BLM

Stillwater Field Office, Nevada

ENVIRONMENTAL ASSESSMENT

TGP Dixie Development Company, LLC

Coyote Canyon South Geothermal Exploration

DOI-BLM-NV-C010-2012-0051-EA

U.S. Department of the Interior
Bureau of Land Management
Carson City District
Stillwater Field Office
5665 Morgan Mill Road
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It is the mission of the Bureau of Land Management to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.

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Table of Contents

List of Tables

List of Figures

List of Appendices

LIST OF ACRONYMS AND ABBREVIATIONS

BLM	United States Department of the Interior, Bureau of Land Management
BMP	best management practice
CCS	Coyote Canyon South
CFR	Code of Federal Regulations
DOI	United States Department of the Interior
EA	environmental assessment
NEPA	National Environmental Policy Act of 1969
PEIS	programmatic environmental impact statement
RMP	resource management plan
ROW	right-of-way
SFO	Stillwater Field Office
SWReGAP	Southwest Regional GAP Analysis Project
TGP	TGP Dixie Development Company
US	United States
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VRM	visual resource management

1.0 INTRODUCTION/PURPOSE AND NEED

This Environmental Assessment (EA) analyzes the potential impacts associated with the proposed construction and testing of geothermal exploration wells, access roads, and ancillary facilities in Dixie Valley, as well as the expansion of and extraction of materials from two aggregate pits in Churchill County, Nevada (**Figure 1**, Project Location and Gravel Sources). Terra-Gen Power Dixie Development Company (TGP) proposes to expand a previously approved geothermal exploration area, originally called "Coyote Canyon". This new proposal is to explore the geothermal resource potential of lands directly to the south of Coyote Canyon in three additional federal geothermal leases, referred to here as the Coyote Canyon South (CCS) lease area (Lease Area). The Lease Area is on federal lands managed by the United States (US) Department of the Interior, Bureau of Land Management (BLM) in Dixie Valley. The BLM is the lead agency for this EA in accordance with the National Environmental Policy Act (NEPA) (40 Code of Federal Regulations [CFR] Parts 1500-1508).

The purpose of the geothermal exploration is to confirm that sufficient reservoir capacity is available to allow long-term production. This EA analyzes potential impacts from the proposed exploration and testing activities.

The exploration activities and associated gravel pit expansions and extraction are referred to as the Proposed Action. The geothermal leases held by TGP for the CCS exploration project contain 7,588 acres, which comprise the Lease Area.

TGP proposes to conduct geothermal exploration in a portion of the Lease Area called the Project Area. **Figure 2**, Proposed Action and Lease Area shows the Lease Area and Project Area.

An operations plan to drill and test up to 15 explorations wells at the Project Area was submitted to the BLM, Stillwater Field Office (SFO) in August 2011. Revised Operations Plans were submitted in October 2011 and again in December 2011.

In addition to the exploration drilling program, mineral material sales contracts would be required for aggregate material obtained from three BLM-managed gravel pits. Gravel extraction from one of the pits was analyzed under a previous NEPA document, and so this EA addresses impacts associated with the other two pits.

Individual geothermal drilling permits would be issued separately from this document.

1.1 LEASE AREAS AND RIGHTS-OF-WAY

Leases held by TGP for the Proposed Action are shown in Figure 2, Proposed Action and Lease Area.

The original lease area at Coyote Canyon that was analyzed for the previously approved exploration and utilization activities covered 7,637 acres. These lands are located directly to the north of the proposed CCS project area (Project Area). The Project Area is defined by the area that has been surveyed under a Class III cultural resources survey in support of the CCS project. The Project Area covers 3,530 acres within the CCS Lease Area and up to an additional 45 acres

for gravel extraction distributed across three gravel pits. The Lease Area is composed of the following three leases purchased by TGP:

- N-86889, which covers 5,045 acres;
- N-88416, which covers 1,263 acres; and
- N-89605, which covers 1,280 acres.

In total, the Lease Area covers 7,588 acres. When combined, the current Lease Area and the original Coyote Canyon lease area to the north cover 15,225 acres. In 2011, the BLM approved the new Coyote Canyon Unit, which includes all 15,225 acres, including all 7,588 acres of the Lease Area and, subsequently, all 3,530 acres of the Project Area (the 45 acres of gravel pits are outside of the Lease Area). The Project Area is shown within the context of the Coyote Canyon Unit and the original Coyote Canyon project area on Figure 2, Proposed Action and Lease Area. Leases held by TGP in the Lease Area, and their effective dates are shown in **Table 1**, Coyote Canyon South Geothermal Leases/Unit.

The primary access to the Lease Area would be via US Route 50 from Fallon. From Route 50, Highway 121 leads north, through Dixie Valley, to the Lease Area.

On October 23, 2009, as part of the original Coyote Canyon project, TGP submitted applications for rights-of-way (ROWs) to develop roads between TGP's separate geothermal leases. This off lease action would provide connectivity to the Lease Area from the original Coyote Canyon lease area. No new ROWs are required for on-lease access roads.

Table 1: Coyote Canyon South Geothermal Leases/Unit

Lease Serial Number	Section Number	Township, Range	Lease Effective Date
N-86889	Sections 19-20 and 28-32	T24N, R36E	September 2009
N-88416	Sections 5-6	T23N, R36E	July 2010
N-89605	Sections 27 and 33	T24N, R36E	May 2011

1.2 PURPOSE AND NEED

1.2.1 Purpose

The purpose of the Proposed Action is to explore the geothermal energy production potential of federal lands managed by the BLM and leased by TGP. This EA has been prepared by the BLM in accordance with NEPA to assess the potential for environmental impacts resulting from installation and testing of exploration wells, which comprise the Proposed Action. This EA serves to support the BLM in determining whether the Proposed Action, with or without any modifications required by the BLM, would result in significant environmental impacts. Based on this determination, a Finding of No Significant Impact could be made. Alternatively, if significant impacts have the potential to occur, the BLM could determine that an environmental impact statement is required.

1.2.2 Need

In accordance with the BLM Programmatic Environmental Impact Statement (PEIS) for Geothermal Development (BLM 2008a) and the Churchill County Master Plan (2010), the expansion and development of geothermal resources is supported and promoted for federal lands in this region in support of the need "to ensure jobs for our future with secure, affordable, and reliable energy" as identified in the Energy Policy Act of 2005. Additionally, the need for the proposed action is to respond to Executive Order 13212, which directs the BLM to process geothermal leases in a timely manner in order to support efforts to increase energy production from federal minerals while preserving the health of public lands.

1.3 DECISION TO BE MADE

Applications for geothermal drilling upon public land submitted to BLM may be approved only after an environmental analysis is completed. BLM decision options include approving the Proposed Action as defined in the plan of operations as submitted by TGP; approving the Proposed Action with conditions of approval to mitigate environmental impacts; or denying the Proposed Action.

1.4 LAND USE PLAN CONFORMANCE STATEMENT

The Proposed Action and alternatives described below are in conformance with the Carson City District Office Consolidated Resources Management Plan (RMP) (BLM 2001),

1.5 RELATIONSHIP TO STATUTES, REGULATIONS AND OTHER PLANS

The proposed action is consistent with federal laws and regulations; other plans, programs and policies and state and local government to the extent practical within federal law, regulation and policy. Specific approvals and permits would be required for constructing, operating, and maintaining the proposed geothermal project.

The EA has been prepared in accordance with the following statutes and implementing regulations, policies, and procedures:

- NEPA of 1969, as amended (Public Law 91-190, 42 US Code [USC] 4321 [et seq.])
- 40 CFR 1500 (et seq.), Regulations for Implementing the Procedural Provisions of NEPA
- Considering Cumulative Effects under NEPA (CEQ 1997)
- 43 CFR Part 46, Implementation of NEPA of 1969; Final Rule, effective November 14, 2008
- Department of the Interior requirements (Departmental Manual 516, Environmental Quality [DOI 2008])
- BLM NEPA Handbook (H-1790 1), as updated (BLM 2008b)
- The Geothermal Steam Act of 1970 (30 USC 1001-1025)
- 43 CFR 3200, Geothermal Resources Leasing and Operations; Final Rule, May 2, 2007
- The 2005 Energy Policy Act; The National Energy Policy, Executive Order 13212, and BMPs as defined in *Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development, Fourth Edition* (Gold Book) (BLM 2007)

- The Geothermal Energy Research, Development, Demonstration Act of 1974
- Federal Land Policy and Management Act of 1976, as amended, Section 501 (43 USC 1961)
- The Federal Land Policy and Management Act of 1976 (PL 94 579, 43 USC 1761 [et seq.])
- Rights-of-Way under the Federal Land Policy and Management Act and the Mineral Leasing Act (43 CFR 2880), final Rule, April 22, 2005
- Churchill County Master Plan (2010 Update) (Churchill County Planning Department 2010)
- Carson City District NEPA Compliance Guidebook (Draft) (BLM 2008c)
- Mineral Material Disposals (43 CFR 3601)
- The Act of July 31, 1947, as amended (30 USC 601 [et seq.])
- The US Government is authorized to collect fees and to require reimbursement of its costs, as described in Section 304 of Federal Land Policy and Management Act [43 USC 1734] and the Independent Offices Appropriation Act of 1952 [31 USC 9701]
- Rights-of-Way, Principles and Procedures; Rights-of-Ways under the Federal Land Policy and Management Act and the Mineral Leasing Act; final Rule April 22, 2005. (43 CFR 2800)

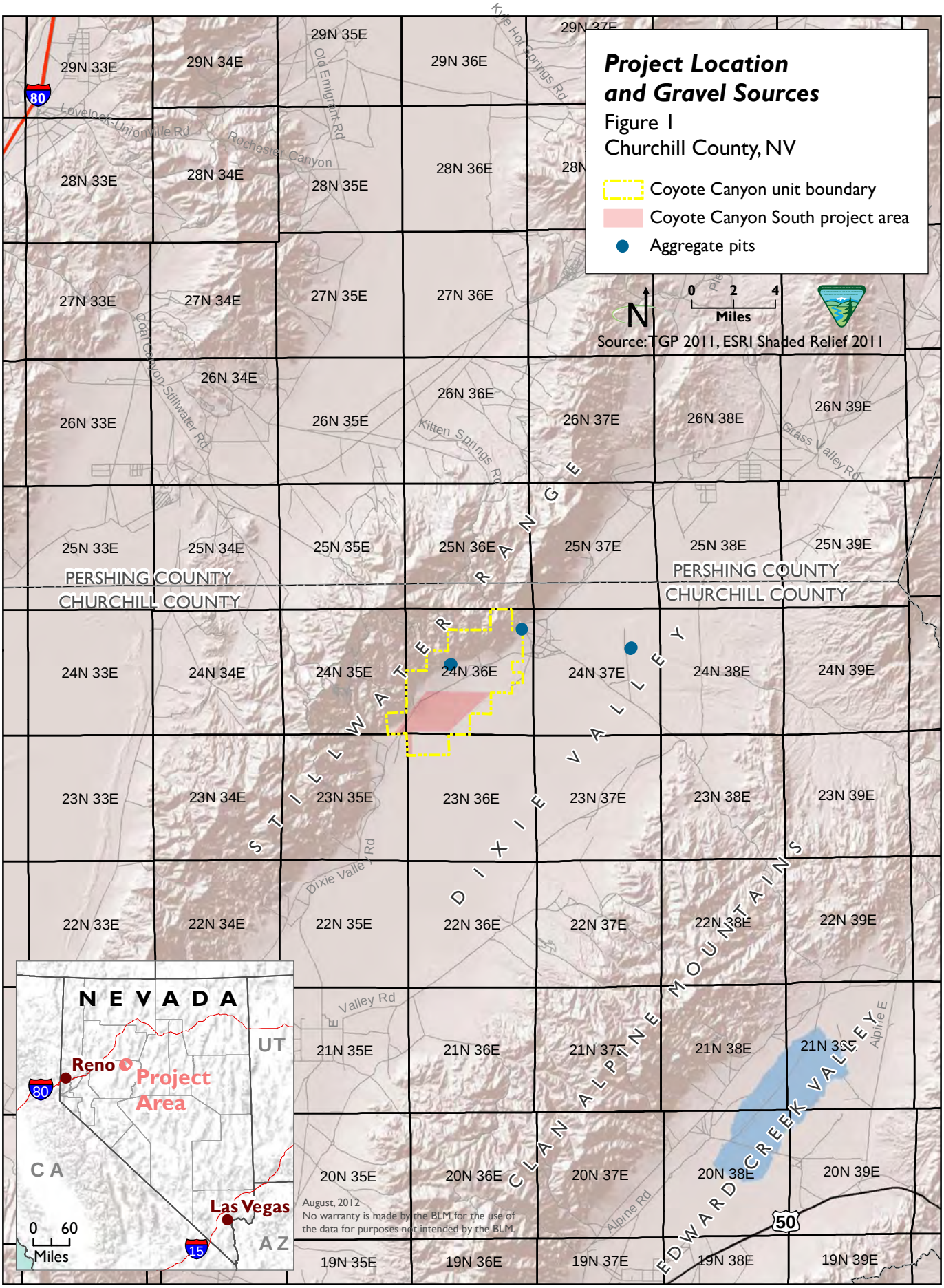
In 2008, the BLM completed the PEIS for Geothermal Resources Leasing in the Western United States (BLM 2008a). This PEIS was the foundation for a Record of Decision and RMP Amendments for Geothermal Resources Leasing in the Western United States, (BLM 2008d). This Record of Decision amended BLM RMPs, including the Carson City Consolidated RMP (2001), to identify public lands that are administratively and legally closed or open to leasing and to develop a comprehensive list of stipulations, BMPs, and procedures to serve as consistent guidance for future geothermal leasing and development. Special stipulations developed in the Record of Decision were applied to geothermal resource leases subsequently issued by BLM, including each of the three federal geothermal leases issued to TGP for Coyote Canyon in 2009, 2010, and 2011.

Copies of the stipulations for all three leases are attached to this EA as **Appendix A**, Geothermal Leases and Stipulations. TGP is required to comply with all lease stipulations.

The Proposed Action would be subject to other applicable state and local permits listed in **Table 2**, List of Federal and State Permits, prior to beginning construction.

Table 2: Potential Regulatory Permits and Approvals for the TGP Dixie Development Company, LLC Coyote Canyon South Geothermal Exploration Project

Regulatory Agency	Authorizing Action
BLM	Access Road Right-of-Way
BLM	Notice of Intent
BLM	Geothermal Drilling Permit
BLM	Contract for the Sale of Mineral Materials
Nevada Division of Minerals	Application for Permit to Drill an Oil and Gas and Geothermal Well
Nevada Department of Environmental Protection – Bureau of Water Pollution Control	Construction Stormwater Permit
Nevada Department of Environmental Protection – Bureau of Water Pollution Control	Discharge Permit
Department of Conservation and Natural Resources, Nevada Division of Water Resources	Temporary Consumptive Water Use permit
Nevada Department of Conservation and Natural Resources, Division of Environmental Protection, Bureau of Air Pollution Control	Surface Area Disturbance Permit
Churchill County	Right-of-way permit for temporary encroachment on County Route 121
BLM, Nevada Division of Historic Preservation and Archaeology	Section 106 compliance with the National Historic Preservation Act


Project Location and Gravel Sources
Figure 1
Churchill County, NV
Coyote Canyon unit boundary
Coyote Canyon South project area
Aggregate pits
N
0 2 4
Miles
Source: TGP 2011, ESRI Shaded Relief 2011
29N 33E
29N 34E
29N 35E
29N 36E
28N 33E
28N 34E
28N 35E
28N 36E
27N 33E
27N 34E
27N 35E
27N 36E
26N 33E
26N 34E
26N 35E
26N 36E
26N 37E
26N 38E
26N 39E
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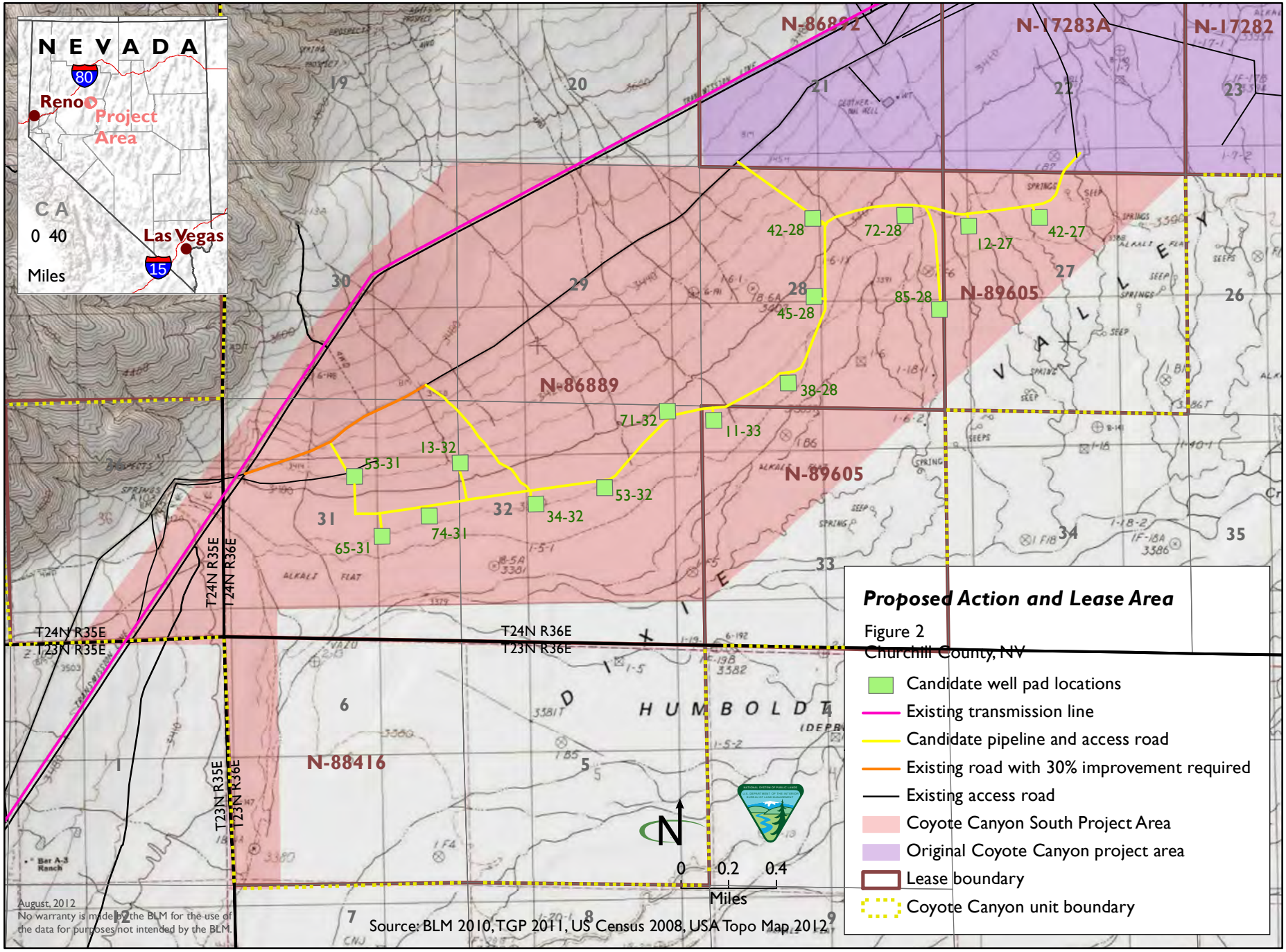
20N 35E
20N 36E
20N 37E
20N 38E
20N 39E
19N 35E
19N 36E
19N 37E
19N 38E
19N 39E
PERSHING COUNTY
CHURCHILL COUNTY
PERSHING COUNTY
CHURCHILL COUNTY
Kyle Hot Springs Rd
Old Emigrant Rd
Lovelock-Unionville Rd
Rochester Canyon
Coal Canyon-Stillwater Rd
Kitten Springs Rd
Grass Valley Rd
Dixie Valley Rd
Valley Rd
Alpine E
Alpine Rd
80
50
15
STILLWATER RANGE
DIXIE VALLEY
CLAN ALPINE MOUNTAINS
EDWARDS CREEK VALLEY
NEVADA
UT
CA
AZ
Reno
Project Area
Las Vegas
0 60
Miles
August, 2012
No warranty is made by the BLM for the use of the data for purposes not intended by the BLM.


NEVADA
80
Reno
Project Area
CA
0 40
Miles
Las Vegas
15
N-86892
N-17283A
N-17282
N-89605
N-86889
N-89605
N-88416
42-28
72-28
12-27
42-27
45-28
85-28
38-28
71-32
11-33
13-32
53-31
53-32
34-32
74-31
65-31
T24N R35E
T23N R35E
T24N R36E
T23N R36E
HUMBOLDT
Bar A-3 Ranch
N
0 0.2 0.4
Miles
August, 2012
No warranty is made by the BLM for the use of the data for purposes not intended by the BLM.
Source: BLM 2010,TGP 2011, US Census 2008, USA Topo Map 2012
Proposed Action and Lease Area
Figure 2
Churchill County, NV
Candidate well pad locations
Existing transmission line
Candidate pipeline and access road
Existing road with 30% improvement required
Existing access road
Coyote Canyon South Project Area
Original Coyote Canyon project area
Lease boundary
Coyote Canyon unit boundary

2.0 PROPOSED ACTIONS AND ALTERNATIVES

This chapter presents the Proposed Action and the No Action Alternative.

2.1 PROPOSED ACTION

TGP proposes to construct up to 15 wells pads and may drill up to three wells per pad for geothermal resource exploration. TGP would drill either small diameter explorations wells (slim wells) or full-size exploration wells (exploration wells). The primary objective of the project is to further evaluate the characteristics of the geothermal resources in the Project Area. The proposed action consists of:

- Constructing new access roads;
- Upgrading existing access roads;
- Constructing up to 15 well pads;
- Drilling and completing slim wells or exploration wells;
- Flow testing exploration wells to determine commercial potential;
- Constructing a temporary personnel camp; and
- Extracting gravel from three gravel pits.

2.1.1 Overview and Location of Proposed Action

The project site is located in Dixie Valley, Churchill County, Nevada and is shown in Figure 1, Project Location and Gravel Sources.

The Proposed Action includes drilling up to 15 slim wells or exploration wells in the Project Area. Slim wells would be to depths of 6,000 feet with a maximum diameter of 14 inches, and exploration wells would be to depths of up to 10,000 feet with a maximum diameter of approximately 30 inches. Multiple wells could be drilled within the footprint of one well pad which would reduce the total number of well pads needed and reduce the area needed to be disturbed. Potential well pad locations and access roads have been placed based on geological information gathered at the sites and with a goal of minimizing environmental impacts. Each drill site would explore a specific geological target. Drill sites were proposed to avoid or minimize environmental issues or constraints identified through the environmental assessment process described in this report.

The wells would be used to provide lithologic and stratigraphic information and to measure the temperature and geochemistry of subsurface fluids at various depths in the wells. Well flow tests would be conducted on selected exploration wells to confirm resource production and generating capabilities and to identify eventual production and injection well top and bottom hole locations.

Following well installation, temperature gradients would be measured and performance testing would be completed in the slim wells and exploration wells. TGP would determine resource production and generating capabilities from the data collected. Drilling operations would be conducted in accordance with BLM and Nevada Division of Minerals regulations and permit requirements. If well conditions warrant changes to the design for completion of a well, any

required approval from the responsible regulatory agency would be sought prior to making the changes.

The Lease Area consists of approximately 7,588 acres in Churchill County, Nevada (see Figure 1, Project Location and Gravel Sources). TGP proposes to conduct geothermal exploration in a portion of the Lease Area called the Project Area. The main Project Area consists of 3,530 acres. Figure 2, Proposed Action and lease Area, shows the Lease Area, the Project Area, and potential site layout.

TGP is proposing exploration activities at up to 15 potential well locations. Specific well locations, potentially including up to three wells at a single drill pad, would be determined during field activities based on observations during drilling. In addition to drilling and testing geothermal exploration wells, the Proposed Action involves the construction of access roads and drilling pads. Supporting facilities would also be constructed to support well drilling and testing. Well installation and road construction would disturb approximately 68 acres. These facilities are described in Sections 2.1.3, Site Access and Road Improvements, and 2.1.5, Site Preparation Activities.

The legal description of the proposed exploration well pad locations at CCS and the corresponding Kettleman well numbers is provided in **Table 3**, Exploration Well Pad Locations.

Table 3: Exploration Well Pad Locations

Lease Number	UTM X	UTM Y	Township Range	Section	Modified Kettleman
N-89605	421404	4419734	T24N R36E	27	42-27
N-89605	420927	4419684	T24N R36E	27	12-27
N-86889	419879	4419755	T24N R36E	28	42-28
N-86889	420499	4419762	T24N R36E	28	72-28
N-86889	419879	4419227	T24N R36E	28	45-28
N-86889	420720	4419128	T24N R36E	28	85-28
N-86889	419694	4418650	T24N R36E	28	38-28
N-89605	419188	4418408	T24N R36E	33	11-33
N-86889	418879	4418474	T24N R36E	32	71-32
N-86889	418446	4417967	T24N R36E	32	53-32
N-86889	417477	4418151	T24N R36E	32	13-32
N-86889	417982	4417864	T24N R36E	32	34-32
N-86889	417263	4417797	T24N R36E	31	74-31
N-86889	416942	4417666	T24N R36E	31	65-31
N-86889	416764	4418073	T24N R36E	31	53-31

2.1.2 Schedule of Exploration Activities

The applicant proposes to start exploration drilling activities as soon as possible following BLM approval and Nevada Division of Minerals permit issuance. The exploration drilling activities would be completed within 2 years of permit issuance. Reclamation activities would be

conducted as described in Section 2.1.9, Plans for Surface Reclamation, over an approximately 3-year period following completion of drilling and testing.

2.1.3 Site Access and Road Improvements

Existing access roads would be used to the extent possible, and upgraded as necessary to support construction and operational vehicle traffic. The primary access to the leased areas would be via US Route 50. From Route 50, Highway 121 leads to the leased areas. Access roads, where not already in existence, would be provided to interconnect the different lease parcels. Each well pad site would be built directly adjacent to the access road, eliminating the need for any branch access roads. New access roads would be constructed as part of each Proposed Action according to the following specifications:

- Roads would be 35 feet wide, including travel way, shoulders, and drainage ditches. Roadways would have a travel way of up to 25 feet with 2-foot shoulders and 3-foot drainage ditches on either side. In areas where roads need to be built up with several feet of aggregate and would have fill slopes of 2 to 1, the travel-way width would be reduced down to a minimum of 15 feet to free up space to accommodate the slopes. Road designs, including road cross-section and crowns, rolling dips, culvert designs and placement, and road plans and profiles would be executed in keeping with Gold Book standards.
- Aggregate would be applied to the maximum 25-foot wide travel way and shoulders with an average of two feet of aggregate base course. To include a generous buffer in aggregate calculations, a 35-foot wide roadway was used. The proposed access roads would require approximately 81,000 cubic yards of gravel.
- Well pads would be used as turnouts since most of the proposed well pads are located directly adjacent to the road.
- When permanent new access roads must cross ephemeral washes, rolling dips would be installed. The rolling dips would be designed to accommodate flows from at least a 25-year storm event. Culverts may be used wherever rolling dips are not feasible.
- Where rolling dips are not feasible, culverts would be installed along new access roads in areas of low spots or existing ditches as needed. The culverts would be designed to accommodate flows from at least a 25-year storm event. Exact locations of culverts are yet to be determined, but would be provided to the BLM once the final design is complete.
- Cut-and-fill requirements would be minimal and balanced where possible. The roads would be graded to follow existing topography in order to minimize cut and fill requirements.
- Cross-country access roads are not anticipated as part of the Proposed Action.

Up to 5.9 miles of access roads would be constructed for a total disturbance of up to 25 acres as shown in **Table 4**, Summary of Disturbed Acreage. Well pads are described in Section 2.1.8, Well Pad and Drilling Operations, and **Figure 3**, Typical Well Pad Layout.

Table 4: Summary of Disturbed Acreage

Disturbance Type	Length of Access Roads	Dimensions of Disturbed Areas[1]	Acres Disturbed
Observation Well Footprint (Total of 15 wells)[1]	NA	350 feet by 350 feet (2.8 acres each)	42.0
Water Well for Monitoring and/or Potential Plant Use	NA	150 feet by 150 feet	0.5
Access Roads and Temporary Pipelines	5.9 miles	5.9 miles by 35 feet	25.0
Gravel Pit Expansion	NA	Up to 15 acres per site	45.00
		Total Disturbed Acreage:	112.5

[1] The well pad dimensions include space for storage of drilling equipment, drilling vehicles, and storage of topsoil and spoil material. Laydown areas that would be required for drilling operations would be located on each of the well pads as indicated on Figure 3.

2.1.4 Land Ownership and Rights-of-Way

The exploration wells and access roads would be located wholly on land administered by the BLM and leased for exploration activities to TGP. Because Highway 121 passes through the Lease Area, no new access roads outside the Lease Area would be needed.

2.1.5 Site Preparation Activities

Site preparation activities would include setup of a temporary worker camp and transport and staging of equipment required for exploratory drilling. Staging areas would be established at the temporary worker camp and at the initial well pad locations. In addition, measures would be set up to ensure proper management of hazardous materials and wastes that would be used and generated during implementation of the Proposed Action.

2.1.5.1 Temporary Worker Camp

During drilling operations a temporary worker camp would be set up at existing inactive well pad 36-14 within the Coyote Canyon lease area to the north to provide accommodations for drill crews and subcontractors. Access to the camp would be by roads already developed for access to that inactive well pad. No additional area would be disturbed for use of the camp.

The camp would comprise self-contained trailers used for offices and prefabricated modules (estimated size up to 12 by 60 feet) for lodging. The camp would typically comprise one to two sleeping modules with a centralized kitchen, dining, and recreational area. The camp components would be transported to the site by trailer along the existing access road and proposed access roads. Up to two portable water tanks would supply water for sanitary use, and drinking water would be bottled water. Sanitary storage tanks would be provided as part of the modules and would be periodically serviced by a commercial entity. Electricity would be provided by up to two portable generators.

Communication among field operations, TGP offices, BLM, and Nevada Division of Minerals offices would be maintained using radio and satellite telephones. Support facilities and equipment would be located on the personnel camp pad.

2.1.5.2 Equipment

Each drill site would be prepared to create a level pad for the drill rig and a graded surface for the support equipment. Support equipment used during exploratory drilling activities includes:

- Standby and start-up diesel generator;
- Air compressors;
- Geothermal rotary drilling rigs;
- Personnel vehicles (pick-up trucks); and
- Construction equipment, including dump trucks, road graders, and bulldozers.

2.1.5.3 Staging Areas

Equipment and supplies required for implementation of the Proposed Action would be staged either at the temporary worker camp, at the active well pad, or at an inactive well pad location. No additional areas would be disturbed beyond those shown in Table 4. In particular, no more than 15 well pad locations would be disturbed either by construction of well pads or by temporary use as staging areas.

2.1.5.4 Waste and Hazardous Materials Management

Secondary containment structures would be provided for all chemical and petroleum/oil storage areas during drilling operations. Additionally, absorbent pads or sheets would be placed under likely spill sources and spill kits would be maintained onsite during construction and drilling activities to provide prompt response to accidental leaks or spills of chemicals and petroleum products.

Small quantities of solid wastes (paper, plastic, and other garbage) generated by the Proposed Action would be transported offsite to an appropriate landfill facility. Portable chemical toilet wastes would be removed by a local contractor.

A project hazardous material spill and disposal contingency plan would describe the methods for cleanup and abatement of any petroleum hydrocarbon or other hazardous material spill. The hazardous material spill and disposal contingency plan would be submitted to and approved by the BLM and made readily available onsite before operations begin.

Handling, storage, and disposal of hazardous materials, hazardous wastes, and solid wastes would be conducted in conformance with federal and state regulations to prevent soil, groundwater, or surface water contamination and associated adverse effects on the environment or worker health and safety.

2.1.6 Aggregate Supply for Road and Pad Construction

It is anticipated that total aggregate needs for the project site would be less than 150,000 cubic yards with total new surface disturbance of up to 45 acres across 3 sites. **Table 5**, Summary of Aggregate Requirements, summarizes the maximum potential aggregate needs of access roads and well pads.

Table 5: Summary of Aggregate Requirements

	Length	Width (feet)	Depth (inches)	Total Aggregate (cubic yards)
Access Roads (includes branch roads)	5.9 miles	35	24	80,764.4
Access Roads with 30% Improvement	0.8 mile (30% = 0.24 mile)	35	6	821.3
Observation Well Pads Centerline (15)	110 feet	350	36	64,166.7
Well Footprint (15)	40 feet	40	48	3,555.6
Total Aggregate Required:				**149,308**

The majority of aggregate material for the road and well pad surfaces would be obtained under existing and three proposed mineral material contracts from three BLM gravel sites. Expansion of these gravel sites is proposed as part of this project. These gravel sites were selected due to the quality of gravel at each site as well as the proximity to the Project Area. An overview of the location of these pits is provided in Figure 1, Project Location and Gravel Sources. Maps focusing on each of the three and are provided in **Figures 4**, **5** and **6**. The existing gravel contract is located within the Dixie Valley Community Pit in SW1/4 Sect. 16, T24N, R36E. The three areas identified for gravel extraction as part of this project are:

1. Expansion of Cottonwood Canyon gravel pit in SW/4 SE/4 Sec. 1, T24N, R36E (see Figure 4); and
2. Expansion of the Dixie Valley Community Pit in SW1/4 Sect. 16, T24N, R36E (see Figure 5);
3. Development of an unnamed gravel pit area in SW SE S. 11, T24N, R37E (see Figure 6). TGP would avoid the SW SW SE of Sec. 11 where TGP has a gravel contract, or as guided by BLM.

TGP would apply for gravel contracts at any of the three identified gravel pit locations to meet the gravel needs for the project. If better quality aggregate is needed to augment the gravel sourced from local BLM pits, TGP may acquire additional gravel from private sources not in the vicinity of the Project Area. All three gravel pits would be accessed via existing roads.

Sand and gravel would be loosened from the pits using bulldozers to push down the highwall slopes into the developing pit bottom where loaders would fill haul trucks or load the material directly onto an in-pit conveyor system. No blasting would be required for mining of the deposit. Slopes would be re-contoured as needed to minimize collapse. Loaded material would be transported to an “in-pit” crushing/screening facility. If possible, this facility would be located below grade after the pit is established to reduce local noise levels and aesthetic impacts to the

surrounding area. Water sprays would be used during all phases of material handling to reduce fugitive dust. Water trucks from the existing Dixie Valley plant would be used for dust abatement. The water would come from domestic water wells or cooling tower blowdown. The amount of water would minimal since it would only be needed for dust abatement.

The mineral material would be crushed, sorted, washed and stockpiled.

Front end loaders or backhoes may be used to load stockpiled product into dump trucks, which would haul the materials off the property and to the Project Area by way of existing access roads.

The community gravel pit would be used on a first come first use basis to minimize congestion within the pit area by different users. Slopes would be re-contoured as needed to minimize collapse. Regular reports of use would be submitted according to permit terms.

Construction at the gravel sources would occur incrementally as the gravel demands of the project dictate. During construction, vegetation would be removed and topsoil would be salvaged where possible and stockpiled for use during reclamation. Excavation of the gravel source area would reach depths no greater than 10 feet below ground surface. A safety fence would be installed along the perimeter of the gravel source area once excavation reached depths greater than or equal to 3 feet below ground surface. TGP would not locate any geothermal or water wells in the gravel source area.

Reclamation of the aggregate pit will consist of leveling any stockpile material, reducing the slopes in the pit to 3:1, removing all trash and debris, and re-seeding if necessary. If BLM determines there is a future need for the aggregate pit, revegetation of the pit surface will not be necessary.

2.1.7 Water Supply for Grading, Drilling and Dust Abatement

Water would be required for drilling operations as well as for construction and compaction of roads, pads, sumps, and dust control. Up to 20,000 gallons per day could be required for each observation well throughout the eight-week period during which it would be drilled. One or more portable water tanks holding a combined total of at least 10,000 gallons, but not more than 60,000 gallons, would be maintained on the well sites during drilling activities. Bottled drinking water would be provided for construction and drilling personnel. TGP would obtain drilling water from its nearby, existing Dixie Valley power plant, or from new wells under a Nevada Division of Water Resources temporary waiver. Piping currently extends from the power plant to existing well 76-14. TGP would install additional, aboveground, approximately 8-inch diameter black piping along the proposed access roads from this polyline to well sites or truck water from the water line termination point. Various factors such as topography and distance would help determine water line locations, with an emphasis on minimizing surface disturbance.

TGP may also install groundwater observation wells in the Project Area to determine the availability of water and the quality of available water for future activities such as groundwater monitoring, plant domestic or potential injection augmentation. One or more of these water wells may be used under a temporary water permit for well drilling from the Division of Water Resources. The groundwater aquifer is expected to be at a depth of approximately 500 feet below ground surface. TGP would locate each exploratory water well within the survey area. It is

estimated that a pad measuring 150 feet by 150 feet (0.52 acre) would be required to support drilling for each water well. In addition, a sump for drill cuttings and pump test water may be required. The sump would measure approximately 50 feet long by 15 feet wide by 10 feet deep. Alternately, portable tanks may be used for well drilling, which would help minimize pad size and resulting surface disturbance by removing the need for a sump. BLM and NDEP approval would be required for the temporary surface discharge from flow testing of the groundwater wells. The exact location of each water well has yet to be determined but would be located in the surveyed areas adjacent to existing access roads. The sump would be maintained subsequent to drilling for the storage of water. Water from each well would either be trucked to the well pad sites or would be piped using aboveground, approximately 8-inch diameter black piping that would be installed along the proposed access roads. No new roads would need to be constructed in order to install the water well. Use of the water well would also enable better quality sampling and chemical analysis for monitoring purposes.

As explained in Section 2.1.6, dust abatement during gravel extraction from the gravel pits would use water trucks from the existing Dixie Valley plant. The water would come from domestic water wells or cooling tower blowdown. The amount of water would minimal since it would only be needed for dust abatement and for the duration of time that gravel extraction would occur.

2.1.8 Well Pad and Drilling Operations

This section describes construction of well pads, which would be constructed at each location where slim wells or exploration wells would be drilled, along with a summary of the drilling process.

2.1.8.1 Well Pad Layout and Design

Figure 3 shows a typical well pad layout for slim wells and exploration wells. Each well pad would be 350 feet by 350 feet. The well pad would accommodate the drilling rig, sump, and support equipment and vehicles necessary during drilling. The orientation of the individual well pads would be determined by engineers in the field before construction. The proposed well pad locations are located in the relatively flat Dixie Valley with topography that gently slopes northwest toward the Stillwater Range within the Lease Area (see Figure 2, Proposed Project and Lease Area). Because of the existing topography, there would be no need to construct well pads on steep slopes or narrow ridges.

Any fill slopes that may be constructed as a part of well pad grading would be 2 horizontal to 1 vertical or greater, as necessary, and would be compacted and maintained to minimize erosion and provide slope stability. The natural washes within the Lease Area are ephemeral, with intermittent flows only from substantial rainfall or snowmelt events. The well pads would be constructed to avoid the ephemeral washes to the extent practicable. The well pads would be graded so that cut-and-fill requirements would be balanced and no offsite fill material would be needed. Per the Riparian Areas Stipulation on leases N-88416 and N-89605, no surface occupancy or disturbance is allowed within 650 feet (horizontal measurement) of the mapped waters and 100-year floodplains within the Lease Area.

A fenced sump would be excavated on each well pad for the storage of drilling muds and fluids, flow test fluids, and drill cuttings in accordance with the applicable best management practices (BMPs) identified in the *Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development Activities* (Gold Book) (BLM 2007). TGP would comply with both federal and Nevada Department of Environmental Protection (NDEP) requirements for sump grading. Each sump would have up to one million gallons of capacity, and the interior would measure approximately 320 feet long, 125 feet wide, and 3.34 feet deep below grade with another 2 feet of freeboard. Actual depth of excavation for each sump would depend on the depth necessary to stay above the standing water level. Sumps would be compacted during construction, and settled bentonite clay from drilling mud would accumulate on the bottom of the sump to act as an unconsolidated clay liner which would then serve to minimize percolation. A berm would be constructed around the outer edges of the sump and would measure approximately 4 feet wide by 2 feet tall. Material from sump excavation would be used in the construction of the berm. After the well pad has been graded and spoils from the well pad sump excavation have been laid down for leveling, an average of three feet of gravel would be placed over the areas where the drilling work would be conducted, an area that measures approximately 110 feet by 350 feet. Topsoil from the excavated sump would be conserved by spreading it around the well pad laydown area surface soil. Use of the sumps would be conducted under a permit from NDEP. The well footprint (estimated at approximately 40 feet by 40 feet) would require additional stabilizing for heavier equipment and would have an additional two feet of compacted aggregate for a total average of five feet of compacted aggregate. A typical well pad layout and design is provided in **Figure 3**, Typical Well Pad Layout.

The volume of gravel necessary for all 15 proposed well pads would be approximately 64,200 cubic yards, assuming all are constructed to the maximum proposed size of 2.8 acres. This estimate includes an extra one foot of gravel for the 40-foot by 40-foot well footprint.

Stormwater runoff from undisturbed areas around the constructed drill pads would be directed into ditches surrounding the well pad and back onto undisturbed ground. The ditches would be constructed consistent with BMPs for storm water and erosion control.

Upon completion of the drilling operations, clean-out and flow tests would be performed on the wells. Flow testing would typically run for an average of three days (24 hours per day) for each well, but the duration may vary depending on well characteristics. During these tests the flow would be routed to the sumps. It is anticipated that the initial flow rates of fluid from each well into its sump would be approximately 500 to 1,500 gallons per minute on average depending on the productivity of the well.

During flow testing, additional sump capacity may be required depending on well production rates. To provide this additional sump capacity, TGP would use existing sumps at their Dixie Valley power plant located approximately 2.5 miles north of the CCS site along Dixie Valley Road. Excess fluids from flow testing each well would be either trucked or piped using temporary piping laid on the surface to existing well sumps at the Coyote Canyon project.

Well Pad Disturbed Areas

The Proposed Action includes development of up to 15 slim or exploration wells in each project area. Figure 2, Proposed Project and Lease Area, shows potential locations for the wells. Revisions to the specific proposed well locations within the project area could occur as new information becomes available from initial drilling and testing results. Disturbance calculations for each well pad shown in Table 4 includes staging and laydown requirements for equipment, supplies, and stockpiled soil and aggregate required for well drilling and access road construction. No additional disturbance would occur for staging and storage requirements.

Construction of each of the well pads would disturb up to 2.8 acres, for a total of up to 42.0 acres of disturbance for the 15 wells at Coyote Canyon. Table 4 presents the acreage of disturbance associated with exploration well pads, including staging areas.

2.1.8.2 Drilling Operations

A detailed geothermal drilling program would be submitted to the BLM for review and approval prior to beginning operations. This section summarizes drilling activities for slim wells and exploration wells for purposes of evaluating potential environmental consequences. If necessary, the BLM may include additional provisions or conditions needed to address environmental concerns or other site-specific issues within the geothermal drilling permit.

Each well would be drilled using a large diesel auger drilling rig with a power rating ranging from 1,000 to 3,000 horsepower. During drilling, the top of the drill rig derrick would be up to 160 feet above ground surface depending on the rig used. The typical drill rig and associated support equipment (for example, rig floor and stands; draw works; mast; drill pipe, trailers; mud, fuel, and water tanks; diesel generators; air compressors) would be brought to the prepared pad on large tractor-trailer trucks. An average of six to eight small trucks, service vehicles, and worker's vehicles could be driven to the active well site each day throughout the typical 8-week drilling process. Difficulties encountered during the drilling process, including the need to work over or to re-drill the well, could double the time necessary to successfully complete a full-size observation well. Drilling would be conducted 24 hours per day, 7 days per week by a crew of up to 12 workers per well. Typically, one drill rig would be on site at a time but TGP may elect to drill up to three wells at once, bringing the total crew to as many as 36.

Crews would include the drilling supervisor, geologists, suppliers, and operators. If well conditions warrant changes to the design for completion of a well, required approvals from the responsible regulatory agency would be sought before making the changes.

Well stimulation operations could involve placing a dilute mixture of hydrochloric (muriatic) acid down the well. The amount of dilute acid placed in the well bore (which can vary from 10,000 gallons to 50,000 gallons or more) is determined by calculating the amount of each type of mineral to be dissolved. Concentrated hydrochloric acid (35 percent) would be trucked to the site and mixed onsite with water by experienced contractors. The dilute acid mixture would be placed in the cased well bore, followed by water to push the mixture into the geothermal reservoir. After dissolving the minerals in the geothermal reservoir, the water and now-spent acids would be flowed back through the well to the surface where they would be tested,

neutralized if necessary (using sodium hydroxide or crushed limestone or marble), and discharged to the sump.

Standard aquifer testing procedures would be employed at targeted depth intervals as the boreholes for exploration wells are advanced. The vertical boundaries of the aquifers, the depth of aquifers (non-thermal and thermal) penetrated during drilling, would be noted from the drilling log. The horizontal boundaries would be noted if any are reflected on time-drawdown plots produced during aquifer testing. Borehole geophysics analysis would be conducted from the ground surface to the total depth of the borehole. Aquifer testing would be used to determine drawdown associated with pumping. If possible, an assessment of whether the aquifer is confined or unconfined would be made, as well as an estimate of aquifer thickness and a qualitative assessment of its relative productivity. The temperature of penetrated aquifers would be noted.

Selected wells, identified in the Hydrologic Monitoring Plan prepared for the Coyote Canyon project and determined in consultation with BLM, would be monitored for water table level and water quality prior to and during the Proposed Action.

Secondary containment structures would be provided for all chemical and petroleum/oil storage areas during drilling operations. Additionally, absorbent pads or sheets would be placed under likely spill sources and spill kits would be maintained onsite during construction and drilling activities to provide prompt response to accidental leaks or spills of chemicals and petroleum products.

TGP may decide to conduct directional drilling at each site based on the location and extent of geothermal resources in proximity to the well site. Directional drilling would likely result in a deep bottom hole located under BLM lease areas. TGP Geothermal Drilling Permit applications would be submitted to the BLM for the drilling of these wells, pursuant to 43 CFR 3260.11

2.1.9 Plans for Surface Reclamation

If exploration activities confirm the expected commercial viability of the resource, TGP plans to build and operate a geothermal power plant to generate and sell renewable energy. In that case, TGP would submit an application for regulatory approvals to place the wells, associated access roads, and other components required to operate the facility into commercial service. The wells would be monitored and exploration activities would continue in accordance with these plans while the application is processed. Interim reclamation activities would be implemented as described below. TGP would reassess the usefulness of wells annually, and if TGP were to judge certain observation wells to be unsuitable for commercial use or monitoring, they would be plugged and abandoned in conformance with the procedures for final reclamation outlined below.

Interim and final reclamation activities proposed in this section are consistent with BLM and Nevada Division of Minerals requirements, including BLM Gold Book recommendations. A final drill site/access road reclamation plan may be developed depending upon final well locations and as required by BLM (BLM 2007). The following information is provided for purposes of evaluating potential environmental impacts from the Proposed Action.

Reclamation could also be required for the aggregate source areas and would be described and conducted in accordance with a separate plan as part of permits and sale agreements issued for that purpose.

BLM will include any additional provisions and conditions needed to address environmental concerns or other site-specific issues with the geothermal drilling permits.

2.1.9.1 Interim Reclamation

During the life of the project, all disturbed areas not needed for active support of operations would undergo interim reclamation. During the construction process, topsoil would be salvaged where possible and stockpiled for use during reclamation. Following completion of well testing, drilling and testing equipment would be removed from the site. With the exception of an area required to access maintained wellheads, cut and fill slopes would be recontoured to a final or intermediate contour that blends with the surrounding topography and erosion control BMPs would be implemented. Topsoil would be respread over areas not needed for operations and revegetated, if requested by the BLM, to within a few feet of the area required to access and maintain the wellhead.

Surface facilities selected to remain on site for future production or injection wells would consist of a wellhead and potential monitoring equipment. Following completion of testing activities, the well would be fenced, chained, and locked. Wells could be shut-in with a mineral oil cap as applicable. Pressure and temperature sensors could be installed in the well at fixed depths to monitor any changes in these parameters over time. The well pads and access roads would be left in place and subject to regular inspection and maintenance by TGP personnel, until such time BLM, with input from TGP, directs TGP to reclaim these areas. Portions of the access roads not needed for future vehicle travel may be reclaimed as part of interim reclamation processes. If the well pad is deemed by TGP to be unnecessary or the geothermal lease is released back to the BLM, whichever occurs first, then final reclamation activities would be conducted as described below.

The temporary groundwater well would either be abandoned following completion of exploration activities, in accordance with Nevada regulations, or could be converted to permanent use for the facility. If the well is suitable for long-term use, TGP would obtain the necessary permits from the Nevada State Engineer prior to such use.

2.1.9.2 Final Reclamation

Final reclamation would consist of two steps: well reclamation and road reclamation.

Road Reclamation. Following completion of project activities, access roads would be reclaimed by recontouring, reseeding, and controlling noxious weeds, unless the BLM requests that the roads remain intact. Project-related equipment and machinery would be decommissioned and, where possible, reused or sold as salvage. Equipment with no resale value would be sold or given as scrap.

TGP would restore the area to the original landform or, if restoration of the original landform is not feasible, recontour to blend in with the surrounding landform. Disturbed areas would be

reseeded with a mix specified by the BLM at the time of reclamation, and erosion-control measures and measures to control invasive non-native plants and noxious weeds would be implemented in accordance with appropriate BLM guidelines. Other techniques to improve reclamation success could be implemented at the BLM's direction.

TGP would maintain healthy, biologically active topsoil and minimize habitat, visual, and forage loss during the life of the wells by stockpiling and spreading any extra salvageable topsoil over the area of interim reclamation whenever possible.

Well Site Reclamation. After well operations have ceased and prior to the geothermal lease being released back to the BLM, TGP would reclaim the Project Area by capping and sealing off the wells below ground level in compliance with BLM and Nevada Division of Minerals regulations. Reclamation would be complete to standards considered acceptable to the BLM Authorized Officer. Large areas of gravel fill may need to be removed. Where cut and fill had occurred as part of the project, the area would be recontoured to blend with the surrounding topography. TGP would resurface well pads with stockpiled topsoil where available and reseed with a mix specified by the BLM and free of noxious weeds at the time of reclamation. Any culverts that may have been installed would be removed. Project-related equipment and machinery would be decommissioned and, where possible, reused or sold as salvage. Equipment with no resale value would be sold or given as scrap.

TGP would restore the area to the original landform or, if restoration of the original landform is not feasible, recontour to blend in with the surrounding landform during reclamation activities. If available, topsoil would be respread evenly over the surfaces of the disturbed areas and be reseeded with a mix specified by the BLM at the time of reclamation, and erosion-control measures and measures to control invasive non-native plants and noxious weeds would be implemented in accordance with appropriate BLM guidelines. Where areas have been surfaced with gravel, the gravel would be buried deep in the recontoured cut to prevent possible surface exposure and sumps would be backfilled after they are dry and free of waste and graded to conform to the surrounding terrain.

2.1.10 Standard Operating Procedures, Best Management Practices, and Proposed Mitigation

TGP would comply with the special lease stipulations attached to federal geothermal leases (see Appendix A).

Standard operating procedures and BMPs would reduce the effects on the human and natural environment. In addition to procedures identified in The State of Nevada State Conservation Commission's Best Management Practices Handbook (1994) and the conditions of approval identified in the Coyote Canyon and Dixie Meadows Geothermal Exploration Environmental Assessment (BLM 2010), Finding of No Significant Impact and Decision Record, 2010, the following mitigation measures would be followed to reduce any impacts:

- TGP would comply with any requirements prescribed by the Nevada Division of Environmental Protection-Bureau of Air Pollution Control.

- Dust abatement techniques, such as watering on unpaved, unvegetated surfaces, would be used during construction to minimize airborne dust.
- Speed limits would be posted and enforced during construction and operation to reduce fugitive dust (speed limit of 25 miles per hour within the project site, as necessary).
- Equipment and vehicle idling times during construction activities would be minimized.
- The Proposed Action would be designed to avoid sites determined eligible for listing on the National Register of Historic Places.
- A 30-meter buffer would be placed around identified historic properties to avoid adverse effects.
- Wells would be grouted and cased so that flood water could not penetrate if well pads are inundated. Construction equipment would be cleaned prior to project work (may be washed in Fallon prior to deployment)
- Existing weed infestations would be treated prior to disturbance. The location of the weeds would be communicated to the Stillwater Field Office weed coordinator, and treatment methods and herbicides used would be discussed prior to treatment.
- Herbicides would be applied per label instructions.
- All personnel applying herbicides would either be certified by the BLM and/or the State of Nevada, or they would be supervised by a BLM or State of Nevada Certified Applicator.
- Bureau or other personnel applying herbicides would use personal protective equipment while spraying or handling herbicides
- Herbicide application operations would be suspended when wind speed exceeds 6 miles per hour or when precipitation is imminent.
- Some treatment areas could be signed, if needed, indicating the herbicide used and the date of treatment. Areas that are isolated and/or receive very little use by human beings would not be signed.
- During herbicide treatments, a pre-application sweep of the area would be completed (i.e. looking for nesting birds).
- Prior to construction, TGP will submit to BLM an invasive plant management plan to monitor and control noxious weeds. At a minimum, the plan would incorporate the following measures:

    - Existing weed infestations would be treated prior to disturbance. The location of the weeds would be communicated to the Stillwater Field Office weed coordinator, and treatment methods and herbicides used would be discussed prior to treatment."

    - Herbicides would be applied per label instructions.

    - BLM or other personnel applying herbicides would use personal protective equipment while spraying or handling herbicides.

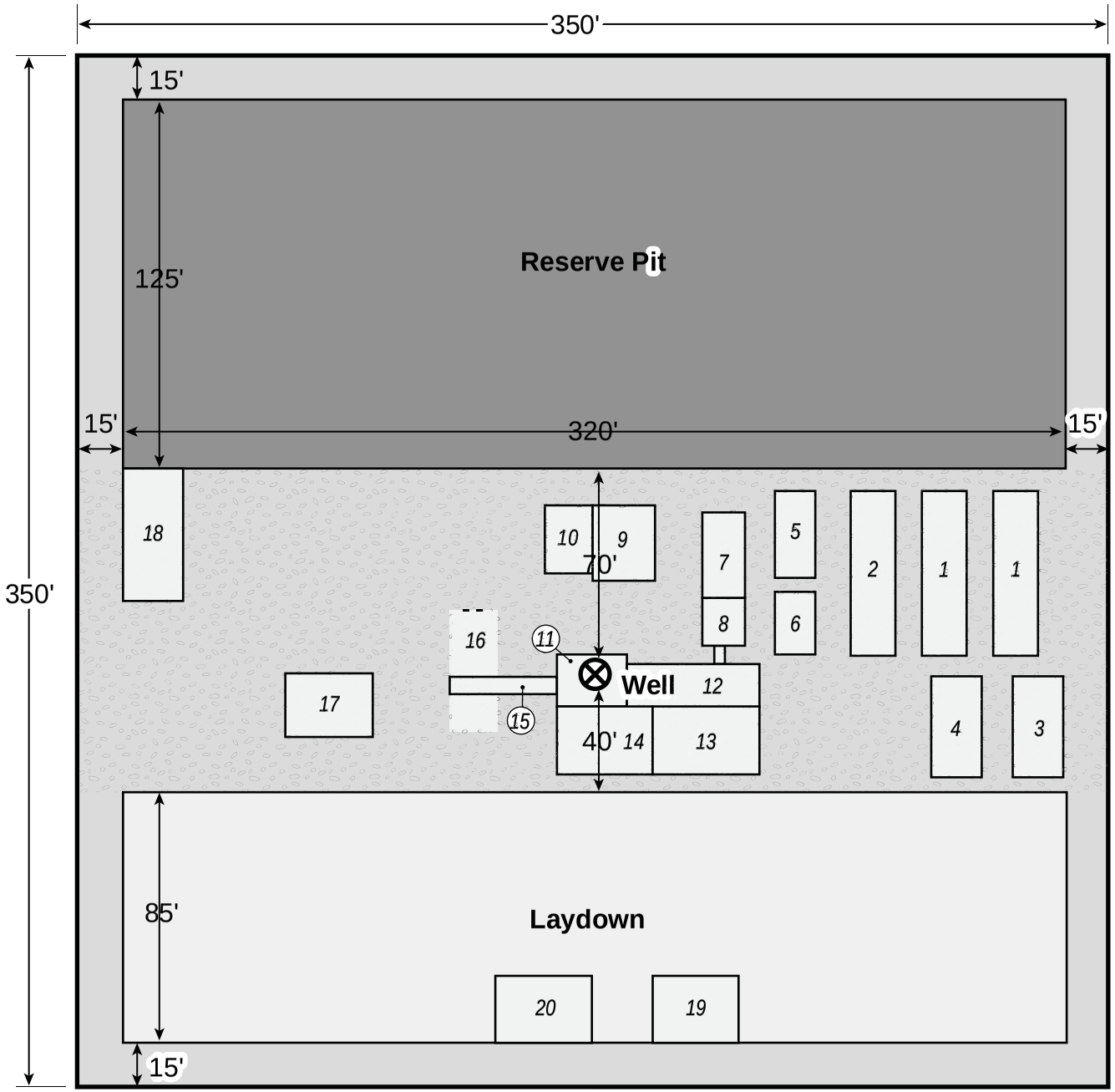
    - Herbicide application operations would be suspended when wind speed exceeds 6 miles per hour or when precipitation is imminent.

  - Some treatment areas could be signed, if needed, indicating the herbicide used and the date of treatment. Areas which that are isolated and/or receive very little use by human beings would not be signed.

  - During herbicide treatments, a pre-application sweep of the area would be completed (i.e., looking for nesting birds). Any areas that become infested with weeds during construction would be mapped and treated.
- Components of the Proposed Action that would result in direct habitat loss within migratory bird nesting habitat would either occur prior to the nesting season or nest surveys would be conducted by a qualified biologist acceptable to the BLM prior to implementation. If nests are found, coordination with the BLM would occur to develop appropriate protection measures, which may include avoidance, timing constraints, and/or buffers.
- Sumps would be fenced to exclude humans and wildlife, and if harmful properties occur in the geothermal fluids, the sumps be netted to exclude birds.
- Adhere to Suggested Practices for Avian Protection on Power Lines (APLIC 2006) guidelines for design overhead utilities such as installation of perch deterrents.
- Hazardous materials would be properly stored in separate containers to prevent mixing, drainage or accidents. Hazardous materials would not be drained onto the ground or into streams or drainage areas.
- A Spill Prevention, Control, and Countermeasures plan would be developed, secondary containment structures would be used on site, and workers would be trained in spill prevention and cleanup methods.
- Solid wastes would be transported offsite to an authorized landfill.
- TGP and its contractors would avoid known eligible and potentially eligible cultural resource sites during all phases of the project.
- A 100-foot buffer zone would be established around eligible and potentially eligible cultural resource sites to help provide protection to the sites. The Proposed Action would not encroach into the established 100-foot buffer zone.
- The project facilities would be operated in a manner consistent with the engineered design to prevent problems associated with run-off that could affect adjacent cultural sites. This includes the use of acceptable erosion control methods that are applicable to the site conditions.
- Where the installation of project facilities could impact eligible or potentially eligible cultural sites(s), TGP would retain a qualified archaeologist to serve as a cultural monitor during construction of the facility in order to avoid potential effects to cultural site(s). The BLM would decide when cultural monitors are necessary.
- Vehicle and equipment travel would be limited to established roads and roads that are part of the Proposed Action.
- If human remains are identified during construction of any of the components of the Proposed Action, work within 300 feet of the discovery would be stopped and the remains would be protected from further exposure or damage. If the remains are determined to be Native American, the BLM would follow the procedures set forth in 43 CFR Part 10, Native American Graves Protection and Repatriation Regulations.

2.2 NO ACTION ALTERNATIVE

Section 1502.14(d) of NEPA's implementing regulations requires the alternatives analysis to "include the alternative of no action" as a baseline against which to assess impacts of the Proposed Action.



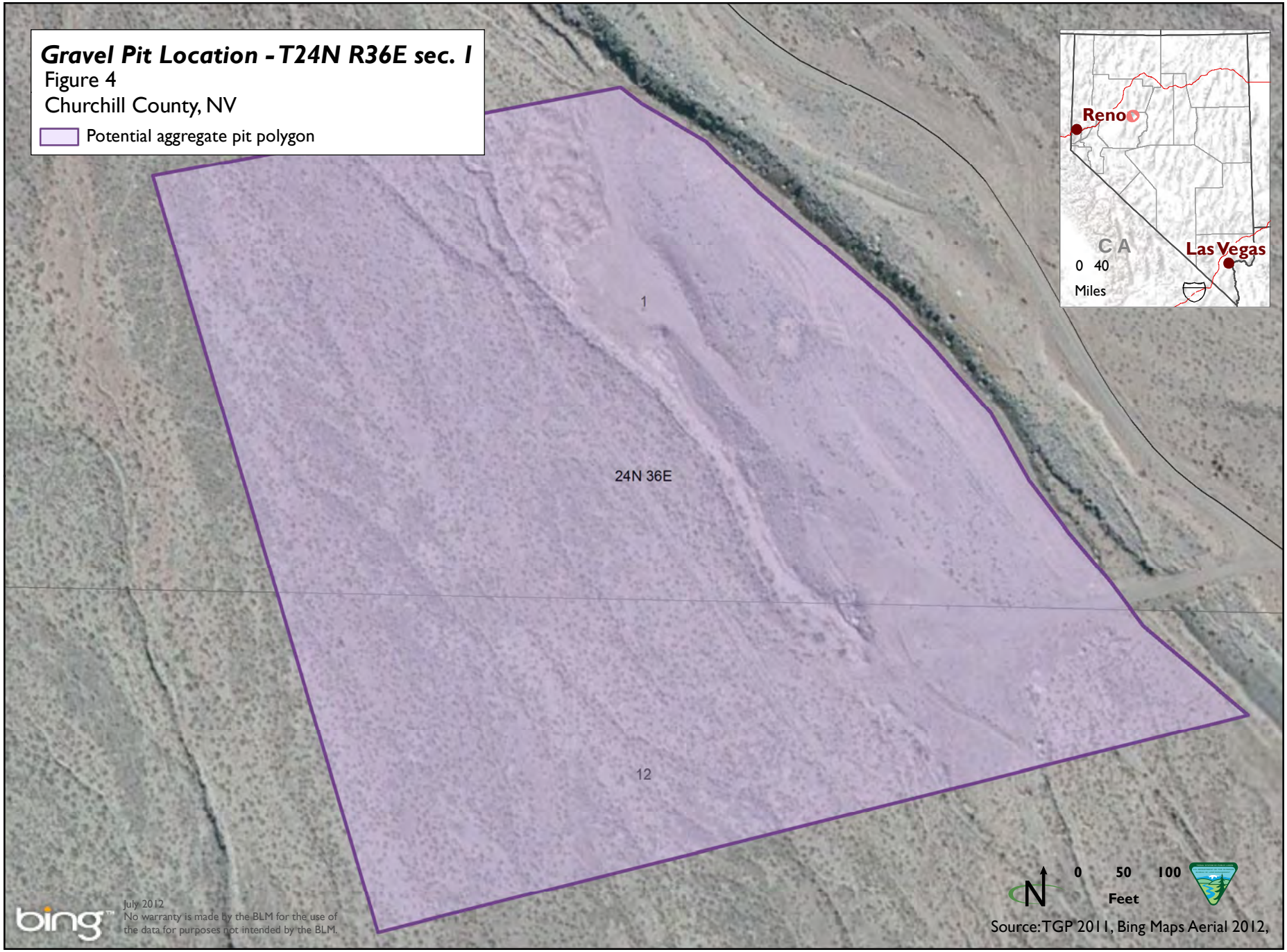
LEGEND

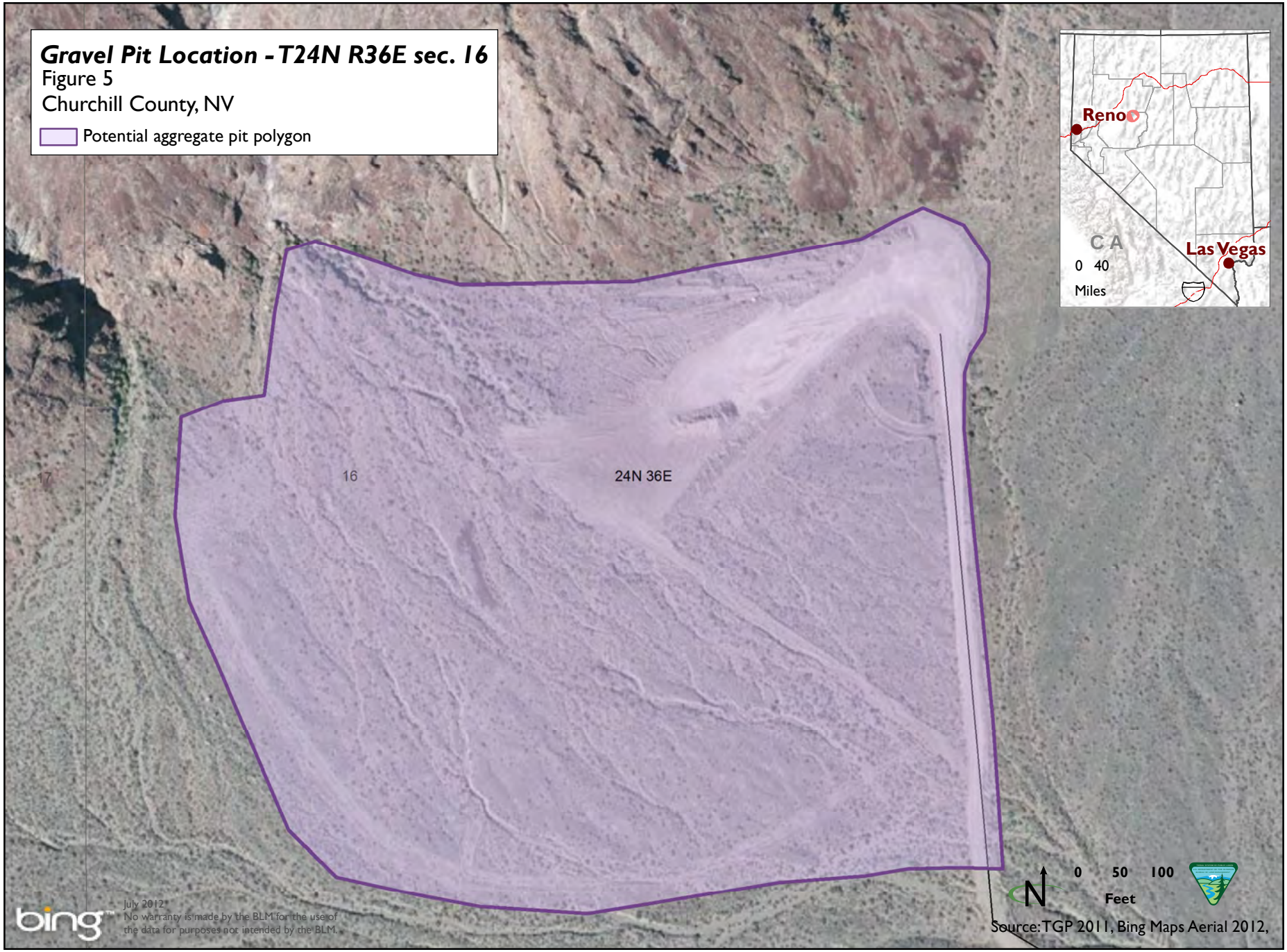
1 Air Compressors
2 Mud Tank
3 Fuel Tank
4 Water Tank
5 Mud Storage
6 Generator
7 Change House
8 Accumulator
9 Mud Pit
10 Shale Shaker
11 Rig Floor
12 Draw Works
13 Storage
14 Dog House
15 Catwalk
16 Pipe Rack
17 Electric Logger
18 Mud Logger
19 Trailer House
20 Trailer Office
Gravel Fill

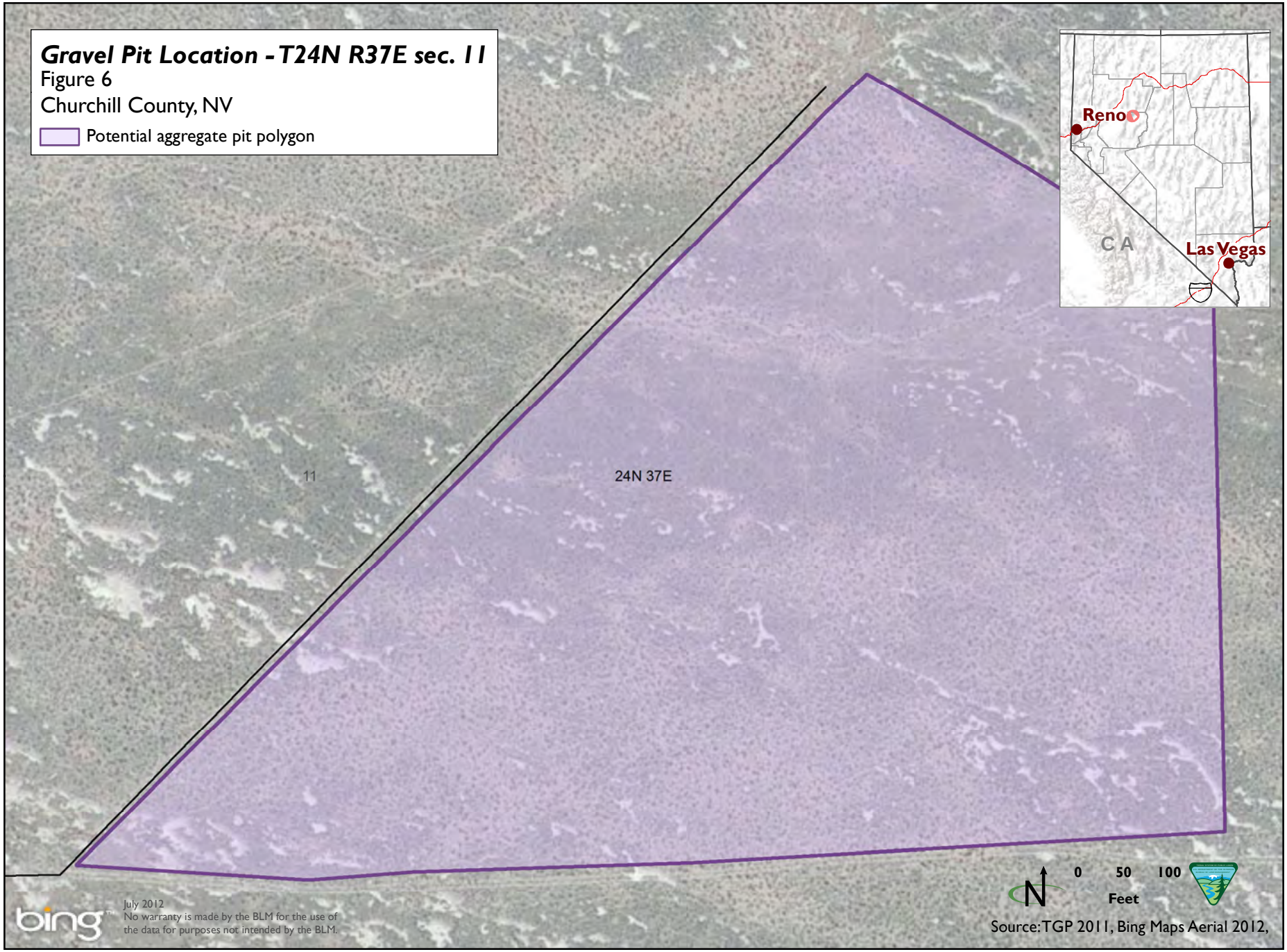
United States Department of the Interior
Bureau of Land Management
Stillwater Field Office
Carson City District Office
5665 Morgan Mill Road
Carson City, NV 89701

Figure 3

Typical Well Pad Layout
Coyote Canyon South Exploration Project
Plan of Operation


Gravel Pit Location - T24N R36E sec. 1
Figure 4
Churchill County, NV
Potential aggregate pit polygon
Reno
CA
Las Vegas
0 40
Miles
1
24N 36E
12
0 50 100
Feet
July 2012
No warranty is made by the BLM for the use of the data for purposes not intended by the BLM.
Source: TGP 2011, Bing Maps Aerial 2012,


Gravel Pit Location - T24N R36E sec. 16
Figure 5
Churchill County, NV
Potential aggregate pit polygon
Reno
Las Vegas
CA
0 40
Miles
17
16
24N 36E
0 50 100
Feet
July 2012
No warranty is made by the BLM for the use of the data for purposes not intended by the BLM.
Source: TGP 2011, Bing Maps Aerial 2012,


Gravel Pit Location - T24N R37E sec. 11
Figure 6
Churchill County, NV
Potential aggregate pit polygon
Reno
CA
Las Vegas
11
24N 37E
N
0 50 100
Feet
July 2012
No warranty is made by the BLM for the use of the data for purposes not intended by the BLM.
Source: TGP 2011, Bing Maps Aerial 2012,

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This section identifies and describes the current condition and trend of elements or resources in the human environment that may be affected by the Proposed Action or Alternatives and the environmental consequences or effects of the action(s).

3.1 SCOPING AND ISSUE IDENTIFICATION

The BLM SFO held an interdisciplinary team meeting on January 17, 2012. Per the Interdisciplinary Team Checklist for EA Preparation (included as **Appendix B**) and per BLM staff direction the following issues were identified as needing to be addressed in the EA: Air Quality; Floodplains; Water Quality; Visual Resources; ROWs/Lands; Minerals; Invasive, Nonnative and Noxious Species; Migratory Birds; Wetlands/Riparian Zones; Wildlife/Key Habitat; Special Status Species; Cultural Resources; and Native American Religious Concerns.

The following issues were identified as not being present in the Project Area: Areas of Critical Environmental Concern; Environmental Justice; Farm Lands; Forests and Rangelands; Human Health and Safety; Threatened and/or Endangered Species; Wild and Scenic Rivers; Wilderness; Lands with Wilderness Characteristics; Recreation; Wild Horses and Burros; and Livestock Grazing. Threatened and Endangered Species are discussed in this EA to clearly lay out the reason for a conclusion of no impact to this resource, in accordance with the Endangered Species Act.

3.1.1 Proposed Action General Setting

The Project Area is located in the western portion of Dixie Valley and is approximately 27 air miles northeast of Fallon, Nevada. The western edge of Dixie Valley is defined by the Stillwater Range and the eastern edge is defined by the Clan Alpine Mountains. The Project Area is located at elevations ranging from approximately 3,400 feet to 3,600 feet in the northern part of Dixie Valley.

3.1.2 Supplemental Authorities

Appendix 1 of BLM's NEPA Handbook (H-1790-1) identifies supplemental authorities that are subject to requirements specified by statute or executive order and must be considered in all BLM environmental documents (BLM 2008b). Supplemental authorities that may be affected by the Proposed Action are listed in **Table 6**, Supplemental Authorities and Rationale for Detailed Analysis for the Proposed Action, and further described in this EA.

Table 6: Supplemental Authorities and Rationale for Detailed Analysis for the Proposed Action

Elements[a]	Not Present[b]	Present/Not Affected	Present/May Be Affected[c]	Rationale
Air Quality			X	Carried through EA.
Areas of Critical Environmental Concern	X			
Cultural Resources[d]		X		Survey of project area and gravel areas revealed no eligible sites.
Environmental Justice	X			
Farm Lands (prime or unique)	X			
Floodplains		X		No proposed activities within mapped floodplains. Discussion provided in EA.
Invasive, Nonnative Species			X	Carried through EA.
Migratory Birds			X	Carried through EA.
Native American Religious Concerns[d]	X			Several field trips with Fallon Paiute Shoshone Tribe cultural coordinator; no concerns.
Threatened and/or Endangered Species (animals)	X			
Threatened and/or Endangered Species (plants)	X			
Wastes, Hazardous or Solid		X		All wastes would be handled in accordance with all applicable laws.
Water Quality (Surface/Ground)			X	Carried through EA.
Wetlands/Riparian Zones			X	Carried through EA.
Wild and Scenic Rivers	X			
Wilderness/WSA	X			

Table 6: Supplemental Authorities and Rationale for Detailed Analysis for the Proposed Action

Elements[a]	Not Present[b]	Present/Not Affected	Present/May Be Affected[c]	Rationale
[a] See BLM Handbook H-1790-1(2008b) Appendix 1, Supplemental Authorities to be Considered. [b] Supplemental Authorities determined to be Not Present or Present/Not Affected need not be carried forward or discussed further in the document. [c] Supplemental Authorities determined to be Present/May Be Affected must be carried forward in the document. [d] Cultural Resources and Native American resources are discussed in detail in this EA even though no concerns were identified.				

3.1.3 Resources Other Than Supplemental Authorities

The resources or uses identified in Table 7, which are not Supplemental Authorities as defined by BLM's Handbook H-1790-1, are present in the area. BLM specialists have evaluated the potential impact of the Proposed Action on these resources and documented their findings in the table below. Resources or uses that may be affected by the Proposed Action are further described in this EA.

Table 7: Resources Other Than Supplemental Authorities

Elements[a]	Not Present[b]	Present/Not Affected	Present/May Be Affected[c]	Rationale
BLM Sensitive Species (animals)			X	Carried through EA.
BLM Sensitive Species (plants)			X	Carried through EA.
Fire Management/Vegetation			X	Carried through EA.
Forest Resources	X			
General Wildlife			X	Carried through EA.
Lands and Realty			X	Carried through EA.
Lands with Wilderness Characteristics	X			
Livestock Grazing		X		
Minerals			X	Carried through EA.
Paleontological		X		
Recreation		X		
Socioeconomics		X		
Soils			X	Carried through EA.
Travel Management	X			
Vegetation			X	Carried through EA.
Visual Resources			X	Carried through EA.
Wild Horses and Burros	X			
[a] Resources or uses determined to be Present/Not Affected need not be carried forward or discussed further in the document. [b] Resources or uses determined to be Present/May Be Affected must be carried forward in the document.				

3.1.4 Resources or Uses Present and Brought Forward for Analysis (All Supplemental and Resources)

The following resources are present in the Proposed Action area, may be affected by the Proposed Action, and are carried forward for analysis:

- Air Quality
- Floodplains
- Invasive, Nonnative and Noxious Species
- Migratory Birds
- Water Quality
- Wetlands/Riparian Zones
- Visual Resources
- Lands and Realty
- Minerals
- Wildlife/Key Habitat
- BLM Sensitive Species

3.2 AIR QUALITY

3.2.1 Regulatory Environment

The US Environmental Protection Agency Office of Air Quality Planning and Standards and the NDEP have set National Ambient Air Quality Standards and Nevada ambient air quality standards for the following criteria pollutants: nitrogen dioxide, sulfur dioxide, carbon monoxide, particulate matter smaller than 10 microns in aerodynamic diameter, particulate matter smaller than 2.5 microns in aerodynamic diameter, ozone, and lead. In addition to these listed criteria pollutants, NDEP has established an ambient air quality standard for hydrogen sulfide. Nevada Administrative Code 445B.22097 provides the minimum standards of quality for Nevada ambient air.

Attainment is achieved when the existing background concentrations for criteria air pollutants are less than the maximum allowable ambient concentrations defined in the National Ambient Air Quality Standards. Nevada is mandated to identify geographic areas that do not meet federal and state air quality standards. The state uses air quality data gathered by monitoring networks to determine the areas within the state not attaining standards. Areas that violate federal or state standards are referred to as "nonattainment areas" for the relevant pollutants.

3.2.2 Affected Environment

The Proposed Action area is located in a sparsely populated rural area with minimal industrial sources or potential impacts to the airshed. Activities associated with the Proposed Action would occur in Groundwater Basin 128 in Churchill County, Nevada. Groundwater basins in the state of Nevada correspond to airsheds; therefore, Groundwater Basin 128 is the analysis area for air quality. **Figure 5**, Groundwater Basin, shows the Dixie Valley Groundwater Basin, which is the same as Groundwater Basin 128. This basin is in attainment for all National Ambient Air Quality Standards and Nevada air quality standards.

3.2.3 Environmental Consequences

Air emissions from the Proposed Action would be primarily attributable to the following air pollution sources:

- Gravel mining, crushing, and screening
- Heavy equipment and drill rig (diesel exhaust and greenhouse gas emissions)
- Earth moving and grading (particulate fugitive and greenhouse gas emissions)
- Well testing (hydrogen sulfide and greenhouse gas emissions)

3.2.3.1 Gravel Mining, Crushing, and Screening

Fugitive dust emissions during gravel extraction, crushing, screening and transportation to the project site would result in temporary emissions of particulate matter. These emissions would be mitigated through the onsite water spraying for dust control.

3.2.3.2 Heavy Equipment, Drill Rig, and Earth-moving and Grading Activities

Fugitive dust emissions during gravel extraction, construction, and from construction vehicles using the access roads would result in temporary emissions of particulate matter, but these emissions would be of larger particulate sizes and the majority of these fugitive particulate emissions would settle before Dixie Valley. Since the proposed total disturbed area is greater than 5 acres, the NDEP Bureau of Air Pollution Control requires a Surface Area Disturbance Permit and corresponding Dust Control Plan. The NDEP Bureau of Air Pollution Control has jurisdiction of air quality programs over all counties in Nevada except Washoe and Clark counties.

Short-term construction and drill rig exhaust emissions, including volatile organic compounds, carbon monoxide, nitrogen dioxide, particulate matter smaller than 10 microns in aerodynamic diameter, hazardous air pollutants, and oxides of sulfur would result from internal combustion engines and heavy equipment used at the construction site and at the gravel pits. These short-term fugitive emissions would be below the threshold level that would require a permit from NDEP Bureau of Air Pollution Control.

3.2.3.3 Well Testing

Small quantities of naturally occurring non-condensable gases, such as hydrogen sulfide and greenhouse gases (carbon dioxide and much smaller amounts of methane) would be emitted to the air during well testing. Hydrogen sulfide initial concentrations in local geothermal fluids are estimated at approximately 70 parts per million, and methane concentrations are estimated at less than 2 percent of non-condensable gases, based on historical data (Freeman 1986). This estimate is conservative in that more recent tests at the existing Dixie Valley geothermal plant indicate lower concentrations (TGP 2009). As discussed in Chapter 2 of this EA, up to 15 slim wells or exploration wells up to 10,000 feet deep would be drilled and performance tested. Well testing would be conducted for an average of 3 days (24 hours per day) for each well. It is anticipated that the initial flow rates of fluid from each well into its sump (and to the existing Dixie Valley sumps, as required) would be approximately 500 to 1,500 gallons per minute on average (with up

to 700,000 pounds per hour geothermal flow) depending upon the productivity of the well. Based on this estimate, total potential emissions from the proposed well testing would be approximately 26.40 tons hydrogen sulfide (1.76 tons per well).

Air emission sources that exceed 5 tons per year of criteria air pollutant emissions require an air permit from the NDEP Bureau of Air Pollution Control. This permit would be a temporary permit for operations of less than one year duration or a stationary source permit for operations greater than one year duration.

The Proposed Action would require a temporary permit because project-related emissions would be greater than five tons per year, and performance testing would last less than one year. If the total activity duration were extended beyond one year, TGP would obtain a stationary source permit.

3.2.3.4 Heavy Equipment and Well Testing

Cumulative greenhouse gas emissions from well testing and construction-related diesel engines were reviewed and determined to be less than 25,000 tons per year, which is below the level that triggers federal reporting requirements.

Additionally, according to State of Nevada regulations, only electrical generating power plants are required to report greenhouse gas emissions; therefore, the Proposed Actions would not be required to report greenhouse gas emissions.

To minimize air pollution emissions from construction activities and construction and drill rig diesel engines, the following BMPs for fugitive dust and diesel exhaust would be implemented during operational activities:

- Surfacing access roads with aggregate materials, wherever appropriate;
- Using dust abatement techniques, such as watering on unpaved, unvegetated surfaces to minimize airborne dust, as needed. (The source of water to be used for dust abatement is described in Section 2.1.8);
- Posting and enforcing speed limits to reduce fugitive dust (speed limit of 25 miles per hour, as necessary);
- Applying dust abatement techniques (such as watering, requiring loader buckets to be emptied slowly, minimizing drop heights, etc.) to earth-moving, excavating, trenching, and grading activities; and
- Minimizing equipment and vehicle idling times during construction activities.

3.3 FLOODPLAINS

3.3.1 Regulatory Environment

Floodplains are defined by Executive Order 11988, Floodplain Management, as "the lowland and relatively flat areas adjoining inland and coastal waters including flood-prone areas of offshore islands, including at a minimum, that area subject to a one percent or greater chance of flooding in any given year" (i.e., area inundated by a 100-year flood). Executive Order 11988 directs

federal agencies to take actions to reduce the risk of flood loss, minimize flood impacts on human safety, health and welfare, and restore and preserve floodplain natural and beneficial values. To do this, the order bans approving activities in a floodplain unless no practicable alternative exists, and measures to minimize unavoidable short-term and long–term impacts are included.

3.3.2 Affected Environment

Federal Emergency Management Agency flood maps indicate that a southern portion of the Project Area is a designated 100-year floodplain. A portion of this floodplain is also identified as a "lake" by the US Fish and Wildlife Service (USFWS)-administered National Wetland Inventory. These designations are shown in **Figure 8**, Water Features, and are part of the Humboldt Salt Marsh.

3.3.1 Environmental Consequences

All project features have been designed to comply with the lease stipulation requiring no surface occupancy or surface disturbance within 650 feet of any floodplain. There would be no effect on floodplains.

3.4 WATER RESOURCES

3.4.1 Affected Environment

3.4.1.1 Groundwater

The Lease Area is located in the internally drained Dixie Valley groundwater basin (Nevada Division of Water Resources-designated Administration Groundwater Basin 128). Dixie Valley is located in Nevada Hydrographic Region 10 (Central Region) (NDCNR-DWR 2005), and is in the Great Basin hydrographic area. By Order 715, dated June 8, 1978, the Nevada State Engineer has designated the Dixie Valley groundwater basin, which indicates that the permitted groundwater rights approach or exceed the estimated average annual recharge and the water resources are being depleted or require additional administration (NDCNR-DWR 2009).

When the US Navy purchased the ranches of Dixie Valley, they also purchased the related water rights. The Navy does not fully use all of these water rights in Dixie Valley. The main interest for future water use in Dixie Valley is for a water importation project by the City of Fallon, which has been put on hold indefinitely. There are no water right holders within or near the proposed project area.

There are no source water protection areas within the Project Area, per Figure 2-1 of the 2010 Nevada Integrated Source Water Protection Program (NDEP 2010).

Groundwater Basin 128 has an area of 1,303 square miles and a perennial yield of 15,000 acre-feet per year. The basin has committed underground water rights of 18,076 acre-feet per year and geothermal water rights of 13,428 acre-feet per year (NDCNR-DWR 2009). Groundwater occurs in alluvial basin fill sediments and in underlying bedrock. In the northern portion of Dixie Valley

where the Project Area is located, groundwater moves south through the valley, east from the Stillwater Mountains, and west from the Clan Alpine Mountains.

Recharge to groundwater occurs from precipitation, primarily snowmelt, at higher elevations in the Stillwater Range and Clan Alpine Range west and east of Dixie Valley and in the alluvial fans and landslide deposits at the base of these mountains. The Humboldt Salt Marsh (playa) is the ultimate groundwater sink for Dixie Valley and six subbasins that are adjacent to Dixie Valley (Fairview, Pleasant, Jersey, Eastgate, Cowkick, and Stingaree valleys). Groundwater moves radially from the surrounding mountains and converges on the playa, where it discharges to the surface. Vertically, groundwater moves upward in the central part of the valley in response to hydraulic gradients, where it discharges to the playa and is lost to evaporation and transpiration.

Groundwater occurs in two separate but related aquifers in Dixie Valley: a shallow, non-thermal, alluvial aquifer and a deep, thermal, bedrock aquifer (Karst 1987).

Groundwater in the alluvium occurs under unconfined and confined conditions; however, hydraulic heads are typically beneath the elevation of the valley floor. Thermal groundwater is confined and generally occurs in fractured, zones within the bedrock underlying the alluvial basin fill sediments. Deep thermal groundwater and shallower alluvial groundwater are separated by a confining sequence thousands of feet thick, composed of shale, siltstone, volcaniclastic rocks, and a complex of intrusive and extrusive igneous rocks that includes gabbro, diorite, and basalt (Bruton et al. 1997). Fumaroles, hot springs, and warm springs along the west edge of Dixie Valley near the base of the Stillwater Range are believed to originate from deep geothermal water moving up a zone of locally enhanced permeability caused by the Dixie Meadows fault system (Smith et al. 2001). Chloride isotope analysis and a geochemical mixing evaluation reported by Bruton et al. (1997) indicates that shallow groundwater in Dixie Valley contains approximately 15 percent geothermal water, likely from fumaroles and hot springs in the area. As a groundwater discharge area, the depth to groundwater is anticipated to be shallow throughout much of northern Dixie Valley and would be expected to be shallowest close to the Humboldt Salt Marsh.

The total dissolved solids concentration in shallow alluvial groundwater in Dixie Valley ranges from 900 to 1,900 milligrams per liter according to data tabulated by Karst (1987). Thermal groundwater in the area generally has higher dissolved solids content; however, the maximum total dissolved solids value reported by Karst was 1,920 milligrams per liter, essentially the same as the maximum non-thermal groundwater concentration of 1,900 milligrams per liter (Karst 1987).

3.4.1.2 Surface Water

Based on analysis of US Geological Survey (USGS) topographic maps and Nevada Division of Water Resources groundwater basin mapping (Figure 5, Groundwater Basin), the Proposed Action would be located in an internally drained desert basin that is a great distance from and lacks hydrographic connectivity to major rivers and water bodies. Therefore, there are no navigable waters of the United States within Rivers and Harbors Act jurisdiction (as defined by

33 CFR part 329) and no waters of the United States within Clean Water Act jurisdiction (as defined by 33 CFR 328) in the Project Area.

The USGS 7.5-minute topographic map of the area (Bolivia, Nevada Quadrangle 1990) shows ephemeral washes flowing southeast across the alluvial fan and valley bottom within the Lease Area and into the Humboldt Salt Marsh within Dixie Valley (see Figure 8, Water Features). The southeastern portion of the Lease Area is within the Humboldt Salt Marsh. The ephemeral washes only flow from significant rainfall or snowmelt events and those observed during field visits were dry. Federal Emergency Management Agency Flood Insurance Rate Maps show the presence of a flood hazard zone within the southern portion of the Lease Area. Floodplains are discussed in **Section 3.3**, Floodplains. USGS mapping shows four seeps and springs in Section 27 and a grouping of spring-fed wetlands on the western edge of the Lease Area in Section 36 (see Figure 8, Water Features).

3.4.2 Environmental Consequences

Groundwater use for the proposed project would be temporary, in support of drilling activities and dust control for construction of well pads, access roads, and gravel pits. TGP has the right under State water law to get a waiver to drill a water well for temporary use. Under this waiver, TGP also has the right to use water on a temporary basis from an existing well. Therefore, there would be no impact to water resources affecting any holders of water rights.

As discussed in **Section 3.9**, Vegetation, palustrine emergent wetlands associated with springs and seeps are present within the Lease Area in Section 27 (see Figure 8, Water Features). Based on a review of USGS topographic maps and Nevada Division of Water Resources groundwater basin mapping, these water bodies are not jurisdictional waters of the U.S. because they are located in an internally drained desert basin that is distant from and lacks hydrographic connectivity to major rivers and water bodies. Although the waters are not jurisdictional waters of the United States, construction activities would avoid wetland areas associated with seeps and springs to the extent possible.

As described in Chapter 2, access roads would be constructed as part of the Proposed Action. Roads and wells would be located and designed to avoid impacts to surface water features such as springs, seeps, and ephemeral washes to the extent possible.

Well testing would involve removing thermal groundwater and discharging it to the drill pad sump. Excess fluids from each well would be trucked to existing sumps at the Dixie Valley geothermal power plant. The anticipated test flow rates (500 to 1,500 gallons per minute) and durations (average of 3 days) may result in 2 to 6 million gallons of thermal groundwater being extracted from the geothermal aquifer for each well during testing. Installation and testing of deep geothermal wells has the potential to cause impacts on surface water through accidental release of geothermal fluids to surface water features. To prevent a release of geothermal fluids to surface water features, drilling muds and geothermal fluids would be contained in the sump or trucked to the existing sumps at the Dixie Valley geothermal power plant when quantities dictate. BMPs for well installation and testing would be implemented as described below.

The release of hazardous materials to the environment could affect surface water features and could result in groundwater contamination. Hazardous materials brought onto the project site would be limited to petroleums, oils and lubricants. Because ephemeral washes exist in the proposed Project Area, impacts on surface hydrology may occur.

Possible releases of materials utilized during construction activities, primarily hydrocarbon releases from construction equipment, potentially could impact stormwater. A Stormwater Pollution Prevention Plan and a Spill Prevention, Control, and Countermeasures Plan would be developed to prevent release of hazardous materials to the environment. TGP would provide a Notice of Intent to the NDEP prior to well pad construction.

In addition to these measures, the following steps would be undertaken during construction to avoid or minimize the potential for impacts to surface water or groundwater in the area:

- When permanent new access roads must cross ephemeral washes, rolling dips would be installed. The rolling dips would be designed to accommodate flows from at least a 25-year storm event. Culverts may be used wherever rolling dips are not feasible.
- Drill pad sumps would be compacted during construction and settled bentonite clay from drilling mud would accumulate on the bottom of the drill pad sump to act as an unconsolidated clay liner, reducing the potential for drilling fluid to percolate to groundwater.
- TGP would obtain necessary working in waters and/or groundwater discharge permits and provide a Notice of Intent to NDEP prior to well pad construction.
- Wetland boundaries would be avoided to the extent possible.
- A BLM-approved grouting and casing program for construction of slim well or exploration wells would be implemented to prevent water quality effects on groundwater during or after well installation.
- Borehole geophysics analyses (cement bond logs) would be conducted to document that well-casing grouting activities provide an effective seal, isolating the geothermal aquifer from shallow alluvial aquifers and therefore minimizing potential impacts on surface washes, springs, seeps, or floodplains.
- BMPs would be implemented to ensure that any geothermal fluid encountered during the drilling does not flow uncontrolled to the surface. These include the use of blowout prevention equipment during drilling and the installation of well casing cemented into the ground.
- A Hydrologic Monitoring Plan will be submitted to the BLM for approval prior to drilling.
- Hazardous materials would be properly stored in separate containers to prevent mixing, drainage or accidents. Hazardous materials would not be drained onto the ground or into streams or drainage areas.
- A Spill Prevention, Control, and Countermeasures plan would be developed, secondary containment structures would be used on site, and workers would be trained in spill prevention and cleanup methods.
- Solid wastes would be transported offsite to an authorized landfill.

3.4.2.1 Hydrologic Monitoring Plan

Standard aquifer testing procedures would be employed at targeted depth intervals as the boreholes for slim wells or exploration wells are advanced. The vertical boundaries of the aquifers, the depth of aquifers (non-thermal and thermal) penetrated during drilling, would be noted from the drilling log. The horizontal boundaries would be noted if any are reflected on time-drawdown plots produced during aquifer testing. Borehole geophysics analysis would be conducted from the ground surface to the total depth of the borehole. Aquifer testing would be used to determine drawdown associated with pumping. If possible, an assessment of whether the aquifer is confined or unconfined would be made, as well as an estimate of aquifer thickness and a qualitative assessment of its relative productivity. The temperature of penetrated aquifers would be noted. A Hydrologic Monitoring Plan would be put in place to confirm the expectation that no impacts to quality, quantity, or temperature of groundwater occurred as a result of slim well or exploration well installation and testing.

3.5 SOILS

3.5.1 Affected Environment

Soil types in the project area were identified using the Churchill County Area, Parts of Churchill and Lyon Counties soil survey (USDA NRCS 2009). Descriptions of the three soil types found in the Project Area are provided in this section. Soil types related to the playa and the Stillwater Range are not discussed since no activities are proposed for these areas; however, the location of these soil types are shown on **Figure 7**, Soils.

3.5.1.1 Slaw-Trocken-Chuckles association

Slaw soils occur on 0 to 4 percent slopes, are well drained, occasionally flood but never pond, and are moderately to strongly saline. The typical profile is composed of silt loam underlain by stratified very fine sandy loam to silty clay. Trocken soils occur on 0 to 2 percent slopes, are well drained, occasionally flood but never pond, and are moderately to strongly saline. The typical profile includes very gravelly loam and gravelly loamy coarse sand. Chuckles soils occur on 0 to 2 percent slopes, are moderately well drained, never flood or pond, and are moderately to strongly saline. The typical profile is composed of loam and silt loam underlain by stratified very fine sandy loam to silty clay. This soil unit has a slight hazard of off-road or off-trail erosion and is poorly to moderately suited for natural surface road construction primarily due to flooding potential and low strength (USDA NRCS 2009).

3.5.1.2 Settlement-Louderback-Rustigate association

Settlement soils occur on 0 to 2 percent slopes, are poorly drained, have a water table depth of 12 to 36 inches, rarely flood and never pond, and are slightly to moderately saline. The typical soil profile consists of silty clay and clay. Louderback soils occur on 0 to 2 percent slopes, are somewhat poorly drained, have a water table at 36 to 40 inches, rarely flood and never pond, are very slightly or slightly saline, and support saline meadow vegetation. The typical soil profile is composed of sand underlain by stratified sand to loam. Rustigate soils occur on 0 to 2 percent slopes, are somewhat poorly drained, have a water table at 36 to 40 inches, rarely flood and never pond, and support a saline meadow vegetation community. The profile is typically silt

loam underlain by loam. This soil unit has a slight hazard of off-road or off-trail erosion and is moderately suited for natural surface road construction, primarily due to low strength and sandiness (USDA NRCS 2009).

3.5.1.3 Bluewing-Pineval association

Bluewing soils occur on 4 to 8 percent sloping fans or washes, are excessively drained, and flood rarely to occasionally but never pond. The soil profile typically consists of very gravelly loamy sand underlain by stratified very gravelly sand to extremely loamy coarse sand. Pineval soils occur on 4 to 8 percent slopes, are well drained, and rarely flood and never pond. The typical soil profileincludes very cobbly loam and very gravelly sandy clay loam underlain by stratified extremely gravelly sand to gravelly sandy loam. This soil unit has a slight hazard of off-road or off-trail erosion and is moderately suited for natural surface road construction, due to flooding potential, sandiness, and slope (USDA NRCS 2009).

3.5.2 Environmental Consequences

The hazard of off-road or off-trail soil erosion in the Project Area is slight (USDA NRCS 2009). The soils are poorly to moderately suited for natural surface road construction (USDA NRCS 2009); therefore, TGP would implement the BMPs described below when constructing access roads and well pads.

The loss of soil productivity is expected to be low because the soils have low native fertility and no farmlands, as covered under the Farmland Protection Policy Act (Public Law 97-98, 7 USC 4201), are present within the Lease Area.

The release of hazardous materials to the environment could affect soil resources. BMPs to prevent such a release, including development of a Spill Prevention, Control, and Countermeasures Plan, are described in Section 3.4.2.

Erosion and loss of soil productivity would be minimized by implementing the following BMPs during access road and well pad construction:

- Excavation into native soil during construction of well pad sumps would be minimized to the maximum extent possible.
- Wells and roads not required for development purposes would be re-contoured to blend with the surrounding topography, in accordance with lease stipulations.
- Topsoil would be salvaged and reused whenever possible and in a timely manner.
- Temporarily disturbed areas would be reseeded where previously vegetated using a BLM-approved seed mixture.
- Erosion control measures, including but not limited to silt fencing, diversion ditches, water bars, temporary mulching and seeding, and application of gravel or rip rap, would be installed where necessary immediately after completion of construction activities to avoid erosion and runoff.
- Access roads would follow existing contours to the maximum extent possible. In areas where new access roads must be constructed across slopes, erosion control measures would be installed as necessary, in accordance with Gold Book standards (BLM 2007).

- An average of 6 inches of gravel would be used as road surface because roads would be used during all seasons. Up to 3 feet of gravel may be used on some sections of road, and no gravel would be used on road sections where the natural surface is adequate.
- Additional gravel would be laid down when ground conditions are wet enough to cause rutting or other noticeable surface deformation and severe compaction. As a general rule, if vehicles or other project equipment create ruts in excess of 4 inches deep, a gravel surface would be installed prior to additional use.
- When construction occurs in areas of very soft soils, up to 3 feet of aggregate would be used.
- An NDEP Bureau of Air Pollution Control Surface Area Disturbance documenting the BMPs to be used would be required for the project because the surface disturbed would be greater than 5 acres.

3.6 VISUAL RESOURCES

3.6.1 Affected Environment

BLM utilizes a visual resource management (VRM) process to manage the quality of landscapes on public land and to evaluate the potential impacts to visual resources resulting from development activities. VRM class designations are determined by assessing the scenic value of the landscape, viewer sensitivity to the scenery, and the distance of the viewer to the subject landscape. These management classes identify various permissible levels of landscape alteration, while protecting the overall visual quality of the region. They are divided into four levels (Classes I, II, III, and IV). Class I is the most restrictive and Class IV is the least restrictive in terms of changes that are allowed to the characteristic landscape (BLM 1986).

Based on information contained in the Consolidated RMP (BLM 2001) and environmental assessments for other projects sharing this vicinity, the Lease Area is located within a Class IV VRM category. The objective for this class is to provide for management activities that allow major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. Activities in a Class IV category may dominate the view and be the major focus of viewer attention.

However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.

The closest transportation route is Dixie Valley Road, which is designated State Route 121. The closest urban sensitive receptor (park, church, residence, school, or hospital) is located in Lovelock, Nevada, approximately 27 air miles west of the project sites. The Stillwater Mountain Range, with peaks higher than 8,500 feet, is located south and west of the Lease Area. The closest receptor would be the 7 Devils Ranch located approximately 18 miles northeast of the Lease Area.

3.6.2 Environmental Consequences

Temporary impacts to visual resources would occur during road and well pad construction activities at the Project Area and as a result of the presence of drill rigs. Drilling equipment

would be seen from Dixie Valley Road. Roads, drill pads, and laydown areas are near ground level and would not affect visual resources. Construction impacts would be minor and short-term and would be consistent with the objectives of Class IV VRM objective.

During the drilling operations, the drill rig could extend up to about 160 feet above ground level. These operations would be 24 hours per day, 7 days per week. During drilling operations, the rig would be visible at distances of greater than 1 mile from the respective drill sites, and lights used when drilling at night would increase rig visibility. All drill rig and well test facility lights would be limited to those required to safely conduct the operations and would be shielded or directed in a manner that focuses direct light to the immediate work area.

Access roads would remain after the wells have been drilled until reclamation is conducted as described in Section 2.1.10. Laydown areas and concrete slab drill pads would be removed as described in Section 2.1.10 if they are no longer needed.

The Stillwater Mountain Range, with peaks higher than 8,500 feet, is between the Lease Area and Lovelock. The Project Area is, therefore, not visible from the Lovelock area. The Project Area is located approximately 18 miles away from the 7 Devils Ranch and are therefore not likely to be visible from the ranch.

3.7 LANDS AND REALTY

3.7.1 Affected Environment

Most of the land in Dixie Valley is federal land managed by the BLM and nearly all of it is designated as having the highest geothermal resource potential of any BLM-managed public lands in the state (BLM 2001). The federal government administers more than 82 percent of the land in Churchill County. In accordance with the BLM PEIS for Geothermal Development (BLM 2008a) and the Churchill County Master Plan (2010), the expansion and development of geothermal resources is supported and promoted for federal lands in this region in support of a national energy policy for renewables. A BLM designated utility corridor exists within Dixie Valley with the express purpose of providing an outlet for geothermal power to be produced in the valley (BLM 2001). There is a transmission line within this corridor.

Small private parcels exist throughout the valley, and a large portion of the southern half of the valley is controlled by the Department of Defense for testing of low-level supersonic flight operations as part of the Fallon Range Training Complex.

The existing Terra-Gen Dixie Valley geothermal plant is just north of the Lease Area, and a small private ranch is approximately 12 miles northeast of the Dixie Valley geothermal plant. The area is relatively undeveloped and most of the valley is utilized for cattle grazing, with BLM assuming grazing management responsibility on adjacent military-controlled lands.

Several ROWs or other authorizations have been granted on public lands within the Project Area. These include ROWs for transmission lines, roads, and geothermal leases. All BLM-registered geothermal leases in the area are held by TGP.

BLM also has prepared a PEIS for Geothermal Leasing in the Western US (BLM 2008a), which analyzes potential impacts of geothermal development and provides a list of stipulations and BMPs related to geothermal leasing and related development on BLM-managed public land. In 2008, BLM issued a Record of Decision for geothermal leasing in the Western US, including adoption of RMP amendments related to geothermal leasing (BLM 2008d).

3.7.2 Environmental Consequences

Existing linear ROWs in the vicinity of the Lease Area include the Terra-Gen Dixie Valley 230-kilovolt transmission line and its associated access road and State Route 121 to the south, which would be used only for access to the Project Area. The Proposed Action does not include drilling or other exploration activities in the State Route 121 ROW. The use of the lands for geothermal development would not preempt the other current uses of the land identified in Section 3.7.1.

The Department of Defense operates the Fallon Range Training Complex, a portion of a military operating area designated for low-level supersonic flight operations over the Dixie Valley region. Impacts to the military operating area are reviewed by the Federal Aviation Administration if the Federal Aviation Administration obstruction thresholds are triggered. The Proposed Action would not trigger the Federal Aviation Administration obstruction thresholds (14 CFR Part 77.13) because it would not include:

- Construction or alteration exceeding 200 feet above ground level;
- Construction or alteration:
  - within 20,000 feet of a public use or military airport which exceeds a 100 to 1 (horizontal to vertical) surface from any point on the runway of each airport with at least one runway more than 3,200 feet,
  - within 10,000 feet of a public use or military airport which exceeds a 50:1 surface from any point on the runway of each airport with its longest runway no more than 3,200 feet
  - within 5,000 feet of a public use heliport which exceeds a 25:1 surface;
- Highway, railroad, or other traverse way whose prescribed adjusted height would exceed the above noted standards; or
- Construction or alteration located on a public use airport or heliport regardless of height or location.

3.8 MINERALS

3.8.1 Affected Environment

Precious metals have historically been mined in the Clan Alpine Mountains bordering Dixie Valley. Existing mines in Churchill County are located around its periphery, far from Dixie Valley, which is situated in the central part of the county. Based on a review of the online Mineralogy Databases (Mindat.org 2012), Cottonwood Canyon is the only identified mine within Dixie Valley, located approximately 4 miles north of the Lease Area. The mine is reported as being a producer of opal. There are no major mines currently operating in Dixie Valley (Nevada Bureau of Mines and Geology 2011). There are currently 100 active unpatented lode mining claims within Township T24N, Range R36E. There is a material community pit near the

Proposed Action area in Township 24N, Range 36E, Section 16, approximately 1.5 miles north of the Lease Area.

3.8.2 Environmental Consequences

The Proposed Action would result in the extraction of gravel from up to three gravel pits in Dixie Valley. Gravel is an abundant resources in the area and the Proposed Action would not impact the availability of gravel for other users. The Proposed Action does not involve any other mineral extraction and would not affect current or anticipated future mineral exploration, extraction, or processing activities beyond the physical impediment presented by project infrastructure (roads, pipelines, drill pads, and appurtenant features).

3.9 VEGETATION

A field survey of the Project Area was conducted in May 2011. The geographic information systems landcover data from the Southwest Regional GAP Analysis Project (SWReGAP) (USGS National Gap Analysis Program 2004) were used as a basis for field verification of vegetation communities.

3.9.1 Affected Environment

In general, the vegetation within the Project Area is fairly homogenous, composed of mainly salt desert shrub, greasewood flat, or playa. Biotic crusts occur in many locations, indicating a lack of prior soil disturbance. However, invasive species such as cheatgrass (*Bromus tectorum*) and halogeton (*Halogeton glomeratus*) occur throughout the Project Area, and cheatgrass is the dominant species in some areas. **Table 8**, SWReGAP Landcover Types within the Project Area, presents the SWReGAP landcover types, landcover description, and associated acreages within the Project Area.

Table 8: SWReGAP Landcover Types within the Project Area

SWReGAP Landcover Type	Landcover Description	Approximate Acres
Inter-Mountain Basins Mixed Salt Desert Scrub	Open-canopied shrublands of typically saline basins, alluvial slopes and plains; substrates are often saline and calcareous, medium- to fine-textured, alkaline soils; vegetation characterized by a typically open to moderately dense shrubland composed of one or more saltbush (*Atriplex*) species; herbaceous layer varies from sparse to moderately dense.	2,130 (~44 acres of which is within gravel pit areas)
Inter-Mountain Basins Playa	Composed of barren and sparsely vegetated playas (generally less than 10% plant cover); salt crusts common, with small saltgrass (*Distichlis s*p.) beds in depressions and sparse shrubs around the margins; intermittently flooded.	1,147
Inter-Mountain Basins Greasewood Flat	Typically occurs near drainages on stream terraces and flats or may form rings around more sparsely	283 (~1 acre of which is within a

Table 8: SWReGAP Landcover Types within the Project Area

SWReGAP Landcover Type	Landcover Description	Approximate Acres
	vegetated playas; typically have saline soils, a shallow water table and flood intermittently, but remain dry for most growing seasons; usually occurs as a mosaic of multiple communities, with open to moderately dense shrublands dominated or co-dominated by greasewood (*Sarcobatus* spp.); often surrounded by mixed salt desert scrub.	gravel pit area)
North American Arid West Emergent Marsh	Frequently or continually inundated, with water depths up to 2 meters. Water levels may be stable or may fluctuate 1 meter or more over the course of the growing season. Vegetation is characterized by herbaceous plants that are adapted to saturate soil conditions, such as rushes (*Juncus* spp.) and cattails (*Typha* spp.)	16
Inter-Mountain Basins Cliff and Canyon	Found from foothill to subalpine elevations and includes barren and sparsely vegetated landscapes (generally <10% plant cover) of steep cliff faces, narrow canyons, and smaller rock outcrops of various igneous, sedimentary, and metamorphic bedrock types. Also included are unstable scree and talus slopes that typically occur below cliff faces. Widely scattered trees and shrubs may include *Abies concolor, Pinus edulis, Pinus flexilis, Pinus monophylla, Juniperus* spp., *Artemisia tridentata, Purshia tridentata, Cercocarpus ledifolius, Ephedra* spp., *Holodiscus discolor*, and other species often common in adjacent plant communities.	0.5 (gravel pit area only)
Source: USGS National Gap Analysis Program 2005		

3.9.2 Environmental Consequences

Impacts to vegetation would be minimized by reseeding all areas of access roads and well pads not required for subsequent energy production using a BLM-approved native seed mixture. Topsoil would be salvaged whenever possible and reused in a timely manner.

Withdrawal of groundwater for flow testing has the potential to affect hydrophytic marsh vegetation that is supported by hot springs in the vicinity of the Project Area by lowering the water table. As described in Section 3.4, Water Resources, a Hydrologic Monitoring Plan would be put in place to confirm the expectation that no impacts to quality, quantity, or temperature of surface water and groundwater occurred as a result of slim well or exploration well installation and testing. Disturbance to marsh vegetation would be avoided to the extent possible.

3.10 INVASIVE, NONNATIVE, AND NOXIOUS WEED SPECIES

3.10.1 Regulatory Environment

3.10.1.1 Federal Noxious Weed Act of 1974

The Federal Noxious Weed Act of 1974 provides for the control and management of nonindigenous weeds that injure or have the potential to injure the interests of agriculture and commerce, wildlife resources, or the public health. The act prohibits importing or moving any noxious weeds identified by the regulation and allows for inspection and quarantine to prevent the spread of noxious weeds.

3.10.1.2 Executive Order 13112, Invasive Species

Signed in 1999, Executive Order 13112 directs federal agencies to prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause. To do this, the executive order established the National Invasive Species Council; currently there are 13 departments and agencies on the council.

3.10.2 Affected Environment

The State of Nevada lists 47 noxious weed species that require control (Nevada Administrative Code 555.10). Of these, tamarisk was observed in several areas within the Project Area. Tamarisk within the Project Area has been treated with pesticides by the BLM to eradicate this invasive species. Cheatgrass and halogeton are invasive species that were observed throughout the Project Area. In particular, small cheatgrass-dominated patches were noted in certain areas.

3.10.3 Environmental Consequences

The Proposed Action has the potential to increase the spread of invasive, nonnative species. Weed seeds can germinate when soils are disturbed by construction activities, particularly where available soil moisture is increased by application of water for dust suppression. Weeds also could be introduced by construction equipment brought to the project from infested areas or by the use of seed mixtures or mulching materials containing weed seeds.

The potential for the Proposed Action to increase the spread of invasive, non-native species would be minimized through the use of BMPs as described in Section 2.1.10.

3.11 MIGRATORY BIRDS

Surveys were completed as described in **Section 3.9**, Vegetation. Migratory birds were noted when seen.

Raptors were surveyed specifically for the presence of nests by examining all rocky outcrops for suitability (e.g., enough vertical exposure), whitewash, and stick nests. Special status species raptors, including golden eagles, are discussed in **Section 3.14**, Special Status Species.

3.11.1 Regulatory Environment

3.11.1.1 Migratory Bird Treaty Act of 1918

The Migratory Bird Treaty Act implements a series of international treaties that provide for migratory bird protection. The Act authorizes the Secretary of the Interior to regulate the taking of migratory birds; the act provides that it shall be unlawful, except as permitted by regulations, "to pursue, take, or kill any migratory bird, or any part, nest or egg of any such bird" (16 USC 703) but does not regulate habitat. The list of species protected by the Act was revised in March 2010, and includes almost all bird species (1,007 species) that are native to the US.

3.11.1.2 Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds

Signed on January 11, 2001, this Executive Order directs each federal agency taking actions that are likely to have a measureable effect on migratory bird populations to develop and implement a Memorandum of Understanding with the USFWS that promotes the conservation of migratory bird populations.

3.11.1.3 Memorandum of Understanding to Promote the Conservation of Migratory Birds

On April 12, 2010, the USFWS and BLM signed this Memorandum of Understanding, pursuant to Executive Order 13186. The purpose of this Memorandum of Understanding is to strengthen migratory bird conservation by identifying and implementing strategies that promote conservation and avoid or minimize adverse impacts on migratory birds through enhanced collaboration between the USFWS and BLM, in coordination with state, tribal, and local governments. This Memorandum of Understanding identifies specific activities where cooperation between the USFWS and BLM will contribute to the conservation of migratory birds and their habitat.

3.11.2 Affected Environment

Based on the habitats observed, numerous migratory bird species have the potential to occur within the Project Area. Eighteen species were observed during field surveys, including black-throated sparrow (*Amphispiza bilineata*), loggerhead shrike (*Lanius ludovicianus*), northern harrier (*Circus cyaneus*), and western kingbird (*Tyrannus verticalis*).

3.11.2.1 Birds of Conservation Concern

Birds of Conservation Concern that could potentially occur within the Project Area are presented in **Table 9**, Birds of Conservation Concern Potentially Occurring within the Project Area. The following Birds of Conservation Concern are considered unlikely to occur based on lack of suitable habitat within the Project Area: tricolored blackbird (*Agelaius tricolor*), American bittern (*Botaurus lentiginosus*), yellow-billed cuckoo (*Coccyzus americanus*), peregrine falcon (*Falco peregrinus*), olive-sided flycatcher (*Contopus cooperi*), northern goshawk (*Accipiter gentilis*), rufous hummingbird (*Selasphorus rufus*), pinyon jay (*Gymnorhinus cyanocephalus*), pygmy nuthatch (*Sitta pygmaea*), flammulated owl (*Otus flammeolus*), spotted owl (*Strix*

occidentalis), greater sage-grouse (*Centrocercus urophasianus*), red-naped sapsucker (*Sphyrapicus nuchalis*), Williamson's sapsucker (*Sphyrapicus thyroideus*), black swift (*Cypseloides niger*), black-throated gray warbler (*Dendroica nigrescens*), Virginia's warbler (*Vermivora virginiae*), willet (*Tringa semipalmata*), Lewis's woodpecker (*Melanerpes lewis*), and white-headed woodpecker (*Picoides albolarvatus*).

Table 9: Birds of Conservation Concern Potentially Occurring within the Project Area

Species	Habitat	Potential for Occurrence
American avocet *Recurvirostra americana*	Shallow marsh with sparse emergent vegetation; large mudflats; dry islands; playa margins	Potential to occur.
Long-billed curlew *Numenius americanus*	Grasslands and irrigated agricultural fields	Potential to occur.
Golden eagle *Aquila chrysaetos*	Variety of open and semi-open landscapes with sufficient mammalian prey base and cliff sites for nesting	Confirmed (see Section 3.14.2).
Prairie falcon *Falco mexicanus*	Nests on cliffs; forages over a variety of shrub habitats, agricultural crops, and native perennial grasses. Avoids dense cheatgrass	Potential to occur. Ample cliffs for nesting and shrublands for foraging. Observed during 2009 surveys.
Northern harrier *Circus cyaneus*	Marshes, meadows, grasslands, and cultivated fields; nests on ground, usually in dense cover	Confirmed. Observed within Project Area during surveys.
Swainson's hawk *Buteo swainsoni*	Usually occurs close to riparian or other wet habitats; forages over agricultural fields, wet meadows, or open shrublands	Confirmed. Observed within Project Area during surveys.
Ferruginous hawk *Buteo regalis*	Grasslands and semi-desert shrublands; nest in isolated trees, on rock outcrops, or ground	Potential to occur.
Costa's hummingbird *Calypte costae*	Desert, shrubland, chaparral	Potential to occur.
Burrowing owl *Athene cunicularia*	Treeless areas with low vegetation and burrows	Potential to occur.
Short-eared owl *Asio flammeus*	Wet meadow or grassland bordered by open shrublands or other dry habitat	Potential to occur.
Wilson's phalarope *Phalaropus tricolor*	Variety of large and small marshes with sufficient shoreline vegetation; ephemeral wetlands and playas for migration	Potential to occur.
Snowy plover *Charadrius alexandrinus*	Alkali flat, mudflat, or flat beach adjacent to permanent or seasonal surface water	Potential to occur.
Loggerhead shrike *Lanius ludovicianus*	Open country with scattered trees and shrubs, desert scrub; nests in shrubs or	Confirmed. Observed within Project Area during surveys.

Table 9: Birds of Conservation Concern Potentially Occurring within the Project Area

Species	Habitat	Potential for Occurrence
	small trees	
Brewer's sparrow *Spizella breweri*	Sagebrush, greasewood, perennial upland grasslands	Potential to occur.
Sage sparrow *Amphispiza belli*	Treeless sagebrush or salt desert shrubland with little or no cheatgrass invasion	Potential to occur.
Gray vireo *Vireo vicinior*	Hot, semi-arid, shrubby habitats	Potential to occur.
Sources: GBBO 2010; NatureServe 2011; Wildlife Action Plan Team 2006		

3.11.2.2 Game Birds Below Desired Condition

The two species of game birds below desired condition that could occur within the Project Area are the mallard and mourning dove. Many mourning doves were observed during the field survey, although no mallards were observed. Game birds below desired condition considered unlikely to occur based on lack of suitable habitat include canvasback (*Aythya valisineria*), ring-necked duck (*Aythya collaris*), wood duck (*Aix sponsa*), band-tailed pigeon (*Columba fasciata*), and northern pintail (*Anas acuta*).

3.11.3 Environmental Consequences

Direct impacts stem from approximately 113 acres of actual habitat that would be disturbed in the Lease Area plus the three gravel pits during the life of the Proposed Action, although effective habitat loss from the disturbance and fragmentation may encompass a larger area for some species. Construction, human activity, and increased noise in the area from construction and drilling could temporarily displace migratory birds from the area. However, large tracts of similar habitat are found adjacent to the Project Area, and migratory birds would likely return to the area after construction.

The Migratory Bird Treaty Act analyzes requirements related to ground-disturbing activities during the migratory bird nesting season. To meet these requirements, habitat for migratory birds would be eliminated within areas of proposed disturbance prior to the nesting season. In the event this elimination measure is not implemented, if ground-disturbing activities do take place during the migratory bird nesting season, migratory bird nest surveys would be conducted early in the nesting season by a qualified biologist acceptable to BLM. This survey would be conducted to identify either breeding adult birds or nest sites within the specific areas to be disturbed. If active nests are present within these areas to be disturbed, TGP would coordinate with BLM to develop appropriate protection measures for these sites, which may include avoidance, construction constraints, and/or the establishment of buffers.

To minimize impacts to migratory birds and other wildlife, in addition to the management practices described above, well pads and roads would be recontoured and reseeded following completion of the Proposed Action as described in Section 2.1.9. Erosion-control measures would be implemented as described in Section 3.5.2. Topsoil would be salvaged and reused whenever possible and in a timely manner.

3.12 WETLANDS/RIPARIAN ZONES

3.12.1 Regulatory Environment

3.12.1.1 Executive Order 11990, Protection of Wetlands

Executive Order 11990 directs federal agencies to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial value of wetlands in carrying out programs affecting land use.

3.12.1.2 Executive Order 11988, Floodplain Management, as amended by Executive Order 12148

This Executive Order directs each federal agency to take action to avoid the long- and short-term adverse impacts associated with the occupancy and modification of floodplains. Agencies are further required to avoid direct or indirect support of floodplain development whenever there is a practicable alternative.

3.12.2 Affected Environment

There are no riparian zones within the Project Area. However, there are two seasonally wet habitat types that occur in the Project Area: Inter-Mountain Basins Playa and North American Arid West Emergent Marsh.

3.12.2.1 Inter-Mountain Basins Playa

The playa community comprises the eastern portion of the Project Area. It is largely unvegetated, with some salt grass (*Distichlis spicata*) growing and salt crusts visible.

3.12.2.2 North American Arid West Emergent Marsh

One area in the southwestern portion of the Project Area is characterized as North American Arid West Emergent Marsh. Within the Project Area, this community is more accurately described as a wet meadow with a small marsh component, as it has a high percent cover of salt grass and small patches of Baltic rush (*Juncus balticus*) and canary reedgrass (*Phragmites australis*). The source of water for the wet meadow is located just west of the Project Area boundary, where there is a spring.

3.12.3 Environmental Consequences

As described in Chapter 2, access roads would be constructed as part of the Proposed Action. Roads and wells would be located and designed to avoid impacts to surface water features such as springs, seeps, ponds, and ephemeral washes to the extent possible.

The release of hazardous materials to the environment could affect wetlands. BMPs to prevent such a release, including development of a construction Stormwater Pollution Prevention Plan and a Spill Prevention, Control, and Countermeasures Plan, are described in Section 3.4.2. Similarly, erosion could affect surface water quality. Erosion-control measures would be

implemented as described in Section 3.5.2. In addition to these measures, measures listed in Section 3.4.2 would avoid or minimize the potential for impacts on wetlands in the area.

3.13 WILDLIFE/KEY HABITAT

Surveys were completed as described in **Section 3.9**, Vegetation. Wildlife were noted when seen, and the SWReGAP was used to field verify the vegetation types within the Project Area.

3.13.1 Affected Environment

Table 10, Typical Wildlife Species Associated with Habitats within Project Area, presents the habitat types within the Project Area and typically associated wildlife species within the Great Basin. Species documented during surveys were characteristic of the habitat types found within the Project Area. Acreages of habitat types are presented in **Section 3.9**, Vegetation.

Table 10: Typical Wildlife Species Associated with Habitats within Project Area

Habitat Type[1]	Associated Species
Inter-Mountain Basins Mixed Salt Desert Scrub	Pronghorn antelope; coyote; pocket mouse; loggerhead shrike; common raven; side-blotched lizard
Inter-Mountain Basins Playa	Pocket gopher; killdeer; American avocet; black-necked stilt
Inter-Mountain Basins Greasewood Flat	Black-tailed jackrabbit; white-tailed antelope squirrel; black-throated sparrow; horned lark; desert horned lizard
North American Arid West Emergent Marsh	Yellow-headed blackbird; marsh wren; spotted sandpiper; bullfrog
[1] Based on SWReGAP landcover types	

3.13.2 Environmental Consequences

Direct impacts to wildlife species stem from disturbance of approximately 113 acres of actual habitat, although effective habitat loss from disturbance and fragmentation may encompass a larger area for some species.

Construction of access roads, installation of wells and extraction of gravel would result in direct loss of habitat. Direct impacts from mortality to smaller, less mobile species could occur during construction and gravel extraction if those species are present. Noise, human presence, and heavy equipment present during construction activities are likely to temporarily displace wildlife that may be present or near the Project Area and could have an indirect effect on wildlife species in the area. These indirect effects could reduce breeding success of species that are sensitive to human activity. These impacts are expected to be temporary and short term for the duration of the proposed construction and drilling activities. Wildlife would be able to return to the disturbed areas upon completion of ground-disturbing activities. No population-level impacts to wildlife species are expected as a result of implementation of the Proposed Action. Because wildlife would likely return to the area after construction is complete and because similar habitat is available near the Project Area, impacts to wildlife are expected to be minor from implementation of the Proposed Action.

3.14 SPECIAL STATUS SPECIES

Surveys were completed as described in **Section 3.9**, Vegetation. Special status species were noted when seen, but species-specific surveys were not conducted.

In addition, an aerial golden eagle survey was conducted for two nearby projects which encompassed a four-mile buffer around the Project Area. Active and inactive nests were mapped using GPS technology.

3.14.1 Regulatory Environment

3.14.1.1 Endangered Species Act

The Endangered Species Act of 1973 (16 USC 1531 et seq.), as amended, provides for the conservation of federally listed plant and animal species and their habitats. The ESA directs federal agencies to conserve listed species and imposes an affirmative duty on these agencies to ensure that their actions are not likely to jeopardize the continued existence of a listed species or adversely modify its designated critical habitat.

Critical habitat is defined in the Endangered Species Act as "the specific areas within the geographical area occupied by the species, …, on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection; and… specific areas outside the geographical area occupied by the species… upon a determination by the Secretary [of the Interior] that such areas are essential for the conservation of the species" (16 USC 1532[5][A]).

3.14.1.2 BLM Manual 6840 – Special Status Species Management

BLM Manual 6840 provides management policy for federally listed species and BLM-designated sensitive species. Species classified as BLM-designated sensitive must be native species found on BLM-administered lands for which the BLM has the capability to significantly affect the conservation status of the species through management, and either:

1. There is information that a species has recently undergone, is undergoing, or is predicted to undergo a downward trend such that the viability of the species or a distinct population segment of the species is at risk across all or a significant portion of the species range; or
2. The species depends on ecological refugia or specialized or unique habitats on BLM-administered lands, and there is evidence that such areas are threatened with alteration such that the continued viability of the species in that area would be at risk.

BLM protects and manages habitat for the enhancement and protection of the species future existence.

3.14.1.3 Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (1940 as amended 1959, 1962, 1972, 1978) prohibits the take or possession of bald and golden eagles with limited exceptions. Take, as defined in the Act, includes "to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or

disturb". "Disturb" means "to agitate or bother a bald or golden eagle to a degree that causes or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding or sheltering behavior."

An important eagle-use area is defined in the Act as an eagle nest, foraging area, or communal roost site that eagles rely on for breeding, sheltering, or feeding, and the landscape features surrounding such nest, foraging area, or roost site that are essential for the continued viability of the site for breeding, feeding, or sheltering eagles.

BLM requires consideration and NEPA analysis of golden eagles and their habitat for all renewable energy projects (BLM Instruction Memorandum No. 2010-156). The BLM Instruction Memorandum on Golden Eagles provides direction for complying with the Act, including its implementing regulations (i.e., Eagle Rule, 50 CFR parts 13 and 22) for golden eagles, and identifying steps that may be necessary within the habitat of golden eagles to ensure environmentally responsible authorization and development of renewable energy resources. The Instruction Memorandum primarily addresses golden eagles because a process to acquire take permits for bald eagles already exists. The Instruction Memorandum is applicable until the USFWS establishes criteria for programmatic golden eagle permits.

3.14.2 Affected Environment

3.14.2.1 Threatened or Endangered Species

No federally listed endangered or threatened species have the potential to occur within the Project Area (USFWS 2011). In addition, no critical habitat for any federally endangered or threatened species has been designated within the Project Area. The USFWS noted that a candidate for ESA listing, greater sage-grouse, could occur in the Project Area (USFWS 2011), although this is unlikely given the lack of sagebrush habitat.

3.14.2.2 BLM Sensitive Species

BLM Sensitive species with the potential to occur within the Project Area are presented in **Table 11**, BLM Sensitive Species Potentially Occurring within the Project Area. The NNHP does not have any recorded special status species within a five kilometer radius around the Project Area (NNHP 2011). In addition, the following BLM sensitive species are considered unlikely to occur based on lack of suitable habitat: northern leopard frog (*Rana pipiens*), northern goshawk, peregrine falcon, long-eared owl (*Asio otus*), flammulated owl, Lewis's woodpecker, red-naped sapsucker, juniper titmouse (*Baeolophus griseus*), pinyon jay, black rosy finch (*Leucosticte atrata*), mountain quail (*Oreortyx pictus*), greater sage-grouse, sandhill crane (*Grus canadensis*), black tern (*Chlidonias niger*), least bittern (*Ixobrychus exilis*), California wolverine (*Gulo gulo*), river otter (*Lontra canadensis*), western white-tailed jackrabbit (*Lepus townsendii*), pygmy rabbit (*Brachylagus idahoensis*), California floater (*Anodonta californiensis*), Hardy's aegialian scarab (*Aegialia hardyi*), Sand Mountain aphodius scarab (*Aphodius* sp.), Sand Mountain serican scarab (*Serica psammobunus*), Sand Mountain blue (*Euphilotes pallescens arena montana*), wind-loving buckwheat (*Eriogonum anemophilum*), and oryctes (*Oryctes nevadensis*).

Table 11: BLM Sensitive Species Potentially Occurring within the Project Area

Species	Habitat	Potential for Occurrence
Plants		
Nevada dune beardtongue *Penstemon arenarius*	Deep, volcanic, sandy soils; common associates include fourwing saltbush, littleleaf horsebrush, and greasewood	Potential to occur, though not observed during surveys.
Lahontan beardtongue *Penstemon palmeri* var. *macranthus*	Along washes, roadsides, and canyon floors, particularly on carbonate-containing substrates, usually where subsurface moisture is available throughout most of the summer.	Potential to occur, though not observed during surveys.
Invertebrates		
Pallid wood nymph *Cercyonis oetus pallescens*	Alkaline flats	Potential to occur.
Carson valley wood nymph *Cercyonis pegala carsonensis*	Wet meadows	Potential to occur.
Great Basin small blue *Philotiella speciosa septentrionalis*	Unknown	Unknown.
Birds		
Golden eagle *Aquila chrysaetos*	Variety of open and semi-open landscapes with sufficient mammalian prey base and cliff sites for nesting	Confirmed.
Ferruginous hawk *Buteo regalis*	Grasslands and semi-desert shrublands; nest in isolated trees, on rock outcrops, or ground	Potential to occur.
Prairie falcon *Falco mexicanus*	Nests on cliffs; forages over a variety of shrub habitats, agricultural crops, and native perennial grasses. Avoids dense cheatgrass	Potential to occur. Ample cliffs for nesting and shrublands for foraging.
Swainson's hawk *Buteo swainsoni*	Usually occurs close to riparian or other wet habitats; forages over agricultural fields, wet meadows, or open shrublands	Confirmed. Observed within Project Area during surveys.
Burrowing owl *Athene cunicularia*	Treeless areas with low vegetation and burrows	Potential to occur.
Loggerhead shrike *Lanius ludovicianus*	Open country with scattered trees and shrubs, desert scrub; nests in shrubs or small trees	Confirmed. Observed within Project Area during surveys.
Vesper sparrow *Pooecetes gramineus*	Plains, prairie, dry shrublands, savanna, weedy pastures, fields, sagebrush, arid scrub, and woodland clearings	Potential to occur.

Table 11: BLM Sensitive Species Potentially Occurring within the Project Area

Species	Habitat	Potential for Occurrence
Gray vireo *Vireo vicinior*	Hot, semi-arid, shrubby habitats	Potential to occur.
Snowy plover *Charadrius alexandrinus*	Alkali flat, mudflat, or flat beach adjacent to permanent or seasonal surface water	Potential to occur.
Long-billed curlew *Numenius americanus*	Grasslands and irrigated agricultural fields	Potential to occur.
Mammals		
Western pipistrelle bat *Pipistrellus hesperus*	Deserts and lowlands, desert mountain ranges, desert scrub flats, and rocky canyons	Potential foraging habitat.
Pallid bat *Antrozous pallidus*	Arid deserts and grasslands, often near rocky outcrops and water	Potential foraging habitat.
Spotted bat *Euderma maculatum*	Various habitats from desert to montane, including canyon bottoms, and open pastures	Potential foraging habitat.
Silver-haired bat *Lasionycteris noctivagans*	Prefers forested areas adjacent to lakes, ponds, and streams	Potential foraging habitat.
Townsend's big-eared bat *Corynorhinus townsendii*	Maternity and hibernation colonies typically in caves and mine tunnels	Potential foraging habitat.
Big brown bat *Eptesicus fuscus*	Various wooded and semi-open habitats including cities	Potential foraging habitat.
Hoary bat *Lasiurus cinereus*	Prefers deciduous and coniferous forests and woodlands	Potential foraging habitat.
Brazilian free-tailed bat *Tadarida brasiliensis*	Roosts primarily in caves	Potential foraging habitat.
Long-eared myotis *Myotis evotis*	Mostly forested areas; also shrubland, along wooded streams, over reservoirs	Potential foraging habitat.
Fringed myotis *Myotis thysanodes*	Desert, grassland, and wooded habitats	Potential foraging habitat.
California myotis *Myotis californicus*	Western lowlands; canyons, riparian woodlands, desert scrub, and grasslands	Potential foraging habitat.
Small-footed myotis *Myotis ciliolabrum*	Desert, badland, and semi-arid habitats	Potential foraging habitat.
Little brown myotis *Myotis lucifugus*	Adapted to using human-made structures; also uses caves and hollow trees	Potential foraging habitat.

Table 11: BLM Sensitive Species Potentially Occurring within the Project Area

Species	Habitat	Potential for Occurrence
Long-legged myotis *Myotis volans*	Primarily in montane coniferous forests; also in riparian and desert habitats	Potential foraging habitat.
Desert bighorn sheep *Ovis canadensis nelsoni*	Steep slopes on or near mountains with a clear view of surrounding area	Suitable habitat within the Stillwater Range adjacent to Project Area.
Source: BLM 2010; GBBO 2010; NatureServe 2011; Wildlife Action Plan Team 2006		

3.14.2.3 Plants

Two BLM sensitive plant species could potentially occur within the Project Area based on literature reviews and habitat assessment. Generally, the habitats within the Project Area are not sandy enough for the Nevada dune beardtongue, but based on the habitat associations for this species, the species could occur. Neither species was observed during the field survey; in fact, no *Penstemon* species were observed. The NNHP indicated that potential habitat exists for Candelaria blazingstar (*Mentzelia candelariae*), which is not a BLM sensitive species, but is considered at-risk by the NNHP. This species has not been recorded within the Project Area (NNHP 2011).

3.14.2.4 Invertebrates

Three BLM sensitive invertebrate species (see Table 11) could potentially occur within the Project Area based on literature reviews and habitat assessment. Little published literature is available regarding the ecology of these species, which makes the likelihood of occurrence determination uncertain.

3.14.2.5 Raptors

Golden Eagle

Stick nests or whitewash were not observed during the ground survey, but were noted in the aerial survey data. Suitable nesting habitat for golden eagles occurs throughout the Stillwater Range bounding Dixie Valley, as this range has rock outcrops with expansive views of the surrounding territory. Three active and eight inactive nests were recorded in the Stillwater Range in the vicinity of the project. The Dixie Valley provides habitat for golden eagle prey, such as rabbits, hares (e.g., jack rabbits), and ground squirrels. In addition, golden eagles have been reported at the existing TGP Dixie Valley power plant about 3 miles north of the Project Area.

Burrowing owl

Burrowing owls rely on other species to construct burrows for shelter and nesting. Within the Project Area, limited suitable burrow opportunities were observed, although some coyote dens and other burrows were noted during field surveys. No burrow examined had characteristic scat or pellets usually found with burrowing owl use.

Swainson's hawk

Swainson's hawk was observed foraging within the Project Area, although suitable nesting habitat is not present.

Other raptors

Ferruginous hawk and prairie falcon could occur within the Project Area, as there are suitable rock outcrops for nesting in the Stillwater Range, and shrublands for foraging. These species were not observed during field surveys.

3.14.2.6 Other Avian Species

Loggerhead shrike was observed within the Project Area during surveys, and potential nesting habitat is present. Other potentially occurring species include vesper sparrow, gray vireo, snowy plover, and long-billed curlew.

3.14.2.7 Mammals

Bats

Potential foraging habitat exists throughout the Project Area for the fourteen BLM Sensitive bat species listed in Table 11. No bats were observed during the field survey, and no potential maternity or hibernation habitats were observed within the Project Area. Some bats (e.g., pallid bat, California myotis, and small-footed myotis) may use rock outcrops within the nearby Stillwater Range. There are also some caves and adits within the Stillwater Range that could be used by bats.

Bighorn sheep

Bighorn sheep have been recorded within the Stillwater Range (BLM 2010) and thus could utilize the Project Area for foraging on grass, forbs, and shrubs and connection to the Tobin Range, which is also occupied habitat. Water is available at Dixie Meadows to the south of the Project Area. Bighorn sheep were not observed during the field survey.

3.14.3 Environmental Consequences

3.14.3.1 Threatened or Endangered Species

Because no threatened or endangered species were observed during field surveys or are known to exist in the Project Area, there would be no impacts to threatened or endangered species from the Proposed Action (USFWS 2011).

3.14.3.2 BLM Sensitive Species

No sensitive bat roosting habitat, rare plants, or sensitive invertebrate species are expected to be disturbed due to implementation of the Proposed Action. However, indirect impacts could occur, as approximately 113 acres of habitat would be disturbed in the Project Area during the life of

the Proposed Action. Effective habitat loss from the disturbance and fragmentation may encompass a larger area for some bat species. Bat species in the area are insectivorous and it is not expected that insect populations would be adversely affected by construction activities. There are large tracts of similar habitat in the vicinity of the Project Area for bats to forage; therefore, no impacts to sensitive bat species are anticipated.

In the Project Area (including the gravel pit areas), BLM sensitive avian species (including golden eagle, Swainson's hawk and loggerhead shrike) would lose approximately 113 acres of habitat as a result of the Proposed Action. Effective habitat loss from disturbance and fragmentation may encompass a larger area for some avian species. Indirect effects from noise and increased human activity could temporarily displace and reduce breeding success of these sensitive avian species; however, the species would be able to return to the disturbed areas upon completion of ground-disturbing activities. No population-level impacts to the sensitive avian species are expected as a result of implementation of the Proposed Action. Because sensitive avian species would likely return to the area after construction is complete and because similar habitat is available near the Project Area, impacts to sensitive avian species are expected to be minor from implementation of the Proposed Action. There are large tracts of similar habitat in the vicinity of the Project Area; therefore, no impacts to BLM sensitive avian species are anticipated.

The Proposed Action would result in a short-term loss of golden eagle foraging habitat for the duration of the project. While the project site does not support golden eagle nesting habitat, it is expected that golden eagles could forage within the project site throughout the year. Due to the size of the project compared to available foraging habitat, population-level effects on golden eagles in the region are unlikely. As a result, geothermal exploration is not expected to result in take or disturbance of golden eagles as defined under the Bald and Golden Eagle Protection Act. The proposed action would be in compliance with the Bald and Golden Eagle Protection Act.

As discussed in Section 2.1.10, components of the Proposed Action that would result in direct habitat loss within migratory bird nesting habitat would either occur prior to the nesting season or nest surveys would be conducted by a qualified biologist acceptable to the BLM prior to implementation. If nests are found, coordination with the BLM would occur to develop appropriate protection measures, which may include avoidance, timing constraints, and/or buffers. The proposed action would be in compliance with the Migratory Bird Treaty Act.

Bighorn sheep habitats within the Stillwater Range are not anticipated to be disturbed by construction or drilling activities because drilling and road construction would not occur in these areas. Therefore, no impacts to bighorn sheep are expected as a result of the implementation of the Proposed Action.

3.15 CULTURAL RESOURCES

Cultural resources include historic and prehistoric sites of interest and may include structures, archaeological sites, or religious sites of importance to Native American cultures. Section 106 of the National Historic Preservation Act as amended (16 USC 40 et seq.) requires federal 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). Archaeological and historic resources are "the

physical evidences of past human activity, including evidences of the effects of that activity on the environment. What makes a cultural resource significant is its identity, age, location, and context in conjunction with its capacity to reveal information through the investigatory research designs, methods, and techniques used by archeologists." Ethnographic resources are defined as any "site, structure, object, landscape, or natural resource feature assigned traditional legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it" (NPS 1998).

3.15.1 Affected Environment

The basic cultural chronology of the western Great Basin includes the Pre-Archaic and Archaic Periods (Elston 1986). More detailed background information for the prehistoric, historic, and ethnographic resources found in the area can be found in the cultural resources report conducted for the Coyote Canyon Geothermal Utilization Project (Young and Garner 2009). Below is a very brief summary of 12,000 years of human occupation in western Nevada.

The Pre-Archaic period is defined by artifacts including Clovis and Folsom fluted lanceolate projectile points and Lake Mojave lanceolate projectile points. Reliance on big game hunting dominated the Pre-Archaic subsistence strategy. The main indicator of the shift to the Archaic period is a change to a broader strategy focused on hunting and gathering of resources. Projectile points became smaller and more suited for hunting smaller game, although they were still mounted on the ends of a dart or spear, and there was an increase in the number and type of stone grinding implements used for plant and seed processing. Material culture diversified greatly with the contemporaneous introduction of pottery and the bow and arrow with smaller projectile points. By around A.D. 1200, an expansion of Numic-speaking peoples into the area seems to have replaced or displaced the previous inhabitants (Bettinger and Baumhoff 1982). Archaeologically, the primary material culture of the Numic includes Intermountain Brownware pottery and Desert Side Notched and Cottonwood Triangular arrow points. The subsistence strategy appears to have shifted back to a focus on hunting and gathering, although there is some evidence of at least limited reliance on horticulture. The Numic-speaking peoples, including the Northern Paiute, were the occupants of the Great Basin upon the initial arrival of Europeans and their influences.

Recent cultural resources investigations of the area included a Class I literature review of both State of Nevada and BLM Carson City field office cultural resources files and a Class III pedestrian inventory of the Coyote Canyon project area to the north. For this current project area, a 3,386-acre Class III cultural resources inventory was conducted in April 2011 (Lennon 2011). The results of the survey have been analyzed in conjunction with the previous inventories.

The April 2011 survey area was not previously inventoried for cultural resources. Results from the survey included four previously recorded sites identified within a 1-mile buffer of the Project Area (Hause 1994). All of these sites are prehistoric. One of the sites was identified as eligible for listing to the NRHP, two were identified as not eligible, and one was not evaluated for eligibility.

Additionally, 26 newly recorded sites were identified. Of these 26 sites, 16 are historic, six are prehistoric and four are multi-component sites. Five of the historic sites are military related from

the World War II era. The remaining historic sites are from the modern era and attributed to road-side dumping, consisting of domestic and/or construction materials. The six prehistoric sites and prehistoric component of the multi-component sites belong to the Middle to Late Archaic/Late Prehistoric time period.

Two of the prehistoric sites and two of the multi-component sites have been determined to be eligible for listing to the NRHP based on the potential to yield data that would contribute to the understanding of the prehistoric occupation of the area. All recommendations for site eligibility for listing on the NRHP are based on preliminary field recommendations and are subject to review and possible changes during BLM and State Historic Preservation Office (SHPO) consultations.

Thirty-seven isolated finds were also recorded. Ten of those finds are prehistoric, most likely from the Middle to Late Archaic/Late Prehistoric periods. Twenty-seven are historic, mostly early to mid-20th century, with some finds identified as being from the late 19th century.

The three 15-acre gravel extraction areas were surveyed by BLM archaeologist Jason Wright in August 2012. The results were negative and no historic properties were found.

3.15.2 Environmental Consequences

The Proposed Action currently has the potential to impact six archeological sites recommended as eligible for NRHP listing within the project area. To avoid impacts, the Proposed Action would implement the proposed mitigation measures identified in Section 2.1.10 and avoid archeological sites recommended eligible for NRHP listing.

Consultation with the SHPO on Determinations of Eligibility and Finding of Effect for cultural resources located within the Proposed Action area is ongoing. Construction and operation of the Proposed Action would avoid all known resources identified during the survey activities in accordance with the State Protocol Agreement between the BLM and the SHPO for Implementing the National Historic Preservation Act, 2009, Appendix G., Sections A and B (BLM and SHPO 2009).

Implementation of the Proposed Action also has the potential to affect undiscovered or subsurface resources.

Based on the avoidance of known sites and the established protocol for the discovery of any new site, there would be no impact on cultural resources.

3.16 NATIVE AMERICAN RELIGIOUS CONCERNS

3.16.1 Affected Environment

Consultation was initiated with the Fallon Paiute-Shoshone Tribe on September 15th 2009, for the original Coyote Canyon Geothermal Exploration Project, covering the area directly adjacent (to the north) of the Proposed Action. Correspondence included a description of the Proposed Action, cultural resource reports, and a map. This letter was followed by face-to-face meetings

between the BLM Stillwater Field Office Manager and the Tribe on August 25th 2010, October 26th 2010 and April 27th 2011.

Additional face-to-face meetings were held between BLM Stillwater Field Office archaeologists and the Tribe on September 15th 2010, December 22nd 2010, and May 25th 2011, and included a field trip to the project area on September 28th 2010.

3.16.2 Environmental Consequences

Consultation regarding the Proposed Action area between the BLM and federally recognized Native American tribes is ongoing. During consultation for the Proposed Action, cultural resources including historic properties and other resources were identified and potentially may be affected by the Proposed Action.

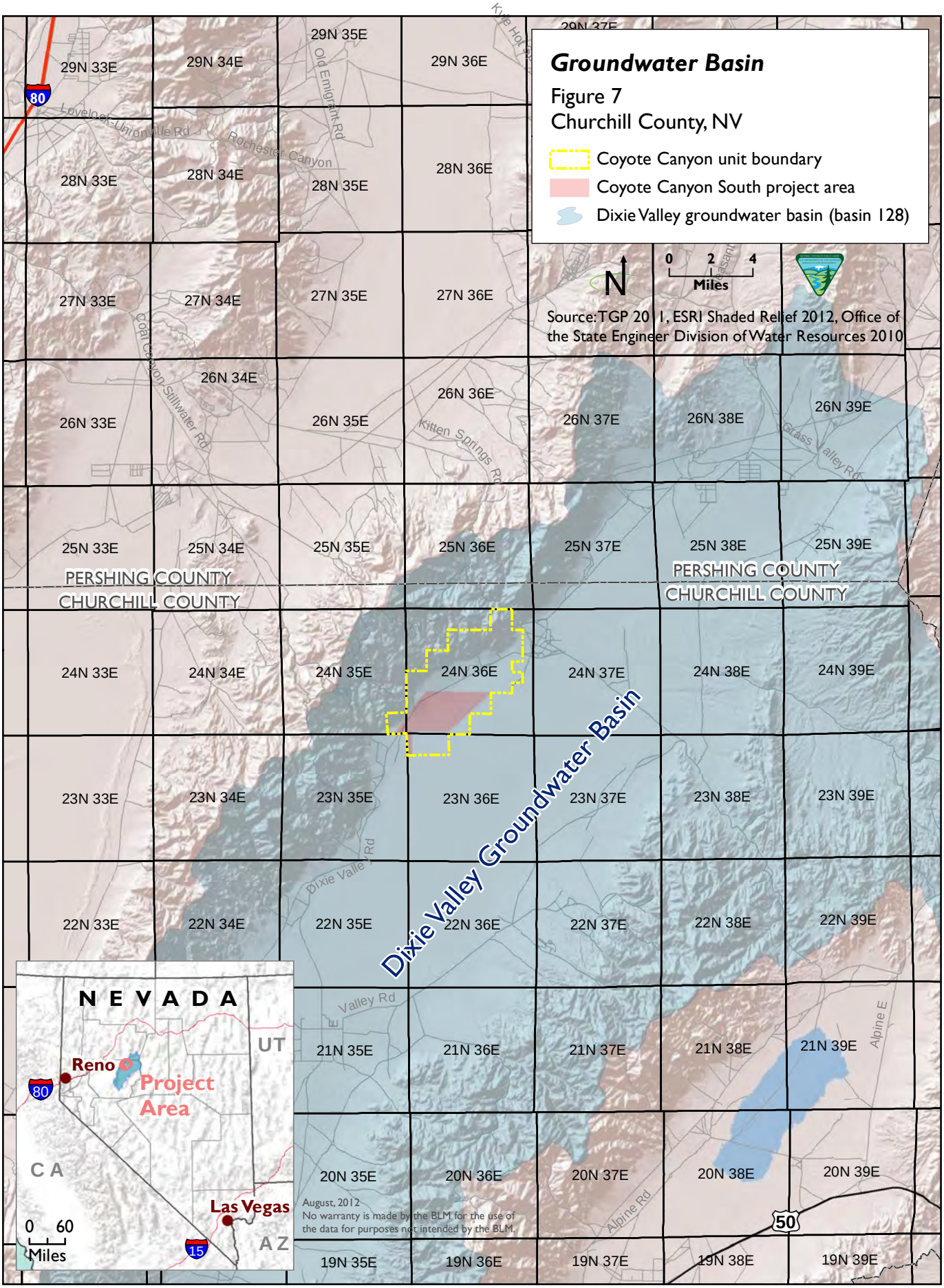
Archaeological sites can and would be avoided through project design. If human remains are identified during construction of any of the components of the Proposed Action, work within 300 feet of the discovery would be stopped and the remains would be protected from further exposure or damage. If the remains are determined to be Native American, the agencies would follow the procedures set forth in 43 CFR Part 10, Native American Graves Protection and Repatriation Regulations. No other concerns have been raised by any of the tribes to date, however consultation is ongoing.

3.17 NO ACTION ALTERNATIVE

Project features would not be constructed under the No Action Alternative. Therefore, none of the resources described in Chapter 3 would be affected by the Proposed Action.

3.18 RESIDUAL IMPACTS

Solid waste would be generated as a result of the Proposed Action, resulting in residual impacts. The waste would be disposed in approved, permitted disposal facilities. Impacts to vegetation and soils would be mitigated by interim and final reclamation process. Impacts to wildlife, including migratory birds and sensitive species, would be temporary. The potential introduction of invasive, non-native species as a result of the Proposed Action would be minimized through the use of BMPs but some potential for the spread of nonnative species could remain once all reclamation procedures have been completed.


Groundwater Basin
Figure 7
Churchill County, NV
Coyote Canyon unit boundary
Coyote Canyon South project area
Dixie Valley groundwater basin (basin 128)
N
0 2 4
Miles
Source: TGP 2011, ESRI Shaded Relief 2012, Office of the State Engineer Division of Water Resources 2010
29N 33E
29N 34E
29N 35E
29N 36E
28N 33E
28N 34E
28N 35E
28N 36E
27N 33E
27N 34E
27N 35E
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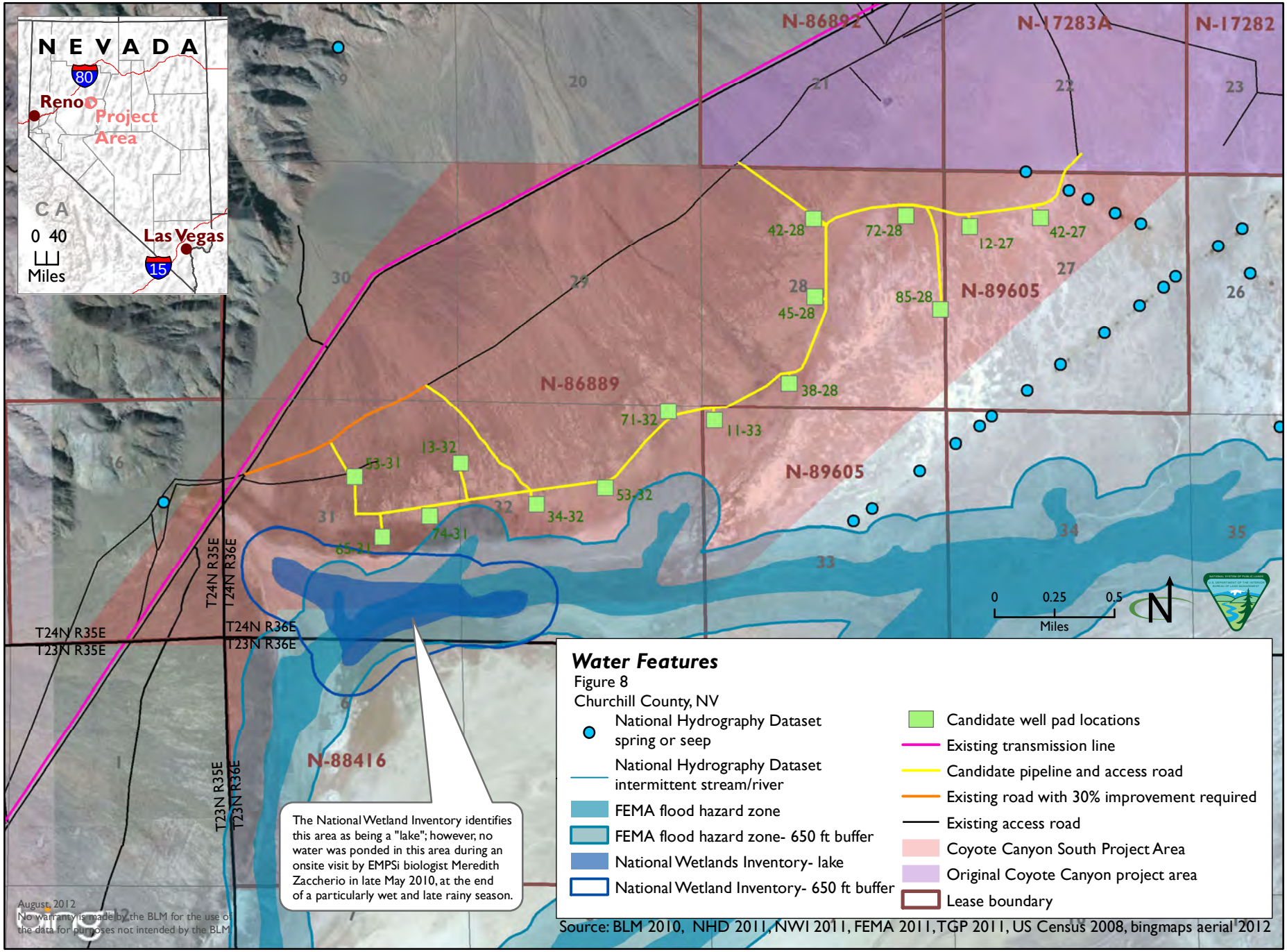
20N 36E
20N 37E
20N 38E
20N 39E
19N 35E
19N 36E
19N 37E
19N 38E
19N 39E
Dixie Valley Groundwater Basin
Old Emigrant Rd
Lovelock-Unionville Rd
Rochester Canyon
Coal Canyon-Stillwater Rd
Kitten Springs Rd
Grass Valley Rd
Dixie Valley Rd
Valley Rd E
Alpine E
Alpine Rd
80
50
NEVADA
UT
CA
AZ
Reno
Las Vegas
Project Area
0 60
Miles
August, 2012
No warranty is made by the BLM for the use of the data for purposes not intended by the BLM.


NEVADA
80
Reno
Project Area
CA
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Miles
Las Vegas
15
N-86892
N-17283A
N-17282
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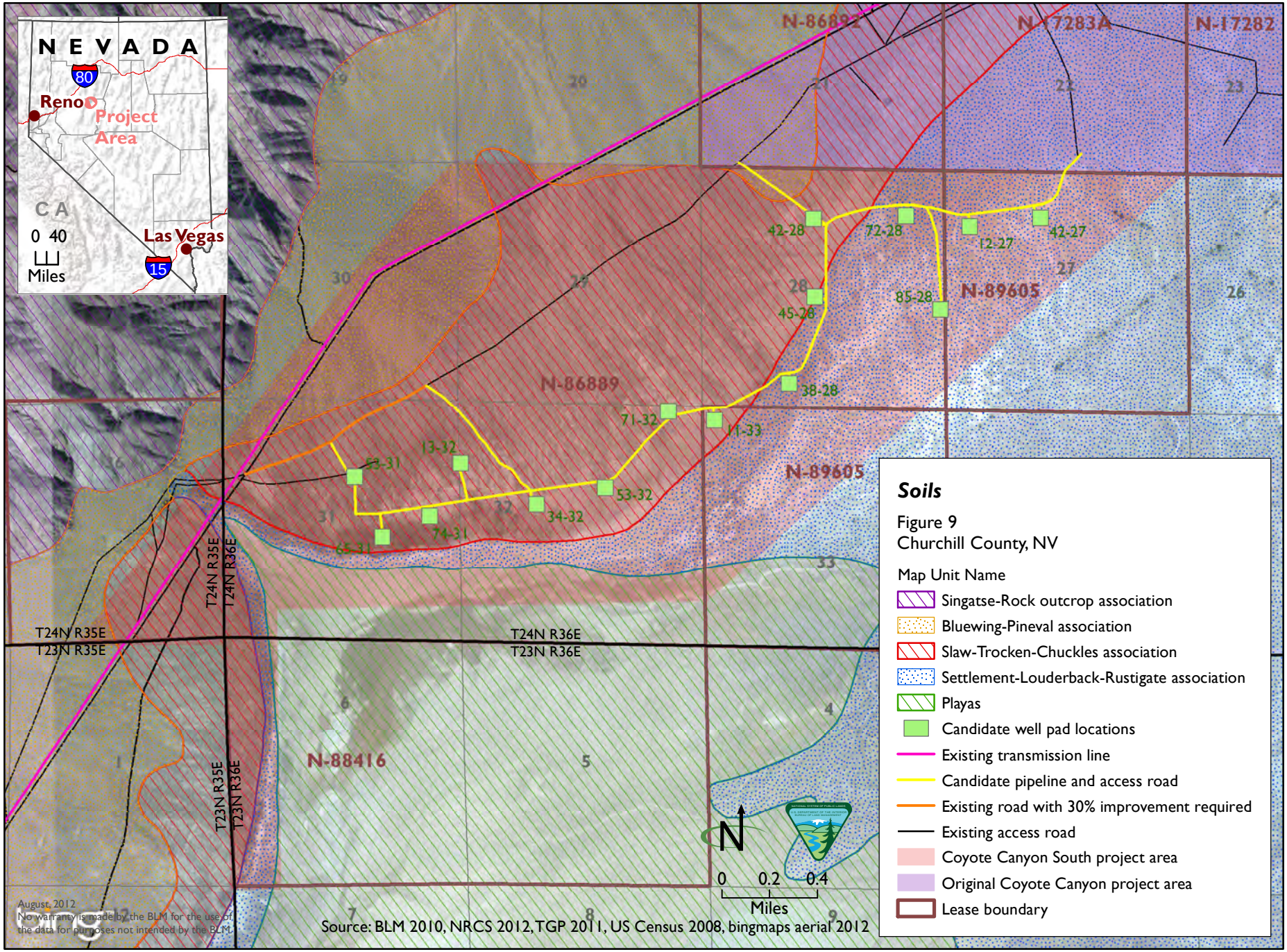
N-86889
N-88416
42-28
72-28
12-27
42-27
28
45-28
85-28
38-28
71-32
11-33
13-32
53-31
53-32
34-32
74-31
65-31
T24N R35E
T23N R35E
T24N R36E
T23N R36E
0 0.25 0.5
Miles
The National Wetland Inventory identifies this area as being a "lake"; however, no water was ponded in this area during an onsite visit by EMPSi biologist Meredith Zaccherio in late May 2010, at the end of a particularly wet and late rainy season.
Water Features
Figure 8
Churchill County, NV
National Hydrography Dataset spring or seep
National Hydrography Dataset intermittent stream/river
FEMA flood hazard zone
FEMA flood hazard zone- 650 ft buffer
National Wetlands Inventory- lake
National Wetland Inventory- 650 ft buffer
Candidate well pad locations
Existing transmission line
Candidate pipeline and access road
Existing road with 30% improvement required
Existing access road
Coyote Canyon South Project Area
Original Coyote Canyon project area
Lease boundary
August, 2012
No warranty is made by the BLM for the use of the data for purposes not intended by the BLM.
Source: BLM 2010, NHD 2011, NWI 2011, FEMA 2011, TGP 2011, US Census 2008, bingmaps aerial 2012


NEVADA
80
Reno
Project Area
CA
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Las Vegas
15
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45-28
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38-28
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11-33
13-32
53-31
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34-32
74-31
65-31
N-86889
N-89605
T24N R35E
T24N R36E
T23N R35E
T23N R36E
N-88416
N
0 0.2 0.4
Miles
August, 2012
No warranty is made by the BLM for the use of the data for purposes not intended by the BLM.
Source: BLM 2010, NRCS 2012, TGP 2011, US Census 2008, bingmaps aerial 2012
Soils
Figure 9
Churchill County, NV
Map Unit Name
Singatse-Rock outcrop association
Bluewing-Pineval association
Slaw-Trocken-Chuckles association
Settlement-Louderback-Rustigate association
Playas
Candidate well pad locations
Existing transmission line
Candidate pipeline and access road
Existing road with 30% improvement required
Existing access road
Coyote Canyon South project area
Original Coyote Canyon project area
Lease boundary

4.0 CUMULATIVE EFFECTS

Cumulative Impacts are defined by the CEQ in 40 CFR 1508.7 as "impacts on the environment which result from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions." Cumulative impacts can result from individually minor but collectively significant actions taking place over time. The analysis area for the cumulative impact analysis is the same as the analysis area for each resource found in Chapter 3.

4.1 PAST AND PRESENT ACTIONS

Current land use activities in the vicinity include geothermal energy production, military operations, dispersed casual recreation, hunting units 182 and 183 (mule deer and desert bighorn sheep in particular), and livestock grazing. In the past, mining claims were active in the vicinity, but no mining activities are currently known. A BLM ROW planning corridor exists within Dixie Valley with the express purpose of providing an outlet for geothermal power to be produced in the valley (BLM 2001). Currently, there is a transmission line within this corridor, and the 62-megawatt Dixie Valley Power Plant has been producing energy for more than 20 years. Multiple geothermal leases are currently authorized and geothermal exploration is permitted in the original Coyote Canyon area directly to the north of the Project Area, as well as in Dixie Meadows to the south. A power plant and well field development has also been approved in the Coyote Canyon lease area.

4.2 REASONABLY FORESEEABLE FUTURE ACTIONS

Reasonably foreseeable future actions constitute those actions that are known or could reasonably be anticipated to occur within the analysis area for each resource, within a time frame appropriate to the expected impacts from the Proposed Action. For the Proposed Action, the time frame for potential future actions is reasonably assumed to be 3 years. Reasonably foreseeable future actions include dispersed recreation, including off-highway vehicle use and hunting; continued geothermal energy production from the Dixie Valley Power Plant; and geothermal exploration and development in the original Coyote Canyon area as well as in Dixie Meadows. There are plans by Churchill County to obtain water from the Dixie Valley groundwater basin.

4.3 CUMULATIVE IMPACTS

Cumulative impacts are discussed below for those resources that had anticipated impacts described in Chapter 3.

4.3.1 Air Quality

Air quality impacts from the Proposed Action would consist only of temporary impacts during well construction, including fugitive dust from gravel extraction, construction vehicles and hydrogen sulfide emissions during well testing. If gravel extraction or well installation activities are performed concurrently at other sites, the Proposed Action could contribute to a cumulative temporary increase in fugitive dust and hydrogen sulfide emissions. These impacts would be minimized through the use of the BMPs described in Section 3.2.3.

4.3.2 Water Quality

When combined with other current and potential future area activities, such as other geothermal development, there would be an increased potential for impacts to surface water and groundwater quality. Potential impacts to groundwater quality would be minimized through the use of BMPs for well construction. Percolation of geothermal fluids from well testing could have a temporary local impact on groundwater quality and water levels. Potential impacts to surface water would be temporary and local, and would be minimized through the use of BMPs.

4.3.3 Visual Resources

Visual impacts from the Proposed Action would be limited and would occur primarily during the construction process. If other geothermal exploration activities in the original Coyote Canyon lease area were to take place at the same time, the Proposed Action could contribute to a temporary cumulative impact on visual resources. This contribution would be largely limited to the duration of construction when drill rigs are present onsite because any remaining structures would be low-level and not visible from a distance.

4.3.4 Biological Resources

The Proposed Action would have impacts on biological resources. Vegetation and habitat would be disturbed and removed, and invasive, non-native plant species may spread as a result of the Proposed Action. The maximum disturbance associated with the Proposed Action of 113 acres would combine with the disturbances estimated for the original Coyote Canyon exploration project of 73 acres and the Coyote Canyon development project of 61 acres, for a total cumulative impact area of up to 247 acres. Other development in the area may also remove vegetation and increase growth of invasive species. However mitigation measures including reseeding of disturbed areas, monitoring and treatment of invasive species would reduce potential impacts. Wildlife habitat, including habitat for migratory birds and BLM sensitive species, could be disturbed or removed due to other development in the area. Human activity and noise could displace wildlife to surrounding areas. However, similar abundant habitat is found in the area and region, and reseeding of disturbed areas could re-establish wildlife habitat. Overall, the Proposed Action would have a negligible contribution to cumulative effects on biological resources within the analysis area.

4.3.5 Cultural Resources

Class III cultural resource investigations of the area adjacent to the Project Area were conducted in July 2009 (Young and Garner 2009), June 2010 (Spurling et al 2011), and September 2010 (Spurling et al 2011). Portions of the Project Area and adjacent areas were surveyed for cultural resources, either by Far Western (Young and Garner 2009), SWCA Environmental Consultants (Spurling 2010), or by other recent investigations in the area for small geothermal exploration or testing projects (McGuire 1993).

The types of impacts noted to affect cultural resources are common for many surface disturbing activities; whenever an activity breaks the surface, there is the possibility for discovering new sites that would contribute to the historic record for a region. All of the new sites noted for this project as well as past projects have contributed to enriching the region's history and our

understanding of the past. New sites discovered as a result of this project or other projects in the surrounding area would also contribute to the scientific database and context of the region.

Additionally, surface activities from past, present and future activities, regardless of the jurisdiction in which they occur, could impact cultural resources through damage or destruction of artifacts and/or features. Once lost, whether through loss of scientific knowledge and context or actual damage to the artifact(s), the loss is irretrievable and permanent. However, actions that occur under the BLM's jurisdiction have numerous mitigation measures available in order to avoid or lessen these impacts; activities occurring in other jurisdictions may or may not have similar measures. The more protections available to prevent damage to artifacts and loss of scientific knowledge would lessen the overall cumulative impact from surface disturbing activities.

4.3.6 Native American Concerns

Much of the state of Nevada is part of the traditional Paiute and Western Shoshone lands occupied for centuries before Europeans arrived, and the land maintains cultural significance for the Fallon Paiute-Shoshone tribe and other tribal communities. Over the last couple of decades more activities have begun encroaching on what has been a largely unpopulated and pristine environment. Increases in livestock grazing, oil and gas exploration, geothermal exploration and development, mining, and recreational activities such as OHV, hunting and fishing, hiking, and mountain biking have become more common in the vicinity. These multiple uses, and the increased frequency of them, contribute to the overall decline in cultural resource sites and traditional cultural properties significant to the spiritual or cultural identities of the Native American Tribes.

In order to minimize the potential cumulative contribution of the Proposed Action to impacts such as these, BLM Stillwater Field Office and the Fallon Paiute-Shoshone Tribe and other tribal groups need to maintain an open and honest dialog in managing public lands. All interested parties need to remain flexible in their approach to making decisions on how to administer the multiple activities taking place on public lands. Through productive communications and understanding the needs of the other parties, the decisions made on how to manage the land can reduce or eliminate impacts to any party's interests on public lands.

4.3.7 No Action Alternative

Under the No Action Alternative, the project site would not be explored for geothermal resources at this time and would be available for development in the future. There would be no impacts to any of the identified resources or activities from implementation of the No Action Alternative.

All resource values have been evaluated for cumulative impacts. It has been determined that cumulative impacts would be negligible as a result of the Proposed Action or No Action Alternative.

5.0 CONSULTATION AND COORDINATION

5.1 AGENCIES, GROUPS, AND INDIVIDUALS CONTACTED

Table 12, Agencies, Groups, and Individuals Contacted, presents the individuals contacted for the preparation of the original Coyote Canyon project directly to the north. Since the Proposed Action is nearly identical to the originally proposed project, is being proposed as an expansion to that original exploration plan, and since the location is directly adjacent to the original project with no additional resource issues identified, separate consultation and coordination during the scoping phase of the project was determined to be unnecessary prior to the release of the Draft EA. All agency feedback on that original project was incorporated into this EA.

Table 12: Agencies, Groups, and Individuals Contacted

Name	Agency	Project Expertise
Jeryl Gardner	Bureau of Water Pollution Control, NDEP	Water Resources
Kristine Hansen	USACE, Reno District Office	Wetlands and Waters of the U.S.
Karen Clementsen	USACE, Reno District Office	Wetlands and Waters of the U.S.
Tom McKay	Natural Resource Conservation Service	Soils
Melissa Marr	Nevada Division of Water Resources (DWR)	Water Resources
Ken Haffey	Nevada Division of Water Resources (DWR)	Water Resources
Commanding Officer	NAS Fallon	Air Space
Alvin Moyle	Chairman Fallon Paiute Shoshone Tribe	Native American Consultation
Rochanne Downs	Vice Chairperson Fallon Paiute Shoshone Tribe	Native American Consultation
Richard Black	Fallon Paiute Shoshone Tribe	Native American Consultation

5.2 PUBLIC INVOLVEMENT

Comments were accepted on the Environmental Assessment, TGP Dixie Development Company, LLC, Coyote Canyon South Geothermal Exploration Project, DOI-BLM-NV-C0110-2012-0051 EA, for a 30-day period from September 24, 2012, until October 24, 2012. Hard copies of the EA were available at the Carson City District Office.

Comments were received from the Nevada Department of Environmental Protection, Bureau of Water Pollution Control; Nevada Department of Transportation; Nevada Department of Wildlife; Nevada Division of State Lands and the State Land Use Planning Agency; Nevada State Historic Preservation Office; and US Environmental Protection Agency. As summarized in **Appendix D**, all comments were reviewed, considered, and minor changes were made to the content of the Final EA.

The Final EA is posted at:

http://www.blm.gov/nv/st/en/fo/carson_city_field/blm_information/nepa.html (note: click the "Click here to access the NEPA archive" link to be redirected to the Final EA).

5.3 LIST OF PREPARERS

Table 13, List of Preparers, presents the individuals who contributed to the preparation of this EA. Much of the analysis presented in this EA was identical to the original EA for exploration at Coyote Canyon, and so substantial portions of text from that analysis were used. The original Coyote Canyon Exploration EA was prepared by CH2M HILL.

Table 13: List of Preparers

Name	Title	Project Expertise
BLM Stillwater Field Office		
Ed Klimasauskas	Geologist	PM
Linda Appel	Rangeland Management Specialist	Air Quality, Floodplains, Wetlands/Riparian Zones
Jill Devaurs	Rangeland Management Specialist (Weeds)	Invasive, Nonnative and Noxious Species
John Wilson	Wildlife Biologist	Migratory Birds, Wildlife/Key Habitat, BLM Sensitive Species
Ken Depaoli	Geologist	Minerals
Eric Pignata	Realty Specialist	Lands and Realty
Dan Westermeyer	Outdoor Recreation Planner	Visual Resources
John Axtell	Wild Horse and Burros Specialist	Wild Horses and Burros
Dave Schroeder	Reclamation Compliance Specialist	Wastes, Hazardous or Solid
Coreen Francis	Staff Supervisor Stillwater Field Office	Forest and Rangelands (HFRA Projects Only)
Angelica Rose	Planning and Environmental	NEPA

Table 13: List of Preparers

	Coordinator	
Jason R. Wright	Archeologist	Cultural Resources, Native American Religious Concern
Steve “Chip” Kramer	Planning and Environmental Coordinator	NEPA
Intertech Services Corporation		
Mike Baughman	Consultant	NEPA compliance, senior review
EMPSi		
Andrew Gentile	Environmental Planner	Project Manager, NEPA
Meredith Zaccherio	Senior Biologist	Biological Resources
Matt Kluvo	Biologist	Biological Resources
Jenna Jonker	GIS Analyst	Soils
Laura Long	Editor	Water Resources

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Appendix A: Geothermal Leases and Stipulations

Form 3200-24a
(September 2008)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Serial No.
NVN86899

OFFER TO LEASE AND LEASE FOR GEOTHERMAL RESOURCES
(For New Leases Issued Under the Energy Policy Act of 2005 [August 5, 2005])

The undersigned (see page 2) offers to lease all or any of the lands in item 2 that are ava
Steam Act of 1970, as amended (30 U.S.C. 1001-1025).

Future rental payments must be made on or before the anniversary date to:
Minerals Management Service
Royalty Management Program
P.O. Box 5640
Denver, CO 80217

READ INSTRUCTIONS BEFORE COMPLETING

1. Name	1a. Street	
TGP DEVELOPMENT COMPANY LLC	9590 PROTOPYPE CT STE 200	
1b. City	1c. State	1d. Zip Code
RENO	NV	89521

2. Surface managing agency if other than BLM: _____ Unit/Project: _____

Legal description of land requested (segregate by public domain and acquired lands): Enter T., R., Meridian, State and County

Total Acres Applied for _____

Percent U.S. interest _____

Amount remitted: Processing Fee $ _____ Rental Fee $ _____ Total $ _____

DO NOT WRITE BELOW THIS LINE

3. Land included in lease: Enter T., R., Meridian, State and County

```
T.0270N, R.0380E, 21 MDM, NV
    Sec. 004   LOTS 1-4;
         004   S2N2,S2;
         005   LOTS 1,2;
         005   S2NE,SE;
         005   PROT W2;
         008   E2;
         008   PROT W2;
         009   ALL;
  T.0280N, R.0380E, 21 MDM, NV
    Sec. 032   ALL;
         033   ALL;
Pershing County
```

Total Acres in Lease 3810.02

Rental Retained $ 7622.00

In accordance with the above offer, or the previously submitted competitive bid, this lease is issued granting the exclusive right to drill for, extract, produce, remove, utilize, sell, and dispose of all the geothermal resources in the lands described in Item 3 together with the right to build and maintain necessary improvements thereupon, for a primary term of 10 years and subsequent extensions thereof in accordance with 43 CFR subpart 3207. Rights granted are subject to: applicable laws; the terms, conditions, and attached stipulations of this lease; the Secretary of the Interior's regulations and formal orders in effect as of lease issuance; and, when not inconsistent with the provisions of this lease, regulations and formal orders hereafter promulgated.

Type of Lease:

☑ Competitive

☐ Noncompetitive

☐ Noncompetitive direct use (43 CFR subpart 3205)

Comments:

THE UNITED STATES OF AMERICA

BY _____
(Signing Official)

ATANDA CLARK
(Printed Name)

Chief, Branch of Minerals Adjudication
(Title)

AUG 07 2009
(Date)

EFFECTIVE DATE OF LEASE SEP - 1 2009

Check if this is a converted lease ☐

EFFECTIVE DATE OF LEASE CONVERSION _____

(Continued on page 2)

4 (a) The undersigned certifies that

(1) The offeror is a citizen of the United States, an association of such citizens, a municipality, or a corporation organized under the laws of the United States, any State or the District of Columbia, (2) All parties holding an interest in the offer are in compliance with 43 CFR part 3200 and the authorizing Act; (3) The offeror's chargeable interests, direct and indirect, do not exceed those allowed under the Act; and (4) The offeror is not considered a minor under the laws of the State in which the lands covered by this offer are located

(b) The undersigned agrees that signing this offer constitutes acceptance of this lease, including all terms, conditions and stipulations of which the offeror has been given notice The offeror further agrees that this offer cannot be withdrawn, either in whole or part, unless the withdrawal is received by the proper BLM State Office before this lease, an amendment to this lease, or a separate lease, whichever covers the land described in the withdrawal, has been signed on behalf of the United States

This offer will be rejected and will afford the offeror no priority if it is not properly completed and executed in accordance with the regulations or if it is not accompanied by the required payments Title 18 U S C § 1001 makes it a crime for any person knowingly and willfully to make to any Department or agency of the United States any false, fictitious, or fraudulent statements or representations as to any matter within its jurisdiction

Duly executed this _____ day of _____, 20____

(Printed Name of Lessee or Attorney-in-fact) (Signature of Lessee or Attorney-in-fact)

LEASE TERMS

Sec 1 Rentals—Rentals must be paid to the proper office of the lessor in advance of each lease year. Annual rental rates per acre or fraction thereof, as applicable, are:

(a) Noncompetitive lease (includes post-sale parcels not receiving bids, a direct use lease or a lease issued to a mining claimant): $1.00 for the first 10 years; thereafter $5 00; or

(b) Competitive lease $2 00 for the first year, $3 00 for the second through tenth year, thereafter $5 00.

Annual rental is always due by the anniversary date of this lease (43 CFR 3211 13), regardless of whether the lease is in a unit or outside of a unit, the lease is in production or not, or royalties or direct use fees apply to the production.

Rental may only be credited toward royalty under 43 CFR 3211 15 and 30 CFR 218 303 Rental may not be credited against direct use fees Failure to pay annual rental timely will result in late fees and will make the lease subject to termination in accordance with 43 CFR 3213 14

Sec. 2. (a) Royalties—Royalties must be paid to the proper office of the lessor Royalties are due on the last day of the month following the month of production Royalties will be computed in accordance with applicable regulations and orders. Royalty rates for geothermal resources produced for the commercial generation of electricity but not sold in an arm's length transaction are 1.75 percent for the first 10 years of production and 3 5 percent after the first 10 years The royalty rate is to be applied to the gross proceeds derived from the sale of electricity in accordance with 30 CFR part 206 subpart H.

The royalty rate for byproducts derived from geothermal resource production that are minerals specified in section 1 of the Mineral Leasing Act (MLA), as amended (30 U S C 181), is 5 percent, except for sodium compounds, produced between September 29, 2006 and September 29, 2011 (Pub L. No 109-338, §102, note to 30 U S C 362) for which the royalty rate is 2 percent. No royalty is due on byproducts that are not specified in 30 U S C § 181 (43 CFR 3211 19.)

If this lease or a portion thereof is committed to an approved communitization or unit agreement and the agreement contains a provision for allocation of production, royalties must be paid on the production allocated to this lease

(b) Arm's length transactions—The royalty rate for geothermal resources sold by you or your affiliate at arm's length to a purchaser is 10 percent of the gross proceeds derived from the arm's-length sale (43 CFR 3211 17, 3211 18)

(c) Advanced royalties—In the absence of a suspension, if you cease production for more than one calendar month on a lease that is subject to royalties and that has achieved commercial production, your lease will remain in effect only if you make advanced royalty payments in accordance with 43 CFR 3212 15(a) and 30 CFR 218 305

(d) Direct use fees—Direct use fees must be paid in lieu of royalties for geothermal resources that are utilized for commercial, residential, agricultural, or other energy needs other than the commercial production or generation of electricity, but not sold in an arm's length transaction (43 CFR 3211.18, 30 CFR 206 356) This requirement applies to any direct use of federal geothermal resources (unless the resource is exempted as described in 30 CFR 202 351(b) or the lessee is covered by paragraph (e), below) and is not limited to direct use leases Direct use fees are due on the last day of the month following the month of production.

(e) If the lessee is a State, tribal, or local government covered by 43 CFR 3211 18(a)(3) and 30 CFR 206 366, check here ☐ A lessee under this paragraph is not subject to paragraph (d), above In lieu of royalties, the lessee under this paragraph must pay a nominal fee of

$ _____

Sec. 3. Bonds—A bond must be filed and maintained for lease operations as required by applicable regulations

Sec. 4. Work requirements, rate of development, unitization, and drainage--Lessee must perform work requirements in accordance with applicable regulations (43 CFR 3207 11, 3207 12), and must prevent unnecessary damage to, loss of, or waste of leased resources Lessor reserves the right to specify rates of development and production and to require lessee to commit to a communitization or unit agreement, within 30 days of notice, if in the public interest. Lessee must drill and produce wells necessary to protect leased lands from drainage or pay compensatory royalty for drainage in the amount determined by lessor Lessor will exempt lessee from work requirements only where the lease overlies a mining claim that has an approved plan of operations and where BLM determines that the development of the geothermal resource on the lease would interfere with the mining operation (43 CFR 3207 13).

Sec. 5. Documents, evidence, and inspection—Lessee must file with the proper office of the lessor, not later than (30) days after the effective date thereof, any contract or evidence of other arrangement for the sale, use, or disposal of geothermal resources, byproducts produced, or for the sale of electricity generated using geothermal resources produced from the lease At such times and in such form as lessor may prescribe, lessee must furnish detailed statements and all documents showing (a) amounts and quality of all geothermal resources produced and used (either for commercial production or generation of electricity, or in a direct use operation) or sold; (b) proceeds derived therefrom or from the sale of electricity generated using such resources; (c) amounts that are unavoidably lost or reinjected before use, used to generate plant parasitic electricity (as defined in 30 CFR 206.351) or electricity for lease operations, or otherwise used for lease operations related to the commercial production or generation of electricity, and (d) amounts and quality of all byproducts produced and proceeds derived from the sale or disposition thereof. Lessee may be required to provide plats and schematic diagrams showing development work and improvements, and reports with respect to parties in interest.

In a format and manner approved by lessor, lessee must keep a daily drilling record, a log, and complete information on well surveys and tests, keep a record of subsurface investigations, and furnish copies to lessor when required.

Lessee must keep open at all reasonable times for inspection by any authorized officer of lessor, the leased premises and all wells, improvements, machinery, and fixtures thereon, and all books, accounts, maps, and records relative to operations, surveys, or investigations on or in the leased lands. Lessee must maintain copies of all contracts, sales agreements, accounting records, billing records, invoices, gross proceeds and payment data regarding the sale, disposition, or use of geothermal resources, byproducts produced, and the sale of electricity generated using resources produced from the lease, and all other information relevant to determining royalties or direct use fees. All such records must be maintained in lessee's accounting offices for future audit by lessor and produced upon request by lessor or lessor's authorized representative or agent. Lessee must maintain required records for 6 years after they are generated or, if an audit or investigation is underway, until released of the obligation to maintain such records by lessor

Sec. 6. Conduct of operations—Lessee must conduct operations in a manner that minimizes adverse impacts to the land, air, and water, to cultural, biological, visual, and other resources, and to other land uses or users Lessee must take reasonable measures deemed necessary by lessor to accomplish the intent of this section. To the extent consistent with leased rights granted, such measures may include, but are not limited to, modification to siting or design of facilities, timing of operations, and specification of interim and final reclamation measures Lessor reserves the right to continue existing uses and to authorize future uses upon or in the leased lands, including the approval of easements or rights-of-way. Such uses will be conditioned so as to prevent unnecessary or unreasonable interference with rights of lessee Prior to disturbing the surface of the leased lands, lessee must contact lessor to be apprised of procedures to be followed and modifications or reclamation measures that may be necessary Areas to be disturbed may require inventories or special studies to determine the extent of impacts to other resources. Lessor may require lessee to complete minor inventories or short term special studies under guidelines provided by lessor. If, in the conduct of operations, threatened or endangered species, objects of historic or scientific interest, or substantial unanticipated environmental effects are observed, lessee must immediately contact lessor Lessee must cease any operations that are likely to affect or take such species, or result in the modification, damage or destruction of such habitats or objects.

Sec. 7. Production of byproducts—If the production, use, or conversion of geothermal resources from these leased lands is susceptible of producing a valuable byproduct or byproducts, including commercially demineralized water for beneficial uses in accordance with applicable State water laws, lessor may require substantial beneficial production or use thereof by lessee

Sec. 8. Damages to property—Lessee must pay lessor for damage to lessor's improvements, and must save and hold lessor harmless from all claims for damage or harm to persons or property as a result of lease operations

Sec. 9. Protection of diverse interests and equal opportunity—Lessee must maintain a safe working environment in accordance with applicable regulations and standard industry practices, and take measures necessary to protect public health and safety. Lessor reserves the right to ensure that production is sold at reasonable prices and to prevent monopoly Lessee must comply with Executive Order No 11246 of September 24, 1965, as amended, and regulations and relevant orders of the Secretary of Labor issued pursuant thereto Neither lessee nor lessee's subcontractor may maintain segregated facilities.

Sec. 10. Transfer of lease interests and relinquishment of lease—As required by regulations, lessee must file with lessor any assignment or other transfer of an interest in this lease Subject to the requirements of 43 CFR subpart 3213, lessee may relinquish this lease or any legal subdivision by filing in the proper office a written relinquishment, which will be effective as of the date BLM receives it, subject to the continued obligation of the lessee and surety to be responsible for paying all accrued rentals and royalties, plugging and abandoning all wells on the relinquished land; restoring and reclaiming the surface and other resources; and complying with 43 CFR 3200 4

Sec. 11. Delivery of premises—At such time as all or portions of this lease are returned to lessor, lessee must place all wells in condition for suspension or abandonment, reclaim the land as specified by lessor, and within a reasonable period of time, remove equipment and improvements not deemed necessary by lessor for preservation of producible wells or continued protection of the environment

Sec. 12. Proceedings in case of default—If lessee fails to comply with any provisions of this lease or other applicable requirements under 43 CFR 3200 4, and the noncompliance continues for 30 days after written notice thereof, this lease will be subject to termination in accordance with the Act and 43 CFR 3213. This provision will not be construed to prevent the exercise by lessor of any other legal and equitable remedy or action, including waiver of the default Any such remedy, waiver, or action will not prevent later termination for the same default occurring at any other time Whenever the lessee fails to comply in a timely manner with any of the provisions of the Act, this lease, the regulations, or other applicable requirements under 43 CFR 3200 4, and immediate action is required, the lessor may enter on the leased lands and take measures deemed necessary to correct the failure at the lessee's expense

Sec. 13. Heirs and successors-in-interest—Each obligation of this lease will extend to and be binding upon, and every benefit hereof will inure to, the heirs, executors, administrators, successors, or assigns of the respective parties hereto

(Continued on page 3)

INSTRUCTIONS

A. General

1. Items 1 and 2 need to be completed only by parties filing for a noncompetitive lease. The BLM will complete the front of the form for other types of leases. The BLM may use the "Comments" space under Item 3 to identify when the lessee has elected to make all lease terms subject to the Energy Policy Act of 2005 under 43 CFR 3200.7(a)(2) or 43 CFR 3200.8(b) (box labeled "converted lease" must also be checked), the lease is being issued noncompetitively to a party who holds a mining claim on the same lands as is covered by the lease under 43 CFR 3204.12; the lease is a direct use lease issued to a State, local, or tribal government (box at section 2(e) under Lease Terms must also be checked); the lease is a competitive lease with direct-use-only stipulations attached; or other special circumstances exist. A lessee who seeks to convert only the royalty rate of a lease under 43 CFR 3212.25 or who qualifies for a case-by-case royalty rate determination under 43 CFR 3211.17(b)(1)(i) should not use this form, but should instead use an addendum to the existing lease.

2. Entries must be typed or printed plainly in ink. The offeror must sign the form (Item 4) in ink.

3. An original and two copies of this offer must be prepared and filed in the proper BLM State Office. See regulations at 43 CFR 1821.10 for office locations.

4. If more space is needed, additional sheets must be attached to each copy of the form submitted.

B. Specific

Item 1—Enter the offeror's name and billing address.

Item 2—Indicate the agency managing the surface use of the land and the name of the unit or project of which the land is a part. The offeror may also provide other information that will assist in establishing status of the lands. The description of land must conform to 43 CFR 3203.10. Total acres applied for must not exceed that allowed by regulations (43 CFR 3203.10; 43 CFR 3206.12).

Payments: For noncompetitive leases, the amount remitted must include the processing fee for noncompetitive lease applications (43 CFR 3204.10; 43 CFR 3000.12) and the first year's rental at the rate of $1 per acre or fraction thereof. If the United States owns only a fractional interest in the geothermal resources, you must pay a prorated rental under 43 CFR 3211.11(d). The BLM will retain the processing fee even if the offer is completely rejected or withdrawn. To maintain the offeror's priority, the offeror must submit rental sufficient to cover all the land requested. If the land requested includes lots or irregular quarter-quarter sections, the exact acreage of which is not known to the offeror, rental should be submitted on the assumption that each such lot or quarter-quarter section contains 40 acres. If the offer is withdrawn or rejected in whole or in part before a lease issues, the BLM will return the rental remitted for the parts withdrawn or rejected.

The BLM will fill in the processing fee for competitive lease applications (43 CFR 3203.17; 43 CFR 3000.12) and the first year's rental at the rate of $2 per acre or fraction thereof.

Item 3—The BLM will complete this space.

NOTICES

The Privacy Act of 1974 and the regulation at 43 CFR 2.48(d) provide that you be furnished with the following information in connection with information required by this geothermal lease application.

AUTHORITY: 30 U.S.C. 1000 et seq.

PRINCIPAL PURPOSE—The information is to be used to process geothermal lease applications.

ROUTINE USES: (1) The adjudication of the lessee's rights to the land or resources. (2) Documentation for public information in support of notations made on land status records for the management, disposal, and use of public lands and resources. (3) Transfer to appropriate Federal agencies when concurrence is required prior to granting uses or rights in public lands or resources. (4) Transfer to the appropriate Federal, State, local, or foreign agencies, when relevant to civil, criminal, or regulatory investigations or prosecutions.

Threatened, Endangered, or other special status species

All development activities proposed under the authority of this lease are subject to the requirement for Native American consultation prior to BLM authorizing the activity. Depending on the nature of the lease developments being proposed and the resources of concerns to tribes potentially affected, Native American consultation and resulting mitigation measures to avoid significant impacts may extend time frames for processing authorizations for development activities, as well as, change in the ways in which developments are implemented.

Authority/Supporting Documentation:
EA-NV-02-029 Geothermal Resources Leasing PEA, September 10, 2002
PEIS for Geothermal Leasing in the Western US, October 2008

Description of Lands

PARCEL NV-09-07-001 THRU PARCEL NV-09-07-006	ALL LANDS
PARCEL NV-09-07-009 THRU PARCEL NV-09-07-014	ALL LANDS
PARCEL NV-09-07-018 THRU PARCEL NV-09-07-019	ALL LANDS
PARCEL NV-09-07-021 THRU PARCEL NV-09-07-024	ALL LANDS
PARCEL NV-09-07-029 THRU PARCEL NV-09-07-031	ALL LANDS
PARCEL NV-09-07-034	ALL LANDS
PARCEL NV-09-07-035	ALL LANDS
PARCEL NV-09-07-036	ALL LANDS
PARCEL NV-09-07-038 THRU PARCEL NV-09-07-039	ALL LANDS
PARCEL NV-09-07-052 THRU PARCEL NV-09-07-054	ALL LANDS

PARCEL NV-09-07-058 THRU PARCEL NV-09-07-059	ALL LANDS
PARCEL NV-09-07-068 THRU PARCEL NV-09-07-071	ALL LANDS
PARCEL NV-09-07-076	ALL LANDS
PARCEL NV-09-07-084 THRU PARCEL NV-09-07-090	ALL LANDS
PARCEL NV-09-07-092	ALL LANDS

National Historic Protection

All surface disturbing activities proposed after issuance of the lease are subject to compliance with Section 106 of the National Historic Protection Act (NHPA) and its implementation through the protocol between the BLM Nevada State Director and the Nevada State Historic Preservation Officer.

Authority/Supporting Documentation:
EA-NV-02-029 Geothermal Resources Leasing PEA, September 10, 2002
PEIS for Geothermal Leasing in the Western US, October 2008

	Description of Lands
PARCEL NV-09-07-001 THRU PARCEL NV-09-07-006	ALL LANDS
PARCEL NV-09-07-009 THRU PARCEL NV-09-07-014	ALL LANDS
PARCEL NV-09-07-018 THRU PARCEL NV-09-07-019	ALL LANDS
PARCEL NV-09-07-021 THRU PARCEL NV-09-07-024	ALL LANDS
PARCEL NV-09-07-029 THRU PARCEL NV-09-07-031	ALL LANDS
PARCEL NV-09-07-034	ALL LANDS
PARCEL NV-09-07-035	ALL LANDS
PARCEL NV-09-07-036	ALL LANDS
PARCEL NV-09-07-038 THRU PARCEL NV-09-07-039	ALL LANDS
PARCEL NV-09-07-052 THRU PARCEL NV-09-07-054	ALL LANDS

PARCEL NV-09-07-058 THRU PARCEL NV-09-07-059	ALL LANDS
PARCEL NV-09-07-068 THRU PARCEL NV-09-07-071	ALL LANDS
PARCEL NV-09-07-076	ALL LANDS
PARCEL NV-09-07-084 THRU PARCEL NV-09-07-090	ALL LANDS
PARCEL NV-09-07-092	ALL LANDS

Stipulation

No drilling, including exploration or development activities within linear Rights-of –way.

Authority/Supporting Documentation EA-NV-02-029 Geothermal Resources Leasing PEA, September 10, 2002
PEIS for Geothermal Leasing in the Western US, October 2008
BLM Instruction Memorandum No. 2002-174

	Description of Lands
PARCEL NV-09-07-001 THRU PARCEL NV-09-07-006	ALL LANDS
PARCEL NV-09-07-009 THRU PARCEL NV-09-07-014	ALL LANDS
PARCEL NV-09-07-018 THRU PARCEL NV-09-07-019	ALL LANDS
PARCEL NV-09-07-021 THRU PARCEL NV-09-07-024	ALL LANDS
PARCEL NV-09-07-029 THRU PARCEL NV-09-07-031	ALL LANDS
PARCEL NV-09-07-034	ALL LANDS
PARCEL NV-09-07-035	ALL LANDS
PARCEL NV-09-07-036	ALL LANDS
PARCEL NV-09-07-038 THRU PARCEL NV-09-07-039	ALL LANDS
PARCEL NV-09-07-052 THRU PARCEL NV-09-07-054	ALL LANDS

PARCEL NV-09-07-058 THRU PARCEL NV-09-07-059	ALL LANDS
PARCEL NV-09-07-068 THRU PARCEL NV-09-07-071	ALL LANDS
PARCEL NV-09-07-076	ALL LANDS
PARCEL NV-09-07-084 THRU PARCEL NV-09-07-090	ALL LANDS
PARCEL NV-09-07-092	ALL LANDS

Stipulation

In the event that previously undiscovered paleontological resources are discovered in the performance of any surface disturbing activities, the item(s) or condition(s) will be left intact and immediately brought to the attention of the authorized officer of the BLM.

Authority/Supporting Documentation EA-NV-02-029 Geothermal Resources Leasing PEA, September 10, 2002
PEIS for Geothermal Leasing in the Western US, October 2008
BLM Instruction Memorandum No. 2002-174

	Description of Lands
PARCEL NV-09-07-001 THRU PARCEL NV-09-07-006	ALL LANDS
PARCEL NV-09-07-009 THRU PARCEL NV-09-07-014	ALL LANDS
PARCEL NV-09-07-018 THRU PARCEL NV-09-07-019	ALL LANDS
PARCEL NV-09-07-021 THRU PARCEL NV-09-07-024	ALL LANDS
PARCEL NV-09-07-029 THRU PARCEL NV-09-07-031	ALL LANDS
PARCEL NV-09-07-034	ALL LANDS
PARCEL NV-09-07-035	ALL LANDS
PARCEL NV-09-07-036	ALL LANDS
PARCEL NV-09-07-038 THRU PARCEL NV-09-07-039	ALL LANDS
PARCEL NV-09-07-052 THRU PARCEL NV-09-07-054	ALL LANDS

PARCEL NV-09-07-058 THRU PARCEL NV-09-07-059	ALL LANDS
PARCEL NV-09-07-068 THRU PARCEL NV-09-07-071	ALL LANDS
PARCEL NV-09-07-076	ALL LANDS
PARCEL NV-09-07-084 THRU PARCEL NV-09-07-090	ALL LANDS
PARCEL NV-09-07-092	ALL LANDS

Controlled Surface Use

Controlled surface use for moderate potential for paleontological resources. Potential Fossil Yield Classification (PFYC) 3: Moderate Potential.
Inventory and/or on-site monitoring during disturbance or spot checking may be required. If fossils are discovered, avoidance or data recovery will be required prior to their disturbance if they are deemed to be of scientific importance.
It has been determined the following areas contain lands classified as PFYC 3:

Authority/Supporting Documentation:
EA-NV-02-029 Geothermal Resources Leasing PEA, September 10, 2002
PEIS for Geothermal Leasing in the Western US, October 2008

	Description of Lands
PARCEL NV-09-07-001	T. 23 N., R. 24 E., MDM, Nevada sec. 02, S2NW, SW; sec. 10, all; sec. 12, E2, S2SW; sec. 14, all. T. 23 N., R. 25 E., MDM, Nevada sec. 18, lots 1-4, E2NW.
PARCEL NV-09-07-002	T. 23 N., R. 24 E., MDM, Nevada sec. 04, S2N2, S2; sec. 16, all; sec. 22, W2, W2E2; sec. 24, all.
PARCEL NV-09-07-003	ALL LANDS
PARCEL NV-09-07-004	T. 33 N., R. 24 E., MDM, Nevada sec. 15, PROT SE; sec. 21, PROT SE, S2NE, SW.
PARCEL NV-09-07-005	T. 33 N., R. 24 E., MDM, Nevada sec. 29, PROT E2NE, SE; sec. 31, PROT SE.
PARCEL NV-09-07-006	T. 24 N., R. 25 E., MDM, Nevada sec. 026, S2NE, S2.
PARCEL NV-09-07-009	T. 27 N., R. 27 E., MDM, Nevada sec. 01, lots 3,4, S2NW, SW; sec. 02, lots 1-3, S2NE, SENE, SE; sec. 11, E2W2; sec. 12, All; sec. 14, E2, E2W2.

PARCEL NV-09-07-010	T. 27 N., R. 27 E., MDM, Nevada sec. 21, SW, S2SE; sec. 22, S2SW, SE; sec. 26, all; sec. 28, all; sec. 34, all.
PARCEL NV-09-07-011	T. 28 N., R. 27 E., MDM, Nevada sec. 01, lots 1-4, S2N2, S2; sec. 02, lots 1-4, S2N2, S2; sec. 03, lots 1-4, S2N2, S2; sec. 04, lots 1-4, S2N2, S2; sec. 09, N2, N2SW, SWSW, SE; sec. 10, all; sec. 11, all; sec. 12, all.
PARCEL NV-09-07-012	T. 28 N., R. 27 E.,MDM, Nevada sec. 13, all; sec. 14, all; sec. 15, all; sec. 16, NENE; sec. 22, E2, E2W2; sec. 23, all; sec. 24, all; sec. 25, all.
PARCEL NV-09-07-013	T. 28 N., R. 27 E., MDM, Nevada sec. 27, NE, E2SE, NWSE; sec. 31, lots 1-4, E2, E2W2; sec. 32, W2NW; sec. 35, E2, NW, E2SW; sec. 36, all.
PARCEL NV-09-07-014	T. 45 N., R. 27 E., MDM, Nevada sec. 14, PROT All; sec. 15, PROT N2, NESE.
PARCEL NV-09-07-018	T. 27 N., R. 28 E., MDM, Nevada sec. 06, lots 1-7, S2NE, SENE, E2SW, SE; sec. 08, all; sec. 16, all; sec. 18, lots 1-4, E2, E2W2; sec. 20, all; sec. 30, lots 1-4, E2, E2W2.
PARCEL NV-09-07-021	T. 23 N., R. 29 E., MDM, Nevada sec. 03, lots 1,2, SWNE, S2S2; sec. 10, SENE, SESW, NESE; sec. 12, SENE, W2NW, SENW, S2; sec. 14, NE, S2NW, S2; sec. 16, SWNE, S2NE, NW, E2SW, NWSW, SE; sec. 22, N2N2, SWNW.

PARCEL NV-09-07-022	T. 47 N., R. 29 E., MDM, Nevada sec. 13, lots 2-4, E2, E2W2; T. 47 N., R. 30 E., MDM, Nevada sec. 07, lots 1-2, W2NE, W2, SE; sec. 08, lots 1-4, NE, SW, N2SE; sec. 17, NENE, S2NE, NWNW, S2NW, S2; sec. 19, all; sec. 20, all.
PARCEL NV-09-07-023	T. 37 N., R. 30 E., MDM, Nevada sec. 04, lots 3,4, S2NW, SW; sec. 05, lots 1-4, S2N2, S2; sec. 08, all; sec. 09, W2E2, W2; T. 38 N., R. 30 E., MDM, Nevada sec. 32, All; sec. 33, NE, W2, NESE, W2SE.
PARCEL NV-09-07-024	T. 37 N., R. 30 E., MDM, Nevada sec. 16, all; sec. 17, all; sec. 20, all; sec. 21, N2, N2SW, SWSW.
PARCEL NV-09-07-029	ALL LANDS
PARCEL NV-09-07-030	ALL LANDS
PARCEL NV-09-07-031	ALL LANDS
PARCEL NV-09-07-034	ALL LANDS
PARCEL NV-09-07-036	ALL LANDS
PARCEL NV-09-07-038	ALL LANDS
PARCEL NV-09-07-039	T. 40 N., R. 33 E., MDM, Nevada sec. 05, lots 1,2,5,8,9,10,12, S2NE, SE; sec. 07, lots 8-11, 14-18; sec. 08, E2, E2SW; sec. 17, E2, NW, NWSW; sec. 18, lots 5, 12, 13, 16, 17; sec. 19, lots 7-10, 13-20; sec. 20, NE, E2NW, SWNW, SW, N2SE.
PARCEL NV-09-07-052	T. 25 N., R. 35 E., MDM, Nevada sec. 09, all; sec. 16, all; sec. 20, all; sec. 21, all; sec. 22, W2; sec. 28, N2, W2SW; sec. 29, all; sec. 32, NE, W2, W2SW.

PARCEL NV-09-07-053	ALL LANDS
PARCEL NV-09-07-054	T. 41 N., R. 35 E., MDM, Nevada sec. 20, S2NE, NENW, NESE.
PARCEL NV-09-07-058	T. 26 N., R. 36 E., MDM, Nevada sec. 20, PROT All; sec. 21, PROT All; sec. 28, PROT All; sec. 33, PROT N2N2, SE.
PARCEL NV-09-07-059	ALL LANDS
PARCEL NV-09-07-068	T. 27 N., R. 38 E., MDM, Nevada sec. 01, lots 1-4, S2N2, S2; sec. 12, NE, W2, NESE, W2SE. T. 28 N., R. 38 E., MDM, Nevada sec. 25, all; sec. 36, all.
PARCEL NV-09-07-069	T. 27 N., R. 38 E., MDM, Nevada sec. 04, lots 1-4, S2N2, S2; sec. 05, lots 1,2, S2NE, SE; sec. 05, PROT W2; sec. 08, E2; sec. 08 PROT W2; sec. 09, all. T. 28 N., R. 38 E., MDM, Nevada sec. 32, NE, S2; sec. 33, all.
PARCEL NV-09-07-070	T. 28 N., R. 38 E., MDM, Nevada sec. 12, all; sec. 13, all; sec. 24, all. T. 28 N., R. 39 E., MDM, Nevada sec. 05, lots 1,4, S2N2, SW, W2SE; sec. 06, lots 7-15, S2NE, SENW, E2SW, SE; sec. 07, lots 1-4, E2, E2W2; sec. 18, lots 1-4, W2E2, E2W2; sec. 19, lots 1-4, W2NE, E2W2.
PARCEL NV-09-07-071	ALL LANDS
PARCEL NV-09-07-076	T. 29 N., R. 39 E., MDM, Nevada sec. 01, lot 2, S2NE, N2SE; sec. 12, E2NE, SWNE, E2NW, SESW, E2SE. T. 30 N., R. 39 E., MDM, Nevada sec. 36, NE, N2NW, SENW, NESE.
PARCEL NV-09-07-084	ALL LANDS

PARCEL NV-09-07-085	ALL LANDS
PARCEL NV-09-07-086	ALL LANDS
PARCEL NV-09-07-087	ALL LANDS
PARCEL NV-09-07-090	T. 31 N., R. 41 E., MDM, Nevada sec. 04, lots 1-4, S2N2, S2. sec. 05, SWSW. T. 32 N., R. 41 E., MDM, Nevada sec. 32, N2, N2SW, SESW, SE.
PARCEL NV-09-07-092	ALL LANDS

Controlled Surface Use

Controlled surface use for high and very high potential for paleontological resources. Potential Fossil Yield Classification (PFYC) 4, and 5: High and Very High Potential.
This land is underlain by geologic units that have been documented to contain a high occurrence of fossils, which may consist of scientifically significant vertebrate, invertebrate, and, or plant fossils. A field survey by a qualified paleontologist, and at the lessee's expense, will be required prior to surface disturbing activities. If significant fossils of scientific importance are discovered they will require avoidance or data recovery prior to their disturbance. On site monitoring may be necessary during construction activities.
It has been determined the following areas contain lands classified as PFYC 2 or 5:

Authority/Supporting Documentation:
EA-NV-02-029 Geothermal Resources Leasing PEA, September 10, 2002
PEIS for Geothermal Leasing in the Western US, October 2008

Description of Lands

PARCEL NV-09-07-001	T. 23 N., R. 24 E., MDM, Nevada sec. 02, lots 2-4.
PARCEL NV-09-07-002	T. 24 N., R. 24 E., MDM, Nevada sec. 34, E2NE, SWNE, E2SE, NWSE.
PARCEL NV-09-07-003	ALL LANDS
PARCEL NV-09-07-011	T. 28 N., R. 27 E., MDM, Nevada sec. 04, lot 4.
PARCEL NV-09-07-021	T. 23 N., R. 29 E., MDM, Nevada sec. 02, lots 1-4, SENE, S2NW, NESW, W2SW, E2SE; sec. 10, N2, E2SW, N2SE; sec. 12, N2, NESW, W2SW, NWSE; sec. 16, NE, E2NW, N2SE.
PARCEL NV-09-07-069	T. 28 N., R. 38 E., MDM, Nevada sec. 32, SWSW.
PARCEL NV-09-07-070	T. 28 N., R. 39 E., MDM, Nevada sec. 05, SESW, SE; sec. 07, E2SE, SWSE; sec. 18, E2; sec. 19, E2, E2SW.
PARCEL NV-09-07-090	T. 31 N., R. 41 E., MDM, Nevada sec. 05, lot 4, SWNW, E2SW. T. 32 N., R. 41 E., MDM, Nevada sec. 32, N2N2NW, NWSW, S2SW.

Controlled Surface Use

Controlled surface use for protection of erosive soils and soils on slopes greater than 30 percent. This stipulation would be applied to minimize the potential for adverse impacts to soils as defined as severe or very severe erosion classes based on Natural Resources Conservation Service mapping. There are portions of parcels that have >30% slope:

Authority/Supporting Documentation:

EA-NV-02-029 Geothermal Resources Leasing PEA, September 10, 2002
PEIS for Geothermal Leasing in the Western US, October 2008

Description of Lands

PARCEL NV-09-07-001	T. 23 N., R. 24 E., MDM, Nevada sec. 02, lots 1-4, S2N2, SE. T. 23 N., R. 25 E., MDM, Nevada sec. 18, lots 1-4, E2, E2W2.
PARCEL NV-09-07-002	T. 23 N., R. 24 E., MDM, Nevada sec. 04, S2; sec. 16, all; sec. 24, all. T. 24 N., R. 24 E., MDM, Nevada sec. 34, all.
PARCEL NV-09-07-003	T. 24 N., R. 24 E., MDM, Nevada sec. 26, SE; sec. 36, all. T. 24 N., R. 25 E., MDM, Nevada sec. 32, W2.
PARCEL NV-09-07-004	T. 33 N., R. 24 E., MDM, Nevada sec. 21, PROT SE.
PARCEL NV-09-07-005	ALL LANDS
PARCEL NV-09-07-009	T. 27 N., R. 27 E., MDM, Nevada sec. 01, lots 3,4, S2NW, SW; sec. 02, lots 1,2, S2NE, SE; sec. 12, all; sec. 14, E2.
PARCEL NV-09-07-010	T. 27 N., R. 27 E., MDM, Nevada sec. 26, NE.
PARCEL NV-09-07-014	T. 45 N., R. 27 E., MDM, Nevada sec. 15, PROT All.
PARCEL NV-09-07-011	T. 28 N., R. 27 E., MDM, Nevada sec. 04, lots 3,4, S2NW, SW; sec. 09, NE.

PARCEL NV-09-07-012	T. 28 N., R. 27 E., MDM, Nevada sec. 13, NW, S2; sec. 14, all; sec. 15, SW; sec. 22, E2; sec. 23, all; sec. 24, all; sec. 25, all.
PARCEL NV-09-07-013	T. 28 N., R. 27 E., MDM, Nevada sec. 27, E2; sec. 31, E2; sec. 32, W2; sec. 35, E2; sec. 36, E2.
PARCEL NV-09-07-018	T. 27 N., R. 28 E., MDM, Nevada sec. 08, W2; sec. 18, lots 1-4, E2, E2W2; sec. 20, W2; sec. 30, lots 1-4, E2, E2W2.
PARCEL NV-09-07-021	T. 23 N., R. 29 E., MDM, Nevada sec. 02, SW; sec. 10, all; sec. 12, N2, SE; sec. 14, E2; sec. 16, W2; sec. 22, SESE.
PARCEL NV-09-07-022	T. 47 N., R. 29 E., MDM, Nevada sec. 13, lots 1,2, NE, S2NW T. 47 N., R. 30 E., MDM, Nevada sec. 08, lots 1-4, NE, SW, N2SE; sec. 17, NENE, S2NE, NWNW, S2NW, S2; sec. 19, all; sec. 20, all.
PARCEL NV-09-07-023	T. 37 N., R. 30 E., MDM, Nevada sec. 04, lots 1-4, S2N2, S2; sec. 09, all.
PARCEL NV-09-07-024	T. 37 N., R. 30 E., MDM, Nevada sec. 16, E2; sec. 21, SE.
PARCEL NV-09-07-030	ALL LANDS
PARCEL NV-09-07-031	ALL LANDS
PARCEL NV-09-07-039	T. 40 N., R. 33 E., MDM, Nevada sec. 17, all; sec. 18, lots 5-20.

PARCEL NV-09-07-052	T. 25 N., R. 35 E., MDM, Nevada sec. 22, S2.
PARCEL NV-09-07-058	T. 26 N., R. 36 E., MDM, Nevada sec. 33, PROT All.
PARCEL NV-09-07-059	T. 29 N., R. 37 E., MDM, Nevada sec. 33, PROT S2.
PARCEL NV-09-07-069	T. 28 N., R. 38 E., MDM, Nevada sec. 32, NW.
PARCEL NV-09-07-070	T. 28 N., R. 39 E., MDM, Nevada sec. 07, E2; sec. 18, E2; sec. 19, E2.
PARCEL NV-09-07-076	T. 29 N., R. 39 E., MDM, Nevada sec. 12, NWNW, SE.
PARCEL NV-09-07-084	T. 29 N., R. 40 E., MDM, Nevada sec. 27, W2.
PARCEL NV-09-07-090	T. 31 N., R. 41 E., MDM, Nevada sec. 05, lot 4, SWNW, W2SW. T. 32 N., R. 41 E., MDM, Nevada sec. 32, W2.

Threatened, Endangered, or other special status species

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 will 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 modifications of a designated or proposed critical habitat. BLM will not approve any ground disturbing activity that may affect any such species or critical habitat until it completes its obligations under applicable requirements of the Endangered Species Act, 16 U.S.C. 1531, as amended, including completion of any required procedure for conference or consultation Additionally, the BLM will provide a separate notification through a lease notice to prospective lessees identifying the particular special status species that are present on the lease parcel offered.

Authority/Supporting Documentation EA-NV-02-029 Geothermal Resources Leasing PEA, September 10, 2002
PEIS for Geothermal Leasing in the Western US, October 2008
BLM Instruction Memorandum No. 2002-174

Description of Lands	
PARCEL NV-09-07-001 THRU PARCEL NV-09-07-006	ALL LANDS
PARCEL NV-09-07-009 THRU PARCEL NV-09-07-014	ALL LANDS
PARCEL NV-09-07-018 THRU PARCEL NV-09-07-019	ALL LANDS
PARCEL NV-09-07-021 THRU PARCEL NV-09-07-024	ALL LANDS
PARCEL NV-09-07-029 THRU PARCEL NV-09-07-031	ALL LANDS
PARCEL NV-09-07-034	ALL LANDS
PARCEL NV-09-07-035	ALL LANDS
PARCEL NV-09-07-036	ALL LANDS
PARCEL NV-09-07-038 THRU PARCEL NV-09-07-039	ALL LANDS
PARCEL NV-09-07-052 THRU PARCEL NV-09-07-054	ALL LANDS

PARCEL NV-09-07-058 THRU PARCEL NV-09-07-059	ALL LANDS
PARCEL NV-09-07-068 THRU PARCEL NV-09-07-071	ALL LANDS
PARCEL NV-09-07-076	ALL LANDS
PARCEL NV-09-07-084 THRU PARCEL NV-09-07-090	ALL LANDS
PARCEL NV-09-07-092	ALL LANDS

Threatened, Endangered, or other special status species

"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 will 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 that may affect any such species or critical habitat until it completes its obligations under applicable requirements of the Endangered Species Act as amended, 16 USC 1531 et seq., including completion of any required procedure for conference or consultation."

Authority/Supporting Documentation:

EA-NV-02-029 Geothermal Resources Leasing PEA, September 10, 2002
PEIS for Geothermal Leasing in the Western US, October 2008

Description of Lands

PARCEL NV-09-07-001 ALL LANDS
NTL: The Regap data shows the presence of big sagebrush on the lease, which may be potential pygmy rabbit (Brachylagus idahoensis) habitat

PARCEL NV-09-07-002 ALL LANDS
NTL: The Regap data shows the presence of big sagebrush on the lease, which may be potential pygmy rabbit (Brachylagus idahoensis) habitat

PARCEL NV-09-07-003 ALL LANDS
NTL: The Regap data shows the presence of big sagebrush on the lease, which may be potential pygmy rabbit (Brachylagus idahoensis) habitat

PARCEL NV-09-07-006 ALL LANDS
NTL: The Regap data shows the presence of big sagebrush on the lease, which may be potential pygmy rabbit (Brachylagus idahoensis) habitat

PARCEL NV-09-07-009 ALL LANDS
NTL: The presence of pale kangaroo mouse (Microdipodops pallidus) on the lease has been documented (Nevada Department of Wildlife Diversity Data Base). It's a State of Nevada protected species.

PARCEL NV-09-07-014 ALL LANDS
NTL: The Regap data shows the presence of big sagebrush on the lease, which may be potential pygmy rabbit (Brachylagus idahoensis) habitat

PARCEL NV-09-07-011 ALL LANDS

NTL: The presence of pale kangaroo mouse (Microdipodops pallidus) on the lease has been documented (Nevada Department of Wildlife Diversity Data Base). It's a State of Nevada protected species.
NTL: The Regap data shows the presence of big sagebrush on the lease, which may be potential pygmy rabbit (Brachylagus idahoensis) habitat

PARCEL NV-09-07-012 ALL LANDS

NTL: The presence of pale kangaroo mouse (Microdipodops pallidus) on the lease has been documented (Nevada Department of Wildlife Diversity Data Base). It's a State of Nevada protected species.

PARCEL NV-09-07-013 ALL LANDS

NTL: The presence of pale kangaroo mouse (Microdipodops pallidus) on the lease has been documented (Nevada Department of Wildlife Diversity Data Base). It's a State of Nevada protected species.
NTL: The Regap data shows the presence of big sagebrush on the lease, which may be potential pygmy rabbit (Brachylagus idahoensis) habitat

PARCEL NV-09-07-018 ALL LANDS

NTL: The presence of pale kangaroo mouse (Microdipodops pallidus) on the lease has been documented (Nevada Department of Wildlife Diversity Data Base). It's a State of Nevada protected species.

PARCEL NV-09-07-021 ALL LANDS

NTL: The Nevada Natural Heritage Data Base indicates the presence of Nevada Oryctes (Oryctes nevadensis), a BLM designated sensitive species, in the vicinity of the lease. Portions of the subject lease with habitat characteristics for this species should be inventoried for its presence.
NTL: The presence of Pallid bats (Antrozous pallidus) and Townsend's big-eared bats (Corynorhinus townsendii), both designated BLM sensitive species, has been indentified on the subject lease (Nevada Department of Wildlife Diversity Data Base).

PARCEL NV-09-07-022 ALL LANDS

NTL: The Nevada Natural Heritage Data Base indicateds the presence of Pueblo Valley peppergrass (Lepidium montanum var. nevadense), and Denio sandhill skipper, both BLM designated sensitive species, in the vicinity of the lease. If portions of the subject lease exhibit habitat characteristics for these species, these portions should be inventoried for their presence.
NTL: The Regap data shows the presence of big sagebrush on the lease, which may be potential pygmy rabbit (Brachylagus idahoensis) habitat

PARCEL NV-09-07-023 ALL LANDS

NTL: The Regap data shows the presence of big sagebrush on the lease, which may be potential pygmy rabbit (Brachylagus idahoensis) habitat

PARCEL NV-09-07-024 ALL LANDS

NTL: The Regap data shows the presence of big sagebrush on the lease, which may be potential pygmy rabbit (Brachylagus idahoensis) habitat

PARCEL NV-09-07-036 ALL LANDS

NTL: The Nevada Natural Heritage Data Base indicates the presence of Nevada Oryctes (Oryctes nevadensis), a BLM designated sensitive species, in the vicinity of the lease. Portions of the subject lease with habitat characteristics for this species should be inventoried for its presence.
NTL:The Regap data shows the presence of big sagebrush on the lease, which may be potential pygmy rabbit (Brachylagus idahoensis) habitat

PARCEL NV-09-07-038 ALL LANDS

NTL: The Nevada Natural Heritage Data Base indicates the presence of Bruneau River prickly phlox (Leptodactylon glabrum), a BLM designated sensitive species, in the vicinity of the lease. Portions of the subject lease with habitat characteristics for this species should be inventoried for its presence.

NTL: The Regap data shows the presence of big sagebrush on the lease, which may be potential pygmy rabbit (Brachylagus idahoensis) habitat

PARCEL NV-09-07-039 ALL LANDS

NTL:The Regap data shows the presence of big sagebrush on the lease, which may be potential pygmy rabbit (Brachylagus idahoensis) habitat.

NTL: The Nevada Natural Heritage Data Base indicates the presence of Wind Loving Buckwheat (Eriogonum anemophilum), a BLM designated sensitive species, in the vicinity of the lease. If portions of the subject lease exhibit habitat characteristics for this species, those portions should be inventoried for its presence.

NTL: The presence of Pallid bats (Antrozous pallidus) and Townsend's big-eared bats (Corynorhinus townsendii), both designated BLM sensitive species, has been indentified on the subject lease (Nevada Department of Wildlife Diversity Data Base).

PARCEL NV-09-07-052 ALL LANDS

NTL: The Regap data shows the presence of big sagebrush on the lease, which may be potential pygmy rabbit (Brachylagus idahoensis) habitat.

NTL: The lease contains occupied desert bighorn sheep (Orvis Canadensis nelson) habitat.

PARCEL NV-09-07-053 ALL LANDS

NTL:The Regap data shows the presence of big sagebrush on the lease, which may be potential pygmy rabbit (Brachylagus idahoensis) habitat.

PARCEL NV-09-07-058 ALL LANDS

NTL: The presence of Pallid bats (Antrozous pallidus) and Townsend's big-eared bats (Corynorhinus townsendii), both designated BLM sensitive species, has been indentified on the subject lease (Nevada Department of Wildlife Diversity Data Base).

NTL:The Regap data shows the presence of big sagebrush on the lease, which may be potential pygmy rabbit (Brachylagus idahoensis) habitat.

NTL: The lease contains occupied desert bighorn sheep (Orvis Canadensis nelson) habitat.

PARCEL NV-09-07-059 ALL LANDS

NTL:The Regap data shows the presence of big sagebrush on the lease, which may be potential pygmy rabbit (Brachylagus idahoensis) habitat.

NTL: The lease contains occupied desert bighorn sheep (Orvis Canadensis nelson) habitat.

PARCEL NV-09-07-068 ALL LANDS

NTL:The Regap data shows the presence of big sagebrush on the lease, which may be potential pygmy rabbit (Brachylagus idahoensis) habitat.

NTL: The lease contains occupied desert bighorn sheep (Orvis Canadensis nelson) habitat.

PARCEL NV-09-07-069 ALL LANDS

NTL:The Regap data shows the presence of big sagebrush on the lease, which may be potential pygmy rabbit (Brachylagus idahoensis) habitat.

NTL: The lease contains occupied desert bighorn sheep (Orvis Canadensis nelson) habitat.

PARCEL NV-09-07-070 ALL LANDS

NTL:The Regap data shows the presence of big sagebrush on the lease, which may be potential pygmy rabbit (Brachylagus idahoensis) habitat.

NTL: The lease contains occupied desert bighorn sheep (Orvis Canadensis nelson) habitat.

PARCEL NV-09-07-071 ALL LANDS

NTL:The Regap data shows the presence of big sagebrush on the lease, which may be potential pygmy rabbit (Brachylagus idahoensis) habitat.

PARCEL NV-09-07-076 ALL LANDS

NTL:The Regap data shows the presence of big sagebrush on the lease, which may be potential pygmy rabbit (Brachylagus idahoensis) habitat.

NTL: The lease contains occupied desert bighorn sheep (Orvis Canadensis nelson) habitat.

PARCEL NV-09-07-085 ALL LANDS

PARCEL NV-09-07-086 ALL LANDS

PARCEL NV-09-07-087 ALL LANDS

NTL:The Regap data shows the presence of big sagebrush on the lease, which may be potential pygmy rabbit (Brachylagus idahoensis) habitat.

PARCEL NV-09-07-090 ALL LANDS

The lease is located in the Eleven Mile flat and 25 Allotment. Wildlife is administered by the Tuscorara Field Office, Elko District.

PARCEL NV-09-07-092 ALL LANDS

The lease is located in the Eleven Mile flat and 25 Allotment. Wildlife is administered by the Tuscorara Field Office, Elko District.

Timing Limitation

Timing limitation on wildlife migration corridors and important habitat. This stipulation would be applied to protect the continuity of migration corridors and important habitat. Portions of the subject lease contains crucial pronghorn winter habitat that should be protected from disturbance from 11/15 to 3/16 inclusive.

Authority/Supporting Documentation:

EA-NV-02-029 Geothermal Resources Leasing PEA, September 10, 2002
PEIS for Geothermal Leasing in the Western US, October 2008

Description of Lands

PARCEL NV-09-07-003	ALL LANDS
PARCEL NV-09-07-006	ALL LANDS
PARCEL NV-09-07-053	ALL LANDS
PARCEL NV-09-07-059	ALL LANDS
PARCEL NV-09-07-068	ALL LANDS
PARCEL NV-09-07-069	ALL LANDS
PARCEL NV-09-07-070	ALL LANDS
PARCEL NV-09-07-071	ALL LANDS
PARCEL NV-09-07-076	ALL LANDS
PARCEL NV-09-07-087	ALL LANDS

Stipulations

No exploration during brooding/nesting period (April through August) in identified nesting habitat.

Authority/Supporting Documentation:

EA-NV-02-029 Geothermal Resources Leasing PEA, September 10, 2002
PEIS for Geothermal Leasing in the Western US, October 2008

Description of Lands

PARCEL NV-09-07-014	ALL LANDS
PARCEL NV-09-07-039	ALL LANDS
PARCEL NV-09-07-053	ALL LANDS
PARCEL NV-09-07-059	ALL LANDS
PARCEL NV-09-07-068	ALL LANDS
PARCEL NV-09-07-069	ALL LANDS
PARCEL NV-09-07-070	ALL LANDS
PARCEL NV-09-07-071	ALL LANDS
PARCEL NV-09-07-076	ALL LANDS

Stipulation

Monitoring surface and subsurface water resources. As exploration and development activities commence, the operator shall institute a surface and subsurface hydrologic monitoring program. The details of the monitoring programs will be site-specific and the intensity shall be commensurate with the level of exploration.

Authority/Supporting Documentation EA-NV-02-029 Geothermal Resources Leasing PEA, September 10, 2002
PEIS for Geothermal Leasing in the Western US, October 2008
BLM Instruction Memorandum No. 2002-174

Description of Lands

PARCEL NV-09-07-001 THRU PARCEL NV-09-07-006	ALL LANDS
PARCEL NV-09-07-009 THRU PARCEL NV-09-07-014	ALL LANDS
PARCEL NV-09-07-018 THRU PARCEL NV-09-07-019	ALL LANDS
PARCEL NV-09-07-021 THRU PARCEL NV-09-07-024	ALL LANDS
PARCEL NV-09-07-029 THRU PARCEL NV-09-07-031	ALL LANDS
PARCEL NV-09-07-034	ALL LANDS
PARCEL NV-09-07-035	ALL LANDS
PARCEL NV-09-07-036	ALL LANDS
PARCEL NV-09-07-038 THRU PARCEL NV-09-07-039	ALL LANDS
PARCEL NV-09-07-052 THRU PARCEL NV-09-07-054	ALL LANDS
PARCEL NV-09-07-058 THRU PARCEL NV-09-07-059	ALL LANDS

PARCEL NV-09-07-068 THRU PARCEL NV-09-07-071	ALL LANDS
PARCEL NV-09-07-076	ALL LANDS
PARCEL NV-09-07-084 THRU PARCEL NV-09-07-090	ALL LANDS
PARCEL NV-09-07-092	ALL LANDS

No Surface Occupancy

No surface occupancy in occupied sage-grouse Population Management Units.

Authority/Supporting Documentation:
EA-NV-02-029 Geothermal Resources Leasing PEA, September 10, 2002
PEIS for Geothermal Leasing in the Western US, October 2008

Description of Lands

PARCEL NV-09-07-014	T. 45 N., R. 27 E., MDM, Nevada sec. 15, PROT W2.
PARCEL NV-09-07-039	T. 40 N., R. 33 E., MDM, Nevada sec. 06, lots 1, 8-17, E2SW, N2SE, SESE; sec. 07, lots 7-20; sec. 08, SWSW; sec. 17, W2NW, SW; sec. 18, lots 5-20; sec. 19, lots 5-20; sec. 20, W2NE, W2, NWSE.
PARCEL NV-09-07-053	T. 30 N., R. 35 E., MDM, Nevada sec. 01, lot 1. T. 31 N., R. 35 E., MDM, Nevada sec. 36, E2E2, W2NW, NWSE. T. 30 N., R. 36 E., MDM, Nevada sec. 06, lots 1-4, S2NW, NESW, SE.
PARCEL NV-09-07-059	T. 28 N., R. 36 E., MDM, Nevada sec. 12, PROT SE. T. 28 N., R. 37 E., MDM, Nevada sec. 05, lots 1,2, S2NE, SE; sec. 07, S2. T. 29 N., R. 37 E., MDM, Nevada sec. 32, PROT E2E2; sec. 33, PROT All.
PARCEL NV-09-07-068	ALL LANDS
PARCEL NV-09-07-069	T. 27 N., R. 38 E., MDM, Nevada sec. 04, lots 3,4, S2NW, W2SW; sec. 05, lots 1,2, S2NE, SE; sec. 08, PROT NW, W2SW. T. 28 N., R. 38 E., MDM, Nevada sec. 32, all; sec. 33, N2, SW, N2SE, SWSE.

PARCEL NV-09-07-070	T. 28 N., R. 38 E., MDM, Nevada sec. 12, SESE; sec. 13, E2E2, SWNE, W2SE, E2SW; sec. 24, E2, E2W2, W2SW. T. 28 N., R. 39 E., MDM, Nevada sec. 05, lots 1-4, S2N2, S2; sec. 06E2E2, W2SE; sec. 07, E2, E2W2, SWNW, W2SW; sec. 18, lots 1-4, E2, E2W2; sec. 19, lots 1-4, E2, E2W2.
PARCEL NV-09-07-071	T. 29 N., R. 38 E., MDM, Nevada sec. 02, lots 1-4, SWNE, S2NW, SW, NWSE; sec. 11, NW, W2SW; sec. 14, W2NW. T. 30 N., R. 38 E., MDM, Nevada sec. 35, all; sec. 36, N2NW, SWNW, NWSW.
PARCEL NV-09-07-076	ALL LANDS
PARCEL NV-09-07-087	ALL LANDS

No Surface Occupancy

No exploration during winter (October through March) in identified winter habitats.

Authority/Supporting Documentation:
EA-NV-02-029 Geothermal Resources Leasing PEA, September 10, 2002
PEIS for Geothermal Leasing in the Western US, October 2008

	Description of Lands
PARCEL NV-09-07-014	ALL LANDS
PARCEL NV-09-07-039	ALL LANDS
PARCEL NV-09-07-053	ALL LANDS
PARCEL NV-09-07-059	ALL LANDS
PARCEL NV-09-07-068	ALL LANDS
PARCEL NV-09-07-069	ALL LANDS
PARCEL NV-09-07-070	ALL LANDS
PARCEL NV-09-07-071	ALL LANDS
PARCEL NV-09-07-076	ALL LANDS
PARCEL NV-09-07-087	ALL LANDS

ENDANGERED SPECIES ACT
SECTION 7 CONSULTATION STIPULATION

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 will 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 modifications of a designated or proposed critical habitat. BLM will not approve any ground-disturbing activity that may affect any such species or critical habitat until it completes its obligations under applicable requirements of the Endangered Species Act, 16 USC § 1531 *et seq.*, as amended, including completion of any required procedure for conference or consultation.

CULTURAL RESOURCE PROTECTION
LEASE STIPULATION

This lease may be found to contain historic properties or resources protected under the National Historic Preservation Act, American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, EO 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 exploration or development proposals to be modified to protect such properties, or it may disapprove any activity that is likely to result in adverse effects that could not be successfully avoided, minimized, or mitigated.

Form 3200-24a
(September 2008)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

OFFER TO LEASE AND LEASE FOR GEOTHERMAL RESOURCES
(For New Leases Issued Under the Energy Policy Act of 2005 [August 5, 2005])

Serial No.
NVN-089605

The undersigned (see page 2) offers to lease all or any of the lands in item 2 that are available for lease pursuant to the Geothermal Steam Act of 1970, as amended (30 U.S.C. 1001-1025).

READ INSTRUCTIONS BEFORE COMPLETING

1 Name	1a Street	
TGP Development Company LLC	11521 El Camino Real, Ste 100	
1b City	1c State	1d Zip Code
San Diego	CA	92130

2 Surface managing agency if other than BLM _____ Unit/Project _____

Legal description of land requested (segregate by public domain and acquired lands) Enter T., R., Meridian, State and County

Total Acres Applied for _____

Percent U.S. interest _____

Amount remitted Processing Fee $ _____ Rental Fee $ _____ Total $ _____

DO NOT WRITE BELOW THIS LINE

3 Land included in lease Enter T., R., Meridian, State and County

T. 24 N., R. 36 E., MDM, NV Churchill County
sec. 27: All;
sec. 33: All.

Total Acres in Lease 1,280.00

Rental Retained $ 2,560.00

In accordance with the above offer, or the previously submitted competitive bid, this lease is issued granting the exclusive right to drill for, extract, produce, remove, utilize, sell, and dispose of all the geothermal resources in the lands described in Item 3 together with the right to build and maintain necessary improvements thereupon, for a primary term of 10 years and subsequent extensions thereof in accordance with 43 CFR subpart 3207. Rights granted are subject to applicable laws, the terms, conditions, and attached stipulations of this lease, the Secretary of the Interior's regulations and formal orders in effect as of lease issuance, and, when not inconsistent with the provisions of this lease, regulations and formal orders hereafter promulgated

Type of Lease
- ☑ Competitive
- ☐ Noncompetitive
- ☐ Noncompetitive direct use (43 CFR subpart 3205)

Comments:
NV-11-03-031

THE UNITED STATES OF AMERICA

BY _____
(Signing Official)

Atanda Clark
(Printed Name)

Chief, Branch of Minerals Adjudication
(Title)

APR 15 2011
(Date)

EFFECTIVE DATE OF LEASE 05/01/2011

Check if this is a converted lease ☐

EFFECTIVE DATE OF LEASE CONVERSION _____

(Continued on page 2)

4 (a) The undersigned certifies that

(1) The offeror is a citizen of the United States, an association of such citizens, a municipality, or a corporation organized under the laws of the United States, any State or the District of Columbia, (2) All parties holding an interest in the offer are in compliance with 43 CFR part 3200 and the authorizing Act, (3) The offeror's chargeable interests, direct and indirect, do not exceed those allowed under the Act, and (4) The offeror is not considered a minor under the laws of the State in which the lands covered by this offer are located

(b) The undersigned agrees that signing this offer constitutes acceptance of this lease, including all terms, conditions and stipulations of which the offeror has been given notice The offeror further agrees that this offer cannot be withdrawn, either in whole or part, unless the withdrawal is received by the proper BLM State Office before this lease, an amendment to this lease, or a separate lease, whichever covers the land described in the withdrawal, has been signed on behalf of the United States

This offer will be rejected and will afford the offeror no priority if it is not properly completed and executed in accordance with the regulations or if it is not accompanied by the required payments Title 18 U S C § 1001 makes it a crime for any person knowingly and willfully to make to any Department or agency of the United States any false, fictitious, or fraudulent statements or representations as to any matter within its jurisdiction

Duly executed this 25th day of April, 2011 Vincent J. Sgroi (Printed Name of Lessee or Attorney-in-fact) (Signature of Lessee or Attorney-in-fact)

LEASE TERMS

Sec 1 Rentals--Rentals must be paid to the proper office of the lessor in advance of each lease year Annual rental rates per acre or fraction thereof, as applicable, are

(a) Noncompetitive lease (includes post-sale parcels not receiving bids, a direct use lease or a lease issued to a mining claimant) $1 00 for the first 10 years, thereafter $5 00 or

(b) Competitive lease $2 00 for the first year, $3 00 for the second through tenth year, thereafter $5 00

Annual rental is always due by the anniversary date of this lease (43 CFR 3211 13), regardless of whether the lease is in a unit or outside of a unit, the lease is in production or not, or royalties or direct use fees apply to the production

Rental may only be credited toward royalty under 43 CFR 3211 15 and 30 CFR 218 303 Rental may not be credited against direct use fees Failure to pay annual rental timely will result in late fees and will make the lease subject to termination in accordance with 43 CFR 3213 14

Sec. 2. (a) Royalties—Royalties must be paid to the proper office of the lessor Royalties are due on the last day of the month following the month of production Royalties will be computed in accordance with applicable regulations and orders Royalty rates for geothermal resources produced for the commercial generation of electricity but not sold in an arm s length transaction are 1 75 percent for the first 10 years of production and 3 5 percent after the first 10 years The royalty rate is to be applied to the gross proceeds derived from the sale of electricity in accordance with 30 CFR part 206 subpart H

The royalty rate for byproducts derived from geothermal resource production that are minerals specified in section 1 of the Mineral Leasing Act (MLA), as amended (30 U S C 181), is 5 percent except for sodium compounds, produced between September 29, 2006 and September 29, 2011 (Pub L No 109-338, §102, note to 30 U S C 362) for which the royalty rate is 2 percent No royalty is due on byproducts that are not specified in 30 U S C § 181 (43 CFR 3211 19)

If this lease or a portion thereof is committed to an approved communitization or unit agreement and the agreement contains a provision for allocation of production, royalties must be paid on the production allocated to this lease

(b) Arm's length transactions—The royalty rate for geothermal resources sold by you or your affiliate at arm's length to a purchaser is 10 percent of the gross proceeds derived from the arm's-length sale (43 CFR 3211 17, 3211 18)

(c) Advanced royalties In the absence of a suspension, if you cease production for more than one calendar month on a lease that is subject to royalties and that has achieved commercial production, your lease will remain in effect only if you make advanced royalty payments in accordance with 43 CFR 3212 15(a) and 30 CFR 218 305

(d) Direct use fees - Direct use fees must be paid in lieu of royalties for geothermal resources that are utilized for commercial, residential, agricultural, or other energy needs other than the commercial production or generation of electricity, but not sold in an arm's length transaction (43 CFR 3211 18 30 CFR 206 356) This requirement applies to any direct use of federal geothermal resources (unless the resource is exempted as described in 30 CFR 202 351(b) or the lessee is covered by paragraph (e), below) and is not limited to direct use leases Direct use fees are due on the last day of the month following the month of production

(e) If the lessee is a State, tribal, or local government covered by 43 CFR 3211 18(a)(3) and 30 CFR 206 366, check here ☐ A lessee under this paragraph is not subject to paragraph (d), above In lieu of royalties, the lessee under this paragraph must pay a nominal fee of

$ _____

Sec. 3. Bonds—A bond must be filed and maintained for lease operations as required by applicable regulations

Sec. 4. Work requirements, rate of development, unitization, and drainage--Lessee must perform work requirements in accordance with applicable regulations (43 CFR 3207 11, 3207 12), and must prevent unnecessary damage to, loss of, or waste of leased resources Lessor reserves the right to specify rates of development and production and to require lessee to commit to a communitization or unit agreement, within 30 days of notice, if in the public interest Lessee must drill and produce wells necessary to protect leased lands from drainage or pay compensatory royalty for drainage in the amount determined by lessor Lessor will exempt lessee from work requirements only where the lease overlies a mining claim that has an approved plan of operations and where BLM determines that the development of the geothermal resource on the lease would interfere with the mining operation (43 CFR 3207 13)

Sec. 5. Documents, evidence, and inspection—Lessee must file with the proper office of the lessor not later than (30) days after the effective date thereof, any contract or evidence of other arrangement for the sale, use, or disposal of geothermal resources, byproducts produced, or for the sale of electricity generated using geothermal resources produced from the lease At such times and in such form as lessor may prescribe, lessee must furnish detailed statements and all documents showing (a) amounts and quality of all geothermal resources produced and used (either for commercial production or generation of electricity, or in a direct use operation) or sold, (b) proceeds derived therefrom or from the sale of electricity generated using such resources, (c) amounts that are unavoidably lost or reinjected before use, used to generate plant parasitic electricity (as defined in 30 CFR 206 351) or electricity for lease operations, or otherwise used for lease operations related to the commercial production or generation of electricity, and (d) amounts and quality of all byproducts produced and proceeds derived from the sale or disposition thereof Lessee may be required to provide plats and schematic diagrams showing development work and improvements, and reports with respect to parties in interest

In a format and manner approved by lessor, lessee must keep a daily drilling record, a log, and complete information on well surveys and tests, keep a record of subsurface investigations, and furnish copies to lessor when required

Lessee must keep open at all reasonable times for inspection by any authorized officer of lessor the leased premises and all wells, improvements, machinery, and fixtures thereon, and all books, accounts, maps, and records relative to operations, surveys or investigations on or in the leased lands Lessee must maintain copies of all contracts, sales agreements, accounting records, billing records, invoices, gross proceeds and payment data regarding the sale disposition, or use of geothermal resources, byproducts produced, and the sale of electricity generated using resources produced from the lease, and all other information relevant to determining royalties or direct use fees All such records must be maintained in lessee's accounting offices for future audit by lessor and produced upon request by lessor or lessor's authorized representative or agent Lessee must maintain required records for 6 years after they are generated or, if an audit or investigation is underway, until released of the obligation to maintain such records by lessor

Sec. 6. Conduct of operations - Lessee must conduct operations in a manner that minimizes adverse impacts to the land, air, and water, to cultural, biological, visual, and other resources, and to other land uses or users Lessee must take reasonable measures deemed necessary by lessor to accomplish the intent of this section To the extent consistent with leased rights granted, such measures may include but are not limited to modification to siting or design of facilities timing of operations, and specification of interim and final reclamation measures Lessor reserves the right to continue existing uses and to authorize future uses upon or in the leased lands including the approval of easements or rights-of-way Such uses will be conditioned so as to prevent unnecessary or unreasonable interference with rights of lessee Prior to disturbing the surface of the leased lands, lessee must contact lessor to be apprised of procedures to be followed and modifications or reclamation measures that may be necessary Areas to be disturbed may require inventories or special studies to determine the extent of impacts to other resources Lessor may require lessee to complete minor inventories or short term special studies under guidelines provided by lessor If, in the conduct of operations, threatened or endangered species, objects of historic or scientific interest or substantial unanticipated environmental effects are observed, lessee must immediately contact lessor Lessee must cease any operations that are likely to affect or take such species, or result in the modification damage or destruction of such habitats or objects

Sec. 7. Production of byproducts — If the production, use, or conversion of geothermal resources from these leased lands is susceptible of producing a valuable byproduct or byproducts, including commercially demineralized water for beneficial uses in accordance with applicable State water laws, lessor may require substantial beneficial production or use thereof by lessee

Sec. 8. Damages to property - Lessee must pay lessor for damage to lessor s improvements, and must save and hold lessor harmless from all claims for damage or harm to persons or property as a result of lease operations

Sec. 9. Protection of diverse interests and equal opportunity - Lessee must maintain a safe working environment in accordance with applicable regulations and standard industry practices, and take measures necessary to protect public health and safety Lessor reserves the right to ensure that production is sold at reasonable prices and to prevent monopoly Lessee must comply with Executive Order No 11246 of September 24, 1965, as amended, and regulations and relevant orders of the Secretary of Labor issued pursuant thereto Neither lessee nor lessee's subcontractor may maintain segregated facilities

Sec. 10. Transfer of lease interests and relinquishment of lease—As required by regulations lessee must file with lessor any assignment or other transfer of an interest in this lease Subject to the requirements of 43 CFR subpart 3213, lessee may relinquish this lease or any legal subdivision by filing in the proper office a written relinquishment, which will be effective as of the date BLM receives it, subject to the continued obligation of the lessee and surety to be responsible for paying all accrued rentals and royalties plugging and abandoning all wells on the relinquished land, restoring and reclaiming the surface and other resources, and complying with 43 CFR 3200 4

Sec. 11. Delivery of premises - At such time as all or portions of this lease are returned to lessor lessee must place all wells in condition for suspension or abandonment, reclaim the land as specified by lessor and within a reasonable period of time, remove equipment and improvements not deemed necessary by lessor for preservation of producible wells or continued protection of the environment

Sec. 12. Proceedings in case of default - If lessee fails to comply with any provisions of this lease or other applicable requirements under 43 CFR 3200 4, and the noncompliance continues for 30 days after written notice thereof, this lease will be subject to termination in accordance with the Act and 43 CFR 3213 This provision will not be construed to prevent the exercise by lessor of any other legal and equitable remedy or action, including waiver of the default Any such remedy, waiver, or action will not prevent later termination for the same default occurring at any other time Whenever the lessee fails to comply in a timely manner with any of the provisions of the Act, this lease, the regulations, or other applicable requirements under 43 CFR 3200 4, and immediate action is required, the lessor may enter on the leased lands and take measures deemed necessary to correct the failure at the lessee's expense

Sec. 13. Heirs and successors-in-interest—Each obligation of this lease will extend to and be binding upon, and every benefit hereof will inure to, the heirs, executors, administrators, successors, or assigns of the respective parties hereto

(Continued on page 3)

NOTICE

Washington Office Instruction Memorandum No. 2010-171, dated March 5, 2010, supplements the Bureau of Land Management's 2004 National Sage-Grouse Habitat Conservation Strategy and provides the following guidance pertaining to the sale of parcels for oil/gas development:

"Attach a lease notice to new leases alerting the lessee that additional conditions will be applied to approvals to develop the lease, including Applications for Permit to Drill (APDs), sundry notices and associated rights-of-way, if future sage-grouse conservation efforts are appropriate."

Stipulation

This parcel may contain existing mining claims and/or mill sites located under the 1872 Mining Law. To the extent it does, the geothermal lessee must conduct its operations, so far as reasonably practicable, to avoid damage to any known deposit of any mineral for which any mining claim on this parcel is located, and should not endanger or unreasonably or materially interfere with the mining claimant's operations, including any existing surface or underground improvements, workings, or facilities which may have been made for the purpose of mining operations. The provisions of the Multiple Mineral Development Act (30 U.S.C. 521 et seq.) shall apply on the leased lands.

Description of Lands

PARCEL NV-11-03-002 THRU PARCEL NV-11-03-005	ALL LANDS
PARCEL NV-11-03-007	ALL LANDS
PARCEL NV-11-03-008	ALL LANDS
PARCEL NV-11-03-010 THRU PARCEL NV-11-03-026	ALL LANDS
PARCEL NV-11-03-028	ALL LANDS
PARCEL NV-11-03-030 THRU PARCEL NV-11-03-055	ALL LANDS
PARCEL NV-11-03-057	ALL LANDS
PARCEL NV-11-03-058	ALL LANDS
PARCEL NV-11-03-059	ALL LANDS

Stipulation

The lessee shall comply with the following conditions and stipulation unless they are modified by mutual agreement of the Lessee and the Authorized Officer:

Endangered Species. 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 objectives to avoid BLM-approved activity that will 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 modifications of a designated or proposed critical habitat. BLM will not approve any ground-disturbing activity that may affect such species or critical habitat until it completes its obligations under applicable requirements of the Endangered Species Act, 16 USC §1531 *et seq.*, as amended, including completion of any required procedure for conference or consultation.

	Description of Lands
PARCEL NV-11-03-001	ALL LANDS
PARCEL NV-11-03-002	ALL LANDS
PARCEL NV-11-03-003	ALL LANDS
PARCEL NV-11-03-005	ALL LANDS
PARCEL NV-11-03-007	ALL LANDS
PARCEL NV-11-03-010	ALL LANDS
PARCEL NV-11-03-014	ALL LANDS
PARCEL NV-11-03-015	ALL LANDS
PARCEL NV-11-03-016	ALL LANDS
PARCEL NV-11-03-017	ALL LANDS
PARCEL NV-11-03-018	ALL LANDS
PARCEL NV-11-03-019	ALL LANDS
PARCEL NV-11-03-024	ALL LANDS
PARCEL NV-11-03-025	ALL LANDS
PARCEL NV-11-03-026	ALL LANDS
PARCEL NV-11-03-027	ALL LANDS
PARCEL NV-11-03-031	ALL LANDS
PARCEL NV-11-03-034	ALL LANDS
PARCEL NV-11-03-040	ALL LANDS

Stipulation

The lessee shall comply with the following conditions and stipulation unless they are modified by mutual agreement of the Lessee and the Authorized Officer:

Native American Consultation. All development activities proposed under the authority of this lease are subject to the requirement for Native American consultation prior to BLM authorizing the activity. Depending on the nature of the lease developments being proposed and the resources or concerns to tribes potentially affected, Native American consultation and resulting mitigation measures to avoid significant impacts may extend time frames for processing authorizations for development activities, as well as change in the ways in which developments are implemented.

	Description of Lands
PARCEL NV-11-03-001	ALL LANDS
PARCEL NV-11-03-002	ALL LANDS
PARCEL NV-11-03-003	ALL LANDS
PARCEL NV-11-03-005	ALL LANDS
PARCEL NV-11-03-007	ALL LANDS
PARCEL NV-11-03-010	ALL LANDS
PARCEL NV-11-03-014	ALL LANDS
PARCEL NV-11-03-015	ALL LANDS
PARCEL NV-11-03-016	ALL LANDS
PARCEL NV-11-03-017	ALL LANDS
PARCEL NV-11-03-018	ALL LANDS
PARCEL NV-11-03-019	ALL LANDS
PARCEL NV-11-03-024	ALL LANDS
PARCEL NV-11-03-025	ALL LANDS
PARCEL NV-11-03-026	ALL LANDS
PARCEL NV-11-03-027	ALL LANDS
PARCEL NV-11-03-031	ALL LANDS
PARCEL NV-11-03-034	ALL LANDS
PARCEL NV-11-03-040	ALL LANDS

Stipulation

The lessee shall comply with the following conditions and stipulation unless they are modified by mutual agreement of the Lessee and the Authorized Officer:

Riparian Areas. No surface occupancy within 650 feet (horizontal measurement) of any surface water bodies, riparian areas, wetlands, playas or 100-year floodplains to protect the integrity of these resources (as delineated by the presence of riparian vegetation and not actual water). Exceptions to this restriction may be considered on a case-by-case basis if the BLM determines at least one of the following conditions apply: 1) additional development is proposed in an area where current development has shown no adverse impacts, 2) suitable off-site migration will be provided if habitat loss is expected, or 3) BLM determines development proposed under any plan of operations ensures adequate protection of the resources.

	Description of Lands
PARCEL NV-11-03-001	ALL LANDS
PARCEL NV-11-03-002	ALL LANDS
PARCEL NV-11-03-003	ALL LANDS
PARCEL NV-11-03-005	ALL LANDS
PARCEL NV-11-03-007	ALL LANDS
PARCEL NV-11-03-010	ALL LANDS
PARCEL NV-11-03-014	ALL LANDS
PARCEL NV-11-03-015	ALL LANDS
PARCEL NV-11-03-016	ALL LANDS
PARCEL NV-11-03-017	ALL LANDS
PARCEL NV-11-03-018	ALL LANDS
PARCEL NV-11-03-019	ALL LANDS
PARCEL NV-11-03-024	ALL LANDS
PARCEL NV-11-03-025	ALL LANDS
PARCEL NV-11-03-026	ALL LANDS
PARCEL NV-11-03-027	ALL LANDS
PARCEL NV-11-03-031	ALL LANDS
PARCEL NV-11-03-034	ALL LANDS
PARCEL NV-11-03-040	ALL LANDS

Form 3200-24a
(September 2008)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

OFFER TO LEASE AND LEASE FOR GEOTHERMAL RESOURCES
(For New Leases Issued Under the Energy Policy Act of 2005 [August 5, 2005])

Serial No.
N-88416

The undersigned (see page 2) offers to lease all or any of the lands in item 2 that are available for lease pursuant to the Geothermal Steam Act of 1970, as amended (30 U.S.C. 1001-1025).

READ INSTRUCTIONS BEFORE COMPLETING

1 Name	1a Street	
VENTURE PROSPECTS LLC	8731 RED OAK BLVD, STE 200	
1b City	1c State	1d Zip Code
CHARLOTTE	NC	28217

2. Surface managing agency if other than BLM _____ Unit/Project _____

Legal description of land requested (segregate by public domain and acquired lands) Enter T., R., Meridian, State and County

Total Acres Applied for _____

Percent U.S. interest _____

Amount remitted Processing Fee $ _____ Rental Fee $ _____ Total $ _____

DO NOT WRITE BELOW THIS LINE

3. Land included in lease Enter T., R., Meridian, State and County

T.0230N, R.0360E, 21 MDM, NV — Churchill County
Sec. 005 LOTS 1-4;
005 S2N2,S2;
006 LOTS 1-7;
006 S2NE,SENW,E2SW,SE;

Total Acres in Lease 1263.23

Rental Retained $ 2528.00

In accordance with the above offer, or the previously submitted competitive bid, this lease is issued granting the exclusive right to drill for, extract, produce, remove, utilize, sell, and dispose of all the geothermal resources in the lands described in Item 3 together with the right to build and maintain necessary improvements thereupon, for a primary term of 10 years and subsequent extensions thereof in accordance with 43 CFR subpart 3207. Rights granted are subject to applicable laws; the terms, conditions, and attached stipulations of this lease; the Secretary of the Interior's regulations and formal orders in effect as of lease issuance; and, when not inconsistent with the provisions of this lease, regulations and formal orders hereafter promulgated

Type of Lease
- ☑ Competitive
- ☐ Noncompetitive
- ☐ Noncompetitive direct use (43 CFR subpart 3205)

Comments:

THE UNITED STATES OF AMERICA

BY _____
(Signing Official)

ATANDA CLARK
(Printed Name)

Chief, Branch of Minerals Adjudication
(Title)

JUN 10 2010
(Date)

EFFECTIVE DATE OF LEASE 07/01/2010

Check if this is a converted lease ☐

EFFECTIVE DATE OF LEASE CONVERSION _____

(Continued on page 2)

INSTRUCTIONS

A General

1 Items 1 and 2 need to be completed only by parties filing for a noncompetitive lease The BLM will complete the front of the form for other types of leases The BLM may use the "Comments" space under Item 3 to identify when the lessee has elected to make all lease terms subject to the Energy Policy Act of 2005 under 43 CFR 3200 7(a)(2) or 43 CFR 3200 8(b) (box labeled "converted lease" must also be checked), the lease is being issued noncompetitively to a party who holds a mining claim on the same lands as is covered by the lease under 43 CFR 3204 12, the lease is a direct use lease issued to a State, local, or tribal government (box at section 2(e) under Lease Terms must also be checked), the lease is a competitive lease with direct-use-only stipulations attached, or other special circumstances exist A lessee who seeks to convert only the royalty rate of a lease under 43 CFR 3212 25 or who qualifies for a case-by-case royalty rate determination under 43 CFR 3211 17(b)(1)(i) should not use this form, but should instead use an addendum to the existing lease

2 Entries must be typed or printed plainly in ink The offeror must sign the form (Item 4) in ink

3 An original and two copies of this offer must be prepared and filed in the proper BLM State Office See regulations at 43 CFR 1821 10 for office locations

4 If more space is needed, additional sheets must be attached to each copy of the form submitted

B Specific

Item 1—Enter the offeror's name and billing address

Item 2—Indicate the agency managing the surface use of the land and the name of the unit or project of which the land is a part The offeror may also provide other information that will assist in establishing status of the lands The description of land must conform to 43 CFR 3203 10 Total acres applied for must not exceed that allowed by regulations (43 CFR 3203 10, 43 CFR 3206 12)

Payments For noncompetitive leases, the amount remitted must include the processing fee for noncompetitive lease applications (43 CFR 3204 10, 43 CFR 3000 12) and the first year's rental at the rate of $1 per acre or fraction thereof If the United States owns only a fractional interest in the geothermal resources, you must pay a prorated rental under 43 CFR 3211 11(d) The BLM will retain the processing fee even if the offer is completely rejected or withdrawn To maintain the offeror's priority, the offeror must submit rental sufficient to cover all the land requested If the land requested includes lots or irregular quarter-quarter sections, the exact acreage of which is not known to the offeror, rental should be submitted on the assumption that each such lot or quarter-quarter section contains 40 acres If the offer is withdrawn or rejected in whole or in part before a lease issues, the BLM will return the rental remitted for the parts withdrawn or rejected

The BLM will fill in the processing fee for competitive lease applications (43 CFR 3203 17, 43 CFR 3000 12) and the first year's rental at the rate of $2 per acre or fraction thereof

Item 3—The BLM will complete this space

NOTICES

The Privacy Act of 1974 and the regulation at 43 CFR 2 48(d) provide that you be furnished with the following information in connection with information required by this geothermal lease application
AUTHORITY 30 U S C 1000 et seq
PRINCIPAL PURPOSE—The information is to be used to process geothermal lease applications
ROUTINE USES (1) The adjudication of the lessee's rights to the land or resources (2) Documentation for public information in support of notations made on land status records for the management, disposal, and use of public lands and resources (3) Transfer to appropriate Federal agencies when concurrence is required prior to granting uses or rights in public lands or resources (4) Transfer to the appropriate Federal, State, local, or foreign agencies, when relevant to civil, criminal, or regulatory investigations or prosecutions

NOTICE

Washington Office Instruction Memorandum No. 2010-171, dated March 5, 2010, supplements the Bureau of Land Management's 2004 National Sage-Grouse Habitat Conservation Strategy and provides the following guidance pertaining to the sale of parcels for oil & gas/geothermal development:

"Attach a lease notice to new leases alerting the lessee that additional conditions will be applied to approvals to develop the lease, including Applications for Permit to Drill (APDs), sundry notices and associated rights-of-way, if future sage-grouse conservation efforts are appropriate."

ENDANGERED SPECIES ACT
SECTION 7 CONSULTATION STIPULATION

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 will 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 modifications of a designated or proposed critical habitat. BLM will not approve any ground-disturbing activity that may affect any such species or critical habitat until it completes its obligations under applicable requirements of the Endangered Species Act, 16 USC § 1531 *et seq.*, as amended, including completion of any required procedure for conference or consultation.

CULTURAL RESOURCE PROTECTION
LEASE STIPULATION

This lease may be found to contain historic properties or resources protected under the National Historic Preservation Act, American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, EO 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 exploration or development proposals to be modified to protect such properties, or it may disapprove any activity that is likely to result in adverse effects that could not be successfully avoided, minimized, or mitigated.

Riparian Areas Stipulation

The lessee shall comply with the following special conditions and stipulations unless they are modified by mutual agreement of the Lessee and the Authorized Officer (AO):

No surface occupancy or disturbance will be allowed within 650 feet (horizontal measurement) of any surface water bodies, riparian areas, wetlands, playas, or 100-year floodplains to protect the integrity of these resources (as delineated by the presence of riparian vegetation and not actual water). Exceptions to this restriction may be considered on a case-by-case basis if the BLM determines at least one of the following conditions apply: 1) additional development is proposed in an area where current development has shown no adverse impacts, 2) suitable off-site mitigation will be provided if habitat loss is expected, or 3) BLM determines development proposed under any plan of operations ensures adequate protection of the resources.

PARCEL	DESCRIPTION OF LANDS
PARCEL NV-10-05-006 THRU PARCEL NV-10-05-008	ALL LANDS
PARCEL NV-10-05-011 THRU PARCEL NV-10-05-018	ALL LANDS
PARCEL NV-10-05-021 THRU PARCEL NV-10-05-022	ALL LANDS
PARCEL NV-10-05-024 THRU PARCEL NV-10-05-036	ALL LANDS
PARCEL NV-10-05-040 THRU PARCEL NV-10-05-044	ALL LANDS
PARCEL NV-10-05-052	ALL LANDS
PARCEL NV-10-05-057	ALL LANDS
PARCEL NV-10-05-058	ALL LANDS

Native American Consultation Stipulation

The lessee shall comply with the following special conditions and stipulations unless they are modified by mutual agreement of the Lessee and the Authorized Officer (AO):

All development activities proposed under the authority of this lease are subject to the requirement for Native American consultation prior to BLM authorizing the activity. Depending on the nature of the lease developments being proposed and the resources of concerns to tribes potentially effected, Native American consultation and resulting mitigation measures to avoid significant impacts may extend time frames for processing authorizations for development activities, as well as, change in the ways in which developments are implemented.

PARCEL	DESCRIPTION OF LANDS
PARCEL NV-10-05-006 THRU PARCEL NV-10-05-008	ALL LANDS
PARCEL NV-10-05-011 THRU PARCEL NV-10-05-018	ALL LANDS
PARCEL NV-10-05-021 THRU PARCEL NV-10-05-022	ALL LANDS
PARCEL NV-10-05-024 THRU PARCEL NV-10-05-036	ALL LANDS
PARCEL NV-10-05-040 THRU PARCEL NV-10-05-044	ALL LANDS
PARCEL NV-10-05-052	ALL LANDS
PARCEL NV-10-05-057	ALL LANDS
PARCEL NV-10-05-058	ALL LANDS

Appendix B: Inter-Disciplinary Team Checklist for EA Preparation

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
CARSON CITY DISTRICT OFFICE

EA Project Initiation

Part 1: Project Proposal

Project Lead: Ed Klimasaskas **Field Office:** Stillwater

Name of Proposed Action: Terra-Gen Power LLC Coyote Canyon South Geothermal Exploration

Date of Proposal to ID Team: 01/17/2012

File Code (Project/Serial Number): NVN-086889, NVN-088416, NVN-0

Applicant/ Proponent (if BLM originated, identify program area): Terra-Gen Power LLC

Complete Description of Proposed Action: Terra-Gen Power LLC proposes to evaluate the geothermal resources that exist at their geothermal leases in Dixie Valley. The project area is directly south of the Coyote Canyon geothermal project area previously analyzed. This will include drilling of observation wells between 6,000 and 10,000 feet deep at as many as 15 locations. Each drill site would require construction of a drill pad 350 feet by 350 feet (2.8 acres). Access roads to drill sites would use existing roads to the extent possible. Up to 6 miles of new road would need to be constructed as well as improvements made to some of the existing roads. Disturbance would be limited to a maximum of approximately 25 acres for new access roads and approximately 42 acres for construction of well pads. One or more temporary water wells may also be drilled to supply water for exploration operations, including construction, dust abatement, and drilling activities. Disturbance for possible temporary water wells would be limited to a maximum of approximately 0.5 acres. A personnel camp would be maintained at an existing drill pad for support of drilling operations.

Complete Description of Purpose and Need for the Project: Terra-Gen is preparing to explore the Coyote Canyon South geothermal resource area for the potential construction and operation of a geothermal power plant in Dixie Valley, Nevada. This project would use geothermal fluid to generate electricity. The need for the project is to provide renewable energy as directed by national policy.

Legal Description (Attach a 7.5 Min Scale Electronic Location Map): T23N R36E sec. 6; T24N R35E sec. 36; T24N R36E sec. 27, 28, 29, 30, 31, 32, 33 (Bolivia 1:24,000)

Funding/Project Code: LLNVC01000-EJ0000-LXSIGEOT0000

Does Proposal conform to Carson City CRMP? YES **Cite reference:** MIN-1, 1. Encourage development of energy and mineral resources in a timely manner to meet national, regional, and local needs consistent with the objectives for other public land uses.

Other Considerations:

Part 2: Signature to Proceed

Supervisory Natural Resource Specialist Signature Carla Jaussen **Date:** 01-13-12

Part 3: ID Team CHECKLIST for EA Preparation (*THE FOLLOWING LIST WILL BE REVIEWED AND COMPLETED BY ID TEAM DURING INTIAL INTERNAL SCOPING MEETING)*

Supplemental Authority*	Not Present **	Present/Not Affected	Present/May Be Affected***	Rationale
Air Quality		la		Range Specialist by Allotment:
Areas of Critical Environmental Concern	JRW DW			Jason Wright/Dan Westermeyer:
Cultural Resources		JRW		Jason Wright:
Environmental Justice	X			Chip Kramer:
Farm Lands (prime or unique)	la			Range Specialist by Allotment:
Forests and rangelands (HFRA Projects Only)	X			Coreen Francis:
Human Health and Safety (Herbicide Projects)	JD			Jill Devaurs:
Floodplains			la	Range Specialist by Allotment:
Invasive, Nonnative and Noxious Species			JD	Jill Devaurs:
Migratory Birds			JW	John Wilson:
Native American Religious Concerns	JRW	#		Jason Wright: Several field trips w/ FPST cultural coordinator, no concerns
Threatened and/or Endangered Species	JW			John Wilson:
Wastes, Hazardous or Solid		DS		Dave Schroeder:
Water Quality (Surface/Ground)			X	~~Gabe Venegas~~:
Wetlands/Riparian Zones			la	Range Specialist by Allotment:
Wild and Scenic Rivers	DW			Dan Westermeyer:
Wilderness	DW			Dan Westermeyer:

**See H-1790-1(January 2008) Appendix 1 Supplemental Authorities to be Considered.*
***Supplemental Authorities determined to be Not Present or Present/Not Affected need not be carried forward or discussed further in the document.*
****Supplemental Authorities determined to be Present/May Be Affected must be carried forward in the document.*

Resource or Issue	Present/Not Affected#	Present/May Be Affected##	Rationale
Lands with Wilderness Characteristics	DW		Dan Westermeyer: NOT PRESENT
VRM		DW	Dan Westermeyer:
Recreation	DW		Dan Westermeyer:
ROWs/Lands		ESP	Erik Pignata: Chuck Valentine will run LR2k for ROWs, etc
WHBA	/		John Axtell: Not Present
Minerals		KD	Ken Depaoli: - will check mining claims & CR case file.
Renewable Energy			Ed Klimasaukas/Colleen Sievers: Not Present
Wildlife/Key Habitat		JW	John Wilson:
BLM Sensitive Species		JW	John Wilson:
Livestock Grazing	la		Linda Appel/Jill Devaurs/Chelsy Simerson

#Resources or uses determined to be Present/Not Affected need not be carried forward or discussed further in the document.
##Resources or uses determined to be Present/May Be Affected must be carried forward in the document.

Appendix C: Biological Survey Report

Coyote Canyon Extension Geothermal Exploration Project

Biological Resources Report

TGP Dixie Development Company, LLC

August 2011

Prepared for TGP Dixie Development Company, LLC
By EMPSi
Reno, Nevada

TABLE OF CONTENTS

Chapter Page

APPENDICES

FIGURES

Page

TABLES

Page

ACRONYMS AND ABBREVIATIONS

	Full Phrase
BLM	United States Department of the Interior, Bureau of Land Management
ESA	Endangered Species Act
GPS	global positioning system
IM	Instruction Memorandum
MW	megawatt
NDOW	Nevada Department of Wildlife
NNHP	Nevada Natural Heritage Program
SWReGAP	Southwest Regional GAP Analysis Project
TGP	TGP Dixie Development Company
US	United States
USC	United States Code
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

CHAPTER 1
INTRODUCTION

This report summarizes observations made during a biological field survey for the proposed TGP Dixie Development Company's (TGP) Coyote Canyon Extension Geothermal Exploration Project (Project) at the proposed site in Churchill County, Nevada (**Figure 1**, Coyote Canyon Extension Project Location). The biological field survey was conducted to identify vegetation communities; evaluate project area habitat suitability for special status plant and wildlife species; locate important habitat features, such as nest sites and riparian and wetland areas; identify invasive, non-native species; and document wildlife use of the area.

The results of the biological survey will be used to evaluate potential impacts of the proposed Project on biological resources in the environmental document prepared by the United States (US) Department of the Interior, Bureau of Land Management (BLM), Stillwater Field Office in accordance with the National Environmental Policy Act.

1.1 PROJECT BACKGROUND

The applicant, TGP, proposes to drill up to 15 exploratory geothermal wells, including the construction of access roads, well pads, sumps, and related facilities. Detailed plans are included in TGP's Plan of Operations.

The Project consists of 70.92 acres of disturbance, as follows:

- Up to 15 exploration wells, associated well pads, and a non-potable water well (42.2 acres of disturbance);
- Access roads (28.2 acres); and
- Water well (0.52 acre).

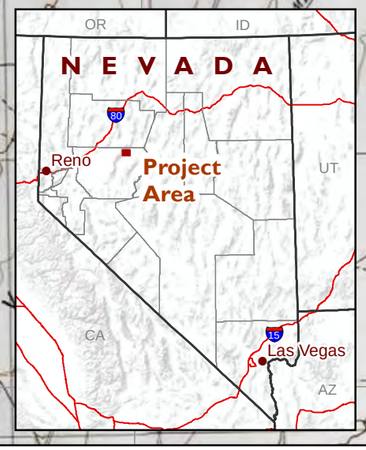
Figure 1- Coyote Canyon Extension Project Location

Churchill County, NV

Coyote Canyon Extension Project Area

Coyote Canyon Unit Boundary

Source: SWReGAP 2004, TGP 2011



24N 35E

24N 36E

23N 36E

HUMBOLDT SALT MARSH (DEPRESSION)

ALKALI FLAT

SPRINGS

SEEP

SEEPS

SPRING

Spring

0 0.2 0.4 Miles

N

June 20, 2011, Version 01
Carson City District Office
No warranty is made by the BLM as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

Aboveground pipelines would carry water to support drilling from the existing Dixie Valley power plant to the north, to each well as it is drilled. Additional temporary piping may also be installed to carry geothermal fluids from wells as they are flow tested, to sumps at the existing Dixie Valley power plant. Access roads would be required for the Project to each well pad and any pipelines would be laid on the ground within the right-of-ways for those access roads.

Access would be from Fallon, Nevada, along US Highway 50. The project area is approximately 43 miles north of Highway 50 along State Route 121.

A biological survey within the original Coyote Canyon lease area, which comprises a subset of the current Coyote Canyon Extension lease area, was conducted in 2009.

1.2 REGIONAL AND GEOGRAPHIC OVERVIEW

The geothermal project area is located in the Dixie Valley, on the east side of the Stillwater Range (Figure 1-1).

The project area is located within the Great Basin ecoregion, which is a cold desert characterized by a series of uplifted mountain ranges and their associated intervening valleys. Elevations range from approximately 3,300 feet to 3,600 feet, and the Stillwater National Wildlife Refuge is located approximately 35 miles to the southwest.

1.3 METHODS

Existing GIS landcover data from the Southwest Regional GAP Analysis Project (SWReGAP) (US Geological Survey [USGS] National Gap Analysis Program 2004) were used for preliminary Project habitat mapping. Vegetation types and acreages of each type were calculated for the project area.

EMPSi reviewed the potentially occurring BLM Sensitive species and their habitat requirements, as listed in the biological survey report for the Coyote Canyon lease area (CH2M HILL 2009). In addition, EMPSi requested lists of threatened, endangered, and sensitive species from the Nevada Natural Heritage Program (NNHP), Nevada Department of Wildlife (NDOW), and the US Fish and Wildlife Service (USFWS) (Appendix A).

A field survey of the project area was conducted by two EMPSi biologists on May 9 and 10, 2011. The SWReGAP data were used as a basis for field verification of vegetation communities, and EMPSi recorded information about vegetation types and habitat conditions while walking meandering transects within the project area. The project area was accessed via car and foot. Biologists recorded a complete list of vegetation observed as well as the dominant shrub, grass, and forb species in each habitat type within the project area. Elevation was recorded based on global positioning system (GPS) locations and USGS topographical maps of the area. Notable habitat features such as rock

outcroppings, burrows, and wetland and riparian areas were recorded, as were incidental wildlife observations and wildlife sign.

For special status plants, potentially suitable plant communities were examined during the bloom period.

Ground burrows were examined for evidence of burrowing owls (e.g. feathers, pellets with insect exoskeletons, scat), although a protocol-level burrowing owl survey was not conducted.

Reconnaissance for potential golden eagle nesting habitat was concurrent with the ground survey; the survey area for this reconnaissance included the project area and a 2-mile buffer around the project area. Golden eagle and other raptors were surveyed specifically for the presence of nests by examining all rocky outcrops for suitability (e.g., enough vertical exposure), whitewash, and stick nests. Surveys focused on the western edge of the project area where the Stillwater Range bounds the project area. Maps and GIS shapefiles were loaded into a handheld GPS unit which was used to delineate a two-mile buffer survey area. Surveys for potential nests were performed by scanning suitable rock outcrops with binoculars and spotting scope generally following the USFWS protocols for golden eagle inventory and monitoring (Pagel et al. 2010). Areas not easily viewed from below were hiked and examined.

In addition, an aerial golden eagle survey was conducted for two nearby projects which encompassed a 4-mile buffer around the project area. Active and inactive nests were mapped using GPS technology. These data are incorporated into this report, where applicable.

CHAPTER 2
VEGETATION

In general, the vegetation within the project area is fairly homogenous, composed of mainly salt desert shrub, greasewood flat, or playa. Biotic crusts occur in many locations, indicating a lack of prior soil disturbance. However, invasive species such as cheatgrass (*Bromus tectorum*) and halogeton (*Halogeton glomeratus*) occur throughout the project area, and cheatgrass is the dominant species in some areas.

2.1 VEGETATION TYPES WITHIN THE PROJECT AREA

Table 2-1, SWReGAP Landcover Types within the Project Area, presents the SWReGAP landcover types, landcover description, and associated acreages within the project area (**Figure 2**, Southwest Regional GAP Analysis Landcover Types). **Appendix B**, Photo Log, shows SWReGAP landcover types observed within the project area. A complete list of plant species observed during the field survey is included as **Appendix C**, List of Species Observed.

2.1.1 Inter-Mountain Basins Mixed Salt Desert Scrub

The mixed salt desert shrub community occurs in the western portion of the project area, and is composed of fairly equal amounts of Bailey's greasewood (*Sarcobatus baileyi*), rabbitbrush (*Chrysothamnus nauseosus* and *C. viscidiflorus*), and budsage (*Artemisia spinescens*). Horsebrush (*Tetradymia spinosa* and *T. glabrata*), Nevada ephedra (*Ephedra nevadensis*), and spiny hopsage (*Grayia spinosa*) were occasionally observed. The greasewood in this community was less robust and shorter than in the greasewood flat vegetation community, and the shrub layer was generally more open in comparison. The forb and grass component is comprised of cheatgrass, red brome (*Bromus rubens*), flixweed (*Descurainia sophia*), pincushion (*Chaenactis* sp.), prince's plume (*Stanleya pinnata*), desert dandelion (*Malacothrix* sp.), globemallow (*Sphaeralcea ambigua*), fiddleneck (*Amsinckia tessellata*), redstem filaree (*Erodium cicutarium*), halogeton, and Great Basin wildrye (*Leymus cinereus*).

Table 2-1
SWReGAP Landcover Types within the Project Area

SWReGAP Landcover Type	Landcover Description	Approximate Acres
Inter-Mountain Basins Mixed Salt Desert Scrub	Open-canopied shrublands of typically saline basins, alluvial slopes and plains; substrates are often saline and calcareous, medium- to fine-textured, alkaline soils; vegetation characterized by a typically open to moderately dense shrubland composed of one or more saltbush (*Atriplex*) species; herbaceous layer varies from sparse to moderately dense.	2,086
Inter-Mountain Basins Playa	Composed of barren and sparsely vegetated playas (generally less than 10% plant cover); salt crusts common, with small saltgrass (*Distichlis* sp.) beds in depressions and sparse shrubs around the margins; intermittently flooded.	1,147
Inter-Mountain Basins Greasewood Flat	Typically occurs near drainages on stream terraces and flats or may form rings around more sparsely vegetated playas; typically have saline soils, a shallow water table and flood intermittently, but remain dry for most growing seasons; usually occurs as a mosaic of multiple communities, with open to moderately dense shrublands dominated or co-dominated by greasewood (*Sarcobatus* spp.); often surrounded by mixed salt desert scrub.	282
North American Arid West Emergent Marsh	Frequently or continually inundated, with water depths up to 2 meters. Water levels may be stable or may fluctuate 1 meter or more over the course of the growing season. Vegetation is characterized by herbaceous plants that are adapted to saturate soil conditions, such as rushes (*Juncus* spp.) and cattails (*Typha* spp.)	16

Source: USGS National Gap Analysis Program 2005

Figure 2- Southwest Regional GAP Analysis Landcover Types

Churchill County, NV

Coyote Canyon Extension Project Area

Coyote Canyon Unit Boundary

SWReGAP Vegetation

- Inter-Mountain Basins Playa
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Greasewood Flat
- North American Arid West Emergent Marsh
- Inter-Mountain Basins Semi-Desert Shrub Steppe

Source: SWReGAP 2004, TGP 2011

22 23 27 26 35 33 34 35 6 5 4 3 2 15 7 8 9 10 11

23N 36E

N

0 0.2 0.4

Miles

June 20, 2011, Version 01
Carson City District Office
No warranty is made by the BLM as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

2.1.1 Inter-Mountain Basins Playa

The playa community comprises the eastern portion of the project area. It is largely unvegetated, with some salt grass (*Distichlis spicata*) growing and salt crusts visible.

2.1.1 Inter-Mountain Basins Greasewood Flat

Greasewood flat occurs in low-lying sites throughout the western portion of the project area, intergrading with the mixed salt desert shrub vegetation community. Greasewood flat is dominated by robust, usually 3- to 4-foot tall Bailey's greasewood, with a few rabbitbrush, budsage, and shadscale (*Atriplex confertifolia*) shrubs associated. In certain locations, tamarisk (*Tamarix ramosissima*) (both dead and alive) grew in a line from the greasewood flat towards the playa. Tamarisk within the project area has been treated with pesticides by the BLM to eradicate this invasive species. The forb and grass component was similar to the mixed salt desert scrub community.

2.1.2 North American Arid West Emergent Marsh

One area in the southwestern portion of the project area is characterized as North American Arid West Emergent Marsh. Within the project area, this community is more accurately described as a wet meadow with a small marsh component, as it has a high percent cover of salt grass and small patches of Baltic rush (*Juncus balticus*) and canary reedgrass (*Phragmites australis*). The source of water for the wet meadow is located just west of the project area boundary, where there is a spring. During field surveys, there were small patches within the project area with a few inches of standing water, but generally any standing water had evaporated.

2.1.3 Noxious, Invasive, and Non-Native Species

The State of Nevada lists 47 noxious weed species that require control (Nevada Administrative Code 555.10) (Nevada Department of Agriculture 2008). Of these, tamarisk was observed in several areas within the project area, notably growing in lines in Sections 28 and 31. Tamarisk within the project area has been treated with pesticides by the BLM to eradicate this invasive species. Cheatgrass and halogeton are invasive species that were observed throughout the project area. Small cheatgrass-dominated patches were noted in certain areas, such as the northeast corner of Section 29.

CHAPTER 3
WILDLIFE

3.1 REGIONAL OVERVIEW

Table 3-1, Typical Wildlife Species Associated with Habitats within Project Area, presents the habitat types within the project area and typically associated wildlife species within the Great Basin. Species documented during surveys were characteristic of the habitat types found within the project area. A complete list of wildlife species observed during the field survey is included as **Appendix C**.

Table 3-1
Typical Wildlife Species Associated with Habitats within Project Area

Habitat Type[1]	Associated Species
Inter-Mountain Basins Mixed Salt Desert Scrub	Pronghorn antelope; coyote; pocket mouse; loggerhead shrike; common raven; side-blotched lizard
Inter-Mountain Basins Playa	Pocket gopher; killdeer; American avocet; black-necked stilt
Inter-Mountain Basins Greasewood Flat	Black-tailed jackrabbit; white-tailed antelope squirrel; black-throated sparrow; horned lark; desert horned lizard
North American Arid West Emergent Marsh	Yellow-headed blackbird; marsh wren; spotted sandpiper; bullfrog

[1] Based on SWReGAP landcover types

3.2 MIGRATORY BIRDS

3.2.1 Regulatory Background

Migratory Bird Treaty Act of 1918

The Migratory Bird Treaty Act implements a series of international treaties that provide for migratory bird protection. The Act authorizes the Secretary of the Interior to regulate the taking of migratory birds; the act provides that it shall be

unlawful, except as permitted by regulations, "to pursue, take, or kill any migratory bird, or any part, nest or egg of any such bird" (16 US Code [USC] 703) but does not regulate habitat. The list of species protected by the Act was revised in March 2010, and includes almost all bird species (1,007 species) that are native to the US.

Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds

Signed on January 11, 2001, this Executive Order directs each federal agency taking actions that are likely to have a measureable effect on migratory bird populations to develop and implement a Memorandum of Understanding with the USFWS that promotes the conservation of migratory bird populations.

Instruction Memorandum 2008-050, Migratory Bird Treaty Act–Interim Management Guidance

This Instruction Memorandum (IM) establishes a consistent approach for addressing migratory bird populations and habitats when adopting, revising, or amending land use plans and when making project level implementation decisions until a national Memorandum of Understanding with the USFWS is established. It provides guidance for conservation planning, land use planning, and management of habitat for USFWS Bird Species of Conservation Concern and Game Birds Below Desired Condition.

3.2.2 Survey Results

Migratory Birds

Based on the habitats observed, numerous migratory bird species have the potential to occur within the project area. Eighteen species were observed during field surveys, including black-throated sparrow (*Amphispiza bilineata*), loggerhead shrike (*Lanius ludovicianus*), northern harrier (*Circus cyaneus*), and western kingbird (*Tyrannus verticalis*) (Appendix C).

Birds of Conservation Concern

Birds of Conservation Concern that could potentially occur within the project area are presented in **Table 3-2**, Birds of Conservation Concern Potentially Occurring within the Project Area. The following Birds of Conservation Concern are considered unlikely to occur based on lack of suitable habitat within the project area: tricolored blackbird (*Agelaius tricolor*), American bittern (*Botaurus lentiginosus*), yellow-billed cuckoo (*Coccyzus americanus*), peregrine falcon (*Falco peregrinus*), olive-sided flycatcher (*Contopus cooperi*), northern goshawk (*Accipiter gentilis*), rufous hummingbird (*Selasphorus rufus*), pinyon jay (*Gymnorhinus cyanocephalus*), pygmy nuthatch (*Sitta pygmaea*), flammulated owl (*Otus flammeolus*), spotted owl (*Strix occidentalis*), greater sage-grouse (*Centrocercus urophasianus*), red-naped sapsucker (*Sphyrapicus nuchalis*), Williamson's sapsucker (*Sphyrapicus thyroideus*), black swift (*Cypseloides niger*), black-throated gray warbler (*Dendroica nigrescens*), Virginia's warbler (*Vermivora*

Table 3-2
Birds of Conservation Concern Potentially Occurring within the Project Area

Species	Habitat	Potential for Occurrence
American avocet *Recurvirostra americana*	Shallow marsh with sparse emergent vegetation; large mudflats; dry islands; playa margins	Potential to occur.
Long-billed curlew *Numenius americanus*	Grasslands and irrigated agricultural fields	Potential to occur.
Golden eagle *Aquila chrysaetos*	Variety of open and semi-open landscapes with sufficient mammalian prey base and cliff sites for nesting	Confirmed (see Section 4.2).
Prairie falcon *Falco mexicanus*	Nests on cliffs; forages over a variety of shrub habitats, agricultural crops, and native perennial grasses. Avoids dense cheatgrass	Potential to occur. Ample cliffs for nesting and shrublands for foraging. Observed during 2009 surveys.
Northern harrier *Circus cyaneus*	Marshes, meadows, grasslands, and cultivated fields; nests on ground, usually in dense cover	Confirmed. Observed within project area during surveys.
Swainson's hawk *Buteo swainsoni*	Usually occurs close to riparian or other wet habitats; forages over agricultural fields, wet meadows, or open shrublands	Confirmed. Observed within project area during surveys.
Ferruginous hawk *Buteo regalis*	Grasslands and semi-desert shrublands; nest in isolated trees, on rock outcrops, or ground	Potential to occur.
Costa's hummingbird *Calypte costae*	Desert, shrubland, chaparral	Potential to occur.
Burrowing owl *Athene cunicularia*	Treeless areas with low vegetation and burrows	Potential to occur.
Short-eared owl *Asio flammeus*	Wet meadow or grassland bordered by open shrublands or other dry habitat	Potential to occur.
Wilson's phalarope *Phalaropus tricolor*	Variety of large and small marshes with sufficient shoreline vegetation; ephemeral wetlands and playas for migration	Potential to occur.
Snowy plover *Charadrius alexandrinus*	Alkali flat, mudflat, or flat beach adjacent to permanent or seasonal surface water	Potential to occur.
Loggerhead shrike *Lanius ludovicianus*	Open country with scattered trees and shrubs, desert scrub; nests in shrubs or small trees	Confirmed. Observed within project area during surveys.
Brewer's sparrow *Spizella breweri*	Sagebrush, greasewood, perennial upland grasslands	Potential to occur.
Sage sparrow *Amphispiza belli*	Treeless sagebrush or salt desert shrubland with little or no cheatgrass invasion	Potential to occur.
Gray vireo *Vireo vicinior*	Hot, semi-arid, shrubby habitats	Potential to occur.

Sources: GBBO 2010; NatureServe 2011; Wildlife Action Plan Team 2006

virginiae), willet (*Tringa semipalmata*), Lewis's woodpecker (*Melanerpes lewis*), and white-headed woodpecker (*Picoides albolarvatus*).

Game Birds Below Desired Condition

Game Birds Below Desired Condition that could potentially occur within the project area are presented in **Table 3-3**, Game Birds Below Desired Condition Potentially Occurring within the Project Area. The two species that could occur within the project area are the mallard and mourning dove. Many mourning doves were observed during the field survey, although no mallards were observed. Game birds below desired condition considered unlikely to occur based on lack of suitable habitat include canvasback (*Aythya valisineria*), ring-necked duck (*Aythya collaris*), wood duck (*Aix sponsa*), band-tailed pigeon (*Columba fasciata*), and northern pintail (*Anas acuta*).

Table 3-3
Game Birds Below Desired Condition Potentially Occurring within the Project Area

Species	Habitat	Potential for Occurrence
Mallard *Anas platyrhynchos*	Primarily shallow waters	Potential to occur.
Mourning dove *Zenaida macroura*	Found in a variety of habitats except playas	Confirmed. Observed within project area during surveys.

Sources: CH2M HILL 2009; GBBO 2010; NatureServe 2011;

3.3 GAME SPECIES

The BLM manages habitat for game species. The Stillwater Range in the vicinity of the Project is year-round mule deer and pronghorn antelope range, potential elk habitat, and occupied bighorn sheep habitat (BLM 2010). Pronghorn antelope and mule deer are the only big game species that were observed within the Coyote Canyon Extension project area during field surveys; the species were observed infrequently in salt desert shrub habitat.

CHAPTER 4
SPECIAL STATUS SPECIES

Special status species in this document include those species listed under the Endangered Species Act (ESA) as threatened or endangered and their designated critical habitat, species proposed or candidates for ESA listing, BLM Sensitive species, and species protected by the Bald and Golden Eagle Protection Act. These species and the regulations protecting them are described below.

4.1 REGULATORY BACKGROUND

Endangered Species Act

The Endangered Species Act of 1973 (16 USC §§1531 *et seq.*), as amended, provides for the conservation of federally listed plant and animal species and their habitats. The ESA directs federal agencies to conserve listed species and imposes an affirmative duty on these agencies to ensure that their actions are not likely to jeopardize the continued existence of a listed species or adversely modify its designated critical habitat.

Critical habitat is defined in the ESA as "the specific areas within the geographical area occupied by the species, …, on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection; and… specific areas outside the geographical area occupied by the species… upon a determination by the Secretary [of the Interior] that such areas are essential for the conservation of the species" [16 USC 1532(5)(A)].

BLM Manual 6840 – Special Status Species Management

BLM Manual 6840 provides management policy for federally listed species and BLM-designated sensitive species. Species classified as BLM-designated sensitive must be native species found on BLM-administered lands for which the BLM has the capability to significantly affect the conservation status of the species through management, and either:

1. There is information that a species has recently undergone, is undergoing, or is predicted to undergo a downward trend such that the viability of the species or a distinct population segment of the species is at risk across all or a significant portion of the species range; or

2. The species depends on ecological refugia or specialized or unique habitats on BLM-administered lands, and there is evidence that such areas are threatened with alteration such that the continued viability of the species in that area would be at risk.

BLM protects and manages habitat for the enhancement and protection of the species future existence.

Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (1940 as amended 1959, 1962, 1972, 1978) prohibits the take or possession of bald and golden eagles with limited exceptions. Take, as defined in the Act, includes "to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb". "Disturb" means "to agitate or bother a bald or golden eagle to a degree that causes or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding or sheltering behavior."

An important eagle-use area is defined in the Act as an eagle nest, foraging area, or communal roost site that eagles rely on for breeding, sheltering, or feeding, and the landscape features surrounding such nest, foraging area, or roost site that are essential for the continued viability of the site for breeding, feeding, or sheltering eagles.

BLM requires consideration and NEPA analysis of golden eagles and their habitat for all renewable energy projects (BLM IM No. 2010-156). The BLM IM on Golden Eagles provides direction for complying with the Act, including its implementing regulations (i.e., Eagle Rule, 50 CFR parts 13 and 22) for golden eagles, and to identify steps that may be necessary within the habitat of golden eagles to ensure environmentally responsible authorization and development of renewable energy resources. The IM primarily addresses golden eagles because a process to acquire take permits for bald eagles already exists. The IM is applicable until the USFWS establishes criteria for programmatic golden eagle permits.

4.2 SPECIAL STATUS SPECIES

BLM Sensitive species with the potential to occur within the project area are presented in **Table 4-1**, BLM Sensitive Species Potentially Occurring within the Project Area. No federally listed endangered or threatened species have the potential to occur within the project area (USFWS 2011). In addition, no critical habitat for any federally endangered or threatened species has been designated

Table 4-1
BLM Sensitive Species Potentially Occurring within the Project Area

Species	Habitat	Potential for Occurrence
Plants		
Nevada dune beardtongue *Penstemon arenarius*	Deep, volcanic, sandy soils; common associates include fourwing saltbush, littleleaf horsebrush, and greasewood	Potential to occur, though not observed during surveys.
Lahontan beardtongue *Penstemon palmeri* var. *macranthus*	Along washes, roadsides, and canyon floors, particularly on carbonate-containing substrates, usually where subsurface moisture is available throughout most of the summer.	Potential to occur, though not observed during surveys.
Invertebrates		
Pallid wood nymph *Cercyonis oetus pallescens*	Alkaline flats	Potential to occur.
Carson valley wood nymph *Cercyonis pegala carsonensis*	Wet meadows	Potential to occur.
Great Basin small blue *Philotiella speciosa septentrionalis*	Unknown	Unknown.
Birds		
Golden eagle *Aquila chrysaetos*	Variety of open and semi-open landscapes with sufficient mammalian prey base and cliff sites for nesting	Confirmed.
Ferruginous hawk *Buteo regalis*	Grasslands and semi-desert shrublands; nest in isolated trees, on rock outcrops, or ground	Potential to occur.
Prairie falcon *Falco mexicanus*	Nests on cliffs; forages over a variety of shrub habitats, agricultural crops, and native perennial grasses. Avoids dense cheatgrass	Potential to occur. Ample cliffs for nesting and shrublands for foraging.
Swainson's hawk *Buteo swainsoni*	Usually occurs close to riparian or other wet habitats; forages over agricultural fields, wet meadows, or open shrublands	Confirmed. Observed within project area during surveys.
Burrowing owl *Athene cunicularia*	Treeless areas with low vegetation and burrows	Potential to occur.
Loggerhead shrike *Lanius ludovicianus*	Open country with scattered trees and shrubs, desert scrub; nests in shrubs or small trees	Confirmed. Observed within project area during surveys.
Vesper sparrow *Pooecetes gramineus*	Plains, prairie, dry shrublands, savanna, weedy pastures, fields, sagebrush, arid scrub, and woodland clearings	Potential to occur.
Gray vireo *Vireo vicinior*	Hot, semi-arid, shrubby habitats	Potential to occur.
Snowy plover *Charadrius alexandrinus*	Alkali flat, mudflat, or flat beach adjacent to permanent or seasonal surface water	Potential to occur.
Long-billed curlew *Numenius americanus*	Grasslands and irrigated agricultural fields	Potential to occur.

Table 4-1
BLM Sensitive Species Potentially Occurring within the Project Area

Species	Habitat	Potential for Occurrence
Mammals		
Western pipistrelle bat *Pipistrellus hesperus*	Deserts and lowlands, desert mountain ranges, desert scrub flats, and rocky canyons	Potential foraging habitat.
Pallid bat *Antrozous pallidus*	Arid deserts and grasslands, often near rocky outcrops and water	Potential foraging habitat.
Spotted bat *Euderma maculatum*	Various habitats from desert to montane, including canyon bottoms, and open pastures	Potential foraging habitat.
Silver-haired bat *Lasionycteris noctivagans*	Prefers forested areas adjacent to lakes, ponds, and streams	Potential foraging habitat.
Townsend's big-eared bat *Corynorhinus townsendii*	Maternity and hibernation colonies typically in caves and mine tunnels	Potential foraging habitat.
Big brown bat *Eptesicus fuscus*	Various wooded and semi-open habitats including cities	Potential foraging habitat.
Hoary bat *Lasiurus cinereus*	Prefers deciduous and coniferous forests and woodlands	Potential foraging habitat.
Brazilian free-tailed bat *Tadarida brasiliensis*	Roosts primarily in caves	Potential foraging habitat.
Long-eared myotis *Myotis evotis*	Mostly forested areas; also shrubland, along wooded streams, over reservoirs	Potential foraging habitat.
Fringed myotis *Myotis thysanodes*	Desert, grassland, and wooded habitats	Potential foraging habitat.
California myotis *Myotis californicus*	Western lowlands; canyons, riparian woodlands, desert scrub, and grasslands	Potential foraging habitat.
Small-footed myotis *Myotis ciliolabrum*	Desert, badland, and semi-arid habitats	Potential foraging habitat.
Little brown myotis *Myotis lucifugus*	Adapted to using human-made structures; also uses caves and hollow trees	Potential foraging habitat.
Long-legged myotis *Myotis volans*	Primarily in montane coniferous forests; also in riparian and desert habitats	Potential foraging habitat.
Desert bighorn sheep *Ovis canadensis nelsoni*	Steep slopes on or near mountains with a clear view of surrounding area	Suitable habitat within the Stillwater Range adjacent to project area.

Source: CH2M HILL 2009; GBBO 2010; NatureServe 2011; Wildlife Action Plan Team 2006

within the project area. The USFWS noted that a candidate for ESA listing, greater sage-grouse, could occur in the project area (USFWS 2011), although this is unlikely given the lack of sagebrush habitat. The NNHP does not have any recorded special status species within a five kilometer radius around the project area (NNHP 2011). In addition, the following BLM Sensitive species are considered unlikely to occur based on lack of suitable habitat: northern leopard frog (*Rana pipiens*), northern goshawk, peregrine falcon, long-eared owl (*Asio*

otus), flammulated owl, Lewis's woodpecker, red-naped sapsucker, juniper titmouse (*Baeolophus griseus*), pinyon jay, black rosy finch (*Leucosticte atrata*), mountain quail (*Oreortyx pictus*), greater sage-grouse, sandhill crane (*Grus canadensis*), black tern (*Chlidonias niger*), least bittern (*Ixobrychus exilis*), California wolverine (*Gulo gulo*), river otter (*Lontra canadensis*), western white-tailed jackrabbit (*Lepus townsendii*), pygmy rabbit (*Brachylagus idahoensis*), California floater (*Anodonta californiensis*), Hardy's aegialian scarab (*Aegialia hardyi*), Sand Mountain aphodius scarab (*Aphodius* sp.), Sand Mountain serican scarab (*Serica psammobunus*), Sand Mountain blue (*Euphilotes pallescens arena montana*), wind-loving buckwheat (*Eriogonum anemophilum*), and oryctes (*Oryctes nevadensis*).

Plants

Two BLM Sensitive plant species could potentially occur within the Coyote Canyon Extension project area based on literature reviews and habitat assessment. Generally, the habitats within the project area are not sandy enough for the Nevada dune beardtongue, but based on the habitat associations for this species, the species could occur. Neither species was observed during the field survey; in fact, no *Penstemon* species were observed. The NNHP indicated that potential habitat exists for Candelaria blazingstar (*Mentzelia candelariae*), which is not a BLM Sensitive species, but is considered at-risk by the NNHP. This species has not been recorded within the project area (NNHP 2011).

Invertebrates

Three BLM Sensitive invertebrate species could potentially occur within the Coyote Canyon Extension project area based on literature reviews and habitat assessment. Little published literature is available regarding the ecology of these species, which makes the likelihood of occurrence determination uncertain.

Raptors

Golden Eagle

Stick nests or whitewash were not observed during the ground survey, but were noted in the aerial survey data (Appendix D). Details are shown in **Table 4-2**, Golden Eagle Observations within the Survey Area and Appendix D. Suitable nesting habitat for golden eagles occurs throughout the Stillwater Range bounding Dixie Valley, as this range has rock outcrops with expansive views of the surrounding territory. Three active and eight inactive nests were recorded in the Stillwater Range in the vicinity of the project. The Dixie Valley provides habitat for golden eagle prey, such as rabbits, hares (e.g. jack rabbits), and ground squirrels. In addition, golden eagles have been reported at the existing TGP Dixie Valley power plant about 3 miles north of the Coyote Canyon Extension project area.

Table 4-2
Golden Eagle Observations within the Vicinity of the Survey Area

Sighting	Location	Coordinates[1]		Description
Ground Survey Sightings				
5/9/11 13:00	Within 2-mile survey buffer	39.56577	-117.56811	Seen flying over survey area. Not recorded in GPS unit but mapped
5/10/11 08:25	Approximately 6 miles south of survey buffer on State Route 121	39.79522177	-118.0763681	Flushed golden eagle feeding on road-killed jack rabbit
5/11/11 08:56	Approximately 3 miles north of survey buffer	39.97867364	-117.8559038	Just north of existing power plant; golden eagle flushed from perch on edge of ditch
Aerial Survey Sightings				
6/22/11 15:22	Within 4 miles of south portion of survey area	39.89093564	-118.0428401	Active, occupied nest, new nest with lots of greenery, one young ready to fledge. Small tight nest. 1 young in nest
6/22/11 15:52	Within 2-mile survey buffer	39.90774781	-118.0118078	Active, occupied nest, one young ready to fledge. Small tight nest. 1 young in nest
6/22/11 16:24	Within 2-mile survey buffer	39.9459154	-117.9913924	Inactive, two nests
6/22/11 16:30	Within 2-mile survey buffer	39.94489733	-117.9724046	Inactive nest
6/23/11 08:08	Within 2 miles of northern Coyote Canyon Unit boundary	39.99760173	-117.9028502	Inactive nest
6/23/11 09:09	Within 2 miles of northern Coyote Canyon Unit boundary	39.9831598	-117.8892667	Inactive nest
6/23/11 09:18	Within 2 miles of northern Coyote Canyon Unit boundary	39.98701128	-117.8669786	Inactive, two nests
6/23/11 09:23	Within 2 miles of northern Coyote Canyon Unit boundary	39.98853436	-117.8654806	Active nest, moderate whitewash. One inactive nest. No young seen but two adults flying nearby. 2 eagles
6/23/11 09:26	Within 2 miles of northern Coyote Canyon Unit boundary	40.0030643	-117.8670884	Inactive nest, very old

[1] NAD 83, UTM Zone 11

[2] See Appendix D for further details

Burrowing owl
Burrowing owls rely on other species to construct burrows for shelter and nesting. Within the project area, limited suitable burrow opportunities were observed, although some coyote dens and other burrows were noted during field surveys. No burrow examined had characteristic scat or pellets usually found with burrowing owl use.

Swainson's hawk
Swainson's hawk was observed foraging within the project area, although suitable nesting habitat is not present.

Other raptors
Ferruginous hawk and prairie falcon could occur within the project area, as there are suitable rock outcrops for nesting in the Stillwater Range, and shrublands for foraging. These species were not observed during field surveys.

Other Avian Species
Loggerhead shrike was observed within the project area during surveys, and potential nesting habitat is present. Other potentially occurring species include vesper sparrow, gray vireo, snowy plover, and long-billed curlew.

Mammals

Bats
Potential foraging habitat exists throughout the project area for the fourteen BLM Sensitive bat species listed in Table 4-1. No bats were observed during the field survey, and no potential maternity or hibernation habitats were observed within the project area. Some bats (e.g. pallid bat, California myotis, and small-footed myotis) may use rock outcrops within the nearby Stillwater Range. There are also some caves and adits within the Stillwater Range that could be used by bats.

Bighorn sheep
Bighorn sheep have been recorded within the Stillwater Range (BLM 2010) and thus could utilize the project area for foraging on grass, forbs, and shrubs and connection to the Tobin Range, which is also occupied habitat. Water is available at Dixie Meadows to the south of the project area. Bighorn sheep were not observed during the field survey.

CHAPTER 5
SUMMARY AND CONCLUSIONS

Vegetation and wildlife within the Coyote Canyon Extension project area are typical of habitats found within the Great Basin. The most common vegetation communities are Inter-Mountain Basins Mixed Salt Desert Scrub and Inter-Mountain Basins Playa.

A number of migratory bird species, including USFWS Birds of Conservation Concern and Game Birds Below Desired Condition, could occur within the project area based on field observations and habitat assessment. Three big game species could occur within the project area.

Three BLM Sensitive species were observed during the field survey: golden eagle, Swainson's hawk, and loggerhead shrike. Golden eagle nest or roost locations were not identified during these surveys, although golden eagles were seen daily during the survey period. Golden eagles use the project area, likely for hunting or for scavenging along State Route 121. Golden eagle nests were subsequently observed during aerial surveys conducted for two nearby projects. Three active and eight inactive golden eagle nests were recorded in the vicinity of the project area. EMPSi has begun coordinating with the USFWS to determine whether any avoidance or mitigation measures will be necessary for the project.

A number of other BLM Sensitive species have the potential to occur, including two plant species, three invertebrates, seven additional bird species, fourteen bat species, and one other mammal species.

CHAPTER 6
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Appendix A
Agency Correspondence

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Nevada Fish and Wildlife Office
1340 Financial Blvd., Suite 234
Reno, Nevada 89502
Ph: (775) 861-6300 ~ Fax: (775) 861-6301

June 18, 2011
File No. 2011-SL-0308

Ms. Meredith Zaccherio
EMPS, Inc.
26 O'Farrell Street, 7th Floor
San Francisco, California 94108

Dear Ms. Zaccherio:

Subject: Species List Request for the Coyote Canyon Extension Geothermal Project, Churchill County, Nevada

This responds to your letter received on June 14, 2011, requesting a species list for the Coyote Canyon Extension Geothermal Project in Churchill County, Nevada. To the best of our knowledge, no listed or proposed species occur in the subject project area; however, the following is a list of candidate species which may occur in the subject project area:

- Greater sage-grouse (*Centrocercus urophasianus*), candidate

This list fulfills the requirement of the Fish and Wildlife Service (Service) to provide information on listed species pursuant to section 7(c) of the Endangered Species Act of 1973 (ESA), as amended, for projects that are authorized, funded, or carried out by a Federal agency. Candidate species receive no legal protection under the ESA, but could be proposed for listing in the near future. Consideration of these species during project planning may assist species conservation efforts and may prevent the need for future listing actions.

Greater sage-grouse are known to occur within and/or near the project area; therefore, we recommend that you analyze potential impacts from this project on the species to ensure that the proposed action does not exacerbate further decline of the species. On March 23, 2010, the Service's 12-month status review finding for the species was published in the Federal Register (75 FR 13910). We determined that the greater sage-grouse warrants the protection of the ESA but that listing the species at this time is precluded by the need to address higher priority species

first. The greater sage-grouse has been placed on the candidate list for future action, meaning the species does not receive statutory protection under the ESA, and States will continue to be responsible for managing the species. The Western States Sage and Columbian Sharp-tailed Grouse Technical Committee, under direction of the Western Association of Fish and Wildlife Agencies, has developed and published guidelines to manage and protect greater sage-grouse and their habitats in the Wildlife Society Bulletin (Connelly *et al.* 2000). We ask that you consider incorporating these guidelines (http://www.ndow.org/wild/conservation/sg/resources/guidelines.pdf) into the proposed project. On a more local level, the Sage Grouse Conservation Plan for Nevada and Portions of Eastern California was completed in June 2004. The Plan is available online at: http://www.ndow/org/wild/conservation/sg/plan/SGPlan063004.pdf. We encourage you to adopt all appropriate management guidance from this Plan as you analyze and implement your proposed action and to engage your local State and Federal wildlife biologists early in the project planning process.

On September 30, 2010, the Service published the 12-month finding for the pygmy rabbit (*Brachylagus idahoensis*) in the Federal Register (75 FR 60516) announcing that the species did not warrant protection under the ESA. We request that you submit any new information concerning threats to the species or its habitat to the Nevada Fish and Wildlife Office. This information will help us monitor the pygmy rabbit and encourage its conservation.

The Nevada Fish and Wildlife Office no longer provides species of concern lists. Most of these species for which we have concern are also on the Animal and Plant At-Risk Tracking List for Nevada (At-Risk list) maintained by the State of Nevada's Natural Heritage Program (Heritage). Instead of maintaining our own list, we adopted Heritage's At-Risk list and are partnering with them to provide distribution data and information on the conservation needs for at-risk species to agencies or project proponents. As you may know, the mission of Heritage is to continually evaluate the conservation priorities of native plants, animals, and their habitats, particularly those most vulnerable to extinction or in serious decline. In addition, in order to avoid future conflicts, we ask that you consider these at-risk species early in your project planning and explore management alternatives that provide for their long-term conservation.

For a list of at-risk species by county, visit Heritage's website (http://heritage.nv.gov). For a specific list of at-risk species that may occur in the project area, you can obtain a data request form from the website (http://heritage.nv.gov/forms.htm) or by contacting the Administrator of Heritage at 901 South Stewart Street, Suite 5002, Carson City, Nevada 89701-5245, (775) 684-2900. Please indicate on the form that your request is being obtained as part of your coordination with the Service under the ESA. During your project analysis, if you obtain new information or data for any Nevada sensitive species, we request that you provide the information to Heritage at the above address.

Furthermore, certain species of fish and wildlife are classified as protected by the State of Nevada (http://www.leg.state.nv.us/NAC/NAC-503.html). You must first obtain the appropriate license, permit, or written authorization from the Nevada Department of Wildlife to take, or possess any parts of protected wildlife species. Please visit http://www.ndow.org or contact the Nevada Department of Wildlife at (775) 688-1500.

If bald eagles (*Haliaeetus leucocephalus*) and/or golden eagles (*Aquila chrysaetos*) occur in the project area or within 10 miles of the proposed project area boundary, we recommend you analyze project impacts to the affected individuals, their habitats, and regional populations. While the bald eagle has been removed from the Federal list of threatened and endangered species (August 8, 2007; 72 FR 37346), it remains classified as endangered by the States of Nevada and California. Further, the bald eagle along with the golden eagle continues to be protected under the Bald and Golden Eagle Protection Act (BGEPA) of 1940, as amended (16 U.S.C. 668-668d) and the Migratory Bird Treaty Act (MBTA) of 1918, as amended (16 U.S.C. 703 *et seq.*). Both the BGEPA and the MBTA prohibit take as defined as pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, destroy, molest, disturb, or otherwise harm eagles, their nests, or their eggs. Under the BGEPA, "disturb" means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available: 1) injury to an eagle, 2) decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior. On September 11, 2009 (74 FR 46836), the Service set in place rules establishing two new permit types: 1) take of bald and golden eagles that is associated with, but not the purpose of, the activity; and 2) purposeful take of eagle nests that pose a threat to human or eagle safety. We recommend you coordinate with State and Federal wildlife officials early in the planning process to ensure compliance with State and Federal regulations and to develop a survey protocol to evaluate the potential risk and the likelihood of take of eagles. If take is reasonably anticipated to occur, we recommend you develop an Avian Protection Plan (APP) in coordination with State wildlife agencies and the Service. An APP is intended to avoid, minimize, or mitigate impacts to these species.

Based on the Service's conservation responsibilities and management authority for migratory birds under the MBTA, we are concerned about potential impacts the proposed project may have on migratory birds in the area. Given these concerns, we recommend that any land clearing or other surface disturbance associated with proposed actions within the project area be timed to avoid potential destruction of bird nests or young, or birds that breed in the area. Such destruction may be in violation of the MBTA. Under the MBTA, nests with eggs or young of migratory birds may not be harmed, nor may migratory birds be killed. Therefore, we recommend land clearing be conducted outside the avian breeding season. If this is not feasible, we recommend a qualified biologist survey the area prior to land clearing. If nests are located, or if other evidence of nesting (*i.e.*, mated pairs, territorial defense, carrying nesting material, transporting food) is observed, a protective buffer (the size depending on the habitat requirements of the species) should be delineated and the entire area avoided to prevent destruction or disturbance to nests until they are no longer active.

Because wetlands, springs, or streams are present in the vicinity of the project area, we ask that you be aware of potential impacts project activities may have on these habitats. Discharge of fill material into wetlands or waters of the United States is regulated by the U.S. Army Corps of Engineers (ACOE) pursuant to section 404 of the Clean Water Act of 1972, as amended. We recommend you contact the ACOE's Regulatory Section [300 Booth Street, Room 3060, Reno, Nevada 89509, (775) 784-5304] regarding the possible need for a permit.

Please reference File No. 2011-SL-0308 in future correspondence concerning this species list. If you have any questions regarding this correspondence or require additional information, please contact me or James Harter at (775) 861-6300.

Sincerely,

Jill A. Ralston
Acting State Supervisor

Appendix B

Photo Log

Salt grass meadow with line of dead tamarisk (Section 31).

Greasewood flat habitat with Stillwater Range in background.

Mixed salt desert scrub habitat with playa and Clan Alpine range in background.

Line of dead and alive tamarisk closer to playa (Section 28).

Playa habitat with salt accumulation on surface and salt grass.

Cheatgrass dominated portion of lease area, with sparse greasewood. Playa visible in background.

APPENDIX C
LIST OF SPECIES OBSERVED

Table C-1 displays the species observed within the project area during the biological field survey.

Table C-1
Species Observed within Project Area

Common Name	Scientific Name
Birds	
Barn swallow	*Hirundo rustica*
Black-throated sparrow	*Amphispiza bilineata*
Blue-gray gnatcatcher	*Polioptila caerulea*
Common raven	*Corvus corax*
Flycatcher	*Empidonax* sp.
Golden eagle[2]	*Aquila chrysaetos*
Horned lark	*Eremophila alpestris*
Killdeer	*Charadrius vociferus*
Lark sparrow	*Chondestes grammacus*
Loggerhead shrike[2]	*Lanius ludovicianus*
Northern harrier	*Circus cyaneus*
Red-tailed hawk	*Buteo jamaicensis*
Rock wren	*Salpinctes obsoletus*
Swainson's hawk[2]	*Buteo swainsoni*
Western kingbird	*Tyrannus verticalis*
Western meadowlark	*Sturnella neglecta*
White-crowned sparrow[1]	*Zonotrichia leucophrys*
Mammals	
Black-tailed jackrabbit	*Lepus californicus*
Cottontail rabbit	*Sylvilagus nuttallii*
Coyote	*Canis latrans*
Kit fox	*Vulpes macrotis*
Mule deer	*Odocoileus hemionus*

Table C-1
Species Observed within Project Area

Common Name	Scientific Name
Pronghorn antelope	*Antilocapra americana*
White-tailed antelope squirrel	*Ammospermophilus leucurus*
Reptiles	
Desert horned lizard	*Phrynosoma platyrhinos*
Side-blotched lizard	*Uta stansburiana*
Western whiptail	*Aspidoscelis tigris*
Invertebrates	
Brine fly	*Ephydra* sp.
Fritillary	*Speyeria* sp.
Sulphur	*Colias* sp.
Plants	
Alkali sacaton	*Sporobolus airoides*
Alyssum	*Alyssum desertorum*
Anderson's larkspur	*Delphinium andersonii*
Annual wheatgrass	*Eremopyrum triticeum*
Arrowgrass	*Triglochin maritima*
Baltic rush	*Juncus balticus*
Bailey greasewood	*Sarcobatus baileyi*
Bassia	*Bassia hyssopifolia*
Big greasewood	*Sarcobatus vermiculatus*
Big saltbush	*Atriplex lentiformus*
Broad-leafed cattail	*Typhia latifolia*
Buckwheat, desert trumpet	*Eriogonum inflatum*
Budsage	*Artemisia spinescens*
Bur buttercup	*Ceratocephala testiculata*
Canary reedgrass	*Phragmites australis*
Cheatgrass	*Bromus tectorum*
Clasping pepperweed	*Lepidium perfoliatum*
Cotton catclaw horsebrush	*Tetradymia axillaris*
Crossflower	*Chorispora tenella*
Desert 4 O'clock	*Mirabilis bigelovii*
Desert dandelion	*Malacothrix* sp.
Ditch polypogon	*Polypogon interruptus*
Fiddleneck	*Amsinckia tessellata*
Flixweed	*Descurainia sophia*
Foxtail barley	*Hordeum jubatum*
Globemallow	*Sphaeralcea ambigua*
Great Basin popcornflower	*Plagiobothrys kingii* var. *harknessii*
Green rabbitbrush	*Chrysothamnus viscidiflorus*
Halogeton[3]	*Halogeton glomeratus*
Hardstem bullrush	*Scirpus acutus*
Hawksbeard	*Crepis* sp.
Inland saltgrass	*Distichlis spicata*

Table C-1
Species Observed within Project Area

Common Name	Scientific Name
Intermediate wheatgrass	*Thinopyrum intermedium*
Iodine bush	*Allenrolfea occidentalis*
Lesser-panicled sedge	*Carex diandra*
Littleleaf horsebrush	*Tetradymia glabrata*
Low goosefoot	*Chenopodium chenopodioides*
Lomatium	*Lomatium* spp.
Meadow hawksbeard	*Crepis runcinata var. imbricata*
Milkvetch	*Astragalus* sp.
Nevada ephedra	*Ephedra nevadensis*
Olney three square	*Scirpus americanus*
Perennial pepperweed [3]	*Lepidium latifolium*
Pigweed, lamb's quarters	*Chenopodium* sp.
Poverty weed	*Iva axillaris*
Prince's plume	*Stanleya pinnata*
Primrose	*Camissonia* sp.
Rabbit's foot grass	*Polypogon monspeliensis*
Red brome	*Bromus rubens*
Rubber rabbitbrush	*Chrysothamnus nauseous*
Russian thistle[3]	*Salsola tragus*
Sagebrush, basin big	*Artemesia tridentata* var. *veseyana*
Salt heliotrope	*Heliotropium curassavicum*
Shadscale	*Atriplex confertifolia*
Short-spine horsebrush	*Tetradymia spinosa*
Slender arrowgrass	*Triglochin concinna* var. *debilis*
Slender wheatgrass	*Elymus trachycaulum* var. *trachycaulum*
Small wirelettuce	*Stephanomeria exigua*
Snakeweed	*Gutierrezia sarothrae*
Spiny hopsage	*Grayia spinosa*
Stork's bill	*Erodium cicutarium*
Tamarisk/ Salt cedar[3]	*Tamarix ramosissima*
Tansy mustard	*Descurania pinnata*
Thick-stemmed cabbage	*Caulanthus crassicaulis*
Western wheatgrass	*Pascopyrum smithii*
Winged 4 O'clock	*Mirabilis alipes*
Yellow peppergrass	*Lepidium flavum* var. *flavum*

[1] Presumed migrant
[2] BLM Sensitive species or USFWS species of conservation concern
[3] Invasive species

Appendix D: Responses to Comments

Appendix D: Responses to Comments

No.	Commenter	Comment	BLM Response
		Permitting, Waivers, and Regulations	
1.	Nevada Department of Environmental Protection, Bureau of Water Pollution Control	Please note that the entity who manages this Coyote Canyon South Geothermal Project may be subject to BWPC permitting associated with any of its discharges- including, but not limited to but not limited to well development, wastewater, Diminimis, UIC, and domestic sewage discharges.	Terra-Gen Power Dixie Development Company (TGP) will apply for all necessary permits. Reference to the potential need for a discharge permit from BWPC has been added to Table 2.
2.	Nevada Department of Transportation	For any temporary or permanent encroachment onto state right-of-way, a permit from District II will be required.	No state right-of-way would be required. Route 121 is a County Road in the vicinity of the project area. Reference to the potential need for a right-of-way permit from Churchill County for any temporary encroachment on County Route 121 has been added to Table 2.
		Water Resources	
3.	US Environmental Protection Agency	*Impacts of Water Usage* Given that the DEA states that water for construction will be obtained from a designated basin, the Final EA should discuss the impacts of this extraction and use of water.	Text has been added to the EA explaining the water usage and water rights of Dixie Valley and the anticipated impacts of the proposed action.
4.	US Environmental Protection Agency	*Drainages and Ephemeral Washes* The EPA recommends that the Final EA characterize the functions of any aquatic features that could be affected by the proposed Project and are determined not to constitute waters of the U.S., and discuss potential mitigation for impacts to such resources. If mitigation would include replacement of desert wash functions lost on the Project site, discuss the availability of sufficient compensation lands within the Project's watershed. To avoid and minimize direct and indirect impacts to desert washes (such as	No aquatic features would be affected by the proposed action. A 600-foot buffer from all surface water bodies is a lease stipulation that is applied to this proposed action. TGP does not propose to use any concrete-lined channels; this is a

No.	Commenter	Comment	BLM Response
		erosion, migration of channels and local scour): • Utilize existing natural drainage channels on site and more natural features, such as earthen berms or channels, rather than concrete-lined channels. • Commit to the use of natural washes, in their present location and natural form and including adequate natural buffers, for flood control to the maximum extent practicable.	temporary exploration effort. TGP will follow the Gold Book guidance for working with desert washes.
5.	US Environmental Protection Agency	*Water Supplies* The Final EA should identify: • Any source water protection areas within the Project Area. • Activities that could potentially affect source water areas. • Potential contaminants that may result from the proposed Project. • Measures that would be taken to protect the source water protection areas.	There are no source water protection areas within the Project Area, per Figure 2-1 of the 2010 Nevada Integrated Source Water Protection Program. Language reflecting this point has been added to Section 3.4.1.1 of the EA. Section 3.4.2 has been revised to add a list of potential contaminants and the measures that would be in place to prevent contamination of surface and water resources.
6.	Nevada Department of Wildlife	NDOW requests that a comprehensive monitoring and mitigation plan be completed and included in the EA regarding those surface water resources. We recommend monitoring the quantity (i.e. flow rate of springs, volume of ponds/lakes, etc.) and quality (i.e. temperature, dissolved solvents, etc) of surface waters near the project area. Furthermore, the mitigation plan should outline the various actions taken to minimize and/or compensate for impacts to wildlife and their habitat is surface water quantity or quality diminishes.	The BLM has issued an Instructional Memorandum (NV-2012-009) clarifying that water monitoring plans are not warranted for exploration plans, which are short-term in nature and do not automatically trigger development of the geothermal resource. A separate NEPA EA analysis was previously completed (Decision Record signed March 7, 2011) for full scale geothermal development and power plant construction and operation within the area directly adjacent

No.	Commenter	Comment	BLM Response
			(to the north) to the proposed exploration area. BLM directed the preparation of a water monitoring plan in support of that project. That plan has been completed and accepted by the BLM. If development of that project were to incorporate wells from the proposed Coyote Canyon South project area, that water monitoring plan would be revised to include those new wells and to ensure that all impacts to existing water features are adequately addressed.
		Air Resources	
7.	US Environmental Protection Agency	*Quantify Emissions* Quantify the emissions of criteria pollutants and volatile organic compounds based on the amount of grading, gravel mining, drill rig operations and well testing to be performed. Compare these to the existing NAAQS threshold levels.	The project is short-term in nature and located in a remote area with no sensitive receptors and little other human presence. The project is located in an air basin that has never been in non-attainment with NAAQS for any criteria pollutant. Due to this context for the project, quantifying emissions would not add value to the analysis of this project and has not been added to the EA.
8.	US Environmental Protection Agency	*Construction Emissions Mitigation Plan* The Final EA should include a Construction Emissions Mitigation Plan, which should be adopted in the FONSI or Conditions of Approval for the Project. In addition to all applicable local, State, or federal requirements, and the proposed Best management Practices for fugitive dust and diesel exhaust,	TGP will comply with air emission requirements as administered by the Nevada Bureau of Air Pollution Control. Permits will be filed for surface

No.	Commenter	Comment	BLM Response
		the EPA recommends that the following control measures be included in the Construction Emissions Mitigation Plan in order to reduce impacts associated with emissions of particulate matter and other toxics from construction-related activities: • *Fugitive Dust Source Controls*: The Construction Emissions Mitigation Plan should include a Fugitive Dust Control Plan and how that plan will meet the requirements of the Nevada .Surface Area Disturbance Permit. We recommend that the latter plan include these general commitments: • Stabilize heavily used unpaved construction roads with a non-toxic soil stabilizer or soil weighting agent that will not result in loss of vegetation, or increase other environmental impacts. • Limit vehicle speeds to 10 miles per hour or less on unpaved areas within construction sites on unstabilized (and unpaved) roads. • Inspect and wash construction equipment vehicle tires, as necessary, so they are free of dirt before entering paved roadways, if applicable. • Provide gravel ramps of at least 20 feet in length at tire washing/cleaning stations, and ensure construction vehicles exit construction sites through treated entrance roadways, unless an alternative route has been approved by appropriate lead agencies, if applicable. • Use sandbags or equivalent effective measures to prevent run-off to roadways in construction areas adjacent to paved roadways. Ensure consistency with the project's Storm Water Pollution Prevention Plan, if such a plan is required for the project • Sweep the first 500 feet of paved roads exiting construction sites, other unpaved roads en route from the construction site, or construction staging areas whenever dirt or runoff from construction activity is visible on paved roads, or at least twice daily (less during periods of precipitation). • Stabilize disturbed soils (after active construction activities are completed) with a non-toxic soil stabilizer, soil weighting agent, or other approved soil stabilizing method.	disturbance construction permits and air emission permits at the appropriate time. All equipment will meet State of Nevada requirements. TGP will comply with the emission requirements as administered by the State. The storm water prevention program will include information about the containment of surface discharge.

No.	Commenter	Comment	BLM Response
		• Cover or treat soil storage piles with appropriate dust suppressant compounds and disturbed areas that remain inactive for longer than 10 days. Provide vehicles (used to transport solid bulk material on public roadways and that have potential to cause visible emissions) with covers: Alternatively, sufficiently wet and load materials onto the trucks in a manner to provide at least one foot of freeboard. • Use wind erosion control techniques (such as windbreaks, water, chemical dust suppressants, and/or vegetation) where soils are disturbed in construction, access and maintenance routes, and materials stock pile areas. Keep related windbreaks in place until the soil is stabilized or permanently covered with vegetation. *Mobile and Stationary Source Controls:* • If practicable, lease new, clean equipment meeting the most stringent of applicable Federal or State Standards. In general, commit to the best available emissions control technology. Tier 4 engines should be used for project construction equipment to the maximum extent feasible • Where Tier 4 engines are not available, use construction diesel engines with a rating of 50 hp or higher that meet, at a minimum, commit to Tier 3 Emission Standards for Off-Road Compression-Ignition Engines, unless such engines are not available. • Where a Tier 3 engine is not available for off-road equipment larger than 100 hp, use a Tier 2 engine, or an engine equipped with retrofit controls to reduce exhaust emissions of nitrogen oxides and diesel particulate matter to no more than Tier 2 levels. • Consider using electric vehicles, natural gas, biodiesel, or other alternative fuels during construction and operation phases to reduce the project's criteria and greenhouse gas emissions. • Plan construction scheduling to minimize vehicle trips. • Maintain and tune engines per manufacturer's specifications to perform at EPA certification levels, prevent tampering, and conduct unscheduled inspections to ensure these measures are followed. *Administrative controls:*	

No.	Commenter	Comment	BLM Response
		• Develop a construction traffic and parking management plan that maintains traffic flow and plan construction to minimize vehicle trips. • Identify any sensitive receptors in the project area, such as children, elderly, and infirmed, and specify the means by which you will minimize impacts to these populations (e.g. locate construction equipment and staging zones away from sensitive receptors and building air intakes). • Include provisions for monitoring fugitive dust in the fugitive dust control plan and initiate increased mitigation measures to abate any visible dust plumes.	
Emergency Planning and Community Right to Know Act and CAA §112(r)			
9.	US Environmental Protection Agency	The Final EA should discuss compliance with CAA §112(r), EPCRA §§ 303, 311, & 312 and the Nevada Chemical Accident Prevention Program, as applicable.	The project will comply with all applicable regulations.
Invasive Species			
10.	US Environmental Protection Agency	The Final EA should include an invasive plant management plan to monitor and control noxious weeds. Appendix D of the Final Programmatic EIS for Geothermal Leasing in the Western United States provides a listing of the recommended elements of such a plan.	An invasive plant management plan has been added to Section 2.1.10 of the EA as a condition required prior to initiating any earth-disturbing activities.
Biological Resources, Habitat and Wildlife			
11.	US Environmental Protection Agency	Identify, in the Final EA, specific measures to minimize impacts to eagles, and clarify how the proposed Project will comply with the MBTA and BGEPA.	Text has been added to Section 3.14.3.2 describing how the only impacts on golden eagles would be the short-term loss of foraging habitat and short-term noise. Neither of these impacts are significant, nor do they violate the MBTA and BGEPA, nor are there any practical means to minimize them. A statement indicating that the project will comply with the

No.	Commenter	Comment	BLM Response
			MBTA has been added to the same section – avoidance of nesting season is already described in this section to support compliance with the MBTA.
		Consultation and Coordination with Tribal Governments	
12.	US Environmental Protection Agency	The Final EA should describe the process and outcome of government-to-government consultation between the BLM and each of the tribal governments within the project area, issues that were raised (if any), and how those issues were addressed in the selection of the proposed alternative.	The EA has been updated with correct references to the cultural report. Consultation with the tribes is considered ongoing.
		Indirect and Cumulative Impacts	
13.	US Environmental Protection Agency	The Final EA should more fully address the cumulative impacts of the construction and operation of the proposed project and other foreseeable projects in the region, especially with respect to groundwater use.	The proposed exploration activities are temporary and occur in a remote area. There would not be any effects to other water users.
		Reserve Pits	
14.	Nevada Department of Wildlife	NDOW applauds TGP LLC for proactively incorporating reserve pit design features that minimize impacts to wildlife into plans as stated in the EA. We recommend fencing that is at least a 42 inch tall with the bottom 24 inches having holes no larger than 2 inches (e.g. stucco/chicken wire, safety, etc) placed tight to the ground. Additionally, we commend TGP for incorporating netting into the project design in the event that liquids harmful to wildlife (e.g. toxic, temperature, physical properties of substance) occur in the reserve pit. To further minimize impacts to wildlife we suggest introducing liquids harmful to wildlife (e.g. flow testing) be conducted at times likely to result in the fewest wildlife issues. For example, we discourage flow testing during the peak of the bird migration season. Furthermore, bird balls may be used in place of netting if liquids	Sumps wouldn't contain toxic materials or oil and would be allowed to dry out to avoid vegetation growth that would attract wildlife. The statement regarding netting in Section 2.1.8.1 of the EA has been removed. This potential concern for materials that may harm wildlife is only present for development phases of geothermal projects and not during the proposed exploration

No.	Commenter	Comment	BLM Response
		harmful to wildlife are placed in sumps. We would appreciate being consulted in the event that sumps are attracting and resulting in wildlife mortalities. In such an event, we wish to work cooperatively with TGP LLC to avoid and minimize such impacts. Depending upon the severity of the mortality event, flagging, placing reflectors, or other measures may be necessary. We recommend immediate reclamation (e.g. liquid Management/Solidification) to occur as soon as sumps are no longer necessary. Lastly, we recommend that all sumps be graded to allow wildlife to escape or have escape ramps installed. The following standards are recommended to permit wildlife to escape: **Pits/Ponds/Tanks with Wall Grades Allowing Wildlife to Escape** Ensure at least two sides or installed shoots are sloped 4:1(horizontal:vertical) or flatter. Even with appropriate grading, wildlife slipping may be an issue (e.g. clay based drilling material) precluding successful escape. If sure-footing or slipping issues may exist, consider installing geo-mesh. If geo-mesh is utilized, it should occur in 2 corners (at least 8 feet wide) and the maximum distance between any two geo-mesh locations should not exceed 200 feet. AND/OR **Escape Ramps - Install when Sump Walls are > 3:1 grading (e.g. 2:1) and/or when Synthetic Liners are Installed** Install escape ramps in 2 corners; should be coated with geo-mesh; maximum	phase. Sumps would be constructed per the BLM's Gold Book and NDEP requirements. Wildlife would be excluded by the fences surrounding the sumps and would therefore not require escape features. Sumps are proposed to have a 3:1 slope and would not have a synthetic liner. TGP is open to further discussion with NDOW regarding any remaining concerns.
		Reclamation	
15.	Nevada Department of Wildlife	NDOW supports developing and implementing interim and final reclamation plans as discussed in the EA. We recommend developing and including such plans in the EA so that we can adequately evaluate the plan. For example, what species will be used in reclaiming areas? When will seeding/planting occur? What are the success criteria in order to determine if reseeding efforts are successful? Is there a contingency plan if reclamation activities are unsuccessful? We recommend further describing reclamation activities so that we can	Per section 2.1.9 of the EA, the BLM will determine the need for a Final Drill Site/Access Road Reclamation Plan at a later date once well locations are finalized and specific reclamation areas can

No.	Commenter	Comment	BLM Response
		adequately evaluate restoration activities.	be finalized.
16.	Nevada Department of Wildlife	We recommend developing a weed management plan prior to construction activities occurring and including the plan in the final EA. For example, we recommend including monitoring protocols during construction activities, post-construction monitoring, and weed treatment measures and describe how the weed management plan fits into overall reclamation efforts. What are the weed management objectives and how will the weed management efforts be evaluated as successful or not successful?	Text has been added to Section 2.1.10 of the EA requiring TGP to submit an invasive plant management plan to the BLM prior to construction.
Construction Crew Impacts – Stay out of Mines			
17.	Nevada Department of Wildlife	NDOW asks for your support in the protection and Conservation of wildlife habitat provided by historical mine features by not entering any mine features.	TGP personnel and contractors will be instructed to avoid all mine features for health and safety reasons, as required by NDOM. Instruction on wildlife protection will also be given.
Habitat Fragmentation			
18.	Nevada Department of Wildlife	Understanding the multi-phase permitting approach with geothermal energy resources, it is reasonable to expect habitat fragmentation (e.g. pipelines, powerlines, etc.) will occur if a viable geothermal resource is discovered. If a viable resource is discovered and utilization planning progresses, we ask that habitat fragmentation be considered and minimized whenever possible. For example, we request that terrestrial wildlife movement remain (e.g. from bedding areas to water sources) available when planning pipeline routing alternatives. Additionally, we encourage siting transmission lines next to existing infrastructure and constructing underbuilds with the existing distribution lines when feasible.	Pipelines and transmission lines are not part of the proposed exploration actions. Future exploration or development in this area will be analyzed at the time it is proposed under additional site-specific environmental analysis, including impacts to wildlife resources.
AB-307 – Energy Development Planning Fund for the Recovery of Costs			
19.	Nevada Department of Wildlife	On March 8, 2012 AB 307 became effective requiring the owners/applicants of all proposed energy projects (of applicable size) to file a notice (application) and provide an initial fee to the Nevada Department of Wildlife (NDOW) for evaluation of the project. The application and initial fee is to be submitted to NDOW concurrently with application submittal to any other (local, State or Federal) government agency in the State of Nevada. If the BLM receives a notice from TGP about the Coyote Canyon Geothermal Project moving towards the	The BLM will keep the Nevada Department of Wildlife informed about any future notices within the Coyote Canyon Geothermal Project area including whether they are moving towards the utilization phase.

No.	Commenter	Comment	BLM Response
		utilization phase, please let us know immediately. For additional information and to access the AB 307 application form, please go to http://www.ndow.org/wild/AB307/index.shtm. Thank you in advance for your attention to this matter.	
		Other	
20.	The State Historic Preservation Office	The SHPO reviewed the subject document. The SHPO has no record of receiving the inventory report as described in the document. If Bureau of Land Management consultation with our office is required by the Protocol Agreement, we encourage the Bureau of Land Management to submit this document at their earliest convenience. If consultation is not required by the Protocol Agreement, then the SHPO recommends that the document be rewritten to state that the Bureau of Land Management is not seeking consultation with our office.	In the document, the report was incorrectly cited. Coordination with SHPO has occurred as required by the Protocol Agreement. The text in the EA has been revised to state the appropriate cultural resource reports applicable to this project.
21.	Nevada Division of State Lands and the State Land Use Planning Agency	Please consider the cumulative visual impacts from development activities (temporary and permanent). Some notable activities include proliferation of new roads, poorly-sited and designed structures, lack of co-location of infrastructure and improper lighting, to name a few. The following mitigation measures are suggested: **Utilize appropriate lighting:** ▪ Utilize consistent lighting mitigation measures that follow "Dark Sky" lighting practices. ▪ Effective lighting should have screens that do not allow the bulb to shine up or out. All proposed lighting shall be located to avoid light pollution onto any adjacent lands as viewed from a distance. All lighting fixtures shall be hooded and shielded, face downward, located within soffits and directed on to the pertinent site only, and away from adjacent parcels or areas. ▪ A lighting plan should be submitted indicating the types of lighting and fixtures, the locations of fixtures, lumens of lighting, and the areas illuminated by the lighting plan. ▪ Any required FAA lighting should be consolidated and minimized wherever possible.	The proposed action is for short-term exploration. No long-term lighting is proposed. There are no residents or other sensitive receptors in the project area. Any lighting impacts would be temporary.

No.	Commenter	Comment	BLM Response
		In addition, the following mitigation measures should be employed. **<u>Utilize building materials, colors and site placement that are compatible with the natural environment:</u>** ▪ Utilize consistent mitigation measures that address logical placement of improvements and use of appropriate screening and structure colors. Existing utility corridors, roads and areas of disturbed land should be utilized wherever possible. Proliferation of new roads should be avoided. ▪ For example, the use of compatible paint colors on structures reduces the visual impacts of the built environment. Using screening, careful site placement, and cognitive use of earth-tone colors/materials that match the environment improve the user experience for others who might have different values than what is fostered by built environment activities. Federal agencies should require these mitigation measures as conditions of approval for all permanent and temporary applications.	