

# **ENVIRONMENTAL ASSESSMENT**

**BRADYS HOT SPRINGS**

Geothermal Drilling Permits  
Geothermal Lease NVN-65561  
Production Well Numbers  
16-12  
&  
17-12

**CHURCHILL COUNTY, NEVADA**

**EA NUMBER: NV-020-08-09**

**Lead Agency:**

**BUREAU OF LAND MANAGEMENT**  
Winnemucca Field Office  
5100 E. Winnemucca Blvd.  
Winnemucca, Nevada 89445

**Project Applicant:**

Brady Power Partners  
6226 Neil Road Suite 300  
Reno, NV 89521



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.

BLM/NV/WN/EA-GI-08/17+

**NV-020-08-EA-09**

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BRADYS HOT SPRINGS  
NV-020-08-EA-09  
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## **1.0 INTRODUCTION**

Brady Power Partners, hereafter known as BPP is a private corporation that seeks to meet the increasing demand for electrical energy supply from renewable energy resources in the United States through an approved use of public lands. The Brady Power Plant has been producing electrical energy from geothermal resources under a permit granted by BLM in 1982. The most recent Plan of Operations for the Brady Power Plant is dated January 1992. BPP has determined the Brady facility is performing under capacity and is in need of additional production fluid to meet generation market expectations. In order to continue optimum operations additional wells need to be brought online to replace or enhance the existing production wells. These wells would be located within the Brady Known Geothermal Resource Area (KGRA) in Churchill County, Nevada. A general vicinity map of the proposed wells is attached as Figure 1.

### **1.1. Purpose and Need**

BPP has submitted to the Bureau of Land Management, Winnemucca Field Office (BLM/WFO) for approval, two geothermal drilling permits (GDPs) for the drilling and testing of production wells 16-12 and 17-12. Both of these wells would be located within the boundaries of federal geothermal lease NVN-65561.

Under the terms of the Geothermal Steam Act and its implementing regulations, BLM must respond to the proposed plans, applications and programs submitted by the lessee or the lessee's designated operator. The BLM is also required to comply with NEPA and the Council of Environmental Quality (CEQ) regulations. The BLM WFO has determined that an Environmental Assessment (EA) would be needed to evaluate and disclose the potential environmental impacts associated with this proposed action and any reasonable alternatives to the proposed action which would include a no action alternative. This analysis would also serve to identify any additional mitigation to minimize potential impacts that have not been previously identified.

This EA will serve as a decision-making tool to assist BLM in its determination to approve, require modification or deny the proposed actions. At the conclusion of the EA process, the BLM must determine if the proposed action, any modifications of the proposed action and/or alternatives, would cause significant environmental impacts. If not, then a Finding of No Significant Impact (FONSI) would be prepared. If, at any time during the analysis, a

determination of significant impacts is made that could not be appropriately mitigated at the EA level, an Environmental Impact Statement (EIS) may be required.

## **1.2. Plan Conformance**

The project area is primarily subject to the BLM WFO Sonoma-Gerlach Management Framework Plan (MFP), dated July 9, 1982. Objective M-5 of the Sonoma-Gerlach MFP states, "Make energy resources available on all public lands and other lands containing federally owned minerals." The MFP provides for the development of geothermal resources in noncompetitive areas and all Known Geothermal Resource Areas (KGRAs) except those which are areas of significant environmental conflict or have cultural significance.

## **1.3. Relationship to Statutes, Regulations, or other Plans**

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

- The National Environmental Policy Act (NEPA) of 1969, as amended (Public Law [PL] 91-190, 42 U.S.C. 4321 *(et seq.)*);
  - 40 CFR 1500 *(et seq.)*. Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act.
- USDI requirements (Departmental Manual 516, Environmental Quality [USDI 2004])
- BLM NEPA Handbook (H-1790-1), January 2008
- Considering Cumulative Effects under the NEPA [CEQ 1997];
- The Geothermal Steam Act of 1970 (Act) (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;
- Best Management Practices as defined in the Oil and Gas "*Gold Book*", Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development", *Fourth Edition*, (Gold Book)

Several environmental documents have been prepared over the past 20 years for the Bradys Hot Springs Area and the adjacent Desert Peak property analyzing the affected environment of the planning area.

The most recent Environmental Assessment, NV-020-05-07, was prepared for two observation wells and one production well for Bradys Hot Springs and was completed in December, 2004. This environmental assessment discussed land and facilities located in Section 12 and will be referenced in this analysis. EA NV-020-05-07, the Decision Record (DR) and Finding of No Significant Impacts (FONSI) are available for review at the Winnemucca Field Office.

The following is a list of environmental documents that have been completed for the Brady KGRA and has been taken into consideration in the cumulative impact assessment section of this document:

-EA NV-020-02-09 for the Brady Power Partners Power Plant project was completed on December 16, 1991.

-EA NV-020-02-11 for three geothermal wells on public land was tiered to NV-020-02-09 and was also completed on December 16, 1991.  
- EA NV-020-03-26 was completed for the Desert Peak 2 geothermal power plant and associated wells and pipelines were completed on October 30, 2003.  
These documents are also available for review at the Winnemucca Field Office.

#### **1.4. Issues**

Only one issue was identified that was not covered by past analyses. That issue is the potential for the specific locations of these two proposed wells to impact to the California Trail. This issue has been addressed in this analysis. Because there are and have been ongoing geothermal activities at the Bradys Hot Springs and adjacent Desert Peak geothermal power plants, scoping for this EA was limited primarily to an internal BLM/WFO interdisciplinary team. The drilling of two more wells within an established geothermal production field should not generate additional public concern.

## **2.0 DESCRIPTION OF ALTERNATIVES, INCLUDING PROPOSED ACTION**

### **2.1. Proposed Action**

BPP proposes to conduct additional production well drilling in the Bradys Hot Springs geothermal field. The purpose of this proposed drilling program is to locate, test, and produce geothermal resources at the following two sites on the same federal geothermal lease:

#### Lease No. NVN-65561

Well 17-12

T. 22 N., R. 26 E., sec. 12, SWSW

Well 16-12

T. 22 N., R. 26 E., sec. 12, NWSW

According to Ormat, the choice of these well locations is based on geology, geophysical data, and environmental concerns (See Figure 2).

#### Well Pad construction and access

Each well pad would be 250 ft. by 300 ft. resulting in 1.7 acres of disturbance for each well pad. Disturbance for both well pads would total approximately 3.4 acres. Reserve pits measuring 7 ft. x 125 ft. x 8 ft. deep would be constructed within the well pad area. Approximately 200 ft. of 30 ft. wide access road from existing well pad 15-12 to well pad 16-12, and approximately 250 ft. of 30 ft. wide access road from well pad 16-12 to well pad 17-12 would be constructed to provide access for the drilling rig and other vehicles to each well site. Total disturbance for access would be approximately 0.3 acre. Total disturbance for the well pads and access road would be 3.7 acres.

#### Site Preparation Activities

Each drill site would be prepared to create a level pad for the drill rig and a graded surface for the support equipment. Storm water runoff from undisturbed areas around the constructed drill

pads would be directed into ditches surrounding the drill pad and back onto undisturbed ground consistent with best management practices for storm water. Each site would be graded to prevent the movement of storm water off of the constructed site.

During drilling, the reserve pits would be fenced with barbed wire on the three sides away from the drilling rig. At the conclusion of drilling, the liquid portion of the reserve pits' contents would be allowed to evaporate. The fencing would remain in place until reclamation of the reserve pit is initiated. The remaining solids (non-toxic drilling fluids and cuttings) would be mixed with stockpiled material and buried by back-filling the pits. The stockpiled topsoil would be smoothed over the back-filled pits.

The well sites would be cleared of organic material, brush, and topsoil. All of this material would be stockpiled separately for reclamation of the pad at the conclusion of drilling, testing, and measuring activities. The sites would be graded to direct runoff from the pad into the reserve pits.

### **2.1.1 Well Drilling**

The production wells would be drilled with a rotary drilling rig such as those used previously at the Bradys Hot Springs field. The rigs would be equipped with diesel engines, storage tanks, mud pumps, and other typical auxiliary equipment.

The well bore would be drilled using non-toxic, temperature-stable drilling mud composed of a bentonite clay-water or polymer-water mix for all wells. Variable concentrations of additives would be added to the drilling mud as needed to prevent corrosion, increase mud weight, and prevent mud loss. Some of the mud additives may be hazardous substances, but they would only be used in low concentrations that would not render the drilling mud toxic. Additional drilling mud would be mixed and added to the mud system as needed to maintain the required quantities.

In the event that very low pressure areas were encountered, compressed air may be added to the drilling mud, or used instead of drilling mud, to reduce the weight of the drilling fluids in the hole and assist in carrying the cuttings to the surface. The air, any drilling mud, rock cuttings, and any reservoir fluids brought to the surface would be diverted through a separator/muffler to separate and discharge the air and water vapor to the air and the drilling mud and cuttings to the reserve pit.

### **2.1.2 Well testing**

At the conclusion of drilling, a test facility would be installed and a flow test conducted to define resource characteristics. Both reservoir temperature and pressure would be measured during and after this test. All fluids produced during testing would be contained in the fenced reserve pits. If necessary, water from the test would be trucked and injected into an adjacent well.

### **2.1.3 Water supply**

Water would be used for site construction, dust control and drilling. Water would be obtained from the Desert Peak and Brady power plant sites water source.



#### **2.1.4 Chemical additives**

The chemicals to be used during drilling and cementing operation are bentonite, barite, drilling mud gel, calcium chloride, sodium bicarbonate, soda ash, silica flour, resinex, caustic soda, quebracho, stiff foam, CFR-2 and Halad-22A. None of these chemicals are considered hazardous. If any hazardous chemicals would be used in the future, BPP would obtain prior approval from the BLM authorized officer. These chemicals would only be present in the proposed project area during the drilling phase of each well and would be properly stored to ensure the prevention of spills.

#### **2.1.5 Well Abandonment**

Upon final abandonment of each well, all equipment would be removed, and the well would be plugged and abandoned according to Federal and State regulations. The well pad would then be restored in conformance with BLM surface reclamation requirements, which typically includes re-grading the pad, if necessary to restore grade; placing the stockpiled topsoil (if any) back over the site; and, if necessary to re-vegetate the disturbed areas, seed the pad with a diverse perennial seed mix certified as being free of noxious weed materials.

#### **2.2 No Action Alternative**

The only alternative considered except the Proposed Action was the No Action Alternative. The No Action alternative would require the BLM to reject the proposed action and not approve the GDPs. Under the no action alternative the production wells would not be drilled at these sites and the Brady facility's performance would remain under capacity. This is inconsistent with the Federal energy policy to promote the development of alternative energy sources and does not meet the stated purpose and need.

### **3.0 AFFECTED ENVIRONMENT**

The location of the proposed wells is typical of most of Nevada valleys, with wide open spaces covered only with small species of brush. There are no surface waters in the area as rainfall is infrequent. The location of the proposed action is a relatively flat area located north of a gravel pit and south of two geothermal industrial developments.

#### **3.1. Critical Elements and Other Supplemental Authorities**

Critical elements of the human environment are subject to requirements specified in statute, regulation, or executive order and must be addressed in any document prepared pursuant to NEPA. The BLM NEPA Handbook (H-1790-1), 1988, stipulates that if the resource or value (critical element) is not present or is not affected by the proposed action or alternatives, this may be documented in the EA as a negative declaration. The following fifteen (15) critical elements were taken into consideration in EA NV-020-05-07 (pgs.4-30): Air Quality, Areas of Critical Environmental Concern (ACECs), Cultural Resources, Environmental Justice, Floodplains, Invasive Nonnative Species, Migratory Birds, Native American Religious Concerns, Prime or Unique Farmland, Threatened and Endangered Species, Wastes, Hazardous or Solid, Water

Quality (Surface and Ground), Wetlands and Riparian Zones, Wild and Scenic Rivers, and Wilderness. EA NV-020-05-07 identified whether any of the fifteen critical elements would be affected and were included in the analysis.

Cultural Resources, Native American Religious Concerns, Migratory Birds and Threatened /Endangered and Special Status Species have been identified as needing additional analysis for the two new proposed well sites as identified in the proposed action and will be carried through in this document.

Other resources that were identified as being affected in the previous analysis were: Range resources, realty and lands, wild horse and burros, soils, vegetation, geology and minerals, wildlife, paleontological, noise, visual (VRM), socio-economic, and recreation (EA NV-020-05-07 pgs.4-30). No additional impacts would occur to these resources for this proposed action and will not be further analyzed in this document.

This proposed action was also reviewed to determine if any additional supplemental authorities would apply as defined in the revised BLM NEPA Handbook (H-1790-1), January, 2008. No issues were identified beyond what has already been described.

### **3.2. Cultural Resources**

The Truckee River Route of the California Trail (CrNV-02-3305/26Ch1772), a National Historic Trail, roughly parallels I-80, passing along the southeastern edge of the project area. This section of the trail was known as the “Forty Mile Desert”. Bradys Hot Springs, a major camp site along the trail, is located approximately 300 meters north of the project area. A Trails West marker (Trails West Marker No. 9) which describes this section of the trail is located approximately 400 meters south of the proposed project area. The Central Pacific Transcontinental Railroad (26Ch1075; CrNV-22-3755) also passed in the vicinity of the project area. The rail lines were torn up by the Southern Pacific, but the railroad grade remains between the east and west lanes of I-80. At its closest point, the railroad bed is 400 meters east of the project area. The current frontage road which the access roads depart from is old Highway 40, previously known as State Route 1 and the Victory Highway.

Don Buck of the Oregon California Trail Association (OCTA) recorded a segment of the California Trail in the immediate vicinity of the proposed well sites in the 1980s. Utilizing the OCTA trail classification system, he evaluated the trail segment as “Class I”, meaning that the trail segment was unaltered. The proposed well sites, drill pads, and access routes are within an area originally inventoried in CR2-921(P) for Munson Geothermal and Morrison-Knudsen in 1983 by Peak & Associates. This inventory did not record the trail or any other cultural resource sites in or near the proposed action.

A brief field meeting at the proposed action site was held on March 30, 2007 with Don Buck and Leslie Fryman of OCTA, as well as Brady Power Partners and BLM representatives. Although, the trail trace was not relocated at that time, a trail vintage artifact scatter in the immediate vicinity of the proposed pads was noted in the approximate location of the recorded trail trace.

Because the CR2-921(P) cultural resource inventory was over 20 years old and had not recorded the California Trail and possibly other historic sites in the area, a reinventory of the project area was required by BLM. Summit Envirosolutions was contracted in 2007 by Brady Power Partners to inventory a block survey area which included the proposed project area. In consultation with the Nevada State Historic Preservation Office (NSHPO) and OCTA, BLM required Summit Envirosolutions to survey the California Trail in the vicinity of proposed project area, attempting to verify the presence of the trail utilizing Mr. Buck's maps, and to evaluate the National Register eligibility of this segment of the trail. In areas where no physical traces or surface artifacts were noted, metal detectors were utilized to verify evidence of the trail and to assist with the National Register evaluation.

Summit Envirosolutions completed the survey, CR2-2966(P), in April, 2007. In this survey, Summit Envirosolutions verified the presence of a segment of the California Trail crossing the southeast corner of well pad 17-12. This segment of the trail was determined to be eligible to the National Register of Historic Places under criteria "a" and "d". In addition, two other sites were recorded outside the project area. CrNV-22-8301 was a segment of U.S. Highway 40 (CrNV-22-8301) and a historic site probably related to a service station and bathing facility that once existed along U.S. Highway 40 (CrNV-22-8302). Neither site CrNV-22-8301 nor -8302 were determined eligible to the National Register.

### **3.3 Migratory Birds**

Migratory birds may be found in the project area as either seasonal residents or as migrants. Migratory birds are protected and managed under the Migratory Bird Treaty Act (MBTA) of 1918, as amended (16 U.S.C. 703 *et. seq.*). Provisions of the Migratory Bird Treaty Act prohibit the killing of any migratory birds, including the taking of any nest or egg, without a permit. Executive Order 13186, titled "Responsibilities of Federal Agencies to Protect Migratory Birds," was signed on October 1, 2001 to further enhance and ensure the protection of Migratory Birds. Migratory birds do not include California quail, sage grouse, chukar partridge, gray partridge, ring-necked pheasant, mountain quail, and sharp-tailed grouse; birds well adapted to the winter climate.

The vegetation at the proposed well sites is characterized by a salt desert shrub vegetative community. Migratory birds associated with this type of vegetative community may include: black-throated sparrow (*Amphispiza bilineata*), brewer's sparrow (*Spizella breweri*), burrowing owl (*Athene cunicularia*), loggerhead shrike (*Lanius ludovicianus*), rock wren (*Salpinctes obsoletus*), sage sparrow (*Amphispiza belli*), sage thrasher (*Oreoscoptes montanus*), horned lark (*Eremophila alpestris*), and lark sparrow (*Chondestes grammacus*). The burrowing owl and loggerhead shrike are designated BLM Sensitive Species.

### **3.4 Native American Religious Concerns**

Bradys Hot Springs is located approximately 300 meters north of the proposed project area. Hot springs have been identified in the ethnographic literature and past Native American consultations as sacred sites. However, Bradys Hot Springs is no longer flowing and the setting has been heavily impacted by modern developments. Native American consultation for well sites 82-14 and 55-14 was conducted for the previous EA with the Fallon Paiute Shoshone Tribe and the Pyramid Lake Paiute Tribe. No comments were received from the Pyramid Lake Tribe.

The Fallon Tribe did not identify any sacred sites or traditional cultural properties in the project area. However, they were concerned that if any burials were found in the project area, that they would be protected. Since well sites 16-12 and 17-12 are in the general vicinity of the other two well sites (82-14 and 55-14) which had yielded no concerns about impacts to traditional cultural properties or sacred sites, no further Native American consultation was conducted for the proposed action.

### **3.5 Threatened/Endangered and Special Status Species**

A list of federally listed, proposed or candidate species was requested from the U.S. Fish and Wildlife Service for the analysis area in 2007. The Fish and Wildlife service responded that the yellow-billed cuckoo (*Coccyzus americanus*), a candidate species and bald eagle (*Haliaeetus leucocephalus*) may be found near the analysis area.

#### Yellow-billed Cuckoo

The yellow-billed cuckoo is a riparian obligate species that requires dense cottonwood-willow forested tracts (Neel, 1999). There are no riparian habitats with those characteristics occurring near the analysis area and no local occupation by this species is known. Any consideration of the cuckoo can be dismissed since it is not present and not affected.

#### Bald eagle

At the time of the request of a Threatened/Endangered species list from the Fish and Wildlife Service, the bald eagle was a threatened species. It has since been de-listed and is now a BLM Sensitive Species. The bald eagle may potentially occur incidentally as a very rare migrant in the analysis area although no foraging, nesting or roosting areas occur locally. For this reason, proposed activities are judged to have no effect on this species or its habitats and it will be dismissed from further analysis.

**Special Status Species** include federally listed, proposed, and candidate species, as well as State of Nevada protected species and BLM Sensitive Species. Nevada BLM policy is to provide State of Nevada Listed Species and Nevada BLM Sensitive Species with the same level of protection as provided for candidate species in BLM Manual 6840.06C, that is to “ensure that actions authorized, funded, or carried out do not contribute to the need for the species to become listed”.

A search of the Nevada Natural Heritage Program’s (NNHP) database and the Nevada Department of Wildlife (NDOW) diversity database were conducted in 2007 to determine which Special Status Species may occur in the area. According to information received during the search, the following species may be present near the project area.

#### Loggerhead Shrike

The Loggerhead shrike is known to occupy salt desert shrub habitats and therefore may occur in the analysis area. It nests in isolated trees and large shrubs and feeds mainly on small animals and insects. The loggerhead shrike is highly adaptable and uses human-made structures for perching while scanning for prey. The species is relatively common and well distributed across the state (Neel, 1999).

### Burrowing Owl

This species could occur in the area. Abandoned mammal burrows, such as those created by badgers, help to provide nesting habitat. This species tends to use disturbed or open sites with minimal vegetation for nesting and loafing, such as recent burned areas or areas near troughs, corrals, or livestock mineral licks where open terrain exists. This may be due to the lack of vegetation at these sites that allows increased visibility from the burrow entrance.

## **4.0 ENVIRONMENTAL IMPACTS**

### **4.1 Introduction**

This section identifies the impacts associated with the proposed project. All potential consequences related to the proposed action of road construction and geothermal well drilling are addressed. Impacts remaining after mitigation are identified and the cause, extent and relative importance are discussed. The proposed action will not cause any major unavoidable impacts. The proposed activities would cause minor environmental impacts.

### **4.2 Cultural Resources**

A National Register eligible segment of the Truckee River Route of the California Trail crosses through the southeast corner of well pad 17-12. The historic Central Pacific Railroad and State Highway 40 (the Victory Highway) are also located within 0.25 miles of the project area. The setting of the trail and other historic routes and sites in this area have already been compromised by I-80, the frontage road, a power line, a geothermal powered dehydration plant, a geothermal plant and associated pipeline, production and injection wells, gravel pits, roads and two tracks. No direct impacts to the trail or other cultural resources and no more than minimal impacts to the setting of the trail, the Central Pacific Railroad, U.S. Highway 40 and other cultural resources in the vicinity are anticipated if the following mitigation measures are implemented:

- BPP would be required to notify the WFO BLM archeologist at least 10 days prior to any surface disturbance activities to coordinate staking and fencing of drill pad and trail.
- The drill pad for well 17-12 would be moved to the west so that the nearest edge of the pad location is at least 30 meters (98 feet) from the trail.
- BPP would erect a construction fence 5 meters from the west side of the trail for a distance of 355 meters (1.164 feet) in order to protect the trail from construction activities.
- The southeast corner of drill pad 17-12 would also be fenced with construction fencing 50 meters to the north and west of the well pad corner.
- When the production wells are successfully completed, all well head and surface production equipment and facilities would be painted a color that blends with the natural surroundings. The selection of the color would be determined by WFO BLM

### **4.3 Migratory Birds**

The proposed project would result in the loss of a minor amount (less than 4 acres) of marginal Migratory Bird habitat. Impacts to nesting birds would occur if vegetation with nests with eggs or young is cleared during the nesting season (April 15-July 15). This situation would be

mitigated by assuring no areas with active Migratory Bird nests would be cleared until the nestlings have fledged (See Mitigation in Chapter 6.3 Migratory Birds). The overall impact to migratory birds is expected to be negligible.

#### **4.4 Native American Religious Concerns**

No impacts to Native American sacred sites or traditional cultural properties are anticipated to occur as a result of the proposed action if the following mitigation measures are implemented:

“Pursuant to 43CFR 10.4(g), the holder of this authorization must notify the authorized officer by telephone, with written confirmation, immediately upon the discovery of human remains, funerary items, sacred objects, or objects of cultural patrimony. Further, pursuant to 43 CFR 10.4(c) and (d), you must stop activities in the immediate vicinity of the discovery and protect it from you activities for 30 days or until notified to proceed by the authorized officer.”

If burials are discovered, the Fallon Tribe and other appropriate Tribes would be notified and the appropriate procedures followed.

#### **4.5 Threatened/Endangered and Special Status Species**

There would be no impacts to Threatened and Endangered species. The proposed project may result in the loss of a minor amount (less than 4 acres) of marginal habitat for the loggerhead shrike and burrowing owl. Any ground disturbing activities proposed during the migratory bird nesting season (April 15-July 15) would be surveyed for nests with eggs or young before ground disturbance could occur. This measure taken to protect migratory birds would also protect the loggerhead shrike and burrowing owl as both species are also migratory birds. The overall impact to these species would be negligible.

#### **4.6 No Action Alternative**

None of the previously described environmental consequences associated with the proposed activity would occur.

Geothermal resources are considered a mineral resource by the state and federal governments. The No Action Alternative would have an adverse effect on the continued development and monitoring of geothermal resources in the Bradys Hot Springs area. The geothermal energy production that would occur as a result of the proposed action would be deferred or foregone under the No Action Alternative.

Most resources would not be affected by the No Action Alternative. Since short term benefits would accrue to the local economy as a result of the proposed action, the economic impacts of the No Action Alternative can be viewed as the economic benefits that would be foregone.

## **5.0 CUMULATIVE EFFECT ANALYSIS**

The CEQ regulations for implementing NEPA (40 CFR 1508.7) define cumulative impacts as:

“ . . . the impact on the environment which results from the incremental impact of the action when added to other past, present, or reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time”

### **5.1. Cumulative Impacts Assessment Area**

For the purpose of this analysis, the cumulative impact assessment area has been identified as being within the Fernley Sink Watershed (USGS Nevada HUC 5 #1605010402). This watershed encompasses approximately 190,782 acres (See attached Figure 3).

Resource values identified as being affected by the proposed action have been evaluated for cumulative impacts. The cumulative impacts from past, present and reasonably foreseeable future actions remain low for air quality, visual resources, surface and ground water, lands and realty actions, geology and mineral resources, vegetation and soils, noxious weeds, wildlife, migratory birds, special status species, wild horse and burro, recreation, and paleontological resources due to limited surface disturbance and the limited scope of the proposed action. It has been determined that cumulative impacts would be negligible as a result of the proposed action or no action alternative (NV-020-05-07 pgs 22-28). Geothermal development has similar short-term impacts as other land disturbing activities but has fewer long-term impacts compared to other energy generation activities.

### **5.2. Past and Present Actions**

Past and present activities consist principally of agricultural development, livestock grazing, recreational activities, ROWs, transportation and access, wildfires, mineral exploration and geothermal exploration activities.

Geothermal wells were drilled in Bradys KGRA as early as the 1950s and a considerable amount of exploration has occurred in the area over the past several decades. A double flash power plant came on line in 1992, producing 21 megawatts of electricity, and a 5 megawatt binary unit was added in 2002 (Garside and Schilling, 2003).

### **5.3. Reasonably Foreseeable Future Actions (RFFAs)**

Geothermal resource exploration and development operations are on the rise and are expected to increase in the future. Known Geothermal Resource Areas (KGRA) hot springs, existing geothermal lease and lease application areas have the highest potential for future use, however; extensive areas of unexplored relatively high potential exist with the assessment area for cumulative impacts.

#### **5.4. Cultural Resources**

Prior to the passage of the National Historic Preservation Act of 1966, the National Environmental Policy Act of 1969, the Federal Land Policy and Management Act of 1976, and the Archeological Resource Protection Act of 1979, few if any measures to control or minimize impacts to cultural resources were required. The construction of the Southern Pacific Railroad, Highway 40, I-80, and other roads, as well as early mining and geothermal exploration and power line construction, have impacted the California Trail, the Central Pacific Railroad, and other cultural resource sites in the cumulative impacts area. This occurred particularly in the vicinity of Bradys Hot Springs where prehistoric and historic utilization of the hot springs took place. In addition to direct impacts to cultural resource sites, these developments impacted the setting of the California Trail, Central Pacific Railroad, U.S. Highway 40 and other cultural resources in the vicinity. Implementation of cultural resource laws has averted most direct impacts to cultural resources on public lands. However, the dehydration plant, the geothermal power plant and associated pipeline, production wells, gravel pits, roads and two tracks have increased impacts to the integrity of setting of the California Trail, the Central Pacific Railroad, and other cultural resources in the vicinity. The proposed action would not cause any increase in direct impacts to cultural resources if mitigation measures are implemented. Impacts to the integrity of setting of cultural resources sites would be minimally increased.

#### **5.5. Native American Religious Concerns**

Hot Springs are valued by Native Americans. Past geothermal exploration resulted in the desiccation of Bradys Hot Springs. Since the hot springs have already dried up, geothermal drilling is not anticipated to increase impacts to areas of Native American concern. The setting has also been compromised by modern development and the well heads would only minimally increase these impacts.

#### **5.6. Threatened/Endangered and Special Status Species and Migratory Birds**

There would be no cumulative impacts to Threatened and Endangered species. Cumulative impacts to Special Status species and Migratory Birds may have resulted from past and present actions within the analysis area as a result of previous drilling operations, road and freeway construction and the associated noise, cattle grazing and general human activity. Although there might have been disturbance or habitat impacts to these species, there is no documentation known to BLM that significant impacts have occurred. Temporary, localized displacements may have occurred during some of these activities. Overall, cumulative impacts to Special Status species and Migratory Birds and their habitat would be low.

#### **5.7 No Action Alternative**

No cumulative impacts, either directly or indirectly would result from the No Action Alternative.



## **6.0 MONITORING AND MITIGATION**

### **6.1 Introduction**

Environmental impacts of the proposed action would be mitigated as described below. The applicant is committed to project development efforts which minimize environmental impacts. Mitigation measures were identified in previous analysis (NV-020-05-07) and would be carried over in its entirety as Conditions of Approval (COAs) to these GDPs. These COAs would include additional mitigation to minimize identified impacts from this proposed action. (Copy of COAs attached as Appendix 1). BLM would be responsible to ensure the approved drilling operations are in compliance with 43 CFR 3260.

These following COAs would be included as additional mitigation to minimize the effects of the proposed action

### **6.2 Cultural Resources**

The following mitigation would be included as conditions of approval with the permit:s

- BPP would be required to notify the WFO BLM archeologist at least 10 days prior to any surface disturbance activities to coordinate staking and fencing of drill pad and trail.
- The drill pad for well 17-12 would be moved to the west so that the nearest edge of the pad location is at least 30 meters (98 feet) from the trail.
- BPP would erect a construction fence 5 meters from the west side of the trail for a distance of 355 meters (1.164 feet) in order to protect the trail from construction activities.
- The southeast corner of drill pad 17-12 would also be fenced with construction fencing 50 meters to the north and west of the well pad corner.
- When the production wells are successfully completed, all well head and surface production equipment and facilities would be painted a color that blends with the natural surroundings. The selection of the color would be determined by WFO BLM

### **6.3 Migratory Birds**

The following mitigation would be included as conditions of approval with the permits:

A careful examination of each area to be disturbed during the breeding season (April 15 to July 15), shall be done to assure no nests with eggs or young are present. Surveys shall be conducted by a qualified biologist acceptable to the Bureau of Land Management (BLM) Authorized Officer. If active nests are found, they shall be avoided by an appropriate distance to prevent destruction of the nest and disturbance of the nesting birds until they have fledged. Ground clearing activities outside of the breeding season are not subject to this condition of approval.

## **6.4 Native American Religious Concern**

The following mitigation would be included as conditions of approval with this permit:

“Pursuant to 43CFR 10.4(g), the holder of this authorization must notify the authorized officer by telephone, with written confirmation, immediately upon the discovery of human remains, funerary items, sacred objects, or objects of cultural patrimony. Further, pursuant to 43 CFR 10.4(c) and (d), you must stop activities in the immediate vicinity of the discovery and protect it from you activities for 30 days or until notified to proceed by the authorized officer.”

If burials are discovered, the Fallon Tribe and other appropriate Tribes would be notified and the appropriate procedures followed.

## **7.0 CONSULTATION AND COORDINATION**

### **7.1 List of Preparers**

#### Bureau of Land Management, Winnemucca Field Office

Lynn Harrison, Project Lead/Planning and Environmental Coordinator  
Rebecca Lange, Geologist  
Cameron McQuivey, Wildlife Biologist  
Margaret McGuckian, Archeologist  
Brooks Wilson, GIS Specialist

### **7.2 Agencies, Groups and Individuals Contacted**

#### Bureau of Land Management, Nevada State Office

Richard Hoops, Fluid Minerals Lead, BLM Nevada State Office  
John Menghini, Petroleum Engineer, BLM Nevada State Office

#### Brady Power Partners

Scott Kessler, Regulatory Affairs Administrator

#### Oregon California Trails Association

Don Buck, member  
Leslie Fryman, CA-NV Chapter Preservation Officer

## **8.0 REFERENCES** (NV-020-04-07 pgs. 31-32)

Bureau of Land Management, Winnemucca District Office, 1981, *Sonoma-Gerlach Grazing Environmental Impact Statement, Winnemucca.*

Bureau of Land Management, Winnemucca District Office, September 1984, *Desert Peak Geothermal Environmental Assessment, Churchill County, Nevada.* Serial Number NV-020-4-39.

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### **8.1 Additional References Specific to This Analysis**

Fernley Sink Watershed (USGS Nevada HUC 5 #1605010402).