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Bureau of Land Management**

**Environmental Assessment UT-010-08-051
December 2008**

**GEOHERMAL LEASING IN THE FISHLAKE
NATIONAL FOREST, CEDAR CITY AND
FILLMORE BLM FIELD OFFICES**

Location: Fishlake National Forest, Cedar City Field Office,
Fillmore Field Office
Juab, Millard, Iron, and Beaver Counties, Utah

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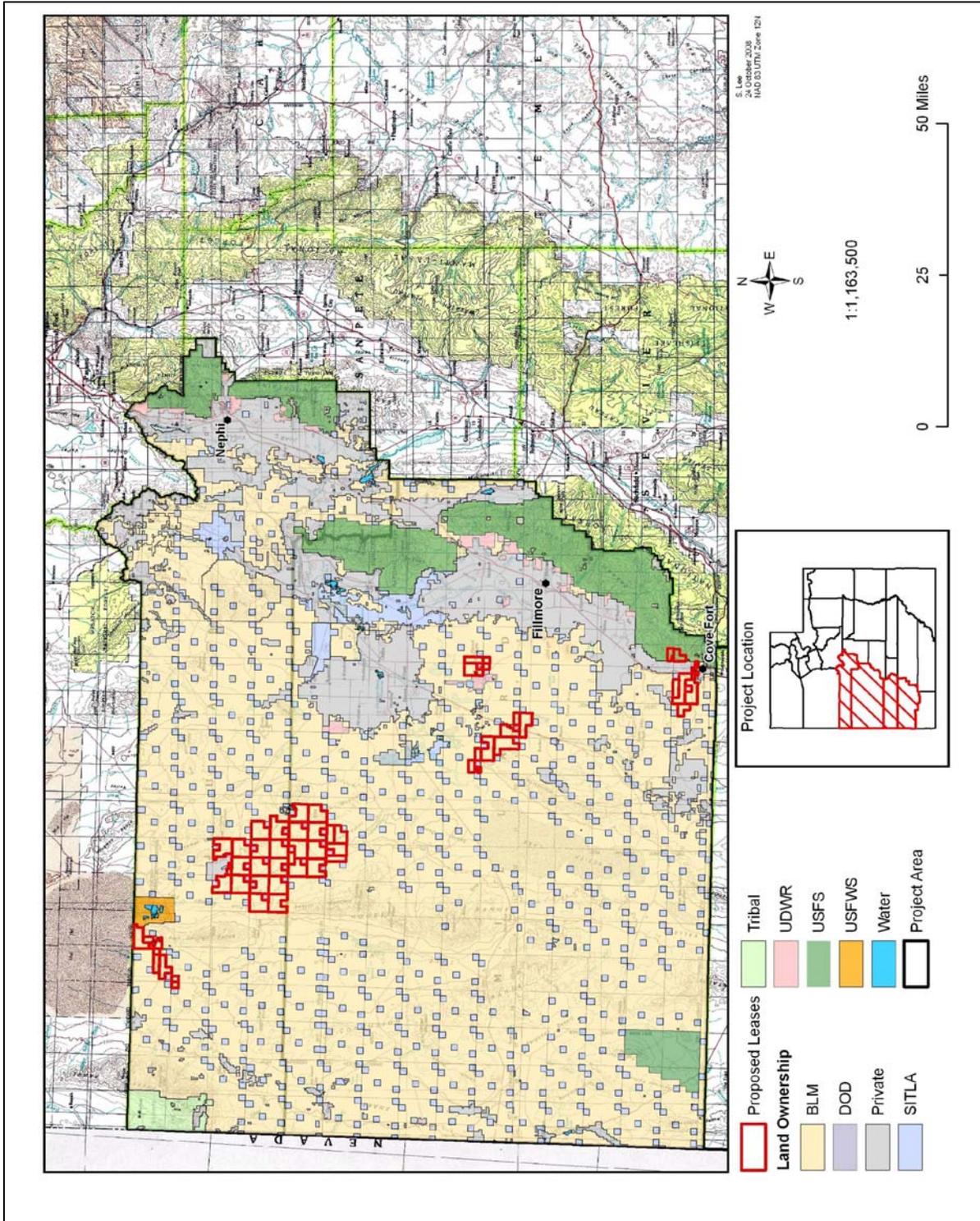
INTRODUCTION

This environmental assessment (EA) is an evaluation of the potential impacts on the natural and human environment that could result from the Bureau of Land Management (BLM) issuing leases for geothermal resources in requested locations as nominated by industry, in Juab, Millard, Beaver, and Iron counties, Utah (Appendix A). This EA is an analysis of impacts on the quality of the environment and serves as a vehicle for interdisciplinary and public review of the proposal and, if necessary, will facilitate the preparation of an environmental impact statement (EIS). This document has been prepared in accordance with the National Environmental Policy Act of 1969 (NEPA), the Council on Environmental Quality (CEQ) regulations (40 CFR 1500-1508), and the Federal Land Policy and Management Act of 1976 (FLPMA). Any decisions based upon this document must be in conformance with the Cedar Beaver Garfield Antimony Resource Management Plan and Record of Decision (CBGA RMP/ROD); the House Range Resource Area Resource Management Plan and Record of Decision (HRRR RMP/ROD); the Warm Springs Resource Area Resource Management Plan and Record of Decision (WSRA RMP/ROD); and the Fishlake National Forest Land and Resource Management Plan (FLNF LRMP). It also meets the requirements of the President's National Energy Policy (NEP), Executive Order (EO) 13212, Actions To Expedite Energy-Related Projects, and the Energy Policy Act of 2005.

The proposed action, issuing leases for geothermal resources, is considered a federal action and a commitment to resource development, so it requires NEPA analysis. While issuing a lease for geothermal resources grants the right to the lessee for future exploration and development of geothermal resources within the lease area, it does not grant the right to explore for or develop geothermal resources if such activities would extend beyond the level of casual use. As a result, the proposed issuance of geothermal leases would have no direct effects on resources. Issuance of geothermal leases could have indirect effects because such leasing represents a commitment of resources, and it is reasonably expected that subsequent exploration, development, production, and closeout activities would occur. This EA therefore presents an analysis of the potential indirect and cumulative effects from geothermal leasing. The analysis will be used by BLM to determine if the potential environmental consequences are determined to be significant.

This EA is limited to 55 parcels within the boundaries of the Cedar City Field Office (CCFO), the Fillmore Field Office (FFO), and the Fishlake National Forest (FLNF) (Figures 1 and 2). Fifty parcels are within the FFO, 3 parcels are within the CCFO, and 2 parcels are located on the FLNF. The parcels encompass a total of 191,911 acres of federal lands. There are 704 acres of private land located within parcels UT-GEO-11 and UT-GEO-12. There are sixteen state land in-holdings (10,343 acres) located within parcels UT-GEO-21-24, 26-27, 31, 35, 38-39, 41, and 43-44. Subsequent decision documents prepared for specific leasing proposals would tier to, or incorporate by reference, relevant sections of this EA. Tiering to this EA would allow the BLM to develop project-specific proposals that concentrate on the issues relevant to a particular proposed project. This EA will be used to determine the environmental protection measures that could be included as stipulations, lease notices, special conditions or restrictions on future leases as necessary to protect the resources within the CCFO, FFO, and FLNF. The analysis serves to verify conformance of geothermal leasing with the approved Land Use Plans (LUP) and will provide rationale for choosing to lease or defer lands from leasing, as well as providing rationale for attaching additional lease stipulations and notices to leases for protection of other resources and uses.

Figure 1. Proposed Lease Parcels in Millard and Juab Counties.



1.1 Purpose and Need

The purpose of this action is to analyze the potential impact of leasing for geothermal resources in the BLM Cedar City Field Office, Fillmore Field Office, and Fishlake National Forest lands. The need is to fulfill the nation's energy requirements. The HERRA and WSRA RMPs state that the desired outcome for minerals and energy management is to "provide for exploration, development and use of minerals on public lands consistent with applicable laws and regulations ..." (HERRA RMP, p. 75; WSRA RMP, p. 43). The CBGA RMP states that the objective of the minerals program is to "provide maximum leasing opportunity for oil, gas, and geothermal exploration and development by utilizing the least restrictive categories necessary to adequately protect sensitive species" (CBGA RMP, p. 18). The National Forest Management Act (NFMA) is the primary statute governing the administration of national forests. The Act expanded and otherwise amended the Forest and Rangeland Renewable Resources Planning Act of 1974, which called for the management of renewable resources on national forest lands. Due to changes in the human environment that have occurred since the completion of the current LUPs, additional analysis of potential environmental consequences is needed.

Leasing is conducted to meet requirements of FLPMA, Geothermal Steam Act of 1970 (GSA) (30 U.S.C. 1001 – 1025) and the Energy Policy Act of 2005, which amended and supplemented the GSA, and the revised regulations written to implement the 2005 Act. BLM policies encourage the orderly development of the mineral resources under their jurisdiction, where such development is consistent with multiple-use management and environmental considerations. These policies meet the intent and purpose of the GSA.

Demand for renewable energy in the United States has increased dramatically in a relatively short time. In accordance with this demand, the BLM's need to process pending geothermal lease applications, while maintaining its responsibilities for safety, public health, and environmental protection has also increased. This requires that adequate provisions are included with the leases to protect public health and safety and assure full compliance with the objectives of NEPA and other federal environmental laws and regulations. Continued leasing is necessary to maintain options for production of geothermal resources as companies seek new areas for production or attempt to locate and develop previously unidentified, inaccessible or uneconomical reserves.

1.2 Conformance with Land Use Plans and Supplemental Analysis

Pursuant to 40 CFR 1508.28 and 1502.21, this EA tiers to and incorporates by reference the information and decisions contained in the FLNF LRMP, BLM Cedar Beaver Garfield Antimony ROD (1986); the House Range Resource Area ROD (1987); and the Warm Springs Resource Area ROD (1987); all as amended. The proposed action is in conformance with relevant BLM LUPs and is consistent with the Fishlake National Forest Plan policies which encourage the orderly development of the mineral resources under its jurisdiction, where such development is consistent with multiple-use management and environmental considerations.

Geothermal operations following leasing would be managed under the regulations of 43 CFR §3200 and the Geothermal Resource Operational Orders (GROs). The GROs describe standard operating procedures, guidelines, and standards that must be followed for: exploratory operations; drilling, completion, and spacing of geothermal wells; plugging and abandonment of wells; and general environmental protection.

On United States Forest Service (USFS) land, a geothermal lease holder must also comply with all rules and regulations governing the use and management of USFS land set forth in the Code of Federal Regulations in Title 36, Chapter II. This includes requirements for protection of cultural and paleontological resources, endangered or threatened species, and floodplains and wetlands.

1.3 Relationship to Statutes, Regulations, or Other Plans

The proposed and other action alternatives are consistent with federal environmental laws and regulations, Executive Orders, and Department of Interior and the BLM policies and are in compliance, to the maximum extent possible, with state laws and local and county ordinances. It is the policy of the BLM as derived from various laws, including the Geothermal Steam Act of 1970, as amended, and FLPMA, to make geothermal resources available for leasing and to encourage development of geothermal resources to meet national, regional, and local needs. As such, the proposed alternatives would meet requirements of the Geothermal Steam Act of 1970, as well as, the Energy Policy Act of 2005.

The State of Utah energy policy (Utah Code §63-53b-301) states that “Utah will promote the development to renewable energy resources, including geothermal.” The Governor has developed a 10-point plan for economic development. Within the plan the Governor identified renewable energy as a key component of Utah’s economy. Utah’s Geothermal Resource Conservation Act and Rule 655-1 govern how high temperature geothermal resources are regulated in Utah. Beaver County is currently preparing an ordinance that would require a conditional use permit for geothermal energy development. The Beaver County ordinance would permit leases in areas designated as a Multiple Use 20 Zone. Millard County allows geothermal energy development with a conditional use permit in areas zoned for Range and Forest as well as Heavy Industrial. Millard County permits leases in areas designated as Range and Forest 20 (RF20) Zones. Iron County has a Geothermal Power Plant ordinance that allows placement and construction of geothermal power plants with a conditional use permit for areas zoned as Agriculture, Commercial, Light Industrial, Industrial and Industrial/Agriculture. Juab County allows geothermal development with a conditional use permit in districts zoned as Agricultural and Grazing, Mining, Recreation, and Forestry; and as a permitted use in districts zoned as Outlying Areas.

A lease for geothermal resources gives a lessee the right to drill and produce, subject to the lease terms, any special stipulations, other reasonable conditions, and following approval of Temperature Gradient (TG) holes or a Geothermal Drilling Permit (GDP). While processing the GDP, or when any surface disturbing activity may occur, the BLM reviews the adequacy of the current environmental analysis and reviews compliance with NEPA requirements. The BLM may conduct additional site-specific evaluations at that time and may require additional reasonable mitigation measures in the approval of a GDP, consistent with the lease terms and stipulations. Holders of geothermal leases are required to comply with all applicable federal, state, and local laws and regulations, including obtaining all necessary permits required, should lease development occur.

BLM reviewed the proposed action and determined it would be in compliance with threatened and endangered (T&E) species management guidelines outlined in the August 2006, *Conservation Measures from Land Use Plan-level Consultations for T&E Species of Utah*. Consultation with the U.S. Fish and Wildlife Service (FWS) over leasing with species-specific T&E lease notices has been completed and concurrence has been reached that leasing with the appropriate lease notices attached would result in a “not likely to adversely affect” determination for T&E species (December 16, 2004). Because this programmatic Section 7 Consultation is current, no further Endangered Species Act (ESA) consultation with the FWS is required at this stage. Although the California condor was not included in these prior consultation documents, the recommendation contained in the FWS Utah Field Office *Guidelines for Raptor Protection from Human and Land Use Disturbances* (Romin and Muck 2002) and the *Best Management Practices for Raptors and Their Associated Habitats in Utah* (Utah State Office Instruction Memorandum No. UT 2006-096; BLM 2006a) would be followed for this and other raptor species.

Compliance with Section 106 responsibilities of the National Historic Preservation Act (NHPA) of 1966, Public Law 89-665 as amended in 1992, were adhered to by following the 2001 Protocol Agreement between the Utah BLM and the Utah State Historic Preservation Office (SHPO), which was developed under the National Cultural Programmatic Agreement between the BLM, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers, and other applicable BLM handbooks. Section 106 Consultation with the SHPO would be completed prior to offering the parcels for lease.

1.4 Identification of Issues

Environmental issues (including those addressed by law) and resource concerns for the geothermal leasing parcels were identified by Interdisciplinary (ID) Teams of resource professionals assembled by the CCFO, FLNF, and the FFO. This process included a review of previous fluid mineral lease sales (including concerns presented in past fluid mineral lease protests) and past coordination with cooperating agencies including the FWS, Utah Division of Wildlife Resources (UDWR) and Native American Tribes. The issues identified for detailed analysis in this EA were impacts on:

- Areas of Critical Environmental Concern
- Cultural Resources
- Native American Religious Concerns
- Floodplains
- Threatened, Endangered, and Candidate Animal Species
- Fish and Wildlife including Special Status Species other than FWS candidate or listed species
- Invasive, Non-native Species
- Water Quality
- Wetlands/Riparian Zones
- Wilderness/Wilderness Study Areas
- Rangeland Health Standards and Guidelines
- Livestock Grazing
- Visual Resources
- Geology and Mineral Resources
- Lands/Access
- Social and Economic Conditions
- Wilderness Characteristics
- Wild Horses and Burros

The ID Team checklist (Appendix B) documents those resources that are not present on the lease parcels and issues and resources that were considered but did not warrant further analysis.

Air Quality within the Fillmore FO area is generally good. The nearest non-attainment areas are within the Salt Lake Field Office to the north. Development would be analyzed on a site specific basis. Given the low ambient concentrations that exist in the CCFO and FFO for criteria pollutants, it is expected that the increase in emissions of CO, NO_x, SO₂, PM₁₀, and PM_{2.5} for the Proposed Action or alternatives would not cause concentrations to exceed NAAQS or state ambient air quality standards. All actions analyzed in the EA would adhere to current air quality standards and emissions would be within established limits.

As a whole, utilizing the Reasonably Foreseeable Development (RFD) Scenario, the proposed action does not present the potential for impacts to air quality other than isolated fugitive dust. In addition, based on the 2007 Division of Air Quality Annual Report, the area is likely to be in

attainment with respect to the new particulate matter (PM) 2.5 standards enacted in September 2006, and the new ozone standard enacted March 12, 2008, although the final determination has not yet been made (Utah Department of Air Quality [UDAQ] 2008).

Although climate change is an acknowledged factor increasingly affecting many resources and management decisions, the alternatives as described below would not contribute to climate change to a degree that detailed analysis is needed or justified.

BLM has considered the Department of Interior Secretary Order #3226, which provides that the BLM will consider and analyze potential climate change impacts when making major decisions regarding the potential utilization of resources include planning and management activities associated with oil, gas and mineral development on public lands. As such, the BLM recognizes that the decision to open these lands to geothermal resource extraction could result in a variety of effects with the potential to contribute to climate change.

BLM recognizes the findings of various studies (U.S. Climate Change Science Program 2008; National Science and Technology Council 2008; Revkin 2008; IPCC 2007; RMCO and NRDC 2008; Hansen et al. 2005) and that global warming has the potential to affect biodiversity as well as result in impacts to human society (WHO 2002, Epstein and Mills 2005). Effects of climate change on ecosystems can include: increases in fire, insect outbreaks and storms; transformation of grasslands to woody shrublands; increased rates of perennial plant mortality; accelerated rates of erosion; increased exotic plant invasions including non-native annuals; reductions in water resources; increased species extinctions and wildfire (Berman 2007), lower precipitation, and increased temperatures with decreased runoff (USGS 2007; USDA 2007). The activities authorized herein under the current RFD would result in negligible increases in emissions of greenhouse gases.

2 DESCRIPTION OF ALTERNATIVES, INCLUDING PROPOSED ACTION

A range of alternatives have been analyzed including: leasing with standard terms in accordance with the current RMPs (No Action alternative), leasing with additional resource protection consistent with existing categories (Proposed Action alternative), and no leasing (No Leasing alternative). This range of alternatives was selected to provide a comprehensive analysis of the issues identified above. The lands under consideration in this EA are located in Juab, Millard, Iron, and Beaver Counties, Utah (Figures 1 and 2) and include 191,911 acres of BLM and USFS - managed lands.

Issuance of geothermal leases grants the exclusive right to the lessee for future exploration and development of geothermal resources within the lease area, but do not authorize any ground-disturbing activities related to exploring for or developing geothermal resources. Although evaluated in this EA, surface-disturbing activities are not part of the Proposed Action to lease the parcels. Depending on the operations proposed by the lessee, there may be up to two additional stages of environmental analysis and documentation that would occur following issuance of leases. These future analyses would be based on proposals that would involve surface-disturbing activities and would be site-specific in nature. The first stage would include proposals for drilling exploration (temperature gradient or slim hole observation) wells. A second stage of analysis would occur if exploration wells lead to a discovery and a proposal to develop a producing geothermal field. A lessee may opt to go directly to the second stage of development. Field development would involve drilling of production wells, injection wells and construction of a geothermal power plant. Each stage would require a site-specific environmental analysis to identify direct, indirect and cumulative effects, would involve a new appealable decision, and could result in additional conditions of approval to mitigate impacts.

2.1 Alternatives Considered but Not Analyzed in Detail

The following alternatives were considered but not carried forward for detailed analysis for the reasons presented:

2.1.1 Change of Leasing Categories Requiring a Land Use Plan Amendment

A LUP amendment is outside the scope of analysis for this EA and is not being proposed at this time. The need to amend the appropriate LUP would arise if impacts were not consistent with other resource decisions in the plan.

2.1.2 Leasing with No Surface Occupancy

Limited extent NSO could be applied under the Proposed Action alternative; therefore, this alternative was not carried forward as a separate alternative. However, if site-specific analysis NSO were needed for large areas, it would necessitate consideration of a plan amendment to change leasing stipulations.

2.2 No Action Alternative: Offer Leases as described in the Existing Land Use Plans

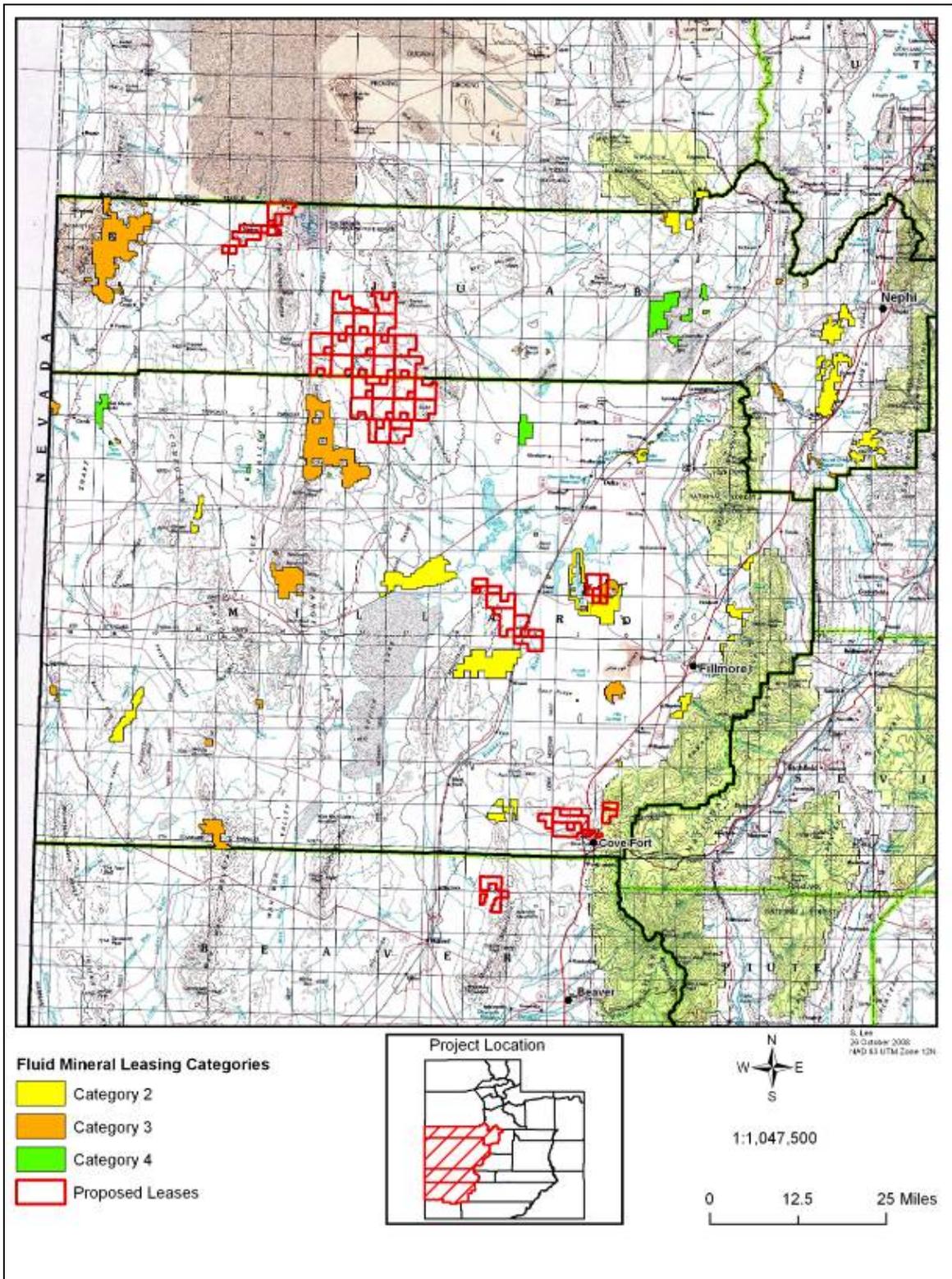
Geothermal leasing would continue as at present and would be guided by the CBGA RMP, the HRRR RMP, the WSRA RMP, and the FLNF FMP, and the regional environmental analyses for geothermal resources. Fluid mineral leasing categories apply to geothermal activities on the public land. These categories are: 1) available with standard lease terms, 2) available with controlled use or timing limitations, 3) available with no surface occupancy, and 4) closed to leasing. Measures identified in the CBGA, HRRR and WSRA are applied through this category system at the time of leasing and the on the ground implementation of those stipulations and categories is accomplished through the GDP process (BLM 1984, BLM 1986b, BLM 1987, Figure 3). Additional protections would not be provided with this alternative. The No Action Alternative serves as a benchmark against which the proposed action is evaluated.

Category 1 lands comprise the majority of the nominated parcels (188,734 acres). Category 1 lands would be available for leasing with standard lease terms (BLM form 3200-24). In addition to protections provided for under standard terms of the lease, two mandatory stipulations are imposed through policy by the BLM on every lease issued: one refers to the statutory protection of cultural resources and one for the statutory protection of threatened or endangered species, as described below.

All leases issued subsequent to October 5, 2004 would include the lease stipulation for the protection of cultural resources (per BLM Washington Office Instruction Memorandum No. 2005-03, Cultural Resources and Tribal Consultation for Fluid Minerals Leasing), which states:

“This lease may be found to contain historic properties and/or resources protected under the National Historic Preservation Act, American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, E.O. 13007, or other statutes and executive orders. The BLM will not approve any ground disturbing activities that may affect any such properties or resources until it completes its obligations 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.”

Figure 3. Fluid Leasing Categories for Juab and Millard Counties.¹



¹ Digitized fluid leasing data are not available for Iron and Beaver Counties. Parcel UT-GEO-003 has 320 acres of Category 2 designation. The remaining parcels in Iron and Beaver Counties are designated Category 1.

All leases issued would include the lease stipulation for the protection of threatened or endangered species (per BLM Washington Office Instruction Memorandum No. 2002-174, Endangered Species Act Section 7 Consultation), which states:

“The lease area may now or hereafter contain plants, animals, or their habitats determined to be threatened, endangered, or other special status species. BLM may recommend modifications to exploration and development proposals to further its conservation and management objective to avoid BLM-approved activity that would contribute to a need to list such a species or their habitat. BLM may require modifications to or disapprove proposed activity that is likely to result in jeopardy to the continued existence of a proposed or listed threatened or endangered species or result in the destruction or adverse modification of a designated or proposed critical habitat. BLM will not approve any ground-disturbing activity until it completes its obligations under applicable requirements of the ESA as amended, 16 United States Code (USC) 1531 et seq. including completion of any required procedure for conference or consultation.”

Category 2 lands comprise 2,068 acres within the nominated parcels. Category 2 lands would be available for leasing with the standard lease terms (BLM form 3200-24), the two mandatory lease stipulations described above, and the special stipulations identified in the HRRR and WSRA RMPs supplements (BLM 1988a, BLM 1988b) and the CBGA RMP (BLM 1984). These special stipulations include timing or controlled surface use stipulations for Clear Lake Buffer Strip, Crucial Raptor Nesting Area, Bald Eagle/Golden Eagle roost and perch sites, and Critical Watersheds (Table 1).

Table 1. Category 2 Stipulations for the Nominated Parcels.

Resource	Parcels Affected	Acres	Stipulation	Exception
House Range Resource Area				
Critical Watersheds	N/A	N/A	No occupancy or other surface disturbance will be allowed within 500 feet of any perennial streams or springs.	Exceptions may be authorized by the BLM if it can be shown that the activity will not have an adverse impact on the watershed.
Warm Springs Resource Area				
Clear Lake Buffer Strip	UT-GEO-07	480	Exploration, drilling and other development activity will not be allowed from March 1 to May 30.	No exceptions allowed.
Crucial Raptor Nesting Area	UT-GEO-06 and 08	1,228	Exploration, drilling and other development activity will not be allowed from March 1 to June 30. This limitation does not apply to maintenance and operation of producing wells.	Exceptions in any year may be specifically authorized in writing by the federal surface management agency if it can be shown that the activity would not impact raptor nests.
Cedar Beaver Garfield Antimony Resource Area				
Bald Eagle / Golden Eagle Roost And Perch Sites	UT-GEO-03	360	Exploration, drilling and other development activity will not be allowed within 0.25 miles of any site from Nov 1 to April 30.	No exceptions listed in CBGA RMP.

Category 3 lands comprise 1,028 acres within the nominated parcels. Category 3 lands would be available for leasing only with the NSO stipulation as identified in the HRRR and WSRA RMP supplements (BLM 1988a, BLM 1988b). This stipulation applies to portions of UT-GEO-05 and UT-GEO-06 which fall within the Pahvant Butte Area Critical Environmental Concern (ACEC).

Category 4 lands comprise 81 acres within the nominated parcels and these lands are closed to leasing. This stipulation applies to a portion of UT-GEO-48 that falls within the Cold Springs Least Chub Habitat.

2.3 Proposed Action: Offer Leases with Additional Resource Protective Measures Consistent with Existing Lease Categories

The Proposed Action alternative would lease the nominated parcels (Figures 1 and 2) subject to additional resource protective measures beyond the terms and stipulations described for the No Action alternative. The effects of implementing the Proposed Action alternative would be similar to the No Action alternative with the caveat that, under this alternative, more stringent measures would be applied to some leases to further protect specific resources. Table 2 summarizes mitigation measures developed for the Proposed Action alternative in response to issues raised during the scoping period and by the project ID Team:

Table 2. Additional protective measures included in the Proposed Action alternative.

Expanding the geographic area and the use of timing limitations for crucial winter and summer mule deer, elk, and pronghorn habitat beyond that identified in the WSRA RMP and the HRRR RMP supplements. Also specifying timing limitations for crucial elk calving, deer fawning habitat, and pronghorn fawning habitat .
Additional protection of raptors wherein surveys would be required whenever disturbances and/or occupancy are proposed in association with exploration and development within potential raptor protection buffer areas. Based on the results of the field survey, the authorized officer will determine the appropriate buffers and timing limitations.
Not allowing surface disturbance or use within 500 feet of riparian areas in FFO or 400 feet in CCFO .
No surface use or otherwise disruptive activity would be allowed that would result in direct disturbance to populations or individual special status plant and animal species, including those listed on the BLM sensitive species list and the Utah sensitive species list.
Requiring a timing limitation for the protection of waterfowl . Disruptive activities near surface waters with nesting waterfowl, wintering waterfowl, or during migration periods would be discouraged.
Not allowing surface disturbance or otherwise disruptive activity from March 15 through July 15 within 2.0 miles of an occupied sage-grouse lek, or within mapped and identified sage-grouse breeding habitat .
Requiring surveys prior to activity to identify areas containing pygmy rabbit habitat. Not allowing surface disturbing activity within 300 feet of pygmy rabbit habitat .
Allowing only short-term or mitigable visual intrusions on VRM Class II or moderate SIO lands for the purpose of preserving the form, line, color or texture of the landscape so as not to attract the viewer's attention.
Not allowing surface disturbance on slopes in excess of 30 percent.

Additional protection would occur where BLM has authority to take discretionary action to protect resources in order to comply with agency regulations or policies (Appendix C). Resource protective measures would be applied through stipulations, lease notices, or administrative actions in the geothermal approval process. In general, new stipulations could only be applied when the leasing category provides for the application of stipulations. Additional protective

measures could in some cases result in NSO on portions of a lease. Application of NSO for protection of a resource would preclude any disturbance of the land surface where the resource is present. Thus any geothermal resources extracted from the area would have to come from wells directionally drilled at an angle underground from nearby lands.

Under this alternative, more restrictive protective measures would be applied to ensure compatibility between exploration and development activities and the surface utilization of existing and projected developments. These measures provide additional protection to specific resources beyond the standard lease terms and conditions described for the No Action alternative.

2.4 No Leasing Alternative

Under this alternative the BLM may determine that the only way to adequately protect a particular resource in a specific area is to not allow geothermal leasing in that area. The No Leasing Alternative is not in conformance with the existing land use plans and thus is not a viable alternative considered for implementation; however, for analysis purposes, it provides for a full range of alternatives and comparison of impacts. Additionally, if significant impacts are identified through this analysis in particular areas, BLM could make a decision to defer those areas until such time that a land use plan amendment could be completed, which would change the category of a particular area to No Leasing.

3 DESCRIPTION OF AFFECTED ENVIRONMENT

This chapter describes the environment that would be affected by implementation of the alternatives described in Chapter 2. Aspects of the affected environment described in this chapter focus on the relevant issues. Certain critical environmental components require analysis under BLM policy. Only those aspects of the affected environment that are potentially impacted are described in detail (Appendix B).

3.1 General Setting

The lease parcels are comprised of approximately 191, 911.20 acres of Bureau of Land Management and Forest Service-managed surface lands located within Beaver, Iron, Juab, and Millard Counties, Utah. The area's land ownership pattern is fragmented between private, state, and federally-managed lands (Figures 1 and 2).

The area is within the Basin and Range physiographic province, which generally consists of north-south trending mountain ranges separated by broad arid valleys with interior drainage and vegetated with sagebrush and other plants typical of the Great Basin. The soil in this area consists mostly of aridisols, an iron-rich desert soil, that is used mainly for range, wildlife, and recreation. Because of the dry climate in which they are found, these soils typically are not used for agricultural production unless irrigation water is available. The valleys throughout the region contain a variety of native grasses, junipers, and pinyon pines, while xerophytic and desert scrub vegetation are common in lower and drier areas.

The climate of the area is characterized by cold winters and hot summers – average minimum temperatures are around 17°F (December – January) and average maximum temperatures are in the 90s (July). Average annual precipitation ranges from about 10 to 13 inches depending on elevation, with approximately 50 percent of the moisture coming during the period of plant growth between April and September (WRCC 2008).

The area has had a relatively long socio-cultural history of resource use and development. Since the late 1800s agricultural pursuits such as farming and cattle and sheep ranching have dominated the character of the general region. In some areas (Iron County and the southernmost portion of the nominated parcels), however, the dominance of the agricultural sector on the economy has somewhat given way to the service sector. This is an indication of the heavy reliance of the

area's economy on tourism attracted by the several national parks, monuments, and recreation areas of the region. Despite heavy visitation to this region, much of its rural western character has been retained through its small cities and towns and its large open expanses.

The Geothermal Steam Act of 1970 required competitive bidding for leases in areas classified as Known Geothermal Resource Areas (KGRAs) by the United States Geological Survey (USGS). Lands could be classified as KGRAs on the basis of geological evidence or if overlapping applications were filed for noncompetitive leases. Nine areas, including almost 128,000 acres in southwestern Utah, were identified as KGRAs in the 1970s as a result of geological evidence or overlapping lease applications. Numerous leases, both competitive and noncompetitive, were issued in the 1970s in central and southern western Utah.

At this time exploration projects were initiated, especially in some of the KGRAs. Exploration involved several types of geophysical investigations and drilling. Drilling included shallow temperature gradient hole, usually less than 500 feet deep, as well as deeper stratigraphic test wells. This exploration confirmed the existence of a viable geothermal resource at both the Roosevelt Hot Spring KGRA and the Cove Fort-Sulphurdale KGRA. Additional exploration and development drilling at these two KGRAs led to the construction of two relatively small power plants in the 1980s. Both of these plants are currently being expanded and additional production and injection wells drilled. Lower temperature thermal waters found in other areas had the potential for direct use applications but, due to their remote locations, are largely undeveloped.

There was little interest in geothermal resources in the later 1980s as energy prices fell and the market for additional geothermal generated power vanished. Some of the existing leases were dropped and when others terminated there was little interest in releasing. In 1988, following Washington Office instructions, all unleased lands in the nine KGRAs were offered for competitive bidding but no bids were received. This demonstrated lack of competitive interest resulted in the elimination of all lands included in KGRAs solely on the basis of overlapping lease applications. After this action only three KGRAs (Crater Springs, Roosevelt and Cove Fort-Sulphurdale) including 58,484 acres remained. A short time later, overlapping lease applications were received for a parcel in the former Thermo Hot Springs KGRA and a new KGRA containing 641 acres was established.

Provisions in the Energy Policy Act of 2005 implemented new geothermal regulations, effective June 1, 2007, which eliminated KGRAs and made all geothermal leasing competitive. The Utah State office received nominations for lands to be offered in a competitive lease sale in late 2008. The nominated lands were divided into the parcels and analyzed in this RFD.

3.2 Elements of the Human Environment and Other Resources Brought Forward for Analysis

Elements of the human environment and other resources brought forward for analysis are identified in Section 1.4. Elements, which are not present in the area and not addressed in this EA, include; Threatened, Endangered or Candidate Plant Species, Threatened, Endangered or Candidate Animal Species, Wild and Scenic Rivers, and Wilderness. Other resources that may be present in the lease parcels but would not be affected, for the reasons listed in Appendix B, include Air Quality, Environmental Justice, Farmlands (Prime and Unique), Wastes (hazardous or solid), Woodland/Forestry, Vegetation including Special Status Plant species other than FWS candidate or listed species, Soils, Recreation, Paleontology, and Fuels/Fire Management. The resources described in this chapter represent only those elements which could potentially be impacted by the proposed action, or alternatives. This narrative describes the resources that will be analyzed in Chapter 4.

3.2.1 Areas of Critical Environmental Concern (ACECs)

Areas of Critical Environmental Concern (ACEC) are areas identified through land use planning as needing special management designation to protect and prevent irreparable damage to relevant and important values such as historic, cultural, or scenic values; fish and wildlife resources, or other natural systems or processes; or to protect life or provide safety from natural hazards. Fluid mineral leasing categories are more restrictive in these areas to preserve the critical environment. There are six ACECs in the project area (Table 3) one ACEC, Pahvant Butte would be impacted by geothermal leasing. The relevant and important issues for this ACEC are scientific educational values, potential for peregrine falcon reintroduction, and recreation potential. Pahvant Butte has been designated a Category 3 area; it is an open lease area subject to no surface occupancy. This ACEC is located within parcels UT-GEO-05 and UT-GEO-06 (Figure 4). No surface occupancy is allowed on FLNF Dog Valley Inventoried Roadless Area within parcels FS -01 and FS-02 as indicated on Figure 5.

Table 3. Areas of Critical Environmental Concern in the project area.

ACEC	Acres	Relevance and Important Values
Fossil Mountain	1,920	Prehistoric life form
Gandy Mountain Caves	1,120	Geologic feature
Pahvant Butte	2,500	Inactive volcano; Peregrine Falcon reintroduction
Rockwell Natural Area	9,630	Sand dunes
Tabernacle Hill	3,567	Unusual volcanic features
Wah Wah Mountain	5,970	Biological community
TOTAL	24,707	

3.2.2 Cultural Resources

The NHPA, as amended in 1992 (16 USC 40 et. seq.), requires government agencies to take into account the effects of their actions on properties listed or eligible for listing on the National Register of Historic Places (NRHP). The term “cultural resources” refers to any historic or prehistoric resource. The term “historic property” specifically refers to a cultural resource that has been determined eligible for inclusion to the National Register of Historic Places (NRHP). These terms imply a great deal more than prehistoric and historic material remains, ruins, or standing structures. They encompass a wide range of material remains that have the potential to provide information about the past occupation and use of the project area. These terms also refer to any such records related to such a resource or property. A total of five classes of historic properties (districts, buildings, structures, sites, and objects) are defined that are eligible for listing on the NRHP (36 CFR 60.3).

Archaeological Categories

- ❖ **Archaeological Site**
A site is a concentration of cultural remains inferred to be the location of specific human activities.
- ❖ **Archaeological Features**
A feature is defined as non-portable cultural remains including but not limited to hearths, storage pits, firepits, architecture, or undisturbed layers of deposited material.
- ❖ **Artifact**
Artifacts are portable cultural remains that exhibit evidence of human use or alteration.
- ❖ **Culturally Altered Landscape**
A culturally altered landscape is a landscape modified by human activity, including but not limited to roadways, agricultural fields, farming terraces, and irrigation ditches, or other water control devices.

❖ **Historical Site**

An historic site is a location, building, or neighborhood more than 50 years old.

Figure 4. ACEC's and Special Designations.

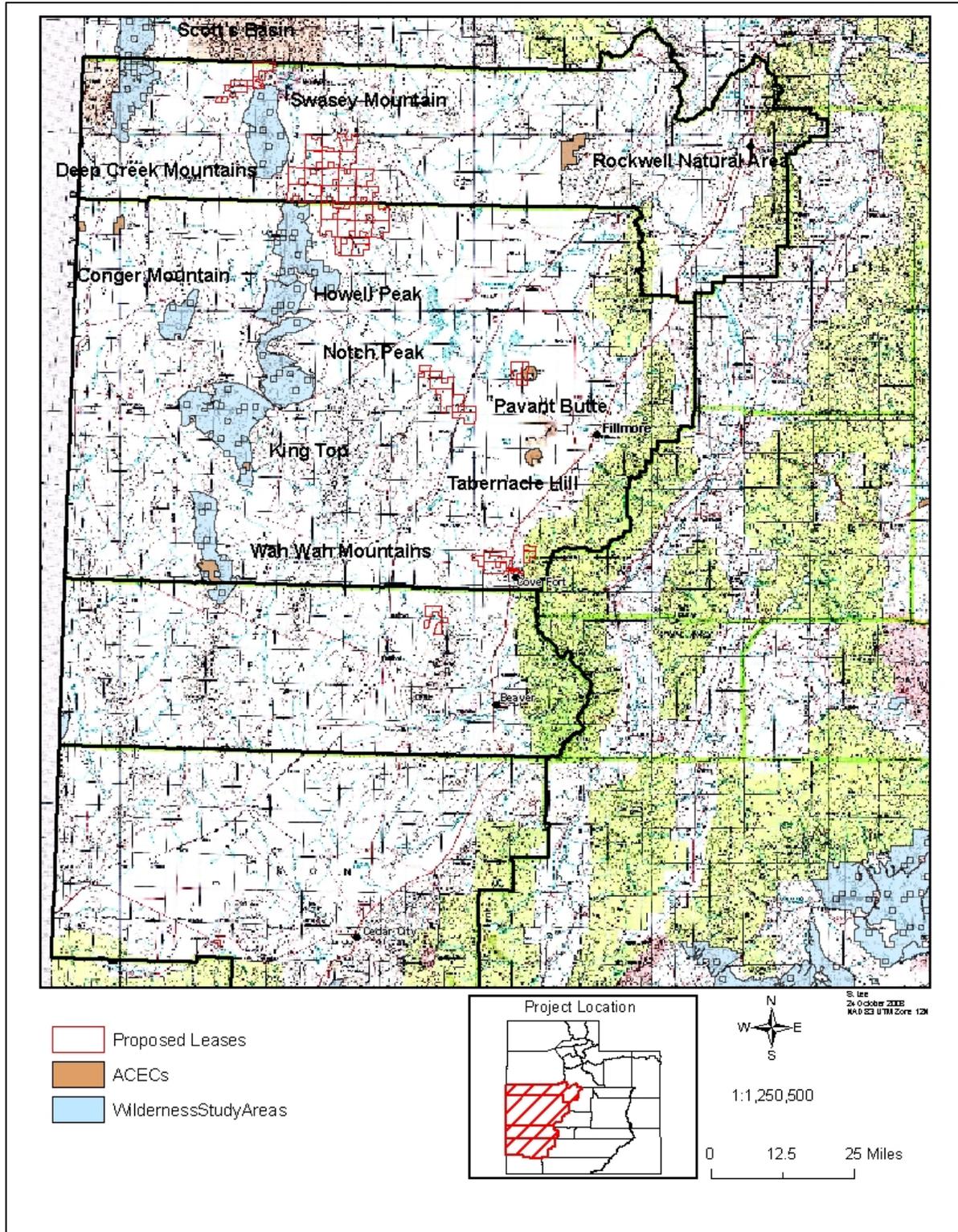
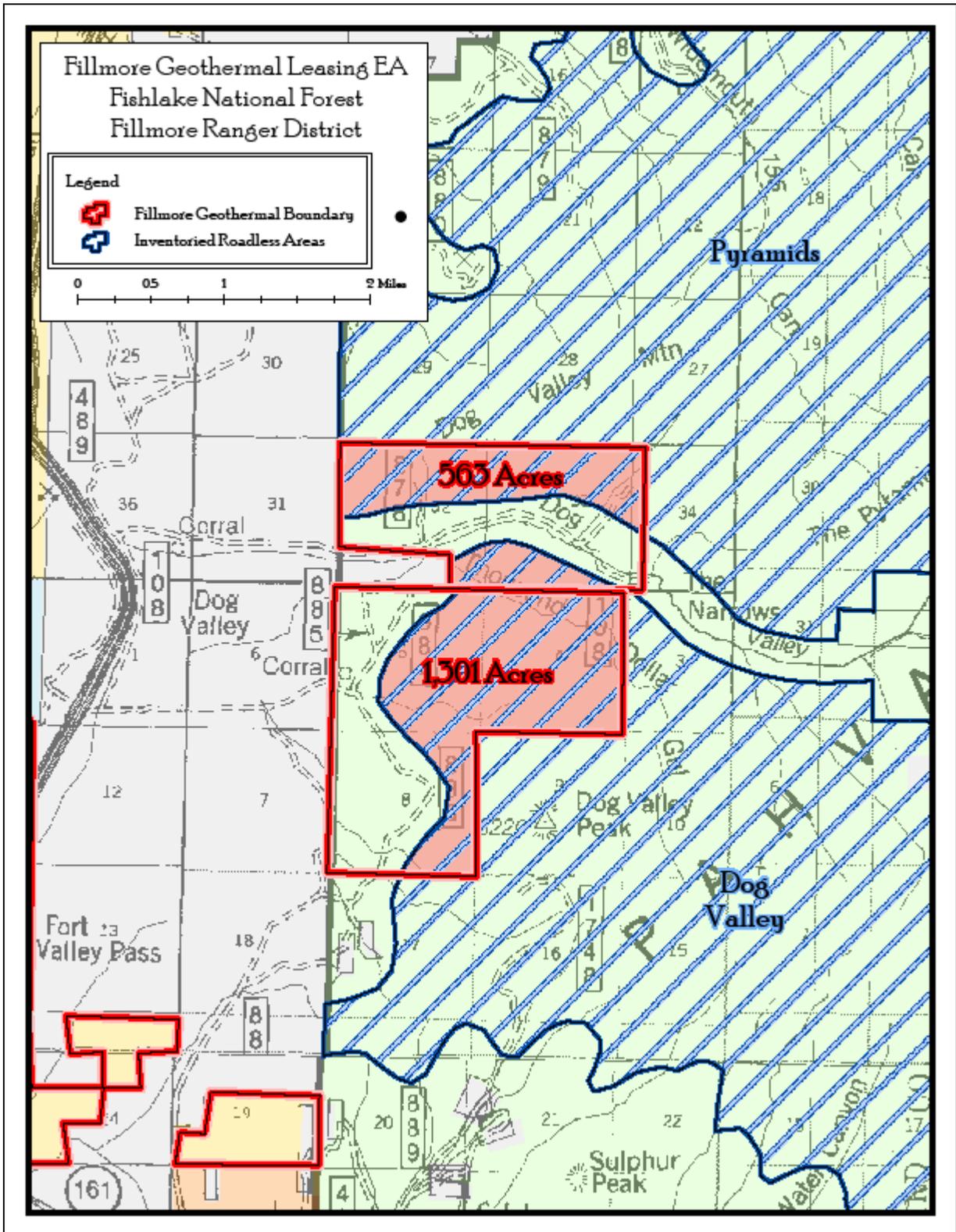


Figure 5. Fishlake National Forest Inventoried Roadless Area.



Cultural resources also include places that are important to a specific group's history and traditions. These places are often referred to as Traditional Cultural Properties (TCPs).

❖ **TCPs**

A traditional cultural property may encompass different site types such as prehistoric campsites, rock art, burials, rock shelters, lithic scatters, and village sites. Additionally, they can also consist of non-archaeological site types such as lakes and springs, land features, and traditional gathering or collection areas (16 U.S.C. 470, Section 101 [d] [6] [a]).

In accordance with law and policy, cultural resources clearances and mitigations are required prior to construction or development on all projects involving surface disturbing activities.

According to 36CFR800.5(1) "An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative." 36CFR800.5 (2) includes these examples of adverse effects "(iv) Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance; (v) Introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features;"

Development introduced to a landscape may cause adverse effects to the landscape and surrounding historic properties in a variety of ways. Adverse effects can be caused to the setting by a change in aesthetic values or by obstruction of views. In regard to a historic property, adverse effects can be those that diminish the property's setting integrity, which negatively affect its historic significance and hence its eligibility for listing in the National Register of Historic Places (NRHP).

The lease parcels are located within the eastern portion of the Great Basin culture area (D'Azevedo 1986). The geographic limits of the Great Basin part of the eastern province extend from Goose and Grouse Creek and the Raft River Mountains on the north, the Pine Valley Mountains of southern Utah in the south, the Wasatch Range on the east, and the Utah-Nevada border on the west. This is essentially the Bonneville Basin and adjacent mountain areas. This is an area of large and varied archeological resources, with sites reflecting occupation and use by various groups over the past 12,000 years, including big game hunters of the Paleo-Indian Period, Archaic hunters and gatherers, Fremont agriculturists, and, most recently, the Paiute hunters and gatherers. As such, Native American groups, particularly local groups, have expressed interest in land use planning in the area, especially if it involves ground disturbing activities. The following is a summation of the prehistory and history of the area.

Paleo-Indian Period (Approximately 12,000 – 7000 B.P./5000 B.C.)

Paleoindian cultures are generally associated with an adaptation to big game, mega-fauna hunting in a plains environment. Archaeological evidence for human occupation in Utah during the Paleo-Indian period is generally limited to surface finds of diagnostic projectile points. The earliest projectile point forms in Utah are associated with fluted Clovis, Folsom, and Lake Mojave lanceolate projectile points types. Most of these finds were in the eastern two-thirds of

the state, although Paleoindian projectile points have been found on the surface within the project area (Copeland and Fike 1988).

Archaic Period (5000 B.C. – A.D. 300)

Following the Paleo-Indian period the eastern part of the Great Basin and adjacent Colorado Plateau area was occupied by a regional manifestation of a highly adapted, mobile hunting and gathering culture. In the early Holocene, the megafauna became extinct and subsistence strategies adapted to the new environment. The projectile points became smaller and more suited for hunting smaller game, and there was an increase in variety of stone grinding implements used for plant and seed processing. The adaptation is characteristic of the Intermountain West and persisted for up to 6,000 years. The prehistoric cultures of the eastern Great Basin may be viewed as variants of what has been described as the Desert Culture or Desert Archaic adaptation that occurred throughout the western United States.

Archaic sites, particularly from the middle and late periods, are relatively abundant throughout the project area. Almost all of the Archaic sites are characterized as “scatters” of widely varying sizes and complexities, but marked by often abundant chipped stone debris from artifact production, chipped stone artifacts (atlatl dart points, scrapers, knives, drills, blades, etc.), very often ground stone (manos and metates), and occasionally hearths, alignments, and other minor features. There are very few caves and rockshelters, which were generally favored as occupation sites by the Archaic people.

Formative Period (A.D. 300 – 1200)

Excepting some nomadic hunting traditions that persisted until historic times, the Archaic period in the Great Basin is considered to end with the development of sedentary adaptations that were coincident with the adoption of a horticultural subsistence base. These traits became elements of the Fremont culture. By A.D. 400 or 500, small quantities of pottery appear, occasionally accompanied by maize. Initially, the introduction of maize may have been minimal. Gathering of piñon nuts is well documented for the first time during this transitional period. By A.D. 800, settled Fremont villages with pit houses and above- or below-ground storage units and maize, beans, and squash horticulture had begun to occur on the northern Colorado Plateau and eastern Great Basin.

The Fremont culture designation has applied to several related but geographically diverse archaeological complexes centered in Utah. In terms of overall culture history of the region, the Fremont is an aberration. For a period of about 900 years the earlier desert foragers were replaced by more sedentary horticulturalists who lived in scattered farmsteads or small villages, made pottery, built substantial dwellings and storage structures, and developed a unique artistic tradition manifested in rock art and modeled clay figurines. The introduction of the bow-and-arrow and its associated smaller projectile points flourished at this time.

Within the project area, agricultural sites are clustered strongly along the streams issuing from the high country on the east. There are also seasonal sites associated with exploitation of the natural resources of the western valleys and ranges.

Late Prehistoric Period (A.D. 1200 – 1826)

Linguistic evidence has suggested members of the Numic family of languages arrived out of southern California into Nevada and Utah by approximately A.D. 1000. By around A.D. 1200, this expansion of Numic-speaking peoples into the area seems to have replaced or displaced the Fremont culture (Bettinger and Baumhoff 1982). Archaeologically, the primary material culture of the Numic consists of Intermountain Brownware pottery and the Desert Side notched and Cottonwood Triangular arrow points. Subsistence strategy appears to shift back to one largely

focused on hunting and gathering; however, there is some evidence of at least limited reliance on horticulture. The Numic-speaking peoples, including the Ute, Shoshone and Paiute, were the occupants of the Great Basin upon the initial arrival of Europeans. Sites associated with the Paiutes, who were occupying the area at the time of white contact, become definable at about the same time as the Fremont demise. Reflected is a return to a transient lifeway supported by hunting and gathering; existing sites in the project area often appear to be clustered around springs.

History

Early Europeans to the area included Francisco Vasquez de Coronado who may have passed into what would become southern Utah in 1540 and the Dominguez-Escalante Expedition from Santa Fe in 1776 reaching as far north as Utah Lake. This was followed only by trappers including Jedediah Smith and Jim Bridger in the 1800s, and soon afterward the Mormon Pioneers in 1847. Gold and silver brought miners on the way to the mine fields in Nevada and California. Ranchers and farmers, supported by several legislative acts such as the Homestead Act of 1862, the Desert Land Act of 1877 and the Taylor Grazing Act of 1934, caused a population influx of people looking for inexpensive land. Railroads furthered the emigrant movement and promoted trade and travel.

Past Findings

Class I Inventory Reports for the November 2008 Geothermal Lease Sale were prepared by the Fillmore and Cedar City Field Office archaeologists as well as the Fishlake National Forest archaeologist in order to determine site type and site density in each of the parcels proposed for lease sale. Neither the BLM nor the Forest Service will approve any ground disturbing activities that may affect cultural properties eligible to the National Register of Historic Places (NRHP) until it completes its obligations under applicable requirements of the NHPA and other authorities. On all parcels, once a project specific proposal is submitted, an additional Section 106 cultural resource assessment would be completed and site specific issues would be addressed as appropriate. The BLM and Forest Service 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.

The Class I Inventory Reports were based on considerable inventory and data accumulation in the project area that has occurred in the last 30 years, mostly the result of wildland fire rehabilitation efforts, chaining and plowing, mineral exploration, transmission lines, roads, pipelines, and a variety of other small projects proposed in the lease areas. All cultural resource information was reviewed and pertinent cultural resource information was analyzed for the **Area of Potential Effect (APE), which is defined as the entire parcel being offered for the November 2008 Geothermal lease sale.** Cultural resource information concerning the proposed parcels varies from parcels with no inventories to parcels where some inventories have covered a portion of the area. In no case is the entire parcel completely surveyed. Uninventoried portions or parcels were compared with similar areas where inventories had been conducted. This analysis included an assessment of soils, elevation, topography, vegetation and water resources. The Class I Inventory Reports results are presented in Appendix D.

A complete inventory of the proposed lease parcels has not occurred; therefore, the following stipulation should be added to any parcel offered for lease:

“This lease may be found to contain historic properties and/ or resources protected under the National Historic Preservation Act (NHPA), American Indian Religious Freedom Act, Native American Graves and Protection Act, E.O. 13007, or other statutes and executive orders. The BLM will not approve any

ground disturbing activities that may affect such properties or resources until it completes its obligations under applicable requirements of the NHPA and other authorities. The BLM may require modification to exploration or development proposals to protect properties, or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized or mitigated."

3.2.3 Native American Consultation and Traditional Cultural Properties

Because geothermal resource development has the possibility of creating an adverse effect to cultural resources, all leases issued subsequent to October 5, 2004 would include the Cultural Resources and Tribal Consultation for Fluid Minerals Leasing stipulation described in Section 2.3. Site specific cultural resource surveys and appropriate mitigation measures are required as part of the GDP process after parcels are leased. Based on a Memorandum of Understanding (MOU) Concerning Communication and Cooperation between the Paiute Tribe, each of the five Bands that comprise the Tribe, and certain BLM offices (including Cedar City), the BLM will notify the Tribe of any actions that might be of interest or concern to them and consultation with SHPO will occur based on the protocol developed with that office.

The Paiute Tribe of Utah, the Hopi Tribe, Confederated Tribes of the Goshute Reservation, Kanosh Band of the Paiute Tribe, Skull Valley Goshute Tribe, and the Ute Tribe were contacted by letters sent on September 30, 2008, regarding proposals for geothermal leasing in the area (Appendix E).

3.2.4 Floodplains

Several of the lease parcels occur in areas that incorporate floodplains. The nominated parcels do not occur in areas previously mapped by HUD or FEMA.

3.2.5 Threatened, Endangered, and Candidate Animal Species

Under Section 7 of the ESA, the BLM is required to consult with the FWS on any proposed action which may affect federally-listed threatened or endangered species or species proposed for listing. Programmatic Section 7 consultation efforts covering a wide variety of actions associated with the current BLM land use plans in Utah was completed in 2006. Additionally, BLM personnel completed programmatic Section 7 consultation work culminating in a set of standard, species-specific lease notices for listed species that are to be attached to fluid mineral leases offered in Utah. These consultation efforts resulted in a memorandum dated December 16, 2004, concurring with the BLM determination that use of the species-specific lease notices on appropriate lease parcels would result in a "may affect, but not likely to adversely affect" determination for leasing actions involving federally-listed species in the state. Washington Office Instruction Memorandum No. 2002-174, Endangered Species Act (ESA) Section 7 Consultation, also directs that the BLM to attach this stipulation to all leases to protect threatened and endangered species. According to this stipulation, the BLM will not approve any ground-disturbing activity until obligations under applicable requirements of the ESA have been fulfilled, including completion of any required procedure for formal or informal conference or consultation. The ESA stipulation states:

"The lease area may now or hereafter contain plants, animals, or their habitats determined to be threatened, endangered, or other special status species. BLM may recommend modifications to exploration and development proposals to further its conservation and management objective to avoid BLM-approved activity that would contribute to a need to list such a species or their habitat. BLM may require modifications to or disapprove proposed activity that is likely to result in jeopardy to the continued existence of a proposed or listed threatened or endangered species or result in the destruction or adverse modification of a

designated or proposed critical habitat. BLM will not approve any ground-disturbing activity until it completes its obligations under applicable requirements of the ESA as amended, 16 United States Code (USC) 1531 et seq. including completion of any required procedure for conference or consultation.”

Although not all special status species are protected by the ESA, 43 CFR 3162.1(a) provides the BLM with broad authority to ensure compliance of lessees with orders of the authorized officer issued for the protection of the environment. Conservation measures associated with this consultation increase the likelihood that the BLM and by association, the lessee, will meet the standard of “may affect, but not likely to adversely affect” for ESA-listed species. It should be noted that BLM may be required to reinitiate Section 7 consultation at the project-level, as necessary, to ensure proper management of listed species in the future. ESA-listed wildlife species with the potential to occur in the planning area are the Utah prairie-dog (*Cynomys parvidens*), the yellow-billed cuckoo (*Coccyzus americanus*). There is limited habitat for these species in the planning area.

Utah prairie dog

The Utah prairie dog was federally-listed as endangered in 1973 (38 FR 14678) and down-listed to threatened in 1984 (49 FR 22330). In Utah, this species is currently found in Iron, Beaver, Garfield, Piute, Wayne, Sevier, Kane, Millard, and Sanpete Counties at elevations between 5,100 and 9,000 feet. Historically, Utah prairie dog colonies were found as far west as Pine and Buckskin Valleys in Beaver and Iron Counties, and may have occurred as far north as Nephi, Utah, southeast to Bryce Canyon National Park, east to the foothills of the Aquarius Plateau, and south to the northern borders of Kane and Washington Counties. A 50 percent range reduction was estimated from 1925 to 1975. Factors that resulted in the historical decline of Utah prairie dogs were poisoning, drought, habitat alteration – primarily in the form of cultivation to agricultural crops, shooting, and disease (72 FR 7843).

Utah prairie dogs are typically restricted to relatively open plant communities with short-stature vegetation such as alfalfa fields and feed on a variety of grasses and forbs. Utah prairie dogs generally begin breeding in March; the young are born in April and the juveniles appear aboveground in early to mid-May. Prairie dogs are among the most social of animals and live together in large groups called colonies or towns. Most colonies are located in well-drained soils and have numerous burrows with a network of entrances (UDWR 2008e).

There is no mapped Utah prairie dog habitat located within any of the nominated parcels, however, there is potential habitat within in the parcels.

Yellow-billed cuckoo

Yellow-billed cuckoo was listed as a candidate species in the western Continental United States on July 25, 2001 (66 FR 38611). The historic breeding range of yellow-billed cuckoo was from southern Canada to northern Mexico, west of the Continental Divide from southern British Columbia to northern Mexico. The species is now restricted to scattered blocks of riparian habitat from central California and southern Idaho south to Mexico. In Utah, cuckoos are found in a few scattered sites, mainly along the Green and Colorado Rivers (UDWR 2008f). Habitat for this species has been lost to agricultural and urban development, water diversions, dams, river channelization, floods, fire, livestock grazing, off-road vehicles and other recreational uses, and replacement of native riparian habitats with non-native plants, particularly salt cedar (UDWR 2008g).

Yellow-billed cuckoos use large tracts of riparian habitat (greater than 25 acres) dominated by mature cottonwoods with a dense understory of willows. The breeding season is late June to mid-July. Yellow-billed cuckoos use large tracts of riparian habitat (greater than 25 acres) dominated

by mature cottonwoods with a dense understory of willows, for nesting and foraging. This species prefers to nest in open woodlands with an understory of dense vegetation, often near streams, rivers or lakes. In the desert southwest, nesting habitat is consistently riparian woodlands, particularly those with an undamaged (i.e., ungrazed) understory, likely because of the lack of dense vegetation away from water. The breeding season is late June to mid-July. Yellow-billed cuckoo habitat has not been inventoried in the parcels at this time.

3.2.6 Fish and Wildlife including Special Status Species other than FWS Candidate or Listed Species (e.g. Migratory Birds)

General Wildlife and Game Species

The foothills and mountain slopes (14,845 acres of the nominated parcels) in the planning area contain vegetation (semiarid foothills and woodland- and shrub-covered low mountains) that provides habitat for a variety of wildlife species including the golden eagle, red-tailed hawk, gray flycatcher, juniper titmouse, scrub jay, pinyon jay, olive-sided and ash-throated flycatchers, mountain bluebird, green-tailed towhee, wild turkey, rainbow, cutthroat, and brown trout, mule deer, pronghorn antelope, and elk. Common species at higher elevations include the western and mountain bluebird, sharp-shinned and Cooper's hawks, golden eagle, Steller's jay, Clark's nutcracker, red-breasted nuthatch, three-toed woodpecker, mountain chickadee, wild turkey, mule deer, and elk. The higher elevation habitats represent a relatively small proportion of BLM-managed land but support a variety of species not commonly found in other areas of the nominated parcels; these areas function as important summer range for mule deer and elk and also are important to many migratory bird species.

The alluvial slopes and valley bottoms (176,713 acres of the nominated parcels) contain semi-desert and desert vegetation types (sagebrush basins and slopes, shadscale-dominated saline basins, and salt deserts) that provide habitat for a variety of wildlife species including the American kestrel, red-tailed hawk, loggerhead shrike, horned lark, Western meadowlark, sage thrasher, Brewer's sparrow, sage sparrow, black-throated sparrow, lark sparrow, sagebrush lizard, mule deer, pronghorn antelope, badger, coyote, black-tailed jackrabbit, and elk. Many reptile species can also be found in this vegetation type. This habitat type functions as critical habitat for wintering big game herds that are forced into the valleys during the winter months. Uplands provide critical thermal- and hiding cover, while the lower elevation areas provide the forage necessary to sustain the wintering herds. These areas are also important to many migratory non-game bird species.

Riparian/wetland areas provide important forage, water, shade, and cover for a variety of wildlife, including elk, mule deer, wild turkey, and many species of migratory birds. Riparian/wetland areas have been specifically identified on 472 acres in UT-GEO-48 (Fish Springs Wetland). UT-GEO-007 contains 1,671 acres of riparian areas bordering Clear Lake Waterfowl Management Area. Small areas consisting of springs are present in parcel UT-GEO-20. Approximately 9.6 acres of riparian habitat in the Newcastle Reservoir in UT-GEO-004 is used by mule deer and wild turkeys in winter as forage and cover, by nongame migratory birds and waterfowl as migration and nesting habitat, and by small mammals, lizards, and amphibians as year-long habitat. Big game species also use these areas extensively, especially during dry summer months. Riparian and wetlands are critical for many bird species because they provide food and resting areas during migration. Some of these areas provide fisheries habitat also. Even though not all of these areas have fisheries habitat, many areas have not been surveyed or inventoried thoroughly within the parcels. Also other riparian/wetland areas that have yet to be specifically identified may exist within other geothermal parcels and would be identified on a site specific basis at the time development is proposed.

Portions of the planning area contain crucial winter range for big game. UDWR defines crucial value as “habitat on which the local population of a wildlife species depends for survival because there are no alternative ranges or habitats available” and “...essential to the life history requirements of a wildlife species.” They further state that degradation or unavailability of crucial habitat will lead to declines in carrying capacity and/or numbers of wildlife species in question. UDWR defines substantial value as “habitat that is used by a wildlife species but is not crucial for population survival.”

Rocky Mountain elk are common in most mountainous regions of Utah. There are 217 acres of crucial value year-long habitat for elk (present in UT-GEO-03) and 1,656 acres of crucial winter value habitat (present in parcels UT-GEO-01, 09-13, FS-01 and FS-02). Elk could be present in any of the parcels throughout the year (Figure 6). They commonly use the area in the late summer, fall and winter months and retreat to higher elevations during the late spring and summer months until the high mountain ranges have too much snow. A few, smaller herds of elk spend the entire year on BLM lands using high desert habitats.

Mule deer are common throughout Utah in open deserts to high mountains to urban areas. Mule deer often migrate from high mountainous areas in the summer to lower elevations in the winter to avoid deep snow (Figure 7). The availability of mule deer habitat is presented in Table 4.

Table 4. Availability and location of mule deer habitat within the nominated parcels.

Habitat Type	Parcels within Habitat Type	Acres in Parcels
crucial winter	UT-GEO-01-04, 09-13, 19-21, 33, FS-01, FS-02	12,245
crucial summer	FS-01	344
crucial spring/fall	UT-GEO-33	68

Pronghorn antelope are common in Utah, where they primarily occur in desert, grassland, and sagebrush habitats. They are often found in small groups and are usually most active during the day. Crucial year-round pronghorn habitat is present on 146,102 acres located in parcels UT-GEO-01-03, 10-12, 14-27, and 29-53 (Figure 8).

Diversity of endemic plants – those that are unique to an area and are not naturally found elsewhere – is high in southeastern Utah and likely plays a role in fostering the endemism of other taxa such as bees (Griswold et al. 1997). Bees are important pollinators of native ecosystems. Many species of bees have specialized foraging habits and may restrict pollen collection to a single family or genus of plants. These species play an important role in pollinating endemic plants and localized desirable species of vegetation and could potentially be affected by the proposed action and alternatives.

Figure 6. Elk Habitat.

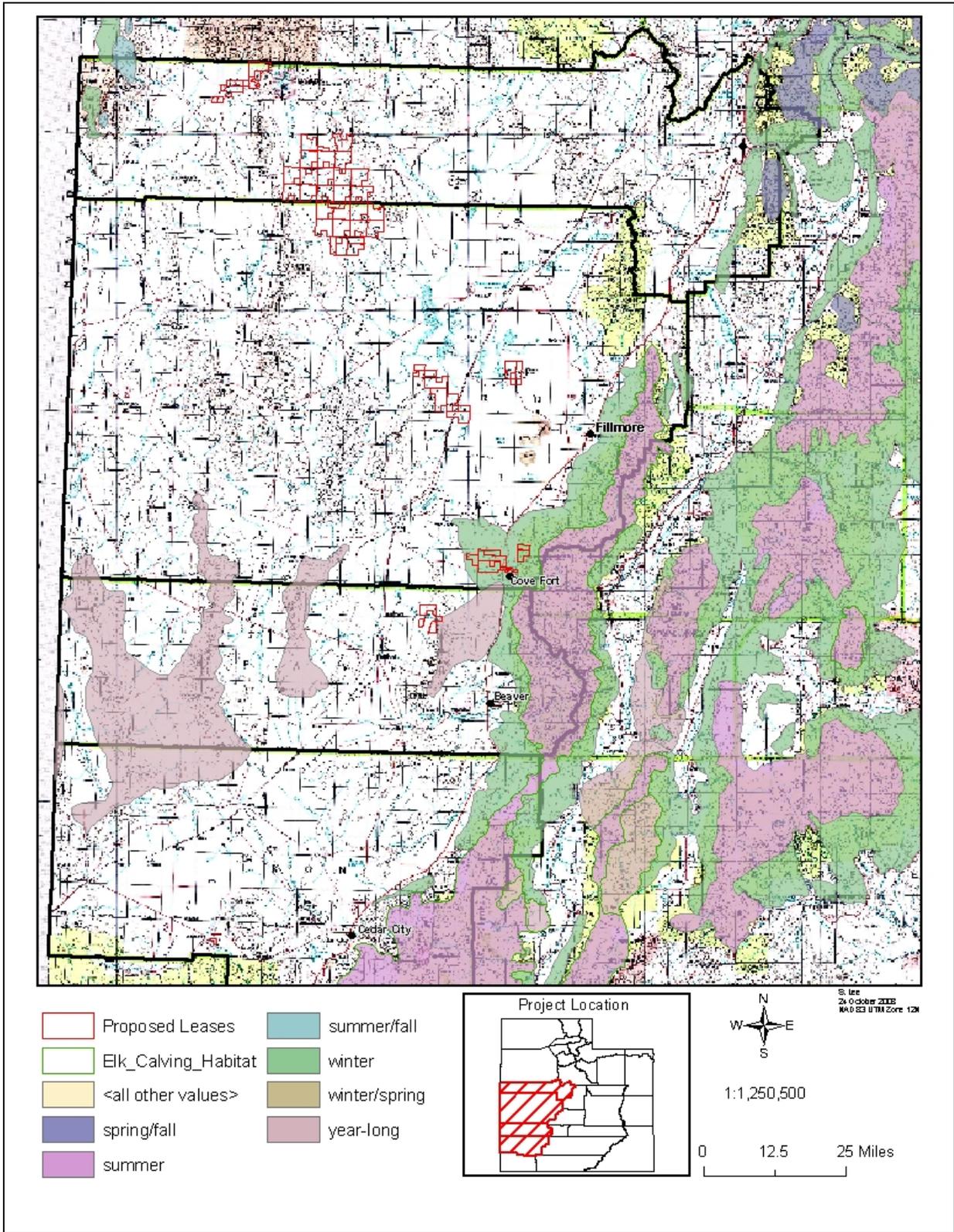


Figure 7. Mule Deer Habitat.

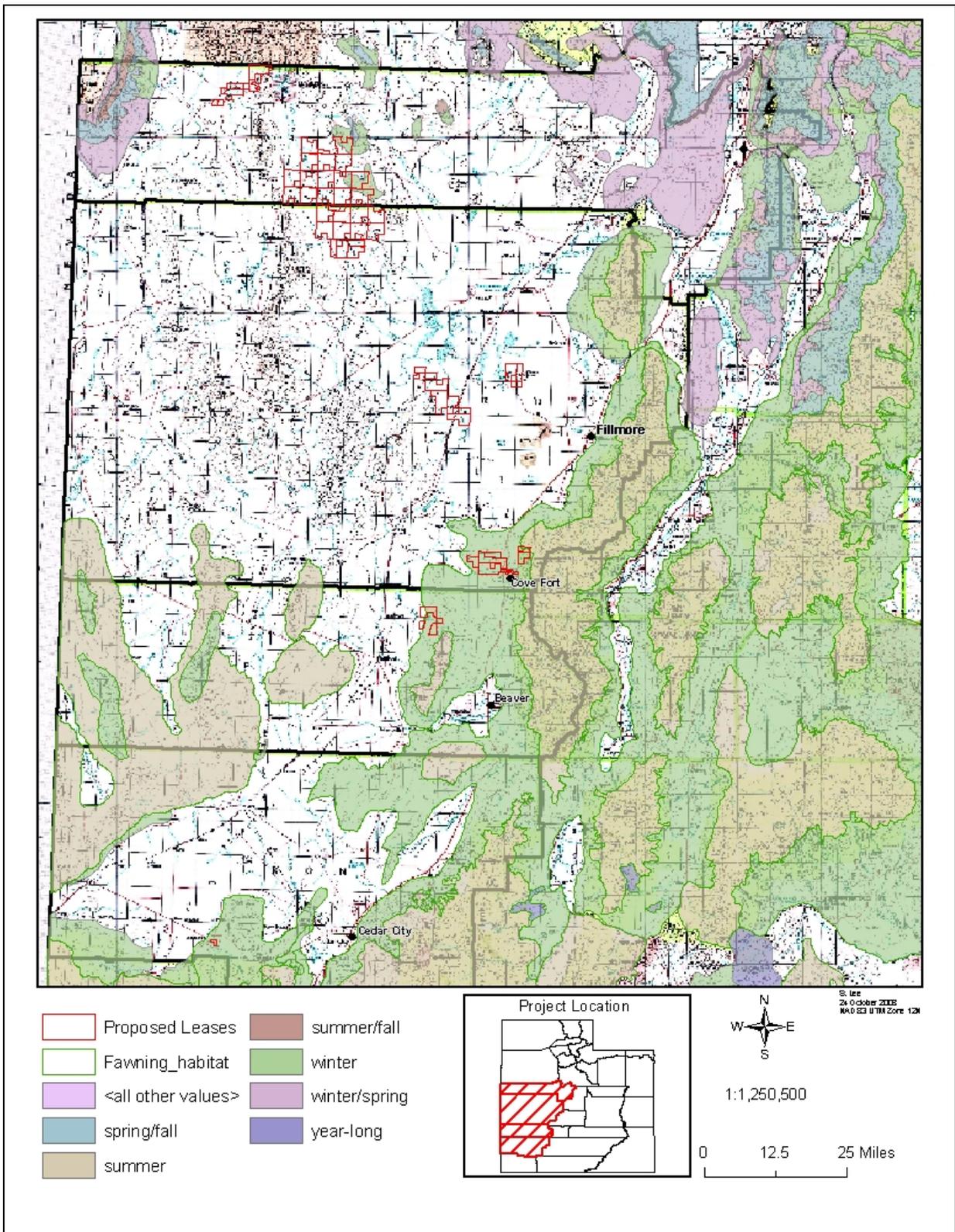
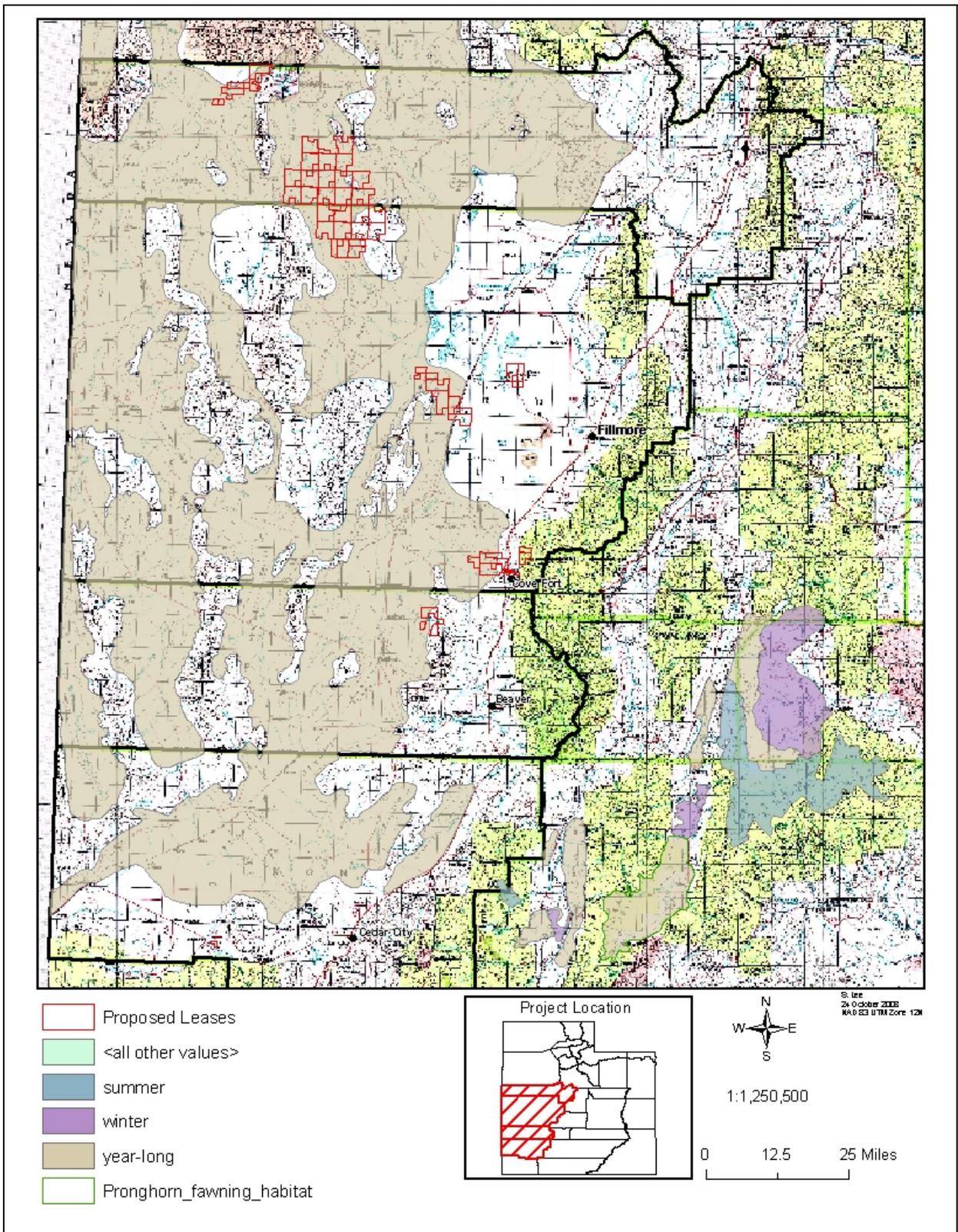


Figure 8. Pronghorn Habitat.



Sensitive Animal Species

BLM manages sensitive species, not federally-listed as threatened or endangered, in accordance with the *Special Status Species Management* policy (BLM 2001); included in this category are state-listed species and federal candidate species which receive no special protections under the ESA. The following 41 sensitive species were identified by the UDWR as occurring or potentially occurring within the nominated parcels: American white pelican (*Pelecanus erythrorhynchos*), Arizona toad (*Bufo micorscaphus*), bald eagle (*Haliaeetus leucocephalus*), bifid duct pyrg (*Pyrgulopsis peculiaris*), big free-tailed bat (*Nyctinomops macrotis*), black swift (*Cypseloides niger*), bobolink (*Dolichonyx oryzivorus*), Bonneville cutthroat trout (*Oncorhynchus clarkia utah*), Brian head mountainsnail (*Oreohelix parawanensis*), brown (grizzly) bear (*Ursus arctos*), burrowing owl (*Athene cunicularia*), cloaked physa (*Physa megalochlamys*), California floater (*Anodonta californiensis*), Columbia spotted frog (*Rana luteiventris*), common chuckwalla (*Sauromalus ater*), dark kangaroo mouse (*Microdipodops megacephalus*), Eureka mountainsnail (*Oreohelix eurekaensis*), ferruginous hawk (*Buteo regalis*), fringed myotis (*Myotis thysanodes*), grasshopper sparrow (*Ammodramus savannarum*), greater sage-grouse (*Centrocecus urophasianus*), Hamlin valley pyrg (*Pyrgulopsis hamlinensis*), kit fox (*Vulpes macrotis*), least chub (*Notichthys phlegethontis*), Lewis's woodpecker (*Melanerpes lewis*), long-billed curlew (*Numenius americanus*), longitudinal gland pyrg (*Pyrgulopsis anguina*), northern goshawk (*Accipiter gentilis*), pygmy rabbit (*Brachylagus idahoensis*), short-eared owl (*Asio flammeus*), southern leatherside chub (*Lepidomeda aliciae*), southwestern willow flycatcher (*Empidonax traillii extimus*), spotted bat (*Euderma maculatum*), spotted owl (*Strix occidentalis*), sub-globose snake pyrg (*Pyrgulopsis saxatilis*), three-toed woodpecker (*Picoides tridactylus*), Townsend's big-eared bat (*Corynorhinus townsendii*), Utah physa (*Physella utahensis*), Utah prairie-dog (*Cynomys parvidens*), western toad (*Bufo boreas*), and yellow-billed cuckoo (*Coccyzus americanus*). There is potential habitat for all of these species in the nominated parcels located in the FFO. Potential habitat in the CCFO is shown in Table 5. Brown (grizzly) bears have been extirpated from Juab, Millard, Iron, and Beaver Counties.

Table 5. Potential habitat presence for BLM sensitive species in each CCFO parcel.

Parcel	Riparian	Raptors	Mountain-snails	Bats	Grassland Species	Crucial game habitat	Wood-peckers	Sage Grouse	Pygmy Rabbit	Dark Kangaroo Mouse	Common Chuckwalla
GEO 002	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	No
GEO 003	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	No
GEO 004	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	No
FS 01	No	Yes	Yes	Yes	No	Yes	No	No	No	No	No
FS 02	No	Yes	Yes	Yes	No	Yes	No	No	No	No	No

Species protections, such as important seasonal timing restrictions and riparian buffers, are important in minimizing impacts to sensitive species. To comply with BLM policy 6840 for Utah BLM State Sensitive Species, lease notices would be attached to appropriate parcels when sensitive species or important, associated habitats are known or have the potential to occur within the immediate area. The sensitive wildlife species are briefly discussed below in the context of the habitat type in which they would occur.

Sagebrush Grasslands Habitat

Sagebrush grasslands comprise the primary habitat present within the nominated parcels. There are 178,312 acres of sagebrush grassland habitat located within the parcels (SGID_U500_DominantVegetation, 2001). Some sensitive species that use sagebrush grassland habitat in the nominated parcels are the bobolink, grasshopper sparrow, long-billed curlew, Utah prairie-dog, dark kangaroo mouse, and the kit fox.

Greater sage-grouse are upland game birds that are entirely dependent on sagebrush communities for all stages of their life cycle, with extensive areas of this habitat type required year-round. Crucial brood habitat (6,866 acres) is present in UT-GEO 01-03, 11, and 12. Sage-grouse have a high seasonal fidelity. The breeding season is mid-February to mid-May. Most nests are located under sagebrush plants and areas with 15 to 30 percent canopy cover. Riparian meadows, springs, and streams are also used, especially in dry years, as these areas produce the forbs and insects necessary for juvenile birds. Diverse plant communities with abundant insect populations are especially important to provide food for chicks. During winter, sage-grouse feed almost exclusively on sagebrush leaves and buds, so exposure above the snow is critical (UDWR 2002) (Figure 9).

Pygmy rabbits are found in northern and western Utah, where they prefer areas with tall, dense sagebrush and loose soils. Pygmy rabbit habitat includes tall, dense stands of big sagebrush that provide critical food and cover for the species. Horizontal obscenity in occupied habitat was observed to be greater and more divergent, moving from low to high readings indicative of an increased vegetative structure in the upper part of shrubs in more heavily occupied areas. Disturbance in these areas that reduce the height, density, or cover of sagebrush are likely to negatively affect pygmy rabbits and reduce available habitat in the short term. Although pygmy rabbits also use edge habitats, this use is restricted to the narrow band of sagebrush adjacent to big sagebrush (Flinders et al. 2008). Flinders et al. (2008) makes recommendations for preservation of existing pygmy rabbit habitat; the presence of pygmy rabbit burrows identifies the suitable soils, vegetation and slopes that best satisfy some of the critical habitat requirements of this species. Recommendations include: leaving long and wide swaths of undisturbed mature big sagebrush to reduce the amount of area within the treatment area that pygmy rabbits would avoid while maintaining corridors of connectivity between all residual stands of big sagebrush. Breeding occurs during the spring and early summer; females may produce a litter of approximately six young about thirty days after mating. Pygmy rabbits primarily eat sagebrush, but other vegetation is also consumed. Pygmy rabbit habitat is known to occur within the planning area and there is potential habitat throughout the parcels (UDWR 2008e).

Burrowing owl habitat includes open grasslands, especially prairie, plains and savannas and other open areas. Burrowing owls are potential summer-time residents in or near the parcels. The *Utah Field Office Guidelines for Raptor Protection from Human and Land Use Disturbances* (Romin and Muck 2002) identify March through August as the key nesting and reproduction period for this species, although individuals may remain into September before migrating. They typically nest and roost in burrows dug by mammals, specifically Utah prairie dog or ground squirrels. Burrowing owls spend much of their time on the ground or on low perches, such as fence posts or dirt mounds (UDWR 2008a).

Peregrine falcons still rare in Utah, it has become much more abundant throughout its range in recent years. The widespread use of the pesticide DDT in the 1940s, 1950s, and 1960s caused a drastic reduction in peregrine falcon numbers (and in the numbers of other raptor species) throughout North America. This species prefers to nest on cliffs or bluffs where it can create a nest site out of a shallow scrape. There is potential breeding habitat scattered throughout the project area. Pahvant Butte (a designated ACEC) is a historical peregrine falcon eyrie, and it has been identified by the UDWR as a reintroduction site for the species.

Raptors, including the bald eagle, golden eagle, ferruginous hawk, northern goshawk, short-eared owl, the spotted owl and other species which use similar habitat types but are not on the sensitive species list, are common in the nominated parcels. Although no longer protected under endangered species act (ESA), bald eagles remain protected under the Bald Eagle Protection Act of 1940 (16 USC 668-668d, 54 Stat. 250). Peregrine falcon habitat is located within the Pahvant Butte ACEC and is protected by the Category 3 restrictions placed on Pahvant Butte ACEC. A portion of (1,028 acres) of parcel UT-GEO-05 is within the Pahvant Butte ACEC.

Because of the variety of raptor species present in the planning area, all habitat types are used including fields, sagebrush steppe, and pinyon pine-juniper woodlands. Nesting tends to be concentrated around cliffs, large trees, embankments, and other habitat features. The FWS has developed the *Utah Field Office Guidelines for Raptor Protection from Human and Land Use Disturbances* (Romin and Muck 2002) which outlines appropriate guidelines for spatial and seasonal buffers to protect nesting raptors.

Forested Woodland Habitat

There is a variety of forested woodland habitat located in the nominated parcels. The majority (13,359 acres) of this habitat in the nominated parcels is Utah juniper habitat.

There are four BLM-sensitive bat and four bird species with the potential to occur in forested/woodland habitat in the planning area. The bat species – big free-tailed bat, Townsend's big-eared bat, spotted bat, and fringed myotis – occur in a wide variety of habitats ranging from the forested/woodland to desert habitat, but rely heavily on areas with caves, mines, rock crevices, and buildings where they can roost. These species occur most prevalently around areas with riparian or open water habitat close by that provides foraging habitat. These habitat types occur primarily along the eastern boundary of the nominated parcels.

The Lewis's woodpecker and three-toed woodpecker occur in areas containing Engelmann spruce, sub-alpine fir, Douglas fir, grand fir, ponderosa pine, tamarack, aspen and lodgepole pine forests. The northern goshawk inhabits mature mountain forests and riparian zones. These habitat types occur primarily along the mountainous areas on the eastern extents of the nominated parcels. Northern goshawks also winter in pinyon pine and juniper habitats throughout the nominated parcels. Black swifts inhabit mountain riparian areas, often mixed-conifer forests. Nest sited typically incorporate water, cliffs, darkness, and ledges or cracks.

Riparian Areas/Flowing Streams and Open Water Shorelines

Species that occur within riparian and wetland habitat include the Arizona toad, American white pelican, bifid duct pyrg, California floater, cloaked physa, Columbia spotted frog, Hamlin Valley pyrg, longitudinal gland pyrg, sub-globose snake pyrg, Utah physa, Western toad, southwestern willow flycatcher, black swift, and the yellow-billed cuckoo. Fish species include the Bonneville cutthroat trout, least chub, and the southern leatherside chub. Please see previous section on riparian and wetland areas for a description of wetlands in the nominated parcels.

Non-game, Migratory Birds

The guidelines set forth in WO IM 2008-050, Migratory Bird Treaty Act – Interim Management Guidelines are followed for all NEPA procedures. As per this WO IM, an MOU will be developed between the USFWS and BLM as to the long term management of Migratory Birds. In the interim, management efforts would adhere to the guidance contained in the WO IM which provides project level NEPA and planning level guidance. The Migratory Bird Treaty Act of 1918 protects migratory birds and their parts. Executive Order 13186 (Responsibilities of federal agencies to Protect Migratory Birds), signed on January 10, 2001, directs federal agencies to evaluate the effects of actions and agency plans on migratory birds, with emphasis on species of

concern. *Birds of Conservation Concern* (FWS 2002) identifies the migratory bird species of concern in different Bird Conservation Regions (BCRs) in the United States. The planning area encompasses a portion of 2 separate BCRs – BCR 9 (Great Basin) and BCR 16 (Southern Rockies/Colorado Plateau) with I-15 being the boundary between these two BCRs. Species lists for both of these regions have been reviewed; the potential exists for at least 39 migratory bird species, currently designated as species of concern, to occur within the nominated parcels, primarily between April and September. The *Utah Partners in Flight Avian Conservation Strategy* (Parrish et al. 2002) identified 24 priority species (Table 6); there is potential for habitat for all of these in the nominated parcels. Migratory birds occur in a wide variety of habitat types including pinyon-juniper woodland, sagebrush-steppe, and grasslands found in the nominated parcels.

Table 6. Utah Partners in Flight priority species (Parrish et al. 2002).

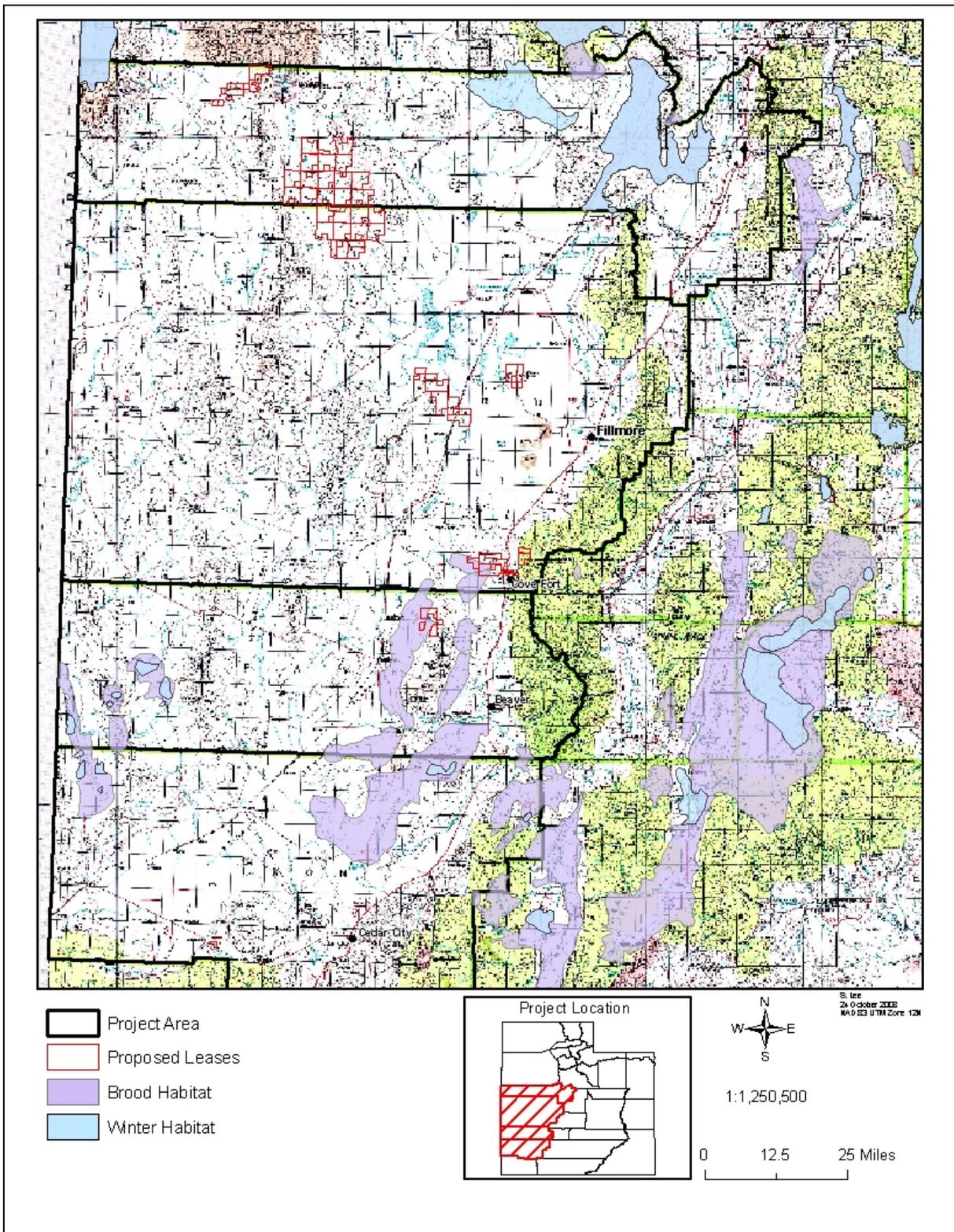
Priority Species	Breeding Habitat	Wintering Habitat
Lewis's Woodpecker	Ponderosa Pine, Lowland Riparian	Oak
Albert's Towhee	Lowland Riparian	Lowland Riparian
American Avocet	Wetland, Playa	Migrant
Mountain Plover	High Desert Scrub	Migrant
Lucy's Warbler	Lowland Riparian, Low Desert Scrub	Migrant
Sage-grouse	Shrubsteppe	Shrubsteppe
American White Pelican	Water, Wetland	Migrant
Bobolink	Wet Meadow, Agriculture	Migrant
Virginia's Warbler	Oak, Pinyon-Juniper	Migrant
Gray Vireo	Pinyon-Juniper, Oak	Migrant
Bell's Vireo	Lowland Riparian	Migrant
Black Rosy-Finch	Alpine	Grassland
Long-billed Curlew	Grassland, Agriculture	Migrant
Sharp-tailed Grouse	Shrubsteppe, Grassland	Shrubsteppe
Brewer's Sparrow	Shrubsteppe, High Desert Scrub	Migrant
Black Swift	Lowland Riparian, Cliff	Migrant
Black-necked Stilt	Wetland, Playa	Migrant
Broad-tailed Hummingbird	Lowland Riparian, Mountain Riparian	Migrant
Ferruginous Hawk	Pinyon-Juniper, Shrubsteppe	Grassland
Yellow-billed Cuckoo	Lowland Riparian, Agriculture	Migrant
Black-throated Gray Warbler	Pinyon-Juniper, Mountain Shrub	Migrant
Three-toed Woodpecker	Sub-Alpine Conifer, Lodgepole Pine	Sub-Alpine Conifer
Sage Sparrow	Shrubsteppe, High Desert Scrub	Low Desert Scrub
Gambel's Quail	Low Desert Scrub, Lowland Riparian	Low Desert Scrub

Management Indicator Species (Fishlake National Forest)

Management indicator species (MIS) are species identified at the forest planning level that could indicate changes in forest habitats resulting from management actions. MIS would apply only to the parcel located within the National Forest. MIS that were identified for the FLNF include elk, mule deer, northern goshawk, cavity nesters, riparian dependent guild species, sage nesters, Bonneville cutthroat trout, resident trout, and macroinvertebrates (Table 7).

Rydberg's milkvetch was included as an MIS because it was listed as a threatened species when the Forest Plan was signed in 1986. In 1989, 13 populations of Rydberg's milkvetch had been found with over 300,000 individuals estimated. On September 14, 1989, Rydberg's milkvetch was de-listed by the FWS (Rodriguez 2006).

Figure 9. Greater Sage-Grouse Habitat.



Information regarding MIS trend, life history, suitable habitats, threats, and ecology can be found in *Life History and Analysis of Endangered, Threatened, Candidate, Sensitive, and Management Indicator Species of the Fishlake National Forest* (Rodriguez 2006). It contains all of the summarized population trend and monitoring information for Fishlake MIS. Population trend is addressed by Rodriguez (2006) at the FLNF level. As outlined in that document, individual species have been chosen to represent sage nesters, cavity nesters, and riparian dependent guild on the FLNF (Table 7). These species include Brewer's sparrow and vesper sparrow (Sage Nesters); hairy woodpecker, western bluebird, and mountain bluebird (Cavity Nesters); Lincoln sparrow, yellow warbler, and song sparrow (Riparian Dependent Guild).

Table 7. Management Indicator Species identified for the Fishlake National Forest.

USFS Management Indicator Species	Suitable Habitat w/in FS parcels	Basic Habitat Description
Mule Deer	Yes	Open prairie to dense coniferous generalist
Rocky Mountain Elk	Yes	Open prairie to dense coniferous generalist
Northern Goshawk	Yes	Mature forest generalist
Cavity Nesters (Hairy Woodpecker, Western and Mountain Bluebirds)	No	Deciduous or mixed conifer forested habitats mixed with riparian habitats
Sage Nesters (Sage Thrasher, and Brewer's and Vesper Sparrow)	Yes	Sagebrush to pinyon-juniper habitats
Riparian Nesters (Lincoln's and Song Sparrow, and Yellow and MacGillivray's Warbler)	No	Riparian vegetation (willows, alders, and other species)
Bonneville Cutthroat Trout	No	Perennial, cool, clean water sources with limited fine sediments, and abundant prey
Resident Trout (Rainbow, Brown, Brook, Cutthroat, and Lake)	No	Perennial, cool, clean water sources with limited fine sediments, and abundant prey

Mule Deer and Rocky Mountain Elk

Crucial habitat for mule deer and Rocky Mountain elk is present in both forest service parcels. See General Wildlife and Game Species section.

Northern Goshawk

This species is treated as a BLM Sensitive Species as well as a MIS. It is discussed under the Sensitive Species section.

Sage Nesters (Brewer's Sparrow, Vesper Sparrow, and Sage Thrasher)

Most of the nominated parcels are pinyon-juniper habitat, which would likely provide suitable nesting and foraging habitat for these species, because they do not rely on open water sources and feed primarily on insects and seeds. As the entire area in the nominated parcels is grazed on an annual basis, nest success may be lower than on ungrazed areas of similar habitat quality (Rodriguez, 2006).

3.2.7 Vegetation including Special Status Plant Species other than FWS candidate or listed species

There are 16 plants that are designated as BLM Sensitive Species in the FFO (*Astragalus uncialis*, *Atriplex canescens gigantea*, *Cryptantha compacta*, *Cymopterus acaulis parvus*, *Epilobium nevadense*, *Eriogonum nummularum ammophilum*, *Hackelia ibapensis*, *Haplopappus crispus*, *Jamesia tetrapetala*, *Penstemon angustifolius dulcis*, *Potentilla cottamii*, *Primula cusickiana domensis*, *Sphaeralcea caespitosa caespitosa*, *Swertia gypsicola*, *Townsendia jonesii lutea*, and *Trifolium friscanum*). There are known occurrences of two different BLM Sensitive Plant Species on three different offered parcels. For the majority of the geothermal lease parcels that are being offered, however, there are no known special status plant species on BLM lands. *Eriogonum nummularum* var. *ammophilum* (sand-loving buckwheat) has been found in parcels UT-GEO-44 & 45. *Sphaeralcea caespitosa* var. *caespitosa* (Jones globemallow) has been found in parcel number UT-GEO-14. The spatial distributions of the two species on these three parcels are quite sparse. Surface occupancy for these three parcels would be restricted from locations where these two plant species are found to occur. The occurrence of the other BLM Sensitive Species is unknown and a plant survey would be necessary before exploration or development activities occurred. There are no known plants on the CCFO parcels or the FLNF parcels.

3.2.8 Invasive, Non-native Species

The State of Utah has 18 listed noxious weed species (Bermuda grass, Johnson grass, medusahead, quackgrass, field bindweed, hoary cress, diffuse knapweed, Russian knapweed, spotted knapweed, squarrose knapweed, purple loosestrife, perennial pepperweed, leafy spurge, yellow starthistle, Canada thistle, musk thistle, scotch thistle, and Dyer's woad).

In Millard County the following species have been identified and documented; whitetop also known as hoary cress (*Cardaria draba*), squarrose knapweed (*Centaurea virgata*), Russian knapweed (*Centaurea repens*), scotch thistle (*Onopordum acanthium*), musk thistle (*Carduus nutans*), perennial pepperweed (*Lepidium latifolium*), spotted knapweed (*Centaurea maculosa*), and purple loosestrife (*Lythrum salicaria*).

In Juab County the following species have been identified and documented: whitetop also known as hoary cress, squarrose knapweed, Russian knapweed, scotch thistle, musk thistle, leafy spurge (*Euphorbia esula*), perennial pepperweed (*Lepidium latifolium*), spotted knapweed (*Centaurea maculosa*), purple loosestrife (*Lythrum salicaria*), and dalmation toadflax (*Linaria genistifolia* spp. *dalmatica*).

The following species have not been documented within Juab or Millard counties; however they are a concern due to infestations in surrounding areas: black henbane (*Hyoscyamus niger*), camelthorn (*Alhagi pseudalhagi*), yellow starthistle (*Centaurea solstitialis*), diffuse knapweed (*centaurea diffusa*), and poison hemlock (*Conium maculatum*).

In the CCFO parcels, the only noxious weed is musk thistle which is present on parcel UT-GEO-003 parcel. Parcels UT-GEO-002 and UT GEO-004 do not have any known noxious weeds. Salt cedar, scotch thistle and field bindweed are present within ½ mile of UT-GEO-004, and all three parcels are highly susceptible to scotch thistle invasion in disturbed situations.

Two noxious species, scotch thistle and hoary cress, are present on the FLNF parcels (FS-01 and FS-02).

Both federal agencies employ a weed control program. The BLM currently treats invasive and noxious weeds using methods and practices approved in the 2007 *Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement* (BLM 2007a). Weeds are treated through cooperative

agreements between the counties and other local agencies within a Cooperative Weed Management Area (CWMA). Methods of weed control include manual, mechanical, biological, prescribed burning, and chemical treatments. The Fishlake National Forest has a noxious weed management program which provides for site-specific treatment of weeds. The *Fishlake National Forest Environmental Assessment for Noxious Weed Management* (USDA Forest Service 2003) is tiered to the *Intermountain Region Noxious Weed and Poisonous Plant Control Program Final Environmental Impact Statement* (USDA Forest Service 1988).

Aquatic invasive species (Eurasian milfoil, chytrid fungus, New Zealand mudsnail, quagga mussels, and whirling disease parasite) pose an ever-increasing threat to the health of ecosystems in the U.S. and some of these species are known to occur in southwestern Utah or the surrounding region. However, none of these species are known to occur in the nominated parcels.

3.2.9 Water Quality

The nominated parcels are located within the Great Basin hydrological region and contain no perennial streams, but there are several intermittent streams, ephemeral washes, and shorelines. Cove Creek is the major drainage feature in the area, which originates in the canyons between the Pahvant and Tushar mountain ranges. Water quality tests show that well water is suitable for human use. Ground water quality is generally good in areas of natural recharge. In areas of natural discharge, ground waters are slightly saline and generally suitable for only livestock use. There have been no non-point source water pollution areas identified under Section 208 of the Federal Water Pollution Control Act within any of the parcels.

3.2.10 Wetlands/Riparian Zones

Wetlands and riparian areas have been identified in parcels UT-GEO-007, UT-GEO-20, and UT-GEO-48. UT-GEO-007 contains 1671 acres of riparian areas bordering Clear Lake Waterfowl Management Area. Springs are present in parcel UT-GEO-20 covering a few acres, while 472 acres of Fish Springs' riparian areas located within UT-GEO-48. All of these areas are in proper functioning condition. A 9.6-acre portion of Newcastle Reservoir is present in UT-GEO-004. The BLM does not manage Newcastle Reservoir and no information is available to determine the condition of the reservoir. Other wetlands and riparian areas have not been identified within the parcels and will need to be on a site by site basis.

3.2.11 Wilderness/Wilderness Study Areas

There are no designated wilderness areas or wilderness study areas (WSAs) located within any of the leasing parcels; however, two parcels are contiguous to WSAs. Parcel UT-GEO-49 is contiguous with the Fish Springs WSA and parcel UT-GEO-46 is contiguous to Swasey Mountain WSA.

3.2.12 Rangeland Health Standards and Guidelines

All grazing areas within the leasing parcels on BLM lands must meet the proper functioning condition for grazing management outlined in the *Standards for Rangeland Health and Guidelines for Grazing Management* (BLM 1997). The *Utah Riparian Management Policy* outlines proper functioning conditions for riparian areas; these conditions must be met for livestock grazing to occur. Livestock grazing is allowable on a total of 142,255 acres of land within the parcels (132,742 in FFO; 6,465 in the CCFO; and 3,048 in FLNF).

In February 2002, the FLNF Forest Supervisor issued a decision to amend the Forest Plan with revised forage utilization criteria. By incorporating the revised criteria into Part 3 of the Term Grazing Permits, the new criteria implemented a maximum allowable use on uplands of 40-60 percent, varying by grazing system. The new standards emphasize residual stubble height criteria on hydric species in riparian areas of utilization to a stubble height of 4 inches triggering the time

to end seasonal grazing in that unit. Historic forage use levels allowed by the Forest Plan were 50%-60% of key forage species grazed under deferred-rotation systems and 70%-80% of key species grazed under rest-rotation systems. Management goals for the Fishlake National Forest range function are listed on page IV-4 and pages IV-21 through IV-24 of the Forest Plan. These goals are summarized below:

1. Provide livestock grazing consistent with range capacity and other uses to sustain wildlife populations and the local dependent livestock industry.
2. Maintain rangelands being used by livestock in at least fair condition with stable or upward trend through the use of proper management and restoration measures.
3. Encourage permittees to assume greater responsibility and latitude in managing permitted grazing use.
4. Manage livestock and wild herbivore forage use by implementing proper use guides.
5. Assure maintenance of range structural and non-structural improvements and promote permittee investment in new structural improvements.
6. Control noxious weed infestations.

3.2.13 Livestock Grazing

Livestock grazing is allowable on a total of 142,255 acres of land within the parcels (132,742 in FFO; 6,465 in the CCFO; and 3,048 in FLNF). The average grazing capacity on BLM-administered lands is 20 acres/Animal Unit Month (AUM) and 8 acres/AUM on USFS-administered lands. There are 21 allotments which contain lease parcels on BLM-administered land and one allotment which contains lease parcels on USFS-administered land (Table 8).

Table 8. Grazing allotments located within the nominated parcels.

Allotment	Lease Parcels within the Allotment	Acres In Parcels	Permittees
Hanson ¹	UT-GEO-002, 003	2,258	2
Milford Bench ¹	UT-GEO-003	141	2
Mineral Range ¹	UT-GEO-002, 003	3,504	5
Knell ¹	UT-GEO-004	144	1
Reservoir ¹	UT-GEO-004	418	1
Swasey Knoll ²	UT-GEO-19-24, 26, 36, 39-47	43,335	1
Spor Mountain ²	UT-GEO-21, 23, 33-38, 44-45	27,237	1
Lady Laird	UT-GEO-19, 20, 25, 26, 28, 36	11,322	1
Little Drum ²	UT-GEO-25-32, 39, 43	27,052	1
Tatow ²	UT-GEO-32, 41-43	9,277	1
East Fish Springs ²	UT-GEO-45	870	3
Boyd Station ²	UT-GEO-49-53	7,097	1
Deseret ²	UT-GEO-005, 006, 14-18	20,779	14
Seely ²	UT-GEO-14, 15, 17, 18	6,225	1
Twin Peaks ²	UT-GEO-001, 10-13, 15	13,095	1
Stott-Rowley ²	UT-GEO-006	570	1
Holden Winter ²	UT-GEO-005	798	7
East Antelope Point ²	UT-GEO-12	1786	1
Sand Pass ²	UT-GEO-45, 46	4,406	1

Allotment	Lease Parcels within the Allotment	Acres In Parcels	Permittees
Antelope ²	UT-GEO-31, 32	1, 598	3
Grass Creek ³	FS-01, 02	3,048	3

¹Cedar City Field Office; ²Fillmore Field Office; and ³Fishlake National Forest

All allotments have a variety of range improvement projects (i.e. reservoirs, fences, wells, etc.) to facilitate livestock management. The allotments within the lease parcels within the FFO include the following range improvements: 85.25 miles of fence, 3.65 miles of pipeline, 11 wells, 7 reservoirs, 2 watering troughs, and 1 corral. The majority of the range improvements in the CCFO are fences. There are 3.5 miles of fence on the FLNF parcels. All improvements are maintained by the permittees on both BLM and USFS-administered land, with the exception of major water projects that are maintained by the BLM.

3.2.14 Visual Resources

Public lands have a variety of visual (scenic) values that warrant different levels of management. Visual Resource Management (VRM) on public lands is conducted in accordance with BLM Handbook 8410 and BLM Manual 8411. The BLM uses the VRM system to identify and evaluate scenic values to determine the appropriate level of scenery management. These management classes regulate the amount of change to landscape features such as shape, line, color and texture that is allowed to occur within a given area – Class I areas are managed to preserve the existing character of the landscape; Class II areas are managed to retain the existing character of the landscape, with a low level of landscape change; Class III areas are managed to partially retain the existing character of the landscape, with only moderate change to the landscape; and Class IV areas are managed to allow major modifications to the existing character of the landscape, and the level of change can be high. The lease parcels contain VRM Class II (503 acres), III (4,425 acres), and IV (187,400 acres) areas (Table 9, Figure 3). There are no VRM Class I areas located within the parcels.

The US Forest Service uses the Scenic Integrity Objective (SIO) system to categorize scenic value and determine the appropriate level of management (USDA Forest Service 1995). Scenic Integrity is the state of naturalness or, conversely, the state of disturbance created by human activities or alteration. The sale parcels in the FLNF have been designated high and moderate SIO. In areas designated as moderate SIO, human elements can't dominate the landscape and in areas designated as high SIO, human elements should not be evident in the landscape. The lease parcels contain 1,724 acres of land designated as SOI moderate, and 1,317 acres of land designated as high SOI (Table 9, Figure 10).

Table 9. VRM and SIO classes located within lease parcels.

BLM Visual Resource Management		
Class	Lease Parcels within VRM Class	Acres in Parcels
I	-	0
II	UT-GEO-003, 49	503
III	UT-GEO-002, 003, 005, 12, 13, 19, 20, 21, 36	4,425
IV	UT-GEO-001-53	187,400
USFS Scenic Integrity Objective		
Class	Lease Parcels within VRM Class	Acres in Parcels
Low	-	0
Moderate	FS-01, FS-02	1,724
High	FS-01, FS-02	1,317

Maintaining visual quality is important in central Utah because major travel corridors occur near a variety of natural and scenic resources including the Cedar Breaks National Monument, Zion National Park, Ashdown Gorge Wilderness, Pine Valley Mountains Wilderness, and the Markagunt High Plateau Scenic Byway (Utah Highway 14). The Mineral Mountains, Circleville Canyon, and several areas along the Parowan Front are still in their natural state and also present a valuable visual resource for the area. These areas receive various amounts of use; some are visible from major roads. They may be managed according to VRM Class II objectives, and are therefore of special concern.

3.2.15 Geology and Mineral Resources

The parcels are located in the Basin and Range Physiographic Province in western Utah. This area is characterized by roughly north-south trending mountain ranges separated by broad, relatively flat, valleys. The valleys have a cover of Quaternary and Tertiary sediments except in local areas where Cenozoic extrusive igneous rocks are present (Mabey and Budding 1987). Mountain ranges adjacent to the valleys generally consist of sedimentary and metamorphic rocks of Precambrian through Mesozoic age and Upper Tertiary and Quaternary intrusive and extrusive igneous rocks. Similar rocks are assumed to underlie the valleys (Mabey and Budding 1987).

In the Cretaceous Period large sheets were thrust eastward for distances of as much as 100 km during the Sevier Orogeny (Mabey and Budding 1987). The leading edges of the sheets were folded, uplifted and eroded resulting in the eastward deposition of debris from the advancing sheets. The onset of Basin and Range extensional faulting in early Miocene time reflected a major change in the stress field affecting western Utah as compressive tectonism gave way to extension resulting in the block faulted mountains and intervening basins that characterize the region's topography today.

Surface geological features that may indicate the potential existence of geothermal resources include Tertiary and Quaternary volcanic rocks, Quaternary faults, active hot springs, recent hot spring deposits, evidence of recent seismic activity, steam, hydrothermal alteration of alluvium and other indications of higher than normal heat flow. These features, in various combinations, are common in southwestern Utah and are especially obvious in the "Sevier thermal area" which lies a short distance southeast of most of the parcels of interest here.

Interest in potential geothermal resources in Utah peaked in the 1970s and early 1980s. At the beginning of that time the Conservation Division of the United States Geological Survey (USGS) was responsible for classifying mineral lands and the Geothermal Steam Act of 1970 defined leasing procedures for federal lands. Based largely on surface geological features certain lands were classified as Prospectively Valuable (PV) for geothermal resources. Most of the lease parcels are located within or adjacent to the Fish Springs, Sevier Desert, Neels Siding and Escalante Desert PV areas.

All of the parcels are located in an area where evidence of geothermal activity is abundant. Little site specific quantitative information is available to predict the potential for occurrence of geothermal resources on the proposed lease parcels. Several parcels are within or near areas that have previously been classified as PV by the USGS based on the observed occurrence of geological features suggesting the presence of thermal fluids. Parcels UT-GEO-48 through UT-GEO-53 are in the Fish Springs PV area where elevated water temperatures have been observed in springs.

Parcels UT-GEO-19 through UT-GEO-47 are located at the southeast corner of Fish Springs PV area and extend to within one mile of the Sevier Desert PV area to the southeast. Two areas with gradients greater than 10 degrees F/100 feet were identified. Parcels UT-GEO-005 through UT-GEO-008 and UT-GEO-14 through UT-GEO-18 are located within or near the Neels Siding PV

area. The PV classification is based on a railroad well drilled in 1906 which encountered “hot” water at depths of 1,382 and 1,974 feet (Goode, 1978, p. 127). Other parcels are located adjacent to the Roosevelt Hot Springs (UT-GEO-002 and 003) and Cove Fort-Sulphurdale (FS- 01 and 02, UT-GEO-001 and UT-GEO-009 through UT-GEO-13) geothermal power plants. Parcel UT-GEO-004 is located in the Newcastle Geothermal area where warm water has been used directly to heat greenhouses and other public and private structures.

3.2.16 Lands/Access

The proposed project involves 191,911 acres in 53 parcels of BLM-administered surface and minerals and 3,048 acres in two Forest Service-administered parcels in Beaver, Iron, Juab, and Millard Counties. There are 57 miles of major road right-of-ways (ROW) within the lease parcels. The Interstate-15 ROW cuts through parcels UT-GEO-11 and UT-GEO-13 for two miles. The I-15 ROW is subject to below the ground surface uses only. Highway 257 cuts through parcel UT-GEO-15 for one mile. The remaining ROWs are smaller county roads.

There are two private land in-holdings. One is located within parcels UT-GEO-11 and UT-GEO-12, and the other is located within parcel UT-GEO-007. There are small access roads to these in-holdings.

Rights-of-way on the potentially affected tracts of BLM administered surface include, but are not limited to, electrical transmission lines, highways, county-maintained roads, BLM maintained roads, other existing roads, private roads, and telephone lines. Access to BLM-administered land is available on existing roads and is minimal in some areas. Additional access roads would need to be negotiated by the prospective lessees with respective landowners for each project which arises from this EA.

The rights-of-way in the nominated parcels all constitute significant investment of time and money as well as being an important part of the infrastructure.

3.2.17 Social and Economic Conditions

Social, economic, and general demographic characteristics of Beaver, Iron, Juab, and Millard Counties are displayed in Table 10 (U.S. Census Bureau Census 2000).

Between 1990 and 2000 the population in the four counties that make up the FFO and CCFO increased from 42,407 to 60,427 (representing an increase of 70%). The regional economy has shifted to one accommodating tourism, manufacturing, and natural resource management in recent years; government and government enterprises, retail trade, and services are the three main sectors of the economy. Bryce Canyon National Park, Cedar Breaks National Monument, and other attractions in the area provide visitor expenditures that contribute substantially to employment and economic activity in these counties.

The Energy Reform Act of 2005 established payment of all bonuses, rent and royalties in the following manner: 50% to the state; 25% to the county; and the remaining 25% in a direct receipt federal fund to utilize solely on geothermal projects. The national average bonus bid is \$287/acre.

Economic benefits, including property taxes and jobs, have accrued to the state and Beaver County from geothermal energy development. Utah Power, a PacifiCorp company that merged with Scottish Power in 1999, has operated the single-flash, Blundell geothermal power station at the Roosevelt Hot Springs geothermal area near Milford in Beaver County since 1984. At Sulphurdale in Beaver County in 1985, Mother Earth Industries, in cooperation with the city of Provo, installed a geothermal binary-cycle power system and a steam-turbine generator. In 1990, Provo and the Utah Municipal Power Agency dedicated the Bonnett geothermal power plant, which became the third geothermal power facility to go on-line at Sulphurdale to provide electricity for Provo. In 2003, Recurrent Resources acquired the Sulphurdale geothermal

properties and shut down the plant in 2005. In 2006, ENEL Cove Fort, LLC acquired the Sulfurdale properties and plans to reconstruct the facility, eventually building a 30 to 40 megawatt binary power plant. A geothermal plant operated by Razor Technology is located at Thermo Hot Springs in Beaver County. Another plant is planned to be built in that geothermal field.

Figure 10. VRM and SIO values within lease parcels.

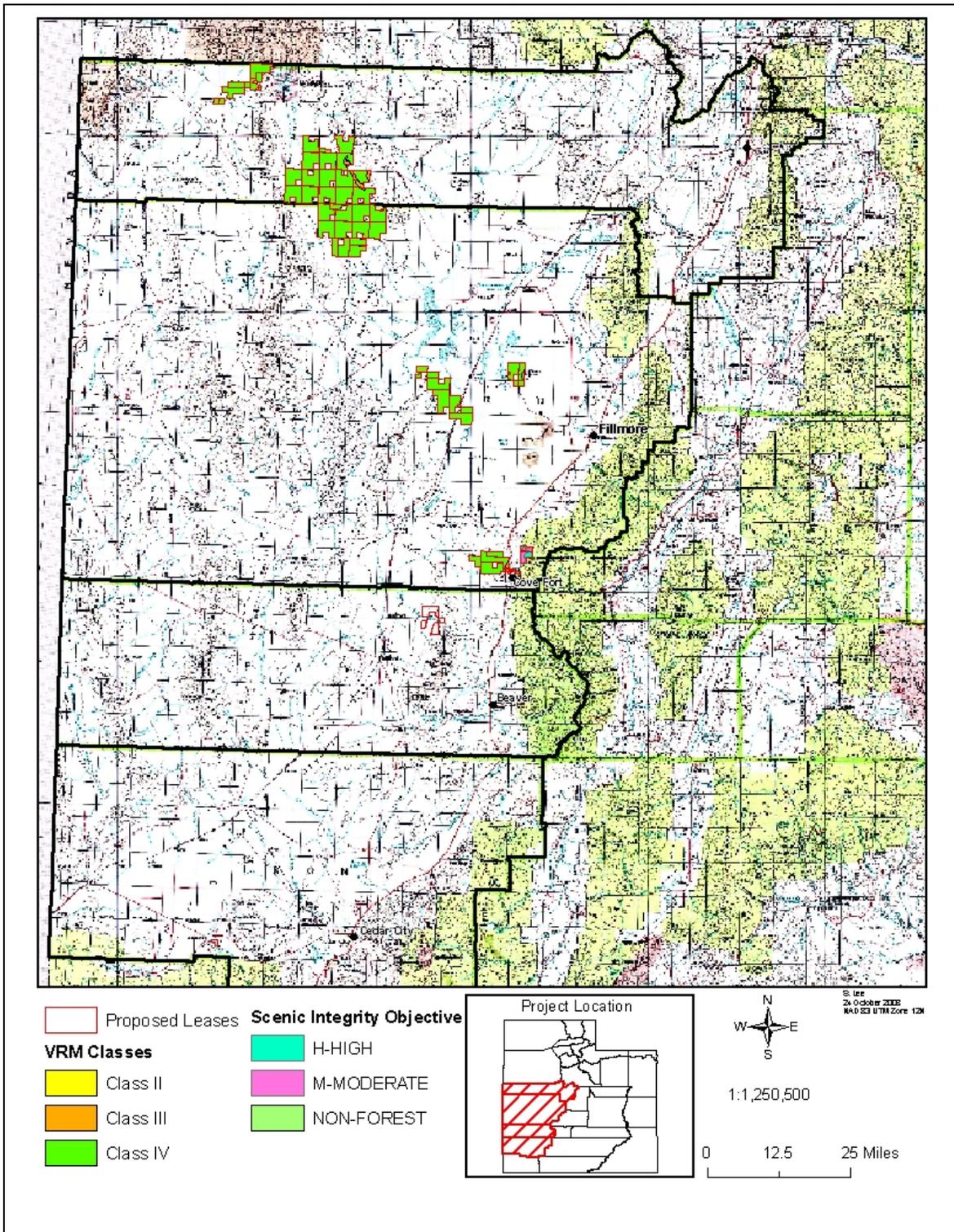


Table 10. Social, Economic, and General Demographic Characteristics of the Nominated Parcels.

Total Population	Median Age (years)	Number in Labor Force	Median Household Income in 1999	Individuals below Poverty Level	Occupation with Largest Number of Employees
Beaver County					
6,005	30.8	2,559	\$34,544	481	Management, Professional, and Related Occupations
Iron County					
33,779	24.2	16,374	\$33,114	6,368	Management, Professional, and Related Occupations
Juab County					
8,238	26.2	3,547	\$38,139	847	Management, Professional, and Related Occupations
Millard County					
12,405	29.9	5,189	\$41,797	1,607	Management, Professional, and Related Occupations

3.2.18 Wilderness Characteristics

Under section 201 of FLPMA, the BLM has the authority to conduct inventories for wilderness characteristics on public lands under its administration. BLM has conducted two statewide inventories for wilderness character, one in 1979 and the other in 1999. The 1979 inventory resulted in the currently existing FLPMA Section 603 Wilderness Study Areas. The 1999 inventory of public lands was associated with the HR-1500 wilderness bill that was before the 106th Congress. This inventory identified approximately 76,315 acres that were determined to possess wilderness characteristics in the FFO and 17,028 acres of wilderness character lands in the CCFO. Areas determined to possess wilderness characteristics are generally contiguous to existing WSAs. The 1999 inventory determined the following areas to have wilderness characteristics: Conger Mountain, Deep Creek Mountains, Dugway Mountains, Fish Springs, Howell Peak, King Top, North Wah Wah Mountains, Notch Peak, Rockwell, and Swasey Mountain in the Fillmore Field Office. Two areas were found to possess wilderness characteristics that are not contiguous to an existing WSA these are the Dugway Mountains in the Fillmore Field Office and Granite Peak in the Cedar City Field Office.

Special interest groups have identified 45 additional areas that they contend to possess wilderness characteristics within the project area. Of the 45 citizen proposals, BLM reviewed one area in 2003 and ten areas that were reviewed by a BLM interdisciplinary team in June – July 2008. Of these eleven areas, Sand Ridge (73,662 acres), Snake Valley (74,078 acres) and portions of six other review areas were determined not to possess wilderness characteristics. Approximately 108,657 acres in the following citizen proposed units were found to possess wilderness characteristics: Crater Bench East, Drum Mountains, Keg Mountains East, Keg Mountains West, Lion Peak, Little Drum Mountains, Little Drum Mountains North, and Swasey Mountain Addition.

There are two areas within the nominated parcels that possess wilderness characteristics (Table 11). There are also two areas within the nominated parcels which were reviewed but determined not to possess wilderness characteristics (Sand Ridge [within UT-GEO-15] and a portion of the Swasey Mountain Addition [within UT-GEO-31 and 32]). Only areas that have been reviewed by BLM personnel are included in the analysis.

Table 11. Areas determined to have wilderness characteristics in the nominated parcels.

Area with Wilderness Characteristic	Lease Parcels	Acres
Fish Springs Range	UT-GEO-49, 51	853
Little Drum Mountains North	UT-GEO-25, 26, 27, 28, 29, 39	12,477
Total		13,330

3.2.19 Wild Horses and Burros

Ten parcels (UT-GEO-23, 24, 31, 32, 41, 42, 44-47) are located within Swasey Wild Horse Management Area (WHMA). The sale parcels contain 2,455 acres of the WHMA.

4 ENVIRONMENTAL CONSEQUENCES

This chapter discusses the environmental consequences of implementing the alternatives described in Chapter 2. Under NEPA, actions with the potential to affect the quality of the human environment must be disclosed and analyzed in terms of direct and indirect effects – whether beneficial or adverse and short or long term – as well as cumulative effects. Direct effects are caused by an action and occur at the same time and place as the action. Indirect effects are caused by an action and occur later or farther away from the resource but are still reasonably foreseeable. Beneficial effects are those that involve a positive change in the condition or appearance of a resource or a change that moves the resource toward a desired condition. Adverse effects involve a change that moves the resource away from a desired condition or detracts from its appearance or condition. Cumulative effects are the effects on the environment that result from the incremental effect of the action when added to other past, present, and reasonably foreseeable future actions.

The No Action alternative (Offer Leases Consistent with the CBGA RMP, HHRA RMP, WSRA RMP, and FLNF LRMP), serves as a baseline against which to evaluate the environmental consequences of the Proposed Action alternative (Offer Leases with Additional Resource Protective Measures) and the No Leasing alternative, which is the minimal impact alternative. For each alternative, the environmental effects are analyzed for the resource topics that were carried forward for analysis in Chapter 3.

4.1 Analysis Assumptions and Guidelines

Issuing a lease for geothermal resources grants the exclusive right to the lessee for future exploration and development of geothermal resources within the lease area; however, it does not authorize the lessee the right to explore for or develop geothermal resources if such activities would extend beyond the level of casual use. As a result, there would be no direct impacts from the proposed issuance of geothermal leases. However, it is reasonably anticipated that issuing a lease would result in subsequent exploration, development, production, and closeout activities by the lessee. Such subsequent activities could result in direct and indirect impacts. For the purposes of this EA, assumptions regarding these subsequent actions are described in a reasonable development scenario.

A Reasonably Foreseeable Development (RFD) scenario was developed (Appendix F) to provide an estimate of future geothermal activities that could occur following leasing. The RFD provides a basis for evaluation of environmental consequences that could result from exploration and development activities if the parcels were leased. The effects described in the following discussions of environmental consequences would be those that would occur if the RFD was fully realized.

Because there is limited knowledge concerning the occurrence, location, and suitability for developing geothermal resources in the area proposed for leasing, it is not possible to quantify the number of facilities that may eventually be built on the leased areas, or to identify their specific location. These uncertainties make it difficult to accurately predict environmental impacts. As a result of these uncertainties, environmental impact analysis must be somewhat generalized and conceptual at the leasing stage. Specific impacts and associated mitigation measures of subsequent activities would be addressed in the required post-leasing analysis and approval process when details of such activities are known.

At the time of this review, it is unknown whether a parcel would be sold or a lease issued. Furthermore, it is unknown when, where, or if future well sites or roads might be proposed. Although no site-specific activities are specified, analysis of projected surface disturbance impacts, should a lease be developed, is estimated based on the RFD. If leases were offered, purchased and issued, typical subsequent developments may include the construction of drill pads, access roads, pipeline construction, and ancillary facilities, described below. If parcels are leased, detailed site-specific analysis of individual wells or roads would occur if a lease holder submits a Notice of Intent (NOI) to Conduct Exploration Activities or a Geothermal Drilling Permit (GDP) application. This EA will be used to determine the necessary administrative actions, stipulations, lease notices, special conditions, or restrictions that will be made a part of an actual lease at the time of issuance. These protective measures will be identified in the decision record (DR) following this EA. Under all alternatives, continued interdisciplinary support and consideration would be required to ensure on the ground implementation of planning objectives, including the proper implementation of stipulations, lease notices and Best Management Practices (BMPs) through the GDP review process.

Standard lease terms provide for reasonable measures to minimize adverse impacts to specific resource values, land uses, or users. Although once the lease has been issued, the lessee has the right to use as much of the leased land as necessary to explore for, drill for, extract, utilize, and inject geothermal resources located under the leased lands as allowed for under the leasing conditions. Operations on the lease must be conducted in a manner that avoids unnecessary or undue degradation of the environment and minimizes adverse impacts to the land, air, water, cultural, biological, and visual elements of the environment, as well as other land uses or users. Compliance with valid, nondiscretionary statutes (laws) is included in the standard lease terms and would apply to all lands and operations that are part of all of the alternatives. Nondiscretionary actions include the BLM's requirements under federal environmental protection laws, such as the Clean Water Act, Clean Air Act, ESA, NHPA, and FLPMA, which are applicable to all actions on federal lands even though they are not reflected in the geothermal resource stipulations in the land use plans and would be applied to all potential leases. Also included in all leases are the two mandatory stipulations for the statutory protection of cultural resources (BLM Washington Office Instruction Memorandum No. 2005-03, Cultural Resources and Native American Consultation for Fluid Minerals Leasing) and threatened or endangered species (BLM Washington Office Instruction Memorandum No. 2002-174, Endangered Species Act Section 7 Consultation), described in Section 2.3.

For purposes of the effects analysis, the RFD and the primary construction, operations, and abandonment elements described below would be similar for the Proposed Action and No Action alternatives. However, because of the additional resource protective measures addressed in the Proposed Action alternative, locations of some facilities may be different to reduce the potential for effects to resources.

Reasonably Foreseeable Development

As described above, the RFD serves as an analytical baseline for identifying and quantifying direct, indirect, and cumulative effects of geothermal resource activity and forms the foundation for the analysis of the effects of geothermal resource management decisions in planning and environmental documents. The RFD describes in detail geothermal leasing operations, as well as a scenarios for the nominated parcels. It is estimated that the following activities would occur in the nominated parcels in the next 15 years: 60 temperature gradient holes, 13 exploratory wells, 16 production/injection wells, 12 miles of transmission lines, and one mid-size (25 MW) power plant.

Once the wells are drilled, all pad sites and roads would be reclaimed to BLM or other Surface Management Agency standards. It would take an estimated 6 to 8 years for new vegetation to become established to the extent that evidence of disturbance is no longer visible, based on past experiences. By the end of the 15 year period, all disturbances due to temperature gradient holes would be completely reclaimed and 46 of 87 acres disturbed via exploration wells would have been reclaimed. The net disturbance from the two exploratory activities would be 41 acres.

Well Pad and Road Construction

Equipment for well pad construction would consist of dozers, scrapers, and graders. Topsoil from each well pad would be stripped to and stockpiled for future reclamation. The topsoil would be seeded with native species of plants and left in place for the life of the well, then used during the final reclamation process. Disturbed land would be seeded with a mixture and rate as recommended or required by the BLM.

Depending on the locations of the proposed wells it is anticipated that some new or upgraded access roads would be required to access well pads and maintain production facilities. It is not possible to determine the distance of road that would be required because the location of the wells would not be known until the GDP stage. However, for purposes of analyses it is assumed that disturbance from access roads would be similar to development in other areas (~5 acres of disturbance).

Production Operations

Exploration on the geothermal leases may or may not lead to the construction of a power plant and ancillary facilities but for purposes of surface disturbance analysis it is assumed for this analysis that one power plant capable of generating approximately 25 MW of electricity would be constructed during the next 15 years. The proposed plant would be a binary power plant utilizing hot water from production wells on the leases.

Hot water would be supplied by approximately 8 production wells from which the hot water would be transported by pipeline to the power plant and returned, at a lower temperature, by pipelines to injection wells. Cooling water would be carried from a storage reservoir to the power plant where a significant portion would be lost by evaporation when cooling the working liquid. The remaining water would be discharged into a “blow down” reservoir.

Surface disturbance would result from construction of the plant, drilling of production and injection wells, construction of access roads, trenches for pipelines, construction of reservoirs and installation of transmission lines. It is estimated that 16 wells, eight production and 8 injection, would be required for a power plant of the type envisioned here. Assuming one acre of each pad would be reclaimed, initial disturbance (48 acres) would be reduced by 16 acres resulting in a net disturbance of 32 acres.

The plant would either use air or water for cooling and condensing the working liquid, and assuming water would be utilized, storage reservoirs would be required. It is estimated that this reservoir would disturb about 25 acres and pipelines for conveying the water to the power plant would impact another 15 acres. Another reservoir would be used to contain the water remaining after cooling (“blow down water”). This reservoir may disturb about 20 acres and pipelines transporting the water from the power plant to the reservoir would affect an additional 3 acres.

It is estimated that the power plant and ancillary structures would occupy approximately 15 acres. Once the power plant begins operation transmission lines would be necessary to connect the plant to the power grid.

Maintenance Operations

Traffic volumes during production would be dependent upon whether the wells produced resources. Well maintenance operations may include periodic use of work-over rigs and heavy trucks for hauling equipment to the producing well.

Plugging and Abandonment

If the wells do not produce economic quantities of geothermal resources, or when the well is no longer commercially productive, it would be plugged and abandoned. The entire disturbance area would be reclaimed and seed Mix #1 or seed Mix #2 would be used (Appendix G). These two seed mixes are mixes that have been used in this area previously; however, the seed mix is subject to change depending on the elevation and range site where a project is constructed (D. Fletcher, personal communication).

4.2 Issues Carried Forward for Analysis

A summary of the additional protective measures proposed in the Proposed Action alternative as a result of the following analysis is located in Appendix F.

4.2.1 Areas of Critical Environmental Concern (ACEC)

There are no ACECs that would be impacted by geothermal leasing in the Cedar City Field Office. There is one ACEC, Pahvant Butte, in the Fillmore Field Office that contains portions of nominated geothermal parcels.

No Action Alternative

Management direction for this ACEC is found in the WSRA RMP. Pahvant Butte ACEC is designated as a Category 3 area which does not allow any occupancy or disturbance to land surface. Lease holders may still exploit resources by directional drilling from outside the area. Under the current RMP, activities from the exploration and development of geothermal resources within the ACEC would not cause surface disturbance. Activities from geothermal exploration and development on lands adjacent to the ACEC could impact the peregrine falcon reintroduction element of the ACEC’s relevant and important values by causing stress to nesting falcons and removal of prey species from the bird’s hunting areas.

Proposed Action Alternative

Under the Proposed Action alternative, the management practices would be the same as those discussed under the No Action alternative; no specific additional protective measure is proposed to address ACECs. Impacts from geothermal extraction activities would not occur within the Pahvant Butte ACEC.

No Leasing Alternative

Under this alternative the BLM would prohibit leasing and thus would not permit any development or disturbance of the land surface. In light of the protective measures designated by the WSRA RMP for this ACEC, application of no leasing is not deemed necessary.

4.2.2 Cultural Resources

No Action Alternative

Cultural resources may occur on lands included in future leases and may be altered by activities related to geothermal leasing. Equipment used in constructing well pads or roads would result in ground disturbance to both surface and subsurface sediments, increasing the opportunity for both direct and indirect impacts to cultural resources. Increased human activity in the area also would increase the possibility of damage to, or removal of, cultural resources in areas with geothermal development. Adverse effects could also include introduction of visual, atmospheric, or audible elements that diminish the integrity of a property's historic features.

The potential for conflicts between leasing and the ability to protect cultural resources would generally be related to the size of an individual lease parcel in relation to the density of known or unknown sites within that parcel. For instance, the larger the parcel, the less chance there would be for conflict between leasing (and development) and cultural resources because of the ability to move the well to a different location within the parcel. Most leases in the planning area would allow for locating one well within a parcel without resulting in adverse effects; a particular locality within a lease area could be unavailable, but some other portions of the parcel would likely be available and suitable for exploration and development.

Under the No Action alternative, both the standard and special lease terms that would apply to future leases provide for reasonable measures to minimize adverse impacts to most cultural resources in the planning area. In addition, the Cultural Resources and Tribal Consultation for Fluid Minerals Leasing stipulation (described in Section 2.3) would be attached to all leases.

Because the precise location of any development activity is not known until the GDP stage, an assessment of site-specific effects would be made at that time and any future undertaking related to geothermal resources on the leases would be subject to compliance with all federal laws, including Section 106 of the NHPA, as well as agency guidance. Site specific cultural resource surveys and appropriate mitigation measures are required as part of the GDP process after parcels are leased. NRHP-eligible or listed sites would be avoided. If objects of cultural value are encountered during construction, all work affecting the resource would stop and the BLM would be contacted so that mitigating measures could be identified and carried out. These measures are generally protective enough that additional mitigation would not be needed for most leases within the planning area.

Summary of Effects and Determinations on Proposed Lease Parcels

After consideration of cultural resource information and other general data including: the applicable House Range Resource Management Plan (RMP), Warm Springs RMP, Cedar-Beaver-Garfield Antimony RMP and associated Environmental Impact Statement (EIS); fluid minerals NEPA documents; specific data relating to the individual proposed parcels such as topography

and soils; as well as personal knowledge and experience of the lands at issue, the Fillmore Field Office, Cedar City Field Office and Fishlake National Forest archaeologists, make the following determinations of effects to historic properties:

Parcels UT-GEO 14-15

Due to the expected site type, size, and density, it has been determined that reasonable development could occur on these proposed parcels, west of Highway 257, without impact to eligible cultural properties. Development of these parcels east of Highway 257 could have an adverse affect on historic properties.

Development of these parcels east of Highway 257 in Fillmore Field Office, where there is high site density and potential for large sites, could have an **Adverse Affect** on historic properties.

Parcels UT-GEO 002, UT-GEO-003, and UT-GEO-48 – 53

Although reasonable development could occur within these parcels based on site density, the parcels contain numerous sites that have a critical setting component that would be adversely affected by geothermal development. The BLM determination for proposed parcels UT-GEO 002, UT-GEO-003, in the Cedar City Field Office and UT-GEO-48 – 53 in the Fillmore Field Office is that leasing these parcels under the existing categories, which would allow one well to be constructed on the parcel, would have an **Adverse Affect** to numerous historic and prehistoric properties.

Within the UT-GEO-002 and UT-GEO-003 Cedar City Field Office lease parcels historic properties include Wildhorse Canyon Obsidian Quarry (NRHP listed) and Negro Mag Wash quarry site (eligible for NRHP listing and possibly eligible as a district or landscape).

Within the UT-GEO 48 – 53 Fillmore Field Office lease parcels historic properties include the Pony Express National Historic Trail (1998), the Boyd Pony Express Station (contributing component of Pony Express National Historic Trail), Fish Springs Caves Archaeological District (NRHP listed #81000582) and Lincoln Highway.

For the Fillmore Field Office, although reasonable development could occur, based on site density, proposed parcels UT-GEO-48 through UT-GEO-53 have a critical setting component and historic properties that would be adversely affected by geothermal exploration or development. Any intrusion on the landscape would require further analysis by a professional archaeologist, in consultation with interest groups associated with the above listed sites, the Advisory Council on Historic Preservation and the SHPO to determine if development would result in an adverse effect to historic properties within the proposed parcels.

Parcels UT GEO 01, 04, 05, 06, 09-13, 16-47, FS 01, and FS 02

Known cultural resources are located in such a fashion (size, density and placement) that avoidance is feasible during development of geothermal resources. The potential for locating additional cultural resources within the proposed lease parcels UT-GEO-01,-04,-05,-06,-09-13,-16-47, FS 01, and FS 02 reviewed for the November 2008 Geothermal Lease Sale is low to moderate. Furthermore, analysis of the reasonably foreseeable impacts of leasing on both identified and unidentified cultural properties resulted in **No Adverse Affect**. This is based on the determination that reasonable development (placement of one well pad and access estimated at 6.5 acres) could occur on proposed parcels UT-GEO-01,-04,-05,-06,-09-13, 16-47, FS 01, and FS 02 without impact to eligible properties.

A complete inventory of the proposed lease parcels has not occurred; therefore, the following stipulation should be added to any parcel offered for lease:

"This lease may be found to contain historic properties and/ or resources protected under the National Historic Preservation Act (NHPA), American Indian Religious Freedom Act, Native American Graves and Protection Act, E.O. 13007, or other statutes and executive orders. The BLM will not approve any ground disturbing activities that may affect such properties or resources until it completes its obligations under applicable requirements of the NHPA and other authorities. The BLM may require modification to exploration or development proposals to protect properties, or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized or mitigated."

Proposed Action Alternative

Effects to cultural resources under the Proposed Action alternative would be similar to those described above for the No Action alternative because the same types of protections would be implemented. In addition, however, application of NSO could occur under this alternative where necessary to protect cultural resources. This would preclude establishment of wells or well pads or construction of roads, pipelines, or power lines on the BLM-managed land within a lease parcel. Any geothermal resources extracted from the leases would have to come from wells directionally drilled at an angle underground from adjacent or nearby private or public lands.

Known cultural resources are located in such a fashion (size, density and placement) that avoidance is feasible during development of geothermal resources. The potential for locating additional cultural resources within the proposed lease parcels reviewed for the November 2008 geothermal is moderate. A complete inventory of the proposed lease parcels has not occurred; therefore, the following stipulation would continue to be applied to each lease parcel:

"This lease may be found to contain historic properties and/ or resources protected under the National Historic Preservation Act (NHPA), American Indian Religious Freedom Act, Native American Graves and Protection Act, E.O. 13007, or other statutes and executive orders. The BLM will not approve any ground disturbing activities that may affect such properties or resources until it completes its obligations under applicable requirements of the NHPA and other authorities. The BLM may require modification to exploration or development proposals to protect properties, or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized or mitigated."

No Leasing Alternative

Under this alternative, lands would not be leased and cultural resources would receive the greatest amount of protection. This alternative would be implemented where the standard stipulations and BMPs under the No Action and Proposed Action alternatives were considered inadequate to protect the resource from indirect effects of exploration and development.

4.2.3 Native American Consultation and Traditional Cultural Properties

No Action Alternative

Effects to Native American Concerns from the No Action alternative would be similar to those described for cultural resources. The same protective measures (e.g., Cultural Resources and Tribal Consultation for Fluid Minerals Leasing stipulation (WO IM 2005-03)) would be applied to provide for reasonable measures to minimize adverse impacts. Implementation of the No Action alternative could result in adverse effects due to the introduction of visual, atmospheric, or

audible elements that diminish the integrity of the property's important historic features if leasing were to occur on parcels adjacent to the property.

On October 3, 2008, the BLM received a letter from Dorena Martineau, Cultural Resources Paiute Indian Tribe of Utah requesting **AVOIDANCE** of all prehistoric archaeological sites and traditional cultural properties.

She expressed concern with UT GEO-05-06 parcel located west of Pahvant Butte in the Pahvant Valley of Millard County noting this area to be a sacred place with extensive and significant cultural resources significant to the Paiute Indian Tribe of Utah; she stated that the 2008 Geothermal Lease Sale should withhold the area and concentration of known cultural sites through a leasing stipulation **prohibiting any surface disturbance or deferral from leasing**.

In addition UT-GEO-002 and UT-GEO-003, Roosevelt Geothermal Field, is located at the mouth of the Negro Mg Wash, on the west slopes of the Mineral Mountains and has vast areas of exposed obsidian flows used by Paiute ancestors for thousands of years, and who claim ancestral and cultural affiliation with the lands. They would like the lands to remain pristine, request the 2008 Geothermal Lease Sale withhold the area through a leasing stipulation **prohibiting any surface disturbance or deferral from leasing**.

On October 28, 2008 the BLM received a letter from Leigh J. Kuwanwisiwma, Director of Hopi Cultural Preservation Office requesting the identification and **AVOIDANCE** of all prehistoric archaeological sites and Traditional Cultural Properties.

The Hopi claim ancestral and cultural affiliation with the Paleo, Archaic, and Fremont prehistoric cultural groups in Utah and have particular concerns with parcels UT GEO 48-53 located in the Fillmore Field Office as these parcels include the Fish Springs Archaeological District. The Hopi would like the lands to remain pristine, requesting that the 2008 Geothermal Lease Sale withdraw these parcels from leasing.

Additionally, parcels UT-GEO 14-15 east of Highway 257 in the Fillmore Field Office/US Forest Service section are of concern and the Hopi would like the lands to remain pristine, request the 2008 Geothermal Lease Sale withhold the area through a leasing stipulation **prohibiting any surface disturbance or deferral from leasing**.

Lastly, UT-GEO-002 and UT-GEO-003, Roosevelt Geothermal Field, located at the mouth of the Negro Mag Wash, on the west slopes of the Mineral Mountains, has vast areas of exposed obsidian flows used by Hopi ancestors for thousands of years, and who claim ancestral and cultural affiliation with the lands. They would like the lands to remain pristine, request the 2008 Geothermal Lease Sale withhold the area through a leasing stipulation **prohibiting any surface disturbance or deferral from leasing**.

The consultation response letters are provided as Appendix H.

Proposed Action Alternative

Effects to Native American Concerns under the Proposed Action alternative would be similar to those described above for the No Action alternative because the same types of protections would be implemented. If it is determined that application of the Cultural Resources stipulation (IM 2005-03) would not provide sufficient protection of resources in an area, application of NSO could occur where necessary to protect Native American Concerns and TCPs. This would preclude establishment of wells or well pads or construction of roads, pipelines, or power lines on the BLM-managed land within a lease parcel. Any geothermal extracted from the leases would have to come from wells directionally drilled at an angle underground from adjacent or nearby private or public lands. If application of NSO would not provide sufficient protection then the permit to drill could be denied.

No Leasing Alternative

This alternative would be implemented where the standard stipulations and BMPs under the No Action and Proposed Action alternatives were considered inadequate to protect the resource from effects of exploration and development. Under this alternative, Native American Concerns, would receive the greatest amount of protection through the exclusion of leasing in the area.

4.2.4 Floodplains

No Action Alternative

Soil disturbing activities such as geothermal exploration and development could result in damage to floodplains. Development and occupancy of any leases would require incorporation of the best management practices or mitigation of planning for the 100 year flood event in the design of the project.

Proposed Action Alternative

Under the Proposed Action alternative, the management practices would be the same as those discussed under the No Action alternative; in addition to a lease notice for parcel UT-GEO-04 addressing development within a floodplain. As per the provisions Departmental Manual 520 DM 1, BLM must avoid short and long term adverse impacts associated with occupancy or development in a floodplain.

No Leasing Alternative

Under this alternative the BLM would prohibit leasing and thus would not permit any development or disturbance of the land surface. Because no surface disturbance would occur, there would be no impacts to water. In light of the small amount of disturbance that would occur over the planning area and protective measures implemented under the Proposed Action alternative, application of no leasing is not deemed necessary to address floodplains.

4.2.5 Threatened, Endangered, or Candidate Animal Species

No Action Alternative

Geothermal exploration and development could affect threatened and endangered wildlife resources in a variety of direct and indirect ways including direct loss of habitat; physiological stress; disturbance and displacement of individuals or populations; habitat fragmentation; introduction of competitive or non-native organisms; and secondary effects and indirect habitat loss, including sedimentation or other loss of habitat functionality. All leases would include the lease stipulation for the protection of threatened or endangered species (per BLM Washington Office Instruction Memorandum No. 2002-174, Endangered Species Act Section 7 Consultation), as described in Section 2.2. Any future leases would also contain a compliance notification that states, "If in the conduct of operations, threatened or endangered species, objects of historical or scientific interest, or substantial unanticipated environmental effects are observed, the lessee will immediately contact the lessor. The lessee shall cease any operations that would result in the destruction of such species or objects."

BLM is required under Section 7 of the ESA to consult on all federal actions that may impact ESA-listed species. Utah prairie-dog and yellow-billed cuckoo were not known or suspected to occur within the FFO at the time the current RMPs were developed. Without specific mitigations for these species in the RMPs or the supplements to the RMPs, formal consultation was needed between the FWS and BLM to address impacts to these species associated with land use planning actions within the field office. BLM and FWS personnel completed programmatic Section 7 consultation work culminating in a set of standard, species-specific lease notices for listed species that are to be attached to fluid mineral leases offered in Utah. These measures include temporal

and spatial buffers to protect known or suitable habitat for these species. The Conservation Measures also require that surveys be conducted, according to FWS protocol, prior to any disturbance related activities that have been identified to have the potential to impact threatened and endangered species. Inclusion of these measures at the lease stage, and compliance with these measures during energy development activities, would ensure that potential effects to listed species are insignificant or discountable, in part by avoiding impacts to sensitive or critical habitats, and by avoiding disturbances during crucial life history seasons (i.e., nesting, breeding or wintering). These measures would also provide full disclosure to the lessee of potential environmental concerns and strategies to minimize effects to listed species. FWS concurred with the BLM determination that where these measures are incorporated into future proposals, there is a greater likelihood that BLM would meet the standard of “*may affect, but not likely to adversely affect*” species listed under the ESA. However, if these measures are not implemented, early coordination and additional Section 7 consultation with FWS would be necessary.

There is no mapped Utah prairie dog habitat located within any of the nominated parcels, however there is potential for habitat within in some of the parcels (UT-GEO-14-18). Impacts to Utah prairie dogs from geothermal exploration and extraction include habitat loss and degradation, disturbance, and road mortality. Habitat degradation and loss occurs through vegetation crushing, increased soil erosion or soil compaction, and introduction or proliferation of invasive weeds (particularly cheatgrass) that degrade prairie dog habitat (Rosmarino 2003).

To minimize potential impacts of geothermal activities on Utah prairie dogs, the FWS and BLM have developed a set of avoidance and minimization measures for federal geothermal leases within this species’ range. These measures currently apply to all BLM leasing activities within the Utah prairie dog’s range, and lessees who follow these guidelines are provided a streamlined Section 7 consultation process. Controlled surface use and timing limitations implemented under this alternative would provide protection for Utah prairie dogs and their habitat within the planning area. BLM projects would be designed to avoid direct disturbance to populations and habitat wherever possible based on recommendations in the Conservation Measures from LUP-Level Consultations for T&E Species of Utah (BLM 2006d). Consultation related to this species has occurred with FWS on past fluid mineral leasing projects and the FWS concurred that use of the species specific lease notices on appropriate parcels would result in a “*may affect, not likely to adversely affect*” determination for listed species. Surface occupancy or other surface disturbing activity would be avoided within 0.5 mile of active prairie dog colonies, and permanent surface disturbance or facilities would be avoided within 0.5 mile of potentially suitable, unoccupied prairie dog habitat, as identified and mapped by Utah Division of Wildlife Resources since 1976. Furthermore, speed limits would be set at 25 mph on operator-created and maintained roads in occupied prairie dog habitat and/or travel would be restricted between April 1 and September 30 when prairie dogs are more likely to be active above ground. Speed restriction of 25 miles per hour in Utah prairie dog occupied habitat is expected to limit prairie dog mortality. These buffers and timing limitations would protect Utah prairie dogs from disturbance caused by geothermal exploration and development.

The Utah prairie dog notice provides adequate protection for this federally-listed species. Although a No Surface Occupancy stipulation or no leasing would provide additional protection for this species, the FWS has concurred that the controlled surface use under the Utah Prairie Dog Notice would not result in adverse affects (FWS 2004).

Yellow-billed cuckoo habitat has not been mapped by the UDWR so it is unknown where habitat for this species occurs. Because it is a riparian species, its habitat would be protected by stipulations placed on riparian and wetland areas in the HRRA (500 foot buffer protecting riparian areas), but no additional protection is provided for riparian areas in the WSRA. The USFWS also agreed that the Utah Sensitive Species (Yellow-Billed Cuckoo) Notice used in

conjunction with the riparian area buffer protection of 500 feet would provide enough protection for the yellow-billed cuckoo for the lease parcels considered for under this EA.

Proposed Action Alternative

As in the No Action alternative, the species-specific lease notices developed as part of the Section 7 Consultation for Oil and Gas Lease Sales (FWS 2004) between the BLM and FWS would be attached to applicable geothermal lease sales to protect the threatened, endangered and candidate species that may occur within the planning area. Effects from implementation of these resource protective measures – such as seasonal restrictions, prohibition on seasonal occupancy, restriction on location of structures and surface disturbance – would be the same as the No Action alternative assuming that these measures would be implemented in a way that would satisfy Section 7 consultation requirements. These lease notices are anticipated to protect ESA-listed species habitats and individuals that may occur within the planning area, and result in a determination of “*may affect, not likely to adversely affect*” for geothermal exploration and development.

No Leasing Alternative

Implementation of the No Leasing alternative would provide additional protection for ESA-listed species or their habitat. If this situation arose it would require more protection than the timing restrictions, controlled surface use, and no surface occupancy presented in the Proposed Action alternative and therefore this alternative would be implemented to protect those resources from effects of exploration and development. Because no surface disturbance would occur, the potential for adverse impacts to threatened and endangered species under this alternative would be eliminated.

4.2.6 Fish and Wildlife, including Special Status Species other than FWS Candidate or Listed species (e.g., Migratory Birds)

No Action Alternative

General Wildlife

Geothermal exploration and development could affect fish and wildlife resources in a variety of direct and indirect ways including direct loss of habitat; physiological stress; disturbance and displacement of individuals or populations; habitat fragmentation; introduction of competitive or non-native organisms; and secondary effects and indirect habitat loss, including sedimentation or other loss of habitat functionality. Environmental effects of the alternatives are likely to be similar to other surface and habitat disturbing activities that affect aquatic and terrestrial species of wildlife.

The majority of the lands in the planning area would be available for leasing with standard lease terms. General protection for wildlife species is provided in accordance with 43 CFR 3262.11 and Section 6 of the standard lease form.

The special stipulations outlined in the CBGA RMP, the HRRA RMP, and the WSRA RMP for land identified as crucial deer and elk winter range, sage-grouse, raptor nesting areas, or riparian areas do not fall within any of the lease parcels. Additional ranges for these wildlife species have been identified (by the UDWR) within the nominated parcels (Table 12). However, under the No Action alternative, no additional protections would be provided for these wildlife species.

Category 2 protection is provided for the crucial raptor nesting area located in UT-GEO-06 and 08 (timing limitation of March 1 to June 20, BLM 1988b) and the raptor nesting/perching area located in UT-GEO-03 (timing limitation of May 1 to October 31, BLM 1984). Peregrine falcon reintroduction potential is a relevant and important value in the Pahvant Butte ACEC and this

area is designated as a Category 3 area which does not allow any occupancy or disturbance to land surface. Lease holders may still develop geothermal resources by directional drilling from outside the area. Under the current RMP, activities from the exploration and development of geothermal resources within the ACEC would not cause surface disturbance. Activities from geothermal exploration and development on lands adjacent to the ACEC could impact the peregrine falcon reintroduction element of the ACEC's by causing stress to nesting falcons and removal of prey species from the bird's hunting areas. The No Action alternative would not include any additional protection for peregrine falcons or for other raptors or their associated habitats and so would not be as protective of these resources as the Proposed Action alternative.

The CBGA RMP contains a stipulation that prohibits surface disturbance associated with mineral development within 400 feet of live water and the HRRR RMP supplement does not allow surface disturbance within 500 feet of any perennial streams or springs. These stipulations indirectly protect fisheries resources within the planning area by reducing the potential for adverse impacts to riparian habitat and water quality. The WSRA RMP and the FLNF LRMP, however, do not contain any stipulations regarding surface disturbance to wetland or riparian areas. Additional protection is provided by the Utah Riparian Management Policy, which states that no new surface disturbing activities are allowed within 100 meters of riparian areas unless it can be shown that (A) there are not practical alternatives, (B) all long term impacts can be fully mitigated, or (C) the activity will benefit and enhance the riparian area. The No Action alternative would not include any additional protection for wetland and riparian areas in the FLNF or WSRA.

Although the amount of disturbance per well site would be relatively small (net disturbance of 41 acres), the removal of vegetation associated with the development of a lease may result in the loss of forage and habitat and may result in the displacement of various wildlife species including small mammals, reptiles, birds, and insects. Overall this affect is expected to be small, given the small extent of disturbance dispersed over the large planning area, rehabilitation after exploration and development activities would restore some of the lost forage and habitat in the long-term.

Sensitive Animal Species

Effects to BLM sensitive animal species under the No Action alternative would be similar to those described above for general wildlife. Although the amount of disturbance per well site would be small, the removal of vegetation associated with the development of a lease may result in the displacement of BLM sensitive species including migratory birds. There are areas where additional wildlife habitat has been detected since the LUPs were written; protection to sensitive animal species would not necessarily occur in these areas. Therefore, the No Action alternative would not be as protective of these resources as the Proposed Action alternative which would include additional resource protective measures for sensitive animal species.

Mitigations presented in the CBGA RMP and the HRRR RMP supplement for the protection of some resources, such as riparian areas, would indirectly benefit some sensitive species such as migratory birds. However, species-specific protection measures are not included in the FLNF LRMP, CBGA RMP, the HRRR RMP, or the WSRA RMP for the majority of the sensitive species. Where appropriate, and based on site-specific analysis, additional protective measures are needed to keep BLM sensitive species from trending toward being listed under the ESA. For instance, no species-specific mitigation measures for pygmy rabbits or sage-grouse are discussed in the FLNF LRMP, CBGA RMP/ROD, the HRRR RMP/ROD, and the WSRA RMP/ROD, and these species are particularly sensitive to habitat fragmentation. Minimization of this impact is considered a priority when locating individual disturbance sites and site-specific analysis would result in management decisions that limit disturbance and/or minimize the impacts of fragmentation for these and other BLM-sensitive species. Similarly, no mitigation is included

that require surveys to determine the presence or absence of BLM sensitive species, such as burrowing owls, or other raptors and the subsequent avoidance of areas containing nests.

Proposed Action Alternative

General Wildlife

Additional protections for general wildlife and crucial habitats would be implemented under this alternative and the location and timing of some activities may be changed compared to the No Action alternative. Special stipulations for the protection of wildlife were identified in the LUPs and supplemental EA's for areas where those resources were known at the time the plan was written. Since that time, however, new information has become available and ranges of some animals have expanded into areas that would not be protected with the stipulations in the LUPs or supplements. Therefore, the Proposed Action alternative would include additional resource protective measures for wildlife that would result in less adverse impacts from exploration and development activities to fish and wildlife species compared to the No Action alternative.

Provisions are present within Section 6 of the Standard Lease Form (BLM from 3200-24) allows the BLM to impose additional restrictions at the permitting phase, if the restrictions will prevent violation of law, policy or regulation, or avoid undue and unnecessary degradation of lands or resources. Resource protective measures for general wildlife that could be applied under this alternative include expanding the geographic area and the use of timing limitations for crucial winter mule deer, elk, and pronghorn habitat beyond that identified in the LUPs, and specifying timing limitations for crucial elk calving, deer fawning habitat, and pronghorn fawning habitat on which the LUPs are silent (Table 12). Crucial yearlong pronghorn habitat is being protected by applying crucial winter and fawning protective measures to the habitat under this alternative. This alternative also would include adding lease notices for protection of raptors wherein surveys would be required whenever disturbances and/or occupancy is proposed in association with exploration and development within potential raptor habitat. Appropriate buffers and timing limitations would be determined based on the *Utah Field Office Guidelines for Raptor Protection from Human and Land Use Disturbances* (Romin and Muck 2002). These measures would provide greater protection than is currently mandated by the LUP's and the WSRA RMP and HERRA RMP supplements along with complying with the non-statutory regulation of the Migratory Bird Treaty Act and WO IM 2008-050.

Other resource protective measures that could be implemented as part of the Proposed Action alternative to protect general wildlife include a controlled surface use stipulation, attached as a lease notice, for riparian areas wherein no surface disturbance or use would be allowed within 500 feet of riparian areas. Protection of the riparian habitat type – although limited within the planning area – is important because it provides habitat for many different species of important wildlife and migratory birds. Fisheries would also be protected through this controlled surface use restriction more than under the No Action Alternative.

A notification of a potential timing limitation would be attached to leases under this alternative for the protection of waterfowl. Disruptive activities near surface waters with nesting waterfowl, wintering waterfowl, or during migration periods would likely cause negative impacts and would be discouraged (Table 12). Specific stipulations would be determined on a site-specific basis. Specific measures for waterfowl protection were not included in the RMPs, and therefore this alternative would provide greater protection to waterfowl than the No Action alternative.

Sensitive Animal Species

Effects to BLM sensitive animal species under this alternative would be similar to those described for general wildlife under the No Action alternative. However, additional species-specific protections would be attached to leases under this alternative beyond those originally included in the FLNF FMP, CBGA RMP, WSRA RMP, and HRRA RMP resulting in changes in location and timing of some activities. Protective measures, such as seasonal restrictions, would be included on leases where sensitive wildlife resources are known or suspected to occur within the nominated parcels and would result in fewer, or less intensive, impacts to sensitive animal species and migratory birds.

A controlled surface use limitation for Utah BLM-sensitive species would be attached to leases, in the form of a lease notice, containing BLM-sensitive species or their known habitats under this alternative. This notice would inform the lessee/operators that additional measures or mitigation may be required to protect and benefit these sensitive and important species. Surface disturbance or otherwise disruptive activities that would result in direct and indirect disturbance to populations or individuals would be avoided where practicable. Modifications to the Surface Use Plan of Operations may be required in order to protect these resources from surface disturbing activities in accordance with Section 6 of the lease terms, ESA, FLPMA, the Migratory Bird Treaty Act and 43 CFR 3262.11.

Notices that highlight the need for timing limitations and controlled surface use restrictions for greater sage-grouse would be attached to leases under the Proposed Action alternative and would emphasize the need for greater protection to sage-grouse breeding habitats (Table 12). The lease notices addressing nesting, early brood rearing, winter habitats and leks, complies with the BLM's 6840 Manual for sensitive species which states that the conservation of special status species incorporates the use of all methods and procedures which are necessary to improve the condition of special status species and their habitats to a point where their special status recognition is no longer warranted. The lease notices are also follow the guidelines identified in BLM's National Sagegrouse Conservation Strategy (11/2004). To comply with Utah's Plan for Sage-grouse and Development, lease notice GEO-LN-08 has been modified to limit development within 0.5 mile of a lek. In addition, lease notices GEO-LN-06 and GEO-LN-07 remain consistent with the intent of the State's plan.

Some studies have shown that full field energy development appears to have severe negative impacts on sage-grouse populations under current lease stipulations (Lyon and Anderson 2003, Holloran 2005, Kaiser 2006, Holloran et al. 2007, Aldridge and Boyce 2007, Walker et al. 2007, Doherty et al. 2008). Research indicates that oil or gas development exceeding approximately 1 well pad and associated infrastructure per square mile results in calculable impacts on breeding populations, as measured by the number of male sage-grouse attending leks (Holloran 2005, Naugle et al. 2006). Studies by Walker et al. (2007) indicate that the current buffer lease stipulation is insufficient to adequately conserve breeding sage-grouse populations in areas having full development. Yearling female greater sage-grouse avoid nesting in areas within 0.6 miles of producing well pads (Holloran et al. 2007), and brood-rearing females avoid areas within 0.6 miles of producing wells (Aldridge and Boyce 2007). Surface disturbance due to geothermal exploration and development is similar to oil and gas development; it can be expected that geothermal activities would have similar impacts on sage-grouse populations.

A lease notice for pygmy rabbits would be attached to leases under this alternative. Surveys prior to the activity would be conducted to identify the areas containing pygmy rabbits. Determination of type and size of restrictions would be determined on a project and site-specific basis. A 300-foot buffer around pygmy rabbit habitat may provide sufficient protection for exploration.

Under the Proposed Action alternative, surveys would be required prior to treatment to identify raptor habitat. Appropriate buffers and timing limitations would be determined based on the *Utah Field Office Guidelines for Raptor Protection from Human and Land Use Disturbances*. (BLM 2006a). Eight of Utah's raptor species that currently receive enhanced protection, in addition to the regulatory authority provided by the Migratory Bird Treaty Act, would be managed under this directive and include the bald eagle, golden eagle, Mexican spotted owl, northern goshawk, ferruginous hawk, short-eared owl, and burrowing owl. Peregrine falcon habitat is located within Pahvant Butte ACEC and would be protected under Category 3 stipulations. No occupancy or disturbance of the land surface would be authorized. The leaseholder would be able to develop resources from outside the area via directional drilling. There are additional lease notices that highlight the need for further protection for peregrine falcons outside of the NSO also in the form of timing limitations and controlled surface use depending. There is also an additional protective measure for bald eagle habitat under this alternative that stems from the T&E lease notice in order to protect bald eagles. Management of raptors under this alternative would provide greater protection to this resource than the No Action alternative, which would not implement the BMPs for raptor management.

Table 12. Proposed Action alternative protective measures for wildlife.

Habitat Type	Parcels Affected	Protective Measure
Mule Deer/Elk		
Crucial Winter	UT-GEO-01-04, 09-13, 19-21, 33, FS-01, FS-02	No surface disturbance from Dec 1 to April 30
Crucial Summer	FS-01	No surface disturbance from May 1 to Nov 30
Fawning	UT-GEO-09, 10-13, FS-02	No surface disturbance from May 1 to June 30
Pronghorn		
Crucial Winter	UT-GEO-01-03, 10-12, 14-27, and 29-53	No surface disturbance from Dec 1 to April 30
Fawning	UT-GEO-01-03, 10-12, 14-27, and 29-53	No surface disturbance from May 1 to June 30
Sage-Grouse		
Nesting or Early Brood-Rearing Habitat	UT-GEO-01-03, 11 12	No surface disturbance from March 15 through July 15 within 2.0 miles of an occupied sage-grouse lek, or within 4.0 mile of mapped and identified greater sage breeding habitat.
Other		
Raptors	All	Surveys would be required prior to activity to identify raptor habitat. Appropriate buffers and timing limitations would be determined based on the <i>Utah Field Office Guidelines for Raptor Protection from Human and Land Use Disturbances</i> .
Peregrine Falcon	UT-GEO-005-008	Exploration, drilling and other development activities would not be allowed from February 1 through August 31 which would disrupt peregrine falcon breeding activities within 1 mile of an occupied nest. AND Surface use or otherwise disruptive activity would not be allowed which would result in an aboveground facility within 1 mile of known peregrine falcon nests, which have been active within the past 3 years.

Habitat Type	Parcels Affected	Protective Measure
Ferruginous Hawk	UT-GEO-004	No surface use or otherwise disruptive activity would be allowed from March 1 through August 1 which would disrupt ferruginous hawk breeding activities within 0.5 mile of an occupied nest. AND No surface use or otherwise disruptive activity would be allowed which would result in an aboveground facility within 0.5 mile of known ferruginous hawk nests, which have been active within the past 3 years.
Bald Eagle Habitat	UT-GEO-01-04, 09-13, 19-21, 33, FS-01, FS-02	Avoidance or use restrictions may be placed on all or portions of the lease. Application of appropriate measures will depend on whether the action is temporary or permanent, and whether it occurs within or outside the bald eagle breeding or roosting season. A <u>temporary</u> action is completed prior to the following breeding or roosting season leaving no permanent structures and resulting in no permanent habitat loss. A <u>permanent</u> action continues for more than one breeding or roosting season and/or causes a loss of eagle habitat or displaces eagles through disturbances, i.e. creation of a permanent structure.
Riparian Areas	all except UT-GEO-004	No surface disturbance or use allowed within 500 feet of riparian areas.
Fisheries	UT-GEO-004	No surface use or otherwise disruptive activity would be allowed within 400 feet of live water or the reservoirs located in the Beaver and Sevier River drainages, Parowan and Cedar Valley drainages, or Pinto Creek/Newcastle Reservoir drainage in order to prevent fisheries degradation.
Waterfowl	All	No surface disturbance allowed from March 15 through July 15 within 0.25 miles of identified surface waters with nesting waterfowl.
BLM Sensitive Species	All	No surface disturbance would be allowed that would result in direct disturbance to populations or individual BLM sensitive species.
Pygmy Rabbit	All	Surveys would be required prior to activity to identify areas containing pygmy rabbit habitat. No surface disturbance would be allowed within 300 feet of pygmy rabbit habitat.
Yellow-Billed Cuckoo	All	Modifications to the Surface Use Plan of Operations may be required in order to protect these resources from surface disturbing activities in accordance with Section 6 of the lease terms, Endangered Species Act, and 43 CFR 3262.11
Utah Prairie Dog	UT-GEO-04	Avoidance and minimization measures in accordance with Section 7 consultation.
Floodplain	UT-GEO-04	Management of floodplains is necessary to take action that avoids impacts associated with the occupancy and modification of floodplains

Habitat Type	Parcels Affected	Protective Measure
Migratory Birds	UT-GEO-07	Address nesting surveys for priority bird species and their habitats. Timing limitations and buffers may be applied as warranted.

No Leasing Alternative

General Wildlife

Under this alternative no leasing would occur and thus impacts to wildlife would be less than those that would occur under the other alternatives. This alternative would provide additional protection to parcels that are found to have wildlife species or crucial habitats that encompass the entire parcel, making it impossible to site even one well without adversely impacting the species. This alternative could protect large blocks of habitat that are important to wildlife species and would be implemented if the BLM determined that the only way to adequately protect the wildlife resource was to not allow leasing in the area.

Sensitive Animal Species

Impact to BLM sensitive animal species would be similar to those described for general wildlife above. While this alternative would provide for protection of sensitive animal species, the seasonal and surface use restrictions under the Proposed Action alternative are considered sufficient to protect sensitive wildlife and their associated habitats that may occur within the planning area, particularly in light of the small amount of disturbance that would be projected to occur. Therefore no leasing for an entire lease is not currently foreseen as a necessary condition for the protection of sensitive wildlife in the planning area.

4.2.7 Vegetation including Special Status Plant Species other than FWS candidate or listed species

No Action Alternative

Geothermal exploration and development could have an impact on individual populations of sensitive plant species if it is not mitigated. Although the amount of disturbance per well site would be small, the removal of vegetation associated with the development of a lease may result in the loss of individual plants or a population of BLM sensitive species. There many sensitive plant species and habitats that have been identified since the LUPs were written and protection for these sensitive species would not necessarily occur in these areas. Therefore, the No Action alternative would not be as protective of these resources as the Proposed Action alternative which would include additional resource protective measures for sensitive plant species and their habitat.

Mitigation presented in the CBGA RMP and the HRRR RMP supplement for the protection of some resources, such as riparian areas, may indirectly benefit some sensitive plant species. However, species-specific protection measures are not included in the FLNF LRMP, CBGA RMP, the HRRR RMP, or the WSRA RMP for the majority of the sensitive species. Where appropriate, and based on site-specific analysis, additional protective measures are needed to keep BLM sensitive species from trending toward being listed under the ESA. Minimization of this impact is considered a priority when locating individual disturbance sites and site-specific analysis would result in management decisions that limit disturbance and/or minimize the impacts of development. Similarly, no mitigation is included that require surveys to determine the presence or absence of BLM sensitive species.

Proposed Action Alternative

This alternative would provide additional protective measures for sensitive plant species and their habitats. There are known occurrences of two different BLM Sensitive Plant Species on three different offered parcels. For the majority of the geothermal lease parcels that are being offered, however, there are no known special status plant species on BLM lands. *Eriogonum nummularum* var. *ammophilum* (sand-loving buckwheat) has been found in parcels UT-GEO-44 & 45. *Sphaeralcea caespitosa* var. *caespitosa* (Jones globemallow) has been found in parcel number UT-GEO-14. The spatial distributions of the two species on these three parcels are quite sparse. Surface occupancy for these three parcels would be restricted from locations where these two plant species are found to occur. The occurrence of the other BLM Sensitive Species is unknown and a plant survey would be necessary before exploration or development activities occurred. Under all alternatives it would be necessary to provide protection for these species by attaching a special status plant notice for not federally-listed species that may require modifications to the operators Surface Use Plan of Operations to protect the plant or its habitat. There are no known plants on the CCFO parcels or on the FLNF parcels.

No Leasing Alternative

Under this alternative the BLM would prohibit leasing and thus would not permit any development or disturbance of the land surface, therefore the sensitive plant species and their habitat would be provided more protection under this alternative.

4.2.8 Invasive, Non-Native Species

No Action Alternative

Soil disturbing activities such as geothermal resource exploration and development could result in the spread of non-native, invasive plant species and noxious weeds. Current practices, on BLM lands, to manage and control noxious and invasive species throughout the nominated parcels would continue as authorized under the 1996 *Noxious Weed Control Environmental Assessment* and the 2007 *Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement* (BLM 2007a). Current noxious weed management practices on Fishlake National Forest lands would continue under the *Fishlake National Forest Environmental Assessment for Noxious Weed Management* (USDA Forest Service 2003). Cooperative agreements with local county and other agencies are also in place to help control further spread and infestation of noxious weeds within the lease parcels. Successful management and control would be accomplished by treating areas where invasive species can become established – such as disturbed soil along roadways, on the margins of well pads, and adjacent to other facilities. To eliminate the spread of noxious and invasive weeds one or both of the following measures would be implemented (1) equipment would be cleaned prior to entering the nominated parcels and (2) equipment would be cleaned prior to exiting the nominated parcels.

Reclamation actions would further reduce the potential for introduction and/or spread of invasive plant species. The entire disturbance area (pad, access roads, etc.) would be reclaimed using either seed mix #1 or seed mix # 2 (Appendix G). Therefore, although soil-disturbing activities could occur under the No Action alternative, practices that are already in place and mitigations that would be required as part of any GDP would limit the potential for establishment or spread of invasive, non-native species.

Proposed Action Alternative

Under the Proposed Action alternative, the management practices would be the same as those discussed under the No Action alternative; however additional protective measures would provide

greater protection against invasive, non-native species. The operator would be required to implement standard BMPs and other measures deemed reasonable for the control of non-native or invasive species as addressed in the management plans. Additionally, no surface disturbance would be allowed on slopes in excess of 30 percent. This mitigation would indirectly benefit vegetation resources when compared to when compared to the No Action alternative by decreasing the risk of erosion and increasing the potential success of rehabilitation of disturbed areas, therein reducing the potential for the spread of invasive species.

In addition, if NSO were applied under this alternative it would provide further resource protection on BLM lands. This stipulation would preclude establishment of wells or well pads or construction of roads, pipelines, or power lines on BLM land. Any geothermal resources extracted from the leases would have to come from wells directionally drilled at an angle underground from adjacent or nearby private lands. The operator would be required to implement standard BMPs associated with rehabilitation of disturbed areas as addressed in management plans for directional drilling from adjacent lands to control the spread of invasive, non-native species.

No Leasing Alternative

Under this alternative the BLM would prohibit leasing and thus would not permit any development or disturbance of the land surface. In light of the small amount of disturbance that would occur on the lease parcels and protective measures implemented under the Proposed Action alternative, application of no leasing is not deemed necessary to address invasive species establishment or spread.

4.2.9 Water Quality

No Action Alternative

Soil disturbing activities such as geothermal resource exploration and development could result in damage to water quality. The BLM may require modification to exploration or development proposals to protect water quality and water resources, or disapprove any activity that is likely to result in adverse effects that cannot be avoided, minimized, or mitigated. Exploration alone would likely have little impact on water quality.

Proposed Action Alternative

Under the Proposed Action alternative, the management practices would be the same as those discussed under the No Action alternative; no specific additional protective measure is proposed to address water quality. The BLM may require modification to exploration or development proposals to protect water quality and water resources, or disapprove any activity that is likely to result in adverse effects that cannot be avoided, minimized, or mitigated. Exploration alone would likely have little impact on water quality.

In addition, if NSO were applied under this alternative it would provide further resource protection on BLM lands. This stipulation would preclude establishment of wells or well pads or construction of roads, pipelines, or power lines on BLM land. Any geothermal resources extracted from the leases would have to come from wells directionally drilled at an angle underground from adjacent or nearby private lands.

No Leasing Alternative

Under this alternative the BLM would prohibit leasing and thus would not permit any development or disturbance of the land surface. In light of the small amount of disturbance that would occur on the lease parcels and protective measures implemented under the Proposed Action alternative, application of no leasing is not deemed necessary to address water quality.

4.2.10 Wetlands/Riparian Zones

No Action Alternative

Soil disturbing activities such as geothermal resource exploration and development could result in damage to wetlands and riparian zones. The *Utah Riparian Management Policy* states that no new surface disturbing activities are allowed within 100 meters of riparian areas unless it can be shown that (A) there are not practical alternatives, (B) all long term impacts can be fully mitigated, or (C) the activity will benefit and enhance the riparian area. The CBGA RMP contains a stipulation that prohibits surface disturbance associated with mineral development within 400 feet of live water. The WSRA RMP supplement contains a stipulation that prohibits surface disturbance within 500 feet of any perennial streams or springs. However, the HRRR RMP or its supplement does not contain any additional protection measures for wetland or riparian areas.

Proposed Action Alternative

Under the Proposed Action alternative, the management practices would be the same as those discussed under the No Action alternative; however, an additional protective measure is proposed to address wetland and riparian zones in parcels that are not protected by the CBGA RMP or the HRRR RMP stipulations. For any parcels that have riparian areas within them (UT-GEO-04, 07, 20, and 48), a lease notice would be attached to any new leases that prohibit surface activities within 500 feet of wetlands or riparian areas. As a result, riparian and wetland areas would be more thoroughly protected under this alternative.

In addition, if NSO were applied under this alternative it would provide further resource protection on BLM lands. This stipulation would preclude establishment of wells or well pads or construction of roads, pipelines, or power lines on BLM land. Any geothermal resources extracted from the leases would have to come from wells directionally drilled at an angle underground from adjacent or nearby private lands.

No Leasing Alternative

Under this alternative the BLM would prohibit leasing and thus would not permit any development or disturbance of the land surface. In light of the small amount of disturbance that would occur on the lease parcels and protective measures implemented under the Proposed Action alternative, application of no leasing is not deemed necessary to address wetlands and riparian zones.

4.2.11 Wilderness/WSA's

No Action Alternative

No wilderness study areas are located within the lease parcels; however, two parcels share a border with WSAs. Parcel UT-GEO-49 is contiguous with the Fish Springs WSA and parcel UT-GEO-46 is contiguous to Swasey Mountain WSA. The boundaries of these leases would need to be clearly identified so the lease operation does not enter the WSA. Also, the area would need to be closely monitored for unauthorized activity in the WSA. Geothermal exploration and development activities on these two parcels would be in the immediate proximity of the WSAs but the sight and sounds of this activity would not be detrimental to the wilderness characteristics of naturalness, outstanding opportunities for solitude, or primitive and unconfined recreation. There would be no impacts to wilderness or wilderness study areas from proposed geothermal leasing.

Proposed Action Alternative

No wilderness study areas are located within the lease parcels; however, two parcels shares a border WSAs. The boundaries of these leases would need to be clearly identified so the lease operation does not enter the WSA. Also, the area would need to be closely monitored for unauthorized activity in the WSA. Under the Proposed Action alternative, the management practices would be the same as those discussed under the No Action alternative; no specific additional protective measure is proposed to address WSAs.

No Leasing Alternative

Under this alternative the BLM would prohibit leasing and thus would not permit any development or disturbance of the land surface. In light of the small amount of disturbance that would occur on the lease parcels and the lack of WSAs within the lease parcels, application of no leasing is not deemed necessary to address WSAs.

4.2.12 Rangeland Health Standards and Guidelines

No Action Alternative

Soil disturbing activities such as geothermal exploration and development could result in changes to the proper functioning condition required to meet guidelines for grazing management according to the *Standards for Rangeland Health and Guidelines for Grazing Management* (BLM 1997). Management goals for the Fishlake National Forest range functions could be unmet for the allotment on Forest Service lands.

Proposed Action Alternative

Under the Proposed Action alternative, the management practices would be the same as those discussed under the No Action alternative; no specific additional protective measure is proposed to address Rangeland Health Standards and Guidelines or the FLNF allotment management plan. As a result, the effects would be similar to those described for the No Action Alternative.

No Leasing Alternative

Under this alternative the BLM would prohibit leasing and thus would not permit any development or disturbance of the land surface. In light of the small amount of disturbance that would occur on the lease parcels and protective measures implemented under the Proposed Action alternative, application of no leasing is not deemed necessary to address Rangeland Health Standards and Guidelines.

4.2.13 Livestock Grazing

No Action Alternative

Soil disturbing activities such as geothermal resource exploration and development could result in changes to livestock grazing opportunities. Any management facilities would need to be either avoided or returned to functioning condition following disruption. The *Standards for Rangeland Health and Guidelines for Grazing Management* (BLM 1997) and the *Utah Riparian Management Policy* would need to be followed to ensure continuation of livestock grazing. On Fishlake National Forest lands, the range function management goals would need to be followed to ensure continuation of livestock grazing.

Proposed Action Alternative

Under the Proposed Action alternative, the management practices would be the same as those discussed under the No Action alternative; no specific additional protective measure is proposed to address livestock grazing. As a result, the effects would be similar to those described for the No Action.

No Leasing Alternative

Under this alternative the BLM would prohibit leasing and thus would not permit any development or disturbance of the land surface. In light of the small amount of disturbance that would occur on the lease parcels, application of no leasing is not deemed necessary to address livestock grazing.

4.2.14 Visual Resources

No Action Alternative

Construction and drilling activities could result in visual impacts under this alternative. New well pads, facilities, and roads would increase visual contrasts created by construction activities within the nominated parcels. These impacts would consist of an increase in vertical and horizontal shapes and lines to the existing landscape. Texture and color of the existing landscape would be impacted by drilling facilities and structures such as storage tanks, pipelines and drill rigs. Contrasts in the majority of the nominated parcels would be minimal, as most of the nominated parcels allow a high level of change to the natural landscape (VRM Class IV). Visual contrasts would be greater in Class III areas. In these areas it is allowable for moderate changes to the natural landscape. Long-term landscape contrasts such as from well pad facilities, roads, etc. yield a more developed visual setting. The contrast in Class II areas would be even greater than those in Class III areas. Class II are managed to retain the existing character of the landscape, with a low level of landscape change. In these areas, mitigation may be needed to meet conformance with VRM management objectives. The introduction of long-term visual modifications that create contrast would reduce visual harmony within the overall landscape.

The majority (1,724 acres) of the FLNF lands are within moderate SIO classification, with the remaining (1,317 acres) classified as SIO high. In lands designated as moderate, the valued landscape character may appear to be slightly altered and noticeable deviations must remain 'visually subordinate' to the landscape character (USDA 1996). In areas designated as high, the valued landscape character must appear to be unaltered. Deviations may be present, but must repeat the line, form, color, and texture present in the landscape character (USDA 1996). The FLNF LRMP suggests all semi-permanent and permanent facilities may require camouflage or painting to better blend in with the natural landscape. However, in areas of high SIO development would be avoided. Development would be limited and any development that did occur would be easily repaired, not permanent, and not noticeable (personal communication, Dave Christiansen, Fishlake National Forest, 30 Oct 2008).

Proposed Action Alternative

Impacts to visual resources from implementation of the Proposed Action alternative would be similar to those described for the No Action alternative but the locations of disturbance may be different due to implementation under this alternative of protective measures for wildlife and other resources. In addition a controlled surface use measure would be attached to leases under this alternative for the protection of VRM Class II and moderate SIO areas. This would allow only short-term or mitigable visual intrusions on VRM Class II lands for the purpose of preserving the form, line, color or texture of the landscape so as not to attract the viewer's

attention. As a result, this alternative would result in fewer potential impacts to visual resources within the planning area than the No Action alternative.

NSO could also be applied under this alternative for protection of other resources, prohibiting any development or disturbance of the land surface associated with a parcel. Any geothermal resources extracted from the leases would have to come from wells directionally drilled from adjacent or nearby private or public lands. This alternative would indirectly result in greater protection to visual resources than the No Action alternative and would ensure VRM objectives are met in Class II areas.

No Leasing Alternative

Under this alternative the BLM would prohibit leasing and thus would not permit any development or disturbance of the land surface. In light of the small amount of disturbance that would occur on the lease parcels and the additional protective measures in the Proposed Action alternative, application of no leasing is not deemed necessary to address VRM or SIO.

4.2.15 Geology and Mineral Resources

No Action Alternative

Soil disturbing activities such as geothermal exploration and development could result in changes to mineral resources if exploration resulted in production. However, exploration alone would have no effect on mineral resources. If geothermal resource production occurred as a result of exploration, it would result in a temporary removal of those resources.

Proposed Action Alternative

Under the Proposed Action alternative, the management practices would be the same as those discussed under the No Action alternative; no specific additional protective measure is proposed to address mineral resources. As a result, the effects would be similar to those described for the No Action. If geothermal resource production occurred as a result of exploration, it would result in a temporary removal of those resources.

In addition, if NSO were applied under this alternative it would provide further resource protection on BLM lands. This stipulation would preclude establishment of wells or well pads or construction of roads, pipelines, or power lines on BLM land. Any geothermal resources extracted from the leases would have to come from wells directionally drilled at an angle underground from adjacent or nearby private lands.

No Leasing Alternative

Under this alternative the BLM would prohibit leasing and thus would not permit any development or disturbance of the land surface. In light of the small amount of disturbance that would occur on the lease parcels, application of no leasing is not deemed necessary to address geology or mineral resources.

4.2.16 Lands/Access

No Action Alternative

Soil disturbing activities such as geothermal exploration and development could result in changes to access to public lands. All leases would be subject to valid existing right-of-ways (ROW). Existing roads and trails would be used unless otherwise authorized. Any ruts deeper than four inches resulting from wet road conditions would be repaired at the Authorized Officer's discretion. Site-specific mitigation at the GDP stage would ensure that all existing ROWs, including, but not limited to communication sites, water projects, and power lines would be

avoided, restored or replaced. All leases would be subject to existing designated corridors and the applicable terms associated with each corridor.

Proposed Action Alternative

Under the Proposed Action alternative, the management practices would be the same as those discussed under the No Action alternative; no specific additional protective measure is proposed to address public lands and access.

In addition, if NSO were applied under this alternative it would provide further resource protection on BLM lands. This stipulation would preclude establishment of wells or well pads or construction of roads, pipelines, or power lines on BLM land. Any geothermal resources extracted from the leases would have to come from wells directionally drilled at an angle underground from adjacent or nearby private lands.

No Leasing Alternative

Under this alternative no development or disturbance of the land surface would be permitted. Thus, there would be no impact on lands and access.

4.2.17 Socioeconomic Conditions

No Action Alternative

Geothermal exploration and development could result in changes to the economics of the area. If geothermal resources are found, this could provide jobs to the residents of the area and revenue to the Counties and State of Utah.

Proposed Action Alternative

Under the Proposed Action alternative, the management practices would be the same as those discussed under the No Action alternative; no specific additional protective measure is proposed to address socio-economics. As a result, the effects would be similar to those described for the No Action.

No Leasing Alternative

Under this alternative no development or disturbance of the land surface would be permitted. Thus, no economic opportunities would be provided by geothermal leasing.

4.2.18 Wilderness Characteristics

This analysis is only applicable to those citizen proposed areas that have been inventoried and/or reviewed by the BLM in the 1999 wilderness inventory, 2003 and the 2008 wilderness character review. There are several citizen proposed areas within the project area that have not been reviewed at this time and are not included in this analysis.

No Action Alternative

Soil disturbing activities such as geothermal resource exploration and development could result in changes to lands with wilderness characteristics, including loss of natural appearance over a moderate length of time before restoration and natural reclamation would return impacted areas to a natural appearance, and reduced opportunity for solitude or primitive recreation for a short term basis generally covering those times where drilling activity is occurring. There are 184,972 acres of land determined to have wilderness characteristics within the project area. Of this acreage, approximately 13,330 acres could be impacted by geothermal exploratory activity. Since the RFD

only anticipates a net land disturbance of 41 acres, the impact to lands with wilderness characteristics is anticipated to be small.

Proposed Action Alternative

Under the Proposed Action alternative, the management practices would be the same as those discussed under the No Action alternative; no specific additional protective measure is proposed to land with wilderness characteristics. As a result, the effects would be similar to those described for the No Action.

In addition, if NSO were applied under this alternative it would provide further resource protection on BLM lands. This stipulation would preclude establishment of wells or well pads or construction of roads, pipelines, or power lines on BLM land. Any fluid minerals extracted from the leases would have to come from wells directionally drilled at an angle underground from adjacent or nearby private lands. This alternative would indirectly result in greater protection to lands with wilderness characteristics than the No Action Alternative.

No Leasing Alternative

Under this alternative no development or disturbance of the land surface would be permitted associated with a parcel. Thus greater protection to lands with wilderness characteristics would be provided than under the Proposed Action or No Action alternatives.

4.2.19 Wild Horses and Burros

No Action Alternative

Soil disturbing activities such as geothermal resource exploration and development could result in impacts to wild horses and burros, specifically, displacement of the herd located on parcels UT-GEO-23, 24, 31, 32, 41, 42, 44-47. However, since the RFD only anticipates a net land disturbance of 41 acres, the impact to wild horses and burros is anticipated to be small.

Proposed Action Alternative

Under the Proposed Action alternative, the management practices would be the same as those discussed under the No Action alternative; no specific additional protective measure is proposed to address wild horses and burros. As a result, the effects would be similar to those described for the No Action.

No Leasing Alternative

Under this alternative no development or disturbance of the land surface would be permitted. Thus, there would be no impact on wild horses and burros.

4.3 Cumulative Impacts Analysis

Because there is limited knowledge concerning the occurrence, location, and suitability for developing geothermal resources in the area proposed for leasing, it is not possible to quantify the number of facilities that may eventually be built on the leased areas or to identify their specific location. As a result, the discussion of cumulative impacts is somewhat generalized and conceptual at the leasing stage. Specific impacts and associated mitigation measures of subsequent activities would be addressed in the required post-leasing analysis and approval process when details of such activities are known.

The Cove Fort -Sulphurdale Facility are directly adjacent to the two Forest Service Parcels (FS-01 & FS-02), UT-GEO-001 and GEO-009 through -013. The Roosevelt Hot Springs facility is adjacent to UT-GEO-002 & -003. No parcels are adjacent to the Thermo facility. However, as discussed in the RFD, pg 3. "All of the parcels are located in an area where evidence of

geothermal activity is abundant and two existing geothermal power plants are currently being expanded.” Geothermal energy is a renewable and sustainable energy.

The Geothermal Steam Act of 1970 required competitive bidding for leases in areas classified as Known Geothermal Resource Areas (KGRAs) by the USGS. Lands could be classified as KGRAs on the basis of geological evidence or if overlapping applications were filed for noncompetitive leases. Nine areas, including almost 128,000 acres in southwestern Utah, were identified as KGRAs in the 1970s as a result of geological evidence or overlapping lease applications. Numerous leases, both competitive and noncompetitive, were issued in the 1970s in central and southern western Utah.

At this time exploration projects were initiated, especially in some of the KGRAs. Exploration involved several types of geophysical investigations and drilling. Drilling included shallow temperature gradient hole, usually less than 500 feet deep, as well as deeper stratigraphic test wells. This exploration confirmed the existence of a viable geothermal resource at both the Roosevelt Hot Spring KGRA and the Cove Fort-Sulphurdale KGRA. Additional exploration and development drilling at these two KGRAs led to the construction of two relatively small power plants in the 1980s. Both of these plants are currently being expanded and additional production and injection wells drilled. Lower temperature thermal waters found in other areas had the potential for direct use applications but, due to their remote locations, are largely undeveloped.

There was little interest in geothermal resources in the later 1980s as energy prices fell and the market for additional geothermal generated power vanished. Some of the existing leases were dropped and when others terminated there was little interest in releasing. In 1988, following Washington Office instructions, all unleased lands in the nine KGRAs were offered for competitive bidding but no bids were received. This demonstrated lack of competitive interest resulted in the elimination of all lands included in KGRAs solely on the basis of overlapping lease applications. After this action only three KGRAs (Crater Springs, Roosevelt and Cove Fort-Sulphurdale) including 58,484 acres remained. A short time later, overlapping lease applications were received for a parcel in the former Thermo Hot Springs KGRA and a new KGRA containing 641 acres was established.

Summaries of three projects underway are shown below:

- At the Cove Fort-Sulphurdale geothermal area, the Utah Municipal Power Agency and Provo City generated power (beginning in 1985) from the Bonnett plant until it shut down in 2003. The project was acquired by Amp Resources and later sold to Enel North America Inc. in March 2007. Enel is currently evaluating the resource and plans to build the first phase of a geothermal binary power plant by 2010, using a deep, liquid-dominated resource. Enel also has plans for an additional 7 MWe steam plant, taking advantage of a shallow, dry-steam resource.
- At the Roosevelt Hot Springs geothermal area, PacifiCorp (Rocky Mountain Power) has operated the Blundell plant since 1984. The company completed an expansion using an Ormat Energy Converter (binary power plant) in November 2007, and is considering expansion for an additional 35 MWe.
- At the Thermo Hot Springs geothermal area, Raser Technologies, Inc. recently completed a power purchase agreement for delivery of up to 11 MWe.

Increased surface disturbance from the alternatives would impact soils, native vegetation, and wildlife habitat and increase the risk of noxious weed invasion and spread. It is anticipated that the additional resource protection measures associated with the Proposed Action and No Leasing alternatives would reduce the impacts to specific resources and areas within the nominated parcels. Based on a continuation of drilling exploration wells within the Fillmore and Cedar City Districts – an analysis area consisting of about 191,911 acres of federal land – at the rate of about

60 temperature gradient holes and 13 exploratory wells over 15 years. All of the parcels are located in an area where evidence of geothermal activity is abundant and two existing geothermal power plants are currently being expanded. Therefore, a rating of moderate (M) occurrence potential for geothermal resources for the nominated parcels is warranted. More site-specific evidence for elevated thermal gradients within and near parcels UT-GEO-19 through UT-GEO-47 probably support a high potential rating (H) for these parcels. A certainty rating of B is given for all parcels except UT-GEO-19 through UT-GEO-47 where certainty is rated as C.” It is anticipated that a total of approximately of 366 acres of surface disturbance would occur over 15 years from geothermal exploration activities. Only approximately 41 acres would remain disturbed after reclamation resulting from exploratory actions (Table 2 Appendix F). The predicted total net disturbance from production is 148 acres, with a total exploratory and production net disturbance of 189 acres, which is less than 1% of the total area considered for leasing. The minimal amount of disturbance associated with the expected level of development in the planning area, in combination with BMPs and additional measures that would minimize development impacts would result in a negligible cumulative impact on the resources within the nominated parcels.

4.4 Irreversible or Irrecoverable Commitments of Resources

Both short- and long-term effects could result from the activities analyzed in this EA. Short-term effects would occur for the duration of geothermal resource exploration and production activities, whereas long-term refers to an indefinite period beyond the termination of geothermal resource production. Most of the effects discussed in Chapter 4 are considered to be short-term because the main effects would occur during the construction and exploration phases and would be reduced through BMPs and mitigation measures. Irreversible commitments are those that cannot be reversed, except in the extreme long-term, and irretrievable commitments are those that are lost for a period of time. Irreversible resource commitments occur when there is unavoidable destruction of natural resources that could limit the range of potential uses of that particular environment. Irreversible commitments apply primarily to nonrenewable resources, such as cultural resources, and also to those resources that are renewable only over long periods of time, such as soil productivity or forest health. Irrecoverable resource commitments occur when use or consumption of the resource is neither renewable nor recoverable for future use. Irrecoverable commitments apply to loss of production, harvest, or use of natural resources. These include the use of nonrenewable resources such as metal, fuel, and other natural or cultural resources considered non-retrievable, in that they would be used for the proposed action when they could have been conserved or used for other purposes. No irreversible commitments of resources would result from geothermal leasing. Conservation measures would be implemented where applicable and energy requirements may be improved by the project.

5 CONSULTATION/COORDINATION

This chapter lists individual resource specialists within the BLM who participated in the preparation of this EA as well as other individuals/agencies/Tribes who contributed to this EA or who were contacted during its development. The issues analyzed in detail in Chapters 3 and 4 were produced through input from those identified below.

5.1 Agency and Tribal Consultation

Tribal Consultation

The following agencies and Tribes were consulted in the development of this analysis: the Paiute Tribe of Utah, Confederated Tribes of the Goshute Reservation, Kanosh Band of the Paiute Tribe, Skull Valley Goshute Tribe, the Hopi Tribe, and the Ute Tribe. A copy of the tribal consultation

letter sent on 9/30/08 is contained in Appendix E. Copies of response letters that have been received are in Appendix H.

Utah SHPO Consultation

The BLM has determined that leasing parcels is an undertaking as defined in 36 CFR 800.16(y). According to Part VII.A.B (1) of the Utah Protocol, the BLM can request the review of the Utah State Historic Preservation Office (SHPO) prior to project implementation. The BLM received concurrence with a “No Historic Properties Affected” determination from the SHPO on 11/17/08. This concurrence is based on the existing information and our Native American consultation, proposed parcels 02, 03, 48-53 and portions of parcels 14 and 15 (east side of Hwy 257) would be deferred. Parcels 05 and 06 would be offered with a conditional No Surface Occupancy stipulation. Other parcels involved in the December 2008 Lease Offering, parcels 1, 7, 8-13, 16-47, FS1, FS2 and portions of 14 and 15 (west side of Hwy 257) could be offered for lease.

United States Forest Service

The USFS reviewed the environmental assessment in consideration of their procedural requirements. The agency was unable to consent to leasing on the parcels within their jurisdiction, specifically north and east of Cove Fort. Additional information is needed to determine the effects of leasing on inventoried roadless areas.

Utah Division of Wildlife Resources

Through the State of Utah (PLPCO/RDCC), UDWR provided information on mule deer, elk and sage-grouse crucial habitats. The State of Utah also recommended that general mitigation be coordinated through UPCD efforts. Oversights were corrected and applicable lease notices were added to parcels FS-01 and 02.

United States Fish and Wildlife Service

The USFWS has reviewed the parcels and has provided specific feedback to the BLM. All comments were double checked against BLM’s listing of applicable lease notices. When applicable, oversights were corrected. As such, lease notices were added to parcels UT-GEO-001, UT-GEO -004, and UT-GEO -007. In some cases, their information prompted the creation of new lease notices (eg. Migratory Birds and floodplains) which were added to parcels 04 and 07.

5.2 Public Involvement

In order to meet the intent of the CEQ regulations that require an “early and open process for determining the scope of issues to be addressed and for identifying significant issues related to a Proposed Action” (40 CFR 1501.7) several actions were taken to involve the public. A 15-day scoping period was conducted beginning Sept. 2, 2008. Scoping comments were received from Southern Utah Wilderness Alliance. The proposal was listed on the Utah BLM Environmental Notification Bulletin Board (ENBB) (<http://www.blm.gov/ut/st/en/info/nepa/enbb.html>). In addition to scoping, BLM opened a 30 day comment period on the environmental assessment which ended on 12/4/2008. The results of the comment period are provided in Section 5.4.

5.3 List of Preparers

The following BLM and non-BLM personnel participated in this analysis:

Name	Title
Bureau of Land Management, Utah State Office	
Terry Catlin	Energy Team Lead
Julie Howard	Archaeologist
Al McKee	Petroleum Engineer
Mike McKinley	Environmental Scientist
Dave Mermejo	NRS, Special Designations
Robin Naeve	Wildlife Biologist
James Fouts	Geologist
Pam Schuller	Environmental Specialist
Bureau of Land Management, Fillmore Field Office	
Steve Bonar	Outdoor Recreation Specialist
Paul Caso	Rangeland Management Specialist
Jerry Mansfield	Geologist
Joelle McCarthy	Archaeologist
Bill Thompson	Rangeland Management Specialist
Matt Rajala	Natural Resource Specialist
Clara Stevens	Realty Specialist
David Whitaker	Rangeland Management Specialist
Bureau of Land Management, Cedar City Field Office	
Becky Bonebrake	Wildlife Biologist, T&E Animals
Jessica Bulloch	Natural Resources Specialist
Gardiner Dalley	Archaeologist
Dan Fletcher	Rangeland Management Specialist
Craig Egerton	Renewable Resources Team Leader
Ed Ginouves	Geologist
Chad Hunter	Wild Horse and Burro Specialist
Melanie Mendenhall	Natural Resources Specialist
Christine Pontarolo	Wildlife Biologist
S. Roche'	Outdoor Recreation Planner
Rachel Tueller	Public Affairs Officer
Rob Wilson	Realty Specialist
Fish Lake National Forest	
Chris Colt	Wildlife Biologist
Robert Leonard	Archaeologist
Non-BLM Preparers (Ecosystem Management, Inc.)	
Nina Harris	Archaeologist
Stephanie Lee	Biologist, GIS Technician
Mike Tremble	Environmental Scientist, Consultant Project Lead
Jill Wick	Biologist
Kate Wright	Archaeologist

5.4 Response to Comments

The BLM received seven letters from interested publics and agencies during the public comment period on the environmental assessment. Appendix I contains copies of the comments from: the State of Utah, Office of the Governor, Public Lands Policy Coordination; USDI, National Park Service; Terra Caliente, LLC; Utah Environmental Congress; Utah Historic Trails Consortium; National Pony Express Association; and the Southern Utah Wilderness Alliance. Of these, three letters were received as protests. While the Geothermal Leasing Regulations do not provide for protests on leasing actions, the BLM has acknowledged the issues contained in the letters as a “comment.”

The majority of the comments are relevant to the GDP stage of geothermal activity on the public lands. Mitigation of surface disturbance would include appropriate timing of activities that address requirements of wildlife and soils or noxious weed control efforts. These would be outlined in or requirements of a Plan of Development and conditions of approval attached to a GDP.

Crucial wildlife habitats for mule deer, elk and sage-grouse do occur within the analysis area. The BLM refers to the lease stipulations and notices contain in the December 2008 Geothermal Sale List located at: http://www.blm.gov/ut/st/en/prog/energy/geothermal0/december_2008_geothermal0.html. The wildlife crossings along Interstate – 80 would not be impacted and would receive additional attention at the GDP stage should a parcel be leased. Lease Notice: Crucial Winter Mule Deer and Elk Habitat (GEO-LN-01) has been added to parcels UT-GEO-01, FS-01 and FS-02. GEO-LN-01 restricts activities from 12/1-4/30. Lease notices for nesting, brood-rearing, winter habitat, and leks are identified in GEO-LN-06, GEO-LN-07 and GEO-LN-08, respectively. The lease notices comply with the BLM’s 6840 policy for sensitive species. To comply with Utah’s Plan for Sage-grouse and Development, lease notice GEO-LN-08 has been modified to limit development within 0.5 mile of a lek. In addition, lease notices GEO-LN-6 and GEO-LN-7 remain consistent with the intent of the State’s plan.

As suggested, the BLM will pursue and further coordinate with the UPCD partners on habitat improvements and maintenance of investments in existing and future projects. Likewise, the BLM values the efforts of cooperating agencies who participate in the preparation of planning actions. The BLM will continue to consult with agencies with jurisdiction by law or special expertise in the development of stipulations for conducting geothermal activities on the public land.

The BLM remains committed to the excellent management of the Nation’s historic trails. The National Park Service and the BLM share the stewardship responsibility for providing the protections outlined in their respective management plans. In consultation with the SHPO and Native American Tribes and response to issues raised by NPS, National Pony Express Association and Consortium, BLM determined that the important visual nature associated with parcels UT-GEO-48 through UT-GEO-53 would be adversely affected by geothermal exploration and development. Further consultations with the National Park Service would be completed as warranted on a site specific basis to protect the NHT corridor.

BLM determinations regarding the management of wilderness characteristics have not been made in the Fillmore Office to the same extent as other Utah BLM offices that have recently completed. The wilderness character review conducted by the Fillmore ID team addressed only the potential possibility of wilderness characteristics within specific units. Unlike the other Utah BLM offices that have conducted similar reviews for wilderness character; the Fillmore determinations do not address or establish management decisions for these areas. This review addressed the potential for wilderness character in several specific citizen proposed wilderness areas that contained geothermal parcels nominated for the December lease sale. Wilderness character reviews are an

interim step in the BLM's internal decision making process. Determinations of wilderness character and no wilderness character do not constitute an appealable decision, pending a plan amendment or revision of the existing land use plan(s). Parcel sizes are based on legal descriptions of allocate parts.

The inventoried roadless areas within the Fishlake NF are undergoing additional analysis. The USFS requires further analysis on inventoried roadless areas and the potential impacts of geothermal leasing. The full analysis would be required before the BLM can consider leasing the geothermal resources.

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APPENDICES

APPENDIX A: Nominated Geothermal Parcels

LANDS NOT IN A BLOCK

UT-GEO-001

T. 25 S., R.8 W., Salt Lake Meridian
Sec. 11, 12, and 13, all.
1,920.00 Acres
Millard County, Utah
Fillmore Field Office

UT-GEO-002

T. 26 S., R. 9 W., Salt Lake Meridian
Secs. 26, 27, 28, and 33, all;
Sec. 34, W2W2;
Sec. 35, E2, E2NW, NESW.
3,160.00 Acres
Beaver County, Utah
Cedar City Field Office

UT-GEO-003

T. 27 S., R. 9 W., Salt Lake Meridian
Sec. 1, all;
Sec. 4, SW, W2SE, NESE;
Sec. 9, W2, W2NE, NWSE;
Sec. 11, E2, E2W2, SWNW, W2SW;
Sec. 14, all;
Sec. 15, E2E2, SWSE.
2,481.40 Acres
Beaver County, Utah
Cedar City Field Office

UT-GEO-004

T. 36 S., R. 15 W., Salt Lake Meridian
Sec. 22, N2, SE.
480.00 Acres
Iron County, Utah
Cedar City Field Office

LANDS IN A BLOCK

BLOCK NAME: Neels East Siding

TOTAL ACRES IN BLOCK: 6,659.07

UT-GEO-005

T. 19 S., R. 6 W., Salt Lake Meridian

Secs. 19, 30, and 31, all.

2,010.52 Acres

Millard County, Utah

Fillmore Field Office

UT-GEO-006

T. 20 S., R. 6 W., Salt Lake Meridian

Sec. 6, all.

727.17 Acres

Millard County, Utah

Fillmore Field Office

UT-GEO-007

T. 19 S., R. 7 W., Salt Lake Meridian

Secs. 23, 24, and 25, all;

Sec. 26, N2, N2SW, SWSW, SE;

Sec. 35, all.

3,160.00 Acres

Millard County, Utah

Fillmore Field Office

UT-GEO-008

T. 20 S., R. 7 W., Salt Lake Meridian

Sec. 1, all.

661.38 Acres

Millard County, Utah

Fillmore Field Office

LANDS IN A BLOCK**BLOCK NAME: Dog Valley****TOTAL ACRES IN BLOCK: 11,713.57 Acres****UT-GEO-009**

T. 25 S., R. 6 W., Salt Lake Meridian
Sec. 19, Lots 3, 4, 7-10, NESW, W2SE.
250.15 Acres
Millard County, Utah
Fillmore Field Office

UT-GEO-10

T. 25 S., R. 7 W., Salt Lake Meridian
Secs. 3, 4, and 5, all.
1,891.64 Acres
Millard County, Utah
Fillmore Field Office

UT-GEO-11

T. 25 S., R. 7 W., Salt Lake Meridian
Secs. 6, 7, 8, 9, 10, 11, and 14.
4,516.45 Acres
Millard County, Utah
Fillmore Field Office

UT-GEO-12

T. 25 S., R. 7 W., Salt Lake Meridian
Secs. 15, 17, 18, 19, 20, and 21, all;
Sec. 22, N2, SW.
4,371.00 Acres
Millard County, Utah
Fillmore Field Office

UT-GEO-13

T. 25 S., R. 7 W., Salt Lake Meridian
Sec. 23, N2, E2SE;
Sec. 24, Lots 7-11, SWNE, NESW.
684.30 Acres
Millard County, Utah
Fillmore Field Office

LANDS IN A BLOCK

BLOCK NAME: Neels Siding

TOTAL ACRES IN BLOCK: 20,113.35 Acres

UT-GEO-14

T. 20 S., R. 8 W., Salt Lake Meridian

Sec. 19, and 20, all;

Sec. 29, W2NE, W2;

Secs. 30, 31, 33, and 34, all.

4,237.08 Acres

Millard County, Utah

Fillmore Field Office

UT-GEO-15

T. 21 S., R. 8 W., Salt Lake Meridian

Secs. 3, 4, 5, 6, 9, and 10, all.

3,820.11 Acres

Millard County, Utah

Fillmore Field Office

UT-GEO-16

T. 19 S., R. 9 W., Salt Lake Meridian

Secs. 29, and 30, all;

Sec. 31, Lots 3, 4, S2NE, E2SW, SE;

Secs. 33, and 34, all.

2,994.72 Acres

Millard County, Utah

Fillmore Field Office

UT-GEO-17

T. 20 S., R. 9 W., Salt Lake Meridian

Secs. 1, 3, 4, 9, 10, 11, and 12, all.

4,581.44 Acres

Millard County, Utah

Fillmore Field Office

UT-GEO-18

T. 20 S., R. 9 W., Salt Lake Meridian

Secs. 13, 14, 15, 23, 24, 25, 26, and 35, all.

4,480.00 Acres

Millard County, Utah

Fillmore Field Office

LANDS IN A BLOCK

**BLOCK NAME: 14 SOUTH RANGE 11 WEST
AND
14 SOUTH RANGE 12 WEST
TOTAL ACRES IN BLOCK: 20,437.32 Acres**

UT-GEO-19

T. 14 S., R. 11 W., Salt Lake Meridian
Secs. 4, 5, 6, 7, 8, 9, 17, and 18, all.
5,094.76 Acres
Juab County, Utah
Fillmore Field Office

UT-GEO-20

T. 14 S., R. 11 W., Salt Lake Meridian
Secs. 19, 20, 21, 22, 28, 29, 30, 31, and 33, all.
5,102.64 Acres
Millard County, Utah
Fillmore Field Office

UT-GEO-21

T. 14 S., R. 12 W., Salt Lake Meridian
Secs. 1, 3, 10, 11, 12, 13, 14, and 15, all.
5,119.92 Acres
Juab County, Utah
Fillmore Field Office

UT-GEO-22

T. 14 S., R. 12 W., Salt Lake Meridian
Secs. 22, 23, 24, 25, 26, 27, 34, and 35, all.
5,120.00 Acres
Juab County, Utah
Fillmore Field Office

LANDS IN A BLOCK

BLOCK NAME: West Side - 14 SOUTH RANGE 12 WEST

TOTAL ACRES IN BLOCK: 10,179.68 Acres

UT-GEO-23

T. 14 S., R. 12 W., Salt Lake Meridian

Secs. 4, 5, 6, 7, 8, 9, 17, and 18, all.

5,085.68 Acres

Juab County, Utah

Fillmore Field Office

UT-GEO-24

T. 14 S., R. 12 W., Salt Lake Meridian

Secs. 19, 20, 21, 28, 29, 30, 31, and 33, all.

5,094.00 Acres

Juab County, Utah

Fillmore Field Office

LANDS IN A BLOCK

BLOCK NAME: 15 SOUTH RANGE 11 WEST

TOTAL ACRES IN BLOCK: 20,546.00 Acres

UT-GEO-25

T. 15 S., R. 11 W., Salt Lake Meridian

Sec. 1, Lots 1-14, SESE;

Secs. 3, 10, 11, 12, 13, 14, and 15, all. (excluding patented mining claims).

5,162.58 Acres

Millard County, Utah

Fillmore Field Office

UT-GEO-26

T. 15 S., R. 11 W., Salt Lake Meridian

Secs. 4, 5, 6, 7, 8, 9, 17, and 18, all.

5,161.52 Acres

Millard County, Utah

Fillmore Field Office

UT-GEO-27

T. 15 S., R. 11 W., Salt Lake Meridian

Sec. 19, 20, 21, 28, 29, 30, 31, and 33, all.

5,102.29 Acres

Millard County, Utah

Fillmore Field Office

UT-GEO-28

T. 15 S., R. 11 W., Salt Lake Meridian

Secs. 22, 23, 24, 25, 26, 27, 34, and 35, all.

5,120.00 Acres

Millard County, Utah

Fillmore Field Office

LANDS IN A BLOCK

**BLOCK NAME: 16 SOUTH RANGE 11 WEST
AND**

16 SOUTH RANGE 12 WEST

TOTAL ACRES IN BLOCK: 10,977.40 Acres

UT-GEO-29

T. 16 S., R. 11 W., Salt Lake Meridian

Secs. 4, 5, and 6, all.

2,364.84 Acres

Millard County, Utah

Fillmore Field Office

UT-GEO-30

T. 16 S., R. 11 W., Salt Lake Meridian

Secs. 7, 8, 9, 17, and 18, all.

3,198.56 Acres

Millard County, Utah

Fillmore Field Office

UT-GEO-31

T. 16 S., R. 12 W., Salt Lake Meridian

Secs. 1, 11, 12, 13, and 14, all.

3,348.00 Acres

Millard County, Utah

Fillmore Field Office

UT-GEO-32

T. 16 S., R. 12 W., Salt Lake Meridian

Secs. 3, 10, and 15, all.

2,066.00 Acres

Millard County, Utah

Fillmore Field Office

LANDS IN A BLOCK**BLOCK NAME: North Drum Mountain****TOTAL ACRES IN BLOCK: 25,757.979 Acres****UT-GEO-33**

T. 13 S., R. 12 W., Salt Lake Meridian

Sec. 2, Tract A, Tract B;

Sec. 3, all;

Sec. 4, Lots 1, 2, S2NE;

Sec. 10, Lots 1-5 N2, SE (Excluding Pat Mining Claim)

Sec. 11, all;

Sec. 12, S2;

Secs. 13, and 14, all;

Sec. 15, E2.

3,996.419 Acres

Millard County, Utah

Fillmore Field Office

UT-GEO-34

T. 13 S., R. 12 W., Salt Lake Meridian

Sec. 17, S2;

Sec. 18, Lots 2-4, S2NE, SENW, E2SW, SE.

790.10 Acres

Millard County, Utah

Fillmore Field Office

UT-GEO-35

T. 13 S., R. 12 W., Salt Lake Meridian

Secs. 19, 20, 21, 28, 29, 30, 31, and 33, all.

5,083.28 Acres

Millard County, Utah

Fillmore Field Office

UT-GEO-36

T. 13 S., R. 12 W., Salt Lake Meridian

Secs. 22, 23, 24, 25, 26, 27, 34, and 35, all.

5,120.00 Acres

Millard County, Utah

Fillmore Field Office

CONTINUED: North Drum Mountain

BLOCK NAME: North Drum Mountain

UT-GEO-37

T. 13 S., R. 13 W., Salt Lake Meridian
Sec. 1, Lots, 7, 9, 11, 12, S2SW;
Secs. 3, 10, and 11, all;
Sec. 12, Lots 2, 3, 6, 7, W2;
Sec. 13, 14, and 15, all.

4,507.22 Acres

Millard County, Utah

Fillmore Field Office

UT-GEO-38

T. 13 S., R. 13 W., Salt Lake Meridian
Secs. 22, 23, 24, 25, 26, 27, 34, and 35, all.

5,120.00 Acres

Millard County, Utah

Fillmore Field Office

LANDS IN A BLOCK**BLOCK NAME: 15 SOUTH RANGE 12 WEST****TOTAL ACRES IN BLOCK: 20,547.36 Acres****UT-GEO-39**

T. 15 S., R. 12 W., Salt Lake Meridian
Secs. 1, 10, 11, 12, 13, 14, and 15, all.
4,497.48 Acres
Millard County, Utah
Fillmore Field Office

UT-GEO-40

T. 15 S., R. 12 W., Salt Lake Meridian
Secs. 3, and 4, all.
1,314.08 Acres
Millard County, Utah
Fillmore Field Office

UT-GEO-41

T. 15 S., R. 12 W., Salt Lake Meridian
Secs. 5, 6, 7, 8, 9, 17, and 18, all.
4,499.48 Acres
Millard County, Utah
Fillmore Field Office

UT-GEO-42

T. 15 S., R. 12 W., Salt Lake Meridian
Secs. 19, 20, 21, 28, 29, 30, 31, and 33, all.
5,116.32 Acres
Millard County, Utah
Fillmore Field Office

UT-GEO-43

T. 15 S., R. 12 W., Salt Lake Meridian
Secs. 22, 23, 24, 25, 26, 27, 34, and 35, all.
5,120.00 Acres
Millard County, Utah
Fillmore Field Office

LANDS IN A BLOCK

BLOCK NAME: 14 SOUTH RANGE 13 WEST

TOTAL ACRES IN BLOCK: 20,422.72 Acres

UT-GEO-44

T. 14 S., R. 13 W., Salt Lake Meridian

Secs. 1, 3, 10, 11, 12, 13, 14, and 15, all.

5,119.92 Acres

Millard County, Utah

Fillmore Field Office

UT-GEO-45

T. 14 S., R. 13 W., Salt Lake Meridian

Secs. 4, 5, 6, 7, 8, 9, 17, and 18, all.

5,089.12 Acres

Millard County, Utah

Fillmore Field Office

UT-GEO-46

T. 14 S., R. 13 W., Salt Lake Meridian

Secs. 19, 20, 21, 28, 29, 30, 31, and 33, all.

5,093.68 Acres

Millard County, Utah

Fillmore Field Office

UT-GEO-47

T. 14 S., R. 13 W., Salt Lake Meridian

Secs. 22, 23, 24, 25, 26, 27, 34, and 35, all.

5,120.00 Acres

Millard County, Utah

Fillmore Field Office

LANDS IN A BLOCK**BLOCK NAME: Fish Springs****TOTAL ACRES IN BLOCK: 14,120.40 Acres****UT-GEO-48**

T. 11 S., R. 14 W., Salt Lake Meridian

Sec. 3, Lots 1-8, 11-14, SW.

Secs. 4, 5, 6, and 7 all.

4,145.32 Acres

Juab County, Utah

Fillmore Field Office

UT-GEO-49

T. 11 S., R. 14 W., Salt Lake Meridian

Secs. 8, 17, 18, 19, and 20, all. (Excluding Mining Patent)

2,411.00 Acres

Juab County, Utah

Fillmore Field Office

UT-GEO-50

T. 11 S., R. 15 W., Salt Lake Meridian

Sec. 21, 22, and 23, all.

1,920.00 Acres

Juab County, Utah

Fillmore Field Office

UT-GEO-51

T. 11 S., R. 15 W., Salt Lake Meridian

Secs. 24, 26, 27, 28, 29, 31, and 33. all.

4,040.00 Acres

Juab County, Utah

Fillmore Field Office

UT-GEO-52

T. 12 S., R. 15 W., Salt Lake Meridian

Sec. 6, all;

677.00 Acres

Juab County, Utah

Fillmore Field Office

UT-GEO-53

T. 12 S., R. 16 W., Salt Lake Meridian

Sec. 1, all.

701.40 Acres

Juab County, Utah

Fillmore Field Office

LANDS IN THE FOREST SERVICE

FS-01

T. 24 S., R. 6 W., Salt Lake Meridian
Sec. 32, Lots 1-4, N2N2, N2S2, SESE.
529.96 Acres
Millard County, Utah
Fillmore Field Office

FS-02

T. 25 S., R. 6 W., Salt Lake Meridian
Secs. 4 (PB36), 5, and 8, all.
1,864.99 Acres
Millard County, Utah
Fillmore Field Office

APPENDIX B:

INTERDISCIPLINARY TEAM ANALYSIS RECORD CHECKLISTS

Project Title: Competitive Geothermal Lease Sale – December 2008 Offering

NEPA Log Number: UT-010-08-051

File/Serial Number:

Project Leader: Fillmore Field Office

DETERMINATION OF STAFF: (Choose one of the following abbreviated options for the left column)

NP = not present in the area impacted by the proposed or alternative actions

NI = present, but not affected to a degree that detailed analysis is required

PI = present with potential for significant impact analyzed in detail in the EA; or identified in a DNA as requiring further analysis

NC = (DNAs only) actions and impacts not changed from those disclosed in the existing NEPA documents cited in Section C of the DNA form.

Determination	Resource	Rationale for Determination*	Signature	Date
CRITICAL ELEMENTS				
NI	Air Quality	Air Quality within the Fillmore Field Office is generally good. The nearest non-attainment areas are within the SLFO to the north. The November Geothermal lease offering does not propose any foreseeable impacts to air quality within the area. Development would be analyzed on a site specific basis. As a whole, utilizing the Reasonably Foreseeable Development Scenario from the previous PEA (UT-050-090-115), the proposed action does not present the potential for impacts to air quality other than isolated fugitive dust.	/s/ Matt Rajala	9/11/08
PI	Areas of Critical Environmental Concern	Geothermal leasing will impact the Pavant Butte ACEC. The ACEC is currently designated as NSO for leasing but the proximity of leasing activity will have an impact on the relevant and important values of peregrine falcon reintroduction sites and volcanic structures.	/s/SBonar	10-24-08
PI	Cultural Resources	<p>Summary of Effects and Determinations:</p> <p>After consideration of cultural resource information and other general data including: the applicable House Range Resource Management Plan (RMP), Warm Springs RMP, Cedar Beaver Garfield Antimony RMP and associated Environmental Impact Statement (EIS); fluid minerals NEPA documents; specific data relating to the individual proposed parcels such as topography and soils; as well as personal knowledge and experience of the lands at issue, the Fillmore Field Office, Cedar City Field Office and Fishlake National Forest archaeologists, make the following determinations of effects to historic properties:</p> <p style="text-align: center;"><i>Parcels UT-GEO 14-15</i></p> <p>Development of these parcels east of Highway 257 in Fillmore Field District, where there is high site density and potential for large sites, could have an Adverse Affect on historic properties. To avoid adverse effects to historic properties, these parcels will be leased with a No Surface Occupancy stipulation for the portions of the parcels located on the eastern side of Highway 257.</p>	/s/Joelle McCarthy	9/24/08

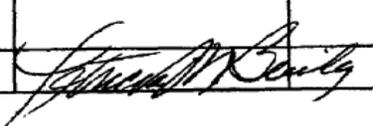
Determination	Resource	Rationale for Determination*	Signature	Date
		<p><i>Parcels UT-GEO 002, UT-GEO-003, and UT-GEO-48 - 53</i> The BLM determination for proposed parcels 002, 003, in the Cedar City Field Office and 48 - 53 in the Fillmore Field Office is that leasing these parcels under the existing categories, which would allow one well to be constructed on the parcel, would have an Adverse Affect to numerous historic and prehistoric properties.</p> <p>Within the UT-GEO 48 - 53 Fillmore Field Office lease parcels historic properties include The Pony Express National Historic Trail (1998), the Boyd Pony Express Station (contributing component of Pony Express National Historic Trail), Fish Springs Caves Archaeological District (NRHP listed #81000582) and Lincoln Highway.</p> <p>For the Fillmore Field Office, although reasonable development could occur, based on site density, proposed parcels UT-GEO-48-53 have a critical setting component and historic properties that would be adversely affected by geothermal exploration or development. Any intrusion on the landscape would require further analysis by a professional archaeologist, in consultation with interest groups associated with the above listed sites, the Advisory Council on Historic Preservation and the SHPO to determine if development would result in an adverse effect to historic properties within the proposed parcels.</p> <p><i>Parcels UT GEO 01, 04, 05, 06, 09-13, 16-47, FS 01, and FS 02</i> Known cultural resources are located in such a fashion (size, density and placement) that avoidance is feasible during development of geothermal resources. The potential for locating additional cultural resources within the proposed lease parcels UT-GEO-01,-04,-05,-06,-09-13,-16-47, FS 01, and FS 02 reviewed for the November 2008 Geothermal Lease Sale is low to moderate. Furthermore, analysis of the reasonably foreseeable impacts of leasing on both identified and unidentified cultural properties resulted in No Adverse Affect. This is based on the determination that reasonable development (placement of one well pad and access estimated at 6.5 acres) could occur on proposed parcels UT-GEO-01,-04,-05,-06,-09-13, 16-47, FS 01, and FS 02 without impact to eligible properties.</p> <p>A complete inventory of the proposed lease parcels has not occurred; therefore, the following stipulation should be added to any parcel offered for lease:</p> <p><i>"This lease may be found to contain historic properties and/ or resources protected under the National Historic Preservation Act (NHPA), American Indian Religious Freedom Act, Native American Graves and Protection Act, E.O. 13007, or other statutes and executive orders. The BLM will not approve any</i></p>		

Determination	Resource	Rationale for Determination*	Signature	Date
		<i>ground disturbing activities that may affect such properties or resources until it completes its obligations under applicable requirements of the NHPA and other authorities. The BLM may require modification to exploration or development proposals to protect properties, or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized or mitigated."</i>		
NI	Environmental Justice	There are no minority or low income populations identified within the Fillmore Field Office. The proposed action would not have a disproportionately adverse impact on low income or minority populations.	/s/ Matt Rajala	9/11/08
NI	Farmlands (Prime or Unique)	The leasing of the parcels does not present an impact to P&U farmlands within the FFO. There are soils that meet the criteria as P&U that are within some of the parcels. Exploratory wells would not remove lands permanently from agricultural production. Development of individual resources would be analyzed on a case by case basis.	/s/ Matt Rajala	9/11/08
PI	Floodplains	Leasing the parcels does not approve any development of the resource. Development of any parcel must be analyzed as to the proposed actions impacts of floodplains within the area.	/s/ Matt Rajala	9/11/08
NI	Invasive, Non-native Species	The BLM coordinates with County and local governments to conduct an active program for control of invasive species. Standard operating procedures such as washing of vehicles and annual monitoring and spraying along with site specific mitigation applied as conditions of approval (COA) at the GDP stage would be sufficient to prevent the spread or introduction of Invasive, Non-native species.	/s/R.B. Probert	9/16/08
PI	Native American Religious Concerns	The Paiute Tribe of Utah (PTU), Confederated Tribes of the Goshute Reservation, Kanosh Band of the Paiute Tribe, Skull Valley Goshute Tribe and the Uinta and Ouray Ute Tribe were notified via certified letter on September 30, 2008. Tribes have 30 days to respond to the BLM. Responses are due on October 30.	Joelle	10/24/08
NP	Threatened, Endangered or Candidate Plant Species	There are no known federally-listed plant species on BLM lands within the proposed geothermal lease parcels.	/s/DWhitaker	9/5/08
PI	Threatened, Endangered or Candidate Animal Species	Even though the bald eagle was delisted the lease T&E notice for them should still be applied for all parcels with winter range. Also there may be potential for Yellow-billed cuckoo and UT prairie dog on the parcels even though we have none that are documented at this time. Much of the Fillmore Field Office has not been surveyed or inventoried for T&E species and it is appropriate to place the T&E stip. the parcels.	Robin Naeve	10/23/08
NI	Wastes (hazardous or solid)	All hazardous materials used or produced must be reported to the FFO. They must be removed and disposed in an appropriately permitted disposal facility. Solid waste must be removed and properly disposed	/s/ B. Crosland	9/15/08
PI	Water Quality (drinking/ground)	Many of the areas have water sources such as wells and springs. BLM should not approve any ground disturbing activities that may affect water quality. The BLM may require modification to exploration or development proposals to protect water quality	/s/PCaso	9/11/08

Determination	Resource	Rationale for Determination*	Signature	Date
		and water resources, or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized or mitigated. Also, see comments under riparian below.		
PI	Wetlands/Riparian Zones	Wetlands and Riparian areas are present in Parcels # UT- GEO-20 (small areas consisting of springs) and 1671 acres of riparian area in UT-GEO-007 (riparian areas bordering Clear Lake Water Fowl Management Area, shape file to be added.), and 472 acres of riparian area in UT-GEO-048 (see shape file). The Utah Riparian Management Policy states that No new surface disturbing activities will be allowed within 100 meters of riparian areas unless it can be shown that: A. there are not practical alternatives or, B. all long term impacts can be fully mitigated or, the activity will benefit and enhance the riparian area. For large riparian areas, it may be necessary to have no surface occupancy or other lease notice or stipulation to protect some of the riparian areas on portions of these parcels.	/s/ Bill Thompson	9/5/08
NP	Wild and Scenic Rivers	There are no Wild & Scenic Rivers within the Fillmore Field Office.	/s/SBonar	9/03/08
PI	Wilderness/WSA's	Geothermal leasing is proposed along the northern boundary of Swasey Mountains WSA. Increased monitoring of geothermal exploration and development activity should ensure this activity will not encroach upon the WSA. The Fish Springs proposed parcel east boundary is the west boundary for the Fish Springs WSA. This boundary should be clearly marked if offered so the lease operation does not go into the WSA. Close monitoring should occur in this area.	/s/SBonar	9/03/08
OTHER RESOURCES / CONCERNS**				
PI	Rangeland Health Standards and Guidelines	Wetlands & Riparian Areas Must be maintained in proper functioning condition to meet the guidelines for grazing management. The Utah Riparian management Policy must be followed for the guidelines to be met. Surface disturbance of riparian areas may cause a riparian area to either not function or function at risk.	/s/ Bill Thompson	9/5/08
PI	Livestock Grazing	Depending on the extent of surface disturbing activities livestock grazing may be affected. Management facilities must be avoided or put in functioning condition following disruption. Further site specific analysis would be completed when the APD is completed.	/s/ Bill Thompson	9/5/08
NI	Woodland / Forestry	Given the low degree of anticipated exploration and development under the RFDs and application of standard operating procedures (SOP's) and site specific mitigation applied at the GDP stage as conditions of approval (COA), it is concluded that woodland or forest resources would not be affected in a way not already analyzed in existing NEPA documents. In summary, the potential exists for removal of piñon or juniper trees on potential access roads and drill pads, but the bottom line is that these resources would not be substantially affected.	/s/ B. Crosland	9/15/08
NI	Vegetation including Special Status Plant Species other than FWS candidate or listed species	There are known occurrences of two different BLM Sensitive Plant Species on three different offered parcels. For the majority of the geothermal lease parcels that are being offered,	/s/DWhitaker	9/5/08

Determination	Resource	Rationale for Determination*	Signature	Date
		however, there are no known special status plant species on BLM lands. <i>Eriogonum nummular</i> var. <i>ammophilum</i> (sand-loving buckwheat) has been found in parcels UT-GEO-44 & 45. <i>Sphaeralcea caespitosa</i> var. <i>caespitosa</i> (Jones globemallow) has been found in parcel number UT-GEO-14. The spatial distributions of the two species on these three parcels are quite sparse. Surface occupancy for these three parcels would be restricted from locations where these two plant species are found to occur.		
PI	Fish and Wildlife Including Special Status Species other than FWS candidate or listed species e.g. Migratory birds.	Big game crucial winter range, summer range, and fawning areas are overlapped by the parcels and therefore need to be analyzed as to possible impacts. Also there is potential habitat and known habitat in some cases within most if not all of the parcels for sensitive species for Juab and Millard county, therefore impacts to those species will also be analyzed within the EA. Migratory birds, including sage-grouse and raptors, should also be part of the analysis and special mitigation measures are needed for protection of such species as well. Seasonal restrictions and mitigation measures should help mitigate impacts to crucial habitat wildlife and fisheries habitat within the parcels. Lease stipulations and notices should be applied for crucial ranges and special status species.	Robin Naeve	10/23/08
NI	Soils	The leasing of lands does not authorize ground disturbing activities. Disturbance resulting from a proposed disturbance would be analyzed on a case by case basis and mitigated as necessary.	/s/Matt Rajala	9/11/08
PI	Recreation	There would be minor impacts to casual recreation if these parcels are leased. Impacts would revolve primarily with utilization of access roads by both recreationalists and lessee's and in some cases displacement of recreational uses of some dispersed campsites and/or staging areas for OHV use.	/s/SBonar	9/03/08
PI	Visual Resources	If the offerings adjacent to the Fish Springs WSA, which is a VRM Class II area, are leased and surface occupancy is developed, visual impacts would occur on the west side of the WSA. The southeastern portion of Parcel UT-GEO-049 could impact VRM Class II objectives in the vicinity of the Wilson Mine which is contiguous to the Fish Springs WSA. In addition, the southern portion of parcel UT-GEO-46 would also impact VRM Class II objectives along the northern boundary of Swasey Mountain WSA. Potential impacts to VRM Class III objectives could result from leasing activity in five parcels UT-GEO 19, 20, 21, 33, and 36 in the Drum Mountains and Thomas Range. Parcels UT-GEO-05 and 06 would also impact VRM Class III objectives in the vicinity of Pavant Butte ACEC. The remaining parcels are located in VRM Class IV and leasing activity would not be construed as undue degradation of class IV objectives. If the offerings adjacent to the Fish Springs WSA, which is a VRM Class II area, are leased and surface occupancy is developed, visual impacts would occur on the west side of the WSA.	/s/SBonar	9/03/08
PI	Geology / Mineral Resources/Energy Production	Leases and lease activity would be according to regulation and the appropriate management plan. However, leasing would not necessarily result in exploration or production activity.	/s/J Mansfield	09/03/08
NI	Paleontology	Paleontological resources are not known to occur at a density in the Fillmore Field Office area at such a density the resource	/s/J Mansfield	09/03/08

Determination	Resource	Rationale for Determination*	Signature	Date
		could not be protected with standard lease stipulations.		
PI	Lands / Access	Geothermal leasing should not affect access to public land and leases would be subject to valid existing rights-of-way (ROW). Existing roads and trails should be used for travel unless otherwise authorized. During wet road conditions, any ruts deeper than four inches remaining on the roads from the project should be repaired at the Authorized Officer's discretion. Subsequent projects should coordinate with existing ROW holders and apply operating procedures and site specific mitigation at the exploration/drilling stage that would ensure that communication sites, water projects, and power-lines, etc. would be avoided, restored or replaced. Any parcels nominated under the UTTR, would require coordination with the USAF.	CStevens	9/8/08
NI	Fuels / Fire Management	Given the low degree of anticipated exploration and development under the RFDs and application of standard operating procedures (SOP's) and site specific mitigation applied at the GDP stage as conditions of approval (COA), it is concluded that woodland or forest resources would not be affected in a way not already analyzed in existing NEPA documents. In summary, the potential exists for removal of piñon or juniper trees on potential access roads and drill pads, but the bottom line is that these resources would not be substantially affected.		9/24/08
PI	Socio-economics	The RFD projects 5 developed and producing projects within 10 years. This has the potential to have an impact on the socioeconomics of the local area.	/s/ Matt Rajala	9/11/08
NI	Wild Horses and Burros	Proposed project areas do include the Swasey HMA and dependent upon the size of area disturbed within the HMA, some wild horse displacement may be noticed. Disturbance areas most likely will be small enough that no adverse effects to the wild horses will occur.	/s/Eric Reid	9/18/08
PI	Wilderness characteristics	There are two areas in the Fillmore Field Office that may be impacted by geothermal leasing activity. The North Drum proposed lease area has been identified by the FFO ID team during the wilderness character reviews conducted during the summer of 2008 that there is a reasonable probability that wilderness characteristics exist in the unit. Unit three of the Fish Springs wilderness inventory area that was subject to intensive wilderness field inventory during the 1999 Utah Wilderness Inventory was found to possess wilderness characteristics.	/s/SBonar	9/03/08

Reviewer Title	Signature	Date	Comments
NEPA / Environmental Coordinator		11/4/08	

Authorized Officer  11-4-08

FINAL REVIEW:

INTERDISCIPLINARY TEAM ANALYSIS RECORD CHECKLIST

Project Title: Competitive Geothermal Lease Sale – December 2008 Offering

NEPA Log Number: UT-010-08-051

File/Serial Number: Proposed Lease Parcels UT-GEO-002, 003, 004.

Project Leader: Ed Ginouves / Chris Hite Cedar City Field Office

DETERMINATION OF STAFF: (Choose one of the following abbreviated options for the left column)

NP = not present in the area impacted by the proposed or alternative actions

NI = present, but not affected to a degree that detailed analysis is required

PI = present with potential for significant impact analyzed in detail in the EA; or identified in a DNA as requiring further analysis

NC = (DNAs only) actions and impacts not changed from those disclosed in the existing NEPA documents cited in Section C of the DNA form.

Determination	Resource	Rationale for Determination*	Signature	Date
CRITICAL ELEMENTS				
NI	Air Quality	<p>Both Beaver and Iron Counties are in attainment of the National Ambient Air Quality Standards (NAAQS) for all pollutants. Currently, air quality in and surrounding the lease parcels meets State Department of Environmental Quality and the Division of Air Quality Standards. The proposed action would not exceed the level of activity projected in the Reasonably Foreseeable Development Scenario (RFDS). The RFDS for the analysis area is currently exploratory work only with projected activities of surface geophysics work, temperature gradient holes drilled from small truck-mounted rotary rigs and (possibly) a handful of deep exploratory wells to further assess promising areas. While there would be some differences between the alternatives, all actions analyzed in the EA would adhere to current air quality standards and emissions would be within established limits. The potential impacts of geothermal development on air quality were adequately analyzed in the RMP/EIS.</p> <p>Given the low level of drilling and other activity described in the RFDS, only minimal emissions are anticipated and effects to air quality are expected to be negligible. The following project activities and sources would produce emissions: Well pad and road construction: earth-moving equipment fugitive dust, earth-moving equipment exhaust, and mobile source tailpipe emissions on access roads; Drilling: mobile source tailpipe emissions, fugitive dust emissions on access roads, and drill rig engine exhaust; Completion: mobile source tailpipe emissions, fugitive dust emissions on access roads, well venting emissions; Operation and maintenance: mobile source tailpipe emissions and ; fugitive dust emissions on access roads.</p> <p>The pollutant emitted in the greatest quantities during well development would be PM₁₀ from earthmoving operations and travel upon unpaved roads. Mineral aerosols from dust are generated from wind erosion of surface soils and can</p>	C. Egerton	10/23/08

Determination	Resource	Rationale for Determination*	Signature	Date
		<p>result in an increase in inputs of K, Mg, Ca, N and P to the ecosystem (Neff et al. 2008). Impacts from ground disturbing activities would be localized and temporary in nature and would decrease significantly with distance from the immediate activity with overall PM₁₀ emission spread out over a large area. It is likely steam, hydrogen sulfide and carbon dioxide would be released from exploratory drilling. These emissions would likely be small and considered de minimus from a permitting standpoint. Any discovery in the area of the Blundell plant would likely be would be utilized as part of a "closed" system, so discharges from the wells themselves would be expected to be unsubstantial.</p> <p>Since the exploratory wells would likely be in relatively remote areas, it is likely these emissions would have no effect. The GOLD Book contains adequate enforceable mitigation measures to assure no adverse impacts on air quality would occur in the affected area. BLM will utilize BMPs and site specific mitigation measures, when appropriate, based on site specific conditions, to reduce emissions and mitigate impacts to air quality. Project specific analyses will consider use of quantitative air quality analysis methods (i.e., modeling), when appropriate as determined by BLM, in consultation with state, federal, and tribal entities. BLM will continue to work cooperatively with state, federal, and tribal entities in developing air quality assessment protocols to address regional air quality issues and with the Utah Airshed Group to manage emissions from wildland and prescribed fire activities. The BLM will also continue to exercise its land management authority and responsibility to analyze potential air quality impacts, to set levels-of-concern and desired-future-conditions, and to support air resources monitoring.</p>		
NP	Areas of Critical Environmental Concern	None in the field office area	S. Roche'	08/20/08
PI	Cultural Resources	<p>UT-GEO-004: Field Office records do not reflect known sites on this parcel, but there has also not been much activity – just a single power line corridor thru the extreme northeast corner. The Kern River pipeline surfaced several sites not far to the west, but these are along the contact between the valley and the hills – where one expects a good density. I would expect our parcel to show a low to moderate density of not very large or complex sites. There is no question, then, that a well could be sited here without resource conflict.</p> <p>UT-GEO-002, 003: Essentially in the mouth of Negro Mag Wash, these parcels nearly surround the old Phillips leases, now the home of the Blundell Geothermal Plant. We have abundant information on this area, including several large inventories for various projects. This is a very special archeological area due to the juxtaposition of very good natural resources and a big source of easily obtainable, high-quality obsidian. There are a great many sites in the area and a nice pattern is beginning to emerge.</p> <p>Still, we have enough inventory and specific information on</p>	G. Dalley	08/22/08

Determination	Resource	Rationale for Determination*	Signature	Date
		the parcels that there is no question that we can find places on each to site a well and access. However, there is, I believe, serious question as to whether this is the proper and appropriate thing to do. I have developed a more detailed memo discussing these issues and recommending that we not support new leases in this particular area. That document should be appended to this checklist.		
NP	Environmental Justice	Not addressed in previous documents however, no groups of concern would be affected.	E. Ginouves	08/01/08
NP	Farmlands (Prime or Unique)	No prime or unique farmlands are present because they lack irrigation water.	C. Egerton	08/21/08
NI	Floodplains	Floodplains are present on all three Cedar City Field Office parcels. In fact, a portion of parcel 004 sits beneath New Castle Reservoir. Development of any parcel must be analyzed as to the proposed actions impacts of floodplains within the area. Selection of the Proposed Action, which allows for additional resource protective measures beyond the terms and stipulations described for the No Action alternative would assure compliance with EO 11988 for all parcels.	C. Egerton	10/23/08
NI	Invasive, Non-native Species	The BLM coordinates with County and local governments to conduct an active program for control of invasive species. Standard operating procedures such as washing of vehicles and annual monitoring and spraying along with site specific mitigation applied as conditions of approval (COA) at the GDP stage would be sufficient to prevent the spread or introduction of Invasive, Non-native species.	J. Bulloch	08/14/08
PI	Native American Religious Concerns	Native American Consultation will be needed because this project is not covered under the MOU. We won't proceed with Native American Consultation until the CCFO archeologists position related to the nominated parcels are known. The Paiute Tribe of Utah Commented on Oct 3, 2008 stating "UT GEO 05-06 proposed parcels located west of Pahvant Butte in the Pahvant Valley of Millard County-this is a sacred place that contains extensive and significant cultural resources significant to the Paiute Tribe of Utah. The tribe requests that the 2008 Geothermal Lease Sale withhold the area and concentration of known cultural sites through a leasing stipulation prohibiting any surface disturbance or deferral from leasing. *UT-GEO-022 and UT-GEO-003, Roosevelt Geothermal Field Mouth of Negro Mag Wash, West Slopes of the Mineral Mountains-these proposed parcels have vast areas of large well exposed obsidian flows that have been here for thousands of year and have been used by our ancestors. You are aware from previous consultations the Paiute Indian Tribe of Utah claims ancestral and cultural affiliation to these lands and would like to (request) that it is kept in it's pristine natural environment. Therefore we request that the 2008 Geothermal Lease Sale withhold the area and concentration of known cultural sites through a leasing stipulation prohibiting any surface disturbance or deferral from leasing.	R. Tueller	08/21/08

Determination	Resource	Rationale for Determination*	Signature	Date
NP	Threatened, Endangered or Candidate Plant Species	None present in the field office.	R. Bonebrake	08/05/08
PI	Threatened, Endangered or Candidate Animal Species	No TEC species are currently known to occur on parcels 002, 003, or 004. The standard T&E lease language would be sufficient for leasing.	R. Bonebrake	10/16/08
NI	Wastes (hazardous or solid)	Given the reasonably foreseeable development scenario of exploration on the parcels 002, 003, and 004, no solid or hazardous waste impacts could be expected.	E. Ginouves	08/01/08
NI	Water Quality (drinking/ground)	As recognized in previous NEPA documents, standard operating procedures (SOPs) and site specific mitigation applied as conditions of approval (COA) at the GPD stage would be sufficient to isolate and protect all usable water zones. Would recommend a lease notice or other stipulation be added to the New Castle Reservoir parcel because it is on the state of Utah's 303(d) list of impaired waters. The following language should be included for water and watershed protection: In order to prevent water pollution and protect municipal and non-municipal watershed areas, no drilling, occupancy or other surface disturbance will be allowed within 500 feet of live water on the Pinto Creek / Newcastle Reservoir drainage in order to prevent water quality degradation.	C. Egerton	10/23/08
PI	Wetlands/Riparian Zones	Parcel UT-GEO-004 should have a controlled surface use lease notice attached to protect riparian resources. (No surface use or otherwise disruptive activity would be allowed within 100 meters of riparian areas unless it can be shown that (1) there is no practicable alternative; (2) that all long-term impacts are fully mitigated; or (3) that the construction is an enhancement to the riparian areas.)	R. Bonebrake	10/16/08
NP	Wild and Scenic Rivers	There are no designated or eligible segments of wild or scenic rivers in the Cedar City field office area	S. Roche'	08/20/08
NP	Wilderness	No designated wilderness areas or WSA's are on or adjacent to the parcels recommended for leasing.	S. Roche'	08/20/08
OTHER RESOURCES / CONCERNS**				
NI	Rangeland Health Standards and Guidelines	Water quality, vegetation, Threatened & Endangered Species habitat and other components of ecological conditions that are considered in Standards and Guidelines for Rangeland Health have been analyzed in the previous NEPA documents pertaining to the nominated parcels. Given the low degree of anticipated exploration and development in conjunction with the application of Standard Operating Procedures (SOPs), and site specific mitigation applied at the GDP stage as conditions of approval (COA), it is expected that there would be no impacts to the Standards and Guidelines for Rangeland Health.	D. Fletcher	08/15/08
NI	Livestock Grazing	Given the low degree of anticipated exploration and development and application of standard operating procedures (SOPs), and site specific mitigation applied at the GDP stage as conditions of approval (COA), it is concluded that existing analysis is adequate and that livestock grazing operations would not be affected. Any range improvements such as fences and cattle guards that would be impacted would be replaced or restored and	D. Fletcher	08/15/08

Determination	Resource	Rationale for Determination*	Signature	Date
		disturbed areas would be reclaimed utilizing a BLM approved seed mix.		
NI	Woodland / Forestry	Given the low degree of anticipated exploration and development under the RFDS and application of standard operating procedures (SOP's) and site specific mitigation applied at the APD stage as conditions of approval (COA), it is concluded that woodland or forest resources would not be affected in a way not already analyzed in existing NEPA documents. In summary, the potential exists for removal of pinyon or juniper trees on potential access roads and drill pads, but the bottom line is that these resources would not be substantially affected.	C. Egerton	08/21/08
NP	Vegetation including Special Status Plant Species other than FWS candidate or listed species	Based on a literature search and existing records in the Cedar City field office, it has been determined that no special status plant species are present on parcels 002, 003, and 004.	C. Pontarolo	08/15/08
NI		Due to the low degree of anticipated exploration and development it is not expected that impacts to vegetation would be limited. In addition, reclamation would occur in disturbed areas utilizing a BLM approved seed mix.	D. Fletcher	08/15/08
PI	Fish and Wildlife Including Special Status Species other than FWS candidate or listed species eg. Migratory birds.	Parcels need to be reviewed for the occurrence of mapped habitat for any game species as mapped by UDWR, as well as the occurrence or potential habitat for sensitive species, as determined by BLM records and UNHP database. Appropriate lease notices or stipulations should be attached. This includes fisheries on parcel UT-GEO-004. I am concerned that a lease notice may not provide adequate protection for crucial big game winter habitat and we should analyze whether or not to defer these parcels since a lease stipulation is not in conformance with CBGA RMP. For leases UT-GEO-002 & 003 there is the cumulative impact of the current & proposed Blundell activities, as well as multiple wind energy developments & the Milford Flat fire to consider. On UT-GEO-004, there is the highly restrictive amount of crucial habitat and the consideration that a lease stipulation may be required. Please see my report of 16 Oct 2008 for additional site specific information.	R. Bonebrake	10/16/08
NI	Soils	<i>Given the low degree of anticipated exploration and development under the RFDS and application of standard operating procedures (SOPs), and site specific mitigation applied at the GDP stage including reclamation, as conditions of approval (COA), it is concluded that existing analysis is adequate and potential impacts on soils have been adequately addressed. Impacts are anticipated to be insubstantial.</i>	C. Egerton	08/21/08
NI	Recreation	Other than a small amount of dispersed recreation, there is no potential for impact of this resource.	S. Roche'	08/20/08
PI	Visual Resources	Portions of parcel 003 occupying sections 11 and 14 occur on VRM class II lands. Class II Objective: To retain the existing character of the landscape. The level of change to the characteristic landscape should be low.	S. Roche'	08/01/08
NI	Geology / Mineral Resources/Energy Production	There are no existing minerals-related authorizations on UT-GEO-004. Unpatented mining claims fall on portions of parcels UT-GEO-002, 003 and a permitted perlite mining operation occupies portions of the SWSWSW of sec. 1 on	E. Ginouves	08/01/08

Determination	Resource	Rationale for Determination*	Signature	Date
		<p>parcel UT-GEO-003. The only known solid mineral resource on the parcels is lapidary-grade opaline silica on portions of 002 & 003 and perlite on portions of 003.</p> <p>Given a reasonably foreseeable development scenario of exploration operations for all three parcels, there would be no impact on the existing locatable minerals authorizations.</p> <p>If a discovery of a commercially-viable geothermal resource be made on parcels 002 or 003, surface interference issues could arise from lease operations conflicting with existing or proposed surface mining operations for perlite /opaline silica on portions of parcels 002 & 003. Lease operations might be constrained or denied on portions of the SWSW sec. 1, T. 26 S., R. 9 W., on parcel 003 to avoid conflict with existing permitted perlite mining operations.</p>		
NI	Paleontology	<p>The surface geology of Parcel UT-GEO-004 (Newcastle area) consists primarily of Tertiary Period pyroclastics (tuff) and volcanoclastics inter-fingered with younger Quaternary Period alluvial plain sedimentary units. Parcels UT-GEO-002 and UT-GEO-003 (Mineral Mountain area) have a surface geology comprised of intermingled Quaternary Period sedimentary units (primarily alluvial-fan deposits, with some basin fill deposits), Quaternary Period lava flow units, and Tertiary Period intrusive units (granite, monzonite, and syenite) interleaved with Precambrian gneisses. These geologic units fall within Class 1 (very low) and Class 2 (low) of the Bureau's Potential Fossil Yield Classification System giving a low probability of impacting any significant paleontological resources. No paleontological resources are known to exist on the parcels recommended for leasing.</p>	E. Ginouves / C. Hite	08/22/08
NI	Lands / Access	<p>Multiple Rights-of-way exist within the proposed lease boundaries. The holder of a geothermal lease would be subject to adhere to all valid and existing rights held by existing right-of-way holders. Rights-of-way in proposed operation areas would not be affected providing application of <i>standard</i> operating procedures (SOPs), and site specific mitigation are applied at the GDP stage would ensure that communication sites, water projects, pipe lines & power lines etc. would be avoided, restored or replaced. The holder of a Geothermal lease would be subject to adhere to all valid and existing rights held by existing right-of-way holders.</p>	R. Wilson	07/31/08
NI	Fuels / Fire Management	<p>Fire and fuels management was not specifically addressed in existing NEPA documents. However, application of standard operating procedures (SOPs), and site specific mitigation and safety measures applied at the GDP stage would minimize the risk of inadvertent ignition. Therefore no impacts to fire management are expected. There are fire stabilization and/or fuels management projects planned for some of the area covered by this action. Mitigation would be required for any future disturbance in these areas.</p>	M. Mendenhall	08/19/08
NI	Socio-economics	<p>Minor increases in local service sector revenue could be expected from the temporary workforce involved in the exploration of the parcels if they are leased. .</p>	E. Ginouves	08/01/08

Determination	Resource	Rationale for Determination*	Signature	Date
		Lasting substantial impacts to the socioeconomics of the communities in the general project area could result from the discovery of a commercial viable geothermal resource on any of the parcels; however the quantification of those impacts would depend on the specifics of any discovery made and would have to be analyzed when a proposal to develop those resources was received.		
NP	Wild Horses and Burros	None present in the proposed parcel areas.	C. Hunter	08/15/08
NP	Wilderness characteristics	Parcels 002, 003, & 004 do not include any areas currently included in proposed wilderness legislation or areas that possess or are likely to possess wilderness characteristics.	S. Roche'	08/20/08

FINAL REVIEW:

Reviewer Title	Signature	Date	Comments
NEPA / Environmental Coordinator	<i>Maria Haines</i>	11/4/08	
Authorized Officer	<i>Randy A. Sigillo</i>	11/4/08	

APPENDIX C:

Additional Resource Protective Measures for the Cedar City and Fillmore Geothermal EA

(LN-01) LEASE NOTICE: CRUCIAL WINTER MULE DEER AND ELK HABITAT
The lessee/operator is given notice that lands in this lease have been identified as containing crucial mule deer and/or elk winter habitat. Exploration, drilling and other development activities would be restricted from December 1 through April 30 to protect crucial winter range. This notice may be waived, accepted, or modified by the authorized officer if either the resource values change or the lessee/operator demonstrates that adverse impacts can be mitigated.
(LN-02) LEASE NOTICE: CRUCIAL ELK CALVING AND DEER FAWNING HABITAT
The lessee/operator is given notice that lands in this lease have been identified as containing crucial elk calving or deer fawning habitat. Exploration, drilling and other development activities would be restricted from May 1 through June 30 to protect antelope fawning. This notice may be waived, accepted, or modified by the authorized officer if either the resource values change or the lessee/operator demonstrates that adverse impacts can be mitigated.
(LN-03) LEASE NOTICE: PRONGHORN FAWNING HABITAT
The lessee/operator is given notice that lands in this lease have been identified as containing antelope fawning habitat. Exploration, drilling and other development activities would be restricted from May 1 through June 29 to protect antelope fawning. This notice may be waived, accepted, or modified by the authorized officer if either the resource values change or the lessee/operator demonstrates that adverse impacts can be mitigated.
(LN-04) LEASE NOTICE: PRONGHORN WINTER HABITAT
The lessee/operator is given notice that lands in this lease have been identified as containing crucial pronghorn winter habitat. Exploration, drilling and other development activities would be restricted from December 1 through April 30 to protect crucial winter range. This notice may be waived, accepted, or modified by the authorized officer if either the resource values change or the lessee/operator demonstrates that adverse impacts can be mitigated.
(LN-05) LEASE NOTICE: ROCKY MOUNTAIN BIGHORN SHEEP
The Lessee/Operator is given notice that the lands in this parcel contains habitat for desert bighorn sheep. Modifications to the surface use plan may be required in order to protect habitat from surface disturbing activities. These modifications may include such measures as timing restrictions to avoid surface use during the crucial lambing and rutting seasons. Measure may also include avoidance of certain areas such as water sources and talus slopes. This notice may be waived, accepted, or modified by the authorized officer if either the resource values change or the lessee/operator demonstrates that adverse impacts can be mitigated.
(LN-06) LEASE NOTICE: GREATER SAGE-GROUSE NESTING AND EARLY BROOD-REARING
The lessee/operator is given notice that this lease has been identified as containing sage grouse nesting and early brooding habitat. Exploration, drilling and other development activities would be restricted from March 15 through July 15 within 2.0 miles of an occupied lek, or in mapped and identified greater sage-grouse nesting and early brood-rearing habitat. This notice may be waived, accepted, or modified by the authorized officer if either the resource values change or the lessee/operator demonstrates that adverse impacts can be mitigated.
(LN-07) LEASE NOTICE: GREATER SAGE-GROUSE WINTER CONCENTRATION AREAS
The lessee/operator is given notice that this lease has been identified as containing sage grouse winter concentration area. Exploration, drilling and other development activities would be restricted from November 15 through March 1 in identified greater sage-grouse winter concentration areas. This notice may be waived, accepted, or modified by the authorized officer if either the resource values change or the lessee/operator demonstrates that adverse impacts can be mitigated.

(LN-08) LEASE NOTICE: GREATER SAGE-GROUSE LEKS

Exploration, drilling, and other associated development should not be allowed from within 0.5 miles of a lek March 1st to July 15th in order to minimize disturbance to breeding sage grouse. Surface occupancy with historic or presently occupied habitat should be avoided. Permanent development near active or historically active leks should be avoided as they are often considered the focal point of year round activities for non-migratory populations (Braun et. al. 1977. Habitat surrounding the breeding grounds provides the majority of the nesting and early brood rearing habitat. Surveys to determine presence/absence of sage grouse prior to commencing work. This notice may be waived, accepted, or modified by the authorized officer if either the resource values change or the lessee/operator demonstrates that adverse impacts can be mitigated.

(LN-09) LEASE NOTICE: WATERFOWL NESTING AREAS

The lessee/operator is given notice that this lease has been identified as containing surface waters with nesting water fowl habitat. Exploration, drilling and other development activities would be restricted from March 15 through July 15 within 0.25 mile of identified surface waters with nesting waterfowl habitat. This notice may be waived, accepted, or modified by the authorized officer if either the resource values change or the lessee/operator demonstrates that adverse impacts can be mitigated.

(LN-10) LEASE NOTICE: WATERFOWL WINTER CONCENTRATION AREAS

The lessee/operator is given notice that this lease has been identified as containing surface waters with concentrations of wintering waterfowl habitat. Exploration, drilling and other development activities would be restricted from November 1 through March 15 within 0.25 mile identified surface waters with concentrations of wintering waterfowl habitat. This notice may be waived, accepted, or modified by the authorized officer if either the resource values change or the lessee/operator demonstrates that adverse impacts can be mitigated.

(LN-11) LEASE NOTICE: UTAH SENSITIVE SPECIES - YELLOW-BILLED CUCKOO

The lessee/operator is given notice that lands in this parcel have been identified as containing important habitat for named species on the Utah Sensitive Species List. Modifications to the Surface Use Plan of Operations may be required in order to protect these resources from surface disturbing activities in accordance with Section 6 of the lease terms, Endangered Species Act, and 43 CFR 3262.11. This notice may be waived, accepted, or modified by the authorized officer if either the resource values change or the lessee/operator demonstrates that adverse impacts can be mitigated. This notice may be waived, accepted, or modified by the authorized officer if either the resource values change or the lessee/operator demonstrates that adverse impacts can be mitigated.

(LN-12) LEASE NOTICE: BALD EAGLE WINTER ROOST SITES

The lessee/operator is given notice that this lease has been identified as containing bald eagle habitat. Exploration, drilling and other development activities would not be allowed from November 1 through March 31 which would disrupt bald eagle roosting activities within 0.5 mile of known roosts, unless the area has been surveyed according to protocol and determined to be unoccupied. This notice may be waived, accepted, or modified by the authorized officer if either the resource values change or the lessee/operator demonstrates that adverse impacts can be mitigated.

(LN-13) LEASE NOTICE: BALD EAGLE NEST SITES

The lessee/operator is given notice that this lease has been identified as containing bald eagle habitat. Exploration, drilling and other development activities would not be allowed from January 1 through August 31 which would disrupt bald eagle breeding activities within 1 mile of any known bald eagle nesting site. This notice may be waived, accepted, or modified by the authorized officer if either the resource values change or the lessee/operator demonstrates that adverse impacts can be mitigated.

(LN-14) LEASE NOTICE: GOLDEN EAGLE NEST SITES

The lessee/operator is given notice that this lease has been identified as containing bald eagle habitat. Exploration, drilling and other development activities would not be allowed from January 1 through August 31 which would disrupt golden eagle breeding activities within 0.5 mile of an occupied nest. This notice may be waived, accepted, or modified by the authorized officer if either the resource values change or the lessee/operator demonstrates that adverse impacts can be mitigated.

(LN-15) LEASE NOTICE: PEREGRINE FALCON NEST SITES

The lessee/operator is given notice that this lease has been identified as containing bald eagle habitat. Exploration, drilling and other development activities would not be allowed from February 1 through August 31 which would disrupt peregrine falcon breeding activities within 1 mile of an occupied nest. This notice may be waived, accepted, or modified by the authorized officer if either the resource values change or the lessee/operator demonstrates that adverse impacts can be mitigated.

(LN-16) LEASE NOTICE: BURROWING OWL HABITAT

The lessee/operator is given notice that this lease has been identified as containing bald eagle habitat. Exploration, drilling and other development activities would not be allowed from March 1 through August 31 which would disrupt burrowing owl breeding activities within 0.25 mile of an occupied nest. This notice may be waived, accepted, or modified by the authorized officer if either the resource values change or the lessee/operator demonstrates that adverse impacts can be mitigated.

(LN-17) LEASE NOTICE: FERRUGINOUS HAWK NEST SITES

The lessee/operator is given notice that surface use or otherwise disruptive activity would not be allowed from March 1 through August 1 which would disrupt ferruginous hawk breeding activities within 0.5 mile of an occupied nest. This notice may be waived, accepted, or modified by the authorized officer if either the resource values change or the lessee/operator demonstrates that adverse impacts can be mitigated.

(LN-18) LEASE NOTICE: GREATER SAGE-GROUSE LEKS

The lessee/operator is given notice that surface use or otherwise disruptive activity would not be allowed which would result in an aboveground facility within 0.5 mile of any active greater sage-grouse lek. This notice may be waived, accepted, or modified by the authorized officer if either the resource values change or the lessee/operator demonstrates that adverse impacts can be mitigated.

(LN-19) LEASE NOTICE: BALD EAGLE HABITAT

The Lessee/Operator is given notice that the lands in this parcel contains nesting/winter roost habitat for the bald eagle. Avoidance or use restrictions may be placed on all or portions of the lease. Application of appropriate measures will depend on whether the action is temporary or permanent, and whether it occurs within or outside the bald eagle breeding or roosting season. A temporary action is completed prior to the following breeding or roosting season leaving no permanent structures and resulting in no permanent habitat loss. A permanent action continues for more than one breeding or roosting season and/or causes a loss of eagle habitat or displaces eagles through disturbances, i.e. creation of a permanent structure. This notice may be waived, accepted, or modified by the authorized officer if either the resource values change or the lessee/operator demonstrates that adverse impacts can be mitigated.

(LN-20) LEASE NOTICE: BALD EAGLE NEST OR WINTER ROOST SITES

The lessee/operator is given notice that surface use or otherwise disruptive activity would not be allowed which would result in an aboveground facility within 0.5 mile of known bald eagle winter roost areas or known bald eagle nest site, which has been active within the past 3 years. This notice may be waived, accepted, or modified by the authorized officer if either the resource values change or the lessee/operator demonstrates that adverse impacts can be mitigated.

(LN-21) LEASE NOTICE: GOLDEN EAGLE NEST SITES

The lessee/operator is given notice that surface use or otherwise disruptive activity would not be allowed which would result in an aboveground facility within 0.5 mile of known golden eagle nests, which have been active within the past 3 years. This notice may be waived, accepted, or modified by the authorized officer if either the resource values change or the lessee/operator demonstrates that adverse impacts can be mitigated.

(LN-23) LEASE NOTICE: PEREGRINE FALCON NEST SITES

The lessee/operator is given notice that surface use or otherwise disruptive activity would not be allowed which would result in an aboveground facility within 1 mile of known peregrine falcon nests, which have been active within the past 3 years. This notice may be waived, accepted, or modified by the authorized officer if either the resource values change or the lessee/operator demonstrates that adverse impacts can be mitigated.

(LN-24) LEASE NOTICE: BURROWING OWL HABITAT

The lessee/operator is given notice that surface use or otherwise disruptive activity would not be allowed which would result in an aboveground facility within 0.25 mile of known burrowing owl nests, which have been active within the past 3 years. This notice may be waived, accepted, or modified by the authorized officer if either the resource values change or the lessee/operator demonstrates that adverse impacts can be mitigated.

(LN-25) LEASE NOTICE: FERRUGINOUS HAWK NEST SITES

The lessee/operator is given notice that surface use or otherwise disruptive activity would not be allowed which would result in an aboveground facility within 0.5 mile of known ferruginous hawk nests, which have been active within the past 3 years. This notice may be waived, accepted, or modified by the authorized officer if either the resource values change or the lessee/operator demonstrates that adverse impacts can be mitigated.

(LN-26) LEASE NOTICE: RAPTORS

Surveys will be required whenever surface disturbances and/or occupancy is proposed in association with fluid mineral exploration and development within potential raptor nesting areas. Field surveys will be conducted as determined by the authorized officer of the Bureau of Land Management. Based on the result of the field survey, the authorized officer will determine appropriate buffers and timing limitations. This notice may be waived, accepted, or modified by the authorized officer if either the resource values change or the lessee/operator demonstrates that adverse impacts can be mitigated.

(LN-27) LEASE NOTICE: PYGMY RABBIT

The lessee/operator is given notice that surface use or otherwise disruptive activity would not be allowed which would result in an aboveground facility or semi-permanent (e.g., roads, pipelines, reservoirs, etc.) within 300 feet of pygmy rabbit habitat. This notice may be waived, accepted, or modified by the authorized officer if either the resource values change or the lessee/operator demonstrates that adverse impacts can be mitigated.

(LN-28) LEASE NOTICE: FISHERIES

The lessee/operator is given notice that surface use or otherwise disruptive activity would not be allowed within 400 feet of live water or the reservoirs located in the Beaver and Sevier River drainages, Parowan and Cedar Valley drainages, or Pinto Creek/Newcastle Reservoir drainage in order to prevent fisheries degradation. This notice may be waived, accepted, or modified by the authorized officer if either the resource values change or the lessee/operator demonstrates that adverse impacts can be mitigated.

(LN-29) LEASE NOTICE: UTAH SENSITIVE SPECIES

The lessee/operator is given notice that no surface use or otherwise disruptive activity would be allowed that would result in direct disturbance to populations or individual special status plant and animal species, including those listed on the BLM sensitive species list and the Utah sensitive species list. The lessee/operator is also given notice that lands in this parcel have been identified as containing potential habitat for species on the Utah Sensitive Species List. Modifications to the Surface Use Plan of Operations may be required in order to protect these resources from surface disturbing activities in accordance with Section 6 of the lease terms, Endangered Species Act, Migratory Bird Treaty Act and 43 CFR 3262.11. This notice may be waived, accepted, or modified by the authorized officer if either the resource values change or the lessee/operator demonstrates that adverse impacts can be mitigated.

(LN-30) LEASE NOTICE: Utah Prairie Dog

The lessee/operator is given notice that lands in this lease may contain historic and/or occupied Utah prairie dog habitat, a threatened species under the Endangered Species Act. Avoidance or use restrictions may be placed on portions of the lease. Application of appropriate measures will depend whether the action is temporary or permanent, and whether it occurs when prairie dogs are active or hibernating. A temporary action is completed prior to the following active season leaving no permanent structures and resulting in no permanent habitat loss. A permanent action continues for more than one activity/hibernation season and/or causes a loss of Utah prairie dog habitat or displaces prairie dogs through disturbances, i.e. creation of a permanent structure. The following avoidance and minimization measures have been designed to ensure activities carried out on the lease are in compliance with the Endangered Species Act. Integration of, and adherence to these measures will facilitate review and analysis of any submitted permits under the authority of this lease. Following these measures could reduce the scope of Endangered Species Act, Section 7 consultation at the permit stage.

Current avoidance and minimization measures include the following:

1. Surveys will be required prior to operations unless species occupancy and distribution information is complete and available. All Surveys must be conducted by qualified individual(s).
2. Lease activities will require monitoring throughout the duration of the project. To ensure desired results are being achieved, minimization measures will be evaluated and, if necessary, Section 7 consultation reinitiated.
3. Where technically and economically feasible, use directional drilling or multiple wells from the same pad to reduce surface disturbance and eliminate drilling in prairie dog habitat.
4. Surface occupancy or other surface disturbing activity will be avoided within 0.5 mile of active prairie dog colonies.
5. Permanent surface disturbance or facilities will be avoided within 0.5 mile of potentially suitable, unoccupied prairie dog habitat, identified and mapped by Utah Division of Wildlife Resources since 1976.
6. The lessee/operator should consider if fencing infrastructure on well pad, e.g., drill pads, tank batteries, and compressors, would be needed to protect equipment from burrowing activities. In addition, the operator should consider if future surface disturbing activities would be required at the site.
7. Within occupied habitat, set a 25 mph speed limit on operator-created and maintained roads.
8. Limit disturbances to and within suitable habitat by staying on designated routes.
9. Limit new access routes created by the project.

Additional measures to avoid or minimize effects to the species may be developed and implemented in consultation with the U.S. Fish and Wildlife Service between the lease sale stage and lease development stage to ensure continued compliance with the ESA.

(LN-31) LEASE NOTICE: California Condor

The Lessee/Operator is given notice that the lands located in this parcel contain potential habitat for the California Condor, a federally-listed species. Avoidance or use restrictions may be placed on portions of the lease if the area is known or suspected to be used by condors. Application of appropriate measures will depend on whether the action is temporary or permanent, and whether it occurs within or outside potential habitat. A temporary action is completed prior to the following important season of use, leaving no permanent structures and resulting in no permanent habitat loss. This would include consideration for habitat functionality. A permanent action continues for more than one season of habitat use, and/or causes a loss of condor habitat function or displaces condors through continued disturbance (i.e. creation of a permanent structure requiring repetitious maintenance, or emits disruptive levels of noise).

The following avoidance and minimization measures have been designed to ensure activities carried out on the lease are in compliance with the Endangered Species Act. Integration of, and adherence to these measures will facilitate review and analysis of any submitted permits under the authority of this lease. Following these measures could reduce the scope of Endangered Species Act, Section 7 consultation at the permit stage.

Current avoidance and minimization measures include the following:

1. Surveys will be required prior to operations unless species occupancy and distribution information is complete and available. All Surveys must be conducted by qualified individual(s) approved by the BLM, and must be conducted according to approved protocol.
2. If surveys result in positive identification of condor use, all lease activities will require monitoring throughout the duration of the project to ensure desired results of applied mitigation and protection. Minimization measures will be evaluated during development and, if necessary, Section 7 consultation may be reinitiated.
3. Temporary activities within 1.0 mile of nest sites will not occur during the breeding season.
4. Temporary activities within 0.5 miles of established roosting sites or areas will not occur during the season of use, August 1 to November 31, unless the area has been surveyed according to protocol and determined to be unoccupied.
5. No permanent infrastructure will be placed within 1.0 mile of nest sites.
6. No permanent infrastructure will be placed within 0.5 miles of established roosting sites or areas.
7. Remove big game carrion to 100 feet from on lease roadways occurring within foraging range.
8. Where technically and economically feasible, use directional drilling or multiple wells from the same pad to reduce surface disturbance and eliminate drilling in suitable habitat. Utilize directional drilling to avoid direct impacts to large cottonwood gallery riparian habitats. Ensure that such directional drilling does not intercept or degrade alluvial aquifers.
9. Reinitiation of section 7 consultation with the Service will be sought immediately if mortality or disturbance to California condors is anticipated as a result of project activities. Additional site-specific measures may also be employed to avoid or minimize effects to the species. These additional measures will be developed and implemented in consultation with the U.S. Fish and Wildlife Service to ensure continued compliance with the ESA.

Additional measures may also be employed to avoid or minimize effects to the species between the lease sale and lease development stages. These additional measures will be developed and implemented in consultation with the U.S. Fish and Wildlife Service to ensure continued compliance with the Endangered Species Act.

(LN-32) LEASE NOTICE: SPECIAL STATUS PLANTS: NOT FEDERALLY-LISTED

The lessee/operator is given notice that lands in this lease have been identified as containing special status plants, not federally-listed, and their habitats. Modifications to the Surface Use Plan of Operations may be required in order to protect the special status plants and/or habitat from surface disturbing activities in accordance with Section 6 of the lease terms, Endangered Species Act, and 43 CFR 3262.11. This notice may be waived, accepted, or modified by the authorized officer if either the resource values change or the lessee/operator demonstrates that adverse impacts can be mitigated.

(LN-33) LEASE NOTICE: RIPARIAN AREA PROTECTION (FFO)

The lessee/operator is given notice that in order to protect watersheds, occupancy or other surface disturbing activities will not be allowed within 500 feet of riparian areas and wetlands. This notice may be waived, accepted, or modified by the authorized officer if either the resource values change or the lessee/operator demonstrates that adverse impacts can be mitigated.

(LN-34) LEASE NOTICE: ERODIBLE SOILS AND STEEP SLOPES

The area is a municipal or non-municipal watershed and has steep slopes and erosive soils. New roads will be constructed to avoid soils that are highly erosive and / or in critical or severe erosion conditions. New roads will be constructed with water bars. Riprap may be required. Road grades in excess of 8 percent will normally not be allowed. In special circumstances, where a road grade of more than 10 percent is allowed, its maximum length will be 1,000 feet. Access grading along with exploration, drilling, construction, or other activities will be prohibited during wet or muddy conditions (usually during spring runoff and summer monsoon rains). This notice may be waived, accepted, or modified by the authorized officer if either the resource values change or the lessee/operator demonstrates that adverse impacts can be mitigated.

(LN-35) LEASE NOTICE: STEEP SLOPES

The lessee/operator is given notice that, occupancy would not be allowed on slopes in excess of 30 percent without written permission from the Authorized Officer.

(LN-36) LEASE NOTICE: RIPARIAN AREAS (CCFO only)

The lessee/operator is given notice that in order to protect riparian areas, no surface use or otherwise disruptive activity would be allowed within 100 meters of riparian areas unless it can be shown that (1) there is no practicable alternative; (2) that all long-term impacts are fully mitigated; or (3) that the construction is an enhancement to the riparian areas. This notice may be waived, accepted, or modified by the authorized officer if either the resource values change or the lessee/operator demonstrates that adverse impacts can be mitigated.

(LN-37) LEASE NOTICE: WATER AND WATERSHED PROTECTION (CCFO only)

The lessee/operator is given notice that in order to prevent water pollution and protect municipal and non-municipal watershed areas, no drilling, occupancy or other surface disturbance will be allowed within 500 feet of live water or the reservoirs located in the Beaver, Milford and Sevier River drainages, Parowan and Cedar Valley drainages, or Pinto Creek/Newcastle Reservoir drainage in order to prevent water quality degradation. This notice may be waived, accepted, or modified by the authorized officer if either the resource values change or the lessee/operator demonstrates that adverse impacts can be mitigated.

APPENDIX D:

Cultural Resources Class I Inventory Report Cedar City Field Office, Fillmore Field Office and Fishlake National Forest

This report compiles the specialist information from the Cedar City Field Office, Fishlake National Forest and Fillmore Field Office for the November 2008 Geothermal Lease Offering. The proposed lease parcels discussed in this report would be offered for lease subject to applicable laws and lease conditions. The proposed parcels described herein may be found to contain historic properties and/or resources protected under the National Historic Preservation Act (NHPA), American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, E.O. 13007, or other statutes and executive orders.

FILLMORE FIELD OFFICE/FOREST SERVICE

INTRODUCTION

The Fillmore Field Office (FFO) Class I Inventory Report for the November 2008 Geothermal Lease Sale adequately summarizes the presence and absence of archaeological inventories and cultural properties located on each proposed parcel. The Bureau of Land Management (BLM) will not approve any ground disturbing activities that may affect cultural properties eligible to the National Register of Historic Places (NRHP) until it completes its obligations under applicable requirements of the NHPA and other authorities. On all parcels, once a project specific proposal is submitted, an additional Section 106 cultural resource assessment would be completed and site specific issues would be addressed as appropriate. 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.

CLASS I INVENTORY RESULTS

All cultural resource information was reviewed and pertinent cultural resource information was analyzed for the **Area of Potential Effect (APE), which is defined as the entire parcel being offered for the November 2008 Geothermal lease sale.** Cultural resource information concerning the proposed parcels varies from parcels with no inventories to parcels where some inventories have covered a portion of the area. In no case is the entire parcel completely surveyed. Uninventoried portions or parcels were compared with similar areas where inventories had been conducted. This analysis included an assessment of soils, elevation, topography, vegetation and water resources. A brief summary and analysis of inventories within the proposed parcels follows, which illustrates how this determination was made.

UT GEO 48 - 53

These proposed parcels are located near Fish Springs National Wildlife Refuge in Juab County, Utah. Soils are silty with salt desert shrub vegetation communities in the valleys to rocky soils with sagebrush and juniper in the foothills. Several surveys have been conducted within and near the parcels. Approximately 122 acres has been surveyed

within or near these parcels. Surveys and site reconnaissance has identified 11 sites within the parcels, ranging from small lithic scatters, large mining area, historic roads and caves. Most notable sites include; The Pony Express Trail, Boyd Pony Express Station, Lincoln Highway, and the Fish Springs Archaeological District. These sites are either listed on or are components of sites listed on the National Register of Historic Places. Although reasonable development could occur within these parcels based on site density, all of the above mentioned sites have a critical visual component that would be adversely affected by geothermal development.

According to 36CFR800.5(1) "An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative." 36CFR800.5 (2) includes these examples of adverse effects "(iv) Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance; (v) Introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features;"

Development introduced to a landscape may cause adverse effects to the landscape and surrounding historic properties in a variety of ways. Adverse visual effects can be caused by a change in aesthetic values or by obstruction of views. In regard to a historic property, adverse visual effects are those that diminish the property's integrity, which negatively affect its historic significance and hence its eligibility for listing in the National Register of Historic Places (NRHP).

Pony Express Trail

Although it existed for a short 19 months, the Pony Express has become an enduring icon of western expansion. As a result, the Pony Express Trail was listed as a National Historic Trail in 1998 and is therefore administered by the National Park Service. Consultation with the Advisory Council on Historic Preservation, the National Park Service, Pony Express Trail Association and the National Pony Express Association would be required to determine the effects to the Pony Express National Historic Trail.

Boyd Pony Express Station

Boyd Pony Express Station was constructed in 1861. It was recorded by the BLM in 1970 and described by Richard Fike in the nomination form as "small, built of stone and contained gunports." Fike goes on to say "Boyd Station survives as one of the best preserved Express Stations in Utah. This preservation is probably due to the fact that Bid Boyd, station master, continued to occupy the site..." (78:1979; Fike). Although not listed, the Boyd Express Station contributes to the significance of the Pony Express National Historic Trail.

Lincoln Highway

Conceived of in 1913, the Lincoln Highway was the first transcontinental highway spanning from New York to San Francisco. From 1913 to 1919 the Lincoln Highway route followed the Pony Express trail through Juab County. The county maintained road that provides access to Callao is essentially the Lincoln Highway. There are many intact portions of the original two-track road, including some of the best preserved within the proposed parcels. Even where improved, the Lincoln Highway retains integrity of location, feeling and character. According to the Utah Chapter of the Lincoln Highway Association brochure, "Despite the passage of time, the wonder and adventure of a trip on the Lincoln Highway can still be experienced today."

Fish Springs Caves Archaeological District

The Fish Springs Caves Archaeological District was nominated for inclusion in the National Register of Historic Places in 1980 by the Utah State Historical Society. Prior to nomination, archaeological investigations were conducted within four caves located at the north end of Fish Springs Range to determine the extent of cultural resources. Archeological evidence demonstrated the caves were occupied seasonally for the last 5000 years. According to the nomination form, the four sites are important to answer questions related to Archaic occupation and the Archaic/Fremont transition. Vandalism to the sites has resulted in gates at two of the caves. Regardless of the county maintained road and the gates, the sites retain the aesthetic values associated with the area for the last 5000 years.

The resources described above make a significant contribution to both State and National Heritage. The landscape within the proposed parcels has maintained integrity of the setting and feeling that the pony express riders on the trail, early travelers in Model T Fords, Archaic groups 5000 years ago and miners at the turn of the 20th century would have experienced. This is one of the few areas in the region where both rich and diverse history and minimal development converge to retain the total integrity of such properties.

The viewshed surrounding these parcels is minimally altered (one county maintained road) since the sites were occupied. Therefore, any intrusion on the landscape would require further analysis by a professional archaeologist, in consultation with interest groups associated with the above listed sites, the Advisory Council on Historic Preservation, National Park Service and the SHPO to determine if development would result in an adverse effect to historic properties within the proposed parcels.

UT GEO 19-47

These proposed parcels are located in Whirlwind Valley, Swasey Mountain, Little Drum Mountains, Drum Mountains, Spor Mountain and Fish Springs Flat in Millard and Juab Counties, Utah. In the valleys soils are silty and vegetation consists primarily of salt desert shrub community. The higher elevations are rocky and contain sagebrush community vegetation. Five cultural inventories have been conducted within these

parcels. No cultural properties were identified. Expected site types in this area would consist of historic trash scatters and meagerly spaced prehistoric lithic debitage scatters. The potential for finding eligible sites within these proposed parcels would be low. Due to the expected site type, size and their density of occurrence, it has been determined that reasonable development could occur on these proposed parcels without impact to eligible cultural properties.

UT GEO 16-18

These parcels are located in the Cricket Mountains of Millard County, Utah. Soils are rocky with sagebrush vegetation. Along the eastern portion of the parcels, soils are silty with salt desert shrub vegetation. Several inventories have been conducted in the valley around the parcels resulting in the identification many large prehistoric lithic scatters. These sites tend to be located near water resources. Parcels UT-GEO-16, 17, 18 are not located near these resources. Expected site types in this area would consist of small historic trash scatters and prehistoric lithic scatters. The potential for finding eligible sites within these proposed parcels would be low (Cricket) to moderate (Valley). Although larger sites may be present in the lower elevations of the proposed parcels, the density of sites would be low. Due to the expected site type, size and their density of occurrence, it has been determined that reasonable development could occur on these proposed parcels without impact to eligible cultural properties.

UT GEO 14-15

These proposed parcels are located east of Cricket Mountains along the Beaver River drainage. Soils are silty with salt desert shrub vegetation. Two small inventories have been conducted within the parcels with negative results. The expected site types would include prehistoric lithic scatters. Based on knowledge of the area, the potential for finding eligible sites in the eastern portions (east of Highway 257) of these proposed parcels is high. The potential for finding eligible sites within the western portion (west of Highway 257) of the proposed parcels is low. Due to the expected site type, size and their density of occurrence, it has been determined that reasonable development could occur on these proposed parcels, west of Highway 257, without impact to eligible cultural properties. Development of these parcels east of Highway 257 could have an adverse affect on historic properties. To avoid adverse effects to historic properties, these parcels could be leased with a No Surface Occupancy stipulation for the portions of the parcels located on the eastern side of Highway 257.

UT GEO 05-06

These proposed parcels are located west of Pahvant Butte in the Pahvant Valley of Millard County. Soils are silty with basalt inclusions and vegetation consists of salt desert shrub. No inventories have been conducted within the proposed parcels. Numerous inventories have been conducted in the vicinity. Expected site types in this area would consist of historic trash scatters and meagerly spaced prehistoric lithic debitage scatters. The potential for finding eligible sites within these proposed parcels is low. Due to the expected site type, size and their density of occurrence, it has been determined that reasonable development could occur on these proposed parcels without impact to eligible cultural properties.

UT GEO 01, 09-13

These proposed parcels are located west of Cove Fort, Millard County, Utah. Soils are colluvial with rocky inclusions and vegetation consists of sagebrush and juniper. Approximately 22,214 acres have been inventoried within these proposed parcels resulting in the identification of 144 cultural properties. These sites are small to medium sized lithic debitage scatters or small historic trash scatters. Sites expected in the unsurveyed portions of the proposed parcels would be consistent with the previously recorded sites in the vicinity. Based on the assessment of soils, elevation, topography, vegetation and water resources in surveyed areas with similar conditions, the potential for finding eligible sites within these proposed parcels is moderate. Due to the expected site type and their density of occurrence (4.2 per square mile), it has been determined that reasonable development could occur on these proposed parcels without impact to eligible cultural properties.

UT GEO FS 01 and FS 02 Fishlake National Forest

Parcels FS 01 and FS 02 are located within the Fishlake National Forest north of Cove Fort in Millard County, Utah. Soils are colluvial with rocky inclusions and vegetation consists of sagebrush and juniper. One small inventory has been conducted within the parcels with negative results. The expected site types would include small to medium sized lithic debitage scatters or small historic trash scatters. The BLM has consulted with the FS archaeologist and based on his knowledge of the area, sites expected in the unsurveyed portions of the proposed parcels would be consistent with the previously recorded sites in the vicinity. Based on the assessment of soils, elevation, topography, vegetation and water resources in surveyed areas with similar conditions, the potential for finding eligible sites within these proposed parcels is moderate. Due to the expected site type and their density of occurrence, it has been determined that reasonable development could occur on these proposed parcels without impact to eligible cultural properties.

CEDAR CITY FIELD OFFICE

INTRODUCTION.

The primary focus of this analysis is to determine what, if any, effects leasing of certain tracts for geothermal activities would have on cultural resources. This sort of analysis has, over the past few years, been several times accomplished by the Cedar City Field Office staff, but for oil and gas leasing rather than for geothermal. It is assumed at the outset, however, that parameters and procedures would be about the same for these seemingly quite similar activities - at least at the leasing level. Also to be noted is that most of our oil and gas efforts involved numerous parcels and acres up into the hundreds of thousands. Here we deal with only three parcels: about 480 acres on one parcel in the vicinity of New Castle, and two parcels totaling about 5640 acres in the Roosevelt Field at the mouth of Negro Mag Wash on the west slopes of the Mineral Mountains. Irregardless the size, however, some serious resource concerns are herein raised that did not surface in the oil and gas undertakings.

Information for the analysis is drawn from two excellent and nicely complementary sources. First, for locational and site density information, the field office maintains a very substantial set of cultural records, compiled from internal as well as consultant work. These are the records upon which the SHPO's data base for the area is anchored. Having compiled and maintained these records, as well as having generated a very substantial portion thereof, the current Field Office Archeologist has 35 years of experience working with the cultural resources of Southwestern Utah, and carries an intimate knowledge thereof. Particularly pertinent to a major thrust of this analysis, the Field Office Archeologist has spent a great many months doing inventory on the west slopes of the Mineral Mountains; he has also been directly involved in the analysis, approval, mitigation, and implementation of/for a large number of often quite extensive projects - industry, as well as Bureau driven.

ANALYSIS PARAMETERS, CAVEATS, AND OTHER CONSIDERATIONS.

Following are outlines of the parameters or "sideboards" that have served us well in successfully working with many rounds of oil and gas leasing. It is found, however, that analysis of two of the current parcels raises some problems in direct application of these, as well as interjecting some serious considerations about effect not previously raised in oil and gas work (although it is proposed that the concerns would be very much the same were these oil and gas leases rather than geothermal). The parameters/givens are thus enumerated in the following paragraphs, but annotated where current application has differed from the "norm."

A. The field office area holds a large, rich, and varied archeological resource spanning the period from 12 to 15,000 years ago to, essentially, the day-before-yesterday. There are large numbers of sites, many of which can be tied to Archaic, Fremont, and Paiute occupations. There is even a little material from the earlier big-game hunting periods (Clovis, Folsom, etc.). Such sites as we have can be extremely data-rich, often more-so in the aggregate than individually, since many represent short-term, transient occupations. For the same reason, they can also be very sensitive to even what might seem to be minor disturbances. A small Paiute station, perhaps even with the remains of a temporary shelter, can be lost in a heartbeat to any sort of machinery, and many - even very large - surficial scatters can lose much of their information potential to surface collection of sensitive artifacts. Further, many of our ubiquitous flake scatters prove to be much more difficult to tease meaningful data from than is the case with substantial sites with stratification and well-defined features.

B. Still, while "A" very much holds true, we have been very successful in supporting previous leasing precisely because of the nature of our cultural resources. Other than Parowan Gap, and a few other localities, we do not control very many "sexy" sites in the field office area. Our Great Basin foragers provided a whole lot of "scatters" of various sorts, mainly reflecting transient hunting and gathering activities, and including not very inspiring flake and tool (sometimes) scatters - fairly often with ground stone, occasionally with features such as hearths, and sometimes - in the later periods - with ceramics. The majority of these sites, however, are scattered rather unevenly over the landscape, with major concentrations rather unusual and usually not particularly areally extensive. Such Fremont village sites as exist are almost exclusively on private land along the Parowan Front, and there are none of the big, based-on-stone structural sites that mark the Anasazi areas to the south and southeast. Rock art is certainly not uncommon, but major concentration, such as the Gap, are. Sheltered sites (caves, rock overhangs) are

not common at all, nor are major, long-term camps and the like. Very much central here, there are two big obsidian source areas to deal with. Located in the Mineral Mountains and in the vicinity of Modena, these have led to strong concentrations of sites reflecting the technology involved in "toolstone" procurement, and stone tool production. While of considerable interest, our historic sites are quite limited in number, and most are located on patented land.

C. The Cultural Resource Program brings to the table a large and strong corpus of protective laws, regulations, and procedures. Included are the National Historic Preservation Act, NEPA, The Antiquities Act of 1979 (and 1906), laws specific to American Indian rights, and several post-lease stipulations and opportunities for site-specific clearances. Further, the following is to be included in each lease granted (per WO IM 2005-003):

"This lease may be found to contain historic properties and/or resources protected under the National Historic Preservation Act (NHPA), American Indian Religious Freedom Act, American Indian Graves and Protection Act, E.O. 13007, or other statutes and executive orders. The BLM will not approve any ground-disturbing activities that may affect such properties or resources until it completes its obligations under applicable requirement of the NHPA and other authorities. The BLM may require modification to exploration or development proposals to protect properties, or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized, or mitigated."

D. In previous leasing efforts, the major criterion for establishing effect/no effect has been that if a 5-acre pad and necessary access could be placed somewhere on the parcel, it would be suitable for leasing without citing conflict with archeology. There is some question as to whether this is as applicable to geothermal as to oil and gas - that will probably need some fine-tuning, but not here. Very pertinent here is that we depart significantly in this analysis from the "5-acre rule." As detailed below, it is proposed that 5-acre segments can be found on the two Mineral Mountain parcels, but that an "Adverse Effect" will nonetheless obtain from leasing in the area.

E. The APE. In all of our previous leasing work, it has been taken that the APE coincides exactly with the boundaries of the particular lease offering. In part, this had to do with the generally large size of the leases, combined with the often scattered nature of the resource. This made it relatively easy to site a pad somewhere on the lease and still avoid direct conflict with sites. Generally these factors also obviated the need to abstract potential impacts/effects, especially those of an adverse nature. Again, however, in the present context, it is deemed necessary to see leasing effects well beyond the limits of the two Mineral Mountain/Negro Mag Wash parcels. Reasoning for this posture is detailed in the following analyses.

Parcel UT-GEO-004, New Castle Vicinity

This relatively small parcel can be disposed of rather quickly. It is located in the low hills southeast of New Castle, and thus in the first screen of elevated country bordering the Escalante Valley on the east. Field office records do not reflect sites on the parcel, but there has also not been much activity - just a single power line corridor through the extreme northeast corner. The Kern River pipeline surfaced several sites not far to the west, but these are along the contact between the valley and the hills - where one expects a good density. Other inventory and reconnaissance in the general area has

shown very little resource, which has also been our experience with a lot of the first hills flanking the Escalante Valley (save in special circumstances). Based on experience with similar country, I would expect the parcel to show a low - to perhaps moderate - density of not very large or complex sites. There should be no problem, then, siting a well on the parcel without resource conflict. A "No Historic Properties Affected" determination seems appropriate here, then.

Parcels UT-GEO-002 and UT-GEO-003, Roosevelt Geothermal Field, Mouth of Negro Mag Wash, West Slopes of the Mineral Mountains

The west slopes of the Mineral Mountains, with Negro Mag Wash about centered on a north-south axis, support just an exceptional archeological area. In large measure, this has to do with the presence of large, well-exposed obsidian flows that provided prehistoric visitors with abundant, readily available, and high-quality "toolstone" suitable for the production of projectile points and a variety of other cutting/scraping/piercing tools. There is evidence for procurement and use of this material for the past 12,000 years or so, and the chemically traceable obsidian from the flows has been found widely distributed over the American Southwest.

There are in the area two primary loci for obsidian procurement; both are exposed and weathered flow margins. One is in the mouth of Wildhorse Canyon about 3.5 miles south of the Blundell Geothermal Plant; the second is along the base of the ridge flanking the margin of the Negro Mag Wash on the south about 1.5 miles east of the plant, which is itself squarely on the alluvial outwash in the mouth of Negro Mag. Wildhorse is the better known site as it is a designated National Register property; Negro Mag may actually be the larger source. Both still show huge amounts of chunks/pieces/whatever of obsidian, much of it usable and some quite large, along the base of the flow - along with great masses of waste flakes from testing and initial artifact forming. Preforms and bifacial pieces used to be abundant, also, but have been extensively collected.

Found in the alluvial outwash fronting Wildhorse Canyon - and particularly Negro Mag Wash - are abundant obsidian nodules with dull, weathered cortical surfaces. These have been seen deep in cuts in the alluvium and occur in sizes from gravel to small boulders - a great many are in the fist- to head-size range. Where these have re-exposed on the outwash areas, there are large numbers of sites that were given over almost exclusively to the breaking, testing, and trimming of the nodules. Sometimes material was carried to a "preform" stage, but the main purpose of the activity seems to have been to reduce bulk and obtain good-looking pieces for use elsewhere. These are known, not too creatively, as "nodule breaks."

We see very good evidence back in the sheltered coves and the first elevated country for "workshops" given over to the production of bifacial tools from the pieces and preforms brought from the breaks; sometimes there is also good evidence for raw nodules being transported to the more sheltered areas to work. Further afield, on the big concentrations of hunting and gathering sites on the basalt flows east of the Minerals, we will often see - in addition to 99% obsidian debris - good evidence for work with preforms, or even small raw nodules, obviously carried in from the breaks and workshops on the west slopes. Occasionally, there will be an obvious workshop, also. To the west, on the strong clusters of big sites along the meandering trace of the old

Beaver River, most of the sometimes intense obsidian debris is quite small, indicating finished artifact production and refurbishing.

Adding to the complexity of trying to work with west slope archeology is that this is first-class subsistence country - without the obsidian. It is well-watered, holds abundant and varied resources to elevations approaching 9,000 ft., and had as an anchor the riparian delights associated with the mature, meandering Beaver River. This juxtaposition of abundant obsidian and far-better-than-average (for the Great Basin) subsistence potential created an extremely desirable area for prehistoric foragers, as well as an exceptional archeological area for those of us that came along a little later. Thus, when we get away from the primary sources, nodule breaks, and outright workshops, there are stations, camps, and task areas very similar to what would be seen in other Great Basin areas - but with the addition of a strong patina reflecting obsidian procurement and use.

While the obsidian is central to the present configuration, it cannot be over emphasized that the west slopes would be a very strong archeological area - were there not a single flake of obsidian available. The nodule breaks and workshops would be gone, but there would still be a good, strong density of subsistence sites, which might actually be a little easier to work with sans obsidian. With the obsidian and the procurement and production activities also in the picture, the area is just exceptional and should be considered as a National Register Property or perhaps as a Traditional Cultural Property (should anyone every find the time to make the nominations).

The basis for the on-going development of the foregoing synopsis has been provided by a great deal of inventory in the Pinnacle Pass to the Pass Road area, particularly in a 4-mile-wide strip from the ridges and coves at the base of the really steep country, out across the lower slopes and flats towards - but not to - the Beaver River. Inventory along the river is very spotty, but quite informative. Higher elevation inventory is very scarce.

The first test wells for geothermal sources were drilled in 1975. In 1977, probably tiring of bringing out an archeologist every other week, Phillips Petroleum commissioned So. Utah State College to inventory 2200 federal - and 640 state - lease acres. This effort yielded 157 sites, gave some idea of the nature and extent of the involved resource, and exposed an unexpected void in the site density that was eventually selected for the generating plant. Considerable inventory has subsequently been associated with field development and expansion. Besides the plant and ancillary facilities, there are several working and abandoned well pads, many miles of pipelines and roads, as well as transmission lines.

In 1977, the first in what was to be a whole series of big wildfires came over the top of the Minerals from the east, and ran down two big coves on the west in the vicinity of Pinnacle Pass. BLM inventory here yielded 112 sites over 1500 acres, and clearly showed the basic subsistence nature of many of the sites in the sheltered coves. Several large fires since then, culminating in the great Milford Flat fire of 2007, essentially burned over every acre of sagebrush in a fairly wide band from several miles south of the Pass Road to the Millard Country line - and beyond. Fewer fires got into the P/J zone, the Honeyboy Fire of 1986 being a notable exception; then the Milford Flat fire burned into Salt Cove and Big and Little Cedar Coves, ran up and over the head of Negro Mag Wash, and burned over virtually the whole of Bearskin Mountain (not to

mention reburning the Pinnacle Pass coves and a bunch of former sagebrush country, as well as the last big patch of sage).

Two things are particularly pertinent and informative with the sagebrush burns. First, where there are no exposed nodules on the alluvium, there are not many sites - fewer as one gets further out from the hills. Secondly, in areas where nodules had been re-exposed, nodule break sites are thick; one 1700 acre tract from the 1987 "Negro Mag Fire" yielded some 300 such loci. Where the 1990's Honeyboy and, to lesser extents, the Milford Bench and Milford Pass fires got into the P/J, good subsistence sites were found, along with obsidian use and procurement activities, but in no great density.

The Kern River Pipeline project kicked off with layout and archeological inventory in 1989 - the line actually runs thru portions of both of the lease parcels considered in this action. The initial inventory actually involved closely parallel, competing lines, then a major reroute of the selected alignment. The line comes over Pinnacle Pass from the east, and from where it exits the big cove and turns south, a high site density is encountered, especially in the mouth of Negro Mag Wash. Density and general scatter was so high in the Negro Mag area, in fact, that the consultants running the inventories invented a giant site (42Be88) that subsumed at least 150 previously recorded sites, plus whatever else happened to be on the nearly 2000 acres involved. While this certainly speaks to the density and intensity of material in the area, it also reflects the people running the inventory taking a huge shortcut in what I consider proper site identification and recording procedures. Just for good measure, they did another of somewhat lesser size on the Wildhorse outwash. We have not had to deal with the Wildhorse area much lately, but the Negro Mag abortion has been a major, unmanageable pain (that we can't find the time to fix).

Not yet in place, there is a wind farm going in on the flats a bit NW of the area specifically considered herein. It will take up a large piece of country and is going to require a substantial commitment of cultural resource (mitigation, etc.). Perhaps more worrisome than this project per se is that it may presage other farms on the Minerals and the west slopes (where there is certainly no lack of wind).

As if one big gas pipeline was not enough, a second line was proposed and built in 2003. This was built essentially in the same R/W as the first, but with some widening required, as well as with many new support facilities. Significant new inventory was required, including relocating and evaluating sites from the first project. Additional, very significant mitigation was also accomplished, but not so much this time on the west slopes (save two extensive off-line efforts meant to supplement and tie together some of the previous work). Between the two projects, then, a swath about 250 ft. wide was taken out between Pinnacle Pass and the crossing on the Corral Canyon drainage. Over this area, with the bulk found in the vicinity of Negro Mag Wash, 25 eligible sites were subjected to mitigation excavation, and a number more not deemed eligible were simply destroyed - along with the sometimes considerable portions of the eligible sites within the take area, but not treated under a sampling protocol.

Just over the past few years, a substantial pearlite mine was opened on State Section 2, squarely in the mouth of Negro Mag Wash. The pearlite deposit overlays the Negro Mag obsidian flow, which would work well for cultural - except that the prehistoric folks brought obsidian up from the flow and established several workshops on the surface of the point containing both deposits. Inventory was done and several of the sites were

tested and excavated to one extent or another, but a great deal of material - residual eligible sites, non-eligible sites, and abundant general scatter went under the blade. The pearlite extends out onto BLM and the old Schoo Mine, which took out a fair piece of country with no cultural considerations. (As an aside, it may be noted that there are big pearlite claims over the Wildhorse flow, some of which have seen testing.

All the while we have been learning about this special area, we have been suffering significant resource loss, in large measure from the very things that have provided the information base for these discoveries, which, not incidentally, are nowhere near complete. Just over the past 30 years, since the initial exploration of the Roosevelt field, we have taken very significant resource abuse and loss. This came about not from a single - or even several - egregious events, but rather in a distinctly accretional, as well as often peripheral, manner. The very essence of cumulative impacts, it would seem. We were never out of control (although the fires were at times) and always had the best of intentions, but the resource suffered substantially nonetheless.

Under the provisions of NEPA, ARPA, NHPA, NAGPA, etc., we have had fairly tight control of the permitted activities in the area. But there has just simply been continuous pressure on the land and resources, with enough residual and collateral effects to be very significant and quite damaging to the base. With some of the geothermal activities, it has been possible to do mitigation by moving project components off major sites, but often then went onto peripheral scatter or sites not at the time considered to be eligible. Further, a sister agency that had the lead in the initial production project was much more interested in developing the field than in worrying about a bunch of obsidian.

As noted above, a great deal of excavation (and intensive surface collection) was done as mitigation for the Kern River pipelines. However, the majority of the sites treated, lithic scatters of varying sizes and intensities, were not particularly conducive to yielding solid information from excavation, especially from the sampling protocols used in the treatment project. Mainly, a certain number of 1x1 m. or 1x2 m. excavation units were spaced over the site, with provisions for expanding to follow features. However, these were almost wholly sites to do with obsidian procurement and flaking/production activities, so the units produced no features, only an occasional point or other tool, and a whole bunch of flaking debris. Then, the requirement of the plan having been met, the balance of the site in the take area was given over to the laying of pipe.

This is the crux of the trade-off inherent in mitigation excavation of cultural sites: the accumulation of some level of information now, in exchange for project support and approval - and some level of loss (and the loss of potential for perhaps more refined information-extraction methods in the future). Sometimes this approach appears to be quite successful, sometimes it does not. My assessment is that we were not very successful in teasing information from the sites involved in the Negro Mag Wash vicinity for the first pipeline effort. Perhaps this could have been done better with a different approach or at a later time - perhaps not. We didn't have much time to figure it out, although a very different approach was tried for the second line, with good results (but not on the scatters of the first try). Whatever the case, a significant amount of resource was committed and essentially used up in a very short period of time.

BLM of course had no control over the wildfires, neither timing, placement, nor extent. Any way you look at it, however, fire is not good for archeological sites. Obsidian can be damaged, although it holds up better than siliceous stone, which will often shatter.

Pottery will change color, and some types will break and crumble. There are also technical considerations relevant to various tests such as C-14, pollen, obsidian hydration, etc. Historic sites usually are simply toast (wood, cans, bottles, etc.). Post-fire erosion can be extremely damaging, as can the set-up of new drainage patterns.

I thoroughly enjoy the inventory we do in advance of wildfire rehabilitation, or at least I did when we were doing the work ourselves. Sites are exposed and easy to find, and it is particularly easy to see materials, features, and site patterning. We have accumulated a great deal of information from these inventories. In fact, I see the fire inventories as much more informative than the pipeline excavations, at least in the development of the story of prehistoric area use presented above. However, the fire and rehabilitation processes constitute a double-edged sword in a number of ways. Besides the fire itself and the natural agencies that work on the sites post-fire, the archeologists are not the only ones that understand that fire can expose a lot of nice material. It has gotten to a point that there are people out on the sites after a fire almost before the ashes are cool, gathering whatever catches an eye - "arrowheads," of course, being right at the top of the list.

There is just no question but that vandalism - illicit surface collection and some digging - has to be right at the top of the list of agents causing significant resource loss. People are constantly collecting in this area, including the occasional pickup load of obsidian from the talus along the big flows. This has been taken to the point that most of our sites have been reduced to scatters of flakes. The artifacts are gone: "arrowheads," bifaces, good scrapers, preforms, ceramics, manos and metates, and anything else considered collectable. While the fires had a lot to do with this recently, some people were collecting the area before either burns or development. But, the very significant opening of the area via the big projects - including particularly exposing it to a great many newcomers - has had an impact on the cultural resource.

Furthermore, just the amount, level, and purpose of the inventory and other work done on the west slopes of the Minerals has caused a significant problem for the Cultural program. Done by many different researchers for several different activities and reasons, inventory information is inconsistent and almost unmanageable. This is due also in large part to the nature and extent of the local resource, as well as things like creating the giant sites noted above in an attempt to deal with it. And, of course, a major part of this problem is that we never have time to plan and regroup. As soon as one project out here is done, we have to move on to another locality. Then, suddenly one morning comes the next west slopes project and all we can do is scramble around and try to get something reasonable in place to deal with the resource vis-a-vis the project - which usually means find the sites, maybe dig a few, and move on to the next project.

With the foregoing, I have not made much effort to show exactly where we have which levels of site density, and where we could - and could not - site a drill hole and required access. That is not the point I am attempting to make herein. Rather, I believe that this is an exceptional archeological area where we have, over the past 30 years learned a lot, but have also taken substantial levels of resource loss and abuse. I think we need to cast a very critical eye on any new activity in the area, especially if we have some discretion in the matter.

I have said in other contexts that I doubt that there are more than a few - if any - 40 acre tracts in the field office area where we could not, if push came right down to shove, work

in a single pad and access. If there are such places, the mouth of Negro Mag Wash and the big obsidian flow area are very good candidates for showing them. Still, the two parcels under consideration are quite large and it is noted a place or two above that there are areas, such as the coves and P/J country, that show no great density, and there are as well some essential voids in site occurrence, such as where the plant went in. Further, we just facilitated placing 6 new pads for PacifiCorp in support of plant expansion and increased output; all were in the vicinity of the mouth of Negro Mag Wash, and all went in with no untoward problems (although one initially selected site was dropped because it was on a big archeological site). There is, then, actually little question whether or not we could find a 40 on each parcel on which to site a well and appropriate access. We could without much trouble.

I have also noted in other lease efforts that while we could site a well and access on about any "40" in the field office area, there are going to be places where we should not and would not want to. The Parowan Gap vicinity is one such area. And I propose that in and around the mouth of Negro Mag Wash is another, as well may be the bulk of the west slopes of the Minerals.

We are already in a relationship with PacifiCorp that essentially requires us to support their activities, as we are, also, with the pipeline folks, whomever they might be next time (and there will be one - and anyone that thinks there will not be more big fires is not watching the trends). In view of the very special nature of the area, we have already taken substantial loss and resource compromise, and already have existing obligations to probably take more. I simply do not believe, then, that we should enter into another binding arrangement that holds potential for exacerbating an already challenging resource management situation, and that to do so would constitute an "Adverse Effect" situation.

NATIVE AMERICAN NOTIFICATION/CONSULTATION

Fillmore Field Office

The following tribes will be notified via certified letter: Paiute Tribe of Utah (PITU), Confederated Tribes of the Goshute Reservation, Kanosh Band of the Paiute Tribe, Skull Valley Goshute Tribe and the Ute Tribe. A copy of this report and maps will be provided to each of the tribes. They will be asked to identify traditional cultural places or any other areas of traditional cultural importance that need to be considered within the APE. Any comments or concerns regarding leasing the proposed parcels must be submitted to the FFO within thirty days of receipt of the letter.

Cedar City Field Office; Fishlake National Forest

Since March, 1999, the Cedar City Field Office has had in place a "Memorandum of Understanding Concerning Communication and Cooperation" with the Paiute Indian Tribe of Utah. While this document is more far-reaching in scope, very central is that BLM will notify the Tribe of any actions that might be of interest or concern to the Tribe, and that the Tribe will provide at least a brief written response - leases and the like are defined as of interest. The cultural resources person for the Tribe has been briefed on

the leasing proposal and will be provided with a copy of this memo. We will append comments when they are forthcoming.

As a result of consultation with the Paiute Tribe and others concerning Parowan Gap (2007 Oil and Gas Sale), it has become quite apparent that the Hopi have interest in the field office area, particularly in the Formative manifestation known locally as Fremont. Since Fremont sites are not uncommon on the west slopes of the Minerals, we will send them a package covering the lease proposal, to include this memo.

SUMMARY/EFFECTS DETERMINATIONS – ALL PARCELS

After consideration of cultural resource information and other general data including: the applicable House Range Resource Management Plan (RMP), Warm Springs RMP, Cedar Beaver Garfield Antimony RMP and associated Environmental Impact Statement (EIS); fluid minerals NEPA documents; specific data relating to the individual proposed parcels such as topography and soils; as well as personal knowledge and experience of the lands at issue, the Fillmore Field Office, Cedar City Field Office and Fishlake National Forest archaeologists, make the following determinations of effects to historic properties:

1) Parcels UT-GEO 14-15

Development of these parcels east of Highway 257, where there is high site density and potential for large sites, could have an **Adverse Affect** on historic properties. To avoid adverse effects to historic properties, it is recommended that these parcels be leased with a No Surface Occupancy stipulation for the portions of the parcels located on the eastern side of Highway 257.

2) Parcels UT-GEO 002, UT-GEO-003, and UT GEO 48 – 53

The BLM determination for proposed parcels 2, 3, and 48 – 53 is that leasing these parcels under the existing categories, which would allow one well to be constructed on the parcel, would have an **Adverse Affect** to historic properties.

Although reasonable development could occur, based on site density, proposed parcels 48-53 have a critical visual component that would be adversely affected by geothermal exploration or development. Any intrusion on the landscape would require further analysis by a professional archaeologist, in consultation with interest groups associated with the above listed sites, the Advisory Council on Historic Preservation and the SHPO to determine if development would result in an adverse effect to historic properties within the proposed parcels.

The BLM Archeologist, Cedar City Field Office, recommends the Roosevelt Field leases 002 and 003 be dropped from further consideration. Failing that, they should be deferred until such time as the Field Office produces a new management plan that could address enhanced protection for the area - to include establishment of a National Register District or a Traditional Cultural Property.

3) Parcels UT GEO 01, 04, 05, 06, 09-13, 16-47, FS 01, and FS 02

Known cultural resources are located in such a fashion (size, density and placement) that avoidance is feasible during development of oil and gas resources. The potential for locating additional cultural resources within the proposed lease parcels UT GEO 01, 04, 05, 06, 09-13, 16-47, FS 01, and FS 02 reviewed for the November 2008 Geothermal Lease Sale is low to moderate. Furthermore, analysis of the reasonably foreseeable impacts of leasing on both identified and unidentified cultural properties resulted in the recommendation of **No Adverse Affect**. This is based on the determination that reasonable development (placement of one well pad and access estimated at 6.5 acres) could occur on proposed parcels UT GEO 01, 04, 05, 06, 09-13, 16-47, FS 01, and FS 02 without impact to eligible properties.

A complete inventory of the proposed lease parcels has not occurred; therefore, the following stipulation should be added to any parcel offered for lease:

"This lease may be found to contain historic properties and/ or resources protected under the National Historic Preservation Act (NHPA), American Indian Religious Freedom Act, Native American Graves and Protection Act, E.O. 13007, or other statutes and executive orders. The BLM will not approve any ground disturbing activities that may affect such properties or resources until it completes its obligations under applicable requirements of the NHPA and other authorities. The BLM may require modification to exploration or development proposals to protect properties, or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized or mitigated."

Utah SHPO Consultation.

The BLM has determined that leasing parcels is an undertaking as defined in 36 CFR 800.16(y).

According to Part VII.A.B (1) of the Utah Protocol, the BLM can request the review of the Utah State Historic Preservation Office (SHPO) prior to project implementation. Consultation with the Utah SHPO will be initiated after comments are received from our Native American contacts.

REFERENCES

Fike, Richard and John W. Headley
1979, The Pony Express Stations of Utah in Historical Perspective. Bureau of Land Management Cultural Resources Series Monograph 2.

Madsen, David B.

1979 Preliminary Analysis of Prehistoric Occupation Patterns, Subsistence Adaptations, and Chronology in the Fish Springs Area, Utah

Simmons-Lohse, Dorothy

1980, Fish Springs Caves Archaeological District National Register of Historic Places Nomination Form, on file at Bureau of Land Management, Fillmore Field Office.

“Rediscovering Utah’s Lincoln Highway”, Lincoln Highway Association, Utah Chapter

APPENDIX E: Native American Consultation Letter



United States Department of the Interior
BUREAU OF LAND MANAGEMENT
FILLMORE FIELD OFFICE

35 East 500 North
 Fillmore, Utah 84631



TAKE PRIDE
 IN AMERICA

BLM - UT - 950
 2008 OCT - 3 AM 9:27

In Reply Refer to:
 8100 (U-010)

September 30, 2008

CERTIFIED MAIL # 7008 0150 0001 3253 4980
 RETURN RECEIPT REQUESTED

BETSY CHAPOOSE
 DIRECTOR
 CULTURAL RIGHTS & PROTECTION DEPT
 PO BOX 190
 FORT DUCHESNE, UTAH 84026

Dear. Ms. Chapoose:

The Fillmore Field Office (FFO) is seeking your tribe's comments, concerns, or recommendations regarding the following Federal Action by the Department of the Interior (DOI), Bureau of Land Management (BLM).

The BLM Utah State Office has received nominations for geothermal leases on about 191,000 acres of federal -owned mineral estates within Juab, Millard, Iron, and Beaver Counties, Utah (see attached nominated parcel map). The projected date of the lease sale is presently December 16, 2008. The surface of the nominated lands are managed by the BLM Cedar City Field Office (CCFO), FFO and the Utah State Forest Service Fishlake National Forest (see attached acreage table). The issuance of leases for geothermal resources is a federal action and a commitment to resource development. As such, it requires National Environmental Protection Act (NEPA) analysis. While existing land use and forest management plans covering the nominated land areas have analyzed possible future fluid mineral leasing, the BLM has elected to review those prior analyses by preparing an environmental assessment (EA) specific to the lands nominated.

If a parcel is not taken by competitive bidding, it may be leased by non-competitive sale for the two years following the competitive offer. A lease may be held for ten years (43 CFR 3120.2-1), after which the lease would expire unless geothermal energy is produced.

A lessee's right to explore and drill for geothermal resources, at some location on the lease, is implied by issuance of the lease, unless the lease has a non-surface occupancy stipulation. An application for a permit to drill must be submitted by the lessee to the BLM for approval; lessee must possess a BLM approved permit prior to drilling. An EA must be prepared and a finding of no significant impact made prior to permit approval.

After consideration of cultural resource information and other general data including: the applicable House Range Resource Management Plan (RMP), Warm Springs RMP, Cedar Beaver Garfield Antimony RMP and associated environmental impact statement (EIS); fluid minerals NEPA documents; specific data relating to the individual proposed parcels such as topography and soils; as well as personal knowledge and experience of the lands at issue, the FFO, CCFO and Fishlake National Forest Archaeologists, make the following determinations of effects to historic properties:

1) Parcels UT-GEO 14-15

Development of these parcels east of Highway 257, where there is high site density and potential for large sites, could have an **adverse effect** on historic properties. To avoid adverse effects to historic properties, it is recommended that these parcels be leased with a No Surface Occupancy stipulation for the portions of the parcels located on the eastern side of Highway 257.

2) Parcels UT-GEO 002, UT-GEO-003, and UT GEO 48 – 53

The BLM's determination for proposed parcels 2, 3, and 48 – 53 is that leasing these parcels under the existing categories, would allow one well to be constructed on the parcel and would have an **adverse effect** to historic properties.

Although reasonable development could occur, based on site density, proposed parcels 48-53 have a critical visual component that would be adversely effected by geothermal exploration or development. Any intrusion on the landscape would require further analysis by a professional archaeologist, in consultation with interest groups associated with the above listed sites, the Advisory Council on Historic Preservation and the State Historic Preservation Officer to determine if development would result in an adverse effect to historic properties within the proposed parcels.

The CCFO Archeologist, recommends the Roosevelt Field leases 002 and 003 be dropped from further consideration. Failing that, they should be deferred until such time as the CCFO produces a new management plan that could address enhanced protection for the area - to include establishment of a National Register District or a Traditional Cultural Property.

3) Parcels UT GEO 01, 04, 05, 06, 09-13, 16-47, FS 01, and FS 02

Known cultural resources are located in such a fashion (size, density and placement) that avoidance is feasible during development of oil and gas resources. The potential for locating additional cultural resources within the proposed lease parcels UT GEO 01, 04, 05, 06, 09-13, 16-47, FS 01, and FS 02 reviewed for the November 2008 Geothermal Lease Sale is low to moderate. Furthermore, analysis of the reasonably foreseeable impacts of leasing on both identified and unidentified cultural properties resulted in the recommendation of **no adverse effect**. This is based on the determination that reasonable development (placement of one well pad and access estimated at 6.5 acres) could occur on proposed parcels UT GEO 01, 04, 05, 06, 09-13, 16-47, FS 01, and FS 02 without impact to eligible properties.

The FFO welcomes your comments relating to cultural, environmental or any other issues regarding this project proposal in accordance with the NEPA, the National Historic Preservation Act, and the American Indian Religious Freedom Act to ensure that any concerns you may have about the proposed project are fully considered and incorporated into the EA. The BLM is requesting your assistance in identifying properties of traditional, religious, or cultural importance which may be affected by the proposed project. The BLM would also like to consult, if possible, with traditional or religious leaders who may have information about places of cultural significance. Your assistance in recommending such leaders would help us in determining the effects to such areas.

We invite your comments, concerns, or recommendations relating to environmental or other issues regarding the alternatives within the proposed EA. If you would like additional information or wish to discuss the project further, please contact Joelle McCarthy, FFO Archaeologist by phone at, (435) 743-3122 or electronically at joelle_mccarthy@blm.gov. We would very much appreciate receiving your comments or questions by no later than October 20, 2008, so we can incorporate any input you may have into the draft EA. When the draft EA is available, we will send it for your review and comment.

Sincerely,



Patricia M. Bailey
Acting Field Office Manager

Enclosures:

Cultural Resources Class I Inventory Report
Maps (14)

cc:

~~Julie~~ Howard
Utah State Office
PO Box 45155
Salt Lake City, UT 84145

Gardiner Dalley
Cedar City Field Office
176 E. D.I. Sargent Drive
Cedar City, UT 84721

Forest Service
390 S Main St.
Fillmore, UT 84631

APPENDIX F:

Reasonably Foreseeable Development of Parcels included in the November 18, 2008 Geothermal Lease Sale

Introduction

A competitive geothermal lease sale scheduled for November 18, 2008 will include 55 parcels containing a total of 191,911 acres of federal lands located in Juab, Millard, Beaver and Iron Counties, Utah. This reasonably foreseeable development (RFD) scenario will project the exploration and development activities that may occur on these parcels after geothermal leases are issued. Guidance for developing RFDs for oil and gas and geothermal resources can be found in BLM Handbook H-1624-1 (1990) and Instruction Memorandum (IM) 2004-089 (2004) and this report will follow the general format recommended in IM 2004-089.

Description of Geology

The parcels are located in the Basin and Range Physiographic Province in western Utah. This area is characterized by roughly north-south trending mountain ranges separated by broad, relatively flat, valleys. The valleys have a cover of Quaternary and Tertiary sediments except in local areas where Cenozoic extrusive igneous rocks are present (Mabey and Budding, 1987). Mountain ranges adjacent to the valleys generally consist of sedimentary and metamorphic rocks of Precambrian through Mesozoic age and Upper Tertiary and Quaternary intrusive and extrusive igneous rocks. Similar rocks are assumed to underlie the valleys (Mabey and Budding, 1987).

In the Cretaceous Period large sheets were thrust eastward for distances of as much as 100 km during the Sevier Orogeny (Mabey and Budding, 1987). The leading edges of the sheets were folded, uplifted and eroded resulting in the eastward deposition of debris from the advancing sheets. The onset of Basin and Range extensional faulting in early Miocene time reflected a major change in the stress field affecting western Utah as compressive tectonism gave way to extension resulting in the block faulted mountains and intervening basins that characterize the region's topography today.

Surface geological features that may indicate the potential existence of geothermal resources include Tertiary and Quaternary volcanic rocks, Quaternary faults, active hot springs, recent hot spring deposits, evidence of recent seismic activity, steam, hydrothermal alteration of alluvium and other indications of higher than normal heat flow. These features, in various combinations, are common in southwestern Utah and are especially obvious in the "Sevier thermal area" which lies a short distance southeast of most of the parcels of interest here.

Past and Present Geothermal Activity

Interest in potential geothermal resources in Utah peaked in the 1970s and early 1980s. At the beginning of that time the Conservation Division of the United States Geological Survey (USGS) was responsible for classifying mineral lands and the Geothermal Steam Act of 1970 defined leasing procedures for federal lands. Based largely on surface

geological features certain lands were classified as Prospectively Valuable (PV) for geothermal resources. Most of the lease parcels are located within or adjacent to the Fish Springs, Sevier Desert, Neels Siding and Escalante Desert PV areas.

The Geothermal Steam Act of 1970 required competitive bidding for leases in areas classified as Known Geothermal Resource Areas (KGRAs) by the USGS. Lands could be classified as KGRAs on the basis of geological evidence or if overlapping applications were filed for noncompetitive leases. Nine areas, including almost 128,000 acres in southwestern Utah, were identified as KGRAs in the 1970s as a result of geological evidence or overlapping lease applications. Numerous leases, both competitive and noncompetitive, were issued in the 1970s in central and southern western Utah. At this time exploration projects were initiated, especially in some of the KGRAs. Exploration involved several types of geophysical investigations and drilling. Drilling included shallow temperature gradient hole, usually less than 500 feet deep, as well as deeper stratigraphic test wells. This exploration confirmed the existence of a viable geothermal resource at both the Roosevelt Hot Spring KGRA and the Cove Fort-Sulphurdale KGRA. Additional exploration and development drilling at these two KGRAs led to the construction of two relatively small power plants in the 1980s. Both of these plants are currently being expanded and additional production and injection wells drilled. Lower temperature thermal waters found in other areas had the potential for direct use applications but, due to their remote locations, are largely undeveloped.

There was little interest in geothermal resources in the later 1980s as energy prices fell and the market for additional geothermal generated power vanished. Some of the existing leases were dropped and when others terminated there was little interest in releasing. In 1988, following Washington Office instructions, all unleased lands in the nine KGRAs were offered for competitive bidding but no bids were received. This demonstrated lack of competitive interest resulted in the elimination of all lands included in KGRAs solely on the basis of overlapping lease applications. After this action only three KGRAs (Crater Springs, Roosevelt and Cove Fort-Sulphurdale) including 58,484 acres remained. A short time later, overlapping lease applications were received for a parcel in the former Thermo Hot Springs KGRA and a new KGRA containing 641 acres was established. Provisions in the Energy Policy Act of 2005 implemented in new geothermal regulations effective June 1, 2007 eliminated KGRAs and made all geothermal leasing competitive. The Utah State office received nominations for lands to be offered in a competitive lease sale in late 2008 which were divided into the parcels analyzed in this RFD.

Potential for the Occurrence of Geothermal Resources

Little site specific quantitative information is available to predict the potential for occurrence of geothermal resources on the proposed lease parcels. Several parcels are within or near areas that have previously been classified as “Prospectively Valuable” (PV) by the USGS (Map 1) based on the observed occurrence of geological features suggesting the presence of thermal fluids. Parcels UT-GEO-48 through UT-GEO-53 are in the Fish Springs PV area where elevated water temperatures have been observed in springs. Temperatures in two springs with moderately high dissolved solids contents are reported as 60.5 and 28 degrees Centigrade by Goode (1978, p.118). Meinzer reported “near boiling temperatures” in these springs (Reported in Goode, 1978, p. 118).

Discharge from the springs supplies water to the Fish Springs National Wildlife Refuge located inside the PV area (Goode, 1978, p. 35).

Parcels UT-GEO-19 through UT-GEO-47 are located at the southeast corner of Fish Springs PV area and extend to within one mile of the Sevier Desert PV area to the southeast. Phillips Petroleum held geothermal leases in this area and formed the Drum Mountain Geothermal Unit in 1981. The Unit Area originally included 64,523 acres but was contracted to 25,000 acres in 1983. Exploration of the leases included geophysical methods and the drilling of 63 shallow (300 to 500 feet) temperature gradient holes and 18 slightly deeper (+/-800 feet) stratigraphic test wells. Two areas with gradients greater than 10 degrees F/100 feet were identified: a larger one in Ts. 14 and 15 S., Rs. 12 and 13 W. and a smaller one in T. 15 S., Rs. 11 and 12 W. The maximum gradient encountered was 16.68 degrees F/100 feet in a stratigraphic test well in Section 30, T. 15 S., R. 11 W. At least one deeper (2517 feet) exploration well was drilled after the unit was formed but no production was reported. The unit and leases later terminated.

Parcels UT-GEO-005 through UT-GEO-008 and UT-GEO-14 through UT-GEO-18 are located within or near the Neels Siding PV area. The PV classification is apparently based on a railroad well drilled in 1906 which encountered "hot" water at depths of 1,382 and 1,974 feet (Goode, 1978, p. 127). Other parcels are located adjacent to the Roosevelt Hot Springs (UT-GEO-002 and 003) and Cove Fort-Sulphurdale (FS- 01 and 02, UT-GEO-001 and UT-GEO-009 through UT-GEO-13) geothermal power plants. Parcel UT-GEO-004 is located farther south in Iron County and is not shown on the map. It is located in the Newcastle Geothermal area where warm water has been used directly to heat greenhouses and other public and private structures. A KGRA was established at Newcastle in 1976 including sections 20, 21, 29 and 30 of T.36 S., R. 15 W., just west of parcel UT-GEO-004. Thermal gradient calculations by Blackett and Shubat (1992) identified a small thermal anomaly in the southern half of Section 20, T. 36 S., R. 15 W. They concluded that undiluted waters from the throat of this system may have flow rates and temperatures sufficient to support a small binary power-generating system. All of the parcels are located in an area where evidence of geothermal activity is abundant and two existing geothermal power plants are currently being expanded. This alone should warrant a rating of moderate (M) occurrence potential for geothermal resources for the parcels. More site specific evidence for elevated thermal gradients within and near parcels UT-GEO-19 through UT-GEO-47 probably support a high potential rating (H) for these parcels. A certainty rating of B is given for all parcels except UT-GEO-19 through UT-GEO-47 where certainty is rated as C.

Potential for the Development of Geothermal Resources

For the purposes of this report only the potential for developing a geothermal electrical generating plant is considered. Lower temperature waters that may be present on the parcels have potential for direct use developments but the remote location of the area essentially precludes this option. Parcels UT-GEO-19 through UT-GEO-47 are rated as having a moderate (M) potential for development and other parcels are given a low (L) development potential rating.

Baseline Scenario Assumptions and Discussion

Following IM 2004-089 it is assumed that all potentially productive areas are open under standard lease terms and conditions. It is further assumed that any future geophysical exploration on the parcels will result in negligible surface disturbance. Activities that may occur that will result in surface disturbance include drilling, both shallow gradient holes and deeper wells, road construction, pipeline construction and power plant construction. It is assumed new exploration activity on the leases, when issued, will likely include drilling temperature gradient holes. Previous work in the area included gradient holes generally between 300 and 500 feet in depth. Some of the potential lessees mentioned that drilling would be a priority if they were able to obtain leases thus we are projecting that a total of 50 temperature holes may be drilled. Deeper stratigraphic and exploration wells are also likely. The offered parcels contain 11 “blocks” ranging from 6,000 to 25,000 acres plus 6 individual parcels ranging from 480 to 3,160 acres. If one well is drilled on each block, and a total of 2 wells on the additional six parcels the number of wells would be 13. Most of the wells would likely be in the 2,500 to 3,500 feet depth range but deeper wells are possible in some areas.

If exploration of the parcels results in the discovery of a viable geothermal resource power plant construction could follow. For analysis purposes it is assumed that one mid size (25 MW) plant will be constructed. Projected surface disturbing activities on the parcels are listed in Table 1.

Table 1. Projected exploration and production activity during the next 15 years.

<u>Activity</u>	<u>Number</u>
Temperature Gradient Holes	60 holes
Exploration Wells	13 wells
Power Plant and Ancillary Facilities	1
Production/Injection Wells	12 wells
Transmission Lines	12 miles

Surface Disturbance

Exploration

It is assumed, for disturbance analysis, that the activities listed in Table 1 will result in surface disturbance. Surface disturbance during the exploration phase would result from drilling temperature gradient holes and stratigraphic test/exploration wells. The temperature gradient holes would be drilled with a small truck mounted rig requiring minimal grading for the pads and access roads. If it is assumed that an average pad size of 0.25 acres is required, the 60 gradient holes in Table 1 would disturb only 15 acres. Drill holes were approximately 2 miles apart in Phillips Petroleum’s Drum Mountain project which would require 120 miles of access roads for the 60 wells projected here. A road 18 feet wide would disturb 2.2 acres/mile of road, thus 120 miles would disturb 264 acres. Gross disturbance from the 60 gradient holes would be: 15 acres (drill sites) + 264 acres (access roads) = 279 acres.

It is likely that temperature gradient measurements will be completed during the first few years after leases are obtained and the disturbance reclaimed. If complete reclamation

requires 6 to 8 years, all of the disturbance would be completely reclaimed by the end of the 15 year period considered here and the net disturbance would be zero.

Deeper stratigraphic tests and other exploration wells would require larger rigs disturbing a greater area for pad and access road construction. Based on RFDs for recent geothermal projects in California (BLM, 2006), pad sizes for these wells would be 2 to 4 acres in area. Using an average size of 3 acres/pad, the 13 wells projected in Table 1 would disturb almost 40 acres initially. Each well location will require an access road estimated here to average one mile in length and 30 feet in width. Each mile of this road will disturb 3.6 acres and the 13 roads will disturb 47 acres. Total initial disturbance for wells and road is: 40 acres (pads) + 47 acres (roads) = 87 acres.

Once the wells are drilled, the pad sites and roads will be reclaimed to BLM or other Surface Management Agency standards. This involves, restoring the original topography as nearly as possible, replacing the topsoil and seeding with native vegetation. It is estimated that it will require 6 to 8 years for new vegetation to become established to the extent that evidence of disturbance is no longer visible. It is assumed here that drilling stratigraphic tests/exploration wells will begin 3 years after leases are issued and one well will be drilled each year for the next 13 years. After 15 years 87 acres will have been disturbed and 46 acres will have been reclaimed resulting in a net disturbance of 41 acres.

Production

Exploration on the geothermal leases may or may not lead to the construction of a power plant and ancillary facilities but for purposes of surface disturbance analysis it is here assumed that one power plant capable of generating approximately 25 MW of electricity will be constructed during the next 15 years. A slightly larger facility is currently being constructed at the Cove Fort- Sulphurdale Geothermal Field and will be used as a general analogue for the hypothetical development described here. The proposed plant will be binary power plant utilizing hot water from production wells on the leases. The plant will consist of 2 closed cycles, one involving geothermal water and the other a liquid with a lower boiling temperature than water. Hot water will circulate through heat exchangers where it will transfer heat to the other liquid and then be re-injected in the injection wells. The second liquid will be vaporized and the vapor directed into a turbine to produce electricity. The vapor is then condensed to a liquid and recycled. The operation thus requires a source of hot water to drive the process and a source of cold water for cooling and condensing the working liquid.

Hot water will be supplied by approximately 8 production wells from which the hot water will be transported by pipeline to the power plant and returned, at a lower temperature, by pipelines to injection wells. Cooling water will be carried from a storage reservoir to the power plant where a significant portion will be lost by evaporation when cooling the working liquid. The remaining water will be discharged into a "blow down" reservoir. Surface disturbance will result from construction of the plant, drilling of production and injection wells, construction of access roads, trenches for pipelines, construction of reservoirs and installation of transmission lines. It is estimated that 16 wells, eight production and 8 injection, would be required for a power plant of the type envisioned here. These wells will be similar in depth and drilling operations to the stratigraphic test/exploration wells discussed above and pad size is estimated to be 3 acres including topsoil stockpiles. Sixteen wells on pads of this size would impact 48 acres. The wells

will be close together and near the power plant minimizing access road construction which is estimated to be about one mile. Surface disturbance from road construction is estimated to be about 3.6 acres (5280 feet x 30 feet). Pipelines for transporting hot water from wells to power plant and then to injection wells will be buried on roads or laid on the surface adjacent to roads and will not cause additional disturbance. Once the wells are completed and in operation, unused areas on the original drill pads can be reclaimed. If one acre of each pad is reclaimed, initial disturbance (48 acres) is reduced by 16 acres resulting in a net disturbance of 32 acres.

The plant will likely use water for cooling and condensing the working liquid which will require storage reservoirs. An initial storage reservoir will contain a supply of cool water collected from wells, streams, diversion structures, etc. (cooling water reservoir). It is estimated that this reservoir will disturb about 25 acres and pipelines for conveying the water to the power plant will impact another 15 acres. Another reservoir will be used to contain the water remaining after cooling (“blow down water”). This reservoir may disturb about 20 acres and pipelines transporting the water from the power plant to the reservoir will affect an additional 3 acres. Service roads from the plant to the reservoirs may impact another 5 acres.

The power plant and ancillary structures could impact approximately 15 acres. Once the power plant begins operation transmission lines will be necessary to connect the plant to the power grid. It is not known where the plant will be located but if it is on any of the parcels near Roosevelt Hot Springs or Cove Fort-Sulphurdale, where plants exist, transmission lines would be short. A plant on the northern parcels would require transmission lines of up to 24 miles to connect with the existing grid. For analysis purposes it is assumed that the plant will result in transmission lines 12 miles in length. During construction of the lines surface disturbance of an area 100 feet wide and 12 miles long would impact approximately 145 acres. When construction is completed a road 20 feet wide will be maintained and the remaining 80 feet can be reclaimed reducing the disturbed area to 29 acres. Table 2 summarizes possible surface disturbance resulting from all activities.

Total Surface Disturbance

Estimated total surface disturbance on the leases is given in Table 2.

Table 2. Estimated surface disturbance resulting from geothermal exploration and production.

Exploration (Gross disturbance)	
Temperature Gradient Wells	
Pads	15 acres
Roads	264 acres
Total	279 acres
Exploration (Net Disturbance)	
Temperature Gradient Well	
Pads	0 acres (all reclaimed)
Roads	0 acres (all reclaimed)
Total	0 acres
Exploration (Gross Disturbance)	
Stratigraphic Tests/Exploration Wells	
Pads	40 acres
Roads	47 acres
Total	87 acres
Exploration (Net Disturbance)	
Stratigraphic Tests/Exploration Wells	
After Reclamation	41 acres
Total Exploration Gross Disturbance	366 acres
Total Exploration Net Disturbance	41 acres
Production (Gross Disturbance)	
Well Pads	48 acres
Roads	3.6 acres
Total	51.6 acres
2 Reservoirs	45 acres
Pipelines	18 acres
Roads	5 acres
Total	68 acres
Power Plant	15 acres
Transmission Lines	145 acres
Production (Net Disturbance)	
Well Pads Partially Reclaimed	32 acres
Trans. Lines Reclaimed	29 acres
Total Production Gross Disturbance	280 acres
Total Production Net Disturbance	148 acres
Total Gross Disturbance	646 acres
Total Net Disturbance	189 acres

References

- BLM, 2008, Geothermal Files.
- BLM, 1990, Planning for Fluid Mineral Resources: BLM Handbook H-1624-1, 92 p.
- BLM, 2004, Policy for Reasonably Foreseeable Develop (RFD) Scenario for Oil and Gas: Instruction Memorandum 2004-089, 9 p.
- BLM, 2006, Reasonable and Foreseeable Development Scenario, Truckhaven-Superstition Mountain: unpaginated.
- Blackett, R. E., and M. A. Shubat, 1992, A case study of the Newcastle Geothermal System, Iron County, Utah: Utah Geological Survey Special Study No. 81, 30 p.
- Goode, H. D., 1978, Thermal Waters of Utah: Utah Geological and Mineral Survey, Report of Investigation No. 129, 183 p.
- Mabey, D. K., and K. E. Budding, 1987, High-Temperature Geothermal Resources of Utah: Utah Geological and Mineral Survey, Bull. No. 123, 64 p.

APPENDIX G:**SEED MIXES TO BE USED FOR SITE RECLAMATION IN THE FFO**

Seed Mix #1: This mix for chaining in the following EcoZones: UP2A, UP2C, UP3A, & UP3C (upland ecological sites-12 - 14" precip.)

<u>Stabilization mix:</u>		LBS/ACRE
Hycrest Crested Wheatgrass	Non-Native	
2.00		
Thickspike Wheatgrass	Native	1.50
Bluebunch Wheatgrass	Native	1.50
Russian Wildrye	Non-Native	1.00
Western Wheatgrass	Native	1.50
Indian Ricegrass	Native	1.00
Alfalfa	Native	0.50
Western Yarrow	Non-Native	0.10
Lewis Flax	Non-Native	0.25
Sainfoin	Non-Native	0.25
 <u>Rehabilitation mix:</u>		
Antelope Bitterbrush	Native	0.50
Wyoming Big Sagebrush	Native	0.25
Mountain Big Sagebrush	Native	0.25
Ladak Alfalfa	Non-Native	0.50
Small Burnet	Non-Native	1.00
Palmer Penstemon	Native	0.10
Total		12.20

Seed Mix #2: This mix for chaining in the following EcoZones: SD1A (semi-desert sites - 8 - 12" of precipitation).

<u>Stabilization:</u>		LBS/ACRE
Hycrest Crested Wheatgrass	Non-Native	3.00
Sodar Streambank Wheatgrass	Non-Native	2.00
Bezowski Russian Wildrye	Non-Native	1.50
Indian Ricegrass	Native	1.00
Western Wheatgrass	Native	1.00
Palmer Penstemon	Native	0.10
Small Burnet	Non-Native	1.00
 <u>Rehabilitation:</u>		
Fourwing Saltbush	Native	0.10
Wyoming Big Sagebrush	Native	0.25
Lewis Flax	Native	0.50
Forage Kochia	Non-native	1.00
Total		11.45

*Substitutes, as necessary, include Intermediate wheatgrass, pubescent wheatgrass, bluebunch wheatgrass.

APPENDIX H:
NATIVE AMERICAN CONSULTATION RESPONSE LETTERS

Oct-28-08 08:26A - Camera 10/28/08 at 11:30 Am

P. 01
RT

THE HOPI TRIBE



Benjamin H. Nuvamsa
CHAIRMAN

Todd Honyama, Sr.
VICE CHAIRMAN

October 28, 2008

Todd S. Christensen, District Manager
Bureau of Land Management, Color Country District Office
176 East DL Sargent Drive
Cedar City, Utah 84721

Dear Mr. Christensen,

Thank you for your correspondence dated September 22, 2008, regarding the Proposed 191,000 acre December, 2008, Geothermal Lease Sale in Juab, Iron and Beaver Counties. The Hopi Cultural Preservation Office appreciates the efforts the Color Country District Office has made to consult on this proposal. The Hopi Tribe claims ancestral and cultural affiliation to the Paleo, Archaic and Fremont prehistoric cultural groups in Utah, and the Hopi Cultural Preservation Office supports the identification and avoidance of prehistoric archaeological sites and Traditional Cultural Properties.

Of the outlined alternatives, we support the No Leasing Alternative, which would defer lands until the applicable land use plan could be amended to include protective measures not currently possible under the present land use plans.

The Hopi Cultural Preservation Office has reviewed the enclosed Cultural Resources Class I Inventory Report which states that parcels UT GEO 48-53 in the Fillmore Field Office/Forest Service section contains historic sites including the Fish Springs Archaeological District, and any intrusion on the landscape would require further analysis and consultation. Therefore, we request these parcels be withdrawn if the Proposed Action Alternative is selected and leasing is implemented.

The Report also states in the Fillmore Field Office/Forest Service section that development of UT GEO 14-15 parcels east of Highway 257 could have adverse effects on historic properties. Therefore, we request that to avoid adverse effects to historic properties these parcels be withdrawn from leasing or concur that a No Surface Occupancy stipulation be implemented for the portions of the parcels located east of Highway 257.

The Report states in the Cedar City Field Office section that an adverse effect will result from leasing the two Mineral Mountain parcels, UT GEO 002 and UT GEO 003, described as an

P.O. BOX 123 KYKOTSMOVI, AZ 86039 (928) 734-3100

Oct-28-08 05:26A

P.02

Todd S. Christensen
October 28, 2008
Page 2

exceptional archaeological area, including the Wildhorse and Negro Mag obsidian sources. The report states:

The area is just exceptional and should be considered a National Register Property or perhaps as a Traditional Cultural Property....The Negro Mag abortion has been a major, unmanageable pain (that we can't find the time to fix)....All the while we have been learning about this special area, we have been suffering significant resource loss....I simply do not believe, then, that we should enter into another binding arrangement that holds potential for exacerbating an already challenging resource management situation, and that to do so would constitute an "Adverse Effect" situation.

The report further states in the Summary/Effects Determinations section

The BLM Archaeologist, Cedar City Field Office recommends the Roosevelt Field leases 002 and 103 be dropped from further consideration. Failing that, they should be deferred until such time as the Field Office produces a new management plan that could address enhanced protection for the area - to include establishment of a National Register District or Traditional Cultural Property.

Therefore, we concur that to avoid adverse effects to historic properties these parcels be withdrawn from leasing.

Because of the above concerns and requests we reiterate that of the outlined alternatives, we support the No Leasing Alternative, which would defer lands until the applicable land use plan could be amended to include protective measures not currently possible under the present land use plans.

Hopi clans that migrated through the Cedar City Field Office area prehistorically and the Paiute peoples of this area have a long, friendly and ongoing relationship. Therefore, the Hopi Tribe recognizes Paiute ancestry to this area and honors their claims to Traditional Cultural Properties in this area, some of which may be in common with the Hopi Traditional Cultural Properties.

We further appreciate your continuing solicitation of our input and your efforts to address our concerns, particularly in the preservation and protection of the Parowan Gap area. If you have any questions or need additional information, please contact Terry Morgart at the Hopi Cultural Preservation Office. Thank you again for your consideration.

Respectfully,


Leigh J. Kuwajiwiswma, Director
Hopi Cultural Preservation Office

cc: Dorena Martineau, Paiute Indian Tribe of Utah
Julie Howard, BLM, State Office
Utah State Historic Preservation Office
Steve Block, SUWA, 425 East 100 South, Salt Lake City, UT 84111



THE PAIUTE INDIAN TRIBE OF UTAH

October 3, 2008

Todd S. Christensen
Bureau of Land Management
Color Country District Office
176 East DL Sargent Drive
Cedar City, Utah 84721

Dear Mr. Christensen,

Subject: Proposed December, 2008 Geothermal Lease Sale

The Paiute Indian Tribe of Utah would like to thank you for your continuing consultations regarding the 2008 Geothermal Lease Sale. As you recall from previous consultations, the Paiute Indian Tribe of Utah Cultural Resources department supports the identification and **AVOIDANCE** of all prehistoric archaeological sites and traditional cultural properties.

UT GEO 05-06 These proposed parcels that are located west of Pahvant Butte in the Pahvant Valley of Millard County, this site is a sacred place that contains extensive and significant cultural resources significant to the Paiute Indian Tribe of Utah. Therefore we request that the 2008 Geothermal Lease Sale **withhold** the area and concentration of known cultural sites through a leasing stipulation **prohibiting any surface disturbance or deferral from leasing.**

UT-GEO-002 and UT-GEO-003, Roosevelt Geothermal Field, Mouth of Negro Mag Wash, West Slopes of the Mineral Mountains These proposed parcels has vast areas of large well exposed obsidian flows that have been here for thousands of years and have been used by our ancestors. You are aware from our previous consultations, the Paiute Indian Tribe of Utah claims ancestral and cultural affiliation to these lands and would like to that it is kept in it's pristine natural environment. Therefore we request that the 2008 Geothermal Lease Sale **withhold** the area and concentration of known cultural sites through a leasing stipulation **prohibiting any surface disturbance or deferral from leasing.**

The Paiute Indian Tribe of Utah sincerely appreciates the consideration and efforts you and your staff have made to consult with the Tribes.



Sincerely

A handwritten signature in cursive script that reads "Dorena Martineau".

Dorena Martineau
Cultural Resources
Paiute Indian Tribe of Utah

APPENDIX I:
COMMENT PERIOD LETTERS



BLM - UT - 950
2000 NOV 28 AM 9:36

November 24, 2008

Christopher Wehrli,
Environmental Coordinator,
Fishlake National Forest
115 East 900 North
Richfield, Utah 84701

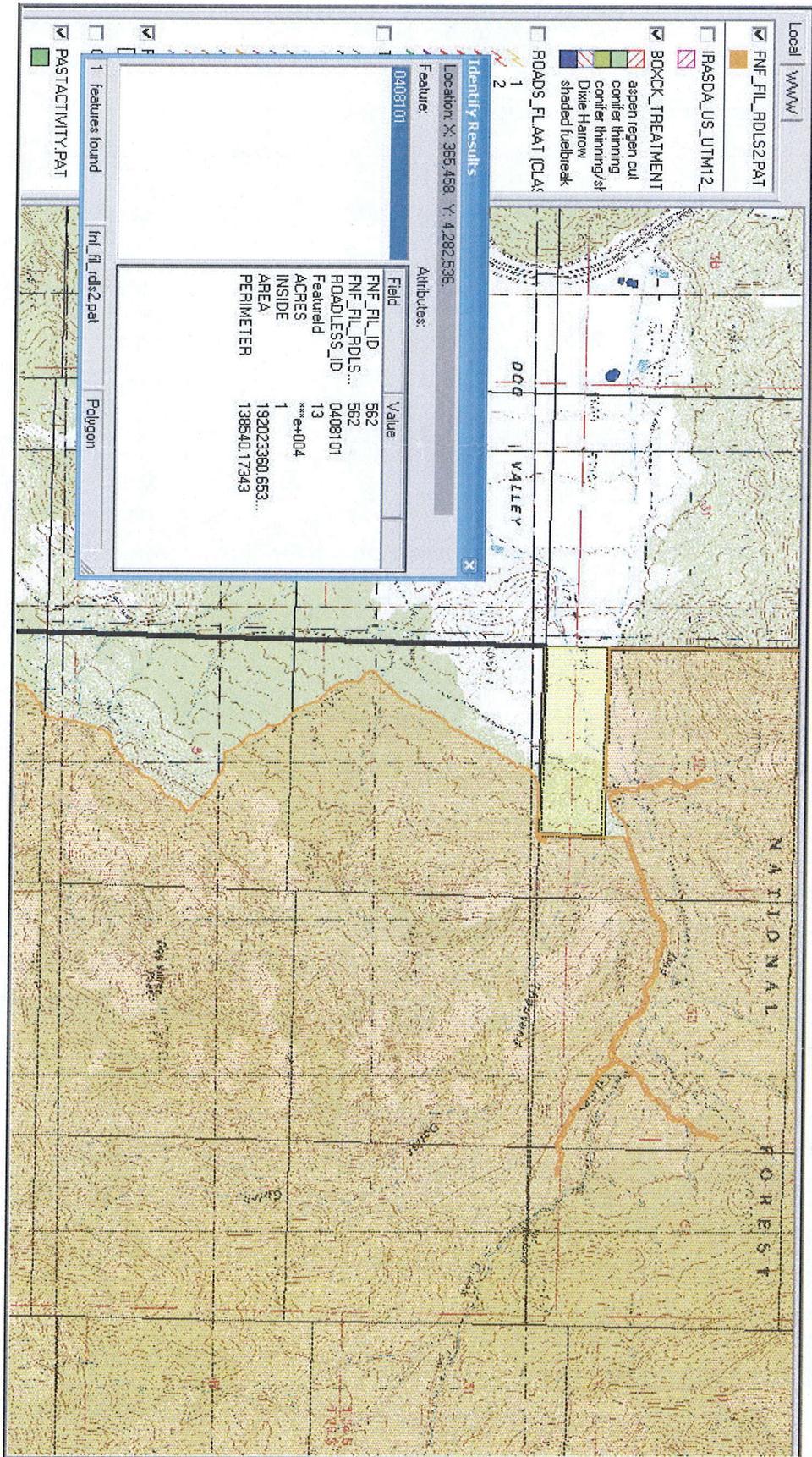
Dear Chris,

The Utah Environmental Congress (UEC) appreciates this opportunity to provide comments in response to the legal notice for the BLM Environmental Assessment that analyzes 191,911 acres of land for geothermal leasing, 3,048 acres of which are located on the Fishlake National Forest. UEC is an interested party with some recommendations and concerns regarding the proposed action, particularly the portion associated with the Fishlake N.F.

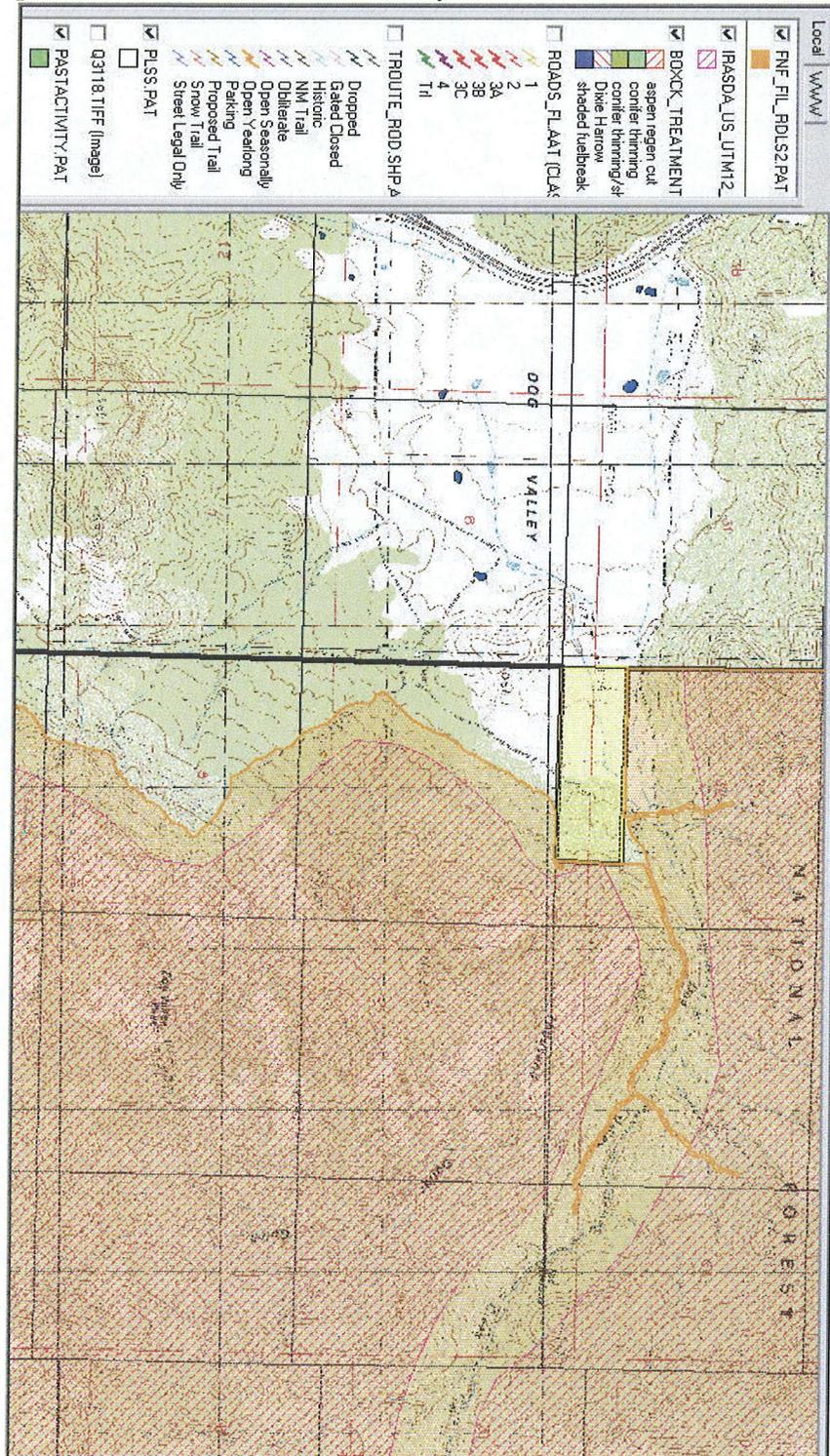
Potential Wilderness Areas and Inventoried Roadless Areas

The lease areas described in the proposed action on Forest Service lands are located inside two Potential Wilderness Areas and two Inventoried Roadless Areas. To the extent that any kind of surface occupancy is allowed the Environmental Assessment (EA) must take PWA and the associated ir retrievable/irreversible commitment of potential wilderness area resources into consideration.

The following map displays the inventory of potential wilderness area(aka unroaded/undeveloped or small case roadless) unit #0408101 in the affected area. The orange-shaded area is the potential wilderness area boundary, as identified by the USFS. When you compare that you see that the overwhelming majority of the proposed leasing is inside this potential wilderness area.



There are two Inventoried roadless areas affected by the proposed leasing they are shown in pink cross hatching on the map below. The pink cross hatching is on top of the orange shaded potential wilderness area boundary.



Potential wilderness areas (PWA)¹ are not assigned the same values as Inventoried Roadless Areas (IRAs),² and their location and boundaries do not always match. However, in this project area the PWA and IRA boundaries appear to be identical. PWA's are the 'lower case roadless areas' or 'undeveloped and unroaded areas' that have been identified for the current Forest Plan revision. Any surface occupancy that is inside the PWA will result in irretrievable and irreversible negative loss of and degradation to the potential wilderness resource.

IRA values are somewhat different, even when their boundaries match that of a related PWA (and that is not the case here. For example, primitive motorized recreation opportunities are an IRA value that is not shared with PWA values. Active management to attain forest and rangeland health goals is positive IRA value, but not necessarily for PWA. Road construction, oil and gas well drilling and pipelines will occur on the IRAs in the Project area. Implementation of the project could cause irreversible damage within the IRA's and to the IRA's values. UEC strongly believes that no leasing, or at least no surface occupancy, must be assigned to the lands inside IRA. Not doing that would be in violation of the roadless area conservation rule, and its prohibitions connected to leasing approved after January 2001. See 36 CFR part 294.

Thus, the Forest Service must consider how implementation of the project could cause the irretrievable loss of: (1) potential wilderness area (PWA) and, (2) inventoried roadless areas (IRA) and associated values. IRA and PWA issues connected to this project involve clear conflicts among alternative uses of available resources. In light of this UEC asks the Agencies to either exclude the 3048 acres of Fishlake N.F. lands from this leasing proposal, or require clear no surface occupancy stipulations to all of the lands inside potential wilderness area (and therefore also the IRA in this case).

We remind you that this has been done in recent years. The Sulfurdale area leasing EA and FONSI from a few years back included a requirement that NSO stipulations be included in all of the Fishlake National Forest's draft unroaded/undeveloped area inventory units associated (a term that is now called 'potential wilderness area').

Migratory Bird Treaty Act, Executive Order 13186, and Neotropical migrants

The Migratory Bird Treaty Act (MBTA) makes it unlawful to take, kill, or possess migratory birds, their parts, nests, or eggs.³ Executive Order 13186 issued in January of 2001 re-instituted

¹ "71 - IDENTIFICATION OF POTENTIAL WILDERNESS

The first step in the evaluation of potential wilderness is to identify and inventory all areas within National Forest System (NFS) lands that satisfy the definition of wilderness found in section 2(c) of the 1964 Wilderness Act." ... "Areas of potential wilderness identified through this process are called potential wilderness areas. This inventory of potential wilderness is not a land designation, nor does it imply any particular level of management direction or protection in association with the evaluation of these *potential wilderness areas*. It is completed with the express purpose of identifying all lands that meet the criteria for being evaluated for wilderness suitability and possible recommendation to Congress for wilderness study or designation." FSH 1909.12 Ch 70

² Inventoried roadless areas. "Areas identified in a set of inventoried roadless area maps, contained in Forest Service Roadless Area Conservation, Final Environmental Impact Statement, Volume 2, dated November 2000, which are held at the National headquarters office of the Forest Service, or any subsequent update or revision of those maps." 36 CFR § 294.11

³ 16 U.S.C. § 703-712.

the responsibilities of Federal agencies to comply with the MBTA. It has been documented that many migratory bird species are currently declining across this region. Compliance with both the MBTA and Executive Order 13186 is critical for this project. Agencies are instructed to "develop and implement, within 2 years, a Memorandum of Understanding (MOU) with the Fish and Wildlife Service (Service) that shall promote the conservation of migratory bird populations." (EO 13186 § 3) Has a current MOU been entered into? If so, we request a copy be provided within (or as an appendix to) this site-specific environmental analysis, and not simply included in the project file. We request that the agency conduct a rigorous evaluation using the newest data and research to minimize impacts to migratory birds (and their habitat) that includes a focus on all species on the 2002 List of Birds of Conservation Concern as well as species that are listed among the Partner's in Flight Priority Species. To help meet responsibilities under Executive Order 13186 (Responsibilities of Federal Agencies to Protect Migratory Birds), we recommend you conduct activities outside critical breeding seasons for migratory birds, minimize temporary and long-term habitat losses, and mitigate all unavoidable habitat losses. If your activities during construction and operation occur in the spring or summer, we recommend you conduct surveys for migratory birds to assist you in your efforts to comply with the Migratory Bird Treaty Act (16 U.S.C. 703-712) and E.O. 13186. If some portion of your mitigation includes off-site habitat enhancement, it should be in-kind and either within the watershed of the impacted habitat or within the foraging range of the habitat-dependent species. All options to avoid impacts/losses must be exhausted before considering action alternatives with impacts that require mitigation.

Clean Water Act and ESA

The proposed leasing and geothermal development activities will most likely have significant impacts on the affected watershed, both within the project area as well as downstream. The impacts to stream flow, both in terms of quantity and quality should be treated as central issues that drive the environmental analysis. The army corps of engineers should be involved for all stream alterations and taking of springs, seeps, wetlands, and other riparian areas.

Any mitigation and project design criteria for loss of wetlands and TES species (or their habitat) must be analyzed in detail and not simply listed. However, before mitigation is considered, all attempts must first be made to avoid impacts. If mitigation for impacts to TES species and wetlands is pursued, please first provide scientifically supported rationale that explains how and why all attempts at avoidance were exhausted.

NFMA

The 1983 USDA Departmental Regulation 9500-4 provides direction to the Forest Service that establish species viability requirements, including plant species:

"Habitats for all existing native and desired non-native plants, fish, and wildlife species will be managed to maintain at least viable populations of such species. In achieving this objective, habitat must be provided for the number and distribution of reproductive individuals to ensure the continued existence of a species throughout its geographic range ... Monitoring

activities will be conducted to determine results in meeting population and habitat goals."

This is a project that will directly manipulate and remove the major structural components of wildlife habitat, alter slope stability, wetlands, springs, and change the vegetative cover. The geothermal exploration and development will also kill individuals and possibly entire populations of native flora and fauna. This is especially true for spring diversions, pipelines and the dewatering of riparian areas that have populations of flora and fauna dependant on that localized habitat. We are concerned that significant impacts to native mollusks and amphibians with limited dispersal abilities will be particularly substantial. Before doing this significant action, the Forest needs to demonstrate that the proposed action will not reduce wildlife to populations to less than the minimum, viable populations. This includes all native and desirable non-native wildlife and plants, not just TES and MIS species. Pursuant to USDA Departmental Regulation 9500-4 wildlife monitoring activities will need to be conducted to determine if you are meeting (and will still meet) population and habitat goals for all existing wildlife and plants in the area. Included with this, the Forest needs to monitor the populations and habitat for amphibian and mollusks as well as any tall forb communities that may be in the watershed.

EA

It was not until Friday afternoon that UEC was able to get a copy of the Environmental Assessment (EA) that was prepared for the proposed action. It was disappointing to learn that the Forest Service had not been able to obtain a copy as of last week. Unfortunately, the rest of this week is already committed and booked so I have only had a few minutes to look at the EA. There has not been time to actually read it. We believe that the EA should have been made more available. For example, it was not appropriate for the Forest Service offices to not have any available, let alone the fact that nobody in the Forest Service appeared to have received a copy from the BLM.

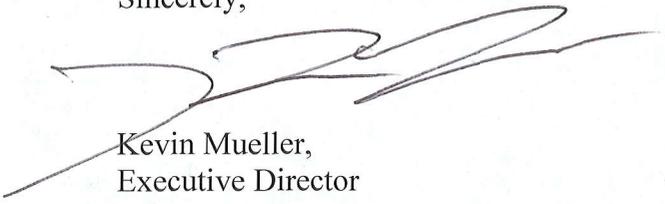
We note that page 14 of the EA states that No Surface Occupancy (NSO) would be required for any leasing under IRA. However there is no analysis of impacts to the larger potential wilderness area impacted by the project. UEC again urges that the potential wilderness area impacted by the proposed action be protected by either no leasing under it, or at least requiring a NSO stipulation that does not have exceptions.

The EA needs to be revised in light of the revised LRMP's direction. While not actually in effect as of today, it's safe to assume that it will be in effect for the next 15 year planning period, which is when developments would occur. It does not have any of the safeguards, such as LRMP standards, and is a planning document that is purely aspirational in nature and by definition. This is very different from the management sideboards, standards, and other legal requirements established in the current LRMP. Due to this the EA assumes that protections afforded by NFMA via the preparation of an LRMP will in fact be in force on the ground during implementation of the proposed leasing. However this is not the case, given the decision-less nature of the revised LRMP. As such, the EA really needs to include analysis of how implementation will occur and what its impacts will be when the Fishlake transitions to the new aspirational and standard-free LRMP. This analysis is likely to find that additional protections

will need to be included in the terms and stipulations on Forest Service land to make up for the lacking protections in the revised LRMP.

We thank you for this opportunity to provide comments. Please mail UEC a hard copy of the final EA, FONSI, and associated decision documents as soon as each become available.

Sincerely,

A handwritten signature in black ink, appearing to read 'Kevin Mueller', written over a horizontal line.

Kevin Mueller,
Executive Director



Comments of Terra Caliente LLC

on

**Environmental Assessment UT-010-08-051 (November 2008)
Geothermal Leasing in the Fishlake National Forest, Cedar City and
Fillmore BLM Field Offices**

Comments Submitted on:

December 4, 2008

Comments Submitted to:

**Terry Catlin
Energy Support Team Lead
U.S. Department of the Interior
Bureau of Land Management
Utah State Office
440 West 200 South, Suite 500
Salt Lake City, Utah 84101**

Introduction

Terra Caliente LLC (“Terra Caliente”) appreciates the opportunity to submit comments on Environmental Assessment UT-010-08-051, Geothermal Leasing in the Fishlake National Forest, Cedar City and Fillmore Field Offices (the “EA” or “November 2008 EA”), dated November 2008. For the reasons stated below, Terra Caliente agrees with the EA’s recommendation to lease parcels with possible wilderness characteristics, but objects to BLM’s decision to defer certain lands nominated for leasing, namely portions of parcels UT-GEO-25, 26, 27, 28, 29 and 39.¹

Background

The November 2008 EA evaluates the potential impacts on the natural and human environment that might result from issuing geothermal leases on 55 parcels nominated by industry. The parcels are located within the boundaries of the Cedar City Field Office, Fillmore Field Office, and the Fishlake National Forest. Many of the nominated parcels will be auctioned at the lease sale in Salt Lake City, Utah on December 19, 2008, but portions of certain parcels, notably UT-GEO-25, 26, 27, 28, 29 and 39 (the “Deferred Parcels”), have been indefinitely deferred from leasing as a result of the findings made by BLM in that Wilderness Characteristics Review (“Wilderness Review”), signed and dated August 14, 2008 by the BLM Fillmore Field Office manager. *See also* December 19, 2008 Final Sale List, issued November 4, 2008. The Deferred Parcels are located in the area known as “Little Drum Mountains North.”

The EA tiers to the relevant resource management plans and environmental impact statements, including the House Range Resource Area Management Plan and Record of Decision

¹ Further information on those comments may be obtained by contacting Greg Hahn, Partner, Terra Caliente LLC, 730 17th Street, Suite 820, Denver, CO 80202, 303-290-9000 ext. 104.

("House Range RMP"), which covers the Little Drum Mountains North area and the Deferred Parcels. The purpose of the EA is to (1) analyze whether geothermal leasing conforms to existing planning directives, (2) provide a basis for determining whether to lease certain parcels, or defer the parcels from leasing, and (3) provide a basis for attaching additional lease stipulations or lease notices to ensure the protection of resource values. Particular lease-development proposals will be evaluated on a site-specific basis, such that the decision documents would incorporate and tier to the EA.

Terra Caliente's Interests

Terra Caliente is in the business of exploring for and developing geothermal resources for electrical power generation, and (together with its affiliates) has made significant investments in Utah and surrounding states in furtherance of its business goals. In particular, a Terra Caliente affiliate, Washoe Energy, LLC, has recently acquired numerous geothermal leases located in and around the Little Drum Mountains North area that were issued by the State of Utah, acting through the Utah School and Institutional Trust Lands Administration (including ML-51287, ML-51289, ML-51291, ML-51292 and ML-51293). The state leases are surrounded by federal lands which have been nominated for geothermal leasing, and therefore Terra Caliente has a significant interest in BLM's decision to offer these lands for lease at the December 19, 2008 lease sale or future lease sales. Accordingly, Terra Caliente favors the preferred alternative and opposes the no leasing alternative, as the latter would eliminate geothermal development on federal lands and thus severely diminish Terra Caliente's or anyone else's ability to develop checkerboard lease holdings in the area. While Terra Caliente favors the preferred alternative, we question BLM's decision to remove the Deferred Parcels from the December 19, 2008 lease sale. The decision appears to contradict the EA's recommendation to lease parcels with possible

wilderness characteristics. Obviously, the decision to defer negatively impacts Terra Caliente's interests in the area and affects how it values, and therefore bids on, the lease parcels that are offered for sale.

Comments and Recommendations

Comment 1: The EA is consistent with existing planning directives.

Under the preferred alternative, the EA recommends leasing the nominated parcels subject to additional resource protective measures. EA, page 11. Terra Caliente is concerned primarily with the Deferred Parcels located in the Little Drum Mountains North area, which lands lie within the House Range RMP planning area. According to the House Range RMP, the Deferred Parcels are known as "Category 1" lands. House Range RMP, Map 9. Category 1 lands are to be offered for geothermal leasing under standard lease terms, subject to any mandatory stipulations. House Range RMP, page 75. Accordingly, the EA recommends leasing consistent with existing lease categories, but subject to additional resource protective measures over and above the existing terms and stipulations. EA, page 11.

At page 63, the EA discusses the proposed action alternative in the context of possible wilderness characteristics. It reiterates that under the proposed action alternative, the management practices would be the same as those discussed under the No Action alternative with no specific additional protective measures proposed to the land with wilderness characteristics. The EA then suggests that no surface occupancy stipulations could further protect the BLM lands with wilderness characteristics. NSO stipulations would have the practical effect of removing these areas from productive geothermal exploration and development. However, it is not necessary for the EA or the Decision Record to specifically address NSO stipulations at this time since any future lease sale and subsequent soil disturbing

activities would be subject to additional NEPA analysis. BLM may ultimately defer some portions of the Deferred Parcels. (See Comment 5, below.) At the same time, certain portions of the Deferred Parcels may be appropriately opened for surface occupancy and development such as along or near currently existing roads and previously explored areas within the Deferred Parcels.

Terra Caliente views the EA recommendation at page 11 as a consistent application of the House Range RMP's planning directives (the no leasing alternative would directly contradict the House Range RMP). 43 C.F.R. 1610.5-3(a) (all future resource management authorizations and actions shall conform to the approved plan). The House Range RMP clearly contemplates geothermal resource development for electrical power generation on Category 1 lands, including the Deferred Parcels.

The EA also recommends leasing those parcels possessing possible wilderness characteristics, because the Reasonably Foreseeable Development ("RFD") analysis found the impact to such areas to be small (41 net acres). EA, page 63 *and* Appendix F (RFD analysis). A recent court decision weighed in on the matter of conducting supplementary NEPA analysis when new information with respect to wilderness character is brought to light. *SUWA v. Norton*, 457 F.Supp.2d 1253, 1264 (D. Utah 2006) (agencies must be alert to new information that may alter the results of its original environmental analysis and must continue to take a hard look at the environmental impact of its planned action) ("Kimball Decision"). Consistent with this imperative, BLM took into account and evaluated the environmental impact on areas possessing wilderness characteristics in the November 2008 EA. As indicated above, the impact was found to be small. The Kimball Decision does not hold that a finding of wilderness characteristics necessitates a no-leasing decision; rather the decision only requires BLM to undertake the

requisite NEPA analysis and take a hard look at the impacts development would have on such areas. By performing supplementary NEPA, BLM has the authority to make land use decisions, whether favorable or not to leasing, and based on the NEPA analysis, BLM can determine whether its current leasing categories adequately protect newly identified resources in an adequately informed manner. 457 F.Supp.2d at 1266.

It is worth reiterating that a finding of possible wilderness characteristics does not require the BLM to choose the no leasing alternative in the EA. Wilderness characteristics are one among various resources and other values recognized under the Federal Land Policy and Management Act and they are to be managed as part of the complex task of managing the various resources. *Oregon Natural Desert Ass'n v. Bureau of Land Management*, 531 F.3d 1114, 1134 (9th Cir. 2007). BLM's "wide authority to 'manage the public lands under principles of multiple use and sustained yield,' allows it ample discretion for management of lands with wilderness values." *Id.* at 1135 (citation omitted).

The existence of wilderness characteristics does not require BLM to manage such land under the non-impairment standard applied to wilderness areas and wilderness study areas. *Id.* And any decision made with regard to the management of these lands could be abandoned or changed under future multiple use decisions. BLM maintains the authority to manage lands with wilderness characteristics in a manner that does not preserve those characteristics "but instead manage them for uses which would be inconsistent with long-term wilderness preservation." *Id.* at 1136.

BLM's investigation of possible wilderness characteristics associated with Little Drum Mountains North parcels is part of its continuing obligations under FLPMA Section 201 to

inventory for public land values and to keep those inventories current. Such inventories “comprise only an informational resource; they do not automatically change BLM’s actual management practices.” *State of Utah v. United States Department of the Interior*, 535 F.3d 1184, 1187 (10th Cir. 2008). Indeed, BLM must strike a balance between the multiple long-term needs of future generations by taking into account those generations’ needs for a variety of resources including, but not limited to, minerals and natural values. *Id.*, citing 43 U.S.C. § 1702(c).

BLM’s supplementary NEPA analysis in the EA is consistent with the Kimball Decision; the EA provides BLM with the requisite knowledge to make an informed decision with respect to the impacts geothermal development might have on areas with wilderness characteristics. BLM has met its duty to evaluate the impacts of geothermal leasing on areas where new information not contemplated in the House Range RMP has been brought to light.

Comment 2: BLM’s decision to defer the Drum Mountain parcels is inconsistent with the EA.

According to the Final List – December 2008 Geothermal Sale (“Final List”), issued by the BLM Utah State Office, the Deferred Parcels were removed from the December lease sale. The reason provided by BLM for deferring the parcels was as follows: “New information regarding a finding of a probability of wilderness characteristics from interdisciplinary wilderness review.” Final List, pages 31-32. The Final List does not provide any further explanation for deferring the parcels, and cites no legal authority in support of the decision.

BLM’s decision to defer the parcels contradicts the EA’s proposed alternative recommendation to lease those parcels with wilderness characteristics because the RFD found

the impact to such areas to be small. Section 2.3 of the EA provides that the “Proposed Action would lease the nominated parcels (Figures 1, 2) subject to additional resource protective measures beyond the terms and stipulations described for the No Action Alternative.” EA, page 11. Figure 1 of the EA clearly depicts the Deferred Parcels as “proposed leases” recommended for leasing under the proposed alternative. While one of the purposes of the EA is to provide a rationale for making a decision to defer, the EA provides no explanation for removing the Deferred Parcels from the December 2008 lease sale. Instead, the EA justifies offering the Deferred Parcels for lease.

As discussed in Comment 1 above, BLM performed its supplementary NEPA analysis for areas found to have wilderness characteristics as a result of new information. The Final List does not attempt to clarify why the decision to defer was made before BLM issued the Decision Record for the EA. Since the proposed alternative recommends leasing the Deferred Parcels, the effect of the decision made in the Final List is to further postpone leasing the Deferred Parcels, because BLM is required by regulation to provide 45 days advance notice of an offer to sell a parcel. 43 C.F.R. § 3203.14(b). In other words, by prematurely deferring the parcels from the sale, BLM cannot now restore the parcels to the sale without offending the 45-day notice period. The Kimball Decision faulted BLM for ignoring new information in its decision to offer parcels for oil and gas leasing; in this case, BLM has not ignored new information, but has engaged the very process required by law (i.e., supplementary NEPA). BLM has overcorrected by needlessly removing the Deferred Parcels from sale. Terra Caliente hastens to add that it does *not* request that BLM defer the December 19 sale of the non-deferred geothermal parcels. Instead, Terra Caliente requests that the Deferral Parcels, or some portion of them, should be listed for sale at the first quarterly auction in 2009.

Comment 3: The Deferral Parcels may be sold without amending the House Range RMP.

There is another complicating factor affecting BLM's decision to defer, though it is not articulated in either the EA, Final List, or any other relevant planning document, which is the so-called "planning moratorium" imposed by Congress. Terra Caliente understands the origin of the planning moratorium to lie in certain provisions of the 2000 and 2006 military appropriations bills, which have been interpreted by BLM as, in effect at least, implementing a moratorium on amending resource management plans in areas that lie under the Utah Test and Training Range or designated airspace for military operation areas. *See* Pub. L. 106-65 (Oct. 5, 1999) § 2815 and Pub. L. 109-163 (Jan. 6, 2006) §§ 381-384. According to BLM, the areas covered by the House Range RMP underlie either the training range or military operations areas, such that BLM is prevented from amending the plan to provide for the management of areas with possible wilderness characteristics. Since the Deferred Parcels possess possible wilderness characteristics (a debatable conclusion, see Comment 4, below), BLM believes a plan amendment is required to offer the Deferred Parcels for lease.

Terra Caliente believes a planning amendment is not required under the regulations governing BLM planning decisions. BLM is required to maintain a resource management plan ("RMP") on a field office area basis, and all future resource management authorizations and actions must conform to the plan. 43 C.F.R. § 1610.1(b) and 1610.5-3(a). The RMP must provide standards for monitoring whether there is "new data of significance to the plan" such that BLM can determine "whether there is sufficient cause to warrant amendment or revision of the plan." 43 C.F.R. § 1610.49. In cases where monitoring discloses minor changes in data, BLM reflects the changes in the form of "maintenance" which involves refining or documenting "a previously approved decisions incorporated" in the RMP. 43 C.F.R. § 1610.5-4. As such, no

formal amendment is required. *Id.* Maintenance decisions, however, must not result in “expansion in the scope of resource uses or restrictions, or change the terms, conditions, and decisions of the approved plan.” *Id.* If new data disclosed by monitoring may result “in a change in the scope of resource uses or a change in the terms, conditions and decisions of the approved plan,” BLM may initiate an amendment to the plan. 43 C.F.R. § 1610.5-5.

With respect to the Deferred Parcels, the analysis provided by the EA RFD supports the conclusion that a plan amendment is not necessary because the new information regarding the possible wilderness character of the Deferred Parcels does not rise to a “change in scope of resources uses” contemplated by the House Range RMP. According to BLM’s planning handbook, a planning amendment is only necessary when “significant new information from resource assessments, monitoring, or scientific studies” prompts the need to consider a change in land use decisions. H-1601-1, BLM Land Use Planning Handbook, page 45. Because the RFD reveals only an insignificant impact to the areas with possible wilderness characteristics, the new findings do not rise to a level commensurate with the need to advance a planning amendment. The EA itself provides that an amendment is “outside the scope of analysis . . . and is not being proposed at this time.” EA, page 8. In addition, the Kimball Decision does not require BLM to advance plan amendments in light of new information, but only requires supplementary NEPA, which BLM in this case has performed.

Thus, the EA’s recommendation to lease the Deferred Parcels is consistent with the House Range RMP, BLM’s planning regulations, and relevant case law. Terra Caliente opposes BLM’s decision to defer the parcels in the manner reflected in the Final List.

Comment 4: BLM's wilderness characteristics findings are questionable.

The EA identifies the Deferred Parcels as possessing wilderness characteristics. EA, page 41. According to the Wilderness Review, BLM undertook a review of the Little Drum Mountains North area on June 30 and July 1, 2008 as a result of a citizen-initiated petition. Terra Caliente, however, questions the accuracy of BLM's review of the Deferred Parcels.

Section 5 of the Wilderness Review lists the "information" consulted in support of its findings. The source information consists mostly of various maps, aerial photographs, and planning documents, but no detail is provided with respect to the field work conducted. The Wilderness Review only cites "field observations" as a source of information, but no supporting documentation was attached to the review which might have detailed the observations with either photographs or field notes. Terra Caliente questions whether the Wilderness Review, conducted over a mere two days, adequately supports a finding of wilderness characteristics, especially in light of certain considerations we offer below that tend to demonstrate a lack of wilderness characteristics.

As noted in the Wilderness Review, a previous review of the area was conducted in April 1979 as part of a statewide wilderness inventory. The Little Drum Mountains North was found not to possess wilderness characteristics because of previous mining activity (as BLM notes, there remains numerous active mining claims in the area). BLM claims the evidence of mining activity was not "as substantial visually" in 2008, but since 1979 other exploration activities have been conducted in the area including the Deferred Parcels. For example, in the 1980s, Phillips Petroleum drilled eight geothermal temperature gradient wells in the Deferred Parcels. *See* Exhibit A attached hereto. Evidence of the drill holes remains today, but BLM provides no discussion of these later exploration activities in the Wilderness Review. The EA itself notes

that in the early 1980s, Phillips Petroleum formed the Drum Mountain Geothermal Unit, which originally encompassed some 63,000 acres (later contracted to 25,000 acres), and drilled “63 shallow (300 to 500 feet) temperature gradient holes and 18 slightly deeper (+/-800 feet) stratigraphic test wells” EA, page 128. In addition, according to publicly-accessible GIS data, numerous roads traverse the Deferred Parcels. *See* Exhibit B attached hereto. As Exhibit B indicates, a number of roads penetrate the interior of the unit and the Deferred Parcels, including a road to state section 16 under lease to Terra Caliente’s affiliate.

This information suggests that BLM did not properly take into account the effect of prior exploration activities on the Little Drum Mountains North area, nor take into account the network of roads in the area which, taken together, diminishes (a) the area’s appearance of naturalness, (b) the area’s opportunities for solitude, and (c) the area’s potential for primitive and unconfined recreation. *See* definition of “wilderness”, 16 U.S.C. 1311(c) (Pub. L. 88-577, Sec. 2, Sept. 3, 1964).

Comment 5: In the alternative, BLM should consider reducing the Deferred Parcels area.

In the preceding comments, Terra Caliente has explained why the EA is consistent with existing planning directives, why the deferral of the subject parcels is inconsistent with the EA, why the Deferred Parcels may be sold at a future auction without amending the House Range RMP and why the BLM’s review of wilderness characteristics is flawed. If BLM does not find these comments persuasive, then, in the alternative, BLM should consider reducing the deferred area. As noted, much of the area, especially the perimeter, is laced with existing roads. Further geothermal exploration may reveal that production could be profitably conducted from the existing road network without significant incursion into the 10,440-acre deferred area as currently defined. BLM should evaluate the possibility of managing portions of the deferred

area for possible wilderness characteristics while allowing important renewable resources to be extracted from other portions.

Both the Bush Administration and the incoming Obama Administration have made pronouncements about the importance of clean, renewable energy as a source of economic activity and future energy needs. Indeed, a broad spectrum of environmental organizations has presented President-elect Obama with a tome for the new administration's transition "to a healthy environment, a green economy, and a sustainable future" (available at http://docs.nrdc.org/legislation/files/leg_08112401a.pdf). The first guiding principle of this nearly 400-page document is that the next administration should invest in clean energy solutions that solve global warming through the installation of clean energy and "green infrastructure." *Id.* at p. iv. The current Administration's Final Programmatic Environmental Impact Statement for geothermal leasing in the western United States proposes that BLM implement the Energy Policy Act of 2005 (Pub. L. 109-58) by recognizing the increased demand for geothermal resources and the need to facilitate leasing decisions. Final PEIS at ES-2. Geothermal leasing on BLM lands responds to the Energy Policy Act and other policy directives calling for clean and renewable energy. Geothermal energy will meet the increasing energy demands of the nation while reducing reliance on foreign energy imports, reducing greenhouse gas emissions, and improving national security. *Id.* at ES-3. Further, a decision by BLM to return all or a portion of the Deferred Parcels to the next lease sale will meet the BLM's need to facilitate geothermal resource leasing in an environmentally responsible manner to help meet the increasing interest in geothermal energy development on BLM lands. *Id.*

Little Drum Mountains, Utah Geothermal Prospect Area BLM Lease Parcels

Phillips Petroleum Drill Hole Locations
within the "Deferred" Area

From USGS Open File Report 99-425

- State Leases Acquired by Terra Caliente
- BLM 12/19 Sale Parcel's
- Deferred BLM Nominations
- County Line
- Road
- Phillips Petroleum Drill Hole Location

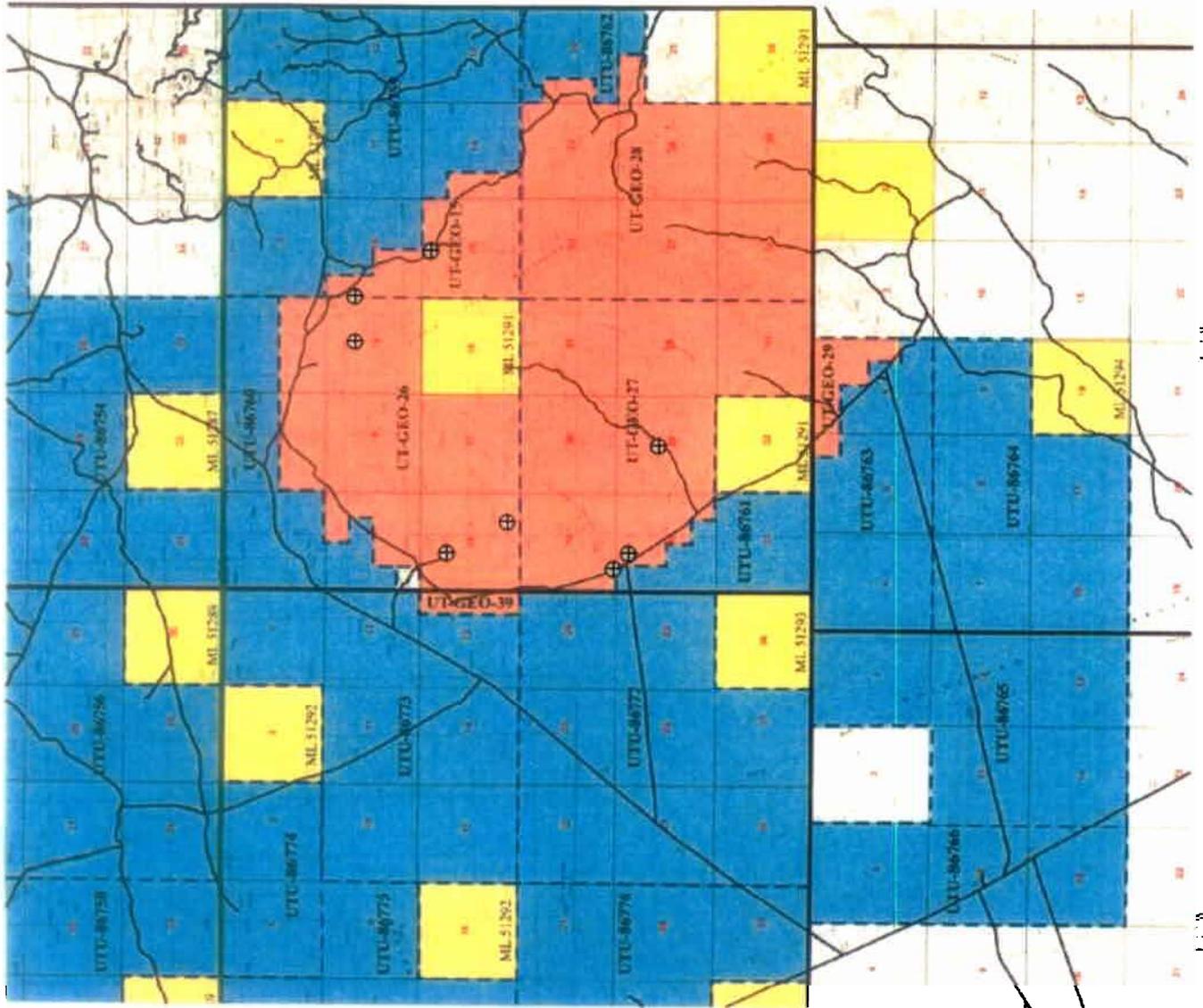
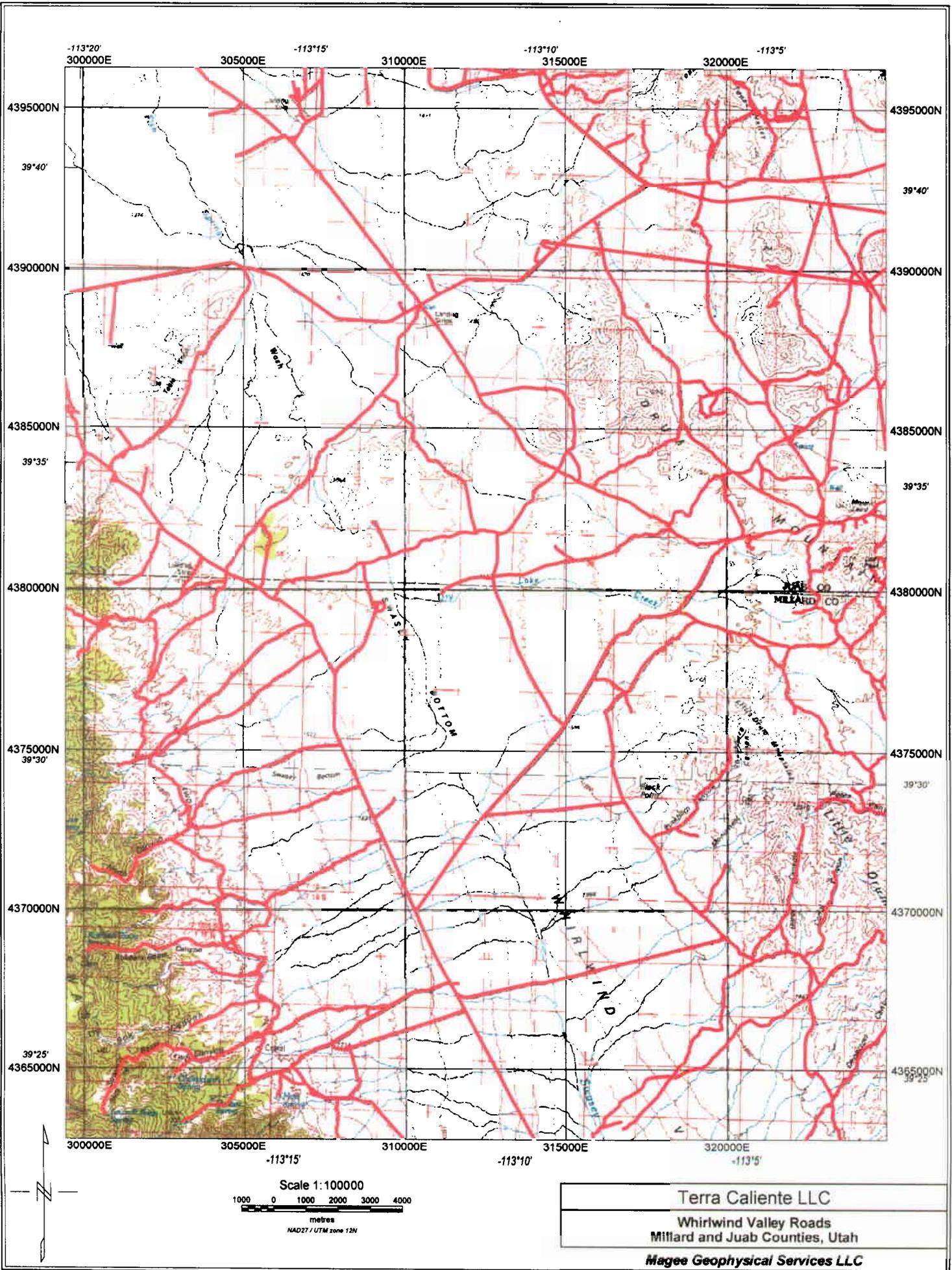


EXHIBIT B





southern
utah
wilderness
alliance

UTAH STATE OFFICE
RECEIVED
ACCOUNTS UNIT

2008 DEC -4 PM 4:20

DEPT OF INTERIOR
BUR OF LAND MGMT

December 4, 2008

Selma Sierra – State Director
Bureau of Land Management
Utah State Office
440 West 200 South, Suite 500
Salt Lake City, Utah 84101

RE: Protest of parcels UT-GEO-25, UT-GEO-26, UT-GEO-27, UT-GEO-28, and UT-GEO-31 and UT-GEO-32 Proposed for Lease Sale in the December 19, 2008 Geothermal Lease Sale

Dear Ms. Sierra,

The Southern Utah Wilderness Alliance (“SUWA”) hereby timely protests the December 19, 2008 Geothermal lease sale offering in Salt Lake City, Utah, of portions of the following five parcels in the Fillmore Field Office:

Fillmore Field Office: UTU-86729 (UT-GEO-25), UTU-86760 (UT-GEO-26), UTU-86761 (UT-GEO-27), UTU-86762 (UT-GEO-28), UTU-86765 (UT-GEO-31), and UTU-86766 (UT-GEO-32)

As you know, SUWA has a deep and longstanding interest in the protection and preservation of all of Utah’s wilderness-quality lands, including tens of thousands of acres of BLM land in the Fillmore and Cedar City Field Offices (“FOs”). SUWA members recreate, study, and appreciate the public lands offered for lease sale and are concerned about the impacts of leasing on some of these sensitive lands discussed.

In general, SUWA supports BLM’s efforts to increase production of alternative energies throughout Utah, including geothermal energy. In order to ensure that wilderness values will be protected and that the December 2008 lease sale otherwise complies with law, SUWA submits the following protest.

1. The Timing of the Geothermal December 2008 Lease Sale Violates the National Environmental Policy Act

The timing of the December 2008 geothermal lease sale violates the National Environmental Policy Act (“NEPA”) because there is not a completed NEPA analysis for the lease sale. Rather, the Geothermal Leasing EA which should provide the NEPA analysis for the December lease sale has not been yet been completed.

425 East 100 South
Salt Lake City, UT 84111
Phone: 801.428.3990
Fax: 801.486.4233
email: tiffany@suwa.org

Comments on the Geothermal Leasing EA are due on December 4, 2008. On the same day, protests for the December 19, 2008, geothermal lease sale are also due. The December 2008 lease sale offers parcels in the Fillmore and Cedar City FOs, and relies upon the Geothermal Leasing EA as the NEPA analysis for the sale of those parcels. BLM cannot offer parcels for sale without first having completed a NEPA analysis for those parcels. Council for Environmental Quality ("CEQ") regulations which implement NEPA require that, until BLM issues a Record of Decision ("ROD"), it shall not take any action which would "(1) Have an adverse environmental impact; or (2) Limit the choice of reasonable alternatives." 40 C.F.R. 1506.1(a)(1)-(2).

By offering parcels for sale without a completed NEPA analysis, BLM is putting the cart before the horse, and is making decisions based on a non-existent final NEPA document. That BLM might fast-track the review of a sister agency and public comments to "finalize" the NEPA analysis upon which the sale of the parcels relies, does not result in a thorough NEPA process. Rather, the end result is driving the process. BLM must fully analyze the "adverse environmental impacts" rather than issuing a Finding of No Significant Impact and Decision Record to conform to the lease parcels that are in the December 19, 2008 lease sale. *See* 40 C.F.R. § 1506.1(a)(1). Likewise, because the protests for the lease sale and the comments for the NEPA document upon which the lease sale relies are due on the same day, BLM limits the choice of reasonable alternatives, and predetermines the validity of the lease sale. *See* 40 C.F.R. § 1506.1(a)(2).

In addition, NEPA requires that, while work on a program Environmental Impact Statement ("EIS") is in progress, BLM shall not engage in any action that will be covered by the EIS and may significantly affect the environment *unless* the action is independently justified, is covered by its own EIS, and will not prejudice the decision in the program EIS. 40 C.F.R. § 1506.1(c). Although the Geothermal Leasing EA is an EA, not an EIS, the same principles apply to an EA. BLM should not undertake a geothermal lease sale that is predicated upon the analysis and the completion of an EA for the same area and may significantly affect the environment prior to the completion of the EA. The Geothermal Leasing EA must be completed *before* BLM proposes to sell geothermal parcels that rely upon that EA. NEPA does not permit the hasty completion of projects that sacrifice the public's participation and the agency's thorough review of the environmental consequences of the project. *See* 40 C.F.R. §§ 1500.2(d), 1506.1.

Finally, the Final Programmatic Environmental Impact Statement ("EIS") for Geothermal Leasing in the Western United States requires BLM to complete additional NEPA environmental analysis, and attach stipulations and best management practices to guide geothermal leasing and development. Environmental Policy Act ("NEPA") analysis *prior to* offering geothermal leases. Final Programmatic Environmental Impact Statement ("EIS") for Geothermal Leasing in the Western United States (October 2008) at ES-2, 1-12 -13 *available at* http://www.blm.gov/wo/st/en/prog/energy/geothermal/geothermal_nationwide/Documents/Final_PEIS.htm. In order to comply with NEPA and the Programmatic Geothermal EIS, BLM must complete the Geothermal Leasing EA before soliciting protests and conducting the December 2008 geothermal lease sale.

2. BLM Must Withdraw Portions of Parcels UT-GEO-25, UT-GEO-26, UT-GEO-27, and UT-GEO-28 Because BLM's 2008 Wilderness Character Review Found that these Parcels Possess Wilderness Character

In June – July 2008, Fillmore BLM conducted a wilderness character review for areas that were likely to be involved in the Geothermal Lease Sale. *See* EA at 43. As a result of that inventory, BLM found that most of the areas proposed for wilderness by the Utah Wilderness Coalition (“UWC”) that were addressed in the geothermal leasing EA, including Crater Bench East, the Drum Mountains, Keg Mountain East and West, Lion Peak, Little Drum Mountains, Little Drum Mountains North possessed wilderness characteristics. As a result of this review, BLM withdrew most these areas from the December lease sale. *Compare* Geothermal Leasing in the Fishlake National Forest, Cedar City, and Fillmore Field Offices, Environmental Assessment UT-010-08-051, at 2, Appendix A (November 2008) *with* December 2008 Geothermal Final Sale List, available at

http://www.blm.gov/ut/st/en/prog/energy/geothermal0/december_2008_geothermal0.html

SUWA appreciates that Fillmore BLM conducted a wilderness character review, as required by Section 201 of the Federal Land Policy and Management Act (“FLPMA”) *before* offering the parcels for sale and potentially impacting the wilderness resource. EA at 63; 43 U.S.C. § 1711. SUWA similarly appreciates the fact that BLM then deferred the parcels that it determined possessed wilderness character from leasing in December 2008.

However, a portion of parcel UTU-86762 (UT-GEO-28), and very small portions of UTU-86759 (UT-GEO-25), UTU-86760 (UT-GEO-26), and UTU-86761 (UT-GEO 27) remain on the December 19, 2008 geothermal lease sale list. A portion of parcel UT-GEO-28 (i.e. T 15 S R 11 W Sec. 25), and small corners of UT-GEO-25, UT-GEO-26, and UT-GEO 27 overlap with lands BLM found to have wilderness character in its recent Wilderness Character Review; these lands are part of the UWC’s Little Drum Mountains North unit which is included in America’s Red Rock Wilderness Act.. EA at 41; *See* Map attached as Exhibit A. BLM must permanently withdraw this parcel from leasing in order to protect the wilderness resource. Thus, BLM must withdraw in the above-listed portion portions of parcels UT-GEO-25, UT-GEO-26, UT-GEO-27, and UT-GEO-28 in the upcoming December 19, 2008 lease sale in order to protect the wilderness resource.

3. BLM Should Withdraw Portions of Parcels UT-GEO-31 and UT-GEO-32 Because They Possess Wilderness Character

A portion of parcels UTU-86765 (UT-GEO-31) and UTU-86766 (UT-GEO-32) (i.e. T 16 S R 12 W Sec. 14, 15) overlaps with the UWC’s Swasey Mountain unit. Although Fillmore BLM’s 2008 Wilderness Character Review did not find that the above-mentioned portion of the Swasey Mountain Addition possessed wilderness character, SUWA respectfully disagrees. *Cf.* EA at 40-1.

The boundary of the wilderness character area should be adjusted to the north to include all lands until a significant manmade intrusion is present.

SUWA requests that BLM reinventory this area and make appropriate boundary adjustments to include all lands that have wilderness character. Specifically, BLM should utilize significant, manmade intrusions for the boundaries, rather than naturally reclaimed routes. BLM's wilderness character review notes that the boundary routes "are substantial in condition and use." WC document on file at Fillmore FO. Although BLM's wilderness character file fails to provide any photographic documentation, SUWA's evaluation performed just weeks after BLM visited the route, indicates that besides BLM's vehicle tracks on this route, the route may have not been used in several years. See Exhibit B and Photograph # 1 of the non-significant reclaimed route BLM used to make its non-wilderness character determination. In addition, looking at the overall area, this reclaimed "route" is completely insignificant when viewed with the entire eastern slope of Swasey Mountain as Photographs # 2 and 3 (Exhibit B) further substantiate that the reclaimed route does not warrant excluding lands to the east from the Swasey Mountain wilderness character unit.

BLM assessed Unit A as retaining naturalness. However, BLM subsequently concluded that due to the topography and vegetation that Unit A does not provide opportunities for solitude. Although the area lacks dramatic topographical relief and the vegetation screening is minimal, this does not necessarily lead to a finding that the area provides no opportunities for solitude. A visitor walking just a few yards off of the boundary route would be instantly rewarded by a feeling of isolation and outstanding solitude in the expansive Whirlwind Valley. This impression of solitude is present regardless of the topography and vegetation screening. Even a rare chance encounter with another vehicle traveling along one of the boundary routes does not diminish the feeling of solitude and isolation in this area.

The map attached as Exhibit A depicts the locations and boundaries of the UWC's Swasey Mountain unit, which UWC has determined possesses wilderness character. SUWA requests that BLM ground-truth and verify its wilderness character boundaries prior to determining that this area lacks wilderness character. BLM has agreed with UWC's determinations for wilderness character for the vast majority of areas reviewed, and a closer look at this area may reveal to BLM that the area does indeed possess wilderness character. SUWA requests that BLM defer leasing parcels UTU-86765 (UT-GEO-31) and UTU-86766 (UT-GEO-32) until BLM can review this area with the appropriate boundaries for wilderness character. In the event that BLM determines this area has wilderness character, SUWA requests that BLM permanently withdraw the few hundred acres of parcels UTU-86765 (UT-GEO-31) and UTU-86766 (UT-GEO-32) that overlap UWC's wilderness unit.

4. **The December Sale List Should Attach Legally-Binding Stipulations, Rather than Unenforceable Notices to Most Parcels**

Although the December 19, 2008 geothermal lease sale obviously deal with geothermal energy, not oil and gas energy, BLM regulations regarding oil and gas lease notices and lease stipulations nevertheless applies. BLM oil and gas leasing regulations explain that there is a major difference between a lease notice and a lease stipulation. Stipulations are part of the lease and “supersede inconsistent provisions of the standard lease form.” Notices, on the other hand, “ha[ve] no legal consequences, except to give notice of existing requirement,” and “shall not be a basis for denial of lease operations.” 43 C.F.R. § 3101.1-3. Thus, a notice is an unenforceable provision, while a stipulation is an enforceable part of a lease contract. Simply put, a lessee may violate the admonitions of a notice with “no legal consequences,” and such action will not invalidate the lease. . In addition, the Programmatic EIS for Geothermal Leasing contemplates that BLM would attach stipulations, not notices, to specific parcels. *See* Programmatic EIS for Geothermal Leasing in the Western United States at ES-2, 1-12 -13.

The House Range Resource Area (“HRRA”) RMP and the Warm Springs Resource Area (“WSRA”) RMP both contemplated stipulations in order to best protect certain resources in the Fillmore FO. However, the final sale list for the December 19, 2008 geothermal lease sale includes many notices but few stipulations. These notices are wholly inadequate to protect the resources at stake in the Fillmore and Cedar City BLM FOs. And, the notices are an aberration from customary BLM practice. Indeed, for the December 19, 2008 oil and gas lease sale, the Price, Moab, Richfield, and Vernal FOs all attach stipulations, sometimes exclusively, and sometimes in addition to notices, to their leases.

Given the resources at stake on public lands managed by the Fillmore and Cedar City BLM FOs, it is unacceptable that few stipulations are implemented to protect important habitat, species, water, air, and other resources. There are myriad examples in the upcoming December 2008 geothermal lease sale where other field offices attach stipulations to protect identical resources in the December oil and gas lease sale, while the geothermal leases attaches only an unenforceable notice for the same resource. *See, e.g.*, greater sage-grouse leks, steep slopes, raptor nesting, and riparian protection.

In particular, the greater sage-grouse is one of the resources that deserves the enforceable protection of a stipulation. The greater sage-grouse is a candidate species for listing under the Endangered Species Act whose numbers are dwindling quickly, in part as a response to habitat loss and human interference. *See, e.g.*, Greater Sage-Grouse Population Trends: An Analysis of Lek Count Databases 1965-2007, *available at* <http://www.fws.gov/mountain-prairie/species/birds/sagegrouse/PopulationTrendsWAFWA%20July2008.pdf>. Many of the lands in the Fillmore and Cedar City field offices historically provided habitat for greater sage-grouse, but the birds’ current range has been greatly reduced. *See id.* at Appendix A, Figure A. Crucial to the birds’ survival are expansive areas called “leks” (Norwegian for “play”) where the birds congregate to mate, and where surrounding habitat is used for the nesting and rearing of chicks. Despite the undeniable importance

of leks for the survival of the greater sage-grouse, Fillmore BLM has failed to protect this species and its leks through oil and gas leasing stipulations.

Requiring a stipulation for greater sage-grouse leks is neither difficult nor uncommon. Indeed, in the December 2008 oil and gas lease sale, the Price FO attaches a No Surface Occupancy (“NSO”) stipulation to leases within a half-mile of greater sage-grouse leks. December 2008 Stipulations and Notices at Stipulation No. PFO-NSO-1, at 8. In addition to its NSO stipulation, the Price FO also attaches a timing stipulation, restricting surface-disturbing and other disruptive activities within two miles of greater sage-grouse leks from March 15 – July 15. December 2008 Stipulations and Notices at Stipulation No. PFO-TL-15, at 10. Likewise, the Moab FO employs a stipulation for Gunnison sage-grouse leks that prohibits surface-disturbing activities within 0.6 miles of leks. Errata Sheet (December 2, 2008), at 13 *available at* http://www.blm.gov/ut/st/en/prog/energy/oil_and_gas/oil_and_gas_lease/december_2008_oil0.html. Likewise, the Vernal FO attaches a stipulation that does not permit any surface-disturbing activity within 2 miles of a sage grouse lek from March 1 – June 15. December 2008 Stipulations and Notices at Stipulation No. VFO-08, at 31. Vernal allows no exceptions, modifications, or waivers to this stipulation. *Id.* Like these other field offices, Fillmore and Cedar City BLM FOs must attach a sage grouse lek stipulation, instead of a notice, to protect this appealing and dwindling species. *See* December 2008 Final List for Geothermal Sale at 34.

Given the resources at stake on public lands managed by the Fillmore and Cedar City BLM FOs, it is unacceptable that few stipulations are implemented to protect important habitat, species, water, air, and other resources. For example, the Geothermal Leasing EA states that it is more protective of riparian resources than the No Action Alternative. EA at 11. However, the House Range Resource Area (“HRR”) Resource Management Plan (“RMP”) attaches a stipulation that does not permit any new surface disturbance within 500 feet of perennial streams or springs in critical watersheds. EA at 10. In order to be as protective as the HRR RMP, the December 2008 geothermal lease sale should attach stipulations, not unenforceable notices, to riparian parcels.

In sum, in order to adequately protect the resources in the Fillmore and Cedar City FOs, and to comply with the Programmatic Geothermal EIS, the December 19, 2008 geothermal lease sale should include more stipulations, rather than unenforceable notices.

CONCLUSION

SUWA supports BLM’s efforts to increase the production of alternative energies, including geothermal energy, throughout Utah. SUWA supports and appreciates the efforts by the Fillmore BLM Field Office to inventory the areas involved in the December 2008 geothermal lease sale for wilderness characteristics. SUWA likewise supports BLM’s decision to defer parcels that conflicted with lands that BLM determined possessed wilderness character. Because BLM found that small portions of parcels UT-GEO-25, UT-GEO-26, UT-GEO-27, and UT-GEO-28 possess wilderness character, BLM must withdraw these portions from the upcoming December 19, 2008 geothermal lease sale. Although Fillmore BLM found that a portion of Swasey’s Mountain Addition, proposed for wilderness in ARWA, does not possess wilderness character, SUWA

urges BLM to take a closer look at its 2008 Wilderness Character Review, find that the area possesses wilderness character, and withdraw this portion of parcels UT-GEO-31 and UT-GEO-32.

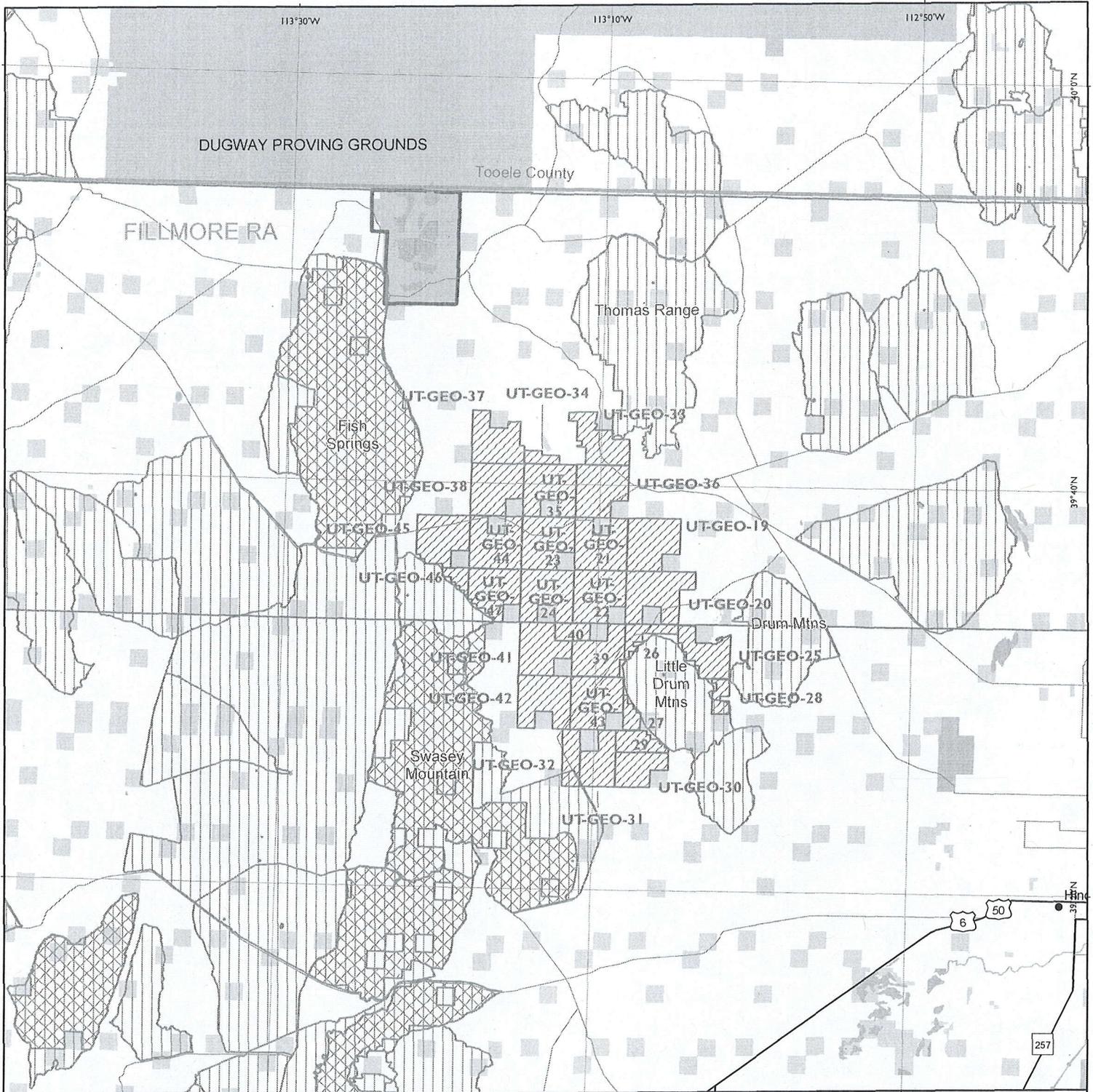
Thank you for your consideration of these comments. If you have questions or concerns, please either email me at tiffany@suwa.org or contact me at the address or phone number at the footer of this letter.

Sincerely,

A handwritten signature in black ink, appearing to read "Tiffany Bartz". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Tiffany Bartz
Field Advocate

EXHIBIT A



Geothermal Lease Sale, Area I

Federal Geothermal Lease Sale - Utah BLM, December 19, 2008

Geothermal Lease Parcels (downloaded from the Utah BLM website on 12/1/2008)

Wilderness quality and wildlife habitat areas

- | | | |
|-------------------------------|--------------------------|--|
| Wilderness (BLM & USFS) | USFS Roadless Area | Designated ACEC/Final RMP ^A |
| BLM Wilderness Study Area | National Wildlife Refuge | Potential ACEC/Draft RMP* |
| Citizens' Wilderness Proposal | Historic Trails | Managed for WC/Final RMP ^{A#} |
| | | WC/Inventory Draft RMP [#] |

Land Management & Administration

- | | | | |
|-----|-----|-------|-------------|
| BLM | DOD | USFWS | State Parks |
| BIA | NPS | USFS | State |

* BLM areas that were designed as ACECs or having wilderness characteristics during the draft RMP
^A BLM areas that will be managed as ACECs or wilderness in the final RMP
[#] Wilderness Characteristic areas might overlap ACECs

NAD 1983 UTM Zone 12N
 Data Sources: BLM, NRDC, SITLA, USDA-FS, UT-AGRC, WUP
 Sara Watterson, December 1, 2008

EXHIBIT B



Photograph #1 – T16S R12W, Section 34 SW, looking northwest –BLM utilizes this exceedingly faint and reclaimed “route” as the boundary of the lands identified as possessing wilderness characteristics. BLM has previously determined that the lands to the west of this “route” have wilderness character. Clearly the lands on the east side of this “route” are no different than the lands to the west. In fact, BLM has acknowledged that the lands to the east, Unit A, are natural in appearance. BLM must re-evaluate Unit A and find wilderness character is present.



Photograph # 2 – T16S R12W, Section 15 SE, looking southwest – The benchlands of Swasey Mountain are natural in appearance and not separated from the range by any significant impact. BLM's recent wilderness character review erroneously characterized one route, located near the foothills, as being a significant impact, thus excluding these lands from the BLM's wilderness character area. Nowhere, whether viewed from the valley, or along one of the reclaimed route, is this "route" a significant impact.



Photograph #3 - T16S R12W, Section 27 NE, looking west – Looking towards the flanks of Swasey Mountain the natural character of the lands within BLM's Unit A are in full view. A group of pronghorn can be seen, but no visual presence of the "route" BLM utilizes as the wilderness character boundary. The impression that this area is impacted by one, naturally reclaimed route is not justified and wilderness values extend to the east.



State of Utah

JON M. HUNTSMAN, JR.
Governor

GARY R. HERBERT
Lieutenant Governor

Office of the Governor

PUBLIC LANDS POLICY COORDINATION

JOHN HARJA
Director

RESOURCE DEVELOPMENT COORDINATING COMMITTEE
Public Lands Section

December 2, 2008

U.S. Department of the Interior
Bureau of Land Management
Utah State Office
440 West 200 South
Salt Lake City, Utah 84101

SUBJECT: Geothermal Leasing
RDCC Project No. 08-9998

To Whom It May Concern:

The Resource Development Coordinating Committee (RDCC) has reviewed this proposal for Geothermal Leasing in the Fishlake National Forest, Cedar City and Fillmore BLM Field Offices. The Division of Wildlife Resources comments:

General Comments:

Seasonal closures and other stipulations are listed as the primary tools to reduce surface disturbing impacts to big game and other wildlife, including sensitive species like the greater sage-grouse. Seasonal closures during construction activities prevent short-term wildlife displacement, however, the product of construction is often a structure that creates long-term displacement or deleterious impacts (e.g., structures that provide raptor perches near or within greater sage-grouse brooding habitat) throughout its lifetime of operation or use (e.g., oil wells and associated infrastructure requiring maintenance for 20 to 30 years). UDWR strongly encourages the BLM to require off-site mitigation for surface disturbing actions on projects that are expected to have long-term impacts to crucial wildlife habitats. Mitigation alternatives could include rangeland and habitat restoration, noxious weed control, prescribed fire, or mitigation banking, thus improving and/or protecting wildlife habitat.

Mitigation of any actions could be coordinated cooperatively within the framework of the Utah Partners for Conservation Development (UPCD), which includes partnerships with UDWR, BLM, USFS, SITLA, NRCS, and other state and local entities. The UPCD has identified high-priority areas in need of restoration in sage-grouse and mule deer habitats across the state of Utah, including the Fish Lake National Forest and lands administered by the Fillmore BLM field office.

Specific Comments:

Mule Deer and Elk:

UDWR is particularly concerned with development of parcels UT-GEO-01, 09, 10, 11, 12, 13, FS-01, and FS-02. All of these parcels are located in mule deer and elk crucial habitat. UDWR and conservation partners, including the BLM, USDA Forest Service, and other state agencies, have a considerable investment in habitat improvements and fire rehabilitation projects in this area. Further, the Utah Department of Transportation and UDWR have high profile wildlife crossing structures within these lease parcels. These wildlife structures maintain an important wildlife crossing across Interstate-15 while protecting human lives and property from vehicle highway collisions.

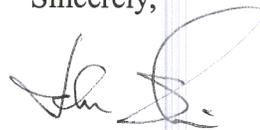
Construction activity in this area could disrupt migration patterns of mule deer which are quite likely to be displaced onto nearby agricultural fields. Impacts can be addressed with stipulations that would not allow construction activity between December 1st and April 15th. UDWR further recommends wildlife impacts be mitigated via an off-site habitat improvement program, which may be administered in cooperation with the UPCD. Other mitigations could include clustered development, directional drilling, and/or time of day avoidance (crepuscular hours).

Sage-grouse:

Stipulations regarding protections for sage-grouse leks, brooding and winter habitats should be specific and follow guidelines established by the best available science. Current research indicates that suitable sagebrush habitat within the 2 miles surrounding active sage-grouse leks is of utmost importance to the viability of sage-grouse populations. The UDWR recommends a minimum ½ mile no surface occupancy buffer and carefully designed controlled surface use stipulations from ½ mile to 2 miles of active leks. The UDWR should be consulted during development of specific management recommendations for these controlled surface use stipulations.

The Committee appreciates the opportunity to review this proposal. Please direct any other written questions regarding this correspondence to the Resource Development Coordinating Committee, Public Lands Section, at the above address, or call the Director, Judy Edwards, at (801) 537-9023, or Carolyn Wright at (801) 537-9230.

Sincerely,



John Harja
Director

BLM - UT - 950
 2008 NOV 26 AM 9:47

United States Department of the Interior



NATIONAL PARK SERVICE
 National Trails Intermountain Region
 324 South State Street, Suite 200
 Salt Lake City, Utah 84111

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Betsy 910 24		

#910-448
 due: 12-2-08

IN REPLY REFER TO:

November 22, 2008

Memorandum

To: Utah State Director, Bureau of Land Management

From: Superintendent, National Trails Intermountain Region

Subject: Comments on Environmental Assessments (UT-010-08-051) and oil and gas lease sales (UT-010-08-050)

Thank you for providing this office of the National Park Service opportunity to comment on proposed geothermal and oil and gas lease sales along the Pony Express National Historic Trail (NHT) in western Utah. As the federal administrator of the NHT, we offer these comments in compliance with the National Trails System Memorandum of Understanding (6-SU-11132424-196), signed in 2006 by NPS and BLM. The MOU states that the agencies shall "coordinate planning and management for National Trails with each other," "consider potential impacts to National Trails," and "cooperate in planning and conducting environmental analysis and meeting other legal compliance requirements associated with the planning and managing of National Trails."

Both environmental assessments conclude that "critical setting component and historic properties" of the NHT would be adversely affected by energy exploration or development on certain parcels, namely Parcels 48-52. Activities there would impact the western portion of Fairfield-to-Ruby Valley segment of the trail and the Boyd Pony Express Station in the Fillmore District of BLM. We believe the proposed activities are incompatible with trail values and BLM's long-time recognition and excellent management of the significant cultural resources there.

- The Fairfield-to-Ruby segment is the most intact, isolated, and visually unimpaired length of the Pony Express Trail in Utah. It is listed as a high potential segment in the trail Comprehensive Management Plan (CMP), developed in

cooperation with BLM. The entire segment includes five interpreted Pony Express stations with standing ruins and/or trail-related archeological features and debris scatters. The National Trails System Act (NTSA) defines high potential segments as those that “afford high quality recreation experience in a portion of the route having greater than average scenic values or affording an opportunity to vicariously share the experience of the original users of a historic route.” Boyd Station likewise is listed as a high potential site in the trail CMP, which describes it as “one of the best-preserved Pony Express stations in Utah.”

- This trail segment is of particular historical interest as the setting of intense Indian resistance to white intrusion in the Great Basin. Several attacks on riders and station-keepers occurred along this stretch of trail. The ruins, earthen features, and debris scatters remaining at these sites are touchstones to those events, and trail setting is important to the recreational experience at those places. Stations along this segment are described in a 1979 BLM publication, *The Pony Express Stations of Utah in Historical Perspective*, by Richard Fike and John Headley.
- BLM has designated this segment of trail as the Pony Express Back Country Byway in recognition of its scenic quality, historical significance, and association recreation values, and has published a byway brochure to promote tourism along the route. Since the mid-1970s, BLM has developed and interpreted this segment of the trail for visitors. In recent years, interpretation has been accomplished in partnership with NPS and the National Pony Express Association. By designating, interpreting, and promoting the byway and its associated sites, BLM has implemented the high potential segment of the trail and recognized its recreation values.
- BLM Salt Lake District designated its portion of the Pony Express Trail as a Special Recreation Management Area (SRMA) in 1988. The Salt Lake District has management responsibility for the entire trail through Utah and manages this entire segment, including the affected portion in the Fillmore District, as an SRMA for its recreation values.
- BLM also recognizes the Pony Express National Historic Trail as a “special area,” one of its National Landscape Conservation System “Landscapes of the American Spirit.”

Construction of geothermal power plant facilities, transmission lines, oil and gas pipelines, and access roads will create dust, noise, emissions, and visual intrusions to “critical setting” that cannot be hidden or effectively mitigated on the open terrain surrounding the affected portion of the Pony Express NHT. Exploration- and development-related traffic and activity on and near the trail will impact the quality of the recreational experience by diminishing opportunities for solitude and “vicarious trail experiences” on the Pony Express Back Country Byway. Existing roads along the trail route may require improvements to accommodate development-related traffic. Impacts of energy development on recreation are not adequately addressed in either EA. These activities conflict with a high potential segment of National Historic Trail, with byway and SRMA designation, and with NLCS values, and are contraindicated by BLM’s own designations and efforts to enhance visitor experience and manage visual, recreational, and historic resources along the Pony Express Route.

According to a Department of Interior news release dated Oct. 22, 2008, Interior's Geothermal Energy Initiative permits the BLM to "implement discretionary closure of units of the National Landscape Conservation System" to make them unavailable for leasing. As a component of the NLCS, this entire segment of the Pony Express National Historic Trail merits consideration for that level of protection.

We ask that BLM consider deferring sale of Parcels 48-52 until such time as BLM and NPS can consult about the possibility of closing of the Fairfield-to-Ruby Valley segment to energy development under the above-cited authority, or to identify appropriate stipulations that will protect the historical, scenic, and recreational values of the national historic trail corridor.

A handwritten signature in black ink, appearing to read 'A. Mahr', written in a cursive style.

Aaron Mahr

Cc: Field Manager, Fillmore Field Office, Bureau of Land Management



Terry
Catlin/UTSO/UT/BLM/DOI
12/01/2008 07:56 AM

To Al_McKee@blm.gov
cc
bcc
Subject Fw: Geothermal Leasing in Utah

----- Forwarded by Terry Catlin/UTSO/UT/BLM/DOI on 12/01/2008 07:56 AM -----



"Ken and Arleta"
<arleta@bluevalley.net>
11/25/2008 01:11 PM

To <Terry_Catlin@blm.gov>
cc <Julie_Howard@blm.gov>, <Dave_Mermejo@blm.gov>
Subject Geothermal Leasing in Utah

As we are preparing to celebrate the 150th Anniversary of the Pony Express in 2010, it is distressing to see that the government is opening up areas in and along the Pony Express National Historic Trail for geothermal development with no regard to physical and/or visual intrusions.

This letter is in protest of the government opening up "historical" parcels of Public Lands for geothermal, or oil and gas development.

We would like to urge development to be kept away from UT-GEO 48 through 53 which is the Fish Springs Block. Within this area lies the Boyd Station on the Pony Express National Historic Trail and the Pony Express Back Country Byway.

There are thousands of acres of undeveloped land that can be used for this type of activity. So please, we encourage development to steer clear of any parcels which have a culture or historical significance.

Sincerely,

Ken & Arleta Martin

National Pony Express Assn.

Visit the Oregon California Trails Assn. website www.octa-trails.org
Visit the National Pony Express Assn website www.xphomestation.com



Everyone has a photographic mind.....some don't have film. Arleta Martin.vcf



Utah Historic Trails Consortium

300 Rio Grande, Salt Lake City, UT 84101

STATE DIRECTORS OFFICE
Tel: (801) 533-3500

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- Mormon Trails Association
- International Society, Daughters of Utah Pioneers
- National Society, Sons of Utah Pioneers
- National Pony Express Assoc., Utah Division
- Oregon/California Trails Assoc., Utah Crossroads Chapter
- The Church of Jesus Christ of Latter-day Saints
- National Park Service, Long-Distance Trails Office
- U.S. Forest Service
- U.S. Bureau of Land Management, UT Mormon Battalion, Assoc.
- Nat'l. Mormon Battalion Aux.
- Utah Division of State History
- Utah Division of Parks and Recreation
- Utah Division of Indian Affairs
- Utah Travel Council
- Utah Dept. of Community and Economic Development
- Utah Dept. of Transportation
- Utah Dept. of Natural Resources
- Old Spanish Trail Association
- Hole-in-the-Rock Assoc.
- Lincoln Highway Association, Utah Chapter

Selma Sierra
 Director
 U. S. Department of the Interior
 Bureau of Land Management
 404 West 200 South, Suite 500
 Salt Lake City, Utah 84101

28 November 2008

Re: Geothermal Parcel Leases

The Utah Historic Trails Consortium, which is composed of representatives from several National Historic Trails organizations in Utah and other state-based history organizations is concerned about the Utah Bureau of Land Management Office decision to lease geothermal parcels identified as UT-GEO 48 to UT-GEO 52 and particularly the parcels that contain segments of the National Pony Express Trail and the Pony Express Boyd Station.

The rush to lease the above named geothermal parcels of BLM land is not in the best interest of preserving these federally recognized and designated cultural "artifacts" which represent the important development of communications nationally and the greater American development in the West.

We strongly recommend that the state BLM office withdrawing those geothermal leases which will impact these cultural artifacts until a thorough evaluation of the Pony Express Trail and Boyd Station be made by cultural specialists in your office along with the Utah State Historic Preservation Officer, local representatives from the National Pony Express Association, and other interested history and historical trail representatives.

A delay to lease the above named parcels of land will not cause irreparable harm to any future geothermal leases but if BLM permits the leases to take place without a thorough evaluation by all interested parties irreparable damage will likely occur to the Pony Express Trail and Boyd Station as well as possible prehistoric sites. The damage to this element to our national cultural heritage cannot be mitigated after the fact.

It is our request that a representative from the Utah Historic Trails Consortium and/or a representative from the local National Pony Express Association be a consulting partner.

Sincerely,

Craig Fuller, Ph.D.

Secretary

Utah Historic Trails Consortium