rig components to reach the site. In some situations, if slope is not a concern, low-impact overland (cross-country) routes may be utilized.

Preparing the site for drilling could include leveling the surface and clearing away vegetation. The lessee could drill several deep exploration wells on a lease, and each drill site could disturb up to approximately 2 acres.

As with geophysical surveys, a geothermal resource developer would be required to obtain authorization from the BLM, in coordination with the USFS, through additional environmental analysis requirements prior to constructing roads, creating drill sites, and drilling.

All surface disturbances would be reclaimed to the satisfaction of the USFS and BLM. If an exploratory well was unsuccessful, it would be abandoned according to state laws, and the drill site would be reclaimed. Abandonment includes plugging, capping, and covering the well. Reclamation includes removing all surface equipment and structures, regrading the site to pre-disturbance contours, and re-establishing native vegetation.

2.1.3.2. Phase Two: Geothermal Resource Development

Based on the results of exploration, geothermal resource development would involve assembling the infrastructure needed to produce the underground geothermal reservoir and generate electricity. The type of development that occurs would be based on the size and temperature of the geothermal reservoir. The development phase involves the most intense activity and would occur over two to ten years. Development would involve the following construction and operation activities:

- Additional drilling would likely take place to install and test production and injection wells. This drilling could take place 24 hours a day. Production-size wells can sometimes be over 10,000 feet deep. In order to drill these deep holes, a two-acre well pad would be constructed
and a large drill rig would be utilized. Commonly, up to two wells could be drilled per lease. One to three injection wells used to inject partly cooled, production geothermal water back into the ground may also be drilled on the lease.

- **Access roads**—New access roads to accommodate the larger equipment associated with the development phase would be constructed. The roads commonly range from 0.5 mile to 3 miles long.

- **Geothermal pipelines**—Pipelines would be installed to carry water from the wellheads to the power plant and to return water to the injection wells. These pipelines are usually 24 to 36 inches in diameter and are covered with insulation. When feasible, they would parallel the access roads and existing roads to the destination of the geothermal resource’s steam or water. The pipelines would generally be no longer than approximately four miles.

- **Power plant construction**—A power plant, likely in the range of 30-50 megawatts (MW) capacity would be constructed on-site. Power plant construction could occupy between 15 to 25 acres.

- **Electric transmission lines**—Transmission lines often range in length from 5 to 50 miles. For the most part these would be overhead lines with metal or wood poles and about one acre could be disturbed per mile of transmission line.

- **Concurrent reclamation**—During the development phase, ground disturbances would be reclaimed in a timely manner. This would include reclamation of well pads, staging areas, and exploration roads. Equipment would be removed and disturbed areas regraded and re-vegetated.

As with other phases, a geothermal resource developer would be required to obtain authorization from the BLM, in coordination with the USFS, through additional NEPA analysis prior to entering the development phase.

### 2.1.3.3. Phase Three: Production

The production phase could last from 10 to 30 years or longer. This phase involves the operation and maintenance of the power plant(s) and the geothermal field(s). The drilling of new production and/or injection wells, if necessary, in order to manage a geothermal field could take place. Activities associated with operation, maintenance, and energy production would involve proper disposal and management of waste generated by daily activities; equipment maintenance, fugitive dust, and well emissions; noise from equipment, vehicles, and wells; and monitoring the equipment that circulates and exchanges heat with geothermal water.

As with other phases, a geothermal resource developer would be required to obtain authorization from the BLM, in coordination with the USFS, through additional environmental analysis prior to entering the production phase.

### 2.1.3.4. Phase Four: Closeout

Closeout would occur when the reservoir is no longer capable of economically producing sufficient energy or other factors require the shutdown of facilities. This abandonment includes:

- Removing the power plant buildings and other facilities.
- Removing the power line.
- Plugging, capping, and covering all wells.
- Regrading the site to pre-disturbance contours, and re-establishing native vegetation.
2.1.3.5. Projected Disturbance

The following is adapted from the *Programmatic Environmental Impact Statement for Geothermal Leasing in the Western United States* (PEIS) (October 2008).

According to the PEIS, the broader Aurora area is projected to produce 120 MW of electricity by 2015 and 240 MW by 2025. Since the project area for this analysis is notably smaller than the broader Aurora project area in the PEIS, it is assumed this area could produce 60 MW of electricity by 2015 and 120 MW by 2025. Estimates of disturbance based on the phases of geothermal leasing and development are discussed in detail in the PEIS. Table 2-3 of the PEIS (Table 2 below) provides an estimate of a typical range of acres disturbed to develop a 30- to 50-MW geothermal power plant. This estimate of disturbed acres and the discussion of typical operational phases constitute the RFD scenario for analyzing the effects of geothermal leasing at Aurora. For analysis purposes, it is assumed that in areas with projected generating capacity greater than 50 MW, there would be multiple power plants rather than one large plant.

Since the 2006 PEIS RFD scenario estimates a total production capacity of 120 MW by 2025, and the average power plant is in the range of 30 MW to 50 MW in capacity, it is estimated that 3 to 4 power plants would be built across the project area. Table 3 displays the acreages of disturbance for a typical power plant in the size range of 30 to 50 MW (PEIS 2008, Table 2-3).

The total acreage of disturbance for a single power plant ranges from 53 to 367 acres. This wide range is largely due to the project-by-project variation in distance to transmission and the varying acres of disturbance associated with long versus short transmission line construction. Multiplying this range by the number of power plants, estimated at 3 to 4 in the project area, results in 159 to 1,468 acres of total estimated disturbance.
### Table 3. Typical Disturbances by Phase of Geothermal Resource Development

<table>
<thead>
<tr>
<th>Development Phase</th>
<th>Disturbance Estimate per Plant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exploration</td>
<td>2 – 7 acres</td>
</tr>
<tr>
<td>Geologic mapping</td>
<td>Negligible</td>
</tr>
<tr>
<td>Geophysical surveys</td>
<td>30 square feet¹</td>
</tr>
<tr>
<td>Gravity and magnetic surveys</td>
<td>Negligible</td>
</tr>
<tr>
<td>Seismic surveys</td>
<td>Negligible</td>
</tr>
<tr>
<td>Resistivity surveys</td>
<td>Negligible</td>
</tr>
<tr>
<td>Shallow temperature measurements</td>
<td>Negligible</td>
</tr>
<tr>
<td>Road/access construction</td>
<td>1-6 acres</td>
</tr>
<tr>
<td>Temperature gradient wells</td>
<td>1 acre²</td>
</tr>
<tr>
<td>Drilling Operations and Utilization</td>
<td>51 – 350 acres</td>
</tr>
<tr>
<td>Drilling and well field development</td>
<td>5 – 50 acres³</td>
</tr>
<tr>
<td>Road improvement/construction</td>
<td>4 – 32 acres⁴</td>
</tr>
<tr>
<td>Power plant construction</td>
<td>15 – 25 acres⁵</td>
</tr>
<tr>
<td>Installing well-field equipment including pipelines</td>
<td>5 – 20⁶</td>
</tr>
<tr>
<td>Installing transmission lines</td>
<td>24 – 240⁷</td>
</tr>
<tr>
<td>Well workovers, repairs and maintenance</td>
<td>Negligible⁸</td>
</tr>
<tr>
<td>TOTAL</td>
<td>53 – 367 acres</td>
</tr>
</tbody>
</table>

¹ Calculated assuming 10 soil gas samples at a disturbance of less than 3 square feet each.
² Calculated assuming area of disturbance of 0.05 to 0.25 acre per well and six wells. Estimate is a representative average disturbance of all well sites. Some wells may require a small footprint (e.g., 30 by 30 feet), while others may require larger rigs and pads (e.g., 150 by 150 feet).
³ Size of the well pad varies greatly based on the site-specific conditions. Based on a literature review, well pads range from 0.7 acres up to 5 acres (GeothermEx 2007; FS 2005). Generally a 30-MW to 50-MW power plant requires about five to 10 well pads to support 10 to 25 production wells and five to 10 injection wells. Multiple wells may be located on a single well pad.
⁴ One-half mile to nine miles; assumes about 0.25 mile of road per well. Estimates 30-foot-wide surface disturbance for an 18- to 20-foot road surface, including cut and fill slopes and ditches.
⁵ Constructing a 30-MW power plant disturbs approximately 15 acres; a 50-MW power plant disturbs approximately 25 acres.
⁶ Pipelines between well pad to plant assumed to be 0.25 mile or less, for a total of 1.5 to 7 miles of pipeline in length, with a 25-foot-wide corridor.
⁷ Five to 50 miles long, 40-foot-wide corridor.
⁸ Disturbance would be limited to previously disturbed areas around the well(s).

### 2.2. No Action Alternative

The No Action Alternative described in the original EA would remain unchanged. Under the EA Supplement “No Action Alternative”, none of the 25 NFS land sections identified in Table 2 would be proposed for lease availability.
CHAPTER 3: AFFECTED ENVIRONMENT

All of the information presented in Chapter 3 of the original EA remains valid and unchanged, except for the additions and changes presented below.

The affected environment described in this supplement is limited to the 25 NFS land sections in the North Aurora and South Aurora lease areas proposed for leasing availability in this supplement. The descriptions documented for all other proposed NFS land sections analyzed in the original EA remain valid. There are no changes to the affected environment for the following resources:

• Air Quality
• Land Use
• Soils, Geology and Minerals
• Water Resources
• Invasive Plant Species
• Paleontological Resources
• Livestock Grazing
• Wild Horse and Burro
• Socioeconomics and Environmental Justice

3.1. Vegetation

The elevation within the North Aurora study area ranges from 5,500 feet to 6,500 feet. Vegetation communities in the North Aurora area likely include sagebrush scrub, pinyon-juniper woodlands, and riparian. Perennial riparian areas include Rough Creek and the East Walker River (Tetra Tech 2009).

The elevation within the South Aurora study area ranges from 6,400 to 9,400 feet. Vegetation communities in the South Aurora area likely include sagebrush scrub, wet meadow, pinyon-juniper woodlands, and riparian. Mount Hicks occurs within the south study area, where Bodie Creek is the only perennial water source. Bodie Creek has a thin riparian area, with a small willow component (Tetra Tech 2009).

3.2. Fish and Wildlife

The 2009 biological report prepared by Tetra Tech titled “A Data Inventory for Potential Geothermal Leasing at North Aurora and South Aurora Study Areas” was prepared to provide updated biological information on the wildlife, fish, and plant species in the North and South Aurora lease areas. This report is incorporated by reference.

A supplemental biological evaluation/biological assessment has been prepared for the proposed action. A biological assessment has also been prepared specifically for Lahontan cutthroat trout (LCT). These documents are incorporated by reference and key findings are summarized below.

3.2.1. Special Status Species

3.2.1.1. Federally Listed Endangered and Threatened Species

The project is within historical habitat of the LCT. No LCT currently occupy the area; however, if they are reintroduced into the area, they may be affected by geothermal activities.
3.2.1.2. USDA Forest Service Wildlife Sensitive Species

The following sensitive species are not expected to occur in the project area:

- North American wolverine (*Gulo gulo luteus*)
- Fisher (*Martes pennanti*)
- Sierra Nevada red fox (*Vulpes vulpes nector*)
- Flammulated owl (*Otus flammeoulus*)
- California spotted owl (*Strix occidentalis occidentalis*)
- Great gray owl (*Strix nebulosa*)
- White-headed woodpecker (*Picoides albolarvatus*)
- Sierra Nevada yellow-legged frog (*Rana sierrae*)
- Yosemite toad (*Bufo canorus*)

The following sensitive species have the potential to occur, or are known to occur, in the project area:

**Spotted bat** (*Euderma maculatum*): No individuals or roosts are known in the project area, but site-specific surveys have not occurred. Potential exists for individuals to use the project area.

**Townsend's western big-eared bat** (*Corynorhinus townsendii townsendii*): No individuals or roosts are known in the project area, but site-specific surveys have not occurred. Potential exists for individuals to use the project area.

**Pygmy rabbit** (*Brachylagus idahoensis*): Pygmy rabbits have not been documented in the project area, but site-specific surveys have not occurred. The potential exists for this species to occur in suitable habitat within the project area.

**Bald eagle** (*Haliaeetus leucocephalus*): Bald eagles are not known to nest in or near the project area, but there may be potential wintering habitat in or near the project area.

**Desert bighorn sheep** (*Ovis canadensis nelsoni*): One section proposed for leasing in the North Aurora area is within year round habitat based on Nevada Department of Wildlife geographic information system (GIS) layers. The southern sections of the South Aurora area are in potential habitat, while the more northern sections near Mud Springs are not considered potential habitat.

**Mountain quail** (*Oerortyx pictus*): While mountain quail have not been documented in the project area, suitable habitat may occur throughout the project area, in dense sagebrush or pinyon habitats.

**Northern goshawk** (*Accipter gentilis*): Northern goshawks have not been documented in the project area, however, they have been documented 2.5 miles to the east (Nevada Natural Heritage Program (NNHP) 2011, observation only, with no date on observation).

**Peregrine falcon** (*Falco peregrinus*): Peregrine falcon are not known to occur in the project area based on distribution maps.

**Sage-grouse** (*Centrocercus urophasianus*): Sage-grouse have been documented in both the North and South Aurora areas. Because of the emphasis on the protection of the sage-grouse, additional information is presented in this EA supplement.

The sage-grouse in the project area are part of a distinct population segment (DPS) of the greater sage-grouse, called the bi-state population.

The bi-state population of greater sage-grouse is a candidate for protection under the Endangered Species Act (ESA). In the west, sage-grouse populations have been declining since their peak in the 1970s and are currently down 49-60 percent from this peak (Neel 2001). The bi-state population of
greater sage-grouse has seen an irregular fluctuation between peaks and lows, but there is no consistent long-term trend for a 40 year period (Garton et al. 2011).

In October 2011, the USFWS published their findings for petitioned candidate species under the ESA. They confirmed the listing of the bi-state population is warranted and committed to publish a proposed rule within 12 months.

The bi-state population has been given a higher priority for listing than the greater sage-grouse as a whole due to more immediate and severe threats (USDI 2010). These threats include habitat loss, inadequate regulatory mechanisms, predators, and small population size. As of the date of this document, the USFWS is scheduled to make a listing decision on the bi-state DPS by the end of 2013.

The majority of the analysis area is in the Bodie/Mount Grant Population Management Unit (PMU) of the bi-state DPS. The northeast corner of Section 30 in T. 5 N., R. 27 E. in the North Aurora area is in the Desert Creek PMU of the bi-state DPS.

Presently sage-grouse habitat maps are being prepared by the Nevada Department of Wildlife and others, but are not available in final format at this time. The Draft Nevada Sage-grouse Habitat Categorization Map (NDOW January 2012) breaks the bi-state area into six habitat categories, with Category 1 (irreplaceable, limited and essential habitat) and Category 2 (important, high quality habitat) being considered priority areas for sage-grouse. Category 3 (important, medium quality habitat) and 4 (habitat with moderate potential) are also used by sage-grouse, but to a much lesser extent, and Category 5 (low potential to become essential or important) and 6 (non-habitat) are of low to no value to sage-grouse. Upon review of this draft Nevada Department of Wildlife map, it appears the project area is within Category 1, 2, 4, and 5 habitats.

### 3.2.1.3. USDA Forest Service Sensitive Plant Species

The July 2011 Regional Forester’s list of threatened, endangered, and sensitive species for the Toiyabe National Forest includes the following species that have the potential to occur on the Bridgeport Ranger District:

- Bodie Hills rockcress (*Arabis bodiensis*)
- Tiehm rockcress (*Arabis tiehmii*)
- Long Valley milkvetch (*Astragalus johannis-howelli*)
- Lavin’s egg milkvetch (*Astragalus oophorus var. lavini*)
- Upswept moonwort (*Botrychium ascendens*)
- Dainty moonwort (*Botrychium crenulatum*)
- Slender moonwort (*Botrychium lineare*)
- Moosewort (*Botrychium tunux*)
- Tioga Pass sedge (*Carex tiogana*)
- Bodie Hills draba (*Cusickiella quadricostata*)
- Star draba (*Draba asterophora var. asterophora*)
- Webber ivesia (*Ivesia webberi*)
- Three-ranked hump-moss (*Meesia triquetra*)
- Shevock rockmoss (*Orthotrichum shevockii*)
- Spjut’s brittle-moss (*Orthotrichum spjutii*)
- Wassuk beardtongue (*Penstemon rubicundus*)
- Mono phacelia (*Phacelia monoensis*)
- White bark pine (*Pinus albicaulis*)
- Marsh's bluegrass (*Poa abbreviata ssp. marshii*)
• White Mountain skypilot (*Polemonium chartaceum*)
• William’s combleaf (*Polyctenium williamsiae*)
• Mono ragwort (*Senecio pattersonensis*)
• Masonic Mountain jewelflower (*Streptanthus oliganthus*)

Based on distribution, habitat, elevation range, and other requirements of these species, only the following have the potential to occur within or near the project area:

• Bodie Hills rockcress (*Arabis bodiensis*)
• Long Valley milkvetch (*Astragalus johannis-howellii*)
• Lavin's egg milkvetch (*Astragalus oophorus var. lavinii*)
• Upswept moonwort (*Botrychium ascendens*)
• Dainty moonwort (*Botrychium crenulatum*)
• Slender moonwort (*Botrychium lineare*)
• Moosewort (*Botrychium tunux*)
• Bodie Hills draba (*Cusickiella quadricostata*)
• Star draba (*Draba asterophora var. asterophora*)
• Shevock rockmoss (*Orthotrichum shevockii*)
• Wassuk beartongue (*Penstemon rubicundus*)
• Mono phacelia (*Phacelia monoensis*)
• William’s combleaf (*Polyctenium williamsiae*)
• Mono ragwort (*Senecio pattersonensis*)
• Masonic Mountain jewelflower (*Streptanthus oliganthus*)

In 1998, over 500 individuals of William’s combleaf were documented in one section proposed for lease with surface occupancy in Aurora South (NNHP 2011). In 2003, this population was surveyed and 131 individuals were documented (Stanton and Pavlik 2006). While this population is in a section proposed for lease with surface occupancy, it is on private land (Stanton and Pavlik 2006). This population showed few signs of human disturbance (Ibid).

Four sensitive plant species were documented outside but near sections proposed for lease with surface occupancy or in sections proposed for no surface occupancy (NNHP 2011). These species are Long Valley milkvetch, Bodie Hills rockcress, Bodie Hills draba, and Mono phacelia. Similar habitats occur inside the sections proposed for lease with surface occupancy as those sections nearby, indicating that potential habitat for these sensitive plant species could occur in sections proposed for surface occupancy.

The biological evaluation (located in the project file) lists sensitive plant species that are documented to occur or have potential habitat within the project area. Because comprehensive surveys have not been done throughout all portions of the project area, it is possible that additional sensitive species could occur within the project area, although the likelihood is considered low based on current known distribution, habitat, and elevational range data.

**3.2.1.4. Management Indicator Species**

The following management indicator species have the potential to occur, or are known to occur, in the project area.
Fish

- Lahontan cutthroat trout (*Oncorhynchus clarkii henshawi*). (LCT are also a federally listed threatened species)

Mammals

- Mule deer (*Odocoileus hemionus*)
- American marten (*Martes americana*)

Birds

- Northern goshawk (*Accipter gentilis*)
- Greater sage-grouse (*Centrocercus urophasianus*). (Greater sage-grouse are also a FS Sensitive Species)
- Yellow warbler (*Dendroica petechia*)
- Yellow-rumped warbler (*Dendroica coronata*)
- Hairy woodpecker (*Picoides villosus*)
- Williamson’s sapsucker (*Sphyrapicus thyroideus*)

Macroinvertebrates

- Macroinvertebrates are likely present in the perennial streams located outside the project area.

3.2.1.5. Migratory Birds

The vegetation communities within the project area contain habitat for numerous species of migratory birds. A Migratory Bird Specialist Report has been prepared for this analysis and is incorporated by reference. The breeding season for birds in the area is typically April 1-August 30. Elevation and winter weather patterns would affect breeding chronology and the presence of species.

3.3. Cultural Resources

The Aurora area is rich in historic and prehistoric resources, although little of the area has been surveyed. An updated Cultural Resources Report was prepared in 2009 and is incorporated by references (Tetra Tech 2009b). The following descriptions are a summary of the findings for each section being analyzed.

3.3.1. Sites in Township 5 N., Range 27 E.

Section 12, T. 5 N., R. 27 E.
There are no previously documented archaeological sites in this section. Located in the vicinity of Aurora and within a pinyon-juniper woodland, it is likely numerous wood cutting camps and areas associated with the charcoal and firewood industries at Aurora and Bodie may exist. Terrain in this section is steep, which may lead to lower site densities than in other areas. As little archaeological survey has been accomplished in any of the surrounding sections, archaeological site density in the area is unknown.

Section 13, T. 5 N., R. 27 E.
Minimal inventory has been conducted in Section 13. The only recorded site in this section, TY-2728 (a historic-period trash scatter), was recommended as not eligible for listing to the National Register of Historic Places (NRHP). It is known that the stage route between Aurora and Bodie, California, follows Aurora Canyon through the middle of this section, and a number of historic stamp mills, brick manufacturing sites, and other sites are probably found in Aurora Canyon. The few archaeological
surveys in this section did not identify any archaeological sites. As little archaeological survey has been accomplished in any of the surrounding sections, archaeological site density in the area is unknown.

Section 14, T. 5 N., R. 27 E.
There are no previously documented archaeological sites in this section. The topographic maps identify the Del Monte historic site within the section; the site is along the historic road or trail from Bodie to Aurora. Based on knowledge of nearby sections, it is likely there would be historic sites associated with Bodie as well as with Aurora in the section. As little archaeological survey has been accomplished in any of the surrounding sections, archaeological site density in the area is unknown.

3.3.2. Sites in Township 5 N., Range 28 E.

Section 5, T. 5 N., R. 28 E.
There are no previously documented archaeological sites in this section, and no archaeological surveys have been conducted. As this section is heavily timbered with pinyon-juniper, it is likely a number of small pinyon collecting camps exist. A number of sites containing house rings, pinyon caches, as well as woodcutting sites are documented a few miles to the north, but it is unknown whether the Aurora Crater lying at the center of this section was conducive or detrimental to archaeological site locations.

Section 6, T. 5 N., R. 28 E.
The Carson to Aurora road lies on the extreme western edge of this section. There are no other previously documented archaeological sites in this section and no inventories have been conducted. As this section is heavily timbered in pinyon-juniper, it is likely a number of small pinyon collecting camps exist in the area. A number of sites containing house rings, pinyon caches, as well as woodcutting sites are documented a few miles to the north, but it is unknown whether the section was conducive or detrimental to archaeological site locations.

Section 7, T. 5 N., R. 28 E.
This majority of this sections lies on the Aurora Crater volcanic flow that has proven largely impenetrable. Limited inventories have been undertaken in the area and few sites have been documented. Those that have been recorded are on the south and west side of the section below the lava flow. Being near to the Esmeralda Mining District (Aurora), it can be expected that a number of logging/woodcutting camps may be found on the flow. The expectation would be that significant sites would be found.

Section 8, T. 5 N., R. 28 E.
The majority of this section lies on the Aurora Crater lava flow. Being largely impenetrable, there have been few inventories. The majority of the sites identified are found at the edge, or to the south of the lava flow. Small woodcutting camps as well as Native American pinyon gathering sites are expected in this section on the lava flow. At the south end of the section, modern mining has created large mine tailings, etc. The expectation would be that significant sites would be found.

Section 11, T. 5 N., R. 28 E.
Given the large number of NRHP eligible sites identified in this section, and based on limited inventories, it is likely this section will be problematic in exploration and development. The section lies immediately south of the previously leased sections which were leased because there was no archaeological information at the time of leasing. Since then archaeological surveys to the immediate north of this section have shown that a sizeable number of NRHP eligible sites are expected. These are likely to be Native American sites with house rings and large lithic scatters. The likelihood of lithic quarrying areas and petroglyph sites also exists. Based on this information, the sites appear smaller than in sections further to the north. It is probable that exploration could be accomplished through avoidance of these sites.
Section 15, T. 5 N., R. 28 E.
There are no previously documented sites in this section. Based on nearby sections, the likelihood of extensive archaeological sites in this section is low. The area is at a fairly high elevation, ranging from about 7,500 feet to over 8,400 feet. Additionally, the vegetation in this section is largely sagebrush and the area would not be expected to contain pinyon gathering camps. Being near Mt. Hicks, there is some likelihood that obsidian quarrying sites may occur, although the primary area known for obsidian is to the east and north of Mt. Hicks. The expectation would be that significant sites may be found.

Section 16, T. 5 N., R. 28 E.
A few large sites are identified in the extreme northwest corner of this section. This is consistent with the sections to the north and west. Archaeological surveys are nonexistent in the southern two-thirds of this section; the likelihood of high archaeological site densities in the majority of this section is expected to be low. This is based on the absence of pinyon-juniper woodland to the south as well as very steep slopes and high elevations. From the northern end of the section, where archaeological sites are found at elevations of 7,200 feet, the section rises to an elevation of 8,400 feet at the south end. The potential is extremely high that significant archaeological sites may be encountered at the northwest portion of the section, with small and infrequent sites to the south.

Section 19, T. 5 N., R. 28 E.
Virtually no archaeological inventories have been conducted in this section. Only the southern edge of the Aurora NRHP site lies within this section. The sites identified above are documented in surrounding sections and overlap with this section. The elevations, between 7,600 and 8,400 feet, and steep slopes preclude a high probability for abundant and large Native American sites, except those associated with historic Aurora mining. This section includes a sizeable portion of the Esmeralda Mining District sites as shown by unrecorded Aurora to Mono Lake stage and freight road, innumerable mines, adits, and mine dumps.

Section 20, T. 5 N., R. 28 E.
Archaeological surveys have only been conducted in the northern portion of this section. Identified sites have been small. Steep slopes and high elevations throughout much of this section would suggest that Native American sites should be smaller and fewer than in other areas in the proposed leases. A general land office (GLO) plat, as well as topographic maps, shows that a number of sites associated with the Esmeralda Mining District, including mines and toll/wagon roads, is present. These are largely in the western half of the section. Some of these sites may be determined significant and eligible for the NRHP.

Section 21, T. 5 N., R. 28 E.
There are no previously documented archaeological sites in this section and no archaeological surveys have been conducted. With elevations ranging from 7,800 feet to over 8,700 feet at Aurora Peak in the center of this section, the likelihood of there being large NRHP eligible sites is low. The majority of sites would probably lie in the southwest corner of the section. Archaeological site densities should be low in this section.

Section 22, T. 5 N., R. 28 E.
Minimal archaeological inventory has been conducted in this section. One small archaeological site has been identified. Because elevations range from about 8,200 to 8,500 feet it is likely that Native American sites are small, seasonally used sites. The absence of pinyon-juniper woodland in this section limits use of much of the section to hunting types of sites. Archaeological site densities should be low in this section.

Section 29, T. 5 N., R. 28 E.
There are no previously documented archaeological sites in this section, and almost no archaeological survey has been conducted. Based on what is known in nearby sections, the likelihood of there being
extensive archaeological sites is low because the section contains minimal or no pinyon-juniper woodland.

Section 30, T. 5 N., R. 28 E.
This section has had minimal archaeological survey and few sites have been recorded. In the northern portion of the section, there are a few small adits and prospects associated with the Esmeralda Mining District. Due to elevations in the section ranging from 8,000 to 9,300 feet, and steep slopes, archaeological sites are expected to be few and small.

3.3.3. Sites in Township 6 N., Range 27 E.

Section 5, T. 6 N., R. 27 E.
The only inventory and known site is the historic stage road between Carson and Aurora. The Lucky Boy Road is the same as the Carson to Aurora road. This site, as documented, has lost its integrity as it is largely subsumed beneath the county road.

Section 6, T. 6 N., R. 27 E.
The only inventory, and known sites are the historic stage road between Carson and Aurora and two small Native American sites identified along the road. The Lucky Boy Road is the same as the Carson to Aurora road. This site, as documented, has lost its integrity as it largely is subsumed beneath the county road.

3.3.4. Sites in Township 6 N., Range 28 E.

Section 13, T. 6 N., R. 28 E.
Section 13 borders areas extensively inventoried for the Borealis Mine in the late 1970s and early 1980s. That area was defined as a potential National Register District, but was never fully documented and defined. Some surveys have been conducted in the section and surrounding areas, particularly on BLM land north of the Lucky Boy Pass Road. These surveys did not exhibit an abundance of sites. In Section 12 to the east, a number of small sites have been previously recorded.

Section 14, T. 6 N., R. 28 E.
A small number of sites have been documented in this section. A seismic line running diagonally across the section for nearly 0.75 mile identified only three small, ineligible sites.

Section 22, T. 6 N., R. 28 E.
Only a few seismic line and road surveys have been conducted in this section, yet a sizeable number of sites, unevaulated or recommended as eligible to the NRHP, have been identified. A number of these sites are quite large. Surrounding sections contain large numbers of Native American sites as well as historic roads leading to the Esmeralda Mining District.

Section 23, T. 6 N., R. 28 E.
Only a few seismic line and road surveys have been conducted in this section, yet a sizeable number of sites, unevaulated or recommended as eligible to the NRHP, have been identified. A number of these sites are quite large. Surrounding sections contain large numbers of Native American sites as well as historic roads leading to the Esmeralda Mining District.

Section 24, T. 6 N., R. 28 E.
A number of sites, eligible for the NRHP or unevaluated, have been identified in this section, but the majority of the section lies within a large lava flow which has had no archaeological investigations. The sites identified within this section are generally smaller than sites identified in nearby sections.
Section 26, T. 6 N., R. 28 E.
The suggested site density, especially with only minimal inventory, indicates much of this section is an archaeological site. All surrounding sections indicate high site densities and a probable National Register Historic District.

3.3.5. Sites in Township 7 N., Range 27 E.
Section 30, T. 7 N., R. 27 E.
There are no previously documented sites in this section although there has been some survey. Based on knowledge of nearby sections, the likelihood of there being extensive archaeological sites is probably low. This characterization would probably not hold true along the East Walker River where site densities should be high.

3.4. Native American Resources
Based on input from local tribal governments, it is understood that the North and South Aurora lease areas contain sites and areas of tribal importance.

3.5. Recreation and Special Designations
3.5.1. East Fork Walker River Scenic area
Portions of Section 30, T. 7 N., R. 27 E. fall within the East Walker Scenic Area that was transferred from the BLM to the USFS as part of the Public Lands Nevada Enhancement Act of 1988 (Public Law 100-550). According to the Act, the East Walker Scenic Area must be managed in accordance with plans in effect on the date of enactment of this Act until considered in plans developed under applicable provisions of law. The following is an excerpt from the BLM Walker Resource Management Plan Record of Decision (BLM 1986, page 15):

“The exclusion from oil, gas and geothermal leasing in the East Walker Scenic Area will be adjusted to conform with the segregation from mineral entry.”

The following portions of Section 30, T. 7 N., R. 27 E. are segregated from mineral entry: Section 30, Lot 4, N/2NE/4, SW/4NE/4 and are closed to consideration for oil, gas, and geothermal leasing.

3.5.2. Wild and Scenic River Designation
The 2006 Carson City Geothermal Leasing EA states:

“The East Fork of the Walker River is being evaluated for Wild and Scenic River designation under the Humboldt-Toiyabe Forest Plan Revision process. The USFS Wild and Scenic River Eligibility Report designated East Walker River as being eligible for wild and scenic river status for its recreational value, specifically related to its fishing opportunities for the blue ribbon trout (USFS 2005). If this designation is afforded to the river, its recreational uses would be protected within a quarter-mile buffer on either side of the river (Fechner 2006).”

3.6. Inventoried Roadless Areas
Five inventoried roadless areas (IRA) are partially located within the project area (see Table 4). The Inventoried Roadless Area Specialist Report with maps (USDA FS 2011) provides additional information on these areas and is located in the project file. The Aurora Crater and Mt. Hicks IRAs fall partially within the South Aurora lease area. The Rough Creek, Chinese, and Pine Grove South IRAs lie partially within the North Aurora lease area.

In 2006, the Humboldt-Toiyabe National Forest drafted a Wilderness Potential Assessment of all roadless areas on the Forest. Aurora Crater, Mt. Hicks, Rough Creek, and Chinese Camp IRAs were
rated as “not capable” or “not considered” for wilderness recommendation due to small size, lack of outstanding attributes, and/or lack of naturalness. The Pine Grove South IRA was identified as capable as the core of the IRA has high potential and offers a rare opportunity to include a major river. However, the IRA has extremely complex boundaries with numerous cherry-stemmed existing roads and contains in-holdings on the perimeter (USDA Forest Service 2006).

In January 2001, the U.S. Department of Agriculture adopted a final rule to establish prohibitions on road construction, road reconstruction, and timber harvesting in IRAs. On October 21, 2011, the US Court of Appeals for the Tenth Circuit found that the 2001 Roadless Area Conservation Rule does not violate federal law. The rule prohibits road construction or reconstruction and timber cutting, sale, or removal in IRAs, with limited exceptions.

Table 4. Inventoried Roadless Areas Addressed in this EA Supplement.

<table>
<thead>
<tr>
<th>IRA</th>
<th>IRA Acreage</th>
<th>Proposed NFS Lease Acres in IRA</th>
<th>Proposed Lease Sections in the IRA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aurora Crater</td>
<td>5,688</td>
<td>1,776</td>
<td>Sections 5-8, T. 5 N., R. 28 E.</td>
</tr>
<tr>
<td>Chinese Camp</td>
<td>19,546</td>
<td>675</td>
<td>Sections 5-6, T. 6 N., R. 27 E.</td>
</tr>
<tr>
<td>Mt. Hicks</td>
<td>15,694</td>
<td>1,107</td>
<td>Sections 11, 15, 22, T. 5 N., R. 28 E.</td>
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<tr>
<td>Pine Grove South</td>
<td>88,936</td>
<td>100</td>
<td>Section 30, T. 7 N., R. 27 E.</td>
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<td>Rough Creek</td>
<td>8,475</td>
<td>550</td>
<td>Section 30, T. 7 N., R. 27 E.</td>
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<tr>
<td>Total IRA Acres within Project Area</td>
<td>138,399</td>
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<td>Sections 5-6, T. 6 N., R. 27 E.</td>
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</table>
CHAPTER 4:
ENVIRONMENTAL CONSEQUENCES

All of the information presented in Chapter 4 of the original EA remains valid and unchanged, except for the following additions and changes.

The description of environmental consequences in this supplement is limited to the impacts of leasing (including the modified lease stipulations, Appendix A) specific to the 25 NFS land sections within the North Aurora and South Aurora lease areas covered in the original EA.

The following tables display a summary of resource concerns (Table 5) and environmental risk levels by proposed NFS lease areas (Table 6) as discussed in the effects analysis presented in this chapter. Risk levels in both tables reflect the potential impacts of implementing the RFD scenario, including adoption of the proposed stipulations and lease notices.

Table 5. Known Locations of “Moderate” Resource Concerns.

<table>
<thead>
<tr>
<th>Township/Range</th>
<th>Section</th>
<th>Resource Concerns*</th>
</tr>
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<tr>
<td><strong>North Aurora Lease Area</strong></td>
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<tr>
<td>6N-27E</td>
<td>5</td>
<td>Category 1 sage-grouse habitat throughout / within IRA</td>
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<td>Category 1 sage-grouse habitat throughout / within IRA</td>
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<tr>
<td>7N-27E</td>
<td>30</td>
<td>Category 1 and 2 sage-grouse habitat east of East Walker River / the East Walker River Scenic Area is not open to geothermal leasing / within IRA / LCT habitat / visual and recreation resources</td>
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<td><strong>South Aurora Lease Area</strong></td>
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<tr>
<td>5N-27E</td>
<td>12</td>
<td>No known sage-grouse priority habitat</td>
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<td>13</td>
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<td>14</td>
<td>No known sage-grouse priority habitat / LCT habitat</td>
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<td>29</td>
<td>Category 1 and 2 sage-grouse habitat throughout / steep slopes</td>
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<td>Category 1 and 2 sage-grouse habitat throughout / expected large archaeological sites</td>
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<td>Category 1 and 2 sage-grouse habitat throughout</td>
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<td>26</td>
<td>Category 2 sage-grouse habitat present / expected large archaeological sites</td>
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*Risk Levels: L=Low, M=Moderate, H=High. Resource specific risk based on the presence and extent of resources within a proposed lease section; extent of resources in the surrounding area; quality of existing data; and implementation of Standard Operating Procedures and Conditions of Approval (2006 EA, Appendix B) and USFS Standard Lease Stipulations (Supplement, Appendix A) and Notices (Appendix B).*
Table 6. Summary of Proposed National Forest Lease Areas and Environmental Risk Levels*

<table>
<thead>
<tr>
<th>Township/Range</th>
<th>Section</th>
<th>Acres**</th>
<th>Air</th>
<th>Water Resources</th>
<th>Land Use</th>
<th>Recreation</th>
<th>Visual</th>
<th>Vegetation</th>
<th>Fish &amp; Wildlife</th>
<th>Special Status</th>
<th>Geology &amp; Soils</th>
<th>Range***</th>
<th>Inventoried Roadless Areas</th>
<th>Cultural and Native American Resources</th>
<th>Paleontology</th>
<th>Economic</th>
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<tbody>
<tr>
<td>North Aurora Lease Area</td>
<td>1,575</td>
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*Environmental Risk Levels: L=Low, M=Moderate, H=High. Resource specific risk based on the presence and extent of resources within a proposed lease section; extent of resources in the surrounding area; quality of existing data; and implementation of Standard Operating Procedures and Conditions of Approval (2006 EA, Appendix B) and USFS Standard Lease Stipulations (Supplement, Appendix C).

**Approximate NFS lands acreage (2006 EA Table 2-1 adjusted to exclude BLM and private land acreage).

***Covers livestock grazing and wild horse and burro territories.

4.1. Land Use

The 2007 DN/FONSI rated Land Use risk as low for most sections, due to the minimal number of land uses within this remote part of the district. Section 30, T. 7 N., R. 27 E. was given a high risk rating due to concerns associated with the East Walker River Scenic Area. Sections 19-21, T. 5 N., R. 28 E. were rated as high due to private inholdings and the communication site on Aurora Peak.

The land use risk rating for the East Walker River Scenic Area in Section 30, T. 7 N., R. 27 E. has been lowered to moderate because 1) a portion of Section 30 has been determined to be segregated
(closed) to mineral entry (p. 28); and 2) the application of two no surface occupancy stipulations (within 0.25 mile on either side of the East Fork Walker River and within 0.25 miles on either side of Forest Road 765 in Section 30). The East Walker River Scenic Area is also discussed under the Special Designation, Recreation, and Visuals sections of this supplement.

The land use risk ratings for Sections 19, 20, 21, T. 5 N., R. 28 E. were lowered to moderate after closer review of the current land uses in the area: 1) the USFS decision regarding lease availability is not applicable to private land; and 2) the USFS special use permit authorizing Aurora Peak Communication Site prohibits the authorization of incompatible uses within the site.

4.2. Soils, Geology, and Minerals

The 2007 risk ratings from the DN/FONSI listed 12 sections as high due to concerns about steep slopes and unstable soils. These ratings were reviewed and updated based on the current understanding of the sections within the lease areas and the application of the stipulations listed below. Overall, the potential risk to soils, geology, and minerals would be low to moderate depending on the location, intensity, stipulations, and timing of geothermal activities.

The following stipulations would apply to protect soils:

- *On lands administered by the Forest Service, no occupancy or other surface disturbance will be allowed on slopes in excess of 40 percent.*

- *No surface occupancy is allowed for all of Section 5, T. 5 N., R. 28 E. due to steep slopes and Native American concerns. No surface occupancy is allowed for all of Section 21, T. 5 N., R. 28 E. due to steep slopes.*

The following is a detailed discussion of the geology and slope conditions of sections that have potential concerns.

**Section 5, T. 5 N., R. 28 E.**

This section lies over the center of the Aurora Crater. The crater is composed of trachy-andesite flows, which are very fractured and unstable on steep slopes. Any proposed operation would create potential for landslides and debris flows, as well as unstable bases for roads or other facilities. The no surface occupancy stipulation applicable to these site conditions for this entire section would minimize the risk associated with the unstable condition.

**Sections 6-8, T. 5 N., R. 28 E.**

These sections border the west, southwest, and south lower flanks of the Aurora Crater. Subsequent field investigation indicates slopes are moderate and although potential for instability exists, the magnitude of instability is much reduced due to moderate slope conditions.

**Sections 18-20, T. 5 N., R. 28 E.**

These sections border and overlie areas of hard rock mining at Aurora, including open pits and ongoing hard rock mining operations. Re-examination of the area indicates that mining and geothermal operations could occur simultaneously without conflict through close coordination and agreements between the operators and the USFS.
Section 21, T. 5 N., R. 28 E.
This section overlies Aurora Peak, a noted landmark in the area. Further field examination suggests slopes are steep, of volcanic deposition, and likely unstable. The no surface occupancy stipulation applied to this entire section would minimize the risk associated with the unstable condition.

Section 22, T. 5 N., R. 28 E.
The area lies east of Aurora Peak in the saddle between Aurora Peak and Mt. Hicks. Field observations suggest expected fracturing is not prominent and the aspect is gentle, allowing a low risk to soil resources.

Section 29, T. 5 N., R. 28 E.
This section lies across a deep valley with an ephemeral stream. There is some risk of slope instability within the valley walls. The area outside the valley, although containing two volcanic hills, is low slope and would be a potential area for geothermal operations.

Section 30, T. 5 N., R. 28 E.
This section includes the northeast and southeast sides of the Brawley Peaks, which form a buttress against the Dry Lakes Plateau. The peaks contain abundant quartz and siliceous veins running across the slopes. The slopes are steep, close to the critical 40 percent, and would require road construction. The steep slopes could also contribute to instability and hazards for operations.

4.3. Fish and Wildlife

The following Lease Notices would apply to all potential lease areas to protect plants, animals or their habitat:

- The lands within this lease may now or hereafter include plants, animals, or their habitat listed as threatened, endangered, proposed, or have candidate status with the USFWS. The BLM, in coordination with the USFS, may require modifications to proposed activity that is likely to jeopardize the continued existence of a proposed, threatened, and endangered or candidate species or result in the destruction or adverse modification of a designated or proposed critical habitat. The BLM, in coordination with the USFS, will not approve any ground-disturbing activity that may affect any such species or critical habitat until it completes its obligations under applicable requirements of the Endangered Species Act (ESA) as amended, 16 USC 1531 et seq., including completion of any required procedure for conference or consultation.

- The lands within this lease may now or hereafter include plants, animals, or their habitat listed as USFS Sensitive or have designation through other federal and state agencies such as with the Nevada Department of Wildlife. Surveys for USFS sensitive species will be conducted prior to initiating any ground disturbing activities. The BLM, in coordination with the USFS, may require modifications to proposed activity that is likely to lead to the listing of a sensitive species or loss of viability.

4.3.1. Special Status Species

The 2007 risk ratings from the DN/FONSI listed 28 sections as high due to concerns about impacts to special status species. These ratings were reviewed and updated based on the current understanding of the sections within the lease areas and the application of the stipulations listed below. The potential risk to special status species would be moderate in all of the 25 sections proposed for leasing.
4.3.1.1. Federally Listed Endangered and Threatened Species

A biological assessment was prepared for consultation with the USFWS concerning LCT (Harvey 2011). On January 26, 2012, the USFWS concurred with the determination that the proposed project may affect, but is not likely to adversely affect LCT.

**Lahontan Cutthroat Trout (LCT)**

The following stipulation would apply to protect LCT:

- No surface occupancy is allowed within 300 feet of Lahontan cutthroat trout habitat within the East Fork Walker River and Bodie Creek.

The following Lease Notice would apply to protect LCT:

- The lands within this lease may now or hereafter include plants, animals or their habitat listed as threatened, endangered, proposed, or have candidate status with the USFWS. The BLM, in coordination with the USFS, may require modifications to proposed activity that is likely to jeopardize the continued existence of a proposed, threatened, and endangered or candidate species or result in the destruction or adverse modification of a designated or proposed critical habitat. The BLM, in coordination with the USFS, will not approve any ground-disturbing activity that may affect any such species or critical habitat until it completes its obligations under applicable requirements of the Endangered Species Act (ESA) as amended, 16 USC 1531 et seq., including completion of any required procedure for conference or consultation.

Because potential impacts from the RFD scenario to LCT may occur in the future within the consent to lease area, it is determined that the proposed action may affect, but is not likely to adversely affect LCT. This determination was reached because: 1) there are no ground disturbances associated with lease consent, 2) no LCT currently occupy the area, however if they are reintroduced into the area they may be affected, and 3) any future geothermal ground-disturbing activities associated with these leases will undergo appropriate environmental analysis including Section 7 consultation. Overall, the potential risk to LCT would be low to moderate depending on the location, intensity, stipulation, and timing of geothermal activities.

4.3.1.2. USDA Forest Service Sensitive Wildlife Species

**Sage-grouse**

The following stipulations would apply to protect sage-grouse:

- No surface occupancy is allowed within three (3) miles of an active sage-grouse lek.

- No surface occupancy is allowed on lands falling within priority habitat for sage-grouse as identified by the Nevada Department of Wildlife (Nevada Sage-grouse Habitat Categorization Map), or as identified based on pre-construction field surveys. Priority habitat for sage-grouse includes Category 1 (irreplaceable, limited, and essential) and Category 2 (important, high-quality habitat) (Governor’s Sage-grouse Conservation Team 2010).

The following Lease Notices would apply to protect sage-grouse:

A. In addition to protection for all species, the following restrictions are in place to limit impacts to the bi-state distinct population segment (DPS) of the greater sage-grouse by becoming conditions of approval:

1. The BLM, in coordination with the USFS, will be consulted regarding the location of sage-grouse strutting grounds (leks), nesting, brood-rearing,
wintering habitats and movement corridors. The distances and times that these areas will be avoided will be determined by the BLM in coordination with the USFS.

2. Areas outside priority habitats (Category 1 and 2) as defined by Nevada Department of Wildlife (Nevada Sage-grouse Habitat Categorization Map) may be designated as no surface occupancy or otherwise restricted from development if they are determined to be important movement corridors for sage-grouse.

3. A comprehensive monitoring plan would be required to monitor sage-grouse demographics and movement patterns before, during, and after construction in any affected, occupied areas. If any work is conducted within any Category 3 sage-grouse habitats, a company representative would be on site to provide training to construction personnel on relevant avoidance/minimization/mitigation measures and oversee compliance during construction.

4. Additional restrictions (e.g., timing) for all potentially ground-disturbing activities to sage-grouse (e.g., drilling, project-related driving), regardless of location, would be analyzed under NEPA and subject to approval by the BLM, in coordination with the USFS, given the most current guidance and standards for sage-grouse conservation. These restrictions would also protect the bi-state DPS from losing habitat needed during all phases of its life cycle: strutting grounds (leks); nesting, brood-rearing, wintering habitats; and movement corridors. As of this writing, current guidance and standards are those found in the following documents:

   • *Nevada Energy and Infrastructure Developments Standards to Conserve Greater Sage-grouse Populations and their Habitats* (Governor’s Sage-grouse Conservation Team 2010).

   • *The Draft Nevada Sage-grouse Habitat Categorization Map* (NDOW, January 2012).


   • *The Draft Bi-state Action Plan* (Bi-state Technical Advisory Team, January 2012)

No direct impacts would occur from leasing because no ground disturbing activity is proposed. However, indirect impacts (those that may occur in the future) may occur if part or all of the RFD is implemented. These impacts may include disturbance or direct mortality from vehicles, humans and equipment; loss, degradation or fragmentation of habitat; blockage of movement corridors essential to maintain the metapopulation; and introduction of exotics/invasives that could lead to competition and changes in ecological factors (i.e., habitat).

By implementing the stipulations and notices listed above and in Appendix A, potential indirect impacts to sage-grouse would be reduced and therefore, the proposed action may impact individuals, but is not likely to lead towards a trend toward federal listing or a loss of viability. The stipulations listed above for the sage-grouse are based on the best available science, and guidance from the Nevada Department of Wildlife, the Governor’s Sage-grouse Conservation Team (Governor’s Team), and the Bi-state Technical Advisory Team (Technical Team).
The four main documents from these advisory groups used to create stipulations are:

1. *Nevada Energy and Infrastructure Developments Standards to Conserve Greater Sage-grouse Populations and their Habitats* (Governor’s Team 2010). This document provides guidance on buffers and other restrictions to place on energy developments to avoid impacts to sage-grouse.

2. *The Draft Nevada Sage-grouse Habitat Categorization Map* (NDOW, January 2012). This map breaks the bi-state area into six habitat categories, with Categories 1 (essential and irreplaceable) and 2 (important) being considered priority areas for sage-grouse. Categories 3 (moderate) and 4 (transitional) are also used by sage-grouse, but to a much lesser extent, and Category 5 (low value) and 6 (non-habitat) are of low to no value to sage-grouse.

3. *The Draft Bi-state Action Plan* (Technical Team, January 2012). This document summarizes sage-grouse population trends, conservation actions, regulatory mechanisms, and research completed in the bi-state area. It also has recommendations for further actions, changes to regulatory mechanisms, further research, monitoring, funding sources, and adaptive management.


**All Other Sensitive Wildlife Species**

The following stipulation would apply to protect pygmy rabbit habitat:

- No sagebrush would be removed in known, occupied pygmy rabbit habitat to protect their burrows. Habitat would be defined with an inclusive polygon around all active burrows plus a 100 meter buffer.

Leasing itself has no impact as there are no ground disturbing activities associated with leasing. The RFD scenario has no direct impact, because there are no site-specific actions proposed. However, the RFD represents a potential scenario, which if implemented could have impacts. Stipulations (Appendix A), site-specific project design features, and mitigation measures that would be developed if a specific area were proposed for a project would minimize any potential impacts. Environmental analysis would be required for any ground disturbing proposals. Because of the stipulations to leasing that minimize impacts to species, and the ability to minimize impacts with site specific project design features and mitigations, it is determined if the RFD scenario is implemented, the project may impact individuals or their habitat, but will not likely contribute to a trend towards federal listing or cause loss of viability to the population or species. Overall, the potential risk to “All Other Sensitive Species” would be low to moderate depending on the location, intensity, and timing of geothermal activities.

**4.3.1.3. USDA Forest Service Sensitive Plant Species**

The following stipulations would apply to protect sensitive plants:

- In areas identified as Mono phacelia habitat, ground-disturbing activities would be limited to periods outside of the growing season, which extends from March 1 to July 1.

The following Lease Notice would apply to protect sensitive plants:

- The lands within this lease may now or hereafter include plants, animals, or their habitat listed as USFS Sensitive or have designation through other federal and state agencies such as with the Nevada Department of Wildlife. Surveys for USFS sensitive species will be conducted prior to initiating any ground disturbing activities. The BLM, in coordination with the USFS, may require modifications to proposed activity that is likely to lead to the listing of a sensitive species or loss of viability. Restrictions related to sensitive species include, but are not limited to:
1. **Operations in occupied rare plant habitat would be restricted to protect species.** Additional restrictions may be added to protect rare/sensitive plants.

For the following species, if the RFD scenario is implemented in the future, there may be impacts to individuals or their habitat, but project actions are not likely to contribute to a trend toward federal listing or loss of viability.

- Bodie Hills rockcress (*Arabis bodiensis*)
- Long Valley milkvetch (*Astragalus johannis-howellii*)
- Lavin's egg milkvetch (*Astragalus oophorus var. lavinii*)
- Upswept moonwort (*Botrychium ascendens*)
- Dainty moonwort (*Botrychium crenulatum*)
- Slender moonwort (*Botrychium lineare*)
- Moorwort (*Botrychium tunux*)
- Bodie Hills draba (*Cusickiella quadricostata*)
- Star draba (*Draba asterophora var. asterophora*)
- Three-ranked hump-moss (*Meesia triquetra*)
- Shevock rockmoss (*Orthotrichum shevockii*)
- Wassuk beardtongue (*Penstemon rubicundus*)
- Mono phacelia (*Phacelia monoensis*)
- Williams combleaf (*Polycytenium williamsiae*)
- Mono ragwort (*Senecio pattersonensis*)
- Masonic Mountain jewelweed (*Streptanthus oliganthus*)

Project actions are not likely to contribute to a trend toward federal listing or loss of viability because:

- On the ground surveys would be required at all stages that require ground disturbance to identify habitat and individuals.
- Site-specific mitigations and design features could be developed at all stages to limit impacts to sensitive species.
- Stipulations that minimize impacts to sensitive species are in place.

There will be no impact on the following sensitive species because they are not expected to occur in the project area:

- Tiehm rockcress (*Arabis tiehmii*)
- Tioga Pass sedge (*Carex tiogana*)
- Webber ivesia (*Ivesia webberi*)
- Three-ranked hump-moss (*Meesia triquetra*)
- Spjut’s brittle-moss (*Orthotrichum spjutii*)
- White bark pine (*Pinus albicaulus*)
- Marsh's bluegrass (*Poa abbreviata ssp. marshii*)
- White Mountain skypilot (*Polemonium chartaceum*)

### 4.3.1.4. Management Indicator Species

If the RFD scenario were developed, the potential disturbance would include 159 to 1,468 acres (see RFD Chapter 2 for explanation) out of the 12,809 acre project area. Sufficient habitat would remain outside disturbed areas for species that may occur in the project area. Therefore, the potential indirect
impacts from implementing the RFD scenario may affect individuals within the following species and their habitat, but will not contribute to a downward trend in the population.

- Mule deer (*Odocoileus hemionus*)
- Yellow warbler (*Dendroica petechia*)
- Yellow-rumped warbler (*Dendroica coronata*)
- Hairy woodpecker (*Picoides villosus*)
- Williamson’s sapsucker (*Sphyrapicus thyroideus*)
- Macroinvertebrates

### 4.3.1.5. Migratory Birds

The following stipulation would apply to protect migratory birds:

- **Migratory Bird Habitat** – No ground disturbing activities would be allowed during the avian breeding season (approximately April 1 through August 30) unless a nest survey is completed prior to ground disturbance. A nest survey would be conducted by a qualified biologist within migratory bird breeding habitat prior to any surface disturbance associated with exploration activities being approved. If nests are located, or if other evidence of nesting (e.g., mated pairs, territorial defense, carrying of nest material, transporting food) is observed, a protective buffer would be delineated and the entire buffer area avoided to prevent destruction or disturbance to nests until they are no longer active. The buffer would be species-dependent and established by a qualified wildlife biologist. The start and end dates of the seasonal restriction may be altered based on site-specific information such as elevation and winter weather patterns, which would affect breeding chronology and the presence of the species.

If the RFD scenario were developed, the potential disturbance area would be a maximum of 1,468 acres of the 12,809 acre project area. Sufficient habitat would remain outside disturbed areas for the migratory bird species that may occur in the project area. Therefore, the potential indirect impacts from implementing the RFD scenario may affect individual migratory birds, but would not contribute to a downward trend in the populations.

### 4.3.2. Other Wildlife Species

The 2007 risk ratings from the DN/FONSI listed 28 sections as high due to concerns about impacts to wildlife species (other than special status species). These ratings were reviewed and updated based on the current understanding of the sections within the lease areas and the application of the stipulations. Overall, the potential risk to special status species would be low or moderate for all of the 25 sections proposed for leasing. These low and moderate risk levels were assigned based on the impacts described for special status species.

### 4.4. Cultural Resources

The 2007 risk ratings from the DN/FONSI listed 14 sections as high due to concerns about impacts to cultural resources and Native American resources. These ratings were reviewed and updated based on the current understanding of the sections within the lease areas and the application of the stipulations listed below.

The following stipulations would apply to protect cultural resources:

- **On lands administered by the USFS, no surface occupancy would be allowed within 200 feet of eligible National Register sites, historic properties, or unevaluated archeological historic sites.**
The following Lease Notices would apply to protect cultural resources:

- The lands within this lease may now or hereafter contain historic properties, traditional cultural properties, and/or sacred sites currently unknown to the BLM or USFS, that were not identified in the Land and Resource Management Plan or during the lease parcel review process. These resources are protected under the National Historic Preservation Act (NHPA), American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, Executive Order 13007, or other statutes and executive orders. All activities proposed under the authority of this lease are subject to compliance with Section 106 of the NHPA and Executive Order 13007. The BLM, in coordination with the USFS, will not approve any ground disturbing activities that may affect any such properties or resources until it completes its obligations (e.g., State Historic Preservation Officer (SHPO) and tribal consultation) under applicable requirements of the NHPA and other authorities. The BLM may require modifications to exploration or development proposals to protect such properties, or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized, or mitigated. Depending on the nature of the lease developments being proposed and the cultural resources potentially affected, compliance with Section 106 of the National Historic Preservation Act and Executive Order 13007 could require intensive cultural resource inventories, Native American consultation, and mitigation measures to avoid adverse effects—the costs for which will be borne by the lessee.

1. Lessee is advised that if previously undiscovered cultural resources (historic or prehistoric objects, artifacts, or sites) are exposed as a result of operations, those operations will not proceed until notification is received from the Authorized Officer that provisions for mitigating unforeseen impacts has been carried out.

2. Lessee would be held responsible for damage to cultural resource sites.

3. In areas of high archaeological sensitivity, as defined by the BLM, in coordination with the USFS, access would be restricted.

4. If impacts occur to continued traditional tribal cultural practices, exploration/development would be restricted to protect tribal traditions.

Existing cultural resource information provided archeologists with broad knowledge in determining where risks were low to moderate. The stipulations listed for cultural resources would ensure that future resource-revealing surveys would protect that resource. Overall, the risk to cultural resources within each of the 25 sections is low to moderate depending on the location, intensity, stipulations, and timing of geothermal activities. This is because more is now known about the types and amounts of cultural resources in the area, and the stipulations would protect against direct impacts.

4.5. Native American Resources

The 2007 DN/FONSI did not display the risk level for Native American Resources separately, but these risk levels were included with cultural resources. The 2007 risk ratings from the DN/FONSI listed 14 sections at high risk due to concerns about impacts to cultural resources and Native American Resources.

The following stipulation would apply to protect Native American Resources:

- No surface occupancy is allowed for all of Section 5, T. 5 N., R. 28 E. due to steep slopes and Native American concerns.

The following Lease Notice would apply to protect Native American Resources:
• The lands within this lease may now or hereafter contain historic properties, traditional cultural properties, and/or sacred sites currently unknown to the BLM or USFS, that were not identified in the Land and Resource Management Plan or during the lease parcel review process. These resources are protected under the National Historic Preservation Act (NHPA), American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, Executive Order 13007, or other statutes and executive orders. All activities proposed under the authority of this lease are subject to compliance with Section 106 of the NHPA and Executive Order 13007. The BLM, in coordination with the USFS, will not approve any ground disturbing activities that may affect any such properties or resources until it completes its obligations (e.g., State Historic Preservation Officer (SHPO) and tribal consultation) under applicable requirements of the NHPA and other authorities. The BLM may require modification to exploration or development proposals to protect such properties, or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized or mitigated. Depending on the nature of the lease developments being proposed and the cultural resources potentially affected, compliance with Section 106 of the National Historic Preservation Act and Executive Order 13007 could require intensive cultural resource inventories, Native American consultation, and mitigation measures to avoid adverse effects—the costs for which will be borne by the lessee.

1. Lessee is advised that if previously undiscovered cultural resources (historic or prehistoric objects, artifacts, or sites) are exposed as a result of operations, those operations will not proceed until notification is received from the Authorized Officer that provisions for mitigating unforeseen impacts has been carried out.

2. Lessee would be held responsible for damage to cultural resource sites.

3. In areas of high archaeological sensitivity, as defined by the BLM, in coordination with the USFS, access would be restricted.

4. If impacts occur to continued traditional tribal cultural practices, exploration/development would be restricted to protect tribal traditions.

Based on modified lease stipulations (Appendix A) impacts to Native American Resources would be minimized and a risk rating of moderate has been assigned to each of the 25 sections proposed for leased.

4.6. Recreation (including Special Designations)

The 2007 risk ratings from the DN/FONSI listed Section 30, T. 7 N., R. 27 E. as high due to concerns about recreational uses within the East Walker River Scenic Area. All other sections received a risk rating of moderate. These ratings were reviewed and updated based on the current understanding of the sections within the lease areas and the application of the stipulations listed below.

The following stipulation would apply to protect recreational resources within Section 30, T. 7 N., R. 27 E.:

• No surface occupancy is allowed within 0.25 mile buffer on either side of the East Fork of the Walker River to protect visual and recreational resources.

Based on the fact that a portion of Section 30 is excluded from geothermal leasing because it is segregated from mineral entry and with the recreational no surface occupancy buffer applied to the river corridor, the risk rating has been reduced to moderate for Section 30, T. 7 N., R. 27 E.
4.7. Visual Resources

The 2007 risk ratings from the DN/FONSI listed Section 30 in T. 7 N., R. 27 E. as high due to concerns about visual resources within the East Walker River Scenic Area. All other sections received a risk rating of moderate. These ratings were reviewed and updated based on the current understanding of the sections within the lease areas and the application of the stipulations listed below.

The following stipulations would apply to protect visual resources:

- No surface occupancy is allowed within 0.25 mile buffer on either side of the East Fork of the Walker River to protect visual and recreational resources.
- No surface occupancy is allowed within a 0.25 mile buffer on either side of Forest Road 765 in Section 30, T. 7 N., R. 27 E. to protect visual resources.

With these stipulations in place, the impacts to the visual setting would be minimized and the risk level for Section 30 has been reduced to moderate.

4.8. Socioeconomics and Environmental Justice

No additional information obtained or further analysis conducted. The low risk rating identified in the 2007 DN/FONSI continues to be applied to each of the 25 sections under analysis.

4.9. Inventoryed Roadless Areas

The following stipulation would apply to protect IRAs:

- No road construction or reconstruction would be authorized in designated inventoryed roadless areas (IRA). Timber would not be cut or sold within the IRAs. Overland or cross-country travel would be restricted to ensure a temporary road is not created.

Since a road network is an important component of exploration, power plant, and well field development, it is expected that with this roadless stipulation issued as part of the lease, only limited development would occur in the IRAs. Development could occur in the leased sections that are not in the IRAs, or in portions of sections outside the IRAs. This development would likely have some indirect effects to the roadless characteristics of the IRAs. Overall it is expected that there would be a moderate risk of potentially significant impacts on roadless area characteristics.

4.10. Cumulative Effects

Cumulative impacts will be the same as those discussed in the 2006 EA.
CHAPTER 5: CONSULTATION AND COORDINATION

All of the information presented in Chapter 5 of the original EA remains valid and unchanged.

This supplemental EA has been distributed to the interested public and copies have been sent to federal agencies, federally recognized tribes, state, and local governments. The mailing list is located in the project record located at the Bridgeport Ranger District.

5.1. List of Preparers

<table>
<thead>
<tr>
<th>Name</th>
<th>Responsibility</th>
<th>Office</th>
</tr>
</thead>
<tbody>
<tr>
<td>Douglas Clarke</td>
<td>NEPA Coordinator</td>
<td>Mountain City Ranger District</td>
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<tr>
<td>Michael Crawley</td>
<td>District Ranger</td>
<td>Bridgeport Ranger District</td>
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<tr>
<td>Eric Dillingham</td>
<td>District Archeologist</td>
<td>Bridgeport Ranger District</td>
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<tr>
<td>Susan Elliott</td>
<td>Forest Geologist</td>
<td>Humboldt-Toiyabe National Forest</td>
</tr>
<tr>
<td>Fred Frampton</td>
<td>Forest Archeologist</td>
<td>Humboldt-Toiyabe National Forest</td>
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<tr>
<td>Jim Harvey</td>
<td>Forest Fisheries</td>
<td>Humboldt-Toiyabe National Forest</td>
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<tr>
<td>Rixey Jenkins</td>
<td>Range Management Specialist</td>
<td>Bridgeport Ranger District</td>
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<tr>
<td>Sherri Lisius</td>
<td>Wildlife Biologist</td>
<td>Bridgeport Ranger District</td>
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<tr>
<td>Kathy Lucich</td>
<td>NEPA Coordinator</td>
<td>Humboldt-Toiyabe National Forest</td>
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<tr>
<td>Rachael Mazur</td>
<td>Forest Biologist</td>
<td>Humboldt-Toiyabe National Forest</td>
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<tr>
<td>Kim O'Connor</td>
<td>Forest Botanist</td>
<td>Humboldt-Toiyabe National Forest</td>
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<tr>
<td>Scott Richey</td>
<td>Geologist</td>
<td>Humboldt-Toiyabe National Forest</td>
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<tr>
<td>Adrianne Thatcher</td>
<td>District Recreation</td>
<td>Bridgeport Ranger District</td>
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<tr>
<td>Jeffrey Weise</td>
<td>District Wilderness Manager</td>
<td>Bridgeport Ranger District</td>
</tr>
<tr>
<td>Keith Whaley</td>
<td>Zone Geologist &amp; Project Lead</td>
<td>Bridgeport Ranger District</td>
</tr>
</tbody>
</table>

5.2. Government Coordination

Nevada State Clearinghouse  
Bureau of Land Management – Carson City Field Office  
Bureau of Land Management – Nevada State Office  
Nevada Division of Minerals  
Nevada Department of Wildlife  
Lyon County, Nevada  
Mineral County, Nevada  
US Fish & Wildlife Service

5.3. Tribal Coordination and Consultation

Benton Paiute Tribe  
Bishop Indian Colony  
Bridgeport Indian Colony  
Walker River Paiute Tribe  
Washoe Tribe of California and Nevada  
Yerington Paiute Tribal Council
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CHAPTER 6: REFERENCES


Tetra Tech, Inc. 2009. A Data Inventory for Potential Geothermal Leasing Interests in the North and South Aurora Study Areas. Report # 100-SFO-T22569.

Tetra Tech, Inc. 2009b. Final Report, A Data Inventory for Potential Geothermal Leasing Interests in the North and South Aurora Study Areas, Confidential Cultural Report.


# Chapter 7: Acronyms and Glossary

<table>
<thead>
<tr>
<th>Acronyms</th>
<th>Definition</th>
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<tbody>
<tr>
<td>BLM</td>
<td>Bureau of Land Management</td>
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<tr>
<td>CCFO</td>
<td>Carson City Field Office</td>
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<tr>
<td>CFR</td>
<td>Code of Federal Regulations</td>
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<tr>
<td>DN/FONSI</td>
<td>Decision Notice / Finding of No Significant Impact</td>
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<tr>
<td>DPS</td>
<td>Distinct Population Segment</td>
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<td>EA</td>
<td>Environmental Assessment</td>
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<td>ESA</td>
<td>Endangered Species Act</td>
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<td>Forest Service</td>
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<td>FSH</td>
<td>Forest Service Handbook</td>
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<td>GLO</td>
<td>General Land Office</td>
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<td>IRA</td>
<td>Inventoried Roadless Area</td>
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<tr>
<td>LCT</td>
<td>Lahontan Cutthroat Trout</td>
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<td>NDOW</td>
<td>Nevada Department of Wildlife</td>
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<td>NEPA</td>
<td>National Environmental Policy Act</td>
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<td>National Historic Preservation Act</td>
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<td>National Forest System</td>
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<td>Nevada Natural Heritage Program</td>
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<td>National Register of Historic Places</td>
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<td>RFD</td>
<td>Reasonably Foreseeable Development</td>
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<td>SHPO</td>
<td>State Historic Preservation Office</td>
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<tr>
<td>USFS</td>
<td>United States Forest Service</td>
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<tr>
<td>USFWS</td>
<td>United States Fish and Wildlife Service</td>
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</table>
Glossary

**Controlled Surface Use (CSU):** The CSU stipulation is intended for application where standard lease terms and permit-level decisions are deemed insufficient to achieve the level of resource protection necessary to protect the public interest, but where no surface occupancy is deemed overly restrictive. A CSU stipulation allows BLM to require that a proposed facility or activity be relocated from the proposed location by a specific distance as determined by specialists to achieve the desired level of protection.

**Exception:** A one-time exemption for a particular site within the leasehold; exceptions are determined on a case-by-case basis; the stipulation continues to apply to all other sites within the leasehold. An exception is a limited type of waiver.

**Lease Notice:** Direction attached to lease issuance that provides a level of protection for other resource values or land uses by providing restrictions or direction to avoid resource impacts, in addition to the standard lease terms, regulations, or stipulations. A lease notice is part of the lease contract and works in conjunction with stipulations to address any inconsistencies or lack of provisions of the standard lease form. Lease notices further implement the BLM’s regulatory authority to protect resources or resource values. Lease notices usually reflect more general or less specific issues than do stipulations.

**Lease stipulation:** A condition of lease issuance that provides a level of protection for other resource values or land uses by restricting lease operations during certain times or locations or to avoid unacceptable impacts, to an extent greater than standard lease terms or regulations. A stipulation is an enforceable term of the lease contract, supersedes any inconsistent provisions of the standard lease form, and is attached to and made a part of the lease. Lease stipulations further implement the BLM’s regulatory authority to protect resources or resource values. Lease stipulations are developed through the land use planning process.

**Modification:** A change to the provisions of a lease stipulation, either temporarily or for the term of the lease. Depending on the specific modification, the stipulation may or may not apply to all sites within the leasehold to which the restrictive criteria are applied.

**No Surface Occupancy (NSO):** A fluid minerals leasing constraint that prohibits occupancy or disturbance on all or part of the lease surface to protect special values or uses. Lessees may exploit the fluid mineral resources under the leases restricted by this constraint through use of directional drilling from sites outside the NSO area.

**Stipulation:** A condition of lease issuance that provides protection for other resource values or land uses by establishing authority for substantial delay or site changes or the denial of operations within the terms of the lease contract

**Timing Limitation (TL):** This stipulation limits activity during a specified period of the year. A TL stipulation is intended for application where standard lease terms are deemed insufficient to achieve the level of resource protection necessary to protect the public interest, but where an NSO is deemed overly restrictive. The scope of the TL stipulation goes beyond ground-disturbing activities to encompass any source of protracted or high-intensity disturbance that could interfere with normal wildlife behavior and adversely affect habitat use. The limitation is applied annually for a specified period lasting more than 60 days. Under the proposed action, TLs may also be applied to land uses and activities other than oil and gas development.

**Waiver:** A permanent exemption from a lease stipulation. The stipulation no longer applies anywhere within the leasehold.
Appendix A:
Geothermal Lease Stipulations (Modified)

The following lease stipulations have been developed as mitigating measures for geothermal leasing and other reasonably foreseeable development activities with regard to geothermal exploration and development within the Humboldt-Toiyabe National Forest.

US Forest Service Stipulations

A. No Surface Occupancy:

Stipulations from 2007 Decision:

1. On lands administered by the USFS, no surface occupancy or other surface disturbance will be allowed on slopes in excess of 40 percent.

2. On lands administered by the USFS, no surface occupancy would be allowed within 200 feet of eligible National Register sites, historic properties or unevaluated archeological historic sites.

Additional Stipulations-This Decision:

1. No surface occupancy is allowed within 300 feet of Lahontan cutthroat trout (LCT) habitat within the East Fork Walker River and Bodie Creek.

2. No surface occupancy is allowed for all of Section 5, T. 5 N., R. 27 E. due to steep slopes and Native American concerns. No surface occupancy is allowed for all of Section 21, T. 5 N., R. 27 E. due to steep slopes.

3. No surface occupancy is allowed within three (3) miles of an active sage-grouse lek.

4. No surface occupancy is allowed on lands falling within priority habitat for sage-grouse as identified by the Nevada Department of Wildlife (Nevada Sage-grouse Habitat Categorization Map), or as identified based on pre-construction field surveys. Priority habitat for sage-grouse includes Category 1 (irreplaceable, limited, and essential) and Category 2 (important, high-quality habitat) (Governor’s Sage-grouse Conservation Team 2010).

5. No surface occupancy is allowed within 0.25 mile buffer on either side of the East Fork of the Walker River to protect visual and recreational resources.

6. No surface occupancy is allowed within a 0.25 mile buffer on either side of Forest Road 765 in Section 30, T. 7 N., R. 27 E. to protect visual resources.
B. Controlled Surface Use:

**Additional Stipulations—This Decision:**

1. No sagebrush would be removed in known, occupied pygmy rabbit habitat to protect their burrows. Habitat would be defined with an inclusive polygon around all active burrows plus a 100 meter buffer.

2. No road construction or reconstruction would be authorized in designated inventoried roadless areas (IRA). Timber would not be cut or sold within the IRAs. Overland or cross-country travel would be restricted to ensure a temporary road is not created.

C. Timing Limitations:

**Additional Stipulations—This Decision:**

1. In areas identified as *Mono phacelia* habitat, ground-disturbing activities would be limited to periods outside of the growing season, which extends from March 1 to July 1.

2. Migratory Bird Habitat – No ground disturbing activities would be allowed during the avian breeding season (approximately April 1 through August 30) unless a nest survey is completed prior to ground disturbance. A nest survey would be conducted by a qualified biologist within migratory bird breeding habitat prior to any surface disturbance associated with exploration activities being approved. If nests are located, or if other evidence of nesting (e.g., mated pairs, territorial defense, carrying of nest material, transporting food) is observed, a protective buffer would be delineated and the entire buffer area avoided to prevent destruction or disturbance to nests until they are no longer active. The buffer would be species-dependent and established by a qualified wildlife biologist. The start and end dates of the seasonal restriction may be altered based on site-specific information such as elevation and winter weather patterns, which would affect breeding chronology and the presence of the species.

### Exceptions, Modifications and Waivers

Stipulations can be excepted, modified, or waived by the BLM authorized officer, in coordination with the USFS. An exemption exempts the holder of a land use authorization document from the stipulation on a one-time basis. A modification changes the language or provisions of a surface stipulation, either temporarily or permanently. A waiver permanently exempts the surface stipulation.

#### Exception, Modification or Waiver Process

An exception, modification, or waiver may be granted at the discretion of the BLM, in coordination with the USFS, if any of the standard exception, modification, or waiver criteria were met, or if any of the exception, modification, or waiver criteria specific to the stipulation were met. In order to implement an action that would not normally be allowed because of a stipulation, the proponent must submit a request in writing for an exception, modification, or waiver. The request shall detail which exception, modification, or waiver criteria are met. When requested concurrently with an application
(typical for situations involving lease stipulations), the exception, modification, or waiver is considered as part of the project proposal in the land and resource management plan (LRMP) and National Environmental Policy Act of 1969 (NEPA) compliance review. For separate requests, the request is considered as a unique action and is analyzed and documented individually for LRMP and NEPA compliance. The BLM authorized officer, in coordination with the USFS, would make the final determination whether to grant an exception, modification, or waiver to stipulations, which would then be applied by the BLM field office processing the application.

**Standard Exception, Modification, or Waiver Criteria**

The standard exception, modification, or waiver applies to all No Surface Occupancy (NSO)/No Surface-disturbing Activities, Controlled Surface Uses (CSUs), and Timing Limitations (TLs). An exception, modification, or waiver may be granted by the BLM Authorized Officer, in coordination with the USFS, if it can be demonstrated that the surface-disturbing activity:

1. would not cause adverse impacts or would have negligible impacts to the resource or resource use that the stipulation was designated to protect; or

2. would improve the protected resource or resource use as defined by the Forest Plan objectives, standards, or conditions in the stipulation (e.g., fuels treatment that improves forbs in key wildlife habitat, or trail construction for resource protection in an area of critical environmental concern [ACEC] or elsewhere); or

3. is necessary to meet health and safety objectives such as fire suppression or fire emergency stabilization and rehabilitation.

In situations where a surface-disturbing activity is excepted, modified, or waived, the activity could be subject to additional conditions of approval, reclamation measures, or best management practices (BMPs). Measures required would be based on the nature and extent of resource values potentially affected by the surface-disturbing activity. Excepted, modified, and waived surface-disturbing activities/lease stipulations are granted on a one-time case-by-case basis and will not necessarily constitute subsequent approvals.

**Specific Requirements**

A 30-day public notice and comment period is required before modification or waiver of a stipulation.
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Appendix B: Lease Notices

For leases within National Forest System (NFS) lands, the lessee/operator must comply with all the rules and regulations of the Secretary of Agriculture set forth in Title 36, Chapter II of the Code of Federal Regulations governing the use and management of the NFS when not inconsistent with the rights granted by the Secretary of Interior in the lease/permit. The secretary of Agriculture’s rules and regulations must be complied with for:

1. All use and occupancy of the NFS lands prior to approval of an exploration plan by the Secretary of Interior;
2. Uses of all existing improvements on NFS lands, such as forest development roads, within and outside the area permitted by the Secretary of Interior; and
3. Use and occupancy of the NFS lands not authorized by an exploration plan approved by the Secretary of Interior.

The following lease notices have been developed to accompany geothermal leasing with regard to geothermal exploration and development within the Humboldt-Toiyabe National Forest.

A. The lands within this lease may now or hereafter include plants, animals, or their habitat listed as threatened, endangered, proposed, or have candidate status with the USFWS. The BLM, in coordination with the USFS, may require modifications to proposed activity that is likely to jeopardize the continued existence of a proposed, threatened, and endangered or candidate species or result in the destruction or adverse modification of a designated or proposed critical habitat. The BLM, in coordination with the USFS, will not approve any ground-disturbing activity that may affect any such species or critical habitat until it completes its obligations under applicable requirements of the Endangered Species Act (ESA) as amended, 16 USC 1531 et seq., including completion of any required procedure for conference or consultation.

B. The lands within this lease may now or hereafter include plants, animals, or their habitat listed as USFS Sensitive or have designation through other federal and state agencies such as with the Nevada Department of Wildlife. Surveys for USFS sensitive species will be conducted prior to initiating any ground disturbing activities. The BLM, in coordination with the USFS, may require modifications to proposed activity that is likely to lead to the listing of a sensitive species or loss of viability. Restrictions related to sensitive species include, but are not limited to:

1. Operations in occupied rare plant habitat would be restricted to protect species. Additional restrictions may be added to protect rare/sensitive plants.

C. In addition to protection for all species, the following restrictions are in place to limit impacts to the bi-state distinct population segment (DPS) of the greater sage-grouse by becoming conditions of approval:

1. The BLM, in coordination with the USFS, will be consulted regarding the location of sage-grouse strutting grounds (leks), nesting, brood-rearing, wintering habitats and movement corridors. The distances and
times that these areas will be avoided will be determined by the BLM in coordination with the USFS.

2. Areas outside priority habitats (Category 1 and 2) as defined by Nevada Department of Wildlife (Nevada Sage-grouse Habitat Categorization Map) may be designated as no surface occupancy or otherwise restricted from development if they are determined to be important movement corridors for sage-grouse.

3. A comprehensive monitoring plan would be required to monitor sage-grouse demographics and movement patterns before, during, and after construction in any affected, occupied areas. If any work is conducted within any Category 3 sage-grouse habitats, a company representative would be on site to provide training to construction personnel on relevant avoidance/minimization/mitigation measures and oversee compliance during construction.

4. Additional restrictions (e.g., timing) for all potentially ground-disturbing activities to sage-grouse (e.g., drilling, project-related driving), regardless of location, would be analyzed under NEPA and subject to approval by the BLM, in coordination with the USFS, given the most current guidance and standards for sage-grouse conservation. These restrictions would also protect the bi-state DPS from losing habitat needed during all phases of its life cycle: strutting grounds (lek); nesting, brood-rearing, wintering habitats; and movement corridors. As of this writing, current guidance and standards are those found in the following documents:

- **Nevada Energy and Infrastructure Developments Standards to Conserve Greater Sage-grouse Populations and their Habitats** (Governor’s Sage-grouse Conservation Team 2010).
- **The Draft Nevada Sage-grouse Habitat Categorization Map** (NDOW, January 2012).
- **The Draft Bi-state Action Plan** (Bi-state Technical Advisory Team, January 2012)

D. The lands within this lease may now or hereafter contain historic properties, traditional cultural properties, and/or sacred sites currently unknown to the BLM or USFS, that were not identified in the Land and Resource Management Plan or during the lease parcel review process. These resources are protected under the National Historic Preservation Act (NHPA), American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, Executive Order 13007, or other statutes and executive orders. All activities proposed under the authority of this lease are subject to compliance with Section 106 of the NHPA and Executive Order 13007. The BLM, in coordination with the USFS, will not approve any ground disturbing activities that may affect any such properties or resources until it completes its obligations (e.g., State Historic Preservation Officer (SHPO) and tribal consultation) under applicable requirements of the NHPA and other authorities. The BLM may require modification to exploration or development proposals to protect such
properties, or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized or mitigated. Depending on the nature of the lease developments being proposed and the cultural resources potentially affected, compliance with Section 106 of the National Historic Preservation Act and Executive Order 13007 could require intensive cultural resource inventories, Native American consultation, and mitigation measures to avoid adverse effects—the costs for which will be borne by the lessee.

1. Lessee is advised that if previously undiscovered cultural resources (historic or prehistoric objects, artifacts, or sites) are exposed as a result of operations, those operations will not proceed until notification is received from the Authorized Officer that provisions for mitigating unforeseen impacts has been carried out.

2. Lessee would be held responsible for damage to cultural resource sites.

3. In areas of high archaeological sensitivity, as defined by the BLM, in coordination with the USFS, access would be restricted.

4. If impacts occur to continued traditional tribal cultural practices, exploration/development would be restricted to protect tribal traditions.